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The Dynamics and Persistence of Poverty: Evidence from Italy

Francesco Devicienti,
University of Torino and LABORatorio Revelli - Collegio Carlo Alberto

and

Valentina Gualtieri,
ISTAT

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Laboratorio R. Revelli, *Collegio Carlo Alberto*
Via Real Collegio, 30 - 10024 Moncalieri (TO)
Tel. +39 011 670.50.60 - Fax +39 011 670.50.61
www.laboratoriorevelli.it - labor@laboratoriorevelli.it

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Francesco Devicienti,
University of Torino and LABORatorio Revelli - Collegio Carlo Alberto

and

Valentina Gualtieri,
ISTAT

Address for correspondence:

Dipartimento di Scienze Economiche e Finanziarie "G. Prato"
Università di Torino - Facoltà di Economia
Corso Unione Sovietica 218bis
10134 Torino (Italy)
Tel: +39 0116706288
email: devicienti@econ.unito.it

Abstract:

This article studies the dynamics and persistence of poverty in Italy during the nineties, using the ECHP, 1994-2001. Various definitions of poverty are analyzed in parallel, income poverty, subjective poverty and a multidimensional index of life-style deprivation. For each poverty definition, the hazard rates of leaving poverty and re-entering into it are estimated and combined to compute a measure of poverty persistence that takes account of individuals' repeated spells in poverty. The estimates provide a picture of high poverty turnover for the majority of the Italian population, which is true for any of the alternative definitions of poverty considered. Thus movements in and out of poverty cannot be simply related to spurious transitions due to measurement errors in household income. Multivariate exit and re-entry rate regressions are then estimated jointly to allow for correlated unobserved heterogeneity. The results highlight the role of demographic characteristics, the insufficiencies of the existing social security system and, above all, the weaknesses of the Italian labor market in generating persistent poverty for certain subgroups of the population.

Keywords:

Poverty dynamics, poverty persistence, repeated spells, duration models, Italy.

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1. INTRODUCTION

This article studies the dynamics and persistence of individual poverty in Italy during the nineties, using longitudinal data from the European Community Household Panel (ECHP), 1994-2001. It is generally agreed that, for a deeper understanding of the poverty phenomenon and for the design of adequate policy interventions, the traditional "static" approach measuring the spread and intensity of poverty at a given moment in time ought to be supplemented with longitudinal analyses of the individual experiences in poverty (eg., Jenkins, 2000). However, very little is currently known on the duration and persistence of poverty for people living in Italy, partly owing to the limited availability of panel data with repeated measurements on individuals' well-being over relatively long time periods.

The transitions in and out of income poverty, and its persistence, are analyzed in OECD (2001), in a comparative perspective for 12 European countries, Canada and the United States. The analyses are conducted for Italy (and the majority of the other European countries) only with reference to the first 3 waves of the ECHP. Other recent studies on the dynamics of income poverty in Italy include Brandolini et. al. (2002), Addabbo (2000) and Giraldo et. al. (2002), all of which have relied on the data from the Bank of Italy's Survey on Household Income and Wealth (SHIW). However, the SHIW has a number of limitations for the study of the duration of poverty at the individual level. First, its panel component is very small and, second, its bi-annual release makes it impossible to detect poverty spells that last less than two years (which, as we will see, are numerous). Annual poverty transitions, which constitute the focus of the present paper, are instead detectable from the ECHP. Unlike the OECD (2001) study, this paper focuses on Italy alone, but it extends the period of observation to the first 8 waves of the ECHP (1994-2001), and adopts a different methodological approach. The availability of a more extended period of observation is crucial given the emphasis on the persistence in poverty. Not only can the estimates be produced with greater precision, they also ought to be of greater interest.

Beyond its focus on Italy, the paper makes a number of additional contributions to the empirical literature on poverty dynamics. In recent years, a number of approaches to complement traditional measurement based on income or expenditure have emerged in the literature (e.g., Deutsch and Silber, 2005), partly reflecting dissatisfaction with traditional monetary approaches and partly as a genuine reflection of the complexity and multidimensionality of the phenomenon studied. Hence our first

additional contribution is to study in parallel the dynamics of a number of alternative definitions of poverty: income poverty, subjective poverty and a multidimensional index of life-style deprivation. Income poverty is defined in terms of equivalent household income. Subjective poverty is defined according to an individual's own assessment of her ability to make ends meet given available financial resources. The index of "life-style deprivation" is similar to that proposed, among others, by Whelan et al. (2004) and is obtained by combining the survey's information on the (lack of) possession of a number of items deemed as "essential" in contemporary western life. For each poverty definition, the transitions in and out of poverty, and poverty persistence, are estimated and compared. This is an important departure from most of the existing literature, which has analyzed the dynamics of poverty only in terms of income insufficiency. One of the main findings of this literature is that, despite frequent re-entry into income poverty, exits are relatively rapid, making most spells of low income of short-duration. How far is this result still valid if other ways of identifying the poor are taken on board? Answering to this question is important because a household's total income is often measured with error, which may result in spurious transitions in and out of low income. While in the literature there are a few attempts at correcting for measurement error, so as to estimate the error-free amount of low-income turnover, the statistical methods employed often rely on somewhat restrictive identifying assumptions (e.g., Breen and Moisio, 2004; Whelan and Maitre, 2006). In this respect, comparing the amount of turnover in poverty obtained with different definitions of poverty – which do not exclusively rely on the household income reconstructed in the surveys – may provide a significant alternative validation strategy.

Second, an important characteristic of the approach adopted lies in its ability to analyze the episodes of repeated poverty to which some individuals are subject over a given observation period. For a number of countries, a few papers have documented that those who succeed to escape income poverty in any one year remain at risk of falling back below the low-income threshold in the following years (for the US, Stevens, 1999; for Spain, Cantó Sanchez, 2002 and 2003; for the UK, Jarvis and Jenkins, 1997; Jenkins, 2000; Devicienti, 2002). To analyze these issues, we first estimate the poverty exit and re-entry rates for the population as a whole. These are then used to calculate the distribution of the number of years (not necessarily consecutive) that the individuals spend below the poverty line within a time horizon of seven years. This distribution lies at the centre of the poverty persistence measures adopted in the

paper. By combining the exit and re-entry rates, this approach takes account of the fact that a relatively high number of those who escape poverty continue to remain at risk of successive falls back, and this risk is particularly high in the years immediately following the escape from poverty. While this approach has been used in a few papers that analyze the persistence of poverty in the US (Stevens, 1999) and in the UK (Devicienti, 2001; Jenkins, Rigg and Devicienti, 2001), no similar estimates for Italy are currently available. Moreover, as far as we know, our own is the first attempt to apply the approach to definitions of poverty other than low income.

Third, we estimate discrete-time multivariate duration models to go more in depth into the demographic and socio-economic circumstances that are associated to persistence in poverty. While other modeling approaches (e.g., covariance structure models) have been used in the case of income poverty (e.g., Biewen, 2005; Devicienti, 2001), these approaches would be less appropriate for the other two poverty definitions considered in the paper. With our hazard-rate models we will try to answer the following questions. If an individual becomes poor, for how long will s/he remain so? In order to measure the persistence in poverty, how important is it to consider the multiple episodes of poverty of the same individual? Which personal and household characteristics are more frequently associated to low (high) transition probabilities out of (in) poverty, thereby making the individual more vulnerable to recurrent and persistent situations of economic deprivation? Is poverty dynamically self-reinforcing, in the sense that "true" state dependence can be found after controlling for unobserved heterogeneity? Are exit rates independent of re-entry rates, conditional on observed characteristics, or are there latent factors that make the two hazards correlated over an individual's lifetime?

To provide answers to these questions we estimate multiple-spell models of transitions in and out of poverty, controlling for observed and correlated unobserved individual heterogeneity. The models are estimated separately for each of our poverty definitions. However, exit and re-entry rates for each poverty definition are estimated jointly, to allow for correlated unobserved heterogeneity in the two hazards. The estimates allow us to assess the relative importance of several characteristics of the family and of the individual, both relative to demographics and the labor market. The estimates of the models are then used to predict the persistence in poverty experienced by selected sub-groups of the population, pointing out those cases that should receive more attention from the public actors committed to combat poverty.

Our results provide a picture of high poverty turnover for the majority of the Italian population, which is true for any of the alternative definitions of poverty considered. Thus movements in and out of poverty cannot be simply related to spurious transitions due to measurement errors in household income. The model estimates highlight the role of demographic characteristics, the insufficiencies of the existing social security system and, above all, the weaknesses of the Italian labor market – with notoriously low participation and deep territorial dualism – in generating persistent poverty for certain subgroups of the population. Moreover, the models indicate that, even after controlling for unobserved heterogeneity, significant negative duration dependence is found in both the poverty exit and the re-entry rates. The results, therefore, cast doubts on the appropriateness of the first-order Markov assumption often made in empirical work aimed at distinguishing between true state dependence in poverty or social exclusion and unobserved heterogeneity (e.g., Cappellari and Jenkins, 2002 and 2004; Breen and Moisio, 2004; Whelan and Maitre, 2006; Poggi, 2007).

The paper is organized as follows. Section 2 briefly describes the ECHP, sample selection issues and the definitions adopted in the empirical analysis. Section 3 first provides an overview of aggregate poverty trends (static analysis) and then moves to the dynamic analysis, estimating the poverty exit and re-entry rates. Next, these rates are combined in order to obtain measures of poverty persistence with reference to the population as a whole. Section 4 introduces the multivariate modeling strategy used to analyze the risks of poverty persistence for various subgroups of the population, whose results are found in sections 5 and 6. Section 7 concludes.

2. DATA, DEFINITIONS AND SAMPLE SELECTION

The data used for our analysis of poverty persistence in Italy are those of the European Community Household Panel (ECHP), which contain detailed income and socio-economic information for a representative sample of national families, and their members, interviewed for the first time in 1994 and then at successive yearly occasions until 2001. See Peracchi (2002) and the official data documentation for further details.[1]

[1] http://forum.europa.eu.int/irc/dsis/echpanel/info/data/information.html

Research on poverty has long clarified its multidimensional nature (e.g., Sen, 1997), however agreement on exactly how to measure poverty within this enlarged context is not unanimous in empirical work. In this paper we take the view that alternative approaches can be considered as complement, and analyze a number of them in parallel.

Our first approach is based on the traditional monetary approach and identifies the poor in terms of low income, which remains one of the main routes towards social exclusion.[2] The definitions that are used in this case are fairly standard in the international literature on low-income dynamics (e.g., Jenkins, 2000; Biewen, 2006; Commissione di Indagine sulla Esclusione Sociale, 2004), which is helpful when placing the results obtained for Italy in an international perspective, although cross-country comparisons are clearly beyond the aim of the present paper [see Valletta (2006) for a recent example of comparative low-income dynamics for the US, Canada, Britain and Germany]. The unit of analysis is the individual (adult and children) and not the household, so that we can follow each person as s/he moves from one household aggregation to another in the course of her/his life. An individual is counted as poor in a given year if his/her household net income is below a chosen poverty threshold. In each survey year, the household income refers to the previous year and is computed by summing all incomes of all household members, including income from employment, investment, private property, private transfers, pension income and other social transfers. All monetary values have been are converted in 2002 prices using the CPI provided by the Italian National Statistical Office (ISTAT). In order to account for varying household size and composition (and related economies of scales within the household), household net income is then divided by the OECD-modified equivalence scale, and the resulting value is equally attributed to all household members. Poor in a given survey year is anybody whose *household net equivalent income per person* (equivalent income, for short) is below the poverty line set for the same year. Following EU practice, the poverty line for year *t* has been fixed at 60% of the median equivalent income of the same year. An alternative line is obtained by fixing the threshold at 60% of the median equivalent income of the first wave (1994) and keeping this same value (fixed in real terms) also for the successive waves.

Subjective poverty is defined in relation to an individual's perception of her ability to make ends meet given available financial resources. Question HF002 of the ECHP asks: "A household may have

[2] While official cross-sectional poverty statistics in Italy are computed on the basis of households' expenditures, the dynamics of poverty cannot be examined in this way because of the lack of the relevant information in the ECHP.

different sources of income and more than one household member may contribute to it. Thinking of your household's total monthly income, is your household able to make ends meet?" The question is asked to the reference person in the household ("household head") and answers are elicited on a five-modality scale, ranging from "with great difficulty" to "very easily". An individual is defined as poor according to the subjective definition if s/he answers with either of the two worse cases: "with great difficulty" or "with difficulty".

Our third way of identifying the poor, inspired by Sen's capability approach (Sen, 1985), is based on assembling the ECHP available information on household deprivation of a plurality of items whose large diffusion in the Italian society make them tantamount to "essential" durable goods and services (see also Deutsch and Silber, 2005). The following is the list of items considered in the analysis, where in each case the lack of possession is indicative of a household's inability to afford the item due to its financial situation: (1) a color TV, (2) a washing-machine, (3) a telephone, (4) running hot water in the dwelling, (5) eating meat or fish every other day, (6) paying for a week's annual holiday away from home, (7) keeping the home adequately warm, (8) pay scheduled rent and mortgage payments for the accommodation, (9) pay scheduled utility bills, such as electricity, water, gas, etc., (10) pay hire purchase installments or other loan repayments. To these ten indicators, income insufficiency (as defined by our income poverty indicator) is also included, reflecting its importance in an individual's ability to achieve a certain standard of living.

The perspective adopted here is in essence multidimensional, even though the constituent indicators are then summarized in a scalar dichotomous indicator of poverty. While this procedure reduces much of the attractiveness of a multidimensional approach, the choice is made for convenience, as longitudinal analyses of multidimensional poverty indicators at the individual level are otherwise intractable. Moreover, it allows us to use the same methodology employed with the other two (dichotomous) measures of individual poverty. The same choice is made by Whelan et al. (2004), who define an index of "life-style deprivation" summarizing their set of "essential" items. For lack of a better alternative, we will use the same name for our third measure of poverty, which is computed as follows. First, for each of the 11 indicators, we construct corresponding dummy indicators, which are equal to 1 when the household is deprived in the item (and is missing when the household does not answer to the

question). Second, the dummy indicators are aggregated on the basis of a set of weights that should reflect the item's importance in the summary indicator of life-style deprivation. Following Lemmi et al., (1997), the weights are the inverse of the logarithm of the probability of the item deprivation in the population, thereby assigning more weight to those aspects of deprivation that are more widespread in the country analyzed. Third, for individual *i* our summary indicator of "life-style deprivation" (S_i) is obtained as:

$$S_i = \frac{\sum_{j=1}^{J} w_j \, 1(D_{ij} = 1)}{\sum_{j=1}^{J} w_j \, 1(D_{ij} = 0 \text{ or } D_{ij} = 1)} \qquad (1)$$

where $0 \leq S_i \leq 1$, D_{ij} is the set of J dummy indicators (J=11 in our case), w_j is the corresponding weight and $1(\cdot)$ is the indicator function. Finally, S_i is made dichotomous by setting a threshold that identifies who is in life-style deprivation and who is not in any given year. Clearly, the choice of the threshold is arbitrary and can be assigned on the basis of the existing literature, as we have done for income poverty, or can be chosen so as to reflect a particular focus. For example, the threshold can be "generous", thereby also capturing the type of deprivation suffered by middle-class households, or it can be set at a fairly low level, which should instead identify situations of more extreme hardship. As one of the aims of the paper is to explore the dynamics of fairly different definitions of poverty, here we have chosen the second alternative. Our threshold is that value of S_i that corresponds to the presence of the most "serious" symptom of deprivation, or to the presence of a number of symptoms whose sum of weights is less or equal to the weight of the most serious symptom. In our case the most serious symptom of deprivation is the inability to afford the most widespread item in the population, a color TV according to the items' weights shown in Table A1. Such circumstance is associated to a value of the threshold S^* equal to about 0.15; therefore, all individuals with $S_i \geq S^*$ are assumed to be in "life-style deprivation".

Once the status of poverty P_{it}^{k} is established for each individual *i* at time *t* and for each definition of poverty (k= income poverty, subjective poverty, life-style deprivation), the next step is to construct individual spells of poverty and non-poverty, for each *k*. To every spell experienced by any sample member, we have then attached a vector of personal and household characteristics (covariates), which are allowed to be time varying. For transitions occurring between year *t* and *t*+1, the covariates refer to the

value that the characteristic assume in year t, so as to reduce endogeneity/simultaneity problems with the transitions in and out of poverty. For the cross-sectional analyses of income poverty we use all the individuals in our sample for which valid household income information was available. For the dynamic analysis, the sample comprises all the individuals with non-missing equivalent income in two or more consecutive years, having one or more spells of poverty and/or non-poverty. This "unbalanced sample" design should reduce biases deriving from non-random attrition. Similarly, cross-sectional samples for subjective poverty and life-style deprivation comprise all individuals with non-missing poverty indicators, and the dynamic analyses are based on corresponding unbalanced samples (see Tables 1-3 for sample sizes).

3. STATIC AND DYNAMIC ANALYSIS OF POVERTY IN ITALY

3.1 The incidence and dynamics of poverty: preliminary evidence

Table 1 adopts a cross-sectional perspective and describes the percentage of individuals who are considered poor during the nineties in Italy, according to each of the three definitions of poverty. It should be noted that a direct comparison of the three levels of poverty, each measured in a different way and with different (arbitrary) poverty lines, is not very informative in any given year. More interesting is to document the aggregate changes in the three indicators over time. However, in general our interest in the rest of the paper will focus on the individual longitudinal experiences of poverty, i.e., the transitions that the individuals make below and above each of the three poverty lines.

Between 1994 and 2001 the median household equivalent income increased by approximately 20% (a 2.6% yearly growth, on average) and, concomitantly, the incidence of income poverty fell from 20% in 1994 to 13% in 2001, if the threshold fixed in real terms is used. If the line is allowed to vary annually, the fall in the incidence of income poverty is more modest, from 20% in 1994 to 19% in 2001, somewhat reflecting the decline in the inequality of the equivalent income distribution.[3]

Table 1 shows that on average about 22% of the individuals live in households who report difficulties in their ability to make ends meet, or what we have labeled "subjective poverty". The

[3] During the period the Gini coefficient declined from 0.33 in 1991 to 0.29 in 2001.

incidence according to this definition of poverty is fairly constant over time, with slightly lower values in 1996 and 1997 and higher values in 1998/9.

On average over the period, about 13% of the population is in "life-style deprivation" according to our definition, or unable to fully satisfy needs that can be considered as "essentials" in the community where they live. Poverty so measured has a declining trend over time, with a reduction of 4 percentage points in its incidence over the period.

< Table 1 around here >

How far do the three definitions of poverty overlap at the individual level? In general, the overlap is not very high. The tetrachoric correlation coefficient between income and subjective poverty is about 0.51, about 0.60 between income poverty and life-style deprivation and 0.63 between subjective poverty and life-style deprivation. Cross-tabulating pairs of poverty definitions show that, among the income poor, only about half are also in subjective poverty. In other words, half of those whose household income is below the poverty line do not report serious difficulties in achieving their ends with the available resources. This may due to a number of reasons, including income underreporting and measurement error, the presence of household needs (e.g., disabled or unhealthy persons in the household) and circumstances (e.g., differences in local prices) not adequately captured by the "equivalence scale" factors. It is also possible that individuals long in situations of financial restraint may develop coping strategies and forms of adaptability that enables them to reach an acceptable standard of living, or at least one that they perceive as such. On the other hand, among those who are in life-style deprivation, about 64% are also in subjective poverty, in line with the view that the former may represent more severe situations of hardship. A moderate overlap is also found between the individual experiences in income poverty and life-style deprivation: among those in the latter, only 52% also report an equivalent household income below the poverty line. This finding is not new and has led Whelan et al. (2004) to conclude that income poverty and life-style deprivation are "tapping different phenomena". While further investigating on the reasons for the moderate overlap between the various definitions of poverty is not the aim of this paper (see also Perry, 2002), we see these results as a confirmation of the importance of

studying the dynamics of poverty from different angles and perspectives, without subscribing a priori to any particular of them. We this idea in mind, we now abandon the “static" approach in favor of a longitudinal perspective at the individual level.

The first result that attracts the attention is offered in the bottom panel of Table 1: although the incidence of poverty in a given year is, on average, between 13% and 23%, depending on which definition is chosen, the fraction of the population that has low income in at least one year during the 1994-2001 period is much higher. In fact, about 41% of the population is touched by income poverty at least once (46% with a time-varying threshold), about 56% if we consider subjective poverty, and 36% in the case of life-style deprivation. These figures imply that, among those who turn out to be poor at least once, poverty is often temporary. For example, about 33% remain below the (fixed) income poverty line for only one year. The percentage is very similar (32%) in the case of subjective poverty, while it is even higher for life-style deprivation (42%). However, the number of people hit by persistence poverty is also fairly high. Among those who fall below the (fixed) low-income threshold, we find that about 37% remain poor for at least four years out of eight. The percentage is equal to 38% for the subjective poverty and slightly lower, at 25%, for life-style deprivation. There is also a non-negligible minority of individuals who are always in poverty: about 2.4% in income poverty, 3.3% in subjective poverty and 1.1% in life-style deprivation. These results provide preliminary evidence of the idea that poverty, however measured, is a condition “in movement”, which can hit in transitory, occasional, repeated and persistent way. The following sections will try to further characterize the ins and outs of poverty in Italy.

Note that the longitudinal calculations discussed above - being based on the simple count of the number of years an individual spends in poverty - are subject to potentially important limitations. Those who at the end of the survey period (2001 in our case) are still in poverty can find themselves in the mid of fairly long spells, although the researcher can only observe them in poverty for a few years. Similarly, those who are already poor when they first enter in the panel (in 1994 in our case) may have been so for many years, although to the observer the individual appears poor only from 1994 onwards. The persistence in poverty computed in OECD (2001), Whelan et al. (2004) and Whelan and Maitre (2006) are all potentially subject to these limitations, besides of being based on a smaller number of waves of the ECHP. As discussed by Bane and Ellwood (1986) and Jenkins (2000), some methodological approaches

exist that are particularly well suited for the study of the dynamics of poverty at the individual level. Not only are these more advanced techniques potentially immune to the censoring problem, they also lend themselves to multivariate analyses of the factors associated to the transitions in and out of poverty. In the following sections, the study of the persistence in poverty will be conducted through the use of special models of transition probabilities, able to hold account of the number of years that the individual has already spent under or above the poverty threshold. Note also that the dichotomous nature of the subjective and life-style deprivation variables prevent us from using models for continuous variables, as in the case of income, from which poverty implications can be successively derived (e.g., Stevens, 1999; Devicienti, 2001; Biewen, 2005).

3.2 Rates of escape and of re-entry in poverty

We now analyze the broad patterns of transitions in and out of poverty using simple non-parametric estimates of the hazard rates in and out of poverty, and examine how these depend on the length of time the persons has already spent below or above the poverty line. The exit rates refer to persons that have just fallen in poverty and are at risk of exiting. The exit rate after d years of poverty is calculated by dividing the number of persons who conclude a poverty spell after d years and the total number of persons in poverty for at least d years. The re-entry rates are calculated in a similar way, with the difference that they now refer to persons that have just terminated a poverty spell and are at risk of falling back in. Contrarily to the simple count of the number of years in poverty, the present approach accommodates right-censored spells: spells that are still in progress at the end of the survey year contribute every year to the estimation of the hazard rate (through its denominator) until the truncation year. On the contrary, as in most of the literature, left-censored are not easily accommodated within the framework and are discarded, implying that only spells that begin in wave 2 or successive can be considered. This means that, with the 8 waves of the ECHP, an escape from poverty can only occur in any of the next six survey years following the one in which the individual has first fallen in poverty. Including this last one, therefore, every individual can be observed from one to a maximum of seven interviews in poverty. A similar reasoning holds for out-of-poverty spells.

Our estimates of hazard and survival function are displayed in Table 2 (poverty spells) and Table 3 (out-of-poverty spells), separately for each poverty definitions. In the interest of brevity, and given the high overlap at the individual level between income poverty with a fixed and with a time-varying threshold (correlation equal to 0.93), we will focus only on the former in the rest of the paper.[4] In many but not all papers on poverty dynamics, concern is expressed for those transitions in and out of low income that occur within a small interval centered over the income poverty line. For example one may not want to regard as genuine a transition if the threshold is overtaken by, say, only one euro. These transitions may simply reflect measurement errors or transitory income shocks that do not significantly affect the individual's living standard. In order to reduce the potential biases caused by this problem, Bane and Ellwood (1986), Duncan et al (1984), Jenkins (2000) and Devicienti (2002) define exits from poverty (out-of-poverty) as occurring only if post-transition income is greater (less) than 110% (90%) of the poverty line. For the same reasons and in order to facilitate comparisons with the existing empirical research, we have decided to follow this practice in this paper too. However, these adjustments to the actual transitions (obtaining what we will call 'adjusted transitions') are somewhat arbitrary and it is not clear whether they can really filter out 'genuine' poverty transitions only. As estimated hazard rates turn out to be sensitive to the used definition of transitions, we have also reported and discussed rates obtained without any modifications to the actual transitions (called 'unadjusted transitions').[5] Since the "adjusted" definition of transitions makes it more difficult for the individual to overtake the income threshold, it will not be surprising to find that the adjusted hazard rates are lower (and, conversely, the survival functions higher) than the unadjusted rates.

As shown in table 2, the estimated exit rates in income poverty reveal the existence of negative duration dependence: the longer an individual stays in poverty the less likely it is that she will leave that state in the next period. For the group of individuals that have just begun a spell of poverty, approximately 58% succeed to exit after the first year, when on looks at the unadjusted transitions; after five years the chances of exiting drop to 20%. If one refers instead to the "adjusted" transitions, the

[4] Note that fixing (in real terms) the income poverty line is more consistent with the way subjective poverty and life style-deprivation are defined, as both have a time-invariant thresholds. The results obtained with the time-varying income poverty line, including our multivariate hazard-rate models, are very similar to those obtained with the fixed line and are available from the authors upon request.

[5] Of the 4268 exits from income poverty observed in the data, 19% refer to individuals whose income exceeds the threshold by less than 10%. Of the 2795 entries in income poverty, 27% are associated to a post-transition income that does not fall below 90% of the poverty line.

estimated exit rate after a year is at 48%; also at longer duration, the adjusted hazards are lower than the unadjusted ones. Consequently, 9% of those who had been observed to become poor are still so after 6 years if the unadjusted transitions are used; and 18% with the adjusted transitions.

As for subjective poverty, about 56% of those who have just started a spell manage to exit after one year, a value not too dissimilar from the corresponding exit rate from income poverty. Exit rates between the two definitions of poverty are fairly similar also at longer duration - particularly if the unadjusted transitions are considered in the case of income poverty - but it is in general not possible to establish that the hazard function of one type of poverty everywhere dominates that of the other. Evidence of negative duration dependence is also found for subjective poverty; for instance, the exit rate drops to only 16% after five years. As shown by the survival function, about 10% of those who entered a spell of subjective poverty are still in the same state after 6 years.

Interestingly, exit rates tend to be higher in the case of life-style deprivation. Of all those who have just started a spell according to this definition of poverty, about 63% manage to leave the state after on year. After five years, the hazard is only 33%. As a consequence, survival in life-style deprivation is less likely than in the other two definitions of poverty: after 7 years, only 5% are still in life-style deprivation, against about 10% in subjective poverty and 7%-14% in income poverty. However, negative duration dependence is also found for life-style deprivation.

< Table 2 around here >

Table 3 displays the re-entry rates and the survival function for those who have just terminated a poverty spell. Also in this case the results confirm the existence of negative duration dependence: the more an individual remains out of poverty, the less likely it is that s/he will fall below the line in the successive periods. Once again, this is true for each of the three definitions of poverty. In general, re-entry rates are smaller than exit rates but still point to a significant risk that the individuals fall back below the threshold, particularly in the years just after an exit from poverty has occurred.

If the adjusted transitions are considered, approximately 19% of the individuals that conclude a spell of income poverty will be poor again after the first year; after four years, approximately 35% of the

poverty escapers will have become poor again. Even higher are the re-entry rates if no adjustments are made to the observed transitions. In this case, the fallback probability is 25% after a year; after 4 years about 46% of the poverty leavers will have returned below the line.

After exiting from a spell in subjective poverty the risk of falling back in after only one year is about 28%; after four years it is about 12%. The same picture emerge if one looks at the survival function: of those who have exited from subjective poverty, and are therefore at risk of re-entry, about 40% have managed to stay out of it for the next four years; after six years only 33% are still out of subjective poverty. Table 2 shows that, as for income poverty, evidence of negative duration dependence is also similarly found for the re-entry rates in subjective poverty. However, re-entry rates in the latter are systematically higher than those in the former. As a result, the survival functions record that, after six years, among 60 and 50% of those at risk of re-entry have managed to remain out of income poverty; in the case of subjective poverty the percentage is only 33%.

Re-entry rates in life-style deprivation are instead very similar to those of income poverty, especially when one considers the unadjusted transitions: after one year out of life-style deprivation the probability of re-entry is 23% and, after four years, is 8%. Not surprisingly, also the survival functions in life-style deprivation and in income poverty (unadjusted transitions) are very similar.

To summarize, the results of tables 2 and 3 show that in Italy, contrary to a static view of poverty, there is a fairly amount of movement in the poverty condition. Although there is a small group of people who are poor in each of the survey years, there is a relatively large number of persons who enter and exit poverty from one year to the next. These dynamic characteristics of poverty have been established empirically for a number of countries in the case of income poverty.[6] Here we have shown that an equally large amount of turnover emerges also when poverty is defined in a number of alternative ways. As the subjective approach does not rely on the net household income reconstructed in the ECHP data, and our multidimensional indicator of life-style deprivation only includes income among other eleven items, one

[6] Devicienti (2002) estimates that in Britain approximately a person out of two escapes poverty after one year; after four years the exit rate is at around 20%. For the US, Stevens (1999) reports similar figures: 54% for the exit rate after a year, and 23% after four years. The re-entry rates after one year is equal to 29% in Britain and 27% in the US. While it should be stressed that cross-country comparisons should always be interpreted with caution, it is interesting to note here that these estimates do not differ very much from those reported for Italy in Tables 2 and 3.

may conclude that frequent movements in and out of poverty are a defining feature of poverty, and cannot be simply related to spurious transitions due to measurement errors in household income.

< Table 3 around here >

3.3 Persistence in poverty

The estimates of the exit and re-entry rates are now combined in order to derive the distribution of the "number of years spent in poverty", which is at the base of the measures of poverty persistence adopted in this paper. The importance of repeated spells in poverty for the same person over a relatively long time period has been emphasized by a number of papers (e.g., Stevens, 1999; Devicienti, 2001; Jenkins and Rigg, 2001). In fact, in our data almost 20% of those who begin an income poverty spell will have a second or a thirds spell during the next seven years, and the percentage is similar for subjective poverty and life-style deprivation. It seems therefore appropriate to consider poverty persistence measures that can take into account the total number of years that an individual spends in poverty within our 7-year temporal horizon, where it is not required – as it would be in a single-spell framework – that the years in poverty be consecutive. In other words, the measures account for both the chances of exiting and for the risks of successive re-entry that an individual is subjected to. As for as we know, this measure of persistence in poverty, based on repeated spells, has never been estimated for Italy before. Moreover, computing the 'distribution of the number of years in poverty' over repeated spells offers a convenient method to summarize the information on the exit and re-entry rates estimated in the previous section. It is then easier to compute and compare measures of poverty persistence of the three definitions of poverty. Two such measures are displayed at the bottom of Table 4, namely the expected number of years in poverty and the percentage of individuals who spend at least four years out of seven in the state.

Table 4 shows the distribution of years spent poor both in a single-spell approach – calculated using only the exit rates, i.e. not taking multiple spells into account – and in a repeated-spell approach – calculated using both exit and re-entry rates. To illustrate the way in which these distributions are calculated, consider the following simple example. Call m the total number of (not necessarily consecutive) interviews in poverty for an individual just starting a poverty spell in wave 2. For instance suppose that we want to calculate Prob(m=4). This is given by the sum of the probability of all the possible poverty sequences over the 7-wave period in which a total of four interviews in poverty are

found. One such sequence is, for instance, (0,1,1,0,0,1,1), where 0 at rank *i*th denotes poverty at interview *i*, while 1 denotes out-of-poverty. Over the entire time period, the individual represented in that sequence has had 4 interviews in poverty. We then need to calculate Prob(0,1,1,0,0,1,1). As we exclude the first left-censored non-poverty spell, this income sequence is clearly composed by a two-year completed poverty spell, a two-year completed non-poverty spell, and finally by a one-year censored poverty spell. Denoting with $e(d)$ and $r(d)$, respectively, the exit and re-entry rates at duration d, as estimated in Tables 2 and 3, then we can write: $\text{Prob}(0,1,1,0,0,1,1)=(1-e(1))e(2)(1-r(1))r(2)(1-e(1))$. In other words, the probability of observing that income sequence is found as the product of the probability of the constituent spells. One then needs to compute the probabilities of all possible sequences that generate a total of four years in poverty, in order to obtain the value of $\text{Prob}(m=4)$ reported in column 3 of Table 4. Note that in a single spell approach of column two, the only event giving rise to four years in poverty is the income sequence (0,1,1,1,1,0,0) which has probability $(1-e(1))(1-e(2))(1-e(3))e(4)$.

We look at income poverty first. As Table 4 shows, there is clear evidence that the single-spell approach estimates a distribution of m in which a larger proportion of the population experiences short stays in income poverty. For example, 58% of the population will have only one year in poverty out of the next seven according to the single spell approach (48% with the adjusted transitions); however, allowing for repeated spells the figure decreases at only 30%. The corresponding percentage obtained from the patterns directly observed in the sample is about 25%.[7] At longer duration, on the other hand, the single spell approach tends to underestimate the distribution of 'time spent poor', while a repeated spell approach does a better job in replicating observed patterns. For example, when referring to the unadjusted transitions, about 40% of the those starting an income poverty spell will spend at least 4 years below the poverty line if repeated spells are accounted for, while only 27% is the corresponding figure in a single spell predicting framework. The actual proportion in the sample that spent four out of seven interviews in poverty is about 47%.

These results seem to confirm the idea stressed in the paper that, in order to supply an adequate measure of the permanence in poverty, it is necessary to use information not only on the transitions out of

[7] This derives from a simple count of the interviews in poverty for the wave-2 low-income entry cohort - sequences (0,1,*x*,*x*,*x*,*x*,*x*), where $x=\{0,1\}$. This distribution of m emerging from the actual patterns observed in the panel data provides a simple way of comparing predictions based on the single and the multiple spell approach.

poverty, but also on those in entrance, so that the two pieces can be combined to account for the numerous patterns of alternations of low and high incomes that the individuals can experience in practice. It is instructive to compare the poverty persistence over multiple spells obtained for Italy with the results available for Britain, as the same methodology and roughly the same time period was used for both countries [the comparison with the USA would be more problematic as the period analyzed by Stevens (1999) refers to the eighties, rather than the nineties]. Devicienti (2001) finds that in Britain approximately 41% of those who begin a poverty spell will remain poor for at least 4 years once the repeated spells are taken into accounted. It is interesting to note that, as in the case of Italy, the single-spell method would predict fairly misleading measures of poverty persistence in Britain, in fact only 19% would spend at least 4 years in poverty in this country according to this method (the actual proportion in the British sample is 45%).

We now turn to the other definitions of poverty. The estimates of the distribution of the number of years in subjective poverty obtained with the single-spell method shows that a fairly high percentage of the poor population is hit by transitory poverty. In particular, 57% of those who become poor experience only one year out of seven in poverty. The percentage of individuals with persistent subjective poverty (at least four years in seven) is moderate, about 21% with the single-spell method. Once again, the estimate of the distribution obtained with the repeated-spell method is rather different: about 20% of the individuals spend one year in seven in subjective poverty, a percentage that is almost three times lower than in the case of single spells. On the contrary, the percentage of those who live at least four years out of seven in subjective poverty increases at 43%. This is not too different from the analogous percentage found with respect to income poverty, 40% for the unadjusted transitions and 33% with the adjusted ones. As for life-style deprivation, the same measure of poverty persistence is at 27%, suggesting that this form of identifying poverty, albeit potentially capturing situations of more extreme hardship, features a somewhat higher degree of turnover. Note, though, that it is not possible to unambiguously conclude that, among the three definitions considered, subjective poverty is the one characterized by a higher degree of persistence. In fact, such a conclusion would not be confirmed if one looks at the expected number of years in poverty, shown in Table 4. Within the single-spell approach, the expected number of years in poverty is highest for the subjective poverty (3.4), followed by income poverty (3.3., or 2.9 with adjusted

transitions), and by life-style deprivation (2.7). However, if as a measure of poverty persistence one refers to the percentage of individuals who spend seven years out of seven in poverty, the ranking changes.[8] Now the highest persistence is obtained with income poverty with unadjusted transitions (14%), followed by subjective poverty (14%) and then by life-style deprivation (5%).[9]

< Table 4 around here >

4. MULTIVARIATE ANALYSIS OF POVERTY EXIT AND RE-ENTRY

The previous analysis assumed that all the observed spells refer to a completely homogeneous population. It is instead more likely that individuals with particular observable and unobservable characteristics face different risks of exiting from and re-entering into poverty, and therefore of being persistently poor. To provide a more realistic picture of the different risks faced by various groups of the population, we now move from the simple life-table estimates presented so far to multivariate techniques that allow exit and re-entry rates to depend on important socio-economic correlates of poverty transitions.

Each individual is recorded in the data as having experienced either a single type of spell (poverty or out-of poverty) or both. In the latter case, it is possible that the person might have gone through repeated spells of poverty and/or repeated spells of non-poverty. In order to establish how poverty exit and re-entry depend on individual and household controls, we have initially pooled all the spells of a given type and have estimated two separate regressions: one for the chances of leaving poverty and the other for the hazard to re-enter into it. However, these separate estimates of the exit and re-entry rates do not control for unobserved heterogeneity. In effect this estimation strategy is tantamount to assuming that the multiple spells in a given state that an individual experiences are not correlated; it also implies that the spells in the two alternating states (poverty and non-poverty) for the same individual are also uncorrelated. In the absence of unobserved individual heterogeneity, these assumptions might be reasonable and each spell in and out of poverty can be treated as conditionally independent. In this case, the likelihood functions for the two types of spells can be maximized separately (e.g., Lancaster, 1990).

[8] Note that the percentage of people with 7 years in poverty out of seven is, by construction, equal in the single and the repeated spell approach.

[9] Note that in both measurements the percentages are rather higher than those obtained with the simple count of the years in poverty of section 3 (respectively, 6% and 2,7%). These figures clearly show the bias in poverty persistence estimates that do not correct for the right censoring of the observed spells.

However, when individuals differ in unobserved terms like ability, effort, tastes, and these unobservables remain constant over the individual's lifetime, the assumption of uncorrelated spells might be inappropriate. People that have had long stays in poverty in the past might be more likely to experience long spells again, particularly so if it is because of their unobservable characteristics that they have long survived in the state. Similarly, individuals that spent a long time out of poverty in the past might be less likely to experience long spells of poverty in the future.

Our second, and preferred, estimation strategy therefore accounts for spell correlation in the presence of unobserved heterogeneity by following the methods proposed by Stevens (1999). [See also Meghir and Whitehouse, 1997; Ham and LaLonde, 1996; Devicienti, 2001]. In this case the hazard rates depend on spell-specific unobserved heterogeneity terms and these terms are correlated across spells, requiring that the exit and re-entry rates be estimated jointly. In particular, let us consider a group of people that have just entered in a state (at d=0) and are at risk of exiting thereafter, at each exit time measured by the (discrete) duration variable d, d =1,2,..,D. The probability that person i leaves the state at duration d, given that has survived in the state to d-1, is assumed to be a standard *cloglog* hazard function (Prentice and Gloecker, 1978). For *poverty spells* this hazard is written as:

$$e_i(d \mid \theta_i^P) = 1 - \exp[-\exp(\theta_i^P + \alpha^P(d) + X_{it}^P{}'\beta^P))] \qquad (2)$$

This complementary log-log model can be interpreted as the discrete-time counterpart of an underlying continuous-time proportional hazard model (see Allison, 1982; Jenkins 1995). In (2) X_{it} is a set of covariates that differ across individuals and, potentially, also over calendar time (represented by t). These covariates can be fixed or time-variant. The dependence of the hazard upon duration in the spell d is explicitly emphasized by (2), while dependence upon X_{it} - and through X_{it} upon calendar time t - is left implicit so as to simplify notation. β is a vector of parameters to be estimated, d refers to duration in the current poverty spell and $\alpha(d)$ is some functional form of how duration affects the hazard rate. As assumptions on the form of the baseline function $\alpha(d)$ can potentially bias the parameter estimates, we will use a fully flexible non-parametric specification (Meyer, 1990) with interval-specific dummies for

the baseline hazard. Finally, note that the hazard rate in (2) is conditional to θ_i^P, an individual and state-specific effect common across all poverty spells of individual *i*.

For *non-poverty spells* instead the hazard is written in a similar way as[10]:

$$r_i(d \mid \theta_i^N) = 1 - \exp[-\exp(\theta_i^N + \alpha^N(d) + X_{it}^N{}'\beta^N))] \quad (3)$$

where θ_i^N is individual effect common across all the non-poverty spells of individual *i* and *d* now indicates duration in the current non-poverty spell. As in most random-effect models, we assume that θ^P and θ^N are uncorrelated with the observed heterogeneity included in the vectors of covariates $X^P{}_{it}$ (poverty spells) and $X^N{}_{it}$ (non-poverty spells).

We allow for temporal correlation across spells of the same type, and also for correlation across spells of different types, by assuming that θ^P and θ^N are jointly distributed. For the model estimation, one can follow two possible routes. The first one is to specify a joint (parametric) distribution $G(\theta^P, \theta^N)$ for the unobserved heterogeneity and to integrate out the random effects in the likelihood function that includes both poverty and non-poverty spells for any individual in the data. The alternative is to use the Heckman and Singer (1984) estimator, where the distribution $G(\theta^P, \theta^N)$ is left unspecified – so as to minimize misspecification biases – and is approximated by a bivariate discrete distribution with a number of support points to be determined by the data. We follow the latter approach in this paper, as in Stevens (1999) [see Devicienti, 2001, for a technical appendix describing the estimation strategy at length].

5. WHO MOVES OUT OF POVERTY? WHO MOVES BACK IN? THE RESULTS OF THE MULTIVARIATE ANALYSIS

The results of our models are shown in table 5 for the exit rates and in Table 6 for the re-entry rates. We have experimented with various specifications and here we present our favorite models, which include both household and individual level covariates. While the table reports the coefficient estimates, $\hat{\beta}$, the proportional effect of each variable on the hazard rate can be obtained as exp($\hat{\beta}$). In the interest

[10] Note that, as we are not modelling the separate probabilities of each household member experiencing the various events with repercussions on household resources, the model in (2) and (3) should essentially be interpreted as a reduced form specification.

of brevity we will only report and comment the results obtained with the joint estimation of the exit and the re-entry rates, which controls for unobserved heterogeneity. In general, the results obtained when separately estimating the exit and re-entry rates, with no control for unobserved heterogeneity, do not differ much from the ones reported here but generally provide a worse fit of the data.[11] In effect, the fixed unobserved terms θ^P and θ^N mainly act as a shifter of the hazard but do not otherwise significantly alter the estimated impact of the personal and household covariates.

Exit rates

By examining the coefficients of the interval-specific duration dummies in Table 5, it can be noted that the data broadly confirm the existence of negative duration dependence for the exit rates, as already found with the simple life-table estimates. As one might have expected, though, its importance and significance is somewhat reduced given that we are now controlling for many other economic and demographic factors, including unobserved heterogeneity. This is often the case in duration models and is generally taken as an indication that the duration dependence is at least partly due to sorting effects (those with favorable characteristics tend to leave earlier) rather than indicating "true state dependence" (e.g. a 'scarring' effect due to depreciation of human capital or to deterioration of one's social network). Indeed, the duration dummies are jointly statistical significant for each poverty definition[12], although a few individual dummies are not. For example, the chances of exiting income poverty remain significantly lower for those already in their fifth or sixth year in poverty than for the rest of the sample, whereas only the first two dummies are significant for subjective poverty and the first four for life-style deprivation. This means that "true state dependence" is likely to exist for the exit rates even after controlling for unobserved heterogeneity. At the same time, the results highlight the importance of using transition models that account for the full duration in the spell, rather than models with a more restrictive dynamics, as those that assume a first-order Markov dynamics.[13]

[11] There is not a single instance in which the coefficient of the covariates change sign or differ dramatically in their magnitude when comparing the two sets ob estimates. These alternative estimates are available upon request from the authors.

[12] A Wald test that the six duration dummies are jointly statistically not significant is easily rejected at conventional levels for each poverty definition.

[13] For example, Giraldo et al. (2002) propose a methodology to distinguish between the two effects and apply it to the case of Italy using the data of the Bank of Italy's SHIW. After assuming a first-order Markov model, they do not find evidence of true state dependence in income poverty.

In general household and individual characteristics impact the probabilities of escaping poverty in predictable ways and, in many cases, the direction of the effect, if not its size, is similar for each poverty definition. However, there are also a few differences worth noticing.

In most of the literature, the number of children in the household has a negative impact on the probability of leaving poverty: in our case this is confirmed for both income and subjective poverty, but the coefficient is not statistically significant for life-style deprivation. The effects are quantitatively strong: for example, other things equal, the changes of leaving income poverty after one year are equal to 0.59 for the base category (all Xs set to zero) but drop at 0.53 when the variable "number of children" is set equal to 1 and to 0.41 with two children. Interesting as it may be, the computation of relative exit rates is only part of the story. In fact, as shown later on by Table 6, as the number of children increases so do the risks of re-entry in income poverty: the re-entry rate after one year is equal to 0.26 for the base category, but increases at 0.48 if the number of children is equal to three. Therefore, to fully characterize the persistence in poverty of the various groups of the population one has to resort to simulation methods and to a multiple spell methodology that simultaneously accounts for the chances of exits and re-entry in poverty. This is aim of the next section. Accordingly, in the rest of this section we will limit ourselves to a qualitative discussion of the estimated impact of the various covariates.

Families with a larger number of adults (aged between 18 and 64) have lower possibilities to move out of poverty, however defined, than the rest of the population. Note that the models already control for the number of working adults in the household; therefore, the variable "number of adults" capture the negative contribution to a household's budget brought about by non-working adults. The impact of the number of elderly people (aged 65 or more) is instead unclear, crucially depending on the poverty definition adopted. The estimated coefficient is positive and statistical significant in the case of income poverty, perhaps reflecting the social security anomalies of the Italian case, in which fairly generous pensions imply that, other conditions being equal, the presence of an elderly person increases a family's welfare, at least when the latter is measured in terms of equivalent income.[14] The variable is instead negative for life-style deprivation and not statistically significant when looking at subjective poverty,

[14] At about 15% of its GDP, Italy has the highest level of pension spending in Europe.

which may suggest that the personal income received by the elderly is compensated within the household by their greater needs (e.g., health expenses).

Crucially important for the chances of leaving poverty is the number of working members in the household[15], which has a positive, economically large and statistically significant coefficient for each poverty definition. The literature on poverty dynamics has pointed out the role of secondary earners (partner, grandparents, etc.) in lifting up poor households above the low-income cut-off (OECD, 1998; Jenkins, 2000). We thus provide further empirical support for this argument, by showing its relevance also beyond the low-income context. Moreover, the result is of particular significance for a country like Italy, as we further elaborate in section 7.

The hazard of leaving poverty increases with the age of the household head, mostly reflecting upward mobility in the head's job career. For both income and subjective poverty the hazard starts to drop after age 46, while for life style-deprivation the turning point is at age 53. This is likely to mirror the decline in the earnings profile in the final stage of a person's career, the lower possibilities of occupational mobility, as well as other important changes in the labor condition or in the family situation (e.g., increasing health-related problems in the household).

The age of the individual does not have a clear effect on the exit rates, once the age of the household head is already controlled for. The models include a dummy (labeled "child") for whether the person is below age 18 and a dummy labeled "old" for persons aged 65 or more. Their inclusion is meant to investigate whether, irrespective of their household-level characteristics, the young and the old tend to face different risks of poverty persistence than the rest of the population. However, the results do not show a clear pattern: either the effects are not significant (subjective poverty) or they provide opposite results (income and life-style deprivation).

Similarly inconclusive are the results concerning the gender of the household head. In fact, those living in households headed by a woman do not appear to face significantly lower exit rates than those living in households headed by a man, with the exception of subjective poverty. Similarly, the gender of the person (as opposed to the head) is not statistically significant, except for income poverty with a negative coefficient.

[15] The variable excludes the household head, whose labour market status is captured by a series of dummies.

The education of the household head is an important determinant of the exit rates. Those living with a head that has a low level of education have systematically lower exit rates than when the head has secondary levels of education (base category). On the contrary, heads with higher level of education (university degree) generally guarantee higher exit probabilities to their households, albeit the dummy is not significant for income poverty.

The status of the household head in the labor market is potentially an important determinant of the chances of escaping poverty, though the effect seems to be more evident in the case of income poverty. Having a household head that works less than 15 hours a week, or is unemployed, discouraged or inactive strongly reduces the probability of leaving income poverty by about 50%-66% with respect to the base category (head works normally). The corresponding impacts in the case of subjective poverty and life-style deprivation are lower, and statistically significant only for unemployed and inactive heads. In part this may reflect the availability of channels other than income (e.g., household wealth and non-market coping strategies) that may weaken the relationship between poverty and current income earned by the head. Nonetheless, the result point out the well-known inadequacies of the Italian social security system towards the categories that stay out of labor market for extended periods of time (e.g., Ferrera, 2005; Baldini et al., 2002; Utili and Rostagno, 1998).

Finally, geography seems to be another crucial determinant of the hazard to escape poverty, which is not surprising given the country's longstanding territorial dualism. Those who live in the underdeveloped and backward South of Italy face higher risks of remaining in poverty, however this is defined, whereas those living in the prosperous North seem to face prospects that are rosier or no worse than those living in the centre (base category).

< Table 5 around here >

Re-entry rates

Our discussion of the estimates of the re-entry rates is kept brief as, in general, the variables that make it more difficult a poverty escape are also those that make it more likely a fall back in.

As shown by Table 6, negative duration in the hazard to re-enter poverty is found for both income and subjective poverty, with all statistically significant duration dummies. As the chances of returning into poverty decrease with the time spent out of poverty, governments may find it effective to help those individuals that have just managed to leave poverty: job retentions policies, start-up grants, continued income maintenance for the novel poverty escapers are examples of measures likely to produce long-lasting poverty reduction effects. Note, however, that the evidence of duration dependence for re-entry rates in life-style deprivation disappears after controlling for observed and unobserved heterogeneity.

For each poverty definition, the hazard for re-entry systematically increases with the number of children present in the household. As for the exit rates, the number of working household members is a crucial determinant of the risks of poverty re-entry. The variable is statistically significant and economically large for each poverty definition. Once this effect is controlled for, not surprisingly the presence of additional (non-working) adults in the household contributes to increase the risk of re-entering into poverty. The same is true with respect to the number of elderly members, although the effect is only significant for subjective poverty. Also the education of the household head impacts the re-entry probability in the expected way: higher risks for those with less than secondary education and lower for those with a university degree, for each poverty definition. Another crucial determinant of the hazard is the area of residence: those living in the South face much higher risks of poverty re-entry than elsewhere in the country, with statistically significant effects for each poverty definition. The employment status of the head of the household has broadly the expected effect upon the re-entry rates. In the case of income and subjective poverty, heads working less than 15 hours a week, those who are unemployed, inactive or discouraged imply higher falling-back risks when compared to heads who are normally working. However, these same variables are not significant when life-style deprivation is considered.

The effect of the remaining controls included in the models is less clear-cut. The quadratic in the age of the household head is only significant for life-style deprivation: the re-entry rate decreases with age, with a turning point at about age 53. The dummies for child and female are not significant. Old persons seem to face higher risks of re-entry in life-style deprivation. Those who live in households headed by a woman have higher probabilities of falling back in income and subjective poverty, but not in life-style deprivation.

Unobserved heterogeneity

The estimated unobserved heterogeneity distribution is displayed in the final rows of Table 5 and Table 6. For each poverty definition, the data allowed only two support points, θ^k_{low} and θ^k_{high}, for each of the individual-specific error terms, $k=P,N$.

Consider income poverty first. The great majority of persons in the population, 91%, are estimated to have high unobserved tendency to exit low-income (θ^P_{high}, normalized to zero with no loss of generality) and low tendency to re-enter ($\theta^P_{low}<0$). A small minority, however, the remaining 9%, have a higher than average persistence, with lower exit rates ($\theta^P_{low}<0$) and higher re-entry rates (θ^N_{high}, also normalized to zero). The data did not support the presence of the other combinations of unobserved heterogeneity terms (i.e., groups with [θ^P_{low}, θ^N_{low}] and [θ^P_{high}, θ^N_{high}], respectively) as the corresponding probabilities are estimated to be zero.[16] Note that the estimated support points are large (θ^P_{low}=-1.20 and θ^N_{low}=-2.21), implying that the persistence in poverty for the individuals who belong to the unlucky 9% is much longer than for the rest of the population. In fact, other things equal, individuals in this group have an exit rate about 91% smaller and a re-entry rate 77% higher than the rest of the population.

The unobserved heterogeneity distributions for the other two definitions of poverty have similar features. In fact, the estimated support points are fairly comparable in magnitude. As with income poverty, the population could be partitioned in two broad groups also for subjective poverty and life-style deprivation: those with favorable unobserved heterogeneity (high tendency to exit and low tendency to re-entry) and those with unfavorable heterogeneity (low tendency to exit and high tendency to re-entry). The group of these disadvantaged individuals makes up about 13% of the population in the case of life-style deprivation, similarly to income poverty. However, the same group represents a much larger share of the population, about 52%, when subjective poverty is being considered. Clearly, it is very difficult for the policy makers to target their interventions on these riskier groups, as by definition they are unobservable. The results here only suggest that there are factors, unobserved to the analyst and the policymakers, which make poverty a very persistent phenomenon, as well as a very challenging one.

[16] The model was initially estimated with six support points, but it did not converge indicating that the data would not allow such a general specification for the unobserved heterogeneity distribution. The model was then re-estimated by constraining at zero some of the mass probabilities.

< Table 6 around here >

6. PREDICTED POVERTY PERSISTENCE

The previous section has shown that there are groups of the population who are likely to suffer from persistent poverty. This happens because individuals who belong to these groups do not only have lower exit rates than the rest of the population; they also tend to have higher exit rates. Therefore, to draw implications for the persistence they experience in poverty we need to bring together the information about their exit rates and their re-entry rates, and calculate the distribution of 'time spent poor' over multiple spells. While we have already done that in section 3 with respect to a homogeneous population, we now provide estimates of poverty persistence for a number of selected sub-groups, which well illustrates the areas that need particular policy attention.

To do so, we simulate the longitudinal poverty profiles of a large sample of poverty entrants (10,000 individuals) who are homogeneous in selected economic and demographic characteristics. The simulations use the variables and coefficients estimated in Table 5 and 6, including the estimated distribution of unobserved heterogeneity.[17] The results are presented in Table 7. While the simulations produce the entire distribution of the 'number of years in poverty out of the next 7', the table shows only two summary measures of persistence, in the interest of brevity: the expected number of years in poverty and the percentage of individuals who spend at least four years in poverty, for each of the three definitions. The group types are chosen so as to reflect an increasing risk of poverty persistence, as indicated by the estimates of the exit and re-entry rates of the previous section.[18]

Consider first the case of a couple without children, the head aged 50, highly educated, normally employed and resident in the North of Italy (group A in Table 7). For a person with those characteristics and just fallen below the poverty line, poverty persistence – measured by the number of expected years under the threshold – is equal to 1.56 years for income poverty.[19] For subjective poverty and lifestyle deprivation the figure is not very different, equal to 1.71 and 1.60, respectively. Couples with those

[17] Devicienti (2001) provide further details on the simulation methodology.
[18] The groups considered in Table 7 are formed by combining only the variables that were broadly statistical significant in the models of Table 5 and 6. The remaining variables are set to zero (base category).
[19] Note that the simulations refer to those who have just entered in poverty, therefore everyone is poor at least for one year by definition.

characteristics, if they slip under the poverty line, do not have too many worries that the condition is of persistent nature, most of them in fact succeed in exiting fairly soon. In fact, only 4% of these individuals will be poor for at least four out of the next seven years for both income poverty and life-style deprivation, and 7% for subjective poverty.

The rest of the rows in Table 7 add "risk factors" cumulatively. The next row (group B) depicts the situation of a person living in the previous household type, but where there are two children. The expected number of years in poverty is now estimated at 1.88 for income poverty, 2.05 for subjective poverty and 1.62 for life-style deprivation. In the next row (group C) the spouse does not work and poverty persistence increases further, ranging from 1.70 to 2.44 years according to the poverty definition. If additionally the head is not working (group D), the expected number of years in poverty rises to between 2.15 and 2.89, and if the head has also low education (group E) persistence ranges between 3.03 and 4.33 years. In this case, the percentage of people with at least four years in poverty is 27% for life style deprivation, 33% for income poverty and as high as 51% for subjective poverty. The situation worsens still if the same household lives in the South of Italy (group F): in this case persistence is expected to be of between 4.45 and 5.03 years, with 57-67% of individuals with at least four years below the line, which increase further if in addition the household head is a young person (aged 30 in group G). The worst scenario represented in the table is that of a young lone-mother, aged 25, with three children, with low education, not working and living in the South. In this case, poverty is extremely persistent, ranging between 5.20 and 5.75 years, and with 72-76% of persons in such a household type spending at least four years below the line.

The bottom panel of the table considers instead the poverty experience of elderly couples, usually regarded as a broad group at high poverty risk and in need of special policy attention. Group I could represent the situation of an elderly couple, with no children, head aged 75, with high education, retired, spouse not working and living in the North of Italy. Indeed, poverty in this case is not particularly persistent: 1.93 years for income poverty, 2.21 for subjective poverty and 2.47 for life-style deprivation. However, things rapidly worsen as soon as additional risk factors are added to the household situation. So, if the head has low education and lives in the South (group M), persistence is now at 3.43 years for income poverty, 4.31 for subjective poverty and 5.12 for life-style deprivation. It is interesting to note that

elderly households appears to be less worse-off when poverty is defined in terms of low-income, rather than when it is directly perceived by the household involved or inferred from a multidimensional perspective. This is perhaps not surprising, in light of the country's rather generous pensions sustaining a household's income during retirement stages. However, an income-based definition may fall short of accounting for the additional needs typically related to the later stages of one's life cycle, whereas both the subjective and the multidimensional approaches may, at least in principle, come closer to represent the real situation of elderly households. The final two rows of the table show how persistent poverty can be when additional non-working members are present in the household and the head is relatively old. If an inactive adult person is added (perhaps a disabled relative) and the head is aged 85, the number of years in poverty is expected to lie between 4.89 and 6.06 years, and between 61 and 88%% of these persons will be poor for at least four years.

< Table 7 around here >

7. CONCLUSIONS

This paper has provided an empirical assessment on the dynamics and persistence of poverty for individuals living in Italy during the nineties, using the eight waves of the ECHP panel (1994-2001). The analysis has focused on the phenomenon longitudinal dimension, studying how long individuals remain below the poverty line, how successfully they are in exiting from it, and how often they fall back in. Unlike most of the recent literature on poverty dynamics, which has focused on low-income only, in this paper poverty has been defined following three different approaches and the analysis has been conducted in parallel for each of them. Our first definition is based on the traditional monetary approach and identifies the poor in terms of low equivalent household income. The second is a subjective definition of poverty, based on the individual's self-perception of his/her ability to make ends meet given available financial resources. Our third definition, which we have called "life-style deprivation", is multidimensional and defines the poor in terms of deprivation from a bundle of items (durable goods and services), whose possession is widely spread in contemporaneous Italy.

The results have shown that poverty features a high degree of turnover: from one year to the next a large number of the Italian population enter and exit from the state in object. We find that these results are true for any of the alternative definitions of poverty considered. Thus movements in and out of poverty cannot be simply related to spurious transitions due to measurement errors in household income. In fact, between 48 and 63% of those who have just started a spell in poverty manage to escape after only one year, depending of which poverty definition is used. However, between 19 and 28% of those who have just left poverty fall back in it after only one year. Therefore, the danger of a re-entry in the immediate future following an exit remains high, which implies that, for a correct measurement of poverty persistence, one cannot dispense with the use of a repeated-spell approach. When we apply the latter, we compute that, depending on the poverty definition, between 21 and 32% of those who become poor remain so for just one year out of the next seven, creating a sort of "temporary poor". However, between 27% and 43% of the poverty entrants are expected to remain poor for at least four years out of seven, and the expected number of years in poverty in a 7-year window lies between 2.7 and 3.4 years. As expected, estimated poverty dynamics and persistence showed differences according to the particular definition adopted and whether or not one attempts to reduce spurious low-income transitions through ad-hoc corrections. Overall, while we were generally unable to rank the various definitions in terms of the degree of turnover and persistence that they generate, we were struck more by the similarities than by the differences in the longitudinal behavior of the three ways of identifying the poor.

Despite poverty appears to be rather transitory in general, there are groups of individuals who are likely to spend a higher number of years below the threshold than the rest of the population. This may occur when certain types of individuals have both lower poverty exit rates and higher re-entry rates. To shed light on the identity of these groups, we have estimated discrete-time multivariate hazard rate models, which control for observed and correlated unobserved heterogeneity. Allowing for the latter was found to be important, as the estimates showed that individuals whose unobserved traits make them less able to escape poverty are also those with an (unobserved) high tendency to fall back in.

Our data generally reveal the existence of a negative relation between hazard rates and the duration of the spell, even after controlling for observed and unobserved heterogeneity. As the permanence in poverty lengthens, it becomes more and more difficult to succeed in moving out of it with one's own

means. This implies that policies should be specifically addressed to the long-term poor, who are otherwise condemned to a spiral of persistent poverty and outright social exclusion. At the same time, the presence of negative duration dependence in the exit rates implies that timely policy interventions, if successful in promoting an early escape above the threshold, can have long-term effects of poverty reduction. Some evidence of negative duration dependence is also found for the re-entry rates, and therefore policies should also be directed at preventing early re-entry. From an econometric point of view, these findings highlight the importance of allowing for an unrestricted dynamics in models studying poverty persistence; therefore models assuming a simpler, first-order Markov dynamics may produce invalid inference.

The results of the multivariate models have shown that people at risk of poverty persistence broadly share the same characteristics, for each poverty definition. Moreover, simulation exercises have computed the distribution of the number of years in poverty for selected groups of individuals, using the model estimates. People living in households with many children, with a head who is either very young or very old, and who has a low level of education constitute cases with higher risk of persistent poverty than the rest of the population. The situation may be even worse for those living with a non-working head (unemployed, out of the labor forces) or working an insufficient number of hours, although these variables were not always statistical significant. What was found to be of crucial importance, with large and statistically significant coefficients for each of the poverty definitions considered, was the household's area of residence and the number of working members other than the household head. This is not surprising for a country like Italy, characterized by a longstanding territorial dualism, with a stagnant and underdeveloped south, and a poorly performing labor market. In fact, Italy shares with some other southern European countries a series of negative records, such as the highest rate of long-term unemployment, the highest youth unemployment rate, the lowest participation rate of women and older workers, and, lastly, the lowest employment rate, which is very far from the target of 70% of the working age population that the European Union has set for 2010. Job opportunities are unevenly distributed among the labor force. Imperfections and institutional rigidities produce the effect, among others, of increasing the marginalization of specific segments of the working population (Dell'Arringa, 2003).

For Italy, perhaps more than elsewhere in Europe, we would therefore emphasize the importance that policies aimed at increasing the presence of secondary income earners in the household may have in the context of the complex strategies to combat poverty. Some examples that appear particularly appropriate to the Italian case include the extension of nursery schools and other fundamental social services, the promotion of part-time and other work arrangements suitable to the needs of young people, women and the elderly, a greater investment in re-training programs and access to new technologies, as well as changes in retirement rules and the elimination of a wide range of institutions reducing the incentive to labor market participation (e.g., Negri and Saraceno, 1996).

While the emphasis on the labor market policies seems widely justified by the estimation results, the well-known limits of the Italian social security system also clearly emerge, as reflected by the risks faced by specific groups of the population, above all those characterized by the presence in the household of children, elderly people or members unable to participate to the labor market for various reasons. Recent tendencies of reform towards a rationalization of public expense for social assistance, a more effective targeting of the policy interventions, and the overcoming of the traditional sectorial logic in favor of a selective-universalistic approach look like promising directions for the future, as is the introduction of a long-awaited minimum income guarantee (Sacchi and Bastagli, 2005).

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Tables:

Table 1: Cross-Sectional Poverty, 1994-2001

A.	Number of years in poverty (unbalanced sample)							
	1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Number of individuals	*21396*	*21423*	*21224*	*19861*	*19141*	*18449*	*17516*	*16014*
income poverty								
poverty line fixed in real terms	20.42	20.08	18.8	17.12	14.68	13.61	12.54	13.02
poverty line time-varying	20.42	20.39	20.13	19.5	17.97	18.01	18.44	19.31
Subjective poverty	22.11	22.51	18.81	19.11	24.08	23.46	21.42	21.66
Life-style deprivation	16.01	16.15	14.84	12.09	11.21	10.21	9.38	9.97

B.	Percentage of individuals in poverty for x years (balanced sample)								
Number of years in poverty (x)	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Income poverty (line fixed in real terms**)**	58.9	13.6	7.2	5.1	4.0	3.4	2.5	3.2	2.4
Income poverty (relative) (line time-varying**)**	54.0	13.4	7.3	6.3	4.2	4.0	3.1	3.9	3.5
Subjective poverty	44.3	17.8	10.2	6.5	5.7	4.3	4.3	3.7	3.3
Life-style deprivation	64.4	14.8	7.4	4.3	3.1	2.0	1.6	1.5	1.1

Note: Panel A is based on an unbalanced sample of persons (adults and children) in complete respondent households for all waves for which they are in the sample. The "fixed" (in real terms) poverty line is 60% of wave 1 median equivalent income. The time-varying poverty line is 60% of contemporaneous median equivalent income (see text). ECHP cross-sectional and longitudinal weights have been used in panel A and B, respectively.

Table 2: Survivor Function And Exit Rates From Poverty, For All Persons Beginning A Poverty Spell (Kaplan-Meier Estimates)

Number of interviews since start poverty Spell	Income poverty				Subjective poverty		Life-style deprivation	
	Survivor Function (s.e.) Adjusted transitions	Exit rates (s.e.) Adjusted transitions	Survivor Function (s.e.)	Exit rates (s.e.)	Survivor Function (s.e.)	Exit rates (s.e.)	Survivor Function (s.e.)	Exit rates (s.e.)
1	1.00	.	1.00	.	1.00	.	1.00	.
	.	.	.	.	.	.	.	.
2	0.52	0.48	0.42	0.58	0.43	0.56	0.37	0.63
	(0.007)	(0.01)	(0.007)	(0.01)	(0.005)	(0.007)	(0.0062)	(0.0102)
3	0.34	0.35	0.23	0.46	0.28	0.36	0.20	0.47
	(0.007)	(0.014)	(0.006)	(0.016)	(0.005)	(0.01)	(0.0054)	(0.0159)
4	0.27	0.20	0.16	0.29	0.21	0.23	0.13	0.34
	(0.008)	(0.016)	(0.006)	(0.02)	(0.005)	(0.012)	(0.0049)	(0.0215)
5	0.21	0.22	0.12	0.29	0.17	0.21	0.09	0.31
	(0.008)	(0.023)	(0.006)	(0.026)	(0.005)	(0.017)	(0.0045)	(0.0275)
6	0.18	0.17	0.09	0.20	0.14	0.16	0.06	0.33
	(0.009)	(0.029)	(0.006)	(0.031)	(0.005)	(0.023)	(0.0042)	(0.0404)
7	0.14	0.19	0.07	0.22	0.10	0.28	0.05	0.16
	(0.01)	(0.048)	(0.006)	(0.051)	(0.007)	(0.049)	(0.0042)	(0.044)

Note: Life table estimates based on all non-left censored poverty spells, pooled from the ECHP waves 1-8. The number of individuals starting a poverty spell is 6095 for income poverty, 8838 for subjective poverty and 6095 for life-style deprivation. Standard errors in parenthesis. 'Adjusted transitions' define exits from poverty (out-of-poverty) as occurring only if post-transition income is greater (less) than 110% (90%) of the poverty line.

Table 3: Survivor Function And Poverty Re-Entry Rates, For All Persons Ending A Poverty Spell (Kaplan-Meier Estimates)

Number of interviews since start non-poverty Spell	Income poverty				Subjective poverty		Life-style deprivation	
	Survivor Function (s.e.) Adjusted transitions	Re-entry rates (s.e.) Adjusted transitions	Survivor Function (s.e.)	Re-entry rates (s.e.)	Survivor Function (s.e.)	Re-entry rates (s.e.)	Survivor Function (s.e.)	Re-entry rates (s.e.)
1	1	.	1	.	1	.	1	.
	.	.	.	.	.	.	.	.
2	0.81	0.19	0.75	0.25	0.72	0.28	0.77	0.23
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.0057)
3	0.73	0.10	0.64	0.15	0.56	0.22	0.66	0.14
	(0.006)	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)	(0.0059)	(0.0056)
4	0.68	0.07	0.57	0.11	0.46	0.17	0.60	0.09
	(0.006)	(0.005)	(0.007)	(0.006)	(0.006)	(0.007)	(0.0063)	(0.0055)
5	0.65	0.04	0.54	0.07	0.40	0.12	0.55	0.08
	(0.007)	(0.005)	(0.007)	(0.006)	(0.006)	(0.008)	(0.0069)	(0.0064)
6	0.63	0.03	0.51	0.05	0.36	0.10	0.51	0.07
	(0.007)	(0.006)	(0.008)	(0.007)	(0.007)	(0.009)	(0.0077)	(0.0079)
7	0.61	0.02	0.49	0.04	0.33	0.08	0.49	0.05
	(0.008)	(0.006)	(0.008)	(0.008)	(0.007)	(0.013)	(0.0087)	(0.0096)

Note: Life table estimates based on all non-left censored non-poverty spells, pooled from the ECHP waves 1-8. The number of individuals starting an out-of-poverty spell is 6749 for income poverty, 8858 for subjective poverty and 7104 for life-style deprivation. Standard errors in parenthesis. 'Adjusted transitions' define exits from poverty (out-of-poverty) as occurring only if post-transition income is greater (less) than 110% (90%) of the poverty line.

Table 4: Distribution Of The 'Number Of Interviews In Poverty Out Of The Next Seven'

Number of interviews with low income out of the next seven	Income poverty				Subjective poverty		Life-style deprivation	
	Unadjusted transitions		Adjusted transitions					
	Single spell	Repeated Spell	Single spell	Repeated Spell	Single spell	Repeated Spell	Single spell	Repeated Spell
1	48.0	30.1	57.6	29.3	56.6	20.6	63.3	32.3
2	18.2	18.8	19.5	22.0	15.7	19.8	17.2	24.0
3	6.9	11.5	6.6	15.9	6.4	17.0	6.6	16.3
4	5.8	9.8	4.7	11.8	4.5	13.2	4.0	10.8
5	3.5	7.7	2.3	7.8	2.7	9.9	3.0	7.5
6	3.4	7.9	2.0	5.9	3.9	9.4	1.0	4.1
7	14.2	14.2	7.3	7.3	10.1	10.1	4.9	4.9
Expected numbed of years in poverty	2.7	3.3	2.1	2.9	2.3	3.4	1.9	2.7
% of individuals poor for at least 4 years	26.9	39.6	16.3	32.8	21.2	42.6	12.9	27.3

Note: Adjusted transitions' define exits from poverty (out-of-poverty) as occurring only if post-transition income is greater (less) than 110% (90%) of the poverty line.

Table 5: Multivariate analysis of exit rates

	Income poverty		Subjective poverty		Life-style deprivation	
	Coeff.	**s.e.**	**Coef.**	**s.e**	**Coef.**	**s.e**
Covariates						
1st year in the spell	-0.225	0.287	0.785	0.243 ***	-0.539	0.308 *
2nd year in the spell	-0.393	0.292	0.452	0.253 *	-0.733	0.311 ***
3rd year in the spell	-0.880	0.302 **	0.122	0.259	-0.836	0.316 ***
4th year in the spell	-0.778	0.315 **	-0.025	0.270	-0.606	0.331 **
5th year in the spell	-1.532	0.374 ***	-0.178	0.302	0.092	0.353
6th year in the spell	-1.349	0.433 ***	0.066	0.330	-0.268	0.531
number of children	-0.159	0.023 ***	-0.128	0.247 ***	-0.014	0.261
no. persons aged 18-64	-0.134	0.022 ***	-0.110	0.193 ***	-0.083	0.212 ***
no. persons aged 65+	0.300	0.056 ***	0.050	0.480	-0.132	0.557 ***
no. of workers	0.323	0.033 ***	0.202	0.264 ***	0.099	0.321 ***
Child	-0.058	0.056	-0.020	0.053	0.005	0.058 *
Old	-0.166	0.089 *	-0.064	0.075	0.002	0.088 **
Female	-0.089	0.041 **	-0.008	0.036	0.051	0.041
age of hh head / 100	5.066	0.012 ***	2.525	0.923 ***	3.696	1.048 ***
age of hh head squared / 1000	-0.547	0.000 ***	-0.274	0.089 ***	-0.346	0.102 ***
female hh head	0.065	0.058	-0.196	0.047 ***	-0.030	0.056
low education of hh head	-0.156	0.048 ***	-0.221	0.044 ***	-0.103	0.046 **
high education of hh head	0.059	0.117	0.453	0.094 ***	0.432	0.134 ***
hh head working <15 hours weekly	-0.448	0.168 ***	-0.016	0.142	-0.184	0.255
Unemployed hh head	-0.674	0.088 ***	-0.780	0.077 ***	0.165	0.174
Discouraged hh head	-1.068	0.236 ***	-0.151	0.146	0.097	0.173
Inactive hh head	-0.274	0.060 ***	-0.148	0.054 **	-0.430	0.182 **
North	0.156	0.062 ***	-0.047	0.053	0.392	0.070 ***
South	-0.392	0.053 ***	-0.283	0.049 ***	-0.141	0.056 ***
Unobserved heterogeneity distribution						
Mass points: θ_{low}	-1.203	0.143 ***	-1.249	0.074 ***	-1.382	0.123 ***
θ_{high}	0*	.	0*	.	0*	.
Mass probabilities:						
$Prob(\theta^P_{low}, \theta^N_{low})$	0*	.	0*		0*	
$Prob(\theta^P_{high}, \theta^N_{low})$	0.91	0.024 ***	0.48	0.032 ***	0.87	0.029 ***
$Prob(\theta^P_{high}, \theta^N_{high})$	0*	.	0*		0*	
$Prob(\theta^P_{low}, \theta^N_{high})$	0.09	0.024 ***	0.52	0.032 ***	0.13	0.029 ***
Number of observations	20596		26987		21089	
Log likelihood	-9303		-14554		-9599	

Notes: Exit and re-entry rates (Table 5 and 6, respectively) are estimated jointly, controlling for unobserved heterogeneity. * constrained at zero in the likelihood maximization.

Table 6: Multivariate analysis of exit rates

	Income poverty		Subjective poverty		Life-style deprivation	
	Coeff.	**s.e**	**Coef.**	**s.e**	**Coef.**	**s.e**
Covariates						
1st year in the spell	-1.511	0.441 ***	-1.804	0.307 ***	0.856	0.451 *
2nd year in the spell	-1.857	0.446 ***	-1.884	0.313 ***	0.546	0.463
3rd year in the spell	-1.943	0.445 ***	-2.157	0.319 ***	0.097	0.469
4th year in the spell	-2.397	0.448 ***	-2.167	0.325 ***	0.163	0.473
5th year in the spell	-2.580	0.459 ***	-2.396	0.338 ***	0.030	0.483
6th year in the spell	-3.056	0.507 ***	-2.329	0.365 ***	-0.492	0.524
number of children	0.337	0.026 ***	0.114	0.297 ***	0.133	0.325 ***
no. persons aged 18-64	0.309	0.028 ***	0.138	0.233 ***	0.214	0.263 ***
no. persons aged 65+	-0.046	0.066	0.168	0.598 **	-0.048	0.704
no. of workers	-0.646	0.042 ***	-0.311	0.338 ***	-0.208	0.390 ***
Child	0.093	0.070	-0.026	0.065	-0.037	0.072
Old	-0.063	0.107	0.009	0.092	0.216	0.109 **
Female	0.067	0.051	-0.002	0.045	-0.019	0.051
age of hh head	1.251	0.015	1.586	1.185	-8.641	1.286 ***
age of hh head squared	0.037	0.000	-0.126	0.115	0.826	0.126 ***
female hh head	0.292	0.072 ***	0.347	0.057 ***	-0.002	0.071
low education of hh head	0.114	0.062 *	0.351	0.057 ***	0.274	0.061 ***
high education of hh head	-0.651	0.196 ***	-0.246	0.123 **	-0.695	0.201 ***
hh head working <15 hours weekly	0.449	0.257 **	0.131	0.214	0.022	0.290
Unemployed hh head	0.931	0.105 ***	0.744	0.101 ***	-0.328	0.224
Discouraged hh head	0.602	0.218 ***	1.054	0.203 ***	-0.160	0.219
Inactive hh head	0.225	0.077 ***	0.079	0.065	0.224	0.229
North	-0.110	0.089	-0.182	0.069 ***	0.195	0.101 **
South	0.450	0.072 ***	0.234	0.060 ***	0.915	0.086 ***
Unobserved heterogeneity distribution						
Mass points: θ_{low}	-2.212	0.211 ***	-1.747	0.086 ***	-1.659	0.189 ***
θ_{high}	0*	.	0*	.	0*	.
Mass probabilities:						
$Prob(\theta^{P}_{low}, \theta^{N}_{low})$	0*	.	0*		0*	
$Prob(\theta^{P}_{high}, \theta^{N}_{low})$	0.91	0.024 ***	0.48	0.032 ***	0.87	0.029 ***
$Prob(\theta^{P}_{high}, \theta^{N}_{high})$	0*	.	0*		0*	
$Prob(\theta^{P}_{low}, \theta^{N}_{high})$	0.09	0.024 ***	0.52	0.032 ***	0.13	0.029 ***
Number of observations	20596		26987		21089	
Log likelihood	-9303		-14554		-9599	

Notes: Exit and re-entry rates (Table 5 and 6, respectively) are estimated jointly, controlling for unobserved heterogeneity. * constrained at zero in the likelihood maximization.

Table 7: Estimated persistence in poverty: selected subgroups of the population (Repeated Spell Approach)

		Income poverty		Subjective poverty		Life style deprivation	
	Group	Mean number of years in poverty	% with at least 4 years in poverty	Mean number of years in poverty	% with at least 4 years in poverty	Mean number of years in poverty	% with at least 4 years in poverty
A	Person in a 2-adult household, no children, household head aged 50 and with high levels of education, both normally working, living in the North of the country.	1.56	0.04	1.71	0.07	1.60	0.04
B	As above, plus 2 children	1.88	0.08	2.05	0.12	1.62	0.05
C	As above, plus spouse not working	2.36	0.15	2.44	0.19	1.70	0.06
D	As above, plus inactive head	2.89	0.24	2.76	0.25	2.15	0.12
E	As above, plus head with low education	3.46	0.33	4.33	0.51	3.03	0.27
F	As above, plus living in the South	5.03	0.67	4.82	0.61	4.45	0.57
G	As above, plus young head (age 30)	5.55	0.72	4.91	0.62	5.05	0.69
H	As above, plus single-mother aged 25 with three children	5.75	0.76	5.44	0.72	5.20	0.73
I	Elderly couple, no children, head aged 75, with high education, retired, spouse not working, living in the North	1.93	0.09	2. 21	0.15	2.47	0.17
L	As above, plus head low education	2.26	0.14	3.47	0.42	3.56	0.38
M	As above, plus living in the South	3.43	0.33	4.31	0.52	5.12	0.70
N	As above, plus a living-in non working adult	3.83	0.40	4.54	0.56	5.41	0.77
O	As above, plus head aged 85	5.04	0.61	5.29	0.63	6.06	0.88

Note: Simulations for those just starting a poverty spell, using estimated parameters and variables as in Table 5 and 6.

APPENDIX

Table A1. Symptoms of life-style deprivation

Symptoms	% of individuals who have the symptom
annual holiday	40.47
home adequately warm	21.99
washing machine	18.60
Low income	17.35
eat meat or fish every other day	6.38
pay utility bills	4.32
telephone	2.74
pay scheduled rent	2.06
loan repayments and installments	1.97
running hot water	1.86
color TV	1.04

Note: having the symptom means a situation of deprivation with respect to the respective item.

Table A2: Descriptive statistics.

Variable	All		Income poor		Subjective poor		Life-style deprived	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
number of children	0.754	1.041	1.069	1.388	0.878	1.088	0.994	1.146
no. persons aged 18-64	2.497	1.405	2.829	1.608	2.649	1.593	2.742	1.688
no. persons aged 65+	0.347	0.639	0.261	0.533	0.314	0.594	0.284	0.563
no. of workers	0.701	0.837	0.404	0.693	0.500	0.781	0.513	0.816
Child	0.184	0.388	0.231	0.422	0.205	0.404	0.224	0.417
Old	0.176	0.381	0.144	0.351	0.168	0.374	0.152	0.359
Female	0.515	0.500	0.533	0.499	0.532	0.499	0.522	0.500
age of household head	52.6	14.60	52.0	14.16	52.7	14.88	51.6	15.28
female household head	0.181	0.385	0.204	0.403	0.236	0.425	0.224	0.417
low education of household head	0.639	0.480	0.843	0.364	0.783	0.413	0.820	0.384
high education of househ. head	0.080	0.272	0.019	0.137	0.028	0.164	0.019	0.137
head working <15 hours weekly	0.010	0.100	0.020	0.141	0.018	0.131	0.024	0.152
Unemployed househ. head	0.029	0.169	0.089	0.285	0.087	0.283	0.097	0.296
Discouraged househ. head	0.006	0.074	0.015	0.120	0.014	0.115	0.012	0.111
Inactive househ. head	0.348	0.476	0.335	0.472	0.363	0.481	0.330	0.470
North	0.486	0.500	0.234	0.423	0.309	0.462	0.239	0.427
South	0.289	0.453	0.587	0.492	0.488	0.500	0.572	0.495