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ORIGINAL PAPER

The determinants of poverty exits and entries and the role of social benefits: the Italian case

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Abstract

This paper uses a novel micro econometric approach to analyze the impact of social benefits on the individual probabilities of poverty exit and entry in Italy, and their relative importance with respect to other socio-economic determinants of poverty transitions. Year to year transitions are defined as dichotomous variables capturing the changes of the individual poverty status, and are analyzed using random effects probit models estimated on pooled Italian data from 9 longitudinal components of IT-SILC covering the period 2004–2015. Our results show that social benefits strongly counteract the adverse effects of individual characteristics like unemployment, work intensity, inactivity, household size (and composition) and past poverty experience on the individual probabilities of poverty exit and entry. Despite their important effects on the individual probabilities of transitions, however, social benefits have a limited coverage among the vulnerable groups of the population, which strongly limits their aggregate impact on transition rates and poverty rates.

Keywords Poverty exits · Poverty entries · Social benefits · Longitudinal data

JEL Classification I30 · I32 · D60 · C23

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1 Introduction

This paper uses a novel approach to analyze the determinants of income poverty exits and entries. The issue is scantily investigated in the literature on poverty in Italy and it is important in a policy perspective, since it is precisely by acting on individuals which are around the poverty line that social policies and employment policies can be more effective and contribute to a general improvement of social cohesion, in line with the prescriptions of the European Union for the next future. We analyze the micro and macro determinants of changes in the individuals' poverty status in Italy over the period 2004–2015, focusing the attention on the role of social transfers. Although they are a fundamental component of anti-poverty interventions, the effects of both cash and in-kind social transfers on poverty transitions are not so clear-cut in theory. On one hand they are expected to help lifting individuals above the poverty/deprivation line or to prevent them falling below it, to the extent that they increase individual and household income or the quantity of essential goods and services that households can enjoy. On the other hand, the receipt of transfers like, e.g., unemployment benefits or family allowances may change the individuals' behavior, in particular their choices regarding labor market participation or household composition, thereby negatively affecting their chances of poverty transitions.

Our main research questions therefore are: (i) whether the different kinds of social benefits are indeed effective in speeding individual poverty exits and preventing poverty entries, and (ii) what is their relative importance with respect to the other possible determinants of poverty transitions. These two issues are generally not addressed by longitudinal micro studies focusing on individual poverty dynamics, while the literature focusing on the effects of social transfers on aggregate poverty levels or on individual poverty states has partially addressed only the first one. This paper tries to fill these gaps.

Our approach differs from the ones usually adopted in the literature on poverty dynamics and in the literature on the anti-poverty effects of social transfers, respectively.[1] As in Polin and Reitano (2014) and Valletta (2006), our dependent variables are year to year poverty exits and entries, defined as dichotomous variables capturing the changes of status from poverty to non-poverty and vice versa. Unlike the above authors, who analyze a cross section of one-time individual changes of status in six clusters of EU countries[2] (Polin & Reitano, 2014) or analyze and compare transitions on single short panels for four different countries ignoring potential unobserved individual effects within countries (Valletta, 2006), we estimate random effects probit regression models for poverty exits and entries focusing on one country, Italy, and pooling data from 9 longitudinal components of IT-SILC, covering the period 2004–2015.

It is worth noticing that we do not study the duration and recurrence of individual poverty spells, also because the short time observation window for each individual

[1] A brief review of these two strands of literature is in next paragraph.

[2] 23 countries are divided in 6 clusters based on the welfare regime type.

in IT-SILC data does not allow this kind of analysis.[3] On the other hand, by pooling the available panels of IT-SILC we observe over a long time period thousands of changes of status for different individuals, which allows to efficiently estimate the effects of the various determinants of poverty exits and entries and their relative importance. Although our intuitive strategy does not catch all of the complexities of poverty dynamics that more sophisticated dynamic approaches can highlight, it does yield important insights about covariate effects on poverty transitions, which are helpful for policy evaluation (Valletta, 2006).

Moreover, we control for several covariates of transitions besides the presence of social benefits, including demographic and economic events affecting household's needs or resources (such as household composition changes, changes in work intensity and the arrival or loss of different kinds of social transfers), controls for individual and household characteristics, as well as structural controls for changes in the macroeconomic environment, and controls for NUTS-1 macro regions, for a better understanding of the role of territorial dualism plaguing the Italian economy. We also check for the robustness of our results to potential endogeneity problems, by estimating instrumental variable linear probability models.

The rest of the paper is structured as follows. After a review of the related literature in Sect. 2, the data and some preliminary descriptive analysis are discussed in Sect. 3. Section 4 describes the model, the explanatory variables and the estimation strategy, while Sect. 5 discusses the results. The conclusions are in Sect. 6.

2 Related literature

Our work is related to two different strands of literature, on poverty transitions and on the effects of social transfers on poverty, respectively.

The first one starts with the contributions by Bane and Ellwood (1986) and Stevens (1994, 1999), and continues with a long series of papers which extend and complement their approach and apply the analysis to different countries and/or in a cross-country perspective.[4] This literature uses hazard rate models, or, far less frequently, first order Markov models (Cappellari & Jenkins, 2004) or dynamic discrete choice models (e.g. Biewen, 2006; Giarda & Moroni, 2018),[5] to analyze individual poverty duration and poverty transitions, and to establish whether poverty is a temporary, recurrent or persistent phenomenon, and what are the main characteristics (and events) associated with individual poverty transitions and/or with poverty persistence. The adverse effects of the length of poverty spells (or of past poverty) on poverty transitions are underlined, even after controlling for observed

[3] In detail, there are four years in the original longitudinal components and three observations as a maximum in our setting, given the use of two consecutive years for the construction of our dependent variables.

[4] Among many others: Duncan et al. (1993), Canto (1996), Jenkins and Rigg (2001), Devicienti (2002), Cappellari and Jenkins (2004), Fouarge and Layte (2005), Biewen (2006), Aranz and Canto (2012), Demir Seker and Dayioglu (2014), Giarda and Moroni (2018).

[5] See Jenkins (2000), Cappellari and Jenkins (2004) on the types of models used to study poverty dynamics.

and unobserved individual heterogeneity: there is substantial state dependence in poverty, in addition to persistence induced by heterogeneity (Cappellari & Jenkins, 2004; on Italy see Devicienti & Poggi, 2011, Devicienti Gualtieri & Rossi, 2014, Giarda & Moroni, 2018; a detailed survey is in Bosco & Poggi, 2020). The analysis of events associated with transitions has been mostly descriptive, and has looked at the frequency of poverty spells endings and beginnings associated with specific main demographic and economic events, differentiated using a mutually exclusive hierarchy.[6] The findings (not surprisingly) are that the biggest shares of poverty exits and entries are associated with economic events, whereas demographic events changing households' size and composition are less important. Among economic events, those associated with the highest share of poverty transitions are the ones which affect households' labor income (Jenkins, 2000; Layte & Whelan, 2003; Oxley et al., 2000).[7] Although the descriptive approach is informative about the salient events associated with poverty transitions, it neither allows to identify the separate effects of events which happen simultaneously, nor provides a means to simulate individual poverty experience.[8] Furthermore, hazard rate models are not a suited framework to model (non) poverty triggering events, since the use of event variables and actually of any time-varying variable as covariates in these models is somewhat problematic.[9] In particular, to simulate the duration of a (non) poverty spell these models typically assume that time-varying covariates are fixed during the spell in question: they can vary only between different spells. Therefore, while these models can simulate the multi-year poverty spells for, say, households of different size, they do not allow for the effects of changes in household size which occur during a poverty spell.

The method we propose analyzes the determinants of poverty transitions taking a different perspective with respect to this literature. Rather than modelling the (non) poverty state and the duration of poverty spells, we focus on the changes of the poverty/non-poverty state, defined as dichotomous variables capturing poverty exits and entries respectively, which we model using random effects probit models. This allows to isolate the marginal effects on the chances of changing the (non) poverty state (i.e., to exit poverty for a poor person or to enter poverty for a non-poor) of all possible qualitative and quantitative covariates, including event variables, time-varying variables and variables at changes.

The results on the adverse effects of poverty duration on poverty exit and re-entry probabilities highlighted in the literature on poverty dynamics have important implications for public policy. If such effects are important, then breaking or avoiding

[6] Following the decomposition method first proposed by Bane and Ellwood (1986). The approach identifies the single main event associated with poverty transitions, and does not attribute any importance to other events which may happen simultaneously.

[7] In addition to the results for the entire population, the findings also show, as one expects, substantial heterogeneity in the importance of the specific events associated with poverty transitions for different population groups: for example, for elderly households most transitions are associated with changes in non-labor income, etc.

[8] Jenkins (2000).

[9] See Jenkins (2000) for a complete discussion on the problems of using event variables and time varying variables as covariates in hazard rate models.

the vicious circle of poverty through income policies like social transfers should be a fundamental component of anti-poverty interventions, together with employment policies, education policies and other social policies aimed at affecting the factors which shape individual heterogeneity (Andriopoulou & Tsakloglou, 2011). The effects of social transfers on individual poverty transitions, however, is generally not analyzed by longitudinal studies on individual poverty dynamics. Two longitudinal studies have instead investigated cross country differences in terms of average poverty levels, duration and recurrence among European countries with different welfare regimes (Fouarge & Layte, 2005), and the share of transitions associated with variations of social transfers in different regimes (Layte & Wehlan, 2003). These studies find that in social-democratic regimes and corporative regimes, the level, average duration and recurrence of poverty are lower and the share of transitions associated with changes of social transfers are higher with respect to liberal and Southern-European regimes.

A different strand of literature has investigated the effectiveness of social benefits in relieving poverty. Most of this literature adopts an aggregate approach, and analyzes the impact of social transfers on average indicators of poverty, like poverty rates and persistent poverty rates, or on aggregate entry and exit rates. Many cross-country studies on OECD countries (Caminada et al., 2010; Duiella & Turrini, 2014; Heady et al., 2001; Nolan & Marx, 2009; Prasad, 2008) analyze the relation between the levels of spending for social protection and the incidence of poverty and inequality, finding that higher social expenditure is associated with lower aggregate poverty rates and/or lower inequality. The average estimated effects are rather strong: in Nolan and Marx (2009), a 1% reduction of social spending increases the poverty rate by 1%, while Prasad (2008) finds a negative correlation of −0.75 between levels of social spending and the Gini indexes. The estimated relations, however, are weaker for the group of EU-15 countries than for the non-EU-15 group (Caminada et al., 2010).

Other studies infer the effects of social transfers (or more generally of redistribution) from the comparison of counterfactual poverty levels based on "market" income before social transfers (and taxes) with actual levels based on disposable income after transfers. Oxley et al. (2000) take this approach and analyze data for six countries over 6–10 years period between the mid '80 s and the mid '90 s.[10] The authors find that poverty rates are lower, exit rates are higher and the incidence of long poverty spells is lower when they are calculated based on actual income after taxes and transfers rather than on market income before redistribution. The effects are more pronounced in countries with more generous welfare regimes. Similar results are found by Valletta (2006), in a study on 6-year panels for four countries in the nineties, and by Smeeding et al. (2012), who focus on twelve countries in the two-year period 1999–2000. The latter study finds that the difference between poverty rates before and after social benefits is wider for natives than for immigrants: poverty reduction after social transfers is around 65% for the first group and 60% for the second. For both groups the effects are stronger in countries with more generous welfare systems (Northern and Central Europe), and lower for English-speaking

[10] US: 1980-93; Germany: 1984-96; Canada: 1986-95; Sweden: 1991-1996; UK: 1991-96.

countries. Eurostat (2020) estimates that in 2018 social transfers in the EU-27 have reduced the aggregate poverty rate from 25% before transfers to 16.8% after transfers, lifting 8.2% of the population above the poverty threshold. In Italy the structure of transfers seems to have one of the lowest impacts on the poverty rate, which is reduced by 5.6% only.

The aggregate approach has been criticized by some authors (Fabrizi et al., 2014; Kittel, 2006) based on the argument that the focus on the average effects of transfers overlooks the fact that their impact on households and individuals can be very different from the mean, depending on specific characteristics. A few studies adopt a microeconomic approach and compare individual poverty before and after transfers to investigate how the impact of transfers differs depending on individual and household characteristics, and whether social transfers are efficiently allocated to the different segments of the (before-transfers) poor population.

Lohmann (2009) uses cross-country microdata for 20 countries in the year 2005 to investigate the incidence of in-work poverty and the role of social benefits in reducing it. The author examines the factors connected to in-work poverty before transfers and those connected to poverty after transfers. He finds that the transfers do reduce the position of disadvantage in the distribution of income before transfers for some groups at high risk of poverty, but also that some groups (in particular the self-employed, the immigrants and low skill workers) have both higher poverty rates before transfers and lower probabilities of exiting poverty after transfers.

Two studies for Italy are those of Addabbo and Baldini (2000) and Fabrizi et al. (2014). Addabbo and Baldini (2000) use data from the panel section of the Survey on Income and Wealth run by the Bank of Italy over the period 1991–1995 to analyze the effectiveness of the Italian system of social transfers in reducing poverty rates (static efficiency) and poverty entry and exit rates (dynamic efficiency) as well as factors associated with the exclusion from the safety net. They find that between 37 and 41% of individuals classified as poor based on income before transfers overtake the poverty line after transfers. As to dynamic efficiency, 41% of poverty entries calculated based on current income before transfers within the group of non-poor (either before or after transfers) in the previous period are avoided thanks to the transfers. Both the static and dynamic efficiency, however, are more pronounced for individuals older than 60 and less pronounced for the unemployed, the self-employed, for households with children and for the residents of the Southern regions. The first three categories also face a particularly high probability of being excluded from the safety net.

Fabrizi et al. (2014) consider three dichotomous variables: the state of poverty before transfers, the receipt of transfers and the state of poverty/non-poverty after transfers for those households who were poor before receiving the transfers, and use cross section data from the IT-SILC survey for the year 2007 to estimate a multivariate probit model connecting the three dichotomous variables to a set of households' characteristics. The analysis allows to check whether the main characteristics associated with poverty before transfers generally correspond to those associated with the receipt of transfers, and to examine the main factors associated with poverty exits after transfers. The central results are in line with those of Addabbo and Baldini (2000): the social transfers system seems to be biased in favor of employees with

permanent contracts and the elderly, whereas households with children (especially the single parent ones) and those with a self-employed, temporary contract worker or unemployed head, face the highest probability of being poor before transfers and the lowest probability of both receiving the transfers and exiting poverty after transfers.

Overall, the results of both the macro and micro literature seem to confirm that social transfers do reduce poverty and its persistence, even if, in particular in the Italian case, the transfer system tends to be biased against some groups of individuals and households.

The approach which this literature adopts, however, has been criticized for resting on questionable assumptions about the possibility to simulate a counterfactual poverty before transfers to be compared with actual poverty after transfers, like for example the assumption of no interdependence between the transfers and pre-transfer income (Brady et al., 2009). Notice that if more generous social transfers determined lower individual incentives to work in order to increase pre-transfer income, the anti-poverty effect of transfers would be overestimated, especially in international comparisons. Moreover, the income distribution simulated in the absence of taxes and transfers could be distorted also because public insurance may crowd out private insurance, and because the welfare state redistributes among individuals and during the life-cycle and affects the distribution of labor income through education (Wright, 2004). But even if this was a minor point, a limit of the approach is that it does not allow to estimate the magnitude of the effects of social transfers on the individual chances of exiting (or entering) poverty, and to assess their relative importance with respect to other possible determinants of individual poverty transitions. The issue needs to be addressed, and this paper is a contribution in this direction, which complements the above literature on the effectiveness of social transfers. Such literature assesses their overall poverty-reducing effect by looking at the share of poor before transfers which is non-poor after transfers (static efficiency) or at the share of poverty entries among the non-poor (before or after transfers) which are avoided thanks to the transfers (dynamic efficiency), and highlights the individual and household characteristics which affect the individual probabilities to remain in poverty (or to exit poverty) after transfers.[11] We propose a different and complementary method of analysis, which assesses the dynamic effectiveness of different kinds of social transfers by estimating their effects on the individual probabilities of changing the actual (rather than counterfactual) poverty/non poverty state, and comparing them with the effects of other possible covariates of poverty exits and entries. So, for example, our approach allows to assess by how much the presence of unemployment benefits affects the probability that a poor (non-poor) unemployed individual climbs out of (slips into) poverty, by how much the presence of family and children related allowances mitigates the adverse effects of increases in the number of children on the individual probabilities of poverty transition, by how much the arrival (or the loss) of the different kinds of benefits affects these probabilities, and

[11] Moreover, it also analyzes whether social transfers are efficient in reaching the more vulnerable groups of the population.

how important these effects are compared with those of the other characteristics and events affecting the individual chances of poverty exit and entry.

3 Data, dependent variables and samples

3.1 Sources of data

Our main source of data is the Italian Statistics on Income and Living Conditions (IT-SILC), released by ISTAT since 2004 as part of the wider EU-SILC project. The survey provides detailed information on individuals' and households' socio-economic characteristics, as well as non-monetary indicators of their lifestyle; it covers all household members, but only members aged 16 or more are interviewed.

We use the longitudinal components of IT-SILC, where the reference population is all current members of private households residing in the five national NUTS-1 regions (North-East, North-West, Center, South and Islands) in the period of data collection. The design of the longitudinal components of IT-SILC is based on four rotating panels. Individuals in each group are followed over 4 years and each year one group is eliminated and substituted with a new one, so that in each year the cross-section sample is composed by individuals belonging to 4 different groups, at the first, second, third and fourth interview respectively. We aggregate the panels of 9 longitudinal components, from 2004 to 2007 to 2012–2015, obtaining a database covering the period 2004–2015, a relatively long-time span characterized by different economic phases. Consistent with the literature on poverty,[12] our analysis will consider the entire population, which in our database consists of all the interviewed individuals, aged from 16 to 80. The pooled dataset consists of 425,223 observations for 144,401 individuals: 67,251 individuals with 4 interviews, 26,597 with 3 interviews, 25,875 with 2 interviews and 24,678 individuals with 1 interview (this last group will be dropped from our analysis of transitions). We combine individual and household data from IT-SILC with data on aggregate structural factors at the macro-regional level, from ISTAT sources, in particular on expenditures on social services at the local level[13] and on indicators of macroeconomic performance.[14]

3.2 The poverty indicator

We will focus on the standard "at risk of poverty" (ARP) indicator defined by Eurostat, which classifies as income poor the individuals whose annual disposable equivalent household income falls below 60% of the national median. Following common practice in the EU disposable equivalent household income is calculated as the ratio between the sum of all household members' incomes (from any source and after taxes and transfers) and the number of "equivalent adults", obtained by assigning to

[12] And as suggested by Jenkins (2000).

[13] From the "Survey on Interventions and Social Services by Single and Associated Municipalities".

[14] From the series of "Territorial Economic Accounts".

each member a weight which depends on age, according to the so called "modified OECD scale".[15]

The unit of analysis is the individual: the same value of the equivalent disposable income is assigned to each component of the household, assuming that household's resources are equally distributed among members. Both the choice of the poverty threshold and the implicit assumptions in the choice of equivalent household income are controversial and somewhat arbitrary, but using the ARP indicator is common practice in the literature analyzing poverty dynamics in Europe, and allows a general comparison of the results.

For each individual and year, we construct the ARP indicator using information available in IT-SILC data. In order to reduce sample selection and attrition errors, we use personal longitudinal weights both in the calculation of the ARP indicator and, where possible, in all our estimates.

Table 1 reports, for the whole country and for the five NUTS-1 macro-regions, the sample average poverty rate during the period 2004–2015 (column 1) as well as the share of the sample population which has experienced poverty at least once during the observation period (column 2).

Looking at column 1, the aggregate poverty rate has been 17.4% on average during the period, but, as expected, the aggregate figure hides wide geographical differences which characterize the well-known Italian North/South divide. The relative poverty rate ranges from 9.4% in the North-East to 30.8% and 35.1% in the South and in the Islands, respectively. Focusing on column 2, notice that the share of population which has experienced poverty at least once during the observation period is always higher than the share of poor in the first column: at the national level the difference is above 5 percentage points, whereas the differences within the macro-regions vary between 3.6 and 4.6 points in the Northern and Central regions and between 7.4 and 8 points in the Southern ones. These differences are a first rough indication that the composition of the group of poor changes over time (i.e. that exit and entry mobility exists), and that for a substantial fraction of the ever poor the state of poverty is only transitory.

In what follows we concentrate on the analysis of individual mobility into and out of income poverty.

3.3 Dependent variables and samples.

Our dependent variables are year to year poverty exits and entries, defined as dichotomous variables representing changes of the individual status from poverty to non-poverty and vice versa. In particular, for each individual and period we define poverty exits (entries) as dummy variables which assume value one if an individual changes her state from poverty in the previous period ($t-1$) to non-poverty in the current one (t) (from non-poverty to poverty for entries), and zero otherwise. All movements across the relative poverty threshold are considered, irrespective of the distance from the threshold before and after the change. However, we will check the

[15] Which assigns a weight of 1 to the first adult component, 0,5 to the second and to all other components from 14 years of age, and 0,3 to the younger children.

robustness of the results by considering 10% and 20% bands around the threshold, to eliminate transitions deriving from small deviations.

A meaningful analysis of the probabilities of poverty exit and entry as above defined requires a careful definition of the samples, as illustrated in Mood and Jonsson (2016). The analysis of poverty exits must be conducted on the population "at risk of exit"; the relevant sample, therefore, is composed by the group of "leavers", changing their status from poor to non-poor, plus the group of "constantly poor", i.e. those maintaining the poverty status between $t-1$ and t. Similarly, the analysis of poverty entries must be based on the population "at risk of entry", and the relevant sample consists of the group of "entrants", changing their status from non-poor to poor, plus the group of the "never poor", who maintain the non-poverty status between $t-1$ and t.

Table 2 displays the composition of the pooled samples for poverty exits and entries, as well as the average poverty exit and entry rates for the whole period 2004–2015.

The national sample for the analysis of poverty exits ("constantly poor" + "leavers") includes 43,855 observations and 12,546 exits, which correspond to an average exit rate of 28.61%. As expected, there are wide regional differences in exit rates, which vary between 36% of the North-Western regions and 25–21% in the South and Islands, respectively. As to poverty entries, the national sample is composed by 204,044 observations and 11,428 entries: the average entry rate is 5.6%, while the regional rates vary between 3.28% in the North-East to 10.46% and 10.61% in the South and Islands, respectively.

The annual aggregate exit and entry rates over 2005–2015 are displayed in Table 3.

It is worth noticing that the effects of the double dip recession of 2008–2009 and 2011–2013 are clearly reflected in the time path of poverty exit rates, which display a continuous decline starting in the second phase of the crisis (since 2012) and by 2015 are 9% points lower with respect to the pre-crises period. On the other hand, poverty entry rates slightly increase in 2010 and 2011, but start declining in 2012, which is not surprising, given that both median income and the poverty threshold decline in periods of declining economic activity.

3.4 Data on social benefits

Before turning to the analysis of the determinants of poverty exits and entries, a brief description of our data on social benefits is in order.

The IT-SILC survey defines social benefits as current cash transfers received by households during the income reference period, intended to relieve them from the financial burden of a number of risks or needs, provided through collectively organized schemes or outside such schemes by government units and non-profit institutions serving households (Eurostat, 2012). They are recorded either as transfers directed to individuals within the household or as transfers directed to the household. Transfers directed to individuals include unemployment benefits, old age and survivors' benefits, sickness and disability benefits and education related allowances. Old

Table 1 Average annual poverty rates 2004–2015 and poverty prevalence (complete sample)

	(1) Poverty rate (%)	(2) Poor at least once* (%)
Italy	**17.5**	**22.7**
North-West	*10.6*	*14.5*
North-East	*9.4*	*13.0*
Centre	*13.6*	*18.2*
South	*30.8*	*38.9*
Islands	*35.1*	*42.5*

Source: own elaborations on data from IT-SILC

*Percentage of the population, which has experienced poverty in at least 1 year during the observation period

age benefits include old age pensions (which in turn include both contributory pensions and supplementary transfers paid to old persons whose work histories do not allow them to reach the amount of social security contributions necessary to be entitled to the minimum old age pension), as well as care allowances and disability benefits paid to persons after retirement age. Unfortunately, the data do not allow to distinguish the different kinds of old age benefits. Transfers directed to the households, on which data are available only starting from 2007, include family and children related allowances, housing allowances and social exclusion allowances. The first category includes transfers such as family allowances paid to a member of a household with dependent children, parental leave benefits, allowances in the event of the birth or the adoption of a child as well as transfers to people who support relatives other than children. The second category includes means tested benefits granted to tenants to help them with rent costs and to owner-occupiers to alleviate current housing costs (typically help with mortgages and/or interest payments). The last category encompasses periodic payments to people with insufficient resources, and other cash benefits which support destitute and vulnerable people, mostly provided in the framework of different local programs implemented at the regional, provincial or municipal level. During the time period considered in this study no national universal income support program was in place in Italy, and the only national transfer program was the "Social Card", started in 2008 and intended to support expenditure for food, medicines and utility bills of particularly vulnerable people.[16]

Besides monetary transfers, different programs managed at the local level provide in kind social transfers, which constitute an important component of the Italian system of social benefits (they amounted to 11–12% of GDP over the period 2004–2013),[17] but are not considered in the IT-SILC survey. At the macro level, however, ISTAT provides survey data on the expenditures on social services by

[16] People older than 65 or parents with children younger than 3 and in particularly bad economic conditions.

[17] OECD National accounts at a glance, March 2020 data.

Table 2 Pooled samples and poverty transitions, average 2005–2015

	Poverty exits			Poverty entries		
	Sample	Exits	%	Sample	Entries	%
Italy	**43,855**	**12,546**	**28.61**	**204,044**	**11,428**	**5.60**
North-West	*5809*	*2093*	*36.03*	*50,458*	*1948*	*3.86*
North- East	*5335*	*1870*	*35.05*	*52,113*	*1711*	*3.28*
Centre	*8036*	*2653*	*33.01*	*50,331*	*2399*	*4.77*
South	*17,202*	*4366*	*25.38*	*37,748*	*3949*	*10.46*
Islands	*7473*	*1564*	*20.93*	*13,394*	*1421*	*10.61*

Source: own elaborations on data from IT-SILC

Table 3 Poverty transitions, annual rates, 2005–2015

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Exit rates (%)	31.8	28.7	28.8	28.8	33.0	30.4	31.5	27.8	26.8	25.8	23.9
Entry rates (%)	7.0	6.6	5.8	5.4	5.6	5.9	7.1	5.8	5.3	4.8	4.7

Source: own elaborations on data from IT-SILC

Municipalities,[18] which also include this kind of benefits. We will use the data on total spending on social services by Municipalities, aggregated at the macro-regional level and divided by the respective population, to obtain the level of per capita social spending in the macro regions, whose yearly change will be included among the possible macro/structural determinants of individual poverty transitions. Between 2010 and 2015 expenditures on social services have been declining in all macro regions but the North-East (ISTAT, 2019). Moreover, the data highlight a large North/South gap: social spending by municipalities in the Southern and Insular regions corresponds to 10% of the total, while their share of the population is 23%.

4 Model, explanatory variables and estimation strategy

4.1 The model

Given the features of our samples and the binary nature of our outcome variables, we will estimate two sets of random-effects probit regression models for poverty exits and entries. The use of both qualitative and quantitative controls is admitted with this technique, that employs maximum likelihood to assess the regression's function. Random effects are introduced to control for possible individual unobserved heterogeneity, and to assure consistent estimation of the parameters.

[18] The ISTAT "Survey on social actions and services of single and associated municipalities" collects annual information on welfare policies managed at the local level within the integrated network of local social services and on related expenditures.

The general form of our probit models is:

$$Pr(Y_{it} = 1|\boldsymbol{X}_{it}, \boldsymbol{c}_i) = \Phi(\boldsymbol{X}_{it}'\boldsymbol{\beta} + \boldsymbol{c}_i) \quad (1)$$

where Y_{it} is the dichotomous outcome variable (poverty entries and poverty exit respectively), $\boldsymbol{X}_{it}$ is the set of observed explanatory variables, $\boldsymbol{c}_i$ is unobserved heterogeneity, $\boldsymbol{\beta}$ is the vector of parameters and Φ is the cumulative distribution function of the Standard Normal distribution. Subscripts i and t refer to individuals and years, respectively.

The explanatory variables can be grouped in four categories: (i) individual and household characteristics (C_{it}), (ii) demographic and economic events affecting households' needs and resources (E_{it}), (iii) macroeconomic controls (M_{it}), which are the same for all the i's in a macro-region, and (iv) other controls (Z_j and Z_t for macro-regional and time dummies, respectively). Specifically, our models can be formally written as follows:

$$Pr(Y_{it} = 1|\boldsymbol{X}_{it}, \boldsymbol{c}_i) = \Phi([C_{it}, E_{it}, M_{it}, Z_j, Z_t]'\boldsymbol{\beta} + \boldsymbol{c}_i) \quad (2)$$

Notice that the units of analysis in the model (the *i's*) are individuals rather than households. The choice is justified not only because the risk of poverty is defined at the individual level, but also because the individual is the only stable entity in a longitudinal perspective,[19] and because in the dataset the longitudinal weights which report the sample to the population are constructed at the individual level, to correct for distortions due to selective non-response. Characteristics and events measured at the household level are applied to all household members, but we also use events and characteristics at the individual level, in order to increase the variability of the regressors and to capture the effects of individual aspects which may affect the changes of status.

Time t refers to the year of the interview. As the poverty status is defined with reference to the flow of equivalent household income in the twelve months preceding the interview, all the variables at levels (namely, the "characteristics") are constructed so as to refer to the twelve months preceding the interview, while the "events" as well as the entries and exits, reflect the changes between the last twelve months and the previous ones.

Let's now focus on the description of the regressors.

4.1.1 Explanatory variables

4.1.1.1 Individual and household characteristics As to controls capturing individual characteristics, we start with a set of standard regressors capturing the effects of education, gender, marital and health status, plus a discrete variable capturing the age

[19] Vandercasteele (2015). Since households' size and composition may vary over time when individuals move between households, die and are born, the household is not a convenient unit of analysis.

class, with possible non-linear effects.[20] We then consider a set of dummy variables capturing the individual's main activity during the income reference period (i.e. the previous twelve months): employed (the omitted dummy), unemployed, retired, inactive (this last category includes students/trainees, disabled persons and other inactive persons). We construct these dummies based on the individual's declaration on her main activity in each of the previous 12 months, reported in IT-SILC data: we sum the number of months the individual declares to have spent in each activity, and define the "main activity" as the one in which the individual has spent the largest number of months. As the retirement dummy is strongly correlated with age, we will exclude it from specifications which include the (nonlinear) effects of the age class, which also capture the effects of retirement.

Household characteristics are captured in a parsimonious way by two discrete variables reflecting the household's size and composition: number of children and number of adults.

To capture the effects of past poverty experience on the current chances of poverty exit or entry we introduce a dummy variable, namely *Past poverty experience*, which assumes value 1 if in the initial period (in $t-1$) the individual had experienced more than one year of poverty, and 0 otherwise.

As a first possible test on the potential role of social transfers in poverty transitions, in some specifications we introduce a set of interactions between individual or household characteristics which typically decrease the probability of poverty exit (or increase the probability of poverty entry) and the presence in individual or household income of the specific social transfers associated to such characteristics. We expect that the presence of the benefit should reduce the adverse effect of the characteristics. We construct dummies for unemployment benefits, sickness/disability benefits and education related allowances in individual income, as well as for family and children related allowances in household income, and consider the interactions between these dummies and the associated individual/household characteristic. In particular, we consider the interactions between: the dummies for unemployment and unemployment benefits, the dummies for inactivity and "inactivity benefits",[21] the discrete control for the number of children and the dummy for family and children related allowances. Notice that only some of the individuals with each of the specific characteristic do receive the associated benefits, which makes analyzing the interactions meaningful. On the other hand, we do not consider interactions between the dummies for old age benefits and the dummy for retirement, since virtually all retired persons do receive old age benefits. Notice also that unemployment benefits,

[20] Six age classes are considered: 16–24, 25–34, 35–44, 45–54, 55–64 and ≥ 65. The use of the age classes (and their squares) rather than a standard polynomial in age allows us to obtain higher magnitudes and more meaningful interpretations of the estimated marginal effects, which show how the changes from youth to adulthood, from adulthood to middle age, and from middle age to retirement age modify the probability of poverty exit (or poverty entry). We also performed the estimates using a standard polynomial in age, which yielded similar results.

[21] I.e. sickness/disability benefits or education related allowances. In the Italian system ill and disable persons and students are the only categories of inactive people who may receive specific individual cash social transfers. Retired people are not included in the category of inactive.

"inactive benefits" as well as family and children related allowances do not depend on the current poverty/non-poverty state and hence on the dummy for the change of state (the dependent variable)[22]; reverse causality can therefore be ruled out when considering interactions involving levels of such benefits. This is not possible when considering levels of benefits like housing allowances and social exclusion allowances, which are typically assigned to households with very low-income levels only. In this case reverse causality determines a negative link between the dummy for poverty exit and the receipt of these benefits (i.e. one does not receive the benefit due to poverty exit) and a positive link between the dummy for poverty entry and the benefits (i.e. one receives the benefit due to poverty entry). Therefore, we do not consider interactions including these benefits.

4.1.1.2 Demographic and economic events We capture demographic events affecting household's needs with two regressors reflecting household's size and composition: a discrete quantitative variable measuring the variation in the number of members and a qualitative binary variable assuming value 1 if the individual belongs to different households in $t-1$ and t (which may happen in case of separation or divorce, or when grown up children leave the original household), and 0 otherwise.

As to events affecting households' resources, we consider first of all those which change individual labor income. As a proxy for all labor market events potentially affecting individual labor income we use the change in individual work intensity between $t-1$ and t. Individual work intensity is defined as the number of months spent in a full or part time job as an employee or self-employed, divided by 12. The variable is constructed based on the individuals' statements on their main activity in each of the preceding twelve months. It can vary between 0 and 1, hence its change is a continuous variable varying between -1 and 1.

As a further probing test on the effects of social transfers on poverty transitions, we consider a set of controls reflecting changes in the flows of social benefits which support individual and/or household income. In particular, among the determinants of poverty exits we consider a set of dummies assuming value 1 in case of the "arrival" of a specific benefit, i.e., if the individual (or her household) did not receive the specific benefit in $t-1$ and does receive it in t. Among the determinants of poverty exits, vice versa, we consider a set of dummies which reflect the "loss" of a specific benefit. We do not consider the arrival/loss dummies for old age benefits, since there are no such occurrences in our sample. In some alternative specifications, as a robustness check, we replace the "arrival/loss" dummies with generic dummies reflecting an increase/decrease in the specific benefits.

Notice that the "arrival" dummies are introduced only in the exit regressions and the "loss" dummies in the entry regressions, in order to avoid reverse causality (e.g., one may lose the benefit due to poverty exit or get the benefit due to poverty entry). One expects that poor individuals who start receiving a benefit (or see an increase in a benefit) have higher chances of climbing out of poverty with respect to those who

[22] They are paid to poor and non-poor individuals alike, either because they are assigned irrespective of household income levels or because also households with income levels well above the poverty line are entitled to the benefits.

do not. Similarly, non-poor individuals who stop receiving a benefit should be more likely to enter poverty with respect to those who do not.

4.1.1.3 Controls for the macroeconomic context and other controls The macroeconomic environment and other structural differences in the local conditions may play an important role in the individual chances of poverty exit and entry. We consider two controls at the macro-regional (NUTS-1) level: the growth rate of total hours worked in the macro-region between $t-1$ and t (a proxy for the local macroeconomic conditions)[23] and the growth rate of per capita expenditure on social services by municipalities. Beneficial effects of both macroeconomic controls on poverty transitions is expected, as both better macroeconomic conditions and higher efforts for local welfare policies should speed poverty exits and prevent poverty entries.

Finally, we control for time effects and include regional dummies at the NUTS-1 level, to control for invariant structural factors within the macro-regions (among which, for example, the different degrees of efficiency in the allocation of public subsidies at the local level).[24]

4.2 Endogeneity issues and IV linear probability estimates

An endogeneity issue regarding the estimated effects of social benefits could arise from an omitted variable bias if there was some unobservable variable correlated with both poverty exit (or entry) and the fact that the individual/household has received a given benefit, or has seen an increase (or decrease) in the benefit. To check the robustness of our random effects probit estimates, therefore, we will estimate two sets of Instrumental Variable Linear Probability models for poverty exits and entries, using a set of characteristics of the household and of its head as instruments for the interaction variables as well as for the arrival/loss (increase/decrease) variables referring to the different social benefits. For household characteristics we use a set of dummies indicating the type of household (single person household, single person with dependent children, two adults with one dependent child, two adults with two or more dependent children, two adults without dependent children, at least one adult 65 years or more). As to the characteristics of the household's head, we consider the years of work experience, and a set of dummies indicating the type of employment (self-employed or employee, full time or part time) as well as the education level, gender, age and marital status. All our instruments are plausibly exogenous and correlated with the benefits variables; their validity will be tested by means of a Wald test.

[23] We also experimented the GDP growth rate and with the employment growth rate, with similar results.

[24] All variables are descripted in Table 6 of the Appendix. Tables 7 and 8 report the descriptive statistics referring to both the exits and entries samples.

Table 4 Poverty exits—estimated models

Poverty exits	Panel probit models					IV LPM estimates				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Individual and household characteristics										
Unemployed	−0.2314***	−0.2612***	−0.2004***	−0.2014***	−0.2294***	−0.2081***	−0.2458***	−0.1847***	−0.1848***	−0.2207***
Unemployed *unemployment benefits	0.1334***	0.1334***				0.1096***	0.1109***			
Inactive	−0.1169***	−0.1722***	−0.1060***	−0.1040***	−0.1647***	−0.1132***	−0.1772***	−0.1048***	−0.1030***	−0.1714***
Inactive *inactive benefits	0.0410**	0.0582***				0.0390***	0.0568***			
Retired		−0.1430***			−0.1773***		−0.1525***			−0.1809***
Age class	0.0348***		0.0328***	0.0271***		0.0330***		0.0341***	0.0281***	
Age class^2	−0.0076***		−0.0064***	−0.0053***		−0.0074***		−0.0067***	−0.0056***	
First level tertiary education	0.1316***	0.1353***	0.1126***	0.1200***	0.1284***	0.1274***	0.1307***	0.1105***	0.1170***	0.1244***
Secondary education	0.0805***	0.0827***	0.0746***	0.0784***	0.0849***	0.0739***	0.0762***	0.0699***	0.0729***	0.0786***
Married	0.0249***	0.0205***	0.0206***	0.0143**	0.0191***	0.0203***	0.0148**	0.0165**	0.0109	0.0143**
Female	0.0192***	0.0233***	0.0153***	0.0190***	0.0227***	0.0168***	0.0215***	0.0136***	0.0172***	0.0217***
(Bad) Health	−0.0095***	−0.0132***	−0.0099**	−0.0134***	−0.0218***	−0.0113***	−0.0144***	−0.0111***	−0.0143***	−0.0205***
Number of children	−0.0498***	−0.0468***	−0.0194***	−0.0247***	−0.0205**	−0.0446***	−0.0399***	−0.0189***	−0.0231***	−0.0180**
Number of children *fam. children benefits	0.0446***	0.0450***				0.0391***	0.0382***			
Number of adults	0.0295***	0.0323***	0.0315***	0.0304***	0.0359***	0.0270***	0.0302***	0.0298***	0.0288***	0.0340***
Past poverty experience	−0.0583***	−0.0572***	−0.0582***	−0.0579***	−0.0574***	−0.0170**	−0.0169**	−0.0135	−0.0138*	−0.0148*

Table 4 (continued)

Poverty exits	Panel probit models					IV LPM estimates				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Demographic and economic events										
New household	0.1506*	0.1536*	0.1458*	0.1508*	0.1563*	0.1481*	0.1490*	0.1450	0.1482*	0.1508*
Change of household size	−0.0042	−0.0045	−0.0133	−0.0124	−0.0138	−0.0041	−0.0051	−0.0120	−0.0116	−0.0136
Change of work intensity	0.0835***	0.0607***	0.0788***	0.0792***	0.0567***	0.0745***	0.0492***	0.0709***	0.0720***	0.0466***
Unemployment benefits arrival			0.1238***					0.1196***		
Inactive benefits arrival			0.1257***					0.1182***		
Family and children benefits arrival			0.0757***					0.0699***		
Housing benefits arrival			0.0241*					0.0227*		
Social exclusion benefits arrival			0.0044					0.0080		
Unemployment benefits increase				0.1261***	0.1208***				0.1243***	0.1180***
Inactive benefits increase				0.0498***	0.0766***				0.0484***	0.0744***
Pension increase					0.0886***					0.0790***
Family and children benefits increase				0.0816***	0.0826***				0.0741***	0.0747***
Housing benefits increase				0.0248*	0.0266*				0.0259**	0.0267**

Table 4 (continued)

Poverty exits	Panel probit models					IV LPM estimates				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Social exclusion benefits increase				−0.0098	−0.0131				−0.0040	−0.0083
Macro− structural and other factors										
Growth of hours worked	0.0091**	0.0089*	0.0054	0.0055	0.0049	0.0086***	0.0085***	0.0060*	0.0060*	0.0056*
Growth of social spending per capita	0.1130	0.1142	0.0896	0.0952	0.1034	0.1073	0.1069	0.0851	0.0895	0.0956
Center	0.0752***	0.0736***	0.0798***	0.0822***	0.0804***	0.0750***	0.0729***	0.0797***	0.0817***	0.0792***
Islands	−0.0422***	−0.0428***	−0.0332***	−0.0319***	−0.0314***	−0.0364***	−0.0368***	−0.0280***	−0.0268***	−0.0265***
North-East	0.1006***	0.1002***	0.0986***	0.0994***	0.1000***	0.1040***	0.1027***	0.1019***	0.1024***	0.1014***
North-West	0.1130***	0.1123***	0.1205***	0.1248***	0.1244***	0.1119***	0.1108***	0.1211***	0.1248***	0.1235***
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43 855	43 855	38 257	38 257	38 257	43 855	43 855	38 257	38 257	38 257
Log-likelihood	−24 339	−24 259	−21 265	−21 179	−21 059					
Wald Chi-squared (p-value)						74.60 (0)	57.62 (0)	33.79 (0)	32.45 (0)	37.47 (0)

*Source: our elaborations on IT-SILC and ISTAT data. Legend: *** $p<0.01$, ** $p<0.05$, * $p<0.10$*

Notice: for the random effects panel probit estimates (columns 1–5), we report marginal effects. Columns 6–10 report linear probability models (LPM) with the instrumental variables (IV) approach

Table 5 Poverty entries – Estimated models

Poverty entries	Panel probit models					IV LPM estimates				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Individual and household characteristics										
Unemployed	0.0506***	0.0514***	0.0477***	0.0470***	0.0480***	0.1434***	0.1456***	0.1307***	0.1287***	0.1311***
Unemployed*unemployment benefits	−0.0097***	−0.0091***				−0.0363***	−0.0352***			
Inactive	0.0255***	0.0235***	0.0249***	0.0252***	0.0238***	0.0502***	0.0480***	0.0482***	0.0484***	0.0471***
Inactive *inactive benefits	−0.0105***	−0.0062***				−0.0202***	−0.0139***			
Retired		−0.0034*			−0.0039**		−0.0010			−0.0010
Age class	0.0084***		0.0078***	0.0070***		0.0202***		0.0173***	0.0162***	
Age class^2	−0.0016***		−0.0015***	−0.0013***		−0.0035***		−0.0030***	−0.0028***	
First level tertiary education	−0.0347***	−0.0314***	−0.0333***	−0.0321***	−0.0295***	−0.0600***	−0.0529***	−0.0567***	−0.0542***	−0.0481***
Secondary education	−0.0175***	−0.0148***	−0.0168***	−0.0161***	−0.0139***	−0.0338***	−0.0278***	−0.0326***	−0.0312***	−0.0260***
Married	−0.0066***	−0.0074***	−0.0058**	−0.0062***	−0.0072***	−0.0120**	−0.0138***	−0.0096*	−0.0100**	−0.0121***
Female	−0.0039***	−0.0041***	−0.0036***	−0.0035***	−0.0035***	−0.0057***	−0.0056**	−0.0054***	−0.0053***	−0.0051***
(Bad) Health	0.0010	−0.0026	0.0009	0.0007	−0.0024	0.0016	−0.0035	0.0019	0.0016	−0.0027
Number of children	0.0164***	0.0186***	0.0113***	0.0104***	0.0125***	0.0355***	0.0408***	0.0248***	0.0230***	0.0280***
Number of children*fam. children benefits	−0.0075***	−0.0073***				−0.0160***	−0.0156***			
Number of adults	−0.0066***	−0.0056***	−0.0070***	−0.0072***	−0.0063***	−0.0129***	−0.0109***	−0.0137***	−0.0139***	−0.0120***
Past poverty experience	0.0245***	0.0246***	0.0236***	0.0242***	0.0243***	0.0518***	0.0523***	0.0478***	0.0484***	0.0488***
Demographic and economic events										
New household	0.0134***	0.0152***	0.0133***	0.0154***	0.0172***	0.0650***	0.0663***	0.0629***	0.0669***	0.0684***
Change of household size	−0.0124***	−0.0127***	−0.0113***	−0.0116***	−0.0119***	−0.0267***	−0.0281***	−0.0243***	−0.0246***	−0.0259***
Change of work intensity	−0.0055*	−0.0062**	−0.0050*	−0.0054*	−0.0063**	−0.0059	−0.0058	−0.0047	−0.0053	−0.0054
Unemployment benefits loss			0.0140***					0.0289***		
Inactive benefits loss			0.0174***					0.0284***		
Family and children benefits loss			0.0198***					0.0464***		
Housing benefits loss			0.0183***					0.0370***		

Table 5 (continued)

Poverty entries	Panel probit models					IV LPM estimates				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Social exclusion benefits loss			0.0297***					0.0787***		
Unemployment benefits decrease				0.0165***	0.0185***				0.0350***	0.0381***
Inactive benefits decrease				0.0149***	0.0156***				0.0247***	0.0249***
Pension decrease					0.0125***					0.0175***
Family and children benefits decrease				0.0125***	0.0132***				0.0244***	0.0253***
Housing benefits decrease				0.0166***	0.0171***				0.0350***	0.0357***
Social exclusion benefits decrease				0.0310***	0.0306***				0.0868***	0.0862***
Macro-structural and other factors										
Growth of hours worked	−0.0011	−0.0011	−0.0007	−0.0007	−0.0007	−0.0016	−0.0017	−0.0009	−0.0009	−0.0010
Growth of social spending per capita	−0.0100**	−0.0096*	−0.0075	−0.0074	−0.0067	0.0034	0.0041	0.0104	0.0117	0.0129
Center	−0.0238***	−0.0238***	−0.0234***	−0.0235***	−0.0236***	−0.0653***	−0.0655***	−0.0620***	−0.0617***	−0.0617***
Islands	−0.0022***	−0.0020***	−0.0021***	−0.0020***	−0.0018***	−0.0056***	−0.0051***	−0.0043***	−0.0042***	−0.0036***
North-East	−0.0332***	−0.0330***	−0.0342***	−0.0348***	−0.0346***	−0.0815***	−0.0813***	−0.0805***	−0.0806***	−0.0802***
North-West	−0.0293***	−0.0290***	−0.0296***	−0.0297***	−0.0295***	−0.0757***	−0.0756***	−0.0739***	−0.0733***	−0.0731***
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	204,044	204,044	179,211	179,211	179,211	204,044	204,044	179,211	179,211	179,211
Log-likelihood	−38,278	−38,405	−33,204	−33,160	−33,204					
Wald Chi-squared (p-value)						118.52 (0)	126.64 (0)	152.37 (0)	89.33 (0)	90.76 (0)

Source: our elaborations on IT-SILC and ISTAT data. ***p < 0.01, **p < 0.05, *p < 0.10

Notice: for the random effects panel probit estimates (columns 1–5), we report marginal effects. Columns 6–10 report linear probability models (LPM) with the instrumental variables (IV) approach

5 Results and robustness checks

The results of the random effects probit estimates for poverty exits and entries are reported in columns 1–5 of Tables 4 and 5, respectively. Estimated marginal effects are reported. The specifications of columns 1 and 2 consider the interactions between social benefits and the relevant characteristics, and those of columns 3, 4 and 5 consider the changes of social benefits (arrival/loss dummies and generic increase/decrease dummies). All other controls are the same in all specifications. Columns 6–10 of the tables report the corresponding estimates of the instrumental variable linear probability models.

The descriptive statistics of all the variables and their short description are in the Appendix (Tables 6, 7, 8).

A glance to the tables reveals how almost all the individual and household characteristics and life-course events have significant effects of the expected sign on the probability of exiting and entering poverty, which are robust to different specifications.[25]

Focusing on the effects of the different kinds of social benefits, the estimates confirm their effectiveness in increasing the individual chances of poverty exit and lowering the chances of slipping into poverty. Looking at columns 3–5 of Table 4, notice that four out of the five dummies signaling the "arrival" of social benefits (or their increase) significantly increase the chances of poverty exit. Unemployment benefits and inactive benefits have the strongest estimated marginal effects, followed by family and children related allowances, while housing allowances, as expected, have the lowest effect and are significant only at a 90% level. No significant effects on poverty exits are found instead for the arrival of social exclusion allowances, which is expected given the nature of such benefits, which are mostly directed to the more vulnerable individuals among the poor. By the same token, one expects that the loss of such benefits, or their decrease, should have a strong positive effect on the chances of entering poverty, as the benefit is mostly received by the more vulnerable in the group of non-poor population. The estimates of column 3–5 in Table 5 confirm this expectation: all of the five dummies signaling the "loss", or the decrease, of specific benefits significantly increase the probability of poverty entry, but in this case the strongest marginal effect is associated to the social exclusion allowances, followed by family and children related allowances, housing allowances, inactive benefits and unemployment benefits. Columns 5 of both tables also show that increases in old age benefits have a positive marginal effect on the chances of exiting poverty, while decreases of the benefit increase the probability of poverty entry.

The coefficients of the interaction variables in columns 1 and 2 of both tables confirm the beneficial role of the presence of individual unemployment benefits,

[25] The only exceptions are the dummy for bad health (which is not significant in the entry regressions), changes in household size (which are not significant in the exit regressions), changes in work intensity (which is not robustly significant in the entry regressions), and the change in social exclusion allowances (which is not significant in the exit regressions).

of benefits targeted towards the inactive individuals, as well as of family and children related allowances.

The beneficial role of social benefits in preventing individual poverty entries and speeding poverty exits is hardly surprising. Let us now turn the attention on a more interesting and so-far under-researched question which our methodology allows to tackle: how do the effects of social benefits compare with those of the other covariates of individual poverty transitions?

We start with focusing on the characteristics and events related to the labor market status. Being unemployed for most of the previous 12 months is the individual characteristic with the largest impact on both the probability of poverty exit and entry. Compared to an employed individual, an unemployed has a 20–23% lower probability of exiting the risk of poverty, and a 4.7–5% higher probability of ARP entry, depending on specifications. It is informative to compare the marginal effects with the mean transition rates in the sample,which are equal to 28.61% for exits and 5.6% for entries. With respect to these benchmarks, for an unemployed individual (compared to an employed) the risk of entering poverty is almost doubled, and the chance of poverty exit is reduced by 71–78%. Changes of the individual work intensity play a significant role especially in shaping the chances of poverty exit: a unit increase of the individual work intensity raises the probability of poverty exit by 6–8%. The estimated effects on the chances of poverty entry are instead rather weak (−0.5/−0.6%), and their low level of significance is not confirmed by the instrumental variable linear probability estimates. Notice however that an increase (decrease) in work intensity can be associated with a change of the main activity from unemployed to employed (from employed to unemployed), and in this case the total effect on the probabilities of transition would be amplified.

How effective are unemployment benefits in counteracting the adverse effects of unemployment and lower work intensity? A glance to the signs and magnitude of the coefficients of the interactions between the state of unemployment and the presence of unemployment benefits suggests that the compensating effect is strong, especially in the case of poverty exits. Considering the total estimated effect in columns 1–2 of Table 4, being unemployed (with respect to being employed) reduces the chances of poverty exit by 10–13% if unemployment benefits are present compared with 23–26% if they are absent. The result is confirmed by the estimates of column 3, 4 and 5, where the magnitude of the (positive) effects of the arrival of unemployment benefits, or of their increase (12–12.6%), is roughly half the (negative) magnitude of the unemployment effects (−20/−23%), and 1.5–2 times the effect of a unit decrease in work intensity (−8%/−6%). The counterbalancing effect is somewhat milder on the probability of poverty entry: as one can see in columns 1–2 of Table 5, the chances of slipping into poverty are 5% higher for the unemployed who do not receive unemployment benefits and 4% higher in presence of such benefits, while columns 3–5 suggest that the loss of the benefit (or its decrease) increases the likelihood of slipping into poverty by some 1.4–1.8%.

Unfortunately, only a small fraction of the unemployed in our samples receives unemployment benefits: 20.19% in the sample for exits and 33.5% in the sample for entries. This is not surprising, given that the Italian labor market is characterized

by a high share of long term unemployed, who are not entitled to receive unemployment subsidies (nor universal income support measures, at least during the time period considered in this study).[26] Therefore, despite unemployment subsidies are found to be highly effective in increasing the individual probability of poverty exit and lowering the individual probability of poverty entry, they are expected to have only a small impact on aggregate transition rates and on poverty rates among the unemployed (in line with the results of Addabbo & Baldini, 2000, and Fabrizi et al., 2014), as well as on aggregate poverty rates (as in Heady et al., 2001).

A similar picture emerges if one compares the effects of the inactivity dummy with those of social benefits targeted to inactive individuals (namely illness or disability benefits or education related allowances). The negative impact of inactivity on the differential probability of poverty exit with respect to the employed (−10.4/−17%), and the positive impact on the probability of poverty entry (+2.35/2.55%), are strongly counterbalanced by inactive benefits. In columns 1 and 2 their presence reduces the adverse effects of inactivity by some 34–35% in the case of exits and 26–41% in the case of entries, while in columns 3–5 the effect of their arrival/loss, or increase/decrease, is much stronger. However, only a small fraction of the mainly inactive individuals in the samples receives these benefits (7.08% and 7.55% in the exit and entry sample, respectively), so that their aggregate impact is expected to be negligible, confirming the results in Heady et al. (2001).

Looking at the specifications of columns 2 and 5 of Table 4, notice how being retired strongly reduces the differential likelihood of climbing out of poverty (−14.3/−17.7%),[27] while the estimates of column five suggest that an increase of old age benefits increases the chances of exiting poverty by almost 9%. As to poverty entries (Table 5), the significance of the slight negative effect of the state of retirement in columns 2 and 5 is not confirmed by the IV estimates of columns 7 and 10,[28] while a decrease in old age benefits strongly increases the probability of slipping into poverty (+1.25%, as one can see in column 5). Since virtually all the retired individuals in our samples do receive old age benefits, their dynamic effectiveness is confirmed not only at the individual level, but also on aggregate entry and exit rates for the group of the retired (confirming previous results of the literature on social transfers).[29]

Focusing on the effects of household's size and composition and of demographic events, notice how the probability of exiting poverty is negatively related to the number of children in the household, and positively related to the number of adult components, which are potential income earners; the signs are reversed for entries. Demographic events related to changes in household size or to forming a

[26] Moreover, given the particular nature of our samples, one expects that they include higher shares of long term unemployed with respect to the entire population.

[27] The result is expected if we think that while for an employed person the flow of labor income may vary depending on work intensity, for a retired person the flow of the pension is usually steady from period to period. Therefore, a retired poor with a steady and low pension has lower chances of poverty exit compared to an employed poor.

[28] The estimated nonlinear effects of the age class, instead, become negative for the 6th class, suggesting that reaching retirement age slightly reduces the chances of slipping into poverty for a non-poor.

[29] Addabbo and Baldini (2000) and Fabrizi et al. (2014).

new household are not relevant for the probability of ARP exits, but have significant effects of the expected sign on the probability of entry (as in Polin & Reitano, 2014). The latter increases by 1.1–1.2% if the household's (adult) members decrease by one unit, and by 1.3–1.5% in the event of the formation of a new household.

The effectiveness of family and children related allowances in counteracting the adverse effect of an increase in the number of children can be appreciated by looking at the signs and magnitudes of the estimated marginal effects of the interaction between the number of children and the dummy for the presence of such benefits, and of the dummies signaling the arrival/increase of such benefits, in columns 1 and 2 of both Tables 4 and 5. The total effect of a unit increase in the number of children on the chances of poverty exit in columns 1 and 2 of Table 4 is −4.68/−4.98% in the absence of family and children related allowances, but it drops to a mere −0.18/−0.38% when the benefits are present. Similarly, the presence of the benefit almost halves the total marginal effect of an increase in the number of children on the chances of poverty entry (from + 1.64/1.86% to + 0.89/1.13%). Columns 3–5 confirm the comparatively strong effect of the allowances, suggesting that the arrival (increase) of such benefits increases the likelihood of overtaking the poverty line by 12% (8%), and their loss (decrease) increases the chances of falling below it by 2% (1.3%). In this case, however, a considerable share of vulnerable individuals does not receive the benefit, which reaches only 49.8% of poor households with children in our sample for exits. Non-poor households with children receiving the benefit in the sample for entries are 55.86%.

The expected effects of the past poverty experience are also confirmed, with marginal effects of −5.7% for exits and + 2.5% for entries. Again, notice how the beneficial effects of the different kinds of social transfers more than counterbalance these adverse effects.

Finally, let us turn the attention on the effects of the remaining covariates. As expected, having reached a secondary or (first) tertiary education level (which may also be a proxy for unobserved variables like personal ability or productivity) increases the probability of poverty exit (by 8% and 11–13%, respectively), and reduces the chances of slipping into poverty (by 2% and 3%) with respect to lower education levels. Gender and marital status have marginal effects of lower magnitude and of the expected sign, (the latter has a low significance level in the exit regressions).

As to macroeconomic controls, the growth of hours worked does not seem to have robust significant effects on the probabilities of poverty transition: only the linear probability IV estimates suggest small positive effects on poverty exits in all specifications, but with low significance levels. The effects of the growth rates of average per capita expenditure for social services by municipalities, instead, are never significant. The large territorial differences in the levels (rather than growth rates) of per capita expenditure on social services by municipalities highlighted in Sect. 3.4, is certainly one of the relevant factors captured by the macro-regional dummies included in the models. The estimated coefficients for the latter confirm the relevance of territorial differences against the Southern regions, whose residents, all other things equal, have a lower probability of poverty exit, and a higher probability of entry. For a resident of the North-West/North-East, for example, the

probability of poverty exit is 11/10% higher, and the entry probability is around 3% lower, *ceteris paribus*, with respect to a resident of the South.

A simple glance to the estimates of the instrumental variable linear probability models reported in columns 6–10 reveals that the magnitudes, signs and significance of all the estimated coefficients, and most importantly those of the social benefits variables, are in line with the corresponding random effects probit estimates of columns 1–5. The untabulated results show that the Wald test corroborates our choice of exogenous instruments. We are therefore confident that endogeneity bias can be ruled out.

We have also checked for sensitivity to measurement error, by excluding all poverty transitions deriving from changes of household income smaller than 10% (or 20%). All our results are confirmed.[30]

5.1 A further robustness check

We chose to base our analysis on the entire sample population, including working age individuals and individuals in retirement age, those in work and out of work, in order to draw the overall picture on poverty transitions and their covariates. In this respect, incorporating the elderly into the analysis is important, since as much as 20.85% of poverty exits and 17.95% of poverty entries in our sample involve individuals above retirement age.[31]

One may however argue that the elderly represent a very special group compared to the working age population: the average transition rates for this group are lower,[32] nearly all of them receive cash transfers in the form of old age benefits and for virtually all of them the change in work intensity is zero.[33] Their inclusion might risk to influence the results in particular on the importance of changes in work intensity and of the employment status as well as on the relative importance of subsidies, unless the all-encompassing model is correctly specified.[34]

To check the robustness of our results, therefore, we repeated the estimates of the random effect probit models on the subsample of the working age population, which are reported in Tables 9 and 10 in the appendix. All the qualitative results are the same. The signs and significance (or non-significance) of all coefficients are always confirmed[35] in both the exit and entry regressions, and in the exit regressions even the magnitude of the single coefficients is virtually the same as the one for the overall sample in Table 4. In the entry regressions, instead, the magnitude of all

[30] The results of sensitivity analysis, not reported, are available from the authors upon request.

[31] This population group constitutes 26.61% of the sample for exits and 25.36% of the sample for entries.

[32] In our samples average exit rates are 22.41% for the elderly versus 30.85% for the working age group, and average entry rates are 3.96% versus 6.16%. Notice how the lower transition rates for the elderly are correctly reflected by the estimated coefficients of the age class (or of the retirement dummy) in our all-encompassing models.

[33] 99.7% and 99% in our samples for poverty exit and entry, respectively.

[34] We thank an anonymous referee for pointing this out and for suggesting this robustness check.

[35] With the exception of those of the age class, which are now not significant in the exit regression.

coefficients[36] roughly doubles with respect to Table 5,[37] but this does not alter the previous conclusions, and in particular those regarding the effectiveness of social benefits and their relative importance with respect to the other determinants of poverty entries.

6 Conclusions

This paper proposes a novel approach to evaluate the dynamic effectiveness of social benefits in Italy. Unlike the approach used in previous literature on the anti-poverty effects of social transfers (e.g. Addabbo & Baldini, 2000; Fabrizi et al., 2014), our method of analysis allows to evaluate their effectiveness both in terms of their impact on the individual probabilities of poverty exit and entry and in terms of their relative importance compared to other socio-economic determinants of poverty transitions.

Year to year transitions out of and into poverty are defined as dichotomous variables representing changes of the individual poverty status, and are analyzed using both a random effects probit model and an instrumental variables linear probability model, to control for possible endogeneity bias of the estimated effects of social benefits. The estimated models use pooled longitudinal data over 2004–2015; the period is characterized by different economic phases, and the effects of the double-dip recession of 2008–2009 and 2011–2013 are clearly reflected in the time path of aggregate exit rates, which decline steadily starting in 2012 and in 2015 are 9% points lower with respect to the pre-crisis period.

The main results of our analysis show that social benefits are potentially important to limit the effects of the crises on poverty, as they strongly counteract the adverse effects of individual characteristics like unemployment, work intensity, inactivity, household size (and composition) and past poverty experience on the individual probabilities of poverty transition. For example, unemployment benefits more than halve the adverse effects of unemployment on the individual probabilities of poverty exit and reduce its effects on the chances of poverty entry. Similar effects are detected for social benefits targeted to specific categories of inactive individuals (sickness and disability benefits and education related allowances), while family and children related allowances totally counterbalance the adverse effects of increases in the number of children on the probabilities of poverty transitions. The effects of each specific benefit[38] outweigh those of past poverty experience.

[36] With the exception of the coefficients of the change in work intensity (which however remain not significant), and of the two interactions between unemployment and inactivity and the specific social benefits.

[37] From a statistical point of view, the doubling of all coefficients seems to signal that for the working age population, net of the controls, the probability of poverty entry is double with respect to the entire population (including the elderly).

[38] With the exception of social exclusion allowances, which have no significant effects whatsoever on the chances of poverty transitions.

Policymakers are interested in the role of social benefits in preventing aggregate long-term poverty. Our empirical analysis shows their effectiveness in increasing the individual chances of poverty exit (and reducing the chances of poverty entry), but also the lack of an adequate coverage for the vulnerable groups of population. This problem strongly limits their impact on aggregate transition rates and poverty rates, confirming previous results in the literature (Addabbo & Baldini, 2000; Fabrizi et al., 2014). For instance, unemployment benefits reach only 20.19% of the unemployed poor, which constitute 15.96% of our sample for exits. Similarly, family and children related allowances reach only 49.8% of poor households with children, which constitute 34.93% of the sample for exits. In the period considered in this study no universal income support measure was in place at the national level, but our results suggest the potential relevance of the impact on aggregate transition rates and poverty rates of the introduction of such measures, which are now in place closing the gap with the other European Member States.

Finally, we find a strong effect of macro regional dummies, confirming the well-known North–South dualism also for the chances of poverty transition. All other things equal, the chances of exiting poverty are much higher (and the chances of slipping into poverty much lower) for individuals living in the Northern and Central regions with respect to the residents of the South. The large territorial differences in the levels of per capita expenditure on social services by municipalities, which our data highlight, is probably one of the relevant factors accounting for these effects.

Appendix

See Tables 6, 7, 8, 9 and 10.

Table 6 Variables description

Variables	Description
Poverty exit	Dummy equal to 1 if an individual changes his state from poverty in the previous period ($t-1$) to non-poverty in the current one (t), and 0 otherwise
Poverty entry	Dummy equal to 1 if an individual changes her state from non-poverty in the previous period ($t-1$) to poverty in the current one (t), and 0 otherwise
Main activity (basis: Employed) Unemployed Inactive Retired	Dummies equal to 1 if being unemployed, inactive or retired respectively has been the individual's main activity during the previous twelve months, and 0 otherwise
Interactions with benefits Unemployed*unemployment benefits Inactive *inactive benefits	Dummies equal to 1 if the (mainly) unemployed or the inactive person has received the specific benefit, and 0 otherwise
Age class	Scale from 1 to 6 for considering six age classes: 16–24, 25–34, 35–44, 45–54, 55–64 and ≥ 65
Age class^2	Nonlinear effect of age
Education (basis Primary Education) First level tertiary education Secondary education	Dummies equal to 1 if the individual declares to have attained the specific level of education and 0 otherwise
Married	Dummy equal to 1 if the respondent declares to be married, and 0 otherwise
Female (basis Male)	Dummy equal to 1 for females, 0 for males
(Bad) Health	Dummy equal to 1 if the respondent declares to be in bad health conditions, and 0 otherwise
Number of children	Discrete variable: number of children in the household
Number of children*fam. children benefits	Interaction capturing the presence of family and children related allowances
Number of adults	Discrete variable: number of adults in the household
Past poverty experience	Dummy assuming value 1 if in the initial period ($t-1$) the individual had experienced more than one year of poverty, and 0 otherwise
New household	Dummy variable assuming value 1 if the individual belongs to different households in $t-1$ and t (which may happen in case of separation or divorce, or when grown up children leave the original household), and 0 otherwise
Change of household size	Discrete variable measuring the variation in the number of household members
Change of work intensity	Change in individual work intensity between $t-1$ and t. Continuous variable varying between -1 and 1
Benefits Arrival Unemployment Inactive Family and children Housing Social exclusion	Dummies assuming value 1 if the individual or her household did not receive the specific benefit in $t-1$ and does receive it in t, and 0 otherwise

Table 6 (continued)

Variables	Description
Benefits Increase	Dummies assuming value 1 if the specific benefit has increased in period t with respect to period $t-1$, and 0 otherwise
Unemployment	
Inactive	
Pension	
Family and children	
Housing	
Social exclusion	
Benefits Loss	Dummies assuming value 1 if the individual did receive the relative benefit in $t-1$ and does not receive it in t, and 0 otherwise
Unemployment	
Inactive	
Family and children	
Housing	
Social exclusion	
Benefits Decrease	Dummies assuming value 1 if the specific benefit has decreased in period t with respect to period $t-1$, and 0 otherwise
Unemployment	
Inactive	
Pension	
Family and children	
Housing	
Social exclusion	
Growth of hours worked	Growth rate of total hours worked in the macro-region between $t-1$ and t
Growth of social spending per capita	Growth rate of per capita expenditure on social services by municipalities between $t-1$ and t
Macro-regions (basis South)	
Center	Dummies equal to 1 if the respondent resides in the specific macro-region of Italy and 0 otherwise
Islands	
North-East	
North-West	

Table 7 Poverty exits descriptive statistics for the sample (leavers + always poor)

Variable	Observations	Mean	Standard deviation	Min	Max
Poverty exit	43,855	0.2861	0.4519	0	1
Unemployed	43,855	0.1596	0.3663	0	1
Unemployed*unemployment benefits	43,855	0.0322	0.1766	0	1
Inactive	43,855	0.3905	0.4879	0	1
Inactive *inactive benefits	43,855	0.0276	0.1639	0	1
Retired	43,855	0.1825	0.3863	0	1
Age class	43,855	3.8348	1.7392	1	6
Age class^2	43,855	17.73	13.03	1	36
First level tertiary education	43,855	0.0548	0.2276	0	1
Secondary education	43,855	0.2844	0.4511	0	1
Married	43,855	0.5231	0.4995	0	1
Female	43,855	0.5706	0.4950	0	1
(Bad) Health	43,855	0.1472	0.3543	0	1
Number of children	43,855	0.5619	0.8945	0	8
Number of children*fam. and children benefits	43,855	0.2905	0.7263	0	7
Number of adults	43,855	2.4249	1.1738	1	9
Past poverty experience	43,855	0.4833	0.4997	0	1
New household	43,855	0.0039	0.0621	0	1
Change of household size	43,855	−0.0183	0.4041	−6	6
Change of work intensity	43,855	0.0239	0.2799	−1	1
Unemployment benefits arrival	43,855	0.0438	0.2047	0	1
Inactive benefits arrival	43,855	0.0096	0.0974	0	1
Family and children benefits arrival	38,257	0.0647	0.2460	0	1
Housing benefits arrival	38,257	0.0205	0.1418	0	1
Social exclusion benefits arrival	38,257	0.0264	0.1604	0	1
Unemployment benefits increase	43,855	0.0785	0.2690	0	1
Inactive benefits increase	43,855	0.0394	0.1947	0	1
Pension increase	43,855	0.2646	0.4411	0	1
Family and children benefits increase	38,257	0.1798	0.3840	0	1
Housing benefits increase	38,257	0.0261	0.1595	0	1
Social exclusion benefits increase	38,257	0.0323	0.1769	0	1
Growth of hours worked	43,855	−0.9662	1.7685	−4.61	2.69
Growth of social spending per capita	43,855	0.0001	0.0299	−0.69	2.26
Center	43,855	0.1832	0.3869	0	1
Islands	43,855	0.1704	0.3760	0	1
North-East	43,855	0.1217	0.3269	0	1
North-West	43,855	0.1325	0.3390	0	1

Source: Our elaborations on IT-SILC data

Table 8 Poverty entries descriptive statistics for the sample (entrants + never poor)

Variable	Observations	Mean	Standard deviation	Min	Max
Poverty entry	204,044	0.0560	0.2299	0	1
Unemployed	204,044	0.0494	0.2167	0	1
Unemployed*unemployment benefits	204,044	0.0165	0.1273	0	1
Inactive	204,044	0.2291	0.4202	0	1
Inactive *inactive benefits	204,044	0.0173	0.1304	0	1
Retired	204,044	0.2449	0.4300	0	1
Age class	204,044	3.9822	1.6304	1	6
Age class^2	204,044	18.52	12.47	1	36
First level tertiary education	204,044	0.1474	0.3545	0	1
Secondary education	204,044	0.3939	0.4886	0	1
Married	204,044	0.5999	0.4899	0	1
Female	204,044	0.5140	0.4998	0	1
(Bad) Health	204,044	0.1021	0.3027	0	1
Number of children	204,044	0.4134	0.7543	0	8
Number of children*fam. and children benefits	204,044	0.2342	0.6153	0	7
Number of adults	204,044	2.4925	1.0297	1	9
Past poverty experience	204,044	0.0388	0.1930	0	1
New household	204,044	0.0055	0.0737	0	1
Change of household size	204,044	−0.0337	0.3959	−6	8
Change of work intensity	204,044	−0.0069	0.2393	−1	1
Unemployment benefits loss	204,044	0.0437	0.2045	0	1
Inactive benefits loss	204,044	0.0072	0.0845	0	1
Family and children benefits loss	179,211	0.0517	0.2214	0	1
Housing benefits loss	179,211	0.0106	0.1023	0	1
Social exclusion benefits loss	179,211	0.0063	0.0794	0	1
Unemployment benefits decrease	204,044	0.0705	0.2561	0	1
Inactive benefits decrease	204,044	0.0099	0.0992	0	1
Pension decrease	204,044	0.0424	0.2015	0	1
Family and children benefits decrease	179,211	0.1444	0.3515	0	1
Housing benefits decrease	179,211	0.0139	0.1170	0	1
Social exclusion benefits decrease	179,211	0.0068	0.0822	0	1
Growth of hours worked	204,044	−0.7352	1.7027	−4.61	2.69
Growth of social spending per capita	204,044	0.0005	0.0355	−0.70	2.37
Center	204,044	0.2467	0.4311	0	1
Islands	204,044	0.0656	0.2477	0	1
North-East	204,044	0.2554	0.4361	0	1
North-West	204,044	0.2473	0.4314	0	1

Source: Our elaborations on IT-SILC data

Table 9 Poverty exits—estimated models for the sub-sample of individuals in working age

Poverty exits	Panel probit models				
	(1)	(2)	(3)	(4)	(5)
Individual and household characteristics					
Unemployed	−0.2372***	−0.2398***	−0.2083***	−0.2072***	−0.2102***
Unemployed *unemployment benefits	0.1284***	0.1275***			
Inactive	−0.1513***	−0.1546***	−0.1377***	−0.1353***	−0.1428***
Inactive *inactive benefits	0.0634***	0.0580***			
Retired		−0.0786***			−0.1471***
Age class	−0.0081		−0.0021	−0.0079	
Age class^2	−0.0008		−0.0010	0.0001	
First level tertiary education	0.1214***	0.1234***	0.1013***	0.1089***	0.1125***
Secondary education	0.0696***	0.0726***	0.0638***	0.0676***	0.0717***
Married	0.0319***	0.0163***	0.0235***	0.0179***	0.0120**
Female	0.0259***	0.0251***	0.0208***	0.0246***	0.0231***
(Bad) Health	−0.0386***	−0.0430***	−0.0304***	−0.0388***	−0.0450***
Number of children	−0.0568***	−0.0538***	−0.0251***	−0.0315***	−0.0288***
Number of children *fam. children benefits	0.0459***	0.0463***			
Number of adults	0.0210***	0.0230***	0.0235***	0.0220***	0.0248***
Past poverty experience	−0.0525***	−0.0529***	−0.0502***	−0.0496***	−0.0500***
Demographic and economic events					
New household	0.1030	0.1113	0.0915	0.0976	0.1057
Change of household size	−0.0137	−0.0139	−0.0238	−0.0229	−0.0229
Change of work intensity	0.0620***	0.0588***	0.0581***	0.0585***	0.0542***
Unemployment benefits arrival			0.1115***		
Inactive benefits arrival			0.1230***		
Family and children benefits arrival			0.0774***		
Housing benefits arrival			0.0065		
Social exclusion benefits arrival			−0.0012		
Unemployment benefits increase				0.1129***	0.1133***
Inactive benefits increase				0.0572***	0.0657***
Pension increase					0.1160***
Family and children benefits increase				0.0942***	0.0947***
Housing benefits increase				0.0037	0.0046
Social exclusion benefits increase				−0.0201	−0.0189
Macro-structural and other factors					
Growth of hours worked	0.0078	0.0078	0.0045	0.0044	0.0046

Table 9 (continued)

Poverty exits	Panel probit models				
	(1)	(2)	(3)	(4)	(5)
Growth of social spending per capita	0.1245	0.1269	0.0928	0.0983	0.1034
Center	0.0796***	0.0791***	0.0841***	0.0877***	0.0876***
Islands	−0.0359***	−0.0362***	−0.0275***	−0.0261***	−0.0255***
North-East	0.1275***	0.1270***	0.1264***	0.1276***	0.1280***
North-West	0.1245***	0.1243***	0.1271***	0.1334***	0.1334***
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	32,184	32,184	28,256	28,256	28,256
Log-likelihood	−18,194	−18,191	−15,951	−15,848	−15,808

Source: our elaborations on IT-SILC and ISTAT data. ***p < 0.01, **p < 0.05, *p < 0.10

Notice: for the random effect panel probit estimates (columns 1–5), we report marginal effects

Table 10 Poverty entries—estimated models for the sub-sample of individuals in working age

Poverty entries	Panel probit models				
	(1)	(2)	(3)	(4)	(5)
Individual and household characteristics					
Unemployed	0.1034***	0.1019***	0.0957***	0.0931***	0.0918***
Unemployed*unemployment benefits	−0.0193***	−0.0189***			
Inactive	0.0617***	0.0579***	0.0576***	0.0575***	0.0546***
Inactive *inactive benefits	−0.0332***	−0.0327***			
Retired		−0.0095***			−0.0102***
Age class	0.0190***		0.0152***	0.0124***	
Age class^2	−0.0032***		−0.0026***	−0.0021***	
First level tertiary education	−0.0685***	−0.0674***	−0.0645***	−0.0612***	−0.0606***
Secondary education	−0.0335***	−0.0333***	−0.0316***	−0.0298***	−0.0298***
Married	−0.0153**	−0.0143***	−0.0132**	−0.0135**	−0.0127***
Female	−0.0083***	−0.0076***	−0.0070***	−0.0066***	−0.0060***
(Bad) Health	0.0122***	0.0120***	0.0079**	0.0070**	0.0070*
Number of children	0.0308***	0.0321***	0.0208***	0.0190***	0.0198***
Number of children*fam. children benefits	−0.0144***	−0.0142***			
Number of adults	−0.0142***	−0.0147***	−0.0147***	−0.0150***	−0.0153***
Past poverty experience	0.0460***	0.0462***	0.0449***	0.0455***	0.0456***
Demographic and economic events					
New household	0.0430***	0.0430***	0.0391***	0.0426***	0.0425***
Change of household size	−0.0149***	−0.0150***	−0.0137***	−0.0138***	−0.0139***
Change of work intensity	−0.0071	−0.0088	−0.0064	−0.0070	−0.0085
Unemployment benefits loss			0.0280***		

Table 10 (continued)

Poverty entries	Panel probit models				
	(1)	(2)	(3)	(4)	(5)
Inactive benefits loss			0.0387***		
Family and children benefits loss			0.0357***		
Housing benefits loss			0.0357***		
Social exclusion benefits loss			0.0457***		
Unemployment benefits decrease				0.0322***	0.0328***
Inactive benefits decrease				0.0295***	0.0291***
Pension decrease					0.0118*
Family and children benefits decrease				0.0216***	0.0217***
Housing benefits decrease				0.0312***	0.0313***
Social exclusion benefits decrease				0.0461***	0.0462***
Macro-structural and other factors					
Growth of hours worked	−0.0018	−0.0018	−0.0007	−0.0006	−0.0006
Growth of social spending per capita	−0.0181*	−0.0183*	−0.0119	−0.0117	−0.0118
Center	−0.0532***	−0.0533***	−0.0513***	−0.0510***	−0.0510***
Islands	−0.0048***	−0.0049***	−0.0054***	−0.0052***	−0.0052***
North-East	−0.0731***	−0.0733***	−0.0733***	−0.0736***	−0.0737***
North-West	−0.0638***	−0.0639***	−0.0623***	−0.0617***	−0.0618***
Time effects	Yes	Yes	Yes	YES	yes

Table 10 (continued)

Poverty entries	Panel probit models				
	(1)	(2)	(3)	(4)	(5)
Observations	152,305	152,305	133,296	133,296	133,296
Log-likelihood	− 30,241	− 30,259	− 26,411	− 26,377	− 26,380

Source: our elaborations on IT-SILC and ISTAT data. ***p < 0.01, **p < 0.05, *p < 0.10

Notice: for the random effect panel probit estimates (columns 1–5), we report marginal effects

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