Urban Poverty Dynamics in Peru and Madagascar, 1997–99: A Panel Data Analysis

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ABSTRACT Despite the increasing awareness concerning the importance of distinguishing chronic and transient poverty for policy making, cross-country comparative studies of poverty dynamics in developing countries are virtually non-existent. The small, though increasing, number of existing studies makes it difficult to draw general conclusions because of the methodological differences among them. Crucial questions are still unanswered. Are the factors associated with chronic poverty and vulnerability the same from one country to the other? What are the features that characterize exits from poverty? Based on a large three-wave panel sample of Peruvian and Madagascan urban households (1997–99), the importance of poverty transitions is examined, as well as the characteristics of the temporarily and the chronically poor, with respect to those of non-poor households. Then, we highlight through a multinomial logit model, the specific contributions of household characteristics (demographics, human and physical capital), but also of shocks experienced by these households (related to demographics and the job market) in explaining chronic poverty as well as poverty entries and exits. In this analysis, the impact of location variables linked to neighbourhoods (provision of public goods, income levels, human capital and employment structure, among others) on poverty transitions is also considered. One of the main findings is that the factors associated with permanent poverty amply cover the characteristics generally identified in analyses on static poverty correlates. Nevertheless, these results do not confirm the idea that only shocks are relevant to temporary forms of poverty. The type and quality of entry in the job market, as well as the features of the neighbourhood, turn out to be equally relevant in the analysis of poverty dynamics. These results suggest that the spatial inequality dimension should be added to analyses of income and poverty transition dynamics.

Introduction
In recent years, the fight against poverty has become the main objective of development policies. The mixed results produced by two decades of stabilization and structural adjustment on the standard of living of households in developing countries have led the international financial community, encouraged by the Bretton Woods Institutions, to rethink its strategy and develop new instruments to conduct what has now become a real crusade (Cling et al., 2003). This article presents a comparative analysis of poverty
dynamics in two developing countries—Madagascar and Peru—in the late 1990s. The interest of this research lies in a rigorous comparison of the factors that determine poverty transitions, based on two panels of urban households, over a three-year period, in two very different contexts. The first case examines one of the poorest countries in the world during a phase of rapid recovery, and the second an emerging country plunged into recession.

Judgements on the disappointing progress made in the fields of living standards and international inequality are generally founded on a static perspective, based on comparing the indicators of a given year with those of past years, ignoring household trajectories over time. By monitoring a panel of households we could address important questions that have not been studied in developing countries before. What is the rate of chronic poverty and transient poor? How significant is the economic mobility of households, particularly between poor and non-poor? Do the permanent poor have different characteristics from the transient poor? Do the same factors determine entry into poverty and exit from poverty? Which changes in household characteristics and environment are associated with upward and downward mobility? How can this dynamic approach to poverty help us to reconsider anti-poverty policies and reassess their efficiency? Few developing countries are equipped to tackle these issues, as this involves large-scale monitoring of the same households over time, and such surveys are still rare in these countries. The distinction between transient and chronic poverty may mean that different policies should be designed for the specific risk factors inherent to each category. It also helps in the understanding of targeting problems (leakage to the non-poor and exclusion of poor households), which may be linked to a high degree of social mobility between poverty and non-poverty.

Although abundant in developed countries, the literature on economic mobility and poverty dynamics based on panels of households (e.g. Jenkins, 1999) remains very scarce in developing countries, owing mainly to the lack of longitudinal data. Yaqub (2000) states that only 5 of the 44 low human development countries, and 7 of the 66 countries with intermediate human development, according to the UNDP classification, had access to panel data. Recently, Baulch & Hoddinott (2000) confirmed this shortage of panel data. However, the extreme diversity of the panels used (in terms of geographic extension, reference timeframe, type of sampling, welfare indicators, poverty line, etc.) considerably limits the analytical scope of the different case studies, particularly from the comparative standpoint.²

To our knowledge, this article is the first attempt to make a comparative analysis of poverty dynamics, based on a shared methodological approach and identical choices. By mobilizing two high-quality panels and adopting consistent procedures for constructing analytical variables, we studied the risk factors for entering and escaping poverty and those associated with chronic poverty, and analysed the impact of the level of development and the economic situation on the intensity of poverty flows. We paid special attention to shocks on households, including them among the variables that explain poverty transitions, distinguishing the different kinds (demographic and economic) and tackling endogeneity problems thanks to our three-year panel. We also broadened the field of factors explaining poverty transitions by adding variables associated with neighbourhood characteristics to the traditional individual characteristics of households, to assess the possible effects of geographic location on poverty.

In the following section, we briefly examine the macroeconomic context during the three-year period of the study (1997–99), and then in the third section we explain the main features of the data used and the methodological approach. The fourth section
focuses on a descriptive analysis of poverty transitions, which are modelled in the fifth section. Finally, the concluding section provides a summary of the study’s main results and examines some of their implications regarding policies designed to fight poverty.

### Macroeconomic Context

Despite very different development levels—per capita GDP is 10 times higher in Peru than in Madagascar (US$2400 and US$250, respectively)—both countries applied very similar policies in the 1990s. Following the failures of past economic policies, both Peru and Madagascar attempted to redirect their growth model by focusing on economic liberalization and opening up to the world economy. Reforms included the privatization of most public and para-public corporations, suppression of subsidies and price controls, labour market deregulation, elimination of exchange rate controls and foreign trade liberalization. These reforms were adopted by Madagascar in the mid-1980s, and in Peru in 1990, when President Fujimori came to power.

During the period 1997–99, Peru went into recession as a result of external shocks (short-term capital inflow dried up as a consequence of the Asian crisis and main export prices fell, compounded by the devastating effects of El Niño), with a resulting 8% drop in per capita household expenditure between 1997 and 1999. The national incidence of poverty increased significantly from 37.7% in 1998 to 42.2% in 1999.3

After stagnating during the first half of the 1990s, the Madagascan economy finally began to recover in 1997, with the first slight improvement in GDP per capita for many years (+1%). Since then, the process has quickened, and growth neared 5% in 2000. From 1995 to 1999, informal jobs in the cities were in decline, while real wages and household per capita income registered increases of 43% and 35%, respectively, spurred on by very generous public and private wage policies (Razafindrakoto & Roubaud, 1999). The evolution of poverty has followed household income fluctuations. National surveys conducted in 1993, 1997 and 1999 show that the national incidence of poverty decreased slightly from 1997 to 1999 (−2 points). However, this global observation conceals different dynamics in urban and rural areas. While levels of rural poverty remained high (76% and 76.7%), they declined by over 11 points in the cities (63.2% and 52.1%). Table 1 provides a comparison of data for Madagascar and Peru for 1999.

| Table 1. Madagascar and Peru in figures (1999) |
|-----------------------------------------------|
| Madagascar | Peru |
|-----------|------|
| Area (1000 km²) | 587 | 1285 |
| Population (millions) | 14.6 | 25.2 |
| Population growth rate (%) | 2.8 | 1.7 |
| Urban population (%) | 29 | 72 |
| Life expectancy (years) | 58 | 69 |
| GDP (US$ billion) | 3.7 | 51.9 |
| GDP per capita (US$) | 250 | 2130 |
| Investment rate (% GDP) | 12 | 22 |
| Tax burden (% GDP) | 11 | 12 |
| Foreign debt (% GDP) | 123 | 61 |

Source: Author’s calculations from official statistics.
Data, Methodology and Attrition

Analysis of individual poverty transitions requires panel data and also, owing to the comparative perspective adopted here, implies that the surveys and processing procedures should be harmonized. These two imperatives explain why, to our knowledge, no such research had been conducted previously. The following is a brief description of the data used and the main methodological options chosen.

ENAHO Survey in Peru

In 1996, with the support of the Inter-American Development Bank, the Peruvian National Statistics and Data Processing Institute (INEI) set up a system of household surveys (ENAHO), as part of the MECOVI Program. They were designed to monitor the population’s living conditions, among other things. One of the major innovations of the Program was the constitution of a large national panel of households. Besides their national coverage, the surveys broke the results down into seven geographical areas, in addition to the distinction between urban and rural areas. Four quarterly surveys were involved, each focusing on a specific issue (violence, employment, health, education, household expenditure). In the present case study, we used only waves in the last quarter of each year, as they were the only ones to be panel based.

The panel was composed of 1720 urban households and of almost 8000 individuals present every year over the period 1997–99. Two biannual sub-panels, of 2709 households in 1997–98 and 1872 households in 1998–99, were also available. The households present in the panel for all three consecutive years represented a little over 40% of the total in 1997 and 1998, and nearly 78% in 1999. In addition to the information on individuals’ housing and demographic features, the surveys included sections on areas such as education, health, expenditure, income and employment.

1-2-3 Survey in Madagascar

The National Statistics Institute (INSTAT), with the support of the MADIO Project, introduced a 1-2-3 household survey system in the capital city of Antananarivo in 1995 (Rakotomanana et al., 2000; Ramilison et al., 2000). It is based on a yearly labour force survey (phase 1) of a sample of 3000 households and approximately 15 000 individuals. This survey was the basis of phases 2 (informal sector) and 3 (consumption, poverty), conducted every three years (1995, 1998, 2001), using the survey-grafting principle. In 2000, the survey was extended to the country’s 7 largest cities. We must stress that survey designs such as these were unheard of in sub-Saharan Africa, and that, given the strict control procedures used at every step (collecting, screening, processing), the quality of the Madagascan data is far superior to that found in most household surveys in Africa.

The results analysed in this paper were taken from the 1995–2000 labour force surveys, particularly the 1997–99 panel data. Since 1997, the principle of renewing a third of the sample each year (i.e. 1000 households) has been adopted. Nonetheless, taking into account the loss observed between 1997 and 1998, the total 1998 sample was surveyed in 1999. Finally, the 1997–99 panel was based on a usable sample of 2676 households: 1551 surveyed in 1997 and 1998, and 2371 in 1998 and 1999, including 1249 for which data were available over the three years of the study. Because information was gathered
individually from all household members, 13,539 individuals belonging to 2,676 households were involved: 8,149 in 1997 and 1998, and 12,138 in 1998 and 1999, including 6,478 over the three-year period. Besides the traditional socio-demographic data and housing features, the survey addressed the individuals’ situation vis-à-vis the labour market (inactivity, unemployment, job type), as well as income. Table 2 provides details of the samples used for the period 1997–99.

Table 2. Samples used, 1997–99

| Number of households | Madagascar | Peru |
|----------------------|------------|------|
|                      | 1997  | 1998 | 1999 | 1997 | 1998 | 1999 |
| Total sample         | 3,000 | 3,002 | 3,002 | 4,022 | 4,044 | 2,218 |
| 1997–98 panel        | 1,551 |      | —    | 2,709 | 2,709 | —    |
| 1998–99 panel        |      | 2,371 | 2,371 | —    | 1,872 | 1,872 |
| 1997–98–99 panel     | 1,249 | 1,249 | 1,249 | 1,720 | 1,720 | 1,720 |

Source: 1-2-3 surveys 1997–99, MADIO; Enaho 1997–99, INEI; authors’ calculations.

Measuring Welfare and Constructing Poverty Lines

Unlike many studies, welfare levels and the related monetary poverty measurements have been based on household per capita income. This choice was made chiefly to enable a comparison of the two countries—expenditure estimates were not available for the Madagascan panel—but also for a certain number of analytical considerations. Since the aim of the study was to link macroeconomic shocks to changes in household living standards over a short period, it did not seem very appropriate to use the consumption variable, often interpreted as a measure of permanent income. Income seemed more closely connected to conditions in the labour market, which was also under the direct influence of the macroeconomic situation. Furthermore, in terms of economic policy, it is easier to act on income than on consumption, since the latter is actually only a result of the former.

We considered urban households only, to ensure that exogenous, weather-related shocks were minimized. In late 1997, the El Niño phenomenon severely affected agricultural activities in Peru. Both entries into poverty (in 1998) and exits from poverty (in 1999) in rural areas can be linked to the resulting fall and subsequent recovery of agricultural production, but the actual proportions are difficult to assess. This was obviously much less common for urban income, which is more closely linked to changes in the domestic market. The ‘income’ variable used in this study corresponds to the sum of all incomes (monetary and non-monetary) of each household member, except for capital income. They include wages from work in the main and secondary, formal and informal activities, as well as benefits in kind, social assistance benefits and pensions. To establish inter-temporal and geographic comparisons we adopted an absolute poverty line common to both countries, constructed using strictly the same iterative methodology proposed by Ravallion (1996), and further developed by Pradhan (2001). Calculated for 1998, when consumption surveys were available for both countries, these lines were retropolated (1997) and extrapolated (1999) using the corresponding consumer price index. Total poverty lines amounted to an equivalent of 2 and 4 current dollars in Madagascar and Peru, respectively.
Attrition

Finally, we examined the issue of potential attrition biases to ensure that our panels offered a representative picture of the situation to be examined in each country. The attrition rate was quite substantial in Madagascar (22% from 1997 to 1998, and 21% from 1998 to 1999). The rates were much lower in Peru (12% and 3%, respectively). These levels are in line with or lower than the attrition rates found by Alderman et al. (2000) in different countries (from 16% in South Africa, up to 35% in Bolivia and even 41% in Kenya, for couples). However, there is not necessarily a relationship between attrition levels and attrition bias—it depends whether the attrition process is selective and related to our outcome variables of interests. We test this more formally below.

Comparing the distribution of some household characteristics (in 1997) by attrition status, we confirmed that the attrition process is not random. In both countries, the profile of attritors is standard in panel data. Attritors are significantly younger, better educated, with smaller-sized households, and are less often owners of their dwellings. All these factors make attritor households more mobile. In terms of income per capita, attritors earn on average 13% more than non-attritors in Madagascar and 17% in Peru (the differences are significant at 10% and 5%, respectively). However, there is no significant difference in poverty status in 1997 (with various poverty-line thresholds) between attritors and non-attritors, which suggests that attrition may be random with respect to our indicator of welfare.

To go further, we estimated two different models to test the existence of attrition biases, following the procedures proposed by Moffit et al. (1999) and Alderman et al. (2000). First, the attrition probability was not affected by the level of income per capita in the base period (logit model). Second, the dummy for attrition was not significant in the income per capita equation. Moreover, the likelihood ratio test rejected the hypothesis that attritors’ household characteristics were significantly different from non-attritors'. In conclusion, despite substantial attrition rates and unconditional attritor profiles significantly different from non-attritors, panel attrition should not be considered a serious problem in our econometric analysis of poverty transitions.

Individual Poverty Dynamics, 1997–99

Poverty Transitions

In Madagascar, in a context of increasingly fast decline in poverty, slightly more than 10% of individuals exit poverty every year. But, reciprocally, between a third to over 40% of the non-poor enter poverty the following year, showing that not being identified as poor at a given time in no way guarantees that this situation will continue over the longer period. In Peru, which experienced an initial phase of poverty reduction, followed by severe deterioration the following year, transitions into and out of poverty were also intense. Nearly 40% of the poor escaped their situation every year, while 13–20% took the opposite route. In both cases, the transition matrices show surprisingly stable structures over time, although the overall rise (decline) of poverty tends to inflate (reduce) flows into (out of) poverty and limit exits (entries). In total, 17% of individuals change categories in Madagascar every year. In Peru, these ‘cross-overs’ represent between a quarter and a fifth of Peruvians.

Figure 1 is a reconstruction of all flows into and out of poverty over the three-year period in question. It displays three interesting results. First, it gives an exact idea of
Figure 1. Flows into and out of poverty from 1997 to 1999. Source: panels, 1-2-3 surveys 1997–99, MADIO; Enaho 1997–99, INEI; authors’ calculations.
the complexity of poverty transitions. Second, the chart confirms that poverty frontiers go far beyond the category of the poor covered by cross-section (one-shot) analysis. Whereas the poverty rate in 1999 was 77%, 91% of Antananarivo residents had gone through at least one episode of poverty in the two previous years. In Peru, the proportions were 32% and 48%, respectively. However, regardless of the significance of these changes, a hard core of chronic poverty remains which, on the basis of our three-year panel, can be estimated at 13% in Peru and 65% in Madagascar. Finally, it appears that poverty is a memory process. Experiencing poverty at a given time actually increases the probability of remaining poor.

In 1999, in both countries, the probability of staying poor was 24 points higher, depending on whether or not the person had been poor in 1997 (71% and 47% in Peru, and 90% and 66% in Madagascar, respectively). Symmetrically, individuals who had not been poor in 1998 had a far greater chance of remaining out of poverty the following year, whether or not they had been poor in 1997. The difference in probabilities was 28 points in Peru (85% and 57%, respectively) and 40 points in Madagascar (85% and 45%).

Two not necessarily exclusive interpretations can be given to explain this phenomenon. First, being identified as transient poor could act as a signal to detect structurally fragile households (e.g. unstable family, unstable employment and/or health problems). Second, having gone through periods of poverty may weaken households (deschooling, illness, under-investment, aversion to risk) and lead them to real poverty traps from which it is difficult to escape. These hypotheses are formally tested in the fifth section addressing the path dependency issue (i.e. the hypothesis that time spent in poverty in the past increases the probability of remaining poor in future periods).

Analysis of Poverty Profiles

Comparing poverty profiles provides an initial idea of how households are differentiated according to their status with respect to poverty. From the 1997–99 panel of households that took part over the entire period, we constructed three categories of households: the chronically poor (those who remained poor over the three-year period), the transient poor (those who were poor for one or two years) and the never poor. The variables were sorted into three groups, relating to household heads, household structure and neighbourhood of residence. These variables were measured for the baseline year, 1997. This first descriptive approach was complemented by statistical tests, to assess the significance of the differences observed among the distributions.

The first observation is the stunning similarity between the socio-demographic features of both countries’ sample. Madagascan households were slightly larger than Peruvian households (5.8 as opposed to 5.4 in Peru), and its population was slightly younger and less educated. The relative youth of Antananarivo residents was reflected in terms of employment by a higher dependency rate (inactive/active ratio) for Madagascar. Employment structure clearly differentiated the two countries. Jobs were more highly qualified in Peru (proportion of white-collar workers) and the industrial sector more developed, while the Madagascan capital was characterized by the massive prevalence of services and of the informal sector. The greatest differences are to be found in the areas of housing and access to public infrastructure services. These indicators clearly reflect different levels of development, especially Madagascar’s accumulated shortcomings in terms of public investments.
If we examine the variables associated with the different forms of poverty, we can identify those that perform similarly in both countries and those that correspond to specific national features. In both countries, household size, demographic weight of young children, age and low level of education of the household head and, more broadly, the human capital resources of the entire household, are some of the factors associated with a high incidence of poverty, particularly chronic poverty. The type of housing and access to basic infrastructure (water, electrical power) also clearly divide the three household categories. The level of economic dependency, the proportion of public-sector jobs and household asset levels are significantly linked—positively in the first case, negatively in the others—to status with respect to poverty. More originally, neighbourhoods differentiate the diverse forms of poverty. The poor tend to live in disadvantaged neighbourhoods, as regards both individual characteristics (lower average income, more informal-sector jobs) and access to public services (water, electricity, etc.). In both cities, poverty involves a spatial component, but we must take a closer look at the causes: do the poor gather in ‘poor’ neighbourhoods or rather is it that living in such neighbourhoods reinforces or leads to poverty? We will examine this question in the following section.

As for the differences between the two countries, in Peru men seem to have a relative advantage, while in Madagascar—a more egalitarian society with respect to gender—the sex of household heads is irrelevant. However, the most interesting result was the effect of employment on poverty. Typically, in both countries, the more household members are involved in the informal sector, the poorer they are (and inversely, in relation to the formal private sector). However, while in Madagascar these two variables clearly distinguish the two different forms of poverty, this is not the case in Peru, where no significant difference between the chronically poor and transient poor is registered. This result could reflect the reduction in formal-sector wage employment over the past two decades, which led to the massive impoverishment of households that had belonged to the middle class. Finally, and paradoxically, the characteristics of neighbourhoods seemed more significant in Madagascar than in Peru, at least in differentiating chronic from transient poverty, whereas spatial polarization (in terms of residents’ incomes) was lower. This phenomenon cannot be explained a priori by less social mixing in the Madagascar capital, but rather by less polarized urban infrastructure policies in Madagascar. Table 3 provides poverty profiles according to poverty status.

Factors Determining Poverty Transitions

To our knowledge, the approach proposed here is the first comparative study on the factors that determine poverty transitions in two developing countries. To ensure result comparability, the data were treated in strictly the same manner: construction of the welfare indicator, definition of the poverty line, types of households, equal numbers of panel waves, study periods, estimation model and method and, lastly, independent variables. Regarding the latter, our study is distinct from others in that, besides the usual individual socio-economic characteristics of household heads and of the households to which they belong, it also considered the non-current shocks suffered by these households (labour market shocks, demographic shocks). The study is also original because it took into account variables linked to the spatial location of households.
Table 3. Poverty profiles according to poverty status

|                           | Madagascar | Peru         |
|---------------------------|------------|--------------|
|                           | Chronically poor | Transient poor | Never poor | Total | Chronically poor | Transient poor | Never poor |
| Total %                   | 64.9       | 26.0         | 9.0        | 100   | 12.5           | 32.7           | 54.8       |
| Household head            | 43.9***    | 46.7+++      | 47.6       | 44.9  | 47.5           | 43.5***        | 47.6+++     | 48.3       |
| Age                       | 43.9***    | 46.7+++      | 47.6       | 44.9  | 47.5           | 43.5***        | 47.6+++     | 48.3       |
| Sex %                     | Male       | 86.2         | 83.6*      | 89.8  | 85.9           | 83.6           | 76.5**      | 84.6+++    |
| Education %               | No school/primary | 51.6***      | 27.4***+++ | 10.0  | 41.5           | 35.2           | 48.4***     | 46.4***     | 25.5       |
|                          | Secondary  | 45.6         | 52.8**     | 38.4  | 46.8           | 40.8           | 45.1        | 43.5        | 38.3       |
|                          | University | 2.8***       | 19.9***+++ | 51.6  | 11.7           | 24.0           | 6.5***      | 10.0***     | 36.3       |
| Job experience            | 31.7**     | 31.6*        | 28.4       | 31.4  | 33.3           | 31.2           | 34.9***++   | 32.8       |
| Marital status %          | Couple, married | 76.2**       | 73.8**     | 83.9  | 76.3           | 60.0           | 49.7***     | 56.4***     | 64.4       |
|                          | Couple, unmarried | 7.4***       | 3.5+++     | 1.4   | 5.8            | 19.8           | 26.2**      | 27.2**      | 13.8       |
|                          | Single     | 16.4         | 22.6*      | 14.8  | 17.9           | 20.2           | 24.0        | 16.4***+    | 21.8       |
| Job position %            | Skilled wage worker | 11.0***      | 26.8***    | 68.0  | 19.8           | 30.7           | 7.1***      | 19.3***+++  | 42.9       |
|                          | Unskilled wage worker | 45.7***      | 41.2***    | 22.1  | 42.7           | 32.1           | 33.9        | 41.3***     | 26.0       |
|                          | Independent | 43.3***      | 31.3***    | 9.9   | 37.5           | 37.2           | 59.0***     | 39.4***+++  | 31.1       |
| Institutional sector %    | Public     | 17.1**       | 27.6+++    | 37.5  | 21.4           | 12.1           | 4.6***      | 8.7***      | 16.0       |
|                          | Private formal | 27.2***      | 35.8***+++ | 50.4  | 31.3           | 36.1           | 22.7***     | 26.2***     | 45.2       |
|                          | Informal   | 55.7***      | 36.6***+++ | 12.1  | 47.3           | 51.8           | 72.7***     | 65.1***     | 38.8       |
| Branch %                  | Primary sector | 8.5          | 3.7++      | 3.5   | 6.9            | 11.9           | 24.5***     | 15.9***+++  | 6.6        |
|                          | Industry   | 34.7**       | 33.6*      | 24.1  | 33.5           | 51.2           | 49.9        | 57.3**      | 47.9       |
|                          | Services   | 56.9***      | 62.6*      | 72.5  | 59.6           | 36.9           | 25.6***     | 26.8***     | 45.6       |
| Secondary job %           | Yes        | 17.3         | 12.0+++    | 13.2  | 15.6           | 13.3           | 14.4**      | 11.3        | 14.3       |
| Household size            | 6.3***     | 5.0+++      | 4.5         | 5.8   | 5.4            | 6.6***         | 6.1***      | 4.8        |
| Composition               |            |             |             |       |                |                |             |             |
| Number of members | 0–9 years | 1–0.57++ | 0.70 | 1.57 | 1.25 | 2.1+++ | 1.4+++ | 0.95 |
|------------------|-----------|-----------|------|------|------|--------|--------|------|
| 10–15 years      | 1.11+++   | 0.57+++   | 0.49 | 0.91 | 0.85 | 1.2+++ | 1.0+++ | 0.55 |
| 16–60 years      | 3.11      | 3.13      | 3.11 | 3.11 | 3.11 | 3.11   | 3.11   | 3.0 |
| Over 60 years    | 0.17      | 0.27+++   | 0.20 | 0.20 | 0.20 | 0.2    | 0.2    | 0.4 |
| Structure %      |           |           |      |      |      |        |        |      |
| % members 0–9 years | 29.6+++  | 19.1+++   | 14.3 | 25.5 | 20.5 | 31.6+++ | 22.2+++ | 16.9 |
| % members 10–15 years | 15.9+++ | 9.6+++    | 8.5  | 13.6 | 13.1 | 18.0+++ | 15.9+++ | 10.4 |
| % members 16–60 years | 50.1+++ | 64.1+++   | 70.0 | 55.5 | 58.5 | 46.1+++ | 55.0+++ | 63.5 |
| % members over 60 years | 4.4+++ | 7.1+++    | 7.2  | 5.3  | 7.9  | 4.4+++  | 6.8+++  | 9.3 |
| Nuclear household % |          |           |      |      |      |        |        |      |
| Yes              | 69.7      | 64.1      | 73.0 | 68.6 | 62.4 | 64.7    | 57.4    | 64.8 |
| % of income earners | 37.2+++ | 42.4+++   | 53.4 | 40.0 | 47.9 | 32.4+++ | 44.2+++ | 53.7 |
| % of occupied members | 41.4+++ | 45.4+++   | 55.9 | 43.8 | 46.4 | 34.5+++ | 44.3+++ | 50.4 |
| Human capital rate | 0.36+++  | 0.50+++   | 0.63 | 0.42 | 0.49 | 0.39+++ | 0.45+++ | 0.54 |
| Institutional sector % |         |           |      |      |      |        |        |      |
| Public/working age member | 5.6+++ | 10.8+++   | 23.8 | 8.6  | 6.9  | 2.1+++  | 5.3+++  | 9.0 |
| Private formal/WAM | 21.6+++  | 25.5+++   | 35.6 | 23.8 | 22.7 | 15.0+++ | 17.3+++ | 27.7 |
| Informal WAM      | 43.5+++  | 26.6+++   | 12.7 | 36.3 | 34.6 | 44.8+++ | 42.6+++ | 27.5 |
| Unemployed, inactive/WAM | 29.3 | 37.1+++   | 27.9 | 31.3 | 35.8 | 38.1    | 34.8+++ | 35.8 |
| Occupation status % |          |           |      |      |      |        |        |      |
| Home owner with title | 36.8+++ | 45.1+++   | 48.2 | 40.0 | 72.7 | 71.5    | 67.6+++ | 76.0 |
| Home owner without title | 14.7+++ | 9.8+++    | 8.1  | 12.8 | 6.2  | 6.3     | 11.2+++ | 3.2 |
| Tenant & others   | 48.5      | 45.1      | 43.7 | 47.2 | 21.1 | 22.1    | 21.1    | 20.8 |
| Indoor tap %      | 3.5+++    | 23.9+++   | 65.9 | 14.5 | 75.1 | 59.5+++ | 64.2+++ | 85.2 |
| Electrical lighting % | 46.5+++ | 81.0+++   | 96.7 | 60.0 | 92.7 | 80.0+++ | 88.6+++ | 98.0 |
| Indoor toilet %   | 1.5+++    | 16.3+++   | 50.0 | 9.8  | 67.2 | 37.2+++ | 54.0+++ | 81.8 |
| No. of assets owned | 1.2+++   | 2.4+++    | 4.9  | 1.8  | 3.8  | 1.7+++  | 2.6+++  | 5.0 |
| Average income    | 77.3+++   | 95.9+++   | 113.7| 85.5 | 405.6| 194.9+++| 280.0+++| 528.7|
| Access to sanitation % | 10.3+++ | 20.9+++   | 33.4 | 15.1 | 74.6 | 63.6+++ | 64.8+++ | 82.9 |
| Access to electricity % | 55.6+++ | 70.7+++   | 78.9 | 61.7 | 92.2 | 81.4+++ | 89.6+++ | 96.3 |
| Informality rate % | 53.3+++   | 44.8+++   | 38.6 | 49.8 | 50.9 | 64.9    | 58.7    | 43.1 |

**Differences in distribution with the ‘never poor’ category are significant at the 1% level (** and * = significant at the 5% and 10% levels, respectively).+++ , +++, + and + represent the differences in distribution between ‘transient poor’ and ‘chronically poor’ categories.**

**Source:** panels, 1-2-3 surveys 1997–99, MADIO; Enaho 1997–99, INEI; authors’ calculations.
A Review of the Literature

As underlined by Baulch & Hoddinott (2000, p. 2), there are very few studies on individual poverty dynamics in developing countries, although developments in this field of research have recently begun. Most of the work on the inter-temporal aspects of poverty has been conducted within a static comparative perspective. However, Chaudhuri & Ravallion (1994) demonstrate that static poverty indicators distinguish only quite inadequately the chronically poor from the transient poor. As mentioned in the introduction, the main cause for this shortcoming is the absence of longitudinal household surveys in most developing countries. Table 4 lists the different studies conducted on poverty dynamics in developing countries. Half of them examine a few hundred households, and about 40% include only two points in time. The limited data available weaken the robustness of their results (limited sample representativeness, difficult identification of the forms of poverty, whether chronic and transient, and of the shocks experienced by the households).

These studies are different not only with respect to the length of time analysed (and number of waves) but also to the geographic coverage. They also present a great diversity of methodological options and issues addressed. An important point is how to define chronic poverty and transient poverty, as there are two approaches. The first approach, the most common and the one we have adopted is based on crossing the poverty line, in one direction or another, which allows the definition of poverty states. Instead of distinguishing individuals or households in chronic or transient poverty, the second approach aims to isolate a chronic component and a transient component of income. This approach was first used by Jalan & Ravallion (1998, 2000) in their study on rural households in Southern China, and then, for example, by McCulloch & Baulch (1998, 1999) in Pakistan. As pointed out by Yaqub, these two ways of defining poverty—as chronic or transient—are not equivalent. In this sense, in the case of a study on India by Gaiha & Deolalikar (1993), among households whose permanent income was below the poverty line, only a third had current incomes below that line for each of the nine periods covered by the survey (Yaqub, 2000, p. 4). In the end, the extreme heterogeneity of the data and methods makes it difficult to compare results, identify patterns and, therefore, formulate policy proposals, differentiated according to the chronic or transient nature of the poverty encountered.

The Econometric Model

In the previous section on poverty transition profiles, we examined the unconditional risk that households with given characteristics may experience any of the poverty transition states. Through this, we identified variables potentially relevant to policies to fight chronic and transient poverty. A more analytical approach, however, requires that the specific effect of each variable be isolated, while maintaining the impact of the other variables constant. The present section will focus on modelling the factors associated with entries into and exits from poverty, as well as the conditions of the ‘chronically poor’ and ‘never poor’.

We chose to model poverty transitions rather than income dynamics. Our attention is therefore focused on discrete income variations on both sides of the poverty line. The dependent variable corresponds to the four states of poverty transition (chronic poverty, exits from poverty, entries into poverty and non-poverty) observed from 1998.
Table 4. Panel studies of poverty and income dynamics

| Source                   | Country        | No. of waves | Period of study       | Welfare indicator | Panel size | Theme                                                                 |
|--------------------------|----------------|--------------|-----------------------|-------------------|------------|----------------------------------------------------------------------|
| Reardon & Taylor (1996)  | Burkina Faso   | 2            | 1983/84–1984/85       | Income            | 150 households | Impact of climactic shocks on poverty dynamics                       |
| Carter (1999)            | South Africa   | 2            | 1993–98               | Expenditure       | 1183 households | Poverty dynamics, economic mobility, role of assets                  |
| Carter & Mai (1999)      | South Africa   | 2            | 1993–98               | Expenditure       | 1183 households | Poverty dynamics                                                     |
| Maluccio et al. (2000)   | South Africa   | 2            | 1993–98               | Expenditure       | 1400 households | Social dynamics of poverty                                           |
| Dearcon & Krishnan (2000)| Ethiopia       | 3            | 1994–95               | Expenditure       | 1450 households | Poverty dynamics and nutrition                                       |
| Gaiha (1989)             | India          | 3            | 1968/69–1970/71       | Income            | 4118 households | Characteristics of the chronically poor                              |
| Gaiha (1988)             | India          | 3            | 1968/69–1970/71       | Income            | 4118 households | Poverty transitions and economic mobility                           |
| Gaiha & Deolalikar (1993)| India          | 9            | 1975/76–1983/84       | Income            | 170 households   | Chronic poverty according to different approaches                   |
| Chaudhuri & Ravallion (1994) | India      | 8            | 1975/76–1982/83       | Income, expenditure | 170 households | Methodological aspects in targeting policies aimed at the chronically poor |
| Lanjouw & Stern (1991)   | India          | 4            | 1957/58–1983/84       | Income            | 143 households     | Poverty transitions                                                  |
| Walker & Ryan (1990)     | India          | 10           | 1975/76–1984–85       | Expenditure       | 240 households     | Socio-economic dynamics                                              |
| Grootaert & Kanbur (1995)| Ivory Coast    | 2            | 1985–86               | Expenditure       | 700 households     | Poverty transitions                                                  |
| Grootaert et al. (1997)  | Ivory Coast    | 2            | 1987–88               | Expenditure       | 700 households     | Factors determining per capita spending variations                  |
| Herrera (1999)           | Peru           | 4            | 1985, 1990, 1994, 1996| Expenditure       | 460 households     | Factors determining poverty transitions, economic mobility           |

(Table continued)
| Source                                      | Country | No. of waves | Period of study | Welfare indicator | Panel size       | Theme                                                                 |
|--------------------------------------------|---------|--------------|----------------|-------------------|-----------------|----------------------------------------------------------------------|
| Herrera (2001b)                            | Peru    | 3            | 1997–1999      | Expenditure       | 3100 households  | Factors determining poverty transitions                            |
| Cumpa & Webb (1999)                        | Peru    | 3            | 1991, 1994, 1996 | Expenditure       | 676 households   | Poverty transitions                                                  |
| Glewwe & Hall (1995)                       | Peru    | 2            | 1985/86–1990   | Expenditure       | 699 households   | Factors determining per capita spending variations                  |
| Jalan & Ravallion (1998)                   | China   | 6            | 1985–90        | Expenditure       | 38 000 individuals | Transient and chronic poverty and targeting the poor                 |
| Jalan & Ravallion (2000)                   | China   | 6            | 1985–90        | Expenditure       | 38 000 individuals | Factors determining transient and chronic poverty                   |
| McCulloch & Calandrino (2002)              | China   | 5            | 1991–95        | Income            | 3311 households  | Poverty dynamics, vulnerability                                      |
| McCulloch & Baulch (1998)                  | Pakistan|              | 1986/87–1990/91| Income            | 686 households   | Poverty transitions                                                  |
| McCulloch & Baulch (1999)                  | Pakistan| 5            | 1986/87–1990/91| Income            | 686 households   | Factors determining transient and chronic poverty                   |
| Mroz & Popkin (1995)                       | Russia  | 4            | 1992–94        | Income            | 6300 housing units | Poverty and employment transitions                                  |
| Scott & Litchfield (1994)                  | Chile   | 2            | 1967/69–1985/86| Income            | 146 households   | Factors determining economic mobility and inequality                |
| Scott (2000)                               | Chile   | 2            | 1967/69–1985/86| Income            | 146 households   | Poverty transitions                                                  |
| Glewwe et al. (2000)                       | Vietnam | 2            | 1992–93, 1997–98| Expenditure       | 4281 households  | Factors determining transient and chronic poverty                   |
| Freire (2000)                              | Venezuela| 2            | 1997–98        | Income            | 7744 households  | Economic mobility and poverty transitions                            |
| Kedir & McKay (2003)                       | Ethiopia| 3            | 1994, 1995, 1997| Expenditure       | 1036 households  | Poverty transitions                                                  |
| Lawson et al. (2003)                       | Uganda  | 2            | 1992/1999      | Expenditure       | 1398 households  | Poverty transitions                                                  |

Source: Based on Yaqub (2000) and Baulch & Hoddinott (2000, p. 7) and actualized by the authors.
to 1999. The estimated model is a multinomial logit model, so the same variable may have a differentiated impact depending on the type of poverty transition:

\[ P_{ij}(y_i = 1|x_i) = \frac{1}{\sum_{j=2}^{4} e^{\beta(j)X_i}} \]

\[ P_{ij}(y_i = m|x_i) = \frac{e^{\beta(j)X_i}}{\sum_{j=2}^{4} 1 + e^{\beta(j)X_i}} \quad \text{for } 4 > m > 1, \]

where \( P_{ij} \) is the probability that household \( i \) is in poverty transition state \( j \).

Four sets of variables are used: three of them cover structural characteristics concerning household heads (model 1), households (model 2) and their neighbourhood (model 3). The fourth corresponds to variables related to shocks experienced by households (model 4), divided in two subgroups: demographic and economic shocks. To avoid the simultaneity and endogeneity problems mentioned above, the structural variables are those from the beginning of the period (1998) and the shock variables are those of the prior period (1997–98), taking advantage of the three observation points in time available. Variables were introduced block after block, which helped to assess the robustness of our results.9

The choice of this type of modelling requires some comment.

First, the choice of four states, in particular the distinction between entry into and exit from poverty within transient poverty, is justified for related reasons. From the economic point of view, factors that may throw a household into poverty are not necessarily the same as those that would enable it to exit poverty. Just looking at the possible existence of poverty traps should be enough to explain such dissymmetry. In such a case, the policies to be implemented would therefore be different. This hypothesis is confirmed statistically, since, in both countries, statistical tests rejected the hypothesis that different transition states could be combined;10 the variables chosen therefore correctly differentiate the four poverty states analysed (see Appendix Table A1).

Second, since transition statuses are determined wholly by the relative position of incomes with respect to the poverty line, a model to determine panel incomes could have been considered more pertinent, within the perspective of an estimation strategy that maximizes the information available (especially on income amounts). Two reasons led us to discard this solution initially, on the understanding that we intended to look into this option later on. First, as our objective was to compare our results with those obtained in other studies, a similar type of modelling had to be adopted. Then, income and poverty were nonetheless equivalent because we chose an absolute poverty line close to the cost of required calories threshold. It may therefore be considered that crossing the poverty line has an economic meaning and specific consequences for the households concerned, which would not be the case if a more arbitrary, relative threshold had been chosen, since the effect of independent variables on incomes is not necessarily linear and may play differently below and above the poverty line. Finally, binding the incomes of the poor and the non-poor limits the impact of biases caused by income measurement errors, which we know are far from negligible. However, it was essential to ensure that changes in poverty status were not the result of small income variations from one period to the next, which in turn could be attributed to measurement errors. Overall, this hypothesis could be discarded for both countries. The income variations
experienced by households entering or exiting poverty were significant enough while remaining of ‘reasonable’ size in the short term, that is, totally compatible with exogenous (macroeconomic and climactic) shocks suffered by households in developing countries, in the absence of institutional social protection. For instance, in both Madagascar and Peru, nearly 85% of those who entered poverty between 1998 and 1999 saw their income fall over 30%, and vice versa in respect of those who exited poverty.11

Finally, the question of shocks needs to be developed further. The underlying hypothesis of the existing studies on poverty transitions that we sought to test is that a lack of physical assets and human capital is mainly associated with chronic poverty, while transient poverty is more closely linked to shocks suffered by households, which leads to greater income variability. Such shocks may be of different natures. Based on work by Bane & Ellwood (1986), Jenkins (1999) proposed a hierarchy of events linked to poverty transitions. He suggested that the first step was to see whether or not the household head had changed. If so, the demographic changes associated with the examined poverty transition had to be specified. Demographic events include the arrival of new members through birth, marriage or the arrival of relatives and non-relatives; or the reduction of household size due to the death of a member or the separation of the couple and consequent departure of children or other members. In cases where the household head remains, Jenkins suggested comparing the evolution of needs with respect to the evolution of monetary incomes, while specifying the source that contributed most. Events linked to income evolution include variations in the household head’s income and those of the spouse, variations linked to income from work or other types of transfers, capital income, and so on.

Since the welfare indicator is the family income per capita, transitions depend directly on variations in household members’ incomes and demographic composition. Income variations may occur following events related to income creation and returns on these assets, or after changes in household composition (which affect both the numerator and denominator), or following both. Events or shocks may affect households individually (idiosyncratic shock) or as a group (Jenkins, 1999, pp. 4–5; Baulch & Hoddinott, 2000, p. 11). It must be emphasized that, since only a limited observation period is available, macroeconomic shocks (growth, inflation, etc.) or shocks that affect the labour market environment (liberalization, minimum wage, etc.) cannot be taken into account.

Difficult choices must be made concerning the econometric treatment of shocks. To avoid the simultaneity bias, current shocks must be discarded and only past shocks considered, although this means that known information on current shocks is lost. For example, it is clear that an adverse shock—a spouse’s departure, job loss, etc.—between \( t - 1 \) and \( t \) will have a greater influence on income in \( t \) than if the shock had taken place between \( t - 2 \) and \( t - 1 \). However, since we are interested in poverty transitions between \( t - 1 \) and \( t \), the nature of the data does not enable us to determine the order in which the events occurred, and therefore ensure that a given shock took place before the transition and not after. Besides presenting the model with lagged shocks, nonetheless we tested the impact of current shocks, keeping in mind the limits imposed by such modelling, since the exogeneity of this type of independent variable is not guaranteed.

**Estimation Results**

To comment on the results of our poverty transition models, we will focus on the factors more specifically associated with entries into and exits from poverty,12 the most original
feature of our study, as very little research has been done on these issues in developing countries. The question is to determine whether the transient forms of poverty, which, as seen above, do indeed correspond to two populations with their own characteristics, are the result of distinct causes and should therefore be assigned different policies. In each case, we start by analysing the determining factors that are common to both countries, before analysing the differences.

Poverty entries and exits. We have seen that chronic poverty should be distinguished from transitory forms of poverty. Now we must identify specific poverty entry and exit factors, particularly the role of shocks experienced by households. In order to make the results easier to understand, the non-poverty situation will be used as the reference to establish contrasts with entries into poverty, and the chronic poverty situation will serve as the reference case for exits from poverty. As mentioned above, shocks refer to the period 1997–98, while the poverty transitions we wish to explain relate to the period 1998–99. Our approach is different from that of Freire (2000) for Venezuela and Glewwe et al. (2000) for Vietnam, for whom shocks and transitions were simultaneous (their data concerned two-wave panels only). In this way, we avoided possible simultaneity biases in our estimates. Furthermore, if we consider simultaneous shocks and transitions, in the case of Madagascar, we artificially obtain a better predictive quality for the model (the pseudo $R^2$ goes from 0.35 to 0.38), whereas, in the case of Peru, the test for all shock coefficients becomes significant at 5%.

The structural factors of exits from poverty are overall the same as those that affect chronic poverty (household size and composition, human and physical capital, labour market integration, access to infrastructures; see Table 5). Globally and for both countries, coefficients have the same sign as with chronic poverty but are smaller and often less significant. Large households and a higher proportion of young children decrease the probability of exits from poverty. Household human capital (investment in schooling) and physical assets (elements of capital) also play an important role in favouring exits from poverty. Quality integration in the labour market, particularly as a public-service employee, white-collar worker or outside of the primary sector, facilitates exits. Despite the severe uncertainty of wage-earning work and the drop in public employees’ wages, these jobs continued to be at the top of the professional hierarchy. Households headed by women in Madagascar find it more difficult to exit poverty. Spatial features have the expected impact: the proportion of informal workers in the neighbourhood inhibits exits from poverty in Peru, while these are favoured by the high proportion of educated people in the neighbourhoods of Madagascar.

Shocks play a more important role than for chronic poverty, on which they have little or no effect, particularly in Peru. In that country, the departure of the household head reduces the possibilities of coming out of poverty, while the arrival of a spouse is beneficial. These results are similar to those observed in developed countries, where demographic shocks affect poverty transitions. Economic shocks linked to labour market integration are also important. An increasing number of active household members improve the chances of coming out of poverty. The institutional sector in which the new active members are employed is important. In fact, the informalization of the family workforce from one period to the next hinders exits from poverty.

We will now examine entries into poverty, compared with the reference situation (i.e. not having fallen into poverty in 1999). The idea is to identify the vulnerability factors
|                          | Madagascar | Peru            |
|--------------------------|------------|-----------------|
|                          | Never poor | Exit from poverty | Entry into poverty | Entry into poverty | Exit from poverty | Never poor |
| Age of household head    | 0.993      | 1.016           | 1044              | 0.910              | 1285              | 1155       |
| (0.08)                  | (0.21)     | (0.42)          | (1.59)            | (3.62)**           | (2.41)**          |
| Sex of household head   | 2960       | 2644            | 1079              | 0.924              | 1516              | 0.831      |
| (2.32)**                | (2.32)**   | (0.13)          | (0.22)            | (0.91)            | (0.44)            |
| Head with primary education/without education | 1928 | 1644 | 0.880 | 0.636 | 5131 | 2460 |
| (0.74)                  | (0.61)     | (0.12)          | (0.80)            | (2.10)**           | (1.36)            |
| Head with high school education | 1360 | 1298 | 0.890 | 0.904 | 2015 | 1349 |
| (0.58)                  | (0.49)     | (0.19)          | (0.30)            | (1.42)            | (0.74)            |
| Head in common-law relationship | 0.164 | 1.476 | 5391 | 0.838 | 0.840 | 1268 |
| (2.11)**                | (0.72)     | (1.65)**        | (0.78)            | (0.64)            | (1.00)            |
| Single household head   | 1.697      | 2094            | 0.757             | 0.865              | 1321              | 0.776      |
| (1.12)                  | (1.75)**   | (0.48)          | (0.38)            | (0.61)            | (0.61)            |
| Years of experience of household head | 0.987 | 0.993 | 0.967 | 1083 | 0.801 | 0.886 |
| (0.15)                  | (0.09)     | (0.33)          | (1.37)            | (3.26)**           | (2.07)**          |
| Head non-white collar/blue collar | 0.201 | 0.501 | 2666 | 1163 | 0.620 | 0.708 |
| (4.47)**                | (1.88)**   | (2.28)**        | (0.53)            | (1.02)            | (0.88)            |
| Head independent worker  | 0.252      | 0.462           | 1699              | 1273              | 0.802             | 0.395      |
| (3.25)**                | (2.01)**   | (1.06)          | (0.85)            | (0.53)            | (2.58)**          |
| Head unemployed/inactive| 0.559      | 0.790           | 4354              | 1078              | 0.816             | 0.427      |
| (1.03)                  | (0.42)     | (2.17)**        | (0.17)            | (0.36)            | (1.65)*           |
| Head in primary sector  | 0.133      | 1012            | 3282              | 0.462             | 0.859             | 0.613      |
| (2.83)**                | (0.02)     | (1.36)          | (2.52)**          | (0.51)            | (1.77)*           |
| Head in industry        | 0.992      | 1034            | 0.631             | 1104              | 1543              | 1122       |
| (0.03)                  | (0.13)     | (1.21)          | (0.44)            | (1.35)            | (0.41)            |
| Head with a second job  | 0.825      | 1015            | 2116              | 0.871             | 1893              | 1504       |
| (0.46)                  | (0.04)     | (1.71)*         | (0.51)            | (1.77)*           | (1.24)            |

Table 5. Poverty transition models for Madagascar and Peru (1998–99)
| Household characteristics 1998 |  |
|-------------------------------|---|
| **Household size** |  |
| Household size | 0.791 (2.43) |
| **% members aged 0–9** | 0.009 (3.03) |
| % members aged 10–15 | 0.004 (4.58) |
| % members aged over 60 | 3.786 (1.45) |
| Nuclear household | 0.680 (0.45) |
| **No. of assets owned by household** | 1797 (5.58) |
| Home owner without title | 1116 (0.27) |
| Tenant & others | 1118 (0.40) |
| Indoor tap | 1116 (0.27) |
| Electrical lighting | 2044 (1.40) |
| Indoor toilet | 1131 (1.40) |
| Human capital of household | 51687 (2.71)** |
| Employed in formal sector/WAP tot | 16661 (3.18)** |
| Employed in Informal sector/WAP tot | 22122 (2.53)** |
| Unemployed & inactive/WAP tot | 22282 (1.80)** |
| Proportion of employed in household | 0.666 (0.51)** |

(Table continued)
### Table 5. Continued

|                          | Madagascar | Peru           |
|--------------------------|------------|----------------|
|                          | Never poor | Exit from poverty | Entry into poverty | Entry into poverty | Exit from poverty | Never poor |
| Social security coverage | 1953       | 1187           | 0.382             | 0.407              | 0.941             | 4025       |
|                          | (2.25)**   | (0.60)         | (2.70)**          | (3.44)**           | (0.13)            | (3.65)**   |
| Neighbourhood variables 1998 |          |                |                   |                    |                   |            |
| Average neighbourhood income | 1007       | 1000           | 0.994             | 0.997              | 0.996             | 1014       |
|                          | (2.37)**   | (0.16)         | (1.85)*           | (1.37)             | (0.53)            | (2.21)**   |
| Human capital of neighbourhood | 1150       | 1192           | 0.975             | 0.655              | 0.423             | 0.581      |
|                          | (1.32)     | (1.78)*        | (0.20)            | (0.41)             | (0.67)            | (0.48)     |
| % of informal workers in neighbourhood | 18 556     | 3691           | 0.060             | 0.923              | 0.342             | 0.733      |
|                          | (2.41)**   | (1.21)         | (1.84)*           | (0.17)             | (1.91)*           | (0.61)     |
| Shock variables 1997–98 |                          |                |                   |                    |                   |            |
| Departure of spouse     | 0.283      | 0.171          | 0.750             | (1.24)             | 0.894             | 2594       |
|                          | (1.11)     | (1.33)         | (0.24)            | (0.821)            | (0.16)            | (1.81)*    |
| # departure of children | 1614       | 0.970          | 0.625             | 0.830              | 0.908             | 0.978      |
|                          | (1.17)     | (0.07)         | (0.86)            | (0.830)            | (0.42)            | (0.10)     |
| # departure of other members | 0.888     | 0.729          | 1.558             | (1.70)*            | 0.982             | 1.048      |
|                          | (0.26)     | (0.73)         | (0.82)            | (1.447)            | (0.10)            | (0.35)     |
| Employed head 97–inactive/unemployed 98 | 0.440       | 0.526          | 0.125             | (0.86)             | 1618              | 0.913      |
|                          | (1.31)     | (1.14)         | (1.66)*           | (1.06)             | (0.21)            |            |
| Model                                      | Estimate | Std. Error | z-value | p-value | Omega-squared |
|--------------------------------------------|----------|------------|---------|---------|---------------|
| Inactive/unemployed head 97–employed 98    | 0.405    | 0.03       | 12.36   | 0.000   | 0.10          |
| Dif. proportion of informal workers in household | 0.605    | 0.03       | 12.36   | 0.000   | 0.10          |
| Dif. proportion of employed in household   | 0.476    | 0.03       | 12.36   | 0.000   | 0.10          |
| Dif. household size                        | 1.065    | 0.03       | 12.36   | 0.000   | 0.10          |
| Arrival of head                            | 0.915    | 0.03       | 12.36   | 0.000   | 0.10          |
| Arrival of spouse                          | 0.634    | 0.03       | 12.36   | 0.000   | 0.10          |
| # arrival of children                      | 1079     | 0.03       | 12.36   | 0.000   | 0.10          |
| # arrival of other members 97–98           | 0.777    | 0.03       | 12.36   | 0.000   | 0.10          |
| Observations                               | 1214     | 0.03       | 12.36   | 0.000   | 0.10          |

Robust \( z \) statistics in parentheses. *, **, *** = significant at the 10%, 5% and 1% levels, respectively. Reference category: chronically poor (for never poor and for exit from poverty); never poor (for entry into poverty). Defaults: female household head, household head with higher education, non-single household head, head in public sector, head in service sector, household head without a second job, % of members between 16 and 60, multi-family household, home owner with property title, without indoor tap, without electrical lighting, without indoor toilet, employed in public sector/WAP, no change in demographic or economic statuses.
that increase the probability of entering into poverty despite never having been poor before. A widely accepted notion is discredited right from the start: the sex of the household head is not a vulnerability factor per se (from the point of view of entry into poverty). This result was also observed in Venezuela, for both entries into and exits from poverty (Freire, 2000, pp. 25–26), as well as in Vietnam, both in urban and rural areas (Glewwe et al., 2000, p. 34). In Poland, households headed by women have a lower probability of being poor or vulnerable (Okrasa, 1999, p. 24). In the case of our two countries, it would seem that, in Madagascar, households headed by women run a greater risk of finding themselves in chronic poverty than in the other states, which cannot be distinguished on that criterion, whereas, in Peru, the gender of the household head is irrelevant.

The size of households in Peru and the proportion of children in Madagascar both constitute definite risk factors. Having physical capital in both countries and human capital in Peru limits entries into poverty. Being employed in the primary sector in Peru, or as a blue-collar worker in Madagascar, is also a risk factor. Unlike the case of Peru, where exit from poverty is facilitated by household heads having a second job, in Madagascar it favours entries into poverty. Secondary job tenure increases the risk of entering into poverty. In both countries, the social security coverage available to household members, either directly through a protected job or as indirect beneficiaries, more than halves the risk of falling into poverty. This result shows that, despite its shortcomings, the public social security system is capable of reducing households’ vulnerability to adverse shocks. This no doubt explains why, particularly in Madagascar, the poor are so attached to the state’s protective role and are against any sudden liberalization of the labour market (Razafindrakoto & Roubaud, 2003). The variables linked to geographic location do not affect entry into poverty, except for the degree of informality of the neighbourhood, which reduces that probability. This paradoxical result has been discussed above with regard to chronic poverty.

According to our estimates, very few variables linked to changes undergone by households are significant. Among these, the departure of household members (other than those of the nuclear family) decreased the risk of entering into poverty in Peru, which seems to show that such members did not contribute or contributed little to household income. Curiously, in Madagascar we observed that household heads’ job loss, resulting in unemployment or inactivity, reduced the risk of entering into poverty. This result actually reflects reverse causality. Only once households reach a sufficiently high income level do household heads leave the workforce or declare themselves unemployed. More fundamentally, an increasing proportion of informal workers, private-sector wage earners and inactive workers/unemployed (with respect to public-sector wage earners) in households slightly increases the risks of entering into poverty.

Finally, all the empirical studies on factors determining poverty transitions run into difficulties when identifying factors associated with transient forms of poverty. McCulloch & Baulch (1999) found that only the dependency rate distinguished chronic poverty from transient poverty. The estimated model for Southern China by Jalan & Ravallion (2000) has a greater predictive ability for chronic poverty than for transient poverty. The most important variables linked to transient poverty are those linked to the life cycle (age) and to assets. Neither the level of education nor the demographic characteristics of households (except the proportion of children between the ages of 6 and 14) seems to have any impact on transient poverty. These same
authors identified demographic characteristics (household size, education levels, demographic structure), as well as the variability of agricultural yields and the rate of illiteracy in the area, as being more important variables in terms of *chronic poverty* than *transient poverty* (ibid.). They conclude that the determining factors of *chronic poverty* and those of *transient poverty* are very different (ibid.). In the case studied by Glewwe et al. (2000), no independent variable turned out to be significant in explaining *entries into poverty* in urban areas, whereas in rural areas, household heads’ socio-professional groups and education, household size and demographic composition, assets (irrigated land), agricultural yields, and access to markets and to public goods (post office) all have a significant impact on the probability of *entering into poverty* with regard to *chronic poverty*.

The disappointing results obtained from transient poverty models are reflected in their poor predictive ability. While it is highly acceptable in the case of *chronic poverty* and *non-poverty*, it is much lower and almost nil, in the case of *entries into and exits from poverty*. Our model accurately predicts the cases of *never poor* households in 87% and 61% of cases for Peru and Madagascar, respectively. The figures are 41% and 89% for *chronic poverty*. On the other hand, fewer than 5% of *entries into and exits from poverty* were accurately predicted by the model. In Madagascar, most of the *transient poor* are classified as *chronically poor* (55% for *exits from poverty* and 41% for *entries into poverty*). In Peru, where the quality of the regression is less (the pseudo $R^2$ is 0.28 as opposed to 0.35 for Madagascar), the *transient poor* are placed in the category of the *never poor* (53% and 51% for *entries and exits*, respectively). But, in addition, an important proportion could not be classified by the model without ambiguity (about 40% of the *transient poor*; see Appendix Table A2). This poor predictive ability of the econometric model that we found concerning particularly transient poverty (*entries into and exits from poverty*) is in line with results obtained in other empirical studies (Kedir & McKay, 2003; Lawson et al., 2003). Despite this, the hypothesis which suggests that the different poverty transitions could be combined into a single one was rejected for the four models estimated in both countries.

**Path time dependency.** The descriptive analysis of poverty transitions presented in the previous section revealed that, in both countries, time spent in poverty in the past increases the probability of staying poor afterwards, and reciprocally, as illustrated in Figure 1. However, it is important to know whether this result is due to a poverty trap process or whether it simply reflects the differential characteristics (assets, returns) of different groups of poor (transient, chronic), with these characteristics weighting upon their probability of exiting from, entering into and remaining in poverty. We obtained some elements to address this issue by adding the status of poverty in 1997 to the transition model.

In the case of Peru, the poverty status in 1997 has no specific influence on the ulterior transition, once the individual characteristics have been taken into account. Conversely, the hypothesis of time dependency is confirmed in the case of Madagascar. The explanatory power of the model improves slightly. The coefficients of all the other independent variables remain globally unchanged, while the coefficient of poverty status in 1997 is highly significant for all types of transition. Observable characteristics being controlled, being poor in 1997 multiplies the probability of entering into poverty between 1998 and 1999 by 3.6. It reduces the probability of getting out of poverty by 59%, while the
probability of escaping poverty during these two years is divided by 7. This result has important policy implications. It seems to indicate that the time passed in poverty inhibits the capacity of the individuals to build up strategies to escape from it. The mechanisms of this process have been widely discussed in the literature (depreciation in human or physical capital caused by past poverty). Our conclusion is, of course, subject to reservations as to whether time dependency is not due to unobservable characteristics that our data are unable to check.

**Conclusion**

The priority given to the fight against poverty by developing countries and international organizations has led to the refining of the diagnoses of the different forms of poverty and the policies that these require. In particular, the distinction between chronic poverty and transient poverty called into question past policies judged as too ‘welfarist’ and reflected the need to redirect them towards promoting exits from poverty and protecting vulnerable groups. Underlying this new conceptualization is a model that asserts that chronic poverty comes from a structural deficit in assets, whereas transient poverty is a result of adverse shocks that should be prevented. This approach involves expanding the traditional static view to an analysis centred on individual poverty dynamics. By adopting rigorously comparable methods on a three-wave urban household panel in two LDCs (Madagascar and Peru), with highly contrasting economic contexts and levels of development, our aim was to identify the general and specific features of poverty transitions.

First, we confirm that in both countries, flows of entry into and exit from poverty are much higher than the figures indicated in static measurements of poverty incidence. Given the diversity of the situations in the two countries, we believe that this is actually a general result, which has also been obtained by most other studies of the same type. The significant flows between poverty and non-poverty situations explain why anti-poverty programmes based on a static view of poverty (the poor being identified at a given moment in time) run into targeting problems (high filtering and exclusion rates).

The hypotheses based on ‘unconditional’ poverty transition profiles were discussed using a multinomial logit model. Statistical tests confirmed that the variables chosen not only helped to distinguish between the three states (chronic poverty, transient poverty and non-poverty), but also to differentiate entries into and exits from poverty within transient poverty. However, with regard to exits from and entries into poverty, the results are disappointing. The models’ predictive ability is limited, the roles of shocks reduced (even for current shocks) and few independent variables common to Peru and Madagascar were found to account for the transitions. Good integration in the labour market and, above all, access to social welfare cover are determining factors in reducing households’ vulnerability. In the case of Madagascar, more clearly than in Peru, the extent of household attachment to the informal sector also distinguished chronic and transient forms of poverty. This result could be attributed to the instability of formal employment in Peru, following 10 years of labour market liberalization, which made these categories of wage earners, who used to be protected, more vulnerable (Herrera, 1999, 2001a; Verdera, 2000). Nonetheless, in conformity with the model established, structural factors are less significant, while demographic and economic shocks
weigh relatively more than in the case of chronic poverty. In Peru, for example, the departure of the household head lowered the possibilities of coming out of poverty. An increase in family workforce and quality labour market integration (in the formal sector) favour exits.

From the point of view of anti-poverty policies, breaking down poverty into its chronic and transient components showed that transient poverty is a more acute problem in Peru than in Madagascar, where poverty is not only more widespread but also more chronic. The advantages of implementing programmes aimed at reducing the vulnerability of households are therefore more evident in Peru. The econometric results obtained did not allow us to confirm the idea that having assets in human and physical capital is relevant to chronic poverty alone, whereas shocks could explain the different forms of transient poverty. Such a result is actually found in most empirical studies on the issue. This negative result may be linked not only to the real difficulties associated with measuring shocks but also to not taking into account covariant shocks, although they are relatively important in urban areas. One research avenue left open by the present study is to leave aside the excessive focus on the micro factors that determine poverty transitions in order to integrate the evolution of the macroeconomic environment. Finally, our research highlighted a time dependency process, particularly in Madagascar, which appears to indicate that the time spent in poverty reduces individuals’ ability to build up strategies to escape from it, with all its inherent political consequences.

Notes
1. This is an abridged version of a more detailed study on poverty dynamics available at http://www.dial.prd.fr
2. Mitlin stresses this lack of comparability in her review of the main findings on urban chronic poverty in developing countries (Mitlin, 2003, p. 1).
3. Both for Peru and Madagascar, poverty levels mentioned in this section agree with official data. They do not compare with those calculated in the rest of the study owing to different data sources and methodological choices (geographic coverage, poverty line, income versus consumption, etc.).
4. Full results of the estimations can be provided from the authors upon request.
5. Therefore avoiding the problem of simultaneous bias found in certain studies in which panels include only two time periods (see Glewwe et al., 2000).
6. Chronic poverty is defined as the gap between the poverty line and the average income over the entire period observed, while transient poverty is the remainder of total poverty minus chronic poverty.
7. This is the approach adopted by Glewwe & Hall (1995), and by Grootaert & Kanbur (1995).
8. The term chronic poverty was chosen over permanent poverty owing to the short observation period involved (two years).
9. For obvious reasons of space we will present here only the more complete model including the four sets of variables (model 4). However, the estimates do not change substantially from model 1 to model 4. For more details see Herrera & Roubaud (2003).
10. The only exception is the exit/entry distinction in Madagascar.
11. See McCulloch & Baulch (1999) for a similar argument. In the case of France, Maurin & Chambaz (1996, p. 140) arrived at similar results, which led them to formulate the hypothesis that transitions reflected discontinuities in the working/family life of households, that is, in the “way in which income is created”.
12. Risk factors are highly predictable for non-poverty and chronic poverty, including most traditional variables found in static poverty equations. For a comparison between these two extreme states, see Herrera & Roubaud (2003).
13. This problem is addressed explicitly by Glewwe et al. (2000).
14. When the predicted probability that a household may find itself in one of the four states was higher than 50%, this household was classified in the corresponding state.
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Appendix

Table A1. Wald tests for combining outcome categories

| Tested categories                                | Madagascar (chi-square) | Peru (chi-square) |
|--------------------------------------------------|--------------------------|-------------------|
| Never poor–exit                                  | 1161.1***                | 246.5***          |
| Never poor–entry                                 | 110.5***                 | 159.5***          |
| Never poor–chronically poor                      | 336.9***                 | 338.9***          |
| Exit–entry                                       | 1525.3***                | 94.3***           |
| Exit–chronically poor                            | 6403.3***                | 110.0***          |
| Entry–chronically poor                           | 161.2***                 | 142.2***          |

Ho: all coefficients except intercepts associated with given pair of outcomes are 0 (i.e. categories can be collapsed). ***, **, * = significant at the 10%, 5% and 1% levels, respectively.

Table A2. Predictive capacity—Madagascar

| Observed transitions | Never poor | Exit | Entry | Chronically poor | Non-classified | Total |
|----------------------|------------|------|-------|------------------|----------------|-------|
| Never poor           | 60.7       | 0.0  | 0.0   | 10.9             | 28.4           | 100   |
| Exit                 | 14.5       | 2.9  | 0.0   | 55.1             | 27.5           | 100   |
| Entry                | 17.2       | 1.1  | 3.2   | 40.9             | 37.6           | 100   |
| Chronically poor     | 1.2        | 0.5  | 0.0   | 88.6             | 9.7            | 100   |
| Total                | 15.2       | 0.7  | 0.3   | 66.5             | 17.4           | 100   |

Table A3. Predictive capacity—Peru

| Observed transitions | Never poor | Exit | Entry | Chronically poor | Non-classified | Total |
|----------------------|------------|------|-------|------------------|----------------|-------|
| Never poor           | 86.9       | 0.3  | 0.0   | 1.8              | 11.0           | 100   |
| Exit                 | 32.8       | 4.8  | 0.5   | 9.5              | 52.4           | 100   |
| Entry                | 50.8       | 1.5  | 1.0   | 5.5              | 41.3           | 100   |
| Chronically poor     | 17.2       | 1.1  | 0.0   | 40.7             | 41.0           | 100   |
| Total                | 65.8       | 1.1  | 0.2   | 9.2              | 23.9           | 100   |