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# SOCIAL EXCLUSION MOBILITY IN ITALY, 1997-2000

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# Social exclusion mobility in Italy, 1997-2000

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## Abstract

Social exclusion can be defined as a process leading to a state of multiple functioning deprivations. Cross-sectional headcount ratios of social exclusion may overstate the extent of the problem if most individuals do not remain in the same state in successive years. To address this issue, we need to focus on mobility. Therefore, the aim of this paper is to analyse changes in the individual levels of social exclusion focusing on the extent to which individuals change place in social exclusion distribution.

**Keywords**: Social Exclusion, Mobility, Transition Matrix

**JEL – code**: I3, J6

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## 1. Introduction

Social exclusion can be defined as a process leading to a state of multiple functioning deprivations (Sen, 2000). Therefore, we can define as socially excluded every individuals deprived in at least one relevant function and, consequently, we can compute a social exclusion headcount ratio (e.g. D'Ambrogio et al., 2002, and Burchardt, 2000). Note that we can also measure the intensity of the individual social exclusion (social exclusion gap) using the multidimensional generalization of the Foster-Green-Thorbecke index (see Bourguignon and Chakravarty, 2003, about multidimensional measures).

Cross-sectional social exclusion rates may overstate the extent of the problem if most individuals do not remain in the same state in successive years. In other words, if social exclusion is only transitory phenomena, social exclusion headcount ratios based on a single year will overstate the problem. To address this issue, we need to focus on social exclusion dynamics and, in particular, on the degree of mobility. Social exclusion mobility can be seen as changes in the individual state of exclusion. In particular, it can be seen as changes in the individual levels of social exclusion and changes in the individual positions in the distribution of social exclusion.

Few studies have paid attention to the dynamic of social exclusion, and analyses of the degree of mobility are scarcer. No studies analyse changes in the individual position in the distribution of social exclusion, as far as we know. This paper seeks to contribute to generation of the knowledge about social exclusion dynamics by capturing the extent of social exclusion mobility experienced in Italy from 1997 to 2000 and by identifying the personal attributes and life-course transitions that trigger social exclusion mobility. Therefore, the aim of this paper is to analyse mobility focusing on the individual movements within the distribution between two time periods since a certain degree of upward of downward mobility can modify the concentration in the social exclusion distribution at the end of the period.

On one hand, there is a lack of studies about social exclusion mobility but, on the other hand, there exist various approximations for the study of income mobility. In section 2, we review the methods used to analyse income mobility. Section 3 describes the methods we apply to analyse social exclusion mobility. Section 4 gives information about the data and the construction of the social exclusion distribution. In section 5, we report on changes in cross-sectional social exclusion in Italy between 1997 and 2000 and on social exclusion transition. Section 6 concludes, summarising our finding.

## 2. Basic concepts of income mobility measurement

Income mobility concerns the changes in economic status from one time period or generation to another (Fields and Ok, 1999). Any study on mobility analyses the time path of a given distribution among the same individuals (or among dynasties) in a given society. In other words, the theory of mobility measurement can be defined as the study of distributional transformations over two-periods. Note that the very notion of income mobility is not well defined: different studies concentrate on different aspects of mobility (e.g. origin dependence, income movements, income growth, etc.). Therefore, income mobility can be seen as a multi-faceted concept, and any attempt to devise a measure that aims to incorporate all aspects of income mobility is destined for failure. Fields and Ok (1999) highlight the key aspects of the income mobility concept, and analyse the axiomatic studies on the measurement of income mobility and the welfarist approaches developed in the context of income mobility measurement in recent years. This literature is reviewed in some details in Fields and Ok, so here we concentrate on some key aspects of income mobility, which are also important in our analysis of social exclusion mobility. In particular, we illustrate the distinction between basic income mobility concepts like transition matrices, relative versus absolute mobility, and between structural versus exchange mobility. The interested reader is referred to Fields and Ok for further details of income mobility literature.

*Relative vs. absolute mobility*

Relative mobility tells us the extent to which individuals change places in income distribution over time. Note that for all monotonic transformation of the initial distribution such that incomes grow but everyone keeps their positions (or ranks) in the distribution, a relative measure records the same level of mobility in all these transformations (if it records zero mobility, we say that the measure is strong relative).

Absolute mobility is measured as a function of changes in the individual income levels regardless of the ranking of the individuals in the initial distribution and in the final one. Statements about absolute mobility are almost always about changes in the mean of the income distribution, and not about changes in the degree of persistence in income positions. Note that the level of mobility associated with a certain transformation would not be altered if the same amount of money were added to everybody's income in both the initial and the final distribution.

There exists different way to measure both relative and absolute mobility. For example, relative mobility can be measured using the correlation between the initial year income and the final year income: large values of correlation show a strong inertia and, consequently, a low degree of mobility. It can be also measured using indices based on transition matrices as we explain later. Absolute mobility can be measured, for example, using the indicator of the degree of income change experienced by individuals over a given time interval proposed by Fields and Ok (1996).

*Structural vs. exchange mobility*

The sociological literature, when referring to intergenerational mobility, has traditionally emphasised the difference existing between the process of mobility caused by an increase in the positions in the upper part of the social scale due to modification in the income structure (structural mobility) and those which have their origin in the exchange of positions within that scale (exchange mobility). Recent studies have incorporated a third cause of mobility, that which results from the effect of the growth of income.

Attempts have been made in the literature to decompose total mobility into exchange mobility and structural mobility. Markandya (1982) proposes two alternative procedures: to define exchange mobility as the proportion of the change in welfare that could have been obtained if the income distribution stayed constant through time, and let structural mobility be the balance of the total welfare change; or, to define structural mobility as the change in welfare that would have taken place if there had been no mobility, and let exchange mobility be defined as the residual. Field and Ok (1996) also suggest an indicator that is additively decomposable into two sources: exchange mobility and structural mobility. Chakravarty, Dutta and Weymark (1985) propose a measure of mobility based on the comparison between the welfare associated to the distribution resulting from the aggregation of incomes for two periods to that, which would exist if there had been no mobility. Ruiz-Castillo (2000) reformulates the last measure of mobility in order to identify the three components of mobility: structural, exchange and growth mobility.

*Transition matrices*

Relativistic approaches to income mobility seems to be dominant in the income mobility literature, and it is common use to measure relative mobility using a transition matrix from the initial period to the final one. The transformation from the initial to the final distribution is defined as the matrix with elements the proportion of people that

were in class j the initial distribution and have now moved to class h. Therefore, the use of transition matrices requires that income classes have to be previously created from both the initial distribution and the final one (often using as cut-points the deciles or quintiles of the distribution). Note that all the measure based on the idea of calculating mobility after the creation of income classes are defined "two stage mobility measures".[1]

Transition matrices give information about the individuals who have remained in their initial class and, consequently, do not have changed their relative position (the "stayers") and about the individuals who have transited from an income class to another one (the "movers"). Shorrocks (1978) and Bartholomew (1982) propose indices of mobility on the bases of transition matrices. The Shorrocks index quantifies the mobility from a transition matrix though the calculation of its trace, while the Bartholomew index is the weighted mean of the total relative frequencies (where the weights are the distances between income classes).

**3. Social exclusion mobility: methodology**

As seen in the previous section, the analysis of income mobility gives use some "tools" to analyse the degree of mobility in a distribution. However, few studies have paid attention to the dynamics of social exclusion and they lack information on the degree of mobility in the distribution of social exclusion. The information connected to intertemporal variation in individual social exclusion levels can be very useful to check if social exclusion is a transitory phenomenon or not. Therefore, we focus on social exclusion mobility and, in particular, on the extent to which individuals changes place in the social exclusion distribution over time. We use the relativistic approach (that seems to be dominants in the mobility literature) and we highlight the individual probability of exchange position within the scale (exchange mobility). More precisely, we analyse the individual probability to move from one class to another one performing a "two-stage" analysis. In particular, we use transition matrices to summarizing the mobility content of distributional transformations since they provide a simple picture of the "movement" of the individuals among the specific social exclusion classes. Moreover, note that this kind of analysis is shown to be robust to data contamination (Cowell and Schulter, 1998) and permits discussion of a richer pattern of social

[1] Measures based on the comparison of the whole income distribution at the final time with the distribution at the initial time are defined "one stage mobility measures" (for example, the Field-Ok index).

exclusion mobility than the one that can be embodied within a single class of distance-based index *a la* Fields-Ok. Finally, we analyse either short-term mobility looking to social exclusion transition from time t to time t+1 and medium / medium-term mobility studying the transition from time t to time t+6.

More formally, the starting point for the analysis of mobility is the existence of information regarding the distribution of social exclusion for the same individuals in two different periods. Let any distribution of social exclusion be defined over the bounded support [0,1], the population composed of N individuals, with $N \equiv \{1,2,\ldots,n\}$, $\mathbf{x}=(x_1,x_2,\ldots,x_n)$ the initial distribution of social exclusion in ascending order and $\mathbf{y}=(y_1,y_2,\ldots,y_n)$ that corresponding to a second period. Given that the transformation $\mathbf{x} \rightarrow \mathbf{y}$ produces an intertemporal variation in individual social exclusion levels, it is possible to assign to any individual $i \in N$ a vector of social exclusion levels $(x_i,y_i)$ for the whole period. Note that if $x_i$ is equal to zero, the individual *i* is not socially excluded, and $x_i = 1$ indicates the highest level of social exclusion. Intermediate values indicate intermediate levels of social exclusion.

The construction of a transition matrix **P** from time t to time t+k requires that at each period the individuals are grouped in different (and exhaustive) classes. In particular, we classify individuals into five exhaustive classes based on their degrees of social exclusion as follows:

- Class 1: individuals not socially excluded (social exclusion equal to zero)
- Class 2: individuals "not really" excluded (social exclusion bigger than zero and lower than 0.1)
- Class 3: individuals "slightly" excluded (social exclusion bigge r than, or equal to, 0.1 and lower than 0.2)
- Class 4: individuals "a bit" excluded (social exclusion bigger than, or equal to, 0.2 and lower than 0.3)
- Class 5: individuals "really" excluded (social exclusion equal to or bigger than 0.3)

Note that often in the income mobility literature classes are normally defined so that there is always the same proportion of individuals in each class: for example, the r-th class correspond to the r-th decile (quintile) of the distribution. But, we cannot define social exclusion classes in this way due to the shape of the social exclusion distribution: in fact, about 50% of the population is not excluded, and about 80% experience social exclusion lower than 0.1 over one. Therefore, the best option is to define absolute

classes of social exclusion such that each class includes a sufficient number of individuals[2].

The values on the main diagonal of the transition matrix are the probabilities of permanence in each class, while the off-diagonal values are the probabilities of transition from one class to another one (see Figure 1). Therefore, the jh-th element of the matrix is the probability that an individual belonging to class j at time t has passed to class h at time t+k. This probability can be written as $p_{jh}$ (such that $\Sigma_h\ p_{jh}=1$) and it can be estimated using the row relative frequencies.

Figure 1. Transition matrix (P)

| | | Social exclusion at time t+k | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | | |
| | 1 | $p_{11}$ | $p_{12}$ | $p_{13}$ | $p_{14}$ | $p_{15}$ | 100 | |
| social | | 2 | $p_{21}$ | $p_{22}$ | $p_{23}$ | $p_{24}$ | $p_{25}$ | 100 |
| exclusion | 3 | $p_{31}$ | $p_{32}$ | $p_{33}$ | $p_{34}$ | $p_{35}$ | 100 | |
| at time t | | 4 | $p_{41}$ | $p_{42}$ | $p_{43}$ | $p_{44}$ | $p_{45}$ | 100 |
| | 5 | $p_{51}$ | $p_{52}$ | $p_{53}$ | $p_{54}$ | $p_{55}$ | 100 | |

Note: each probability is multiplied by 100

In the empirical analysis, we highlight the persistence and mobility indicators. In particular, $p_{55}$ represents the frequency of socially excluded individuals that have been "really" excluded in both periods. Instead, $p_{11}$ gives us information about the individuals that have never experienced exclusion. We can observe downwards mobility looking to the elements below the diagonal, and upward mobility looking to the elements above the diagonal (for example, the sum of the row relative frequency above the diagonal, $p_{j+,}$ is an indicator of mobility from class *j* to higher classes). Note that we define downwards mobility when the individual improves her situation: social exclusion decreases (she moves to the lower class). Instead, we have upward mobility when the individual situation worsens off: individual social exclusion increases (she moves to the

[2] Note that we are awarded of possible problems due to the definition of "absolute" classes. In fact, Fields and Ok (1999) show a paradoxical outcome of a particular transition matrix analysis due to the radically different number of individuals in the defined classes. However, they also stress on a certain number of problems emerging using deciles (or quintile) matrices. Therefore, no classes definition results without problems and, in our case, we can only design absolute classes.

higher class). Therefore, downwards mobility is a "good" phenomenon, while upward mobility is a "bad" phenomenon.

Note that to perform our analysis we need to kwon the degree of social exclusion of each individual in at least two periods. But, respondents at the first year may fail to give an interview at subsequent years, so that the remaining sample may be no longer representative. This process is known as attrition. Moreover, some eligible individuals could not yield an interview (sample selection problem). In order to try to correct for these sources of bias, the obtained sample can be weighted to reflect population characteristics such as age, sex, type of dwelling, etc, as closely as possible using longitudinal or the cross-section weights as appropriate. We can also check if the exits from the panel are random by grouping individuals in six classes, where the first five are the ones designed above and the sixth class is represented by the individuals that left the panel during the period of analysis. In this way, we can see whether the probability of exit is the same one for every income class or if more excluded individuals have higher probability of leaving the panel.

Finally, transition probabilities may vary from individual to individual depending on certain characteristics and social exclusion dynamics may differ amongst individuals with different characteristics. Therefore, we study the relationship between individuals' attributes and social exclusion mobility. We also perform a multivariate analysis to analyse the simultaneous impacts of different individual attributes on the probability of experiencing social exclusion mobility (in particular downwards mobility).

## 4. Social Exclusion Distribution

Examining changes in mobility over time requires the specification of distributions of social exclusion in at least two periods. Therefore, we need to use a measure of social exclusion able to capture the individual level of social exclusion (exclusion gap). It has to be a multidimensional measure since we have defined social exclusion as a process leading to a state of multiple functioning deprivations. Thus, we also need to define a list of relevant functioning deprivations. In this section, after spending few words about the data we use, we define the relevant functionings (dimensions) of social exclusion and we describe the measure of social exclusion used in this analysis.

*Data*

We use data from the European Community Household Panel (ECHP), a multi-country comparative household panel survey conducted annually by following the same sample of households and persons in Member States of European Union. The advantage of the ECHP is that permits to analyse economic and social household conditions from a dynamic point of view. Instead, the main disadvantage is the omission of the homeless populations that could be expected to be socially excluded. Attrition is an issue: we have 16597 individuals in 1997 and only 11914 individuals remain in the panel in 2000. Therefore, the analyses reported in this paper are weighted using the longitudinal or the cross-section weights available in the ECHP as appropriate.

*Relevant functionings*

The issue of which are the relevant functionings to identify an individual as excluded, or how to select them, is subject to ongoing discussion since a complete list cannot be unequivocally compiled. However, some guidance is offered by Sen and by the 'Scandinavian approach to welfare" as proposed by Brandolini and D'Alessio (1998). Following such guidance, we select eight relevant functionings (dimensions) to capture all the principal aspects of social exclusion.

The selected dimensions are 'the basic needs fulfilment", 'having an adequate income", 'to reach a certain quality of life", 'to have an adequate house", 'the ability to have social relationships", 'being healthy", 'living in a safe and clean environment", and 'being able to perform a paid, or unpaid, work activity (social status)". The first four functionings describe the economic features of social exclusion, and the remaining four functionings emphasize the social dimension of exclusion. Unfortunately, our data does not permit us to analyse the political dimension of social exclusion.

Each of these dimensions represents a functioning considered important in its own right. This is not to deny that there are intersections between functionings, but rather to emphasize that the achievement of every functioning is regarded as necessary for social inclusion. Conversely, impossibility to achieve any one functioning is sufficient for experiencing some degree of social exclusion.

Table 1 summarizes the operationalization of the eight dimensions of social exclusion: it shows the items from the ECHP selected to correspond to each dimension. For each selected item, we assigned to each individual a score ranging from zero to one. A score of one means that the individual can afford the item, has the item or does not have 'the

problem'[3]. Instead, a score equal to zero means that the individual is deprived in that item. All the values between zero and one mean an intermediate situation. We aggregate the items corresponding to every functioning by summing up their scores and dividing the result by the number of items. Equal weights are given to all items.[4] Thus, for each functioning, an individual receives a score between zero and one. A score of one means that the functioning has been fully achieved, a score of zero means that the functioning has not been achieved, and intermediate values represents intermediate situations.

Finally, we estimate the correlation between different items belonging to the same dimension, and between different dimensions and we find low degrees of association. Most coefficients are, in absolute value, below 0.2; just a little stronger is the correlation between economic dimensions ("basic needs fulfilment", "having a n adequate income", "to reach a certain quality of life" and "having an adequate house"). Except for the correlated "basic needs" and "quality of life", the contemporary presence of two deprivations is rare, suggesting that the indicators tend to capture complementary aspects. In particular, social and economic dimensions seem to capture different aspects of social exclusion.

*Measure of social exclusion*

As multidimensional social exclusion measure, *SE(x,x*)*, we use the multidimensional generalization of the Foster-Green-Thorbecke (FGT) index:

$$SE(x)= (1/N) \sum_i \sum_g w_g \max \{ ((x^*_g - x_{ig} )/ x^*_g), 0 \}$$

It is a function of the functioning achievement matrix x and threshold vector $x^*$. We define x as the matrix where each column contains $N$ individuals observations relative to functioning $g$, for $g=1\ldots G$. Therefore, $x_{ig}$ defines the level of functioning $g$ achieved by individual $i$. Each element of the vector $x^*$ represents a threshold, that is, the minimal value necessary to be defined as "not deprived" in a certain dimens ion. Therefore, we define as deprived in dimension $g$ any individual $i=1\ldots N$ such that $x_{ig} < x^*_g$. Note that $x^*_g$ is defined as 50% of the mean of the distribution of functioning g.

Following the most recent literature, the weighting structure is a decreasing function of the proportion of the deprived individuals in each dimension [Desai and Shah (1988),

[3] For example, she can afford a durable or she has an indoor flushing toilet or she does not have pollution in the area she lives.

[4] See Brandolini and D'Alessio (1998) for more details about the use of equal weights and alternative weighting structures.

Cerioli and Zani (1989), Nolan and Whelan 1996, Tsakloglou and Papadopoulos (1999), and Whelan, Layte and Maitre (2001)]. In particular,

$$w_g = [(1-\gamma_g)/(\sum_g (1-\gamma_g))]$$

where $\gamma_g$ is the proportion of deprived people in dimension g determined using $x_g^*$ as threshold.

This multidimensional index measures the social exclusion gap (average individual social exclusion). Its choice among other indices is due to its "good" p roperties as showed by Bourguignon and Chakravarty (2003). These properties are the following ones: if an individual is not excluded with respect to an attribute, then giving him more of this attribute does not change the intensity of social exclusion even if he is excluded in some other attribute (focus); if all individuals in the society are not excluded, than the index is valued zero (normalization); social exclusion does not increase if the condition of excluded individuals improves (monotonicity); if we merge two or more identical population, social exclusion does not change (principle of population); social exclusion should depend on the intensity of the individual level of social exclusion but not on the name of the individual (symmetry); small changes in the attribute quantities will not imply an abrupt jump in the value of the social exclusion index (continuity); if a population is divided into several subgroups, then the overall social exclusion is the population share weighted average of the subgroup exclusion levels (subgroup decomposability); a pure transfer from a not excluded individual to an excluded person must not increase social exclusion (weak transfer principle); an increase in correlation between two attributes should not decrease social exclusion (nondecreasing index under correlation increasing switch).

## 5. Results

*Changes in cross-sectional social exclusion, 1997-2000*

Table 2 shows the proportion of the population aged 16+ who experience deprivation in each dimension in Italy from 1997 to 2000. It also reports the proportion of the population who experience positive degrees of social exclusion. In 1997, we find that about 49.7% of the sample is socially excluded at least in one dimension. This proportion decreases during the study period, and only the 43.4% of the sample is socially excluded in 2000. However, the exclusion gap (average individual social exclusion) is only 0.036 (over one) in 1997, and it remains quite stable over time. Therefore, we find a quite high proportion of excluded individuals but a very low

degree of exclusion. In other words, a big proportion of excluded individuals are "not really" excluded: about 63% of excluded people in 1997 and about 50% in 2000 (see Table 3 for details). We might suspect that those individuals experience short social exclusion spells or do not experience social exclusion in the successive years. In fact, the social exclusion headcount ratio reduces over time, but the social exclusion gap remains stable. Therefore, we could suspect that social exclusion is partially a transitory phenomenon.

*Short-term mobility analysis*

To analyse mobility, as explained above, we classify individuals in five social exclusion classes and we construct the transition matrix from time t to time t+k. In particular, to analyse short-term mobility we use transition matrices from time t to time t+1. Table 3 shows the proportion of the population belonging to each class in Italy during the study period: we can immediately notice that the proportion of social excluded people in 2000 in every class in lower than the corresponding one in 1997.

Table 4 shows the transition probabilities for each pair of consecutive waves during the period 1997-2000. Table 5 summarizes the probability of experiencing downwards mobility, upwards mobility or persistence in two sub-sequent years during the study panel. Note that the average probability to experience downwards mobility in 1997 is about 59%, but the probability is about 36% if the individual is in class 2 ("not really" excluded) and about 83% if the individual is in class 5 ("really" excluded). More generally, during the study period the most excluded individuals are the most likely to experience downward mobility (to improve their situation). The average probability of experience upward mobility in 1997 is lower than the average probability of experiencing downwards mobility: it is only about 11% (but the probability is about 22% if the individual is in class one and only about 4% if the individual is in class five). In other words, the individual situation is more likely to improve (or to remain equal) than to worse in the successive year. Finally, the average probability to remain in the same class in 1997 and in 1998 is about 44%: the probability of persistence is about 78% for individuals in class one and 17% for individuals in class five. Note that in the sub-sequent years the probability of persistence in the class of the most excluded individuals is even higher: about 56% in 1998 and 52% (while downwards mobility reduces respectively).

The average downwards mobility (as well as the average upwards mobility and the average persistence) changes over time, as we can see in Table 5. Therefore, we need to

check if these changes are statistically significant. We can apply a test on the equality of several means to test the hypothesis that several indices computed on independent sample are statistically significant (Ramos, 1999).[5] In particular, we can test the identity of the average downwards mobility (average upwards mobility /average persistence) on a pairwise comparison bases and all at once. The results of these two tests are shown in Table 6 and 7. These tests suggest that the average downwards mobility (average upwards mobility /average persistence) is not statistically different from one year to another one during the study period. Since the average downwards mobility, average upwards mobility and average persistence summarize the information contained in the transition matrices, we would expect the latter also be very similar. However, applying a multinomial test, we find that there are some statistical significant differences among the matrices.[6]

*Medium-term mobility analysis*

Table 8 shows the extent of medium-term mobility relative mobility from 1997 to 2000. For example, the first row of the second panel includes those individuals who did not experience social exclusion in 1997. About 77% also did not experience social exclusion in 2000. Likewise, only about 4.7% of those individuals who were defined as "really" socia lly excluded in 1997 were still in the class of the most excluded people in 2000. Note that about 68% improved their situations from 1997 to 2000.

The row relative frequencies reported in the transition matrix can also be read as probabilities of transition from a class to another one or as probabilities of permanence in the same class. Note that "probability of persistence in the same class" means the probability that the same individual experience a certain degree of exclusion both in time t and in time t+k. However, we do not mean that the individual remains in the same class during all study period. In other words, the individual is in class h at time t and at time t+k, but she can be in a different class during the period between t and t+k.

Table 9 summarizes probabilities for persistence, downwards mobility, and upward mobility for medium-term transition, comparing them with the short-term stationary average values. As we can see in this table, the probability that an individual is in the same class after one year is higher than the probability that she is in the same class t+6 years late. Average upwards mobility is similar over one-year horizon and over six-

[5] A full description of tests on equality of means can be found, for instance, in Mood et al. (1974), pp. 435

[6] For a full description of a multinomial test see, for instance, Mood et al. (1974), pp. 449 and Amemiya (1985), pp.417

years horizon (10.35% versus 11.09%). Conversely, average downwards mobility is much more high over medium-term horizon (68% versus 51%). In other words, our analysis seems to suggest that the probability to experience upward mobility remains stable when the length of time considered rises while the probability to experience downwards mobility increase when the length of time considered rises. Moreover, the probability of an improvement of the individual situation seems to be much more likely than a worsening of her situation.

*Exit from the panel*

Table 10 reports the frequencies of exit from the panel during the considered period.[7] About one third of the individuals that were in the panel in 1997 are not in the panel in 2000. The probability that the most socially excluded individuals leave the panel in 2000 is higher than the probability that not excluded individuals do so (38% versus 25%). Individuals that belong to class 3 and 4 seem to have similar probability to exit from the panel (about 32%). Therefore, the probability to leave the panel does not seem to be fully random. To correct this bias, we have used longitudinal weights where appropriate.

*Differences across socio-demographic groups*

In this sub-section, we analyse the association between socio-demographic attributes of individuals and the incidence of mobility. To do so, we compare social exclusion mobility and persistence in various subgroups, categorised on the basis of sex, education (Table 11), geographical areas of residence (Table 12) and age (Table 13). Note that we analyse mobility from 1997 to 2000 (medium-term horizon).

Probabilities of experience downwards mobility, and to be in the same class in both years, are similar amongst males and females. Individuals with a high level of education have zero probability of being "really excluded" in both years, while low educated individuals have a positive probability (3.3%). The latter experience less downwards mobility.

There is evidence of regional differences. The probability of being in the class of the most excluded individuals in 1997 and in 2000 is positive only in South Italy and is about 9%. Individuals living in South and Centre Italy have the lowest probability to experience downwards mobility (about 60%), while people living in the North have the

[7] We compute this frequencies using the unbalanced panel. We also did not use any weights.

highest probability to experience downwards mobility (73%). Unexpectedly, in the Islands results on both downwards mobility and persistence in the most excluded class are closer to the results observed in North Italy than in South Italy.

Downwards mobility is slightly higher amongst individuals aged between 16 and 24 and individuals aged between 45 and 64 (67% vs. 63%). Instead, the probability of being in the class of the most excluded individuals in 1997 in 2000 is about 5% amongst individuals aged between 16 and 24, increasing to 18% amongst individuals aged 25 to 44, and then declining to zero amongst older individuals.

*Downwards mobility: multivariate analyses*

The analyses carried out above are concerned with either a single variable (analysis of the social exclusion mobility) or the link between two variables at a time (e.g. how mobility differs between age-groups). Now, we extend our analysis on the basis of a multivariate analysis that deals with more than two variables simultaneously and we focus on downwards mobility. We use a logit model in order to determine which socio-demographic characteristics of the excluded individuals explain the probability to experience downwards mobility. We also analyse which individual attributes explain the probability to move from inclusion to exclusion. In both case the dependent variable is a binary variable. In the first model, it is equal to one if an excluded individual in 1997 experiences downwards social exclusion mobility in 2000, and zero otherwise. In the second one, the dependent variable is equal to one if a non-excluded individual in 1997 experiences exclusion in 2000, and zero otherwise. Note that we have also considered the possibility to use a multinomial logit model and an ordered logit model to study the marginal effects of every individual attributes on the probability of experiencing downwards mobility (being in the same class and experiencing upwards mobility) if the individual belongs to intermediate exclusion classes.[8] The results to not add much to the below conclusions and, therefore, they are not presented here.

*First model*. We analyse which individual characteristics explain the probability of experiencing downwards mobility. The sample includes only excluded individuals at time t: we do not consider the non-excluded people in 1997 because they cannot experience downwards mobility by definition. Table 14 gives the results for the logit

[8] The top and the bottom classes have to be excluded in this kind of analysis since not all kinds of transitions are possible in these classes. Mobility in the top and bottom classes has to be separately analysed using logit models.

model. The individual characteristics that we consider in order to explain downwards social exclusion mobility are sex, age, education (high, medium or low level), changes in cohabitation status (from single to couple, and vice versa), changes in the number of children in the household (from zero to some children), and geographical areas of residence (North, Centre, South, Islands). Also dummies representing the social exclusion classes are included in the analysis. The reference group is the group of males aged between 25 and 45, low educated, and living in Centre Italy.

Only few covariates are statistically significant. In particular, no variables representing a change in socio-demographic characteristics result statistically significant. The higher is the degree of social exclusion experienced by the individual in 1997, the higher is the probability to experience downwards social exclusion mobility. Finally, people that live in North Italy have less probability to experience social exclusion.

*Second Model.* We study which individual attributes explain the probability of experiencing some degrees of social exclusion in 2000 if the individual is not excluded in 1997. Table 15 reports the results for the logit model in terms of coefficients, marginal effects and standard errors. As in the previous model, the explanatory variables are sex, age, education, changes in cohabitation status, changes in the number of children in the household, and geographical areas of residence. Also the reference group is the some one: group of males aged between 25 and 45, low educated, and living in Centre Italy. Only few covariates are statistically significant. People with high and medium-level education have lower probabilities of experiencing social exclusion, while individuals leaving in South Italy and in the Islands have higher probabilities to experience social exclusion.

## 6 Conclusions

Much of the debate on social exclusion focuses on those people who are excluded at the time; this would be appropriate if social exclusion was essentially a permanent state of affairs. But this is unlikely to be the case. Therefore, the focus of this paper is on social exclusion mobility. We look at evidence produced from Italian longitudinal data in order to document people's experiences of social exclusion over time. We argue that social exclusion can partially be a transitory phenomenon and we need to investigate the transition probabilities to provide insights into the nature of the dynamic that underlie social exclusion.

We find an average social exclusion rate (positive degree of exclusion) about 46 per cent over the period of study. At one extreme it may mean that those same 46 per cent of individuals are always excluded; at the other extreme every individual may have a bit less than one in two chance of being excluded at any time. In both cases social exclusion is a relevant issue but the nature of the problem we face is clearly dependent on which of these is closer to the truth.

Analysing Italian data from 1997 to 2000, we obtain some interesting results. *First*, the probabilities of experiencing downwards mobility increase when the time horizon rises, while probabilities to experience upwards mobility remain stable. *Second*, the probability of an improvement of the individual situation is much more likely than a worsening of her situation. *Third*, the most excluded individuals are the most likely to experience downwards mobility. *Fourth*, we observe a high degree of downwards mobility: social exclusion seems to be in part a transitory phenomenon. *Fifth*, we also observe some degrees of persistence in the class of the most excluded individuals (individuals seems to have a certain probability to be excluded year after year).

In order to understand who experiences social exclusion downwards mobility, we look at the events associated with decreasing the social exclusion degree or moving out of exclusion. In particular, we focus on family structured events (as marriage, divorce, children) and socio-demographic attributes (as sex, age, education level, area of residence). We mainly find that individuals with low-education, and/or leaving in Centre-South Italy have a lower probability to improve their situations over the study period.

Future research could investigate over a longer horizon other sets of events associated with social exclusion mobility as employment-related events (e.g. labour market participation) and/or events associated with changes in the tax-benefit system. Moreover, we should not be content simply to measure social exclusion and characterize the events associated with social exclusion transition. In addition, we should like to understand the dynamics of the underlying processes, which lead in and out of social exclusion.

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**Table 1**. Functionings

| |
|---|
| **Basic needs fulfilment (BASIC)** |
| Not eating meat or like every second day |
| Being unable to buy new, rather than second hand clothes |
| Being unable to pay bills, rents, etc. |
| **Having an adequate income (INCOME)** |
| Income |
| **To reach a certain quality of life (QUALITY)** |
| Car or van |
| Colour TV |
| Video recorder |
| Telephone |
| Paying for a week's annual holiday |
| Having friends or family for a drink/meal at least once a month |
| **Having an adequate house (HOUSING)** |
| Not having indoor flushing toilet |
| Not having hot running water |
| Not having enough space |
| Not having enough light |
| Not having adequate heating facility |
| Not having damp walls, floors, foundation... |
| Not having leaky roof |
| Not having rot in windows frame, floors |
| **Ability to have social relationships (SOCIAL)** |
| Frequency of talk to the neighbours |
| Frequency of meeting people |
| **Being healthy (HEALTH)** |
| Health of the person in general |
| **Living in a safe and clean environment (LIVING)** |
| Noise from neighbours or outside |
| Pollution, crime or other environment problems caused by traffic or industry |
| Vandalism or crime in the area |
| **Being able to perform a paid or unpaid work activity (WORK)** |
| Being unemployed |

**Table 2**. Cross sectional social exclusion: headcount ratios and gaps

| **Headcount ratios (%)** | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|
| Basic | 4.51 | 3.65 | 3.77 | 3.41 |
| Quality | 1.28 | 1.06 | 0.96 | 0.79 |
| Housing | 1.11 | 1.57 | 1.39 | 1.23 |
| Social | 5.65 | 6.49 | 6.68 | 5.51 |
| Healthy | 11.93 | 12.15 | 11.78 | 11.58 |
| Living | 24.42 | 18.41 | 18.72 | 18.63 |
| Work | 7.35 | 7.14 | 6.98 | 6.30 |
| Income | 15.69 | 14.94 | 14.19 | 13.56 |
| *SE(>0)* | *49.70* | *45.47* | *44.50* | *43.37* |
| **Gaps** | | | | |
| *SE∈ [0,1]* | *0.0362* | *0.0331* | *0.0326* | *0.0308* |

**Table 3**. Cross sectional social exclusion: social exclusion classes (%)

| SE classes | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|
| 1) Not excluded | 50,3 | 54,53 | 55,5 | 56,63 |
| 2) Not really excluded | 31,48 | 28,96 | 28,98 | 28,57 |
| 3) Slightly excluded | 15,43 | 14,06 | 13,13 | 12,83 |
| 4) A bit excluded | 2,37 | 2,12 | 2,03 | 1,77 |
| 5) Really excluded | 0,43 | 0,33 | 0,36 | 0,19 |

**Table 4**. Short-term transition matrices (balanced panel)

| | SE 1998 | | | | | |
|---|---|---|---|---|---|---|
| SE 1997 | 1 | 2 | 3 | 4 | 5 | |
| 1 | **78,27** | 15,95 | 5,57 | 0,21 | 0,01 | 100,00 |
| 2 | 36,37 | **50,20** | 12,38 | 0,92 | 0,12 | 100,00 |
| 3 | 20,99 | 30,88 | **43,20** | 4,48 | 0,46 | 100,00 |
| 4 | 7,71 | 22,55 | 34,13 | **31,51** | 4,10 | 100,00 |
| 5 | 2,00 | 27,29 | 10,14 | 43,71 | **16,86** | 100,00 |

| | SE 1999 | | | | | |
|---|---|---|---|---|---|---|
| SE 1998 | 1 | 2 | 3 | 4 | 5 | |
| 1 | **81,03** | 15,02 | 3,79 | 0,15 | 0,00 | 100,00 |
| 2 | 28,83 | **59,00** | 10,78 | 1,36 | 0,03 | 100,00 |
| 3 | 17,69 | 24,66 | **52,06** | 5,26 | 0,32 | 100,00 |
| 4 | 7,01 | 17,60 | 35,02 | **34,77** | 5,60 | 100,00 |
| 5 | 0,00 | 4,19 | 18,66 | 21,59 | **55,56** | 100,00 |

| SE 1999 | SE 2000 | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| 1 | **81,77** | 14,42 | 3,63 | 0,18 | 0,00 | 100 |
| 2 | 28,38 | **60,57** | 9,78 | 1,24 | 0,05 | 100 |
| 3 | 16,92 | 23,81 | **54,78** | 4,28 | 0,20 | 100 |
| 4 | 4,07 | 13,51 | 46,34 | **32,17** | 3,91 | 100 |
| 5 | 0,00 | 16,45 | 29,18 | 22,55 | **31,83** | 100 |

**Table 5.** Short-term transition probabilities

| **Transition probability** | | | |
|---|---|---|---|
| | A 1997-8 | B 1998-9 | C 1999-00 |
| **Persistence** | | | |
| p11 | 78,27 | 81,03 | 81,77 |
| p55 | 16,86 | 55,56 | 31,83 |
| average | 44,01 | 56,48 | 52,22 |
| **Upwards mobility** | | | |
| p1+ | 21,73 | 18,97 | 18,23 |
| p2+ | 13,42 | 12,17 | 11,06 |
| p3+ | 4,94 | 5,59 | 4,49 |
| p4+ | 4,10 | 5,60 | 3,91 |
| average | 11,05 | 10,58 | 9,42 |
| **Downwards mobility** | | | |
| p2- | 36,37 | 28,83 | 28,38 |
| p3- | 51,87 | 42,36 | 40,74 |
| p4- | 64,39 | 59,63 | 63,92 |
| p5- | 83,14 | 44,44 | 68,17 |
| average | 58,95 | 43,81 | 50,30 |

Note:
(*) The average is computed as (p1+ +,,, +p4+)/4
(**) The average is computed as (p2- +,,, +p5-)/4

**Table 6.** Test on equality of two means

| | A-B | B-C |
|---|---|---|
| Downwards mobility | | |
| **T** | **0,080** | **0,217** |
| Upwards mobility | | |
| **T** | **1,290** | **0,570** |
| Persistence denom | | |
| **T** | **2,786** | **1,006** |

**Table 7**. Test on equality of several means

| Statistics | Downwards mob. | Upwards mob | Persistence |
|---|---|---|---|
| **T** | **0.760** | **0.077** | **0.485** |

**Table 8**. Medium-term transition matrix (balanced panel)

| | SE 2000 | | | | | |
|---|---|---|---|---|---|---|
| SE 1997 | 1 | 2 | 3 | 4 | 5 | |
| 1 | 77,72 | 17,21 | 4,80 | 0,27 | 0,00 | 100 |
| 2 | 38,39 | 48,28 | 11,61 | 1,58 | 0,14 | 100 |
| 3 | 25,41 | 32,15 | 38,36 | 3,53 | 0,54 | 100 |
| 4 | 12,80 | 25,16 | 42,21 | 17,61 | 2,23 | 100 |
| 5 | 0,00 | 18,22 | 39,56 | 37,56 | 4,67 | 100 |

**Table 9**. Transition probabilities from t=1997 to 2000

| **Transition probability** | t+1* | t+6 |
|---|---|---|
| **Persistence** | | |
| p11 | | 77,72 |
| p55 | | 4,67 |
| Average | 50.90 | 37,33 |
| **Upwards mobility** | | |
| p1+ | | 22,28 |
| p2+ | | 13,34 |
| p3+ | | 4,08 |
| p4+ | | 4,67 |
| Average | 10,35 | 11,09 |
| **Downwards mobility** | | |
| p2- | | 38,39 |
| p3- | | 57,56 |
| p4- | | 80,17 |
| p5- | | 95,33 |
| Average | 51,02 | 67,86 |

Note:
(*) stationary probabilities

**Table 10**. Medium-term transition matrix (unbalanced panel)

| | SE 2000 | | | | | | |
|---|---|---|---|---|---|---|---|
| SE 1997 | 1 | 2 | 3 | 4 | 5 | out | |
| 1 | 58,05 | 12,54 | 3,48 | 0,23 | 0,01 | 25,69 | 100 |
| 2 | 28,28 | 33,77 | 8,19 | 1,26 | 0,12 | 28,38 | 100 |
| 3 | 17,77 | 21,54 | 25,42 | 2,47 | 0,24 | 32,56 | 100 |
| 4 | 8,27 | 18,60 | 28,17 | 11,63 | 1,03 | 32,30 | 100 |
| 5 | 0,00 | 11,11 | 25,40 | 22,22 | 3,17 | 38,10 | 100 |

| Out | |
|---|---|
| Average* | 31,41 |
| p1out | 25,69 |
| p5out | 38,10 |

* It is computed as the average of p1out ,,, p5out

**Table 11.** Transition probabilities from 1997 to 2000

| Transition probabilities | 1997-00 |
|---|---|
| Males | |
| p11 | 78,58 |
| p55 | 4,73 |
| average downwards mobility | 67,53 |
| Females | |
| p11 | 77,11 |
| p55 | 5,56 |
| average downwards mobility | 67,84 |
| | |
| High education | |
| p11 | 87,29 |
| p55 | 0,00 |
| average downwards mobility | 75,87 |
| Low education | |
| p11 | 75,48 |
| p55 | 3,33 |
| average downwards mobility | 67,17 |

**Table 12**. Regional transition probabilities from 1997 to 2000

| Transition probabilities | 1997-00 |
|---|---|
| North | |
| p11 | 80,94 |
| p55 | 0,00 |
| average downwards mobility | 73,37 |
| Centre | |
| p11 | 80,26 |
| p55 | 0,00 |
| average downwards mobility | 60,12 |
| South | |
| p11 | 71,18 |
| p55 | 9,09 |
| average downwards mobility | 61,91 |
| Islands | |
| p11 | 65,20 |
| p55 | 0,00 |
| average downwards mobility | 67,73 |

**Table 13** Transition probabilities by age groups

| Transition probabilities | 1997-00 |
|---|---|
| Age<25 | |
| p11 | 78,58 |
| p55 | 4,73 |
| average downwards mobility | 67,53 |
| Age 25-45 | |
| p11 | 74,42 |
| p55 | 18,18 |
| average downwards mobility | 63,19 |
| Age 45-65 | |
| p11 | 77,30 |
| p55 | 0,00 |
| average downwards mobility | 68,03 |
| Age>65 | |
| p11 | 71,07 |
| p55 | 0,00 |
| average downwards mobility | 63,64 |

**Table 14**. Multivariate analysis of medium-term downwards social exclusion: Logit estimates

| | | |
|---|---|---|
| Log likelihood | | -3161,443 |
| Pseudo R2 | | 0.0542 |
| Obs | | 4827 |
| Downwards mobility | Coef. | Std. Err |
| sex (=1 if male) | -0.0173 | .060022 |
| aged under 25 | -0.1778 | .086708 |
| aged over 45 | 0.0574 | .068793 |
| High education | 0.2345 | .146075 |
| medium education | 0.1925 | .069272 |
| single to couple | 0.7389 | .502807 |
| couple to single | -0.2112 | .194623 |
| no child to children | 0.4938 | .206644 |
| class 3 | 0.8047** | .066372 |
| class 4 | 2.074** | .175898 |
| class 5 | 3.3376** | .732542 |
| North | 0.2916* | .084725 |
| South | -0.2077 | .080440 |
| Island | -0.2123 | .089197 |
| Constant | -0.4396** | .076324 |

Note: the reference individual is a male aged between 25 and 45, with low education, and living in Centre Italy.
(**) level of significance at 1% (*) level of significance at 5%

**Table 15.** Multivariate analysis of medium-term upwards mobility from non-exclusion in 1997 to exclusion in 2000: Logit estimates

| | | |
|---|---|---|
| Log likelihood | | -2820,857 |
| Pseudo R2 | | 0,0252 |
| Obs | | 5605 |
| Upwards mobility | Coef. | Std. Err |
| Sex (=1 if male) | -0.0441 | .066398 |
| aged under 25 | 0.2032 | .100030 |
| aged over 45 | -0.0296 | .074552 |
| high education | -0.8433 | .149635 |
| medium education | -0.3387** | .072729 |
| single to couple | -0.1260** | .497187 |
| couple to single | 0.0104 | .237237 |
| No child to children | -0.1383 | .217203 |
| north | -0.1222 | .085353 |
| south | 0.4615** | .092678 |
| island | 0.6809** | .101447 |
| Constant | -1.2891** | .083864 |