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Francesco Devicienti
Valentina Gualtieri
Mariacristina Rossi

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# The Dynamics and Persistence of Poverty: Evidence from Italy

Francesco Devicienti
University of Torino and Collegio Carlo Alberto

Valentina Gualtieri
Institute for the Development of Vocational Training for Workers

Mariacristina Rossi
University of Torino and CeRP - Collegio Carlo Alberto

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Address for correspondence:

Francesco Devicienti

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 (1994-2001). Two definitions of poverty are analyzed: income poverty and a multidimensional index of life-style deprivation. For both definitions, poverty exit and re-entry rates are estimated and combined to compute measures of poverty persistence over multiple spells. A picture of high poverty turnover emerges according to either definition. Multi-spell hazard rate models have been estimated to assess the relative importance of several demographic and labor market characteristics in shaping poverty persistence at the individual level. The results highlight the weaknesses of the Italian labor market, the insufficiencies of the existing social security system and the deep territorial dualism in generating persistent poverty for certain groups of the population. We have stressed the ability of the two definitions to provide a generally consistent characterization of the poverty persistence risks faced by various population subgroups, but also the additional insights to be gained by analyzing the two definitions in parallel in a longitudinal context.

**Keywords:**

Income poverty, multidimensional deprivation, poverty persistence, hazard-rate models, multiple spells.

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## 1. INTRODUCTION

In recent years the empirical literature on poverty has made substantial progress in our knowledge of the characteristics and determinants of the longitudinal poverty experiences at the individuals level. Following the seminal contribution by Stevens (1999), the importance of measuring poverty persistence taking into account both the chances of leaving and the chances of re-entering into poverty over an individual lifecycle is now increasingly appreciated. Despite these developments, a few issues have remained relatively unexplored in this literature. On the one hand, the vast majority of studies on poverty persistence have focused on the dynamics of low income only. A number of approaches to complement traditional measurement based on income or expenditure have emerged in the literature in the last decades (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. However, we are still unclear as to whether what we have learned about the dynamics and persistence of low income extends to these multidimensional measures of poverty. On the other hand, the multiple-spell approach pioneered by Stevens (1999) has only been applied to a few countries, mostly Anglo-Saxon ones [e.g., Stevens for the US; Jenkins, Rigg and Devicienti, 2001, and Devicienti, 2011, for Britain], and it is yet unclear to what extent their results can be extended to countries with different demographics, labor market institutions and social welfare systems.

This article aims at contributing to the empirical literature on poverty persistence on both issues. Our first contribution is to study in parallel the dynamics and persistence of two different definitions of poverty: income poverty and a multidimensional index of life-style deprivation, obtained by combining the survey's information on the (lack of) possession of a number of items deemed as "essential" in contemporary western life. The reasons for analyzing the persistence in poverty according to these different definitions are both theoretical and empirical. One of the most accredited theories of consumption, the life cycle consumption dating back to Modigliani and Brumberg (1954), posits that an individual's welfare depends on her attainable consumption, which in turn depends on her permanent rather than current income. Hence in theory consumption represents a better proxy of a household's standards of living than current income does. Yet, longitudinal household surveys do not generally contain consumption expenditure measures, while increasingly ask families about the possession of a

number of durable goods and services. The empirical researchers wishing to study the longitudinal aspects of poverty can therefore rely on both the observed individual income sequence and the longitudinal sequence of multidimensional deprivation. While the two sequences have in principle the potential to supply hints on the unobserved consumption profile over an individual's lifecycle, they both remain just proxies of the underlying phenomenon. Moreover, many researchers would still wish to look at multidimensional measures of poverty even if longitudinal consumption measures were available (e.g., Sen, 1985; Berthoud et al. 2004). At a very minimum, the parallel analysis of the two poverty definitions can be justified as a robustness check over one's preferred approach.

One of the main findings of the literature analyzing the dynamics in low income is that, despite frequent re-entry, exits are relatively rapid, making most spells of low income of short-duration. How far is this result still valid if poverty is defined in terms of multidimensional deprivation? Are the groups with high risks of persistent income poverty similar in terms of their demographic and labor market characteristics to the groups with high risks of persistent multidimensional deprivation? As far as we know, our own is the first attempt to apply Stevens (1999)'s multi-spell approach to measuring persistence when poverty is defined without directly referring to low income. We will be unable to rank the two approaches according to their ability to reproduce the underlying longitudinal poverty patterns in terms of consumption expenditure, because the latter is unavailable in our panel data. In light of this, our parallel analysis of the two approaches is meant to shed light on their ability to provide a consistent characterization of the dynamics and persistence of poverty.

Our second contribution is to focus on Italy, a country where the dynamics and persistence of poverty has been little studied before. One of the largest economy in Europe, Italy is a country 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 (European Commission, 2002). On top of these negative records, Italy also features a poorly designed social security system (Ferrera, 2005): a traditional sectorial logic of

intervention, one of the lowest shares in Europe of public expenses directed on social assistance and the highest on pensions, and a complete absence of a minimum income guarantee. These circumstances are typically held responsible for the levels of income inequality and the incidence of relative poverty, among the highest in Europe. In this paper we will investigate their potential role in the generation of a deprivation status that persists over time for particular groups of the population.

The availability of 8 waves of the European Community Household Panel (ECHP) makes it possible to study the dynamics and persistence of poverty in Italy over an extended time period, and according to both a low income and a multidimensional deprivation approach.[i] Our empirical analysis is based on multiple-spell models of transitions in and out of poverty, controlling for observed and unobserved individual heterogeneity. The models are estimated separately for each poverty definition. However, the exit and re-entry rates are estimated jointly, to allow for correlated unobserved heterogeneity in the two hazards. The estimates of the models are then used to predict the persistence in poverty experienced by various population groups, pointing out those that should attract greater policy attention.

Our results provide a picture of high poverty turnover according to either definition. As we discuss below, we do not expect the timing of this turnover to be necessarily synchronized across the two definitions, and in fact we find a significant fraction of individuals who, at any given time period, are poor according to one definition but not the other. We also report that, because of their intrinsic differences, income poverty and multidimensional deprivation have the ability to complement each other, and therefore to provide the analyst with a richer picture of the longitudinal patterns of poverty than a focus on one measure only would produce, consistently with the results of Perry (2002), Whelan et al. (2004) and Whelan and Maitre (2006). However, the empirical analysis also shows that income poverty and life-style deprivation are sufficiently correlated to one another that they can both be assumed to provide reasonable, albeit noisy, proxies of the underlying standard of living. Overall, our simulation exercises have stressed the ability of the two approaches to provide a generally consistent characterization of the poverty persistence risks faced by various population subgroups, but also the additional insights to be gained by analyzing the two definitions in parallel in a longitudinal context. The model estimates have also highlighted the role of demographic characteristics, the insufficiencies of the existing social security

system and, above all, the weaknesses of the Italian labor market and the deep territorial dualism in generating persistent poverty for certain subgroups of the population.

## 2. CONCEPTUAL FRAMEWORK

Before undertaking the empirical analysis it is useful to discuss, from a theoretical point of view, what differing implications the two poverty definitions might have for the estimation of poverty persistence. Suppose for a while that we could actually observe both a household's current income and consumption expenditure. The life-cycle theory of consumption helps us predict the different dynamics of consumption and income: because wealth holdings and borrowing usually make it possible to smooth consumption, the latter tend to be less volatile than income (e.g., Deaton and Muellbauer, 1980 and Deaton, 1992). These theoretical consideration also suggest that it would be difficult to justify the use of current income in poverty analysis, when high-quality consumption data are available. In fact, consumption being a choice of the resources to consume today rather than tomorrow, it better summarizes the resources available to the family over its lifetime and therefore its standards of living.

Our interest in this paper is not with volatility *per se*, rather with the persistence of poverty for those who have just slipped below the poverty line.[ii] Consider someone with both income and consumption levels above the poverty line and who is subsequently hit by a negative income shock sufficient to bring income below the poverty line. If the shock was completely anticipated, and therefore already incorporated in the consumer's permanent income, it need not affect consumption, which remains above the line. In this case the spells of income poverty that are observed in the data clearly do not reflect a real situation of deprivation, highlighting an important limitation of the use of current income in longitudinal poverty analyses. If the shock was instead unanticipated, it implies a downward revision of the consumer's permanent income and, therefore, a drop in consumption (smaller, because spread over many future periods). If the shock is large enough, it may be sufficient to make the individual also consumption poor. An immediate implication of this discussion is then that, once a common poverty line has been set in monetary terms, consumption poverty spells are less frequent than income poverty spells. A second implication can be drawn with regards the expected length of time in either types of poverty. In fact, note that the drop in consumption (smaller than income but large enough to make the individual

consumption poor) is likely to materialize only after some time the income shock has occurred, because the individual can initially resort to accumulated wealth to sustain his or her consumption. When income finally recovers from the shock, consumption will raise in turn, but again with a time lag, as the individual's wealth holdings will have to be restored. So, it is likely that - despite the different magnitude of the drop in consumption and in income - the length of time below the poverty line will not be very different in the two cases. What is more, if financial imperfections are widespread, then consumption is bound to follow the dynamics of income more closely, making the expected duration of the two processes even more similar.[iii]

Yet, we have to be aware that several factors are at work that might weaken the link between ex-ante theoretical predictions and the empirical evidence. An important complication derives from the conceptual differences between the theoretical model's variables - income and consumption expenditures - and the variables typically used in empirical poverty analyses. In the latter context, household income is generally deflated by an equivalence scale factor. Additionally, in many panel datasets (including our own) the level of consumption expenditure is not observed and the researcher can, at best, resort to a summary indicator of lack of “necessary” goods. Consumption expenditure and this indicator of deprivation (which we will dub below "life-style deprivation"; LSD henceforth) are clearly correlated but in an imperfect way. Although a fully developed theory for the dynamics of equivalent income and LSD is currently missing, the following conceptual framework will guide much of our discussion in the rest of the paper. We will think of the LSD score as a comprehensive "outcome variable" reflecting a household (in)ability to reach a minimum standard of living, as a function $F(\cdot)$ of its total monetary resources (income and wealth), its level of needs, as well as a set of "additional constraints" faced by the household (e.g., local prices, availability of infrastructure and public services, community/family in-kind help):

*LSD score = F*(*household income and wealth; household needs; other constraints* ...).

On the other hand, the definition of equivalent income implies that this is a function $G(\cdot)$ of a household total current income (but not wealth) and some of its needs, specifically only those incorporated in the equivalence scale used. For instance, the needs incorporated by the OECD scales often used in comparative poverty analysis only relate to a household demographic composition (number of adults and number of children):

*Equivalent income* = *G*(*household income; demographic needs reflected in the eq. scale*).

This conceptual framework helps us predict the differing longitudinal behavior of the two measures. For instance, consider an exogenous "shock" such as the arrival or departure of a child. Equivalent income "mechanically" decreases because the denominator increases in a way dictated by the equivalence scale factor. Clearly, the welfare implications of this raise are only valid to the extent that one agrees with the normative value judgments built into the particular equivalence scale used. Instead, the LSD score being a comprehensive outcome variable, it decreases if the arrival of the child actually implies a decrease in a the household's minimum standard of living, after taking into account the response of the household to the "shock": e.g., the household may have resorted to various coping strategies to reduce the length of time in deprivation, including dissavings and borrowing. For another example, a household with total expenditures below the poverty threshold might improve its deprivation index by purchasing less-expensive/lower-quality versions of the "necessary" goods and services available to most consumers. A deprived household might also receive in-kind transfers from relatives or from their local community, which may improve their deprivation scores while leaving unchanged their current equivalent income. In other words, it can be easier to escape life time deprivation poverty than income poverty. More importantly, this conceptual framework suggests that there are entire categories of shocks that are disregarded by the equivalent income definition, while may be captured by the life-style deprivation measure. An example is the aggravation of the health status of a non-working elderly of the household. If this condition does not attract monetary subsidy from the state, the equivalent income will be clearly unaffected. The life-style deprivation measures, on the other hand, may raise if the household is forced to spend a significant amount of its monetary resources in the purchase of health or long-term care services.

As we will see in the next session, many operational choices have to be made to construct an empirical measure of deprivation out of a survey's questions on a household's ability to afford a list of goods and services. The choice of the poverty line to be used for income poverty (IP, henceforth), on the one hand, and for LSD, on the other, is of particular concern. The empirical guidance offered by the life-cycle consumption theory mentioned above is much reduced because the non-monetary nature of the LSD measures implies that a common monetary poverty line cannot be set. As a practical strategy one can analyze the dynamics behavior of LSD under a number of alternative thresholds, and then compare these

dynamics with the one obtained for IP. While this compromise strategy seems sensible, it clearly weakens the link between the canonical model's predictions and the dynamic behavior of the empirical measures actually used in the poverty analysis.

Another complication derives from the fact that the canonical model of life-cycle consumption refers to the behavior of a single individual, whereas poverty analyses require that all incomes and consumption expenditures of each household members be simultaneously considered. For example, the canonical model has different implications according to which part of the life-cycle the individual is currently living, but households generally consists of members who may be at rather different parts of their life-cycle. While the empirical analysis can try to account for these (and related) family differences, the theoretical model's predictions about the dynamics of income and consumption are less clear cut once the context of the entire household is taken into account. Note also that the link between the theoretical predictions and the empirical analysis is further weakened in the presence of measurement error in income, equivalent income, consumption expenditure and life-style deprivation scores. A number of studies have emphasized that income measurement error tend to inflate the true extent of mobility across the poverty line (e.g., Lee et al., 2009; Breen and Moisio, 2004). However, there is little evidence on the relative importance of measurement error in determining the dynamics of IP and consumption expenditure poverty. While our LSD measures is derived from easy-to-answer questions on enforced lack of a number of goods and services, measurement error cannot be ruled out entirely.

For all these reasons, we believe that the actual longitudinal behavior of IP and life-style deprivation is an empirical issue. Furthermore, we stress that when consumption expenditure is not available, both measures should be looked at, life-style deprivation being correlated to consumption in a different way than income. As both measures present limitations, the use of both can only help augment the comprehension of the underlying phenomenon of poverty over the life cycle.

## 3. DATA AND DEFINITIONS

The data used for our analysis are those of the 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.[iv] Our first poverty measure

identifies the poor in terms of low income, using definitions that have become fairly standard in the international literature (e.g., Jarvis and Jenkins, 1997; Jenkins, 2000; Cappellari and Jenkins, 2004; Biewen, 2006; Cantó Sanchez, 2002 and 2003; Valletta, 2006; Brandolini and Saraceno, 2007). The unit of analysis is the individual (adult and children), which is followed as s/he moves from one household aggregation to another in the course of her/his life. 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 converted in 2002 prices using the CPI provided by the Italian National Statistical Office. To account for varying household size and composition (and related economies of scales within the household), household net income is divided by the OECD-modified equivalence scale, and the resulting value is equally attributed to all household members.[v] 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.

Our second 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 makes them tantamount to "essential" durable goods and services (see also Deutsch and Silber, 2005; Muffels and Fourage, 2004). Following Whelan and Maitre (2006), the following list of 13 items was 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 colour TV, (2) a washing-machine, (3) a telephone, (4) a car or van, (5) a video recorder (6) a microwave (7) keeping the home adequately warm, (8) paying for a week's holiday away from home, (9) replacing any worn-out furniture, (10) buying new, rather than second hand clothes, (11) eating meat or fish every other day, if wanted to, (12) having friends or family for a drink or meal at least once a month, (13) paying scheduled mortgage payments, utility bills or hire purchase installments during the past 12 months.

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 (dichotomous) measure of low income. A similar choice is made by Whelan et al. (2004) and Whelan and Maitre (2006), who summarize the set of items in a scalar measure which they call index of "life-style deprivation". Albeit our index is slightly different than theirs, we will keep that same name for simplicity. The indicator is constructed as follows. First, for each of the 13 indicators, we construct corresponding dummy indicators, which are equal to 1 when the household is deprived in the item, 0 if not deprived, 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. As in Whelan and Maitre (2006), we use a weighted version of this measure in which each item is weighted to the proportion of households not suffering an enforced lack of that item (see Table A1).[vi] Finally, the deprivation score for each individual $i$, call it $S_i$, is made dichotomous by setting a threshold that identifies who is in LSD 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 with IP, 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. We have experimented with a range of values for the threshold, from a relatively low value set at 70% of the median $S_i$ as in D'Ambrosio at al. (2008) and Deutch and Silber (2005), up to a more generous 85% of the median $S_i$. In each case the threshold is fixed at a fraction of the median $S_i$ in wave 1, in line with our fixed-in-real-terms IP.[vii] Note that our thresholds are different than the one used by Whelan and Maitre (2006), who set the income threshold first and then choose the deprivation threshold that guarantees that the incidence in deprivation and low income is the same in each wave. We do not follow this approach because we want to avoid that the two poverty definitions are mechanically related by construction (which explains also why an income component is not directly included in the life-style deprivation

index). As one of our aim is to study in parallel two distinct poverty definitions, without giving priority status to either, we have set our deprivation threshold independently from the low-income threshold.

## 4. INCOME POVERTY AND LIFE-STYLE DEPRIVATION: PRELIMINARY EVIDENCE

Table 1 adopts a cross-sectional perspective and describes the percentage of individuals who are considered poor or deprived during the sample period. On average, IP hits about 16% of the population if the fixed-in-real-terms threshold is used, and 19% if the poverty line is allowed to be time varying. The incidence of life-style deprivation is, on average, at 9% if the 70% threshold is used, 15% with the 80% threshold and about 22% with the 85% threshold (not shown). Clearly a direct comparison of the levels of poverty is not very informative in any given year, as these levels reflect the (arbitrary) poverty lines chosen. More interesting is to document the aggregate changes in the indicators over time. Between 1994 and 2001 mean household equivalent income increased by about 1.7% annually in real terms. If IP is measured with a fixed threshold, the growth in income translates in a reduction in the incidence of poverty, of about 7 percentage points. If the line is allowed to vary annually, the fall in the incidence of IP is more modest, somewhat reflecting a decline in equivalent income inequality.[viii] Life-style deprivation has also a declining trend over time. The reduction in its incidence over the period is at around 8 percentage points if one looks at the 80% threshold, not very different from the reduction in the incidence of IP measured with the fixed threshold. This parallel trend may be taken as an indication that both measures are capturing an "absolute" view of poverty, whereas the IP measured with the time varying threshold is more likely to capture a "relative" concept. In fact, the median of $S_i$ is virtually unchanged during the sample period (which implies that the deprivation thresholds are *de facto* also time-invariant); the decline in the deprivation incidence then reflects growth in the lower percentiles of $S_i$.[ix]

To analyze the longitudinal patterns of poverty, and in particular the transitions that the individuals make below and above each of the respective poverty thresholds, we now turn to the panel component of the data. Table 2 shows the fraction of the population who experience any number of years in poverty within a 8-year period. A number of findings are worth noting. First, the majority of the population is never hit by poverty. Second, the fraction of the population that is below the poverty threshold in at least one year during the 8-year period is much higher than the cross-sectional poverty rates shown in Table 1.

In fact, about 44% of the population are touched by IP at least once within the 8-year period (48% with a time-varying threshold). In the case of LSD, this same fraction is between 29% and 42%, depending on the threshold used. Third, among those who turn out to be poor at least once, poverty is often temporary. For example, it can be easily computed from the table that about 33% remain below the (fixed) IP line for only one year in eight; the corresponding figure for LSD (80% threshold) is 35%. Forth, the number of people hit by persistent poverty is also fairly high. Among those who fall below the (fixed) low-income threshold, about 40% remain poor for at least four years during the sample period; the corresponding figure for LSD is between 26% (with the 70% threshold) and 33% (with the 80% threshold). There is also a non-negligible minority of individuals who are always in poverty within the 8-year period, which vary between 1 and 3% depending on the poverty definition.

Note that the longitudinal calculations discussed above – being based on the simple count of the number of years in poverty and on a balanced longitudinal sample – are subject to potentially important limitations that we discuss later on and try to overcome with a hazard rate approach starting in section 6. Despite these limitations, we are inclined to derive two broad messages from this preliminary longitudinal analysis. To begin with, these results are consistent with the view that poverty, however defined, is a condition "in movement", which can hit in transitory, occasional, repeated and persistent way. The other broad message is that longitudinal movements in LSD are not necessarily less pronounced than IP. In general, for any poverty definition, the higher the threshold set, the longer is the persistence in poverty for those who fall below it. So the figures obtained in the case of IP can be made lower or higher than the values for LSD by varying the generosity of the thresholds. When the thresholds for IP and LSD are set so as to deliver a similar cross-sectional incidence - and this happens most notably for the fixed IP and for the 80% deprivation threshold - then the longitudinal behavior of the two poverty definitions are also very similar. In the following sections these suggestive results will be subject to deeper scrutiny using a multiple-spell hazard rate approach. The persistence in IP and LSD will be analyzed in parallel, applying this approach separately for each definition. This assumes that the two poverty definitions can complement each other, and enrich our understanding of the longitudinal behavior of an underlying material deprivation measure. The next session is meant to investigate the extent to which this assumption is tenable.

## 5. THE "OVERLAP" BETWEEN INCOME POVERTY AND LIFE-STYLE DEPRIVATION

IP and LSD have been constructed independently, assembling different pieces of survey information. They may be capturing rather different aspects of a complex and multidimensional phenomenon. Alternatively, they might be both measure, with different degrees of accuracy, the same underlying (unobserved) notion of poverty. In this case it is also possible that they overlap substantially, making one of the two measures redundant from an empirical point of view.

One way to shed some light on this issue is to investigate whether the two types of deprivation are shaped by the same, or rather different, sets of demographic and economic factors. Table 3 presents a number of multivariate regressions where the dependent variable is either IP or LSD. An extensive set of demographic and socio-economic characteristics, both at the household and at the individual level, are used as covariates. They are meant to capture, on the one hand, the most important determinants of a household's financial situation (e.g., the number of members who are in work, the labor market status and the education of the household head, regional labor market conditions and prices) and, on the other, to reflect a household's needs, for instance those related to its demographic structure (e.g., number of children or of elderly) or to the presence of members with serious health problems.

Model (1) presents the marginal effects from a simple probit model for the probability of being income poor in the current year, pooling all 1994-2001 observations and using contemporaneous covariates. In the interest of brevity, and given the high overlap at the individual level between IP 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.[x] Model (2) is similar, but the dependent variable is now a dummy variable indicating LSD in the current year. Unless otherwise stated, we will focus on the 80% threshold for LSD: as the preliminary static and longitudinal patterns are, with this threshold, very similar than with the income definition, any differences emerging in their determinants will strengthen our case for the non-redundancy of the two measures. In this section we will only briefly discuss and compare the impact of the covariates across the two types of deprivation. The aim here is mainly to provide a first assessment of the overlap or mismatch in the determinants of the two poverty definitions; in later sessions we will analyze more systematically the impact of the various covariates on poverty persistence through simulation exercises.

Most of the covariates impact the probability of both types of deprivation in the same, predictable direction. More children increase the probability of being income poor in the current year; as well as that of being in LSD, although the effect is smaller in the latter case. This confirms our ex-ante prediction that consumption poverty reflects the additional coping strategies that the household might put into practice, therefore any "shock" to the households (such as additional children) should have a lower impact on consumption level, and therefore, LSD than on IP. A larger number of adult members (aged between 18 and 64) raises both probabilities. Note that the models already control for the number of working adults in the household; therefore, the variable “number of adults” is likely to capture the negative contribution to a household’s budget brought about by non-working adults. The effect is stronger (in absolute value) for IP than for LSD, confirming once again the predictions discussed earlier in the conceptual framework. The effect of the number of elderly people in the household (aged 65 or more) is imprecisely measured, and its sign is uncertain.

The chances of being in either type of deprivation are lower when a large number of household members are in paid work[xi]. The estimated impact is about three times larger in the case of IP than in the case of LSD, the former being more directly linked to a household monetary resources. Reflecting upward mobility in one’s job career over the life-cycle, the risks of poverty reduce as the head of the household gets older, but start raising again after around age 50 for both IP and LSD, mirroring the decline in the earnings profile in the final stage of a person’s career. Female headship increases the chances of being in poverty, as does a low education of the household head (less that secondary education, the reference category), with broadly similar effects across the two types of deprivation. A household head that works less than 15 hours a week, or is unemployed, discouraged or inactive (base category: head works normally) significantly increases the chances of being in deprivation. These effects are higher for IP that for LSD, supporting once more the view that coping strategies to fight poverty other than income-related strategies (e.g., borrowing, access to household wealth and non-market coping strategies) may weaken the relationship between poverty and current income earned by the head in the labor market.

Those living in the underdeveloped south of Italy as opposed to the centre (base category) face higher risks of poverty, and the risks are even lower for those living in the prosperous north. These effects are very similar across the two poverty definitions. This result may appear somewhat surprising as one

might expect that the large, and persistent, income differences between the two areas of the country should translate in higher area differences measured by LSD than by IP. However, this does not happen, and my be explained by the (documented) lower prices of many goods and services faced by southern residents. Differences in the average quality of the goods and services, and the differential recourse to community or family-help or other coping strategies between the two areas is another possibility. LSD can in principle capture these additional circumstances, which may contribute to alleviate the territorial differences in the standards of living arising from the large disparities in incomes.

Other factors that increase the risks of poverty are whether the head is separated, divorced or single, once again with very similar effects for both IP and LSD. The effect of being a single parent head is also positive. However, in general these variables are not found to be statistically significant in later models looking at poverty persistence. The models also include individual level covariates: the gender of the person and two dummies indicating whether he or she is young (age 18 or less) or old (age 64 or more). These variables are often imprecisely estimated, particularly in later models, suggesting that it may be difficult to identify individual level covariates once a rich set of household level covariates is already included in the models.

Although most factors seem to influence both types of deprivation in the same direction, and often also with a similar magnitude, two variables stand out for their opposite effects. Having a self-employed head increases the chances of IP but reduces the risks of LSD.[xii] The most plausible explanation for this finding is the under-reporting of self-employment income. On the contrary, the number of adults or elderly in the household who report any chronic physical or mental health problem, illness or disability in the current year has a positive impact on LSD, whereas the effect is negative and statistically insignificant for IP. Given that we are already controlling for a household's needs related to its demographic structure, one possible interpretation of this finding is that LSD is potentially able to reflect additional health-related needs (e.g. health expenses), whereas the definition based on equivalent income is not. As remarked in section 2, one should note, in fact, that the OECD equivalence scale, and other scales more generally, make no allowance for these special needs in adjusting household income.

Models (3) and (4) in Table 3 take a longitudinal perspective. They compare the determinants of persistent LSD and persistent IP. The models are estimated on the sample of all individuals present in

survey years *t*, *t*+1, *t*+2 and *t*+3, where *t* is wave 5, wave 4 or wave 3. The dependent variable is being income poor in all four years (t-t+3) or being in LSD in all four years. Covariates refer to year t.[xiii] The results of these longitudinal models seem to confirm many of the previous lessons. First, the factors that affect persistent poverty are very much the same that affect contemporaneous poverty. Second, these factors impact upon persistent IP and persistent LSD in the same direction, and in many cases the magnitude of the effect is also similar. As noted before, however, there are also a few notable exceptions. Having a self-employed head increases the risks of persistent IP but decreases the risks of persistent LSD. The number of health problems in the household also seem to affect the two definitions differently, positive on LSD, negative or not significant for IP. Third, those factors (number of adults and number of children in the household) that enter in the definition of the equivalence scale have a stronger effect on IP than on LSD. The factors related to the labor market (number of members in paid work, the labor market status and the education levels of the head) also exert as stronger effect on IP.

To further investigate the extent of the "overlap" between the two measures we now look at the correlation between the two definitions at the individual level. The tetrachoric correlation coefficient between current IP and current LSD is about 0.60. Table 4 explores this association within a multivariate framework, using the same covariates and samples as before. Suppose that the two poverty definitions were measuring essentially the same thing, so that knowledge that a person is, say, in LSD renders superfluous the additional knowledge of his or her IP status. In this case a multivariate regression of LSD in which IP is included in the list of covariates should produce a statistically insignificant coefficient for the additional covariate. This is not what is found in table 4. Model 1 clearly shows that, after controlling for the full set of covariates, knowledge that a person is below the IP threshold in a given year helps predict the probability of being in LSD; in fact, this probability is increased by about 10 percentage points when the person is in IP. Models 2 and 3 include indicators for IP in the current year and in the previous three to five years. The results show that each additional year of poverty has an independent effect on LSD in the current year: those households with low income in the current year have 3 percentage points (p.p.) higher probability of being in LSD in the same year; but those who have also been in low income for the previous three years have about 12 p.p. higher risks of LSD. Model 4 shows the effect of persistent IP on the probability of being in persistent LSD, using the same definitions as in Table 3. Having spent

the previous four years in IP increases by about 9 p.p. the probability of persistent LSD in the following four years. Model 5 provides an alternative estimate. It is based on simple OLS estimates of the number of years in IP and in LSD, for all individuals observed in each of the 8 waves (balanced panel). Covariates refer to wave 1 in this case. According to column (5) of table 4, each additional year of IP during the 1994-2001 period increases the number of years in life style deprivation by 0.28.

The existence of this positive correlation should, however, not lead us to expect more than an "imperfect overlap" between the two measures at the individual level. The raw probability of being in LSD, conditional on being in income poor in the same year, is about 38%.[xiv] These findings are not new and have led Perry (2002) and Whelan et al. (2004) to conclude that IP and LSD, albeit correlated, are "tapping different phenomena". This may be due to a number of reasons. First, the "timing" in the evolution of income, with its short-tem fluctuation, does not always translate in changes in a person well-being, as discussed in section 2. Second, the presence of household needs (e.g., disabled or unhealthy persons in the household) and circumstances (e.g., differences in local prices) may not be adequately captured by the "equivalence scale" factors underlying the IP definitions, whereas it should be more directly related to LSD. Third, individuals long in situations of financial restraint tend to develop coping strategies and forms of adaptability enabling them to reach an acceptable standard of living, or at least one that our life-style indicator measures as such. Finally, income underreporting, measurement errors in both income and the deprivation score, the incompleteness of the list of deprivation items (which results in a "truncated" distribution of the deprivation score) are also potentially responsible for part of the observed mismatch. While further investigating on the reasons for the moderate overlap between the two definitions of poverty is not the aim of this paper, we see these results as a confirmation of the importance of studying the dynamics of poverty from different angles and perspectives.

It is however interesting to provide some elements to evaluate the relative ability of the two definitions to represent an underlying notion of low standard of living. If we were able to observe a person's consumption expenditure, then it would be natural to ask which of the two poverty measures better correlates to it. We do not have this information in our data. However, given the characteristics of our data, it is possible to assess the correlation of our two poverty measures with indicators of financial satisfaction and of the ability to make ends meet. This is done in Table 5. Financial satisfaction is asked

to all adult respondents on a 6 grade scale (from not satisfied to fully satisfied). As for the ability to make ends meet, the following question is asked in the ECHP: "*A household may have 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?* ". Answers are elicited on a 6 grade scale (from "with great difficulty" to "very easily"). To investigate the correlation of these variables and our measures of poverty, we run ordered logit models using the same sample and list of covariates as before. The results of Table 5 show that both poverty measures are negatively correlated with indicators of financial satisfaction and a household's ability to make ends meet. Interestingly, in all cases the effect is higher in the case of LSD than for IP, suggesting that this variable might come somewhat closer than IP at representing measuring an underlying notion of low standard of living.

Overall, our reading of the results of this section is that IP and LSD are clearly capturing very much the same underlying concept of "exclusion from acceptable standard of living through a lack of resources", and thus are likely to offer two valid proxies for it. At the same time, the existing differences between the factors correlated with both definitions suggest that they have the potential to complement each other by capturing different facets of needs and deprivation.

## 6. MEASURING POVERTY PERSISTENCE: A HAZARD RATE APPROACH

The results of the previous sections provide a first attempt at characterizing the longitudinal behavior of IP and LSD, but are subject to potentially important limitations.[xv] First, they do not provide an estimate of the total time spent in poverty. The OLS models for the number of years in poverty can in principle do this, but are subject to censoring biases. Like the  statistics in Table 2, they are based on the simple count of the number of years individuals are observed in poverty. However, 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) may have been so for many years, although to the observer the individual appears poor only from 1994 onwards. Note that the persistence in poverty computed in OECD (2001), Whelan et al. (2004) and Whelan and Maitre (2006) are all subject to these limitations. A second limitation is that much panel information is thrown out when computing the

persistent measures employed in Tables 3 and 4. A related problem is that controlling for time-invariant unobserved heterogeneity is not viable once the longitudinal variability is so collapsed. As discussed by Bane and Ellwood (1986) and Jenkins (2000), the hazard rate approach is particularly well suited for the study of the dynamics of poverty at the individual level: it is potentially immune to the censoring problem, while lends itself to multivariate analyses of the factors associated to the transitions in and out of poverty, and hence to estimating poverty persistence over an individual's life-time. Importantly, the approach allows the researcher to assess the effect that time spent in the poverty or non-poverty states has on the probability of ending the state. The issue that interests researchers is whether the length of the current spell (duration dependence), as well as past spells of poverty and non-poverty (occurrence dependence), affects poverty persistence in a "true" sense or is simply the (spurious) effect of uncontrolled individual heterogeneity. In other words, the question is whether a "scarring effect" of the time already spent in the current spell, or deriving from the time spent in past poverty spells, exist that make poverty particularly persistent – other things equal. The issue has policy relevance, for if true state (duration or occurrence) dependence exists, then short-lived shocks can persist over long periods and policy interventions designed to reduce such shocks could have long-term consequences. Because of their ability to confront with these issues, while avoiding the limitations of the previous models, we next apply the hazard rate approach in the following sections.

We start by analyzing the broad patterns of transitions in and out of poverty using simple non-parametric estimates of the hazard rates in and out of poverty (Kaplan-Meier estimates). The sample comprises all spells experienced by individuals with non-missing poverty indicators 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. Note that 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.[xvi] Note that all individuals who have always been above the poverty line (more than half of the sample) do not contribute to the spell sample. As these right- and left- censored spells refer to

individuals who will hardly experience poverty in their lifetime, they do not provide much information on the dynamics of poverty for those who happen to fall below the line. On the contrary, the exclusion of individuals who have always been below the line in each year is more problematic, as they refer to individuals with longer than average spells of poverty. While there are methods that allows the researcher to control for the biases that such an exclusion may imply, they are rather demanding from a technical and empirical point of view, which may explain why most of the literature has ignored the issue. Additionally, a few studies that have attempted to include left-censored spells in the analysis (Stevens 1999; Devicienti, 2011) have concluded that the left-censored biases are likely to be of second order in relatively long panels[xvii]; note also that, in practice, only a minority (between 1 and 3%) of the sample is always below the line in each year of the sample period (Table 2).

Our estimates of hazard and survival functions are displayed in Table 6, separately for each poverty definition. The estimated exit rates in IP hint at 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; after five years the chances of exiting drop to 20%. Consequently, 9% of those who had been observed to become poor are still so after 6 years. Exit rates follow a similar pattern in the case of LSD, with estimated hazards declining with duration. Of all those who have just started a spell according to this definition of poverty, about 60% manage to leave the state after one year. After five years, the hazard is at 25% (19% with the 70% threshold). Survival in LSD is slightly less likely than in IP: after 7 years, about 6% are still in LSD, against about 7% in IP.

Table 6 also displays the re-entry rates and the survival function for those who have just terminated a poverty spell. Also in this case the results hint at 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 both IP and LSD. 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. Approximately 25% of the individuals that conclude a spell of IP will be poor again after the first year; after four years, approximately 46% of the poverty escapers will have become poor again. Re-entry rates in LSD are very similar to those of IP.

After one year out of LSD the probability of re-entry is 25% (22% with the 70% threshold) and, after four years, is 8% (10%). Not surprisingly, also the survival functions in LSD and in IP are fairly similar.

To summarize, the results of table 6 confirm 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 IP. For example, 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 Table 6. In addition, here we have also shown that an equally large amount of turnover emerges also when poverty is defined in terms of LSD.[xviii]

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 multiple 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, 2011; Jenkins and Rigg, 2001). In fact, in our data about 32% of those who end an IP spell will have a second or a third spell during the next seven years, and the percentage is similar for LSD. 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. Moreover, computing the ‘distribution of the number of years in poverty’ over multiple 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 for the two definitions of poverty. Two such measures are displayed at the bottom of Table 7, 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.

We look at IP first. As Table 7 shows, 29% of the population will have only one year in poverty out of the next seven, while about 33% of those starting an IP spell will spend at least 4 years below the poverty line. 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 (2011) finds that in Britain approximately 41% of those who begin a poverty spell will remain poor for at least 4 years once the multiple spells are taken into account. The estimates of the distribution of the number of years in LSD are also shown in the table. When the 80% threshold is used, the poverty persistence measures obtained for LSD and IP are almost indistinguishable. About 29% of the individuals spend one year in seven in poverty, and about 33% will spend 4 years, according to both poverty definitions. The expected number of years in poverty is 2.9. Poverty persistence in IP is and in LSD are similar even if one refers to the percentage of individuals who spend seven years out of seven in poverty, at about 6-7%. The figures for LSD are a bit different if one refers to the 70% threshold, which implies lower persistence. However, they would be rather similar to the ones obtained when setting IP at a lower threshold, e.g. another commonly used cut-off - 50% of median equivalent income - as shown in the second column.

The results of Table 7 have shown a somewhat surprising similarity between the persistence in poverty according to the two definitions. The conceptual framework of section 2 has discussed potential reasons for this similarity, but has also pointed out in what respect the dynamic behavior of IP and LSD is expected to differ. In fact, the results of table 7 only suggest that the aspects of similarity seem to prevail at an aggregate level, for the population as a whole. In the next section multivariate hazard rate models will be estimated to further explore how IP and LSD behave longitudinally for various groups of the population. It will emerge that the results of Table 7 hide a lot of population heterogeneity, and in some cases they also hide interesting differences between the two definitions of poverty.

## 7. MULTIVARIATE ANALYSIS OF POVERTY EXIT AND RE-ENTRY

*Observed household and individual heterogeneity*

The previous analysis assumed that all the observed spells refer to a completely homogeneous population. It is instead more likely that groups of the population with particular observable and unobservable characteristics face different risks of exiting from and re-entering into poverty, and therefore of being persistently poor. To shed light on the identity of these groups we now move to multivariate techniques that allow exit and re-entry rates to depend on important socio-economic correlates of poverty transitions. We use discrete-time, multivariate hazard rate models (*cloglog* formulation; see Prentice and Gloecker, 1978). Our estimation strategy also accounts for spell correlation in the presence of unobserved heterogeneity, as in Stevens (1999). [The model's specification and estimation are detailed in our online Supplementary Material]. 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, and are allowed to be time varying. The set of covariates included in the hazard rate models is the same as before, and in most cases the impact of covariates upon the poverty exit and re-entry rates is consistent with the static and dynamic model results of the previous sections. However, as noted before, the multivariate modeling of poverty hazard rates allows for a much richer characterization of the dynamic experience of poverty for the various groups of the population. The results of our hazard rate models are shown in table 8 for both the exit and the re-entry rates. In the interest 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.[xix]

In general household and individual characteristics impact the probabilities of escaping poverty in predictable ways. Moreover, the variables that make it more difficult a poverty escape are also those that make it more likely a fall back in. For example, the number of children in the household has a negative impact on the probability of leaving IP and life style deprivation. The size of the coefficient is larger (in absolute value) for IP than for life style deprivation. However, the effect of the same variable on the re-entry rate is also higher for the first definition of poverty. Therefore, to fully characterize the persistence in IP and LSD 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 overview of the estimated impact of the various covariates.

We start with the exit rates first. As table 8 shows, exit rates from poverty are lower when there are a large number of children and adults, with a larger effect in the case of IP. Exit rates are instead higher as the number of elderly increases. This latter effect is significant for IP, 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.[xx] The same variable has a non significant negative coefficient for LSD, which may suggest that the personal income received by the elderly is compensated within the household by their greater needs. The exit rate also increases with the number of household members who work, and the estimated impact is economically larger for IP than for LSD. 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.

Reflecting upward mobility in the head's job career, exit rates increases before dropping at age 46 for IP and age 52 for life style-deprivation. This is likely to reflect the typical inverse U-shaped earnings profile; for LSD it might indicate the peak of accumulated asset, thus the buffer stock to use for emergencies. Exit rates are also lower when the household head has less than secondary education; having a university degree, on the other hand, increases the exit rates, but the effect is imprecisely measured. The labor market status of the head also exerts a large impact on the exit rate, making it smaller whenever the head works less than 15 hours a week, or is unemployed, discouraged or inactive (base category: head works normally). Once more, these effects are generally higher for IP that for LSD. Nonetheless, the result points 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), as we further elaborate below.

When the household head is self-employed the hazard of leaving LSD increases, whereas the hazard of leaving IP decreases. This opposite pattern has been noted before and provides further evidence in support of our conjecture that self-employment income might be underreported, and that reference to

alternative poverty indicators has to be made for a correct evaluation of the longitudinal well-being of this type of households. Living in the underdeveloped and economically backward South of Italy, as opposed to the Centre (base category) or the prosperous North further reduces the exit rates, according to both definitions and with similar magnitudes.[xxi] Interestingly, the number of health problems in the household increases the exit rates from IP but has a negative effect for LSD. As noted earlier, this is consistent with the prediction that health-related needs should be captured by our deprivation measure but totally ignored by an equivalent-income based measure. However, the estimates in this case are not statistically significant, with the exception of the re-entry rate in LSD, whose coefficient is positive, as expected.

The other controls considered in the models - namely the dummies for being a child or and old person, for the person's gender, and for whether the household head is single, separated or single parent - do not generally provide clear cut results, with mostly statistically insignificant coefficients. The effect of the gender of the household head on the exit rate is also statistically insignificant for both poverty definitions. The poverty persistence implication of these variables will therefore not be systematically assessed in the simulation exercises of the next session.

In the interest of brevity we will kept our comments of the estimated coefficients for the re-entry rates at a minimum[xxii], leaving to the simulation exercise overall effect of covariates on poverty persistence. As Table 8 shows, the same characteristics that reduce the exit rates often increase the re-entry rates. Note that, as the exit rates are generally much higher than the re-entry rates, the effect of any given covariate on total poverty persistence is dominated by the former.

*Duration dependence*

Our hazard rate models allow for a fully flexible non-parametric specification of the baseline hazard functions (Meyer, 1990) by including interval-specific dummies for the duration in the spell. By examining the coefficients of these interval-specific dummies in Table 8, it can be noted that the data broadly confirm the existence of negative duration dependence for the exit rates, as already suggested by the simple life-table estimates. 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[xxiii], although a few individual dummies are not. 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 (e.g., Cappellari and Jenkins, 2002) may produce invalid inference. Negative duration dependence is also found in the re-entry rate in IP. 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 LSD mostly disappears after controlling for observed and unobserved heterogeneity.

We have also investigated the effect of accumulated poverty and non-poverty on the exit and re-entry rates from the current poverty and non-poverty spell. Dummy indicators indicating that the person had already experienced a poverty (non-poverty) spell in the past were included in the exit (re-entry) rate equations, but always found to be statistically insignificant. A similar conclusion was reached if the number for past spells was included instead. Therefore, we find little evidence of a causal effect of earlier spells of poverty on the current spells, and we suspect that this finding is related to the fact that we are already controlling, quite flexibly, for lots of observed heterogeneity, for (correlated) unobserved heterogeneity and non-parametric duration dependence.

*Unobserved heterogeneity*

Unobserved heterogeneity is controlled for by making our hazard rates dependent on random intercepts specific to the type of spell: $\theta^P$ for poverty spells and $\theta^N$ for out-of-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 $\theta^P$ and $\theta^N$ are jointly distributed with CDF given by $G(\theta^P, \theta^N)$. Exit and re-entry rate models are estimated jointly using the Heckman and Singer (1984) estimator.[xxiv] [see the online Appendix for details]. The estimated unobserved heterogeneity distribution is displayed in the final rows

of Table 8. For each poverty definition, the data allowed only two support points, $\theta^{k}_{low}$ and $\theta^{k}_{high}$, for each of the individual-specific error terms, $k=P,N$.

The great majority of persons in the population, 91%, are estimated to have high unobserved tendency to exit low-income ($\theta^{P}_{high}$, 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 ($\theta^{N}_{high}$, also normalized to zero). The data did not support the presence of the other combinations of unobserved heterogeneity terms (i.e., groups with [$\theta^{P}_{low}$, $\theta^{N}_{low}$] and [$\theta^{P}_{high}$, $\theta^{N}_{high}$], respectively) as the corresponding probabilities are estimated to be zero.[xxv] Note that the estimated support points are large ($\theta^{P}_{low}$=-1.20 and $\theta^{N}_{low}$=-2.21), implying that the persistence in IP 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 life style deprivation has similar features. In fact, the estimated support points and mass probabilities are fairly comparable in magnitude. Clearly, it is very difficult for the policy makers to target their interventions on these small but 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.

## 8. PREDICTED POVERTY PERSISTENCE

The previous section has suggested 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 re-entry 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 6 with respect to a homogeneous population, we now provide estimates of poverty persistence for a number of selected sub-groups. 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 8, including the estimated distribution of unobserved heterogeneity. The groups considered are formed by combining only the covariates that were broadly statistical significant in the models of Table 8; the remaining variables are set to their sample means.[xxvi] The results are presented in Table 9. Note that the simulations refer to those who have just entered in poverty, therefore everyone is poor at least for one year by definition. 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. As background information, we also report the group's likelihood of entering poverty, computed by estimating *Prob*(poor in year t | not poor in t-1; X) from model 1 in Table 4.

In these simulations the characteristics of the individual are held fixed throughout the simulation period, with the exception of age. The purpose here is to contrast, with the strongest possible force, the effect that certain characteristics might have on poverty persistence. For example, we may compare the predicted number of years in poverty for individuals whose spouse is out of work for the entire simulation period (8 years) with the prediction obtained for an individual whose spouse has always been in paid work, other things equal. Clearly, one can easily devise the simulation so as to contrast the poverty persistence arising in intermediate cases (say work for only half the period, or any number of years during the simulation period); the effect is simply bound to be smaller than in the previous case. We think that it is simpler to contrast these most extreme thought experiments, but intermediate cases are easily implemented within the methodology of the paper.

This discussion hinges on the role of "events" as opposed to "characteristics" in the empirical literature on poverty dynamics. Events (e.g., birth a child) are *changes* in the underlying characteristics (number of children in the household), and is clearly very difficult to identify the effects of events while controlling for characteristics at the beginning of the period (Jenkins, 2000, provides excellent discussion on this point). In fact, in our experience estimating dynamic models that include both an extensive set of characteristics and indicators for events generally results in statistical insignificant coefficients for the event indicators. Our empirical – compromise - choice has therefore been (*a*) to estimate discrete-time duration models (Table 8) where we allow covariates (e.g. the number of children) to be time-varying,

without including events indicators directly; (*b*) to use the estimated coefficients of these time-varying characteristics to perform the kind of simulation exercises of Table 9. In this case, the effect of "events" can still be accommodated in the simulation exercises: for example the effect of the "birth of a child in period 3" can be approximated by setting the number of children at, say, 0 for simulation periods t1 and t2, and increase it to 1 for periods t3 onward. But, again, poverty persistence will be found to lie between the value obtained for the case with no children throughout the period and the value obtained for the simulation with 1 child for the whole period.

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 9). Persons with those characteristics rarely fall in poverty: their entry probability is between 0.2%-0.7%, compared to 7% for the whole population. Moreover, when they do fall below the poverty line, they do not tend to stay long: the expected number of years below the line is 1.59 for IP and 1.79 for LSD. Only 4% of these individuals will be poor for at least four out of the next seven years for IP and 7% for LSD.

We now take group A as a sort of base scenario, to which the rest of the rows in Table 9 add "risk factors" cumulatively, which will result in increased "entry probability" and longer persistence in poverty. Note that, in the base group, poverty persistent in LSD is higher than persistence in IP. In light of the warnings given earlier regarding the non-comparability of the *levels* of poverty persistence across the two poverty definitions, our main aim in Table 9 is to investigate how far the two approaches are able to produce a consistent ranking of the population groups in terms of the risks they face of high poverty persistence. Discussing how much the addition of risk factors changes the persistence with respect to the base scenario is also of interest, as this provides a convenient way of summarizing the differential impact of the various sets of covariates on either form of poverty.

The next row (group B) depicts the situation of a person living in a household type as in group A, but where there are two children. The expected number of years in poverty is now estimated at 1.93 for IP and 1.91 for LSD. Note that the increase in IP persistence is larger than in LSD persistence. In the next row (group C) the spouse does not work and poverty persistence increases further, at 2.44 for IP, while for LSD the corresponding figure is 2.03. If additionally the head is not working (group D), the expected number of years in poverty rises to 3.23 for IP and to 2.26 for LSD. Group E shows the additional impact

of living in a household whose head has low education. In this case the expected number of years in poverty is 4.13 for IP and about 2.71 for LSD. The percentage of people with at least four years in poverty is 46% for IP, which is almost halved in the case of LSD, at 22%.

Note that the addition of the risk factors considered above consistently raises IP more than LSD. As noted in section 2, these findings suggest that the household is in part able to mitigate the negative impact of adverse labor market and demographic circumstances on its total income by resorting to a number of market and non-market coping strategies. Thus the use of accumulated wealth can sustain a household's standard of living when, say, its income is low due to non-participation in the labor market. Another possibility is to reduce the quality content (and therefore the value) of the durable goods and other essential items purchased by the household. A low-income household can also escape deprivation within the 7 year period by receiving some of the durable goods as gifts from members of the local community, also as part of informal insurance mechanisms. In a country like Italy, the presence of an extensive net of solidarity, the enlarged family above all, may help low-income households with children to sustain their standard of living. As noted earlier, these mechanisms would be captured by a consumption-based definition such as our LSD indicator, but not necessarily by an equivalent-income based definition.

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 5.82 years for IP and 4.05 for LSD; the percentage with at least four years in poverty is 78% with the first definition and 48% with the second. The increase in poverty persistence when moving from the north to the south of the country is considerable for both definitions, but somewhat lower in the case of LSD. As note earlier, this is consistent with the view that the lower prices of many goods and services in the South of the country may contribute to alleviate the territorial differences in the standards of living arising from the large disparities in incomes. The persistence in poverty increases even further if in addition the household head is a young person (aged 30 in group G). Even worse is the situation of a young single-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 5.96 and 4.73 years, and with 81-61% of persons in such a household type spending at least four years below the line. It is tempting to relate the at least in part the gravity of this situation to the absence of a universal instrument of public assistance, such as a minimum income guarantee. Row I adds to the previous case

the presence of an elderly person. This is found to significantly reduce the persistence in poverty when this is measured with reference to equivalent income, perhaps reflecting additional income deriving from the pension of the elderly; however, persistence in LSD increases slightly, which may be related to a concomitant increase in the household's greater needs (e.g., health expenses of the old person). The worst scenario represented in the table is shown by row L, a young head aged 30 as in case G, but who is unemployed instead of inactive. The increase in poverty persistence is sizeable for both definitions, and illustrates a paradoxical result of the Italian system of social protection: inactivity may be more conducive to poverty escapes than unemployment. The finding may arise from a combination of poorly targeted public assistance for those out of the labor force and insufficient unemployment benefits for many categories of workers, above all young employees and those employed in the large number of small firms (Dell'Arringa, 2003).

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 M 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: 1.97 years for IP and 1.60 for LSD. 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 O), persistence is now at 3.87 years for IP and 3.15 for LSD. The final two rows of the table show how persistent poverty is likely to happen 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 for the two definitions is expected to be, respectively, 5.41 and 3.78 years, and the corresponding percentage of poor for at least four years is 71% and 43%.

So far the two definition of poverty persistence have produced a consistent ranking of the risks of poverty persistence faced by the various groups of the population. The final rows of the table show two cases where the two definitions give conflicting predictions. Row R re-considers case B but imposes that the household head is now self-employed. Persistence in IP increases from 1.9 to 2.1, whereas persistence in LSD is reduced by 1.9 to 1.7. As noted before, it is tempting to relate this circumstance to the inability

of the income definition to adequately capture the living standards of self-employed households due to income under-reporting. The second example is shown in Row S, which re-considers case I but now adds a member with chronic health problems. This additional risk factor is correctly captured by LSD, whose persistence increases slightly, but not by IP.

## CONCLUSIONS

This paper has provided a first empirical assessment on the dynamics and persistence of poverty for individuals living in Italy during the nineties, using the ECHP (1994-2001). Poverty has been defined following two different approaches. The first approach defines the poor in terms of low income; the second, called life-style deprivation, defines the poor in terms of deprivation from a bundle of items 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 enters and exits from poverty. We find that these results are true for both definitions, increasing our confidence that frequent movements in and out of poverty are a fundamental feature of poverty.

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. To shed light on the identity of these groups, we have estimated discrete-time multivariate hazard rate models, which allow for unrestricted duration dependence and 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 also revealed the existence of a negative relation between hazard rates and the duration of the spell. 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.

We have then used the model estimates to simulate the distribution of the number of years in poverty over multiple spells for selected groups of the population. 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. What was found to be of crucial importance, with large and statistically significant coefficients for each poverty definitions, was the household's area of residence, the labor market status of the household head and the number of working members other than the 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.

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 have also emerged, 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. The family and a long-established informal net of community-level social assistance, which remain pillars of the country's social model, are often successful in mitigating the poverty generated in the labor market, but are nonetheless unable to fully counterbalance the inadequacies of the country's social policies. 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).

We have offered theoretical arguments and empirical evidence suggesting that poverty and life-style deprivation offer two valid proxies of the longitudinal behavior of an underlying, unobserved, notion of living standards deprivation. In fact, income poverty and life-style deprivation are shown to be correlated to one another, and also to indicators representing a household financial satisfaction and ability to make ends meet. At the same time, while the longitudinal behavior of the two measures is similar at an aggregate level, important differences between the two definitions are found with respect to the impact of an individual's labor market and demographic characteristics. To begin with, the bulk of the evidence suggests that income poverty is more sensitive to the shocks that hit a household than life-style deprivation is, and this appears to be true for both labor market and demographic shocks. This is because shocks that change a household's total income, or that change its equivalence scale factor, have largely a "mechanical" effect on equivalent income. However, the household can resort to various "coping strategies", most notably through the use of savings and borrowing, to reduce the impact of these shocks on its life style. A second difference relates to the ability of the two approaches to reflect the "needs" level of a household. While income poverty only recognizes "needs" explicitly incorporated in the equivalence scale, life-style deprivation has the potential to reflect a much larger range of "needs" and situations that affect a household's true standards of living. In our empirical application, a deterioration of household health needs was associated with an increased persistence in life-style deprivation but not in income poverty. A third difference emerged with respect to self-employment, a circumstance that was associated with higher income poverty but lower life-style deprivation, suggesting that income might not provide a reliable welfare measures – o be quite inaccurately measured – for certain categories of individuals.

Overall, we have stressed the ability of the two definitions to provide a generally consistent characterization of the poverty persistence risks faced by various population subgroups, but also the additional insights to be gained by analyzing the two definitions in parallel in a longitudinal context. In our view, the two definitions have the potential to complement each other, both in a cross-sectional and in a longitudinal context, and should be analyzed in parallel whenever possible.

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**Tables and comments**

**Table 1: Cross-Sectional Poverty Incidence, 1994-2001**

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Average |
|---|---|---|---|---|---|---|---|---|---|
| *income poverty* | | | | | | | | | |
| threshold fixed in real terms | 20.4 | 20.1 | 18.8 | 17.1 | 14.7 | 13.6 | 12.5 | 13.0 | 16.5 |
| threshold time-varying | 20.4 | 20.4 | 20.1 | 19.5 | 18.0 | 18.0 | 18.4 | 19.3 | 19.3 |
| *Life-style deprivation* | | | | | | | | | |
| threshold at 70% median S score | 11.1 | 11.9 | 9.8 | 8.0 | 7.3 | 6.8 | 6.7 | 6.8 | 8.7 |
| threshold at 80% median S score | 18.7 | 18.3 | 15.8 | 14.4 | 13.7 | 12.5 | 11.6 | 10.7 | 15.0 |
| Number of individuals | 21396 | 21423 | 21224 | 19861 | 19141 | 18449 | 17516 | 16014 | |

Notes: Unbalanced sample of persons (adults and children) in complete respondent households for all waves for which they are in the sample. ECHP cross-sectional weights have been used.

**Table 2. Percentage of individuals in poverty for x years**

| **Number of years in poverty:** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
|---|---|---|---|---|---|---|---|---|---|
| *Income poverty* | | | | | | | | | |
| threshold fixed in real terms | 56.4 | 13.4 | 7.6 | 5.3 | 4.5 | 4.2 | 3.0 | 3.4 | 2.3 |
| threshold time-varying | 51.7 | 13.1 | 7.7 | 6.5 | 4.9 | 4.8 | 4.0 | 4.1 | 3.3 |
| *Life-style deprivation* | | | | | | | | | |
| threshold at 70% median S score | 71.4 | 12.5 | 5.5 | 3.2 | 2.4 | 1.7 | 1.1 | 1.3 | 0.9 |
| threshold at 80% median S score | 58.0 | 14.6 | 7.9 | 5.5 | 4.1 | 3.1 | 2.5 | 2.1 | 2.3 |

*Notes:* Balanced longitudinal sample .

**Table 3: The determinants of income poverty and life-style deprivation. Probit models**

| | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| | Currently Income poor | | Currently Life-style deprived | | Persistently income poor | | Persistently life-style deprived | |
| | Marg. effect | s.e. | Marg. effect | s.e. | Marg. effect | s.e. | Marg. effect | s.e. |
| number of children | 0.03754*** | 0.00107 | 0.01782*** | 0.00094 | 0.00616*** | 0.00085 | 0.00204*** | 0.00065 |
| no. persons aged 18-64 | 0.04839*** | 0.00097 | 0.01951*** | 0.00083 | 0.00533*** | 0.0008 | 0.00251*** | 0.00057 |
| no. persons aged 65+ | -0.00326 | 0.00229 | 0.00370* | 0.002 | 0.00062 | 0.00181 | -0.00446 | 0.00433 |
| no. of workers | -0.09250*** | 0.00133 | -0.03029*** | 0.00111 | -0.01627*** | 0.00153 | -0.00606*** | 0.00092 |
| Child | 0.00243 | 0.00242 | -0.00186 | 0.00213 | 0.00095 | 0.00186 | -0.00022 | 0.00148 |
| Old | 0.01584*** | 0.0038 | 0.00022 | 0.00311 | 0.00019 | 0.00258 | -0.00065 | 0.00182 |
| Female | 0.00428*** | 0.00166 | -0.00005 | 0.00148 | -0.00091 | 0.00127 | -0.00036 | 0.001 |
| age of hh head | -0.00390*** | 0.00045 | -0.00404*** | 0.00039 | 0.00036 | 0.00037 | -0.00063** | 0.00026 |
| age of hh head squared | 0.00004*** | 0.00001 | 0.00003*** | 0.00001 | -1.81e-06 | 3.54e-06 | 0.00001*** | 2.51e-06 |
| female hh head | 0.02654*** | 0.00346 | 0.02392*** | 0.003 | 0.01225*** | 0.00394 | 0.00342 | 0.00219 |
| Head has low education | 0.08628*** | 0.00181 | 0.05965*** | 0.00163 | 0.02452*** | 0.00233 | 0.01169*** | 0.00159 |
| Head has high education | -0.04411*** | 0.00309 | -0.03681*** | 0.00272 | -0.00042 | 0.00499 | 0.00214 | 0.00446 |
| Head working <15 hours | 0.16768*** | 0.014 | 0.15373*** | 0.01264 | 0.04138** | 0.01994 | 0.08744*** | 0.03003 |
| Unemployed head | 0.37868*** | 0.00967 | 0.18195*** | 0.00725 | 0.04750*** | 0.00969 | 0.06995*** | 0.01258 |
| Discouraged head | 0.32320*** | 0.02138 | 0.11227*** | 0.0147 | 0.00351 | 0.00953 | 0.06044** | 0.02411 |
| Inactive head | 0.09384*** | 0.00342 | 0.01938*** | 0.00255 | 0.01157*** | 0.00284 | 0.00856*** | 0.00225 |
| North | -0.02574*** | 0.00238 | -0.02606*** | 0.00213 | -0.00822*** | 0.00217 | -0.00033 | 0.00196 |
| South | 0.09168*** | 0.0027 | 0.07395*** | 0.00242 | 0.01827*** | 0.00285 | 0.01492*** | 0.00278 |
| No. health problems in the hh | -0.00237 | 0.00154 | 0.02242*** | 0.0013 | -0.00240** | 0.00109 | 0.00364*** | 0.00081 |
| Separated/divorced head | 0.03700*** | 0.0045 | 0.02632*** | 0.00383 | 0.00283 | 0.00332 | 0.00181 | 0.0024 |
| Single head | 0.04583*** | 0.00528 | 0.03503*** | 0.00445 | 0.00417 | 0.00424 | 0.00451 | 0.00342 |
| Single parent head | 0.03470*** | 0.00898 | 0.01829** | 0.00724 | -0.00939*** | 0.00181 | 0.00513 | 0.00668 |
| Self employed head | 0.11437*** | 0.00316 | -0.02115*** | 0.00185 | 0.01226*** | 0.00294 | -0.00494*** | 0.00127 |
| Const | | | | | | | | |
| No. observations | 126473 | | 127889 | | 14831 | | 14831 | |

*Notes*: Probit estimates. Pooled w1-w8 sample in model 1 and 2. Persistently deprived or poor are those deprived or poor for at least 4 consecutive waves. For model 3 and 4 the longitudinal sample is unbalanced and includes individuals present in t,t+1,t+2t+3, where t=wave5, wave 4 or wave3. Covariates refer to year t.

**Table 4: The association between deprivation and income poverty**

| | (1) | | (2) | | (3) | | (4) | | (5) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Probit models | | | | | | | | OLS | |
| | Life-style deprivation in t | | | | | | Deprivation for at least 4 consecutive years | | No. of years in life-style deprivation | |
| | Marginal effect | s.e. | Marginal effect | s.e. | Marginal effect | s.e. | Marginal effect | s.e. | Coeff. | s.e. |
| Poor in t | 0.09975*** | 0.00302 | 0.02787*** | 0.00351 | 0.02444*** | 0.00492 | | | | |
| poor in t-1 | | | 0.03529*** | 0.00374 | 0.02236*** | 0.00497 | | | | |
| poor in t-2 | | | 0.02424*** | 0.00335 | 0.02172*** | 0.00478 | | | | |
| poor in t-3 | | | 0.02936*** | 0.00317 | 0.02899*** | 0.00482 | | | | |
| poor in t-4 | | | | | 0.01055*** | 0.004 | | | | |
| poor in t-5 | | | | | 0.01150*** | 0.0037 | | | | |
| Poor at least 4 consecutive years | | | | | | | 0.08985*** | 0.01018 | | |
| No. of years in poverty | | | | | | | | | 0.28051*** | 0.00792 |

*Notes*: All regressions include a full list of controls (as in Tables 4). Probit marginal effects for models (1)-(5). OLS estimates for model (6). Pooled w1-w8 sample for models (1)-(3). Model (4) is based on all individuals observed in each wave between w5-w8, or between w4-w7 or between w3-w7. Controls in model (5) refer to the initial year (w5 or w4 or w3). Model (5) is based on all individuals observed in each of the 8 waves (w1-w8); controls in this case refer to w1.

**Table 5: The association between financial satisfaction, the ability of make ends meet and poverty**

| | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| | Financial satisfaction | | Ability to make ends meet | | Financial satisfaction | | Ability to make ends meet | |
| | Coeff. | s.e. | Coeff. | s.e. | Coeff. | s.e. | Coeff. | s.e. |
| Poor in t | -0.67718*** | 0.01812 | -0.72518*** | 0.01685 | | | | |
| Lifestyle deprived in t | -1.04598*** | 0.02025 | -1.76583*** | 0.01926 | | | | |
| Persistently income poor | | | | | -0.67906*** | 0.08701 | -0.90239*** | 0.08297 |
| Persistently life-style deprived | | | | | -1.43092*** | 0.11573 | -1.49471*** | 0.11405 |
| obs | 103751 | | 126356 | | 12651 | | 14807 | |

*Notes*: All regressions include a full list of controls (as in Tables 4). Ordered logit estimates. Pooled w1-w8 sample for models (1)-(2). Model (3) and (4) are based on all individuals observed in each wave between w5-w8, or between w4-w7 or between w3-w7. Controls refer to the initial year (w5 or w4 or w3). Persistent poverty is defined as income poor for at least 4 consecutive years. Persistent life-style deprivation is defined as life-style deprived for at least 4 consecutive years.

**Table 6: Survivor Functions And Hazard Rates Exit Rates From Poverty (Kaplan-Meier Estimates)**

| | Exit rates | | | | | | re-entry rates | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Income poverty | | Life style deprivation | | | | Income poverty | | Life style deprivation | | | |
| | | | 70% threshold | | 80% threshold | | | | 70% threshold | | 80% threshold | |
| No. Of interviews since start of spell | Survivor function (s.e.) | Exit rates (s.e.) | Survivor function (s.e.) | Exit rates (s.e.) | Survivor function (s.e.) | Exit rates (s.e.) | 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 | . | 1.00 | . | 1.00 | . |
| | . | . | . | . | . | . | . | . | . | . | . | . |
| 2 | 0.42 | 0.58 | 0.39 | 0.60 | 0.40 | 0.60 | 0.75 | 0.25 | 0.78 | 0.22 | 0.75 | 0.25 |
| | (0.007) | -0.01) | (0.0077) | (0.0123) | (0.01) | (0.01) | (0.005) | (0.006) | (0.006) | (0.0068) | (0.01) | (0.01) |
| 3 | 0.23 | 0.46 | 0.22 | 0.46 | 0.24 | 0.40 | 0.64 | 0.15 | 0.69 | 0.12 | 0.63 | 0.16 |
| | (0.006) | (0.016) | (0.0069) | (0.0182) | (0.01) | (0.01) | (0.006) | (0.006) | (0.007) | (0.0063) | (0.01) | (0.01) |
| 4 | 0.16 | 0.29 | 0.13 | 0.42 | 0.16 | 0.35 | 0.57 | 0.11 | 0.63 | 0.08 | 0.57 | 0.10 |
| | (0.006) | (0.02) | (0.006) | (0.0266) | (0.01) | (0.02) | (0.007) | (0.006) | (0.0075) | (0.006) | (0.01) | (0.01) |
| 5 | 0.12 | 0.29 | 0.1 | 0.22 | 0.11 | 0.28 | 0.54 | 0.07 | 0.61 | 0.04 | 0.53 | 0.07 |
| | (0.006) | (0.026) | (0.0057) | (0.0298) | (0.00) | (0.02) | (0.007) | (0.006) | (0.0079) | (0.005) | (0.01) | (0.01) |
| 6 | 0.09 | 0.2 | 0.08 | 0.19 | 0.08 | 0.25 | 0.51 | 0.05 | 0.57 | 0.07 | 0.49 | 0.08 |
| | (0.006) | (0.031) | (0.0056) | (0.0357) | (0.00) | (0.03) | (0.008) | (0.007) | (0.0088) | (0.0082) | (0.01) | (0.01) |
| 7 | 0.07 | 0.22 | 0.06 | 0.19 | 0.06 | 0.28 | 0.49 | 0.04 | 0.55 | 0.04 | 0.47 | 0.04 |
| | (0.006) | (0.051) | (0.0057) | (0.0482) | (0.00) | (0.05) | (0.008) | (0.008) | (0.0098) | (0.0088) | 0.01) | (0.01) |

*Notes*: Life table estimates based on all non-left censored spells, pooled from the ECHP waves 1-8. The number of individuals starting a poverty spell is 6095 for income poverty and 4008 for life-style deprivation (6030 with the 80% threshold). The number of individuals starting an out-of-poverty spell is 6749 for income poverty and 4703 for life-style deprivation (7085 with the 80% threshold). Standard errors in parenthesis.

**Table 7: Distribution Of The 'Number Of Interviews In Poverty Out Of The Next Seven'**

| Number of interviews in poverty out of the next seven | Income poverty | | Life-style derivation | |
|---|---|---|---|---|
| | 50% Threshold | 60% Threshold | 70% Threshold | 80% Threshold |
| 1 | 33.4 | 29.3 | 34.3 | 29.1 |
| 2 | 23.4 | 22.0 | 23.1 | 21.9 |
| 3 | 16.3 | 15.9 | 15.7 | 16.3 |
| 4 | 10.9 | 11.8 | 9.9 | 12.0 |
| 5 | 6.7 | 7.8 | 6.1 | 8.5 |
| 6 | 6.4 | 5.9 | 4.4 | 6.2 |
| 7 | 2.9 | 7.3 | 6.5 | 6.1 |
| Expected numbed of years in poverty | 2.6 | 2.9 | 2.7 | 2.9 |
| % of individuals poor for at least 4 years | 26.8 | 32.8 | 26.9 | 32.8 |

Notes: multiple spell methodology.

**Table 8: Multivariate analysis of exit and re-entry rates**

| | Exit rates | | | | Re-entry rates | | | |
|---|---|---|---|---|---|---|---|---|
| | Income poverty | | Life-style deprivation | | Income poverty | | Life-style deprivation | |
| **Covariates** | **coef** | **s.e.** | **coef** | **s.e.** | **coef** | **s.e.** | **coef** | **s.e.** |
| 1st year in the spell | -0.340 | 0.303 | -0.155 | 0.276 | -1.399 | 0.476** | -0.267 | 0.539 |
| 2nd year in the spell | -0.563 | 0.308* | -0.524 | 0.282** | -1.815 | 0.481*** | -0.658 | 0.552 |
| 3rd year in the spell | -1.092 | 0.316*** | -0.486 | 0.288* | -1.906 | 0.482*** | -1.026 | 0.555* |
| 4th year in the spell | -1.041 | 0.328*** | -0.757 | 0.308** | -2.355 | 0.485*** | -1.294 | 0.560** |
| 5th year in the spell | -1.744 | 0.384*** | -0.275 | 0.338 | -2.580 | 0.497*** | -1.855 | 0.576*** |
| 6th year in the spell | -1.584 | 0.440*** | -0.415 | 0.404 | -3.211 | 0.543*** | -1.257 | 0.585** |
| number of children | -0.148 | 0.023*** | -0.058 | 0.028** | 0.328 | 0.026*** | 0.098 | 0.035** |
| no. persons aged 18-64 | -0.109 | 0.023*** | -0.100 | 0.021*** | 0.328 | 0.030*** | 0.183 | 0.026*** |
| no. persons aged 65+ | 0.267 | 0.059*** | 0.010 | 0.054 | -0.068 | 0.072 | -0.029 | 0.064 |
| no. of workers | 0.324 | 0.033*** | 0.112 | 0.030*** | -0.676 | 0.043*** | -0.154 | 0.039*** |
| Child | -0.050 | 0.056 | 0.000 | 0.059 | 0.083 | 0.071 | -0.004 | 0.075 |
| Old | -0.113 | 0.093 | -0.019 | 0.085 | -0.098 | 0.114 | 0.226 | 0.101** |
| Female | -0.082 | 0.041** | 0.023 | 0.041 | 0.066 | 0.052 | -0.021 | 0.050 |
| age of hh head / 100 | 0.051 | 0.012*** | 0.025 | 0.011** | 0.003 | 0.016 | -0.038 | 0.013** |
| age of hh head squared / 1000 | -0.001 | 0.000*** | -0.000 | 0.000** | 0.0001 | 0.0001 | 0.000 | 0.000*** |
| female hh head | 0.094 | 0.077 | 0.064 | 0.069 | 0.366 | 0.092*** | 0.028 | 0.090 |
| low education of hh head | -0.290 | 0.054*** | -0.254 | 0.055*** | 0.254 | 0.070*** | 0.356 | 0.075*** |
| high education of hh head | 0.034 | 0.119 | 0.358 | 0.344 | -0.558 | 0.197** | 0.097 | 0.183 |
| hh head working <15 hours | -0.418 | 0.168*** | -0.705 | 0.203*** | 0.478 | 0.254** | 0.598 | 0.207** |
| Unemployed hh head | -0.739 | 0.092*** | -0.498 | 0.079*** | 1.052 | 0.111*** | 0.719 | 0.093*** |
| Discouraged hh head | -1.162 | 0.235*** | -0.201 | 0.166 | 0.623 | 0.221** | 0.424 | 0.227* |
| Inactive hh head | -0.336 | 0.068*** | -0.168 | 0.064** | 0.352 | 0.087*** | 0.074 | 0.084 |
| Hh is self employed | -0.133 | 0.054** | 0.186 | 0.062** | 0.269 | 0.067*** | 0.168 | 0.074** |
| North | 0.136 | 0.062** | 0.281 | 0.072*** | -0.096 | 0.090 | -0.121 | 0.099 |
| South | -0.369 | 0.054 | -0.200 | 0.061*** | 0.442 | 0.074*** | 0.611 | 0.080*** |
| No. health problem in the hh | 0.040 | 0.038 | -0.016 | 0.032 | -0.015 | 0.044 | 0.081 | 0.039** |
| Separated/divorced | 0.125 | 0.094 | -0.152 | 0.087* | -0.133 | 0.116 | -0.059 | 0.112 |
| Single | 0.031 | 0.104 | -0.138 | 0.096 | 0.107 | 0.153 | 0.226 | 0.125* |
| Single parent | -0.152 | 0.165 | -0.002 | 0.182 | 0.202 | 0.219 | 0.199 | 0.245 |
| Unobserved heterogeneity distribution | | | | | | | | |
| Mass points: $\theta_{low}$ | -1.125 | 0.151 *** | -1.796 | 0.257*** | -2.347 | 0.232*** | -2.125 | 0.400*** |
| $\theta_{high}$ | 0* | . | 0* | . | 0* | . | 0* | . |
| Mass probabilities: | | | | | | | | |
| $Prob(\theta^P_{low}, \theta^N_{low})$ | 0* | . | | | 0* | . | | |
| $Prob(\theta^P_{high}, \theta^N_{low})$ | 0.94 | 0.024 *** | 0.96 | 0.012*** | | | | |
| $Prob(\theta^P_{high}, \theta^N_{high})$ | 0* | . | 0* | . | | | | |
| $Prob(\theta^P_{low}, \theta^N_{high})$ | 0.06 | 0.024 *** | 0.04 | 0.012*** | | | | |
| Number of observations | 13920 | | 19071 | | | | | |
| Log likelihood | -5651 | | -8812 | | | | | |

*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 9: Estimated persistence in poverty: selected subgroups of the population**

| | | Income poverty | | | Life-style deprivation | | |
|---|---|---|---|---|---|---|---|
| | **Group** | Entry probability | Mean number of years in poverty | % with at least 4 years in poverty | Entry probability | Mean number of years in poverty | % with at least 4 years in poverty |
| | All persons | 0.067 | 2.9 | 0.33 | 0.069 | 2.9 | 0.33 |
| A | Person in a 2-adult household, no children, household head aged 50 and with at least a diploma, both normally working, living in the North of the country. | 0.002 | 1.59 | 0.04 | 0.007 | 1.79 | 0.07 |
| B | As above, plus 2 children | 0.007 | 1.93 | 0.09 | 0.011 | 1.91 | 0.09 |
| C | As above, plus spouse not working | 0.023 | 2.44 | 0.17 | 0.017 | 2.03 | 0.10 |
| D | As above, plus inactive head | 0.059 | 3.23 | 0.30 | 0.021 | 2.26 | 0.14 |
| E | As above, plus head with low education | 0.125 | 4.13 | 0.46 | 0.046 | 2.71 | 0.22 |
| F | As above, plus living in the South | 0.248 | 5.82 | 0.78 | 0.115 | 4.05 | 0.48 |
| G | As above, plus young head (age 30) | 0.260 | 5.96 | 0.81 | 0.143 | 4.73 | 0.61 |
| H | As above, plus single-mother aged 25 with three children | 0.298 | 6.14 | 0.84 | 0.195 | 4.61 | 0.59 |
| I | As above, plus a living-in elderly | 0.290 | 5.46 | 0.71 | 0.198 | 4.57 | 0.58 |
| L | As case G, but head is unemployed | 0.467 | 6.72 | 0.95 | 0.279 | 5.90 | 0.83 |
| M | Elderly couple, no children, head aged 75, with high education, retired, spouse not working, living in the North | 0.007 | 1.97 | 0.10 | 0.007 | 1.60 | 0.05 |
| N | As above, plus head low education | 0.033 | 2.53 | 0.18 | 0.031 | 2.18 | 0.13 |
| O | As above, plus living in the South | 0.086 | 3.87 | 0.42 | 0.083 | 3.15 | 0.31 |
| P | As above, plus a living-in non working adult | 0.125 | 4.23 | 0.49 | 0.096 | 3.44 | 0.36 |
| Q | As above, plus head aged 85 | 0.144 | 5.41 | 0.71 | 0.113 | 3.78 | 0.43 |
| R | As case B, but head is self-employed | 0.023 | 2.12 | 0.12 | 0.008 | 1.74 | 0.06 |
| S | As above, plus 1 member with health problems | 0.283 | 5.35 | 0.69 | 0.238 | 4.64 | 0.59 |

*Notes:* Simulations for those just starting a poverty spell, using estimated parameters and variables as in Table 5. Multiple Spell Approach.
The entry probability is estimated by Prob(poor in t | non poor in t-1; X), using the same models as in Table 4, specification 1.

**APPENDIX**

**Table A1: Exits/entries in life-style deprivation and in each item deprivation**

| | % of individuals deprived of the item | Item deprivation exit rate | Item deprivation entry rate |
|---|---|---|---|
| Color tv | 1.0 | 72.84 | 0.56 |
| Dishwasher | 19.6 | 51.4 | 11.86 |
| home adequately warm | 23.0 | 32.92 | 8.55 |
| annual holiday away from home for a week's | 41.5 | 22.04 | 16.11 |
| second hand clothes | 13.4 | 50.19 | 7.94 |
| replacing any worm-out furniture | 60.9 | 18.07 | 31.24 |
| car o van | 2.6 | 64.14 | 1.6 |
| video recorder | 9.4 | 58.63 | 4.98 |
| Arrears | 5.9 | 60.64 | 3.52 |
| Telephone | 2.7 | 60.66 | 1.47 |
| eat meat or fish every other day | 6.4 | 57.21 | 3.51 |
| friends or family for a drink or meal at least once a month | 5.9 | 44.72 | 9.37 |
| Microwave | 11.2 | 63.4 | 7.55 |

*Notes*: w1-w8 pooled sample. Deprivation threshold is 75% median deprivation score.
Exit rates =Prob(not deprived in the items in year t | deprived in the item in year t-1).
Deprivation re-entry = Prob(deprived in the items in year t | not deprived in the item in year t-1).

**Table A2: Descriptive statistics.**

| | **All** | | **Income poverty** | | **Life style deprived** | |
|---|---|---|---|---|---|---|
| Variable | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| number of children | 0.75 | 1.04 | 1.07 | 1.39 | 0.93 | 1.15 |
| no. persons aged 18-64 | 2.50 | 1.41 | 2.83 | 1.61 | 2.68 | 1.65 |
| no. persons aged 65+ | 0.35 | 0.64 | 0.26 | 0.53 | 0.33 | 0.62 |
| no. of workers | 0.70 | 0.84 | 0.40 | 0.69 | 0.50 | 0.82 |
| Child | 0.18 | 0.39 | 0.23 | 0.42 | 0.21 | 0.41 |
| Old | 0.18 | 0.38 | 0.14 | 0.35 | 0.17 | 0.38 |
| Female | 0.51 | 0.50 | 0.53 | 0.50 | 0.53 | 0.50 |
| age of household head | 52.6 | 14.6 | 52.0 | 14.2 | 52.7 | 15.3 |
| female household head | 0.18 | 0.39 | 0.20 | 0.40 | 0.23 | 0.42 |
| low education of household head | 0.64 | 0.48 | 0.84 | 0.36 | 0.82 | 0.38 |
| high education of househ. head | 0.08 | 0.27 | 0.02 | 0.14 | 0.02 | 0.14 |
| head working <15 hours weekly | 0.01 | 0.10 | 0.02 | 0.14 | 0.02 | 0.15 |
| Unemployed househ. head | 0.03 | 0.17 | 0.09 | 0.29 | 0.09 | 0.29 |
| Discouraged househ. head | 0.01 | 0.07 | 0.01 | 0.12 | 0.01 | 0.12 |
| Inactive househ. head | 0.35 | 0.48 | 0.33 | 0.47 | 0.37 | 0.48 |
| North | 0.49 | 0.50 | 0.23 | 0.42 | 0.25 | 0.43 |
| South | 0.29 | 0.45 | 0.59 | 0.49 | 0.57 | 0.49 |
| No. health problems in the hh | 0.29 | 0.58 | 0.28 | 0.57 | 0.35 | 0.63 |
| Separated/divorced | 0.12 | 0.33 | 0.15 | 0.35 | 0.17 | 0.37 |
| single | 0.05 | 0.22 | 0.05 | 0.21 | 0.06 | 0.24 |
| Single parent | 0.01 | 0.12 | 0.02 | 0.13 | 0.02 | 0.14 |
| self employed househ.head | 0.19 | 0.39 | 0.25 | 0.43 | 0.13 | 0.34 |

*Notes*: w1-w8 pooled sample.

## Notes:

[i] Only a very few papers have studied poverty in Italy using individual longitudinal data. OECD (2001) uses the first 3 waves of the ECHP to study the transitions in and out of low income for a number of countries, including Italy. Other studies 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; 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); finally, the survey does not contain the necessary information to construct indicators of multidimensional deprivation.

[ii] As available panel data are typically too short to analyze an individual's first entry in poverty, the focus in the following will be with the length for time spent below the line for those who are observed to enter poverty within the observation window offered by the data.

[iii] In the extreme case in which the individual is completely unable to borrow against her future income (i.e. is completely liquidity constrained), the duration in consumption poverty is expected to be smaller than the duration in income poverty. The intuition is that, while dissaving enables consumption to drop with some time lag with respect to the income shock, the presence of liquidity constraints implies that consumption subsequently recovers in parallel with income. In an online Appendix we show this is indeed the case, by computing the optimal consumption of a representative household head facing liquidity constraints and a stochastic income flow whose properties are derived from the income observed in our panel data.

[iv] See Peracchi (2002) and the official data documentation for further details (http://forum.europa.eu.int/irc/dsis/echpanel/info/data/information.html).

[v] The OECD equivalence scale assigns weight 1 to the head, 0.7 to each additional adult and 0.5 to each child. The modified scale assigns weights 1, 0.5 and 0.3 respectively. The results did not change appreciably when using either scale.

[vi] The life-style score $S_i$ is computed as the weighted average of all non-missing items: $S_i=\sum_j w_j 1(D_{ij}=1)/ [\sum_j w_j 1(D_{ij}=1 \text{ or } D_{ij}=0)]$, where $0\leq S_i\leq 1$, $D_{ij}$ is the set of $J$ dummy indicators ($J$=13), $w_j$ is the corresponding weight and $1(\cdot)$ is the indicator function. Accordingly, $S_i$ exists even is some items are missing (unless more than 3 items were missing, in which case we forced $S_i$ to be missing). The results were very similar when $S_i$ was defined to be missing if any of the 13 items was missing; in fact, in this case $S_i$ was missing for only 3% of the observations.

[vii] We have also produced "relative" versions of our life-style deprivation indicators, by using wave-specific weights for each of the items that make up $S_i$, and have also set the threshold at fractions of the *contemporaneous* median of $S_i$ (as opposed to the wave 1 median). The results (available from the authors) did not change appreciably from those reported in the paper, and are not shown.

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

[ix] The median of $S_i$ is 0.90, implying that the majority of the population can afford at least 90% of the (weighted) set of items included in our life-style deprivation score. The mean of $S_i$ grows from 0.86 in 1994 to 0.88 in 2001. The 75$^{th}$ percentiles and above are 1 in all years, the 25$^{th}$ is 0.76 in 1994 and grows at 0.83 in 2001; and the 10$^{th}$ grows from 0.60 to 0.68 during the sample period.

[x] 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.

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

[xii] The result holds even if the number of self-employed members of the household is used instead.

[xiii] Because the probability of being below the poverty line for four consecutive years is much lower than the cross-sectional poverty rates, the magnitude of the marginal effects are now also smaller than before.

[xiv] Given that that the number of poor is larger than the number of in life-style deprivation, one could rescale this probability by the ratio of the incidence of the two types of deprivation (equal to 0.93 from Table 1), to obtain a "measure of mismatch" that lies between the 0-100% range. Even so, the rescaled probability is only 0.4.

[xv] Aasvee et al. (2995), Jenkins (2002), Cappellari and Jenkins (2004) provide excellent reviews of the various approaches to modelling poverty dynamics.

[xvi] 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.

[xvii] See Arranz and Cantò (2010) for a recent exception.

[xviii] Table A1 shows that there is much turnover in each constituent item of our LSD measure.

[xix] 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. These alternative estimates are available upon request from the authors.

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

[xxi] We have tried performing the estimation separately for those in the south and those in the north. In fact, the baseline hazard/duration terms was statistically different for the two areas, implying somewhat longer durations in the south. However, the differences in the magnitude of the estimated baseline coefficients were small, implying that most of the effect had already been captured by the intercept shift included in the model specification. For simplicity – and given that in the simulation exercises of Table 9 the different baseline hazards were not producing appreciable differences with respect to the specification with a north/south intercept only – we have opted to report estimates for this simpler model only.

[xxii] A few variables are statistically significant in the re-entry rates for one poverty definitions but not the other: the quadratic in the age of the household head, and the coefficient of old persons are only significant for LSD life-style deprivation; female headship is only significant for IP. However, note that the signs of these variables are consistent across the two definitions.

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

[xxiv] The distribution $G$ 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. As in most random-effect models, we assume that $\theta^P$ and $\theta^N$ are uncorrelated with the observed heterogeneity included in the vectors of covariates.

[xxv] 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.

[xxvi] Unrestricted year effects were included in the models of Table 8 (but not shown) to account for macroeconomic trends and the general trend of reduction in poverty rates of table 1; the simulations in Table 9 assume average year effects.