European Panel Analysis Group

Poverty Dynamics: An Analysis of the 1994 and 1995 Waves of the European Community Household panel Study

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Abstract

Recent poverty research internationally based on analysis of panel data has highlighted the importance of income dynamics. In this paper we study mobility into and out of relative income poverty from one year to the next, using data for twelve countries from the European Community Household Panel Survey (ECHP). The ECHP has unique potential as a harmonised dataset to serve as the basis for comparisons of income and poverty dynamics across countries, and here we begin exploiting this potential by analysing income poverty transitions from Wave 1 to Wave 2. As well as describing the extent of these transitions, we analyse the pattern by fitting log-linear and linear by linear models commonly employed in the analysis of social mobility. Our analysis shows that cross-national variation in short-term poverty dynamics is predominantly a consequence of "shift" rather then "association effects". Models that constrain immobility and affinity effects to be constant across country but allow for variation in the distance between categories and the hierarchy effect provide a parsimonious statistical fit of the observed pattern of mobility.

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Introduction

1. Introduction

In this paper we analyse the extent and nature of entries into and escapes from income poverty from one year to the next in twelve European countries, using data from the first two waves of the European Community Household Panel Survey (ECHP). Recent research internationally based on analysis of panel data has highlighted the importance of income dynamics. Such data has been available for some time in the USA but it has become available more recently in a number of other industrialised countries, notably Germany, the Netherlands and the UK. However, the ECHP has unique potential as a harmonised dataset to serve as the basis for comparisons of mobility into and out of income poverty across European Union countries. In this paper we seek to begin exploiting this potential by looking at income poverty transitions from Wave 1 to Wave 2, carried out in 1994 and 1995 respectively.

Bane and Ellwood (1984), in what has become a classic article, argued that analysis of persistence of poverty was fundamental both to understanding the phenomenon of poverty and to the development of anti-poverty policy. Assumptions about the long-term nature of poverty have been central to the development of notions such as 'culture of poverty' and 'underclass' (Gans, 1990, Wilson, 1987). Interest in persistent poverty has been driven by concern with state dependence or vicious circle processes. More recently Leisering and Liebfried (1999) argue that assumptions about long-term poverty processes underlie arguments that that the welfare state, by undermining people's capacity or inclination to cope, leads to dependency and entrapment. However, recent research based on panel data has argued that poverty spells are shorter than previously thought. In addition to the extensive US research based on the Panel Study of Income Dynamics (PSID), the range of studies documenting such findings now includes Jarvis and Jenkins' (1997) analysis of the British Household Panel Study, Duncan *et al's* (1993) study of eight North American and European countries, studies based on the German Socio-Economic Panel (SOEP) by Heady *et al* (1994), the US/German/Netherlands comparison in Goodin et al (1999), and analyses of the duration of spells on social assistance such as

Leisering and Liebfried (1999). Even the most cautious analysts, such as Jarvis and Jenkins (1997), conclude that from one year to the next there are significant numbers entering and escaping poverty. Liebfried and Liesering (199:9) have offered the somewhat bolder conclusion that "poverty is often no more than an episode in the course of life and is actively overcome by most of those afflicted by it".

The availability of longer runs of panel data has led to increasingly sophisticated analysis of poverty spells. Our analysis based on only two waves of the ECHP does not allow us to pursue such a course. However, it does offer a particularly valuable opportunity to analyse cross-national differences in short-term dynamics on a harmonised data set. Over and above differences in overall rates of poverty, is there any evidence that poverty is more persistent in one rather than another country? If such differences do exist, are they associated with differences in welfare regimes? The value of having a data set of the highest quality to answer such questions is shown by the fact that previous research has produced a number of inconsistent results (Dirven, 1996). In part such confusion may be related to the fact that the analytic methods often employed have not been adequate to distinguish between different dimensions of cross-country differences. Dirven's (1996) analysis is one of the few to apply to poverty mobility the range of analytic techniques current in the analysis of occupational or class mobility. In this paper we seek to show the value of applying such methods to a cross-national data set.

2. Measuring Income Mobility in the ECHP

The results presented in this paper from the ECHP are based on the User Data Base (UDB) containing data from Wave 1 and Wave 2 as released for public use by Eurostat. The income measure employed is total disposable income, including transfers and after deduction of income tax and social security contributions, with the household taken as the income recipient unit. The principal accounting period for income employed in the ECHP is the previous calendar year, so the Wave 1and Wave 2 income measures relate to calendar 1993 and calendar 1994 respectively. The unit of analysis is individuals present in both waves.

Since the standard of living attainable on a given level of household income will vary with the size and composition of the household, we adjust for these differences using equivalence scales. The scale we employ at this point is often termed the "modified OECD" scale: where the first adult in a household is given the value 1, this scale gives each additional adult a value of 0.5 and each child a value of 0.3. The number of equivalent adults in each household is derived using this scale, and equivalised income is household income divided by this number. Equivalised income of the household is then attributed to each member, assuming a common living standard within the household, and our analysis is carried out using the individual as the unit of analysis. A change in the equivalised income of a particular individual over time may thus reflect either a change in the total income coming into the household, or a change in the number of adults and children depending on it, or both. In measuring income poverty we follow the widely employed practice of using a range of relative poverty lines, calculated as proportions of median equivalised income (see for example Eurostat 1999). Our aim is to assess the extent of mobility into and out of income poverty from one year to the next on the basis of the equivalised income reported for 1993 versus that reported for 1994.

3. Mobility Vis-à-vis Relative Income Poverty Lines

Table 1 shows cross-national variations in poverty rates across countries for poverty lines set at 40%, 50% and 60% of median income. Not surprisingly, there is a great deal of variation in the levels of relative income poverty across European Union countries. As many other studies have shown, relative income poverty is generally much higher in the countries with lower mean income per capita (see for example Hagenaars *et al* 1994, Eurostat 1999). However, the nature of the variation depends to some extent on the particular poverty line one chooses. At the 40% line Denmark and Ireland display the lowest poverty rates, with only 2 per cent falling below that line. The highest rates are observed in the Southern European countries, with Greece and Portugal having a rate of 11 per cent and Italy, Spain and Germany seven or eight per cent. With the 50% line Denmark continues to have the lowest rate at 4 per cent and Greece and Portugal the highest rates at 16 and 17 per cent respectively. The UK and Belgium join Italy, Spain and Germany in the group of countries having the next highest rate of poverty, in a range between 11 and 13 per cent. Ireland is

now found in the group of countries with relatively low poverty rates of between 6 and 9 per cent. At the 60% line much less variation is observed. While Portugal and Greece still have the highest poverty rates, at 23 and 22 per cent respectively, the UK, Italy and Spain now have rates of 20% and five other countries have poverty levels between 15 and 17 per cent. The countries with distinctively low numbers below this threshold are the Netherlands and Denmark, with rates of 8 and 10 per cent respectively. Thus while some countries are consistently low, intermediate or high poverty countries, the status of others depends on the line on which one focuses, as does the extent of the disparities between these categories.

Table 1: Distribution of Poverty in 1993 by Country

	< 40%	*<50%*	*<60%*
Germany	7.5	11.7	15.9
Denmark	1.7	4.1	8.3
Netherlands	3.2	6.0	10.3
Belgium	5.7	10.5	17.1
Luxembourg	4.4	7.4	15.1
France	4.6	8.5	15.0
UK	5.5	12.8	20.8
Ireland	2.3	6.5	17.0
Italy	8.2	12.4	20.7
Greece	11.3	15.8	22.3
Spain	7.3	12.3	20.0
Portugal	11.7	17.0	23.3

From a poverty perspective we wish to assess the extent to which changes in income from Wave 1 to Wave 2 bring people above or below relative income poverty lines. To see how common this is and how much it varies across countries, we categorise each individual in the ECHP in relation to the relative income lines constructed for their own country. We take median equivalised income as the reference point, and our categories are

Below 40% of the median
Between 40-50% of the median
Between 50-60% of the median, and
At or above 60% of the median.

Trends in the numbers below the relative income lines between the two waves could clearly have an impact on the extent of poverty escapes or entries. Maître and Nolan (1999) show that poverty rates in Wave 2 were considerably higher than in Wave 1 in Ireland and in Denmark with all three relative income lines, whereas there were consistent falls in relative income poverty in Italy, Greece and Spain. We would thus expect more poverty entries in Ireland and Denmark, and more escapes in Italy Greece and Spain, than if the level of poverty had remained unchanged.

In Table 2 we show the extent of poverty persistence for all three poverty lines by country – in other words, we take those below the line in Wave 1 and see what percentage were still below that line in Wave 2. With the 40% line this varies from a low of 24 per cent in the UK to a high of 59 per cent in Germany. In all but two countries, at least one in two of those in poverty in Wave 1 exits from poverty by Wave 2, and in four countries the escape rate is nearer to two-thirds. Persistence levels are consistently higher with the 50% line, with the lowest persistence level of 41% being found in Netherlands and the highest of 68% in Portugal. However, except for Portugal at least one in three still escape income poverty. With the 60% poverty line a majority of those in poverty in Wave 1 are still in poverty in Wave 2 in all the countries, and in all but two cases the persistence rate is at 60 per cent or above. The lowest level of persistence, 52 per cent, is again found in the Netherlands while the highest level is observed in Ireland and Portugal.

Table 2: Income Poverty Persistence from 1993 to 1994 in the ECHP

	<40%	*<50%*	*<60%*
Germany	59.4	60.7	70.2
Denmark	33.0	42.0	57.6
Netherlands	41.7	41.0	52.2
Belgium	36.2	50.2	57.6
Luxembourg	50.5	54.6	62.2
France	36.2	50.7	64.5
UK	24.4	44.8	59.9
Ireland	34.6	57.8	74.0
Italy	43.3	50.5	60.3
Greece	52.1	56.6	63.5
Spain	45.1	48.7	61.5
Portugal	47.7	67.5	74.1

Given the substantial numbers escaping poverty, the other side of the coin is that the number who experience poverty in either 1993 or 1994 is significantly greater than the number poor at one point in time. We see from Table 3 that with the 40% poverty line the percentage exposed to poverty at some point ranges from 4 per cent to 16.per cent compared to a range of 2 to 12 poor in 1993. Typically the increase is of the order of 50 per cent, but in the UK and Belgium the rate comes closer to doubling. For the 50% line the percentage experiencing poverty at some point runs from 8 per cent to 23 per cent compared to 4 to 17 per cent poor in 1993. With the 60% line the difference is less dramatic, reflecting the lower exit rate. In most countries the numbers experiencing poverty are between 25- 50 per cent higher than the numbers poor in 1993, although in Denmark the increase is significantly higher.

Table 3: Percentage of Individuals Experiencing Poverty in either 1993 or 1994 in the ECHP

	Below 40% Line	*Below 50% Line*	*Below 60% Line*
Germany	10.72	15.68	22.11
Denmark	3.52	7.77	14.25
Netherlands	5.77	9.63	14.28
Belgium	9.37	16.52	24.88
Luxembourg	6.83	12.07	20.21
France	7.46	13.36	21.14
UK	9.99	19.63	28.73
Ireland	5.96	13.88	25.78
Italy	11.44	16.75	25.30
Greece	15.12	21.15	28.88
Spain	10.49	17.22	26.51
Portugal	15.55	22.50	30.28

How far do those escaping from relative income poverty move up the distribution? We look in the first column of Table 4 at how many of those escaping from below the 40% line are in fact above the 50% line in Wave 2. Similarly, we look in column two at how many of those escaping from below the 50% line are above the 60% line in Wave 2. We see that in this sense, across all the countries, a very substantial proportion of those escaping above these relative income lines actually rise well above them. About 60-80% of those rising above the 40% line or the 50% line end up above the 50% and 60% lines respectively. While there is some variation across countries, this is not consistent across the two poverty lines – the

percentage escaping to "well above the line" is low with the 40% line but not the 50% one in Portugal and Denmark, for example.

Table 4: Extent of Income Increase for those Escaping from Poverty between Wave 1 and Wave 2

	% of all those escaping above 40% line who are above 50% line in Wave 2	*% of all those escaping above 50% line who are above 60% line in Wave 2*
Germany	75.8	65.5
Denmark	60.2	80.7
Netherlands	82.9	72.7
Belgium	71.4	78.5
Luxembourg	63.4	74.1
France	76.9	67.6
UK	76.6	64.1
Ireland	73.5	58.8
Italy	82.4	77.4
Greece	77.4	73.3
Spain	77.0	65.7
Portugal	60.2	64.5

With minor exceptions, the clear pattern across all twelve countries is that the higher the relative income line on which one focuses, the lower the exit rate from Wave 1 to Wave 2. There is however no consistent association between the level of poverty in Wave 1 and poverty persistence. Taking the 50% line as an illustration, some countries with relatively high poverty rates in Wave 1 have relatively high persistence rates (Germany, Portugal), while others have relatively low persistence rates (UK). Some of the countries with relatively low poverty rates in Wave 1 with this line have low persistence/high escape rates (Denmark, Netherlands) but some have high persistence/low escape rates (Ireland). Nor is there a consistent association between trends in the overall poverty rate between the two waves, and poverty persistence. Of the countries where poverty rates went up between the two waves, Ireland shows relatively high persistence but this is not true of Denmark. Despite the fact that poverty rates fell between the two waves, Greece still shows relatively high persistence. Furthermore, the proportion escaping to well above the poverty line does not appear to bear a consistent relationship with either the poverty rate or the percentage escaping from poverty with the line in question. These results present a different pattern to that described by Duncan *et al* (1993:221) on the basis of their analysis of eight countries. They found a marked inverse relationship between the poverty rate and the escape rate:

"Countries with large fractions of their populations below the poverty line have lower escape rates. In other words, the higher in the distribution of poverty line cuts. the fewer the transitions out of poverty. This is only logical since, everything else the same, the higher the poverty threshold, the farther away the average poor family is from the line and the higher the income increase required to escape."

The fact that the pattern we observe is by no means so straightforward suggests that all other things are far from being equal. Disentangling the possible impact on mobility of the level of poverty, changes in that level between the two waves, and cross-national differences in underlying patterns of fluidity will require that we move beyond description of poverty dynamics to a formal modelling of the underlying processes. It is to this analysis that we proceed in the next section.

4. Modelling Cross-National Poverty Dynamics

As Dirven (1996) notes, early attempts to model cross-national income dynamics have attempted to draw on Esping-Andersen's work on welfare regimes as a source of hypothesis formulation. Thus Fritzell's (1990) comparison of Sweden and the US hypothesised that the extent of decommodification in Sweden, with the welfare system constructed in a fashion that reduces the impact of market events for people's economic well-being, would reduce mobility compared with the USA. However, there is a complex set of factors at work here that need to be taken into account in the analytic approach one adopts. Since income inequality is less in Sweden, the distance one is required to move between poor and non-poor categories is less and that would actually be expected to promote mobility. Furthermore, when we have controlled for other factors we might expect that exit from poverty would be easier in countries with low poverty rates. In order to develop our understanding of cross-national differences in poverty dynamics it will be necessary to distinguish between different factors contributing to the process. Such an analysis can be undertaken using log-linear models, commonly employed in the study of social class mobility.

Log-linear analysis models cell counts in contingency tables in terms of association among the variables. For our 192 cell table of four destinations by four origin by twelve countries we start by defining the conditional independence or perfect mobility model which allows for association between country and origin and destination but hypothesises no association between origin and destination. This serves as a reference point against which we can evaluate more plausible models. With I x J x K table for origin (O), Destination (D) by Country (C), the independence model has the additive form

$$\log F_{ijk} = \mu + \lambda^{OC} + \lambda^{DC} \tag{1}$$

At the other extreme is the saturated model shown in equation 2 which exhausts the degrees of freedom and provides a perfect fit to the data by allowing for all two way associations and the three way association between origin, destination and country

$$F_{ijk} = \mu + \lambda^{OC} + \lambda^{DC} + \lambda^{OD} + \lambda^{ODC} \tag{2}$$

In considering the application of log-linear models to poverty dynamics, it is useful to make the distinction between absolute and relative mobility. Absolute mobility rates refer to the percentage of individuals in some base category who are mobile. Such rates are easily expressed in the sort of percentage terms we have employed thus far. By contrast relative rates are produced by comparison of such rates across country, time or socio-demographic group. The distinction between absolute and relative mobility rates originates in attempts to understand what were considered to be rather different sorts of mobility, which have frequently been described in the social class context as *structural* and *exchange* mobility (Hout, 1989). Structural mobility relates to share of mobility over time that arises from differences in the origin and destination distributions. The basic idea is that a shift in the distribution across categories leads to people being ‘pushed' out of certain origin categories and ‘pulled’ into certain destination categories. Exchange mobility, on the other hand, is considered to arise as a consequence of the differential advantages associated with different class origins that may be used to avoid access to

undesirable destinations or to enter or remain in desirable ones. Exchange mobility thus reflects the extent of equality of opportunity. In the absence of an overall shift in the extent of poverty, changes in the pattern of exchange mobility would necessarily require both winners and losers, with mobility out of poverty being compensated for by corresponding mobility into poverty.

There are some difficulties with attempting to disaggregate mobility in this fashion since it involves assumptions about what the extent and pattern of mobility might have been in the absence of structural change. In practice, it is implausible to assume that factors, which may alter the shape of the poverty distribution, such as the rate of economic growth, are unrelated to influences shaping the pattern of exchange mobility. However, as Erikson and Goldthorpe (1992:204-205) point out, a model developed by Sobel, Hout and Duncan (1985) allows us to develop an approach to measuring effects of marginals that avoids such difficulties. This involves an alternative way of treating the $\lambda^O + \lambda^D$ terms in equations 1 and 2 which requires a simple linear transformation of $\lambda^O + \lambda^D$ into $\lambda^O + \lambda^D + (\lambda^D - \lambda^O)$. Thus instead of thinking in terms of origin effects plus destination effects we would think in terms of the size effect of the two classes involved ($\lambda^O + \lambda^D$) plus the marginal *shift effects.* Such effects, Erikson and Goldthorpe (1993) note, can be understood as the effects of changes between origin and destination distributions which raise the odds of mobility to a given destination by the same factor across all origins alike.[i] Hout (1989:87-89) stresses that estimates of such effects must control for the strength of association in order to be unbiased. Inferring shift effects from marginal change alone may lead to false inferences since stronger shift effects are required to produce a given change in marginals when association is strong than when it is weak

In measuring relative mobility we require a measure of association that depends only on the joint distribution of the variables and not on the marginals (Rudas, 1998:9). The "effects" or degrees of association of log-linear models are interpreted in terms of odds or odds ratios θ_{ij}.[ii] which provide a measure of association whose possible range of values is not influenced by the marginal distribution of the variables involved. In all log-linear models the θ_{ij} can be expressed as a function of the models parameters. In comparing

tables the odds ratios are unaffected by variations in the marginals of the tables. In studies of mobility the odds ratio can be viewed as the chance of an individual of origin category i being found in destination class j rather than any other single class or set of classes, relative to the chances of an individual of origin category i' being found in j rather than in any other single class or set of classes; that is $(F_{ij}/F_{ij'})/(F_{i'j}/F_{i'j'})$. In mobility terms, equality of access to a more desirable rather than a less desirable destination from different origin classes would give rise to an odds ratio of unity. The greater the deviation from this value the less equal is the competition between individuals of different origins. Although the set of possible odds ratios in an I x J table is $(I^2 - J)^2$, a smaller set of odds ratios formed from adjacent rows and columns is sufficient to generate the full complement of all possible odds ratios. Goodman terms this set of (I-1)(J-1) odds ratios the 'basic set. In the analysis that follows we seek to develop models whose implied odds ratios provide a satisfactory account of the observed patterns of poverty mobility.

Assessment of the fit of a model involves estimating the expected cell frequencies F_{ij}'s using the likelihood-ratio statistic (G^2). Nested models can be compared using differences of G^2 values and degrees of freedom. In addition to G^2 we report two further statistics for each of the models. The first is the index of dissimilarity Δ, which is the sum of the positive differences between the expected and observed frequencies and thus shows the number of cases that would have to be reallocated in order to achieve perfect correspondence between the observed and expected frequencies. Finally we report the BIC statistic which can be used to compare nested and non-nested models (Raftery, 1986). As Vermunt (1997:22) notes, BIC is based on an approach to model selection based on information theory with the aim being not to detect the true model but the model that provides the most information about the real world. It is calculated as $BIC=[G^{2-}(\log n)(df)]$ and supports model parsimony. The lower the value of the BIC statistic the more plausible is the model.

5. Modelling Poverty Transitions from Wave 1 to Wave 2 in the ECHP

We begin our analysis by fitting model A, the conditional independence or perfect mobility model which allows for variation in the distributions of origins and destinations across time but posits no association between origin and destinations. Table 5 shows that this model, which will serve as a reference point for more plausible models, returns a G^2 of 41,887 for 108 degrees of freedom and misclassifies 16 per cent of cases. Model B, the Constant Social Fluidity Model (CnSF), allows for variation across country in the impact of origins and destinations, and therefore absolute mobility, but constrains relative mobility to be constant over time. This model misclassifies only 1.85% of all cases and, reduces the G^2 value of the independence model by 97.3%. However the G^2 value of 1140.3 with 99 degrees of freedom is statistically significant.

Table 5:; Models for Poverty Dynamics 1993 and 1994 for ECHP Countries

Models	G^2	*df*	Δ	rG^2	*BIC*
Conditional Independence O*C + D*C	41887	108	15.99		
B. Constant Social Fluidity O*C + D*C + O*D	1140.3	99	1.85	97.3	-39.37
C. UNIDIFF	887.8	88	1.45	97.9	-160.8
D. Homogenous Quasi Uniform Association	1499.3	104	2.05	96.5	260.0
E. Homogenous Quasi Uniform Association + AF1	1222.6	103	1.94	97.1	-4.8
F. Heterogeneous Quasi Uniform Association + AF1	976.6	92	1.60	97.7	-119.7
G Homogenous Linear by Linear Model of Median Income + AF1	1766.0	103	2.29	95.8	127.7
H. Heterogeneous Linear by Linear Model of Median Income + AF1	999.65	92	1.57	97.6	-96.65

As a first test for differences in relative mobility across countries we employ Model C, a log-multiplicative layer effect model – the so-called 'unidiff' model'. This model posits that the pattern of association is the same over time, but it allows for the strength of this association to differ by a uniform amount, so allowing for more or less marked inequality in social fluidity across time (Erikson & Goldthorpe 1992; Xie 1992). That is, let a_{ijk} represent the log-linear association parameters between origins (I=1,….,I) and destinations (j=1,J) in each of k=1,,…..,K) tables. Then the unidiff model specifies:

(3) $$\alpha_{ijk} = \alpha_{ij}\beta_k$$

where a_{ij} is a set of baseline origin-destination parameters common to all k, and ß is a parameter whose value is specific to each k and whose effect is to raise or lower the association parameter compared with their baseline values. This model uses one degree of freedom more than the CnSF model and yields a deviance of 887.8 for 88 degree of freedom, which is a statistically significant improvement in the CnSF model. It reduces the independence G^2 by 97.9% and leads to a reduction in the BIC statistic compared to the CnSF model from –39.4 to –160.8. Thus the UNIDIFF model suggests that significant variation in the magnitude of association between origins and destinations exists across countries but that the scale of such variation is modest.

Turning to Table 6, column 1 sets out the pattern of variation in the unidiff coefficient across countries. Under this model the origin-destination association parameters in each of the twelve tables are equal to a set of baseline association parameters multiplied by the unidiff coefficient. For ease of presentation we present them in multiplicative rather than additive form i.e. in terms of the odds rather than log odds. Thus the unidiff coefficients are normalised by being setting the value for German respondents to one. A unidiff coefficient less than unity serves to reduce the size of the origin-destination association, relative to the baseline value, and conversely for a coefficient greater than one. From Table 6 we see that Germany has a relatively high level of origin-destination association. Only Luxembourg, Ireland and Portugal fail to display statistically significant lower levels of association. France Denmark and the Netherlands display the next highest level with unidiff coefficients in the range 0.90 to 0.93. The remaining Southern European countries follow this group with values in the range 0.84 to 0.87. Finally the weakest level of association is found in Belgium and the UK with values of 0.79 and 0.76 respectively.

Table 6: Variation in Association Parameters by Country

	UNIDIFF	*Heterogeneous Uniform Association*	*Heterogeneous Linear by Linear Median Income Model*
Germany	1.000	1.219	1.299
Denmark	0.902	1.134	1.451
Netherlands	0.901	1.121	1.236
Belgium	0.787	1.034	1.105
Luxembourg	1.022	1.198	1.231
France	0.927	1.152	1.326
UK	0.755	1.015	1.161
Ireland	0.967	1.107	1.184
Italy	0.856	1.113	1.155
Greece	0.839	1.125	1.164
Spain	0.871	1.123	1.221
Portugal	0.971	1.206	1.248

Our results to this point suggest that the vast bulk of cross-national variation in poverty dynamics is a consequence of structural or shift effects but that some significant variation in social fluidity or relative mobility opportunities does exist. The clustering of countries that emerges does not appear to be to be interpretable either in terms of levels of poverty or welfare regimes. However, before engaging in further discussion of these results we should consider some of the limitations of the models we have employed so far.

The first of these is that the CnSF and unidiff models are of a very general nature and make no attempt to specify the processes underlying poverty dynamics and the extent to which cross-national differences might be explicable in terms of differential operation of such processes. A related problem is that models we have employed thus far ignore the ordering of the origin and destination categories. In what follows we attempt to employ models that rectify such deficiencies. In order to do so we make use of linear-by-linear association models that use row and column scores to structure association.[iii] The model requires assigning scores $\{u_I\}$ and $\{v_j\}$ to the rows and columns of the mobility table. The model is shown is equation (4).

(4) $$F_{ij} = \mu + \lambda^O + \lambda^D + \beta(u_i v_j)$$

Odds ratios can be used to interpret the size of ß. For an arbitrary pair of rows h<i and an arbitrary pair of columns j<k

(5) $$\log(F_{hj}F_{ik} / F_{hk}F_{ij}) = \beta(u_i - u_h)(v_k - v_j)$$

The log odds ratio is larger for pairs of rows or columns that are further apart. The odds ratio equals e^{β} whenever rows are one unit apart. For equal-interval scores all such *local odds ratios* are equal. Goodman (1979) referred to this case as *uniform association*. (UA) For unit–spaced scores all log θ_{ij}=ß and all $\theta_{ij}=e^{\beta}$. The UA model orders the rows and columns using an arbitrary but equally spaced ordering. The row-column association is given by the parameter for the effect of the interaction term formed from these two variables: Thus ß is equivalent to the logarithm of the value of the odds ratios in the basic set. The odds ratios formed from adjacent rows and columns are identical and those formed from non-adjacent rows and/or columns are a power function of those in the basic set (or a multiplicative function if the log odds are used).

Generally models containing only the main effects and the association term fail to provide a satisfactory fit to the data. In most cases it is also necessary to specifically model the diagonal cells. Among the options available is the addition of a single term distinguishing movers from stayers, which is a common convention in mobility analysis (Goodman, 1969). Alternatively one can distinguish a specific immobility tendency for each of the diagonal cells in which case each origin class can display a specific persistence. Preliminary analysis led us to include three inheritance parameters in our models. INH1 relates to immobility below the 40% percent relative income poverty line. INH2 relates to those between the 40% and 50% lines and those between the 50% and 60% lines. Finally INH3 is specific to those above the 60% line. These parameters can be viewed as capturing tendencies towards persistence in a particular category over and above the degree of recruitment to the same class that implied the uniform by the other parameters in the model.

The results of fitting a series of models hypothesising uniform association but allowing for these additional immobility or persistence parameters are also set out in Table 5. Model D, labelled the homogenous quasi-uniform association, constrains both the ß coefficient and the inheritance parameters to be constant. While this model does not fit the data it does correctly classify the almost 97 per cent of cases and reduces the G^2 by 96.5 per cent. These results confirm the substantial degree of uniformity in patterns of fluidity.

An examination of residuals showed one consistent deviation of observed from expected values. This involved an overestimation of the reciprocal flows between those below the 40 per cent poverty line and those between the 50-60% line. The latter will tend to contain many of those being provided for by the main welfare programmes relating to unemployment and old age. It is plausible that those who have established such rights will have acquired additional protection against a drop into the lowest category. Correspondingly, inability to establish such rights may serve as an additional barrier to entry to this category for the poorest group. In order to capture this tendency, we add what is usually referred to as an affinity term AF1 in our subsequent analysis. Since the term is constant across countries it does not affect our international comparisons. The addition of this term in Model E produces an improvement in fit in terms of both G^2 and BIC criteria. Finally in model F we allow the ß parameter to vary across country but constrain the inheritance and affinity terms to be constant. The model takes the form set out in equation 6. It returns a G^2 of 976.6 with 92 degrees of freedom, which remains statistically significant. However it correctly classifies 98 per cent of cases, reduces the conditional independence G^2 by almost 98 per cent and returns an improved BIC statistic of –119.7.

$$(6) \qquad LogF_{ijk} = \mu + \lambda^{OC} + \lambda^{DC} + AF1 + INH1 + INH2 + INH3 + \beta_k(u_i v_j)$$

In terms of grouping of countries the outcome resembles the unidiff pattern. From Table 6 we see that Germany, Portugal and Luxembourg display the highest level of association, with ß coefficients ranging between 1.219 and 1.198, and do not differ

significantly from each other. The next highest level of association is found for France and Denmark with coefficients of 1.152 and 1.134 respectively. Once again the lowest degree of origin-destination association is found in Belgium and the UK with ß coefficients of 1.034 and 1.015 respectively. However, the remaining countries are found in a narrow range between 1.107 and 1.125. The only country for which the heterogeneous quasi UA model with the additional affinity term presents a significantly different picture to the unidiff model is Ireland. Whereas the unidiff results located Ireland among the countries with the highest level of association, the UA model locates it between the Southern European countries and Belgium and the UK and, indeed, closest to the latter.

Agresti (1990: 265) recommends that unless an uneven spacing of scores is natural then the uniform association model, which allows for the ß scores to be interpreted simply as the common local odds ratio is to be preferred. However, in the case of poverty dynamics we do have a reasonable case for attempting to approximate distances between midpoints of categories for an underlying interval scale. In Table 7 we show the median income ratios by poverty category by country. The CnSF and unidiff models made no use of information on distance between categories, and the UA model assumed that categories were equally spaced and such spacing was equal across countries. By using the information contained in Table 7 we can estimate distances between categories and allow for cross-national variation in such distances. This allows us to begin to distinguish between cross-national difference in inequality and dynamics.

Table 7: Poverty Category Median Income Ratios for Origins By Country for 1993

	< 40%	*40-50%*	*50-60%*	*60% +*
Germany	1.00	1.64	1.96	3.93
Denmark	1.00	1.40	1.68	3.21
Netherlands	1.00	1.77	2.16	4.07
Belgium	1.00	1.85	2.25	4.45
Luxembourg	1.00	1.80	2.10	4.23
France	1.00	1.57	1.88	3.85
UK	1.00	1.46	1.77	3.75
Ireland	1.00	1.77	2.08	4.60
Italy	1.00	1.73	2.05	4.31
Greece	1.00	1.65	2.00	4.32
Spain	1.00	1.61	1.94	4.11
Portugal	1.00	1.57	1.94	4.11

Our final model then differs from equation 6 in that the u_I and v_j are not assumed to be equally spaced. Instead for both origins and destinations we take those below the 40% poverty line as a reference category and score them as 1. We then assign each of the other categories a score equal to the ratio of the median income of that category to the median income of the category containing those below the 40% line. The relevant set of scores for origins is set out in Table 7 and the corresponding one for destinations is provide in Appendix Table A1. From Table 7 we can see that Denmark is quite distinctive in that the differentials between the categories of our poverty classification are significantly narrower. For example the value of ratio between those above the 60% line and those below the 40% line is at a value of 3.21 lower that for any of the other countries. The countries closest to Denmark are the U. K. and France who display ratio values for the comparison of the extreme categories of 3.75 and 3.85 respectively. Germany and Spain, the Netherlands and Portugal follow these with corresponding values of 3.93 and 4.11. The remaining countries all display consistently higher ratios. These include Italy, Greece, Luxembourg, Belgium and Ireland with values for the extreme categories comparison in the range 4.23 to 4.60. The highest values are observed in Belgium and Ireland. A very similar pattern is observed for destination scores.

All other things being equal, we would expect that mobility would be easier in those countries where the distance between categories is less. The linear association model can

capture this effect. The first variant of this model – model G in table 5 - constrains all of association parameters including ß to be constant across countries this model provides a poorer fit to the data than a number of earlier models returning a BIC statistic of 127.7. However, it misclassifies only 2.3 per cent of cases and reduces the conditional independence G^2 by 95.8 per cent. Model H in Table 5 allows ß to vary and provides a significantly better fit while not quite providing a statistical fit to the data. It misclassifies only 1.57 per cent of cases and reduces the conditional independence G^2 by 97.6 per cent. The BIC statistic value of –96.65 is slightly larger than in the case of the UA model. However, we would argue that the model employing the median income ratios should be preferred because it is substantively more plausible and allows us to make important conceptual distinctions.

The ß parameters for this model are shown in column three of Table 6 to facilitate comparison with the unidiff and UA models. The coefficients are reported in multiplicative form and in terms of actual country values rather than as deviations from the German case. For the median income model the highest level of association is shown by Denmark with a beta of 1.451, followed by France with a coefficient of 1.33 and Germany 1.30. The intermediate group of countries with values in the range of 1.22 to 1.25 includes Spain, Portugal, the Netherlands and Luxembourg. While the countries with the weakest level of association encompassing a set of scores running from 1.18 to 1.11 include Italy, Greece, Belgium, Ireland and the UK. Thus the somewhat weaker association between origins and destinations shown by earlier models for Denmark and France appears to be a consequence of the lesser distance between the categories of our poverty classification in these countries. The association for the UK remains relatively weak even when we take the distance factor into account. The relative position of the other countries remains relatively unchanged.

We now turn our attention to the parameters of our preferred model. As we have shown earlier, it is variation in the shift effects that accounts for the bulk of the cross-national variation in patterns of poverty dynamics. In Table 8 we show the distribution of such effects across country. The reference category is below the 40% income line and this thus

has a shift effect value of unity. The shift effects of the remaining three categories are then expressed relative to this category. The shift effect for the categories other than below the 40% line relative to each other can be deduced from the values contained in Table 8. Portugal, Greece, Italy and to a lesser extent Spain and France show a shift away from the reference category towards all other categories. In Portugal, France and Italy the shift is strongest towards the 40-50% category while Spain it is towards those above the 60% line. In Greece both these categories benefit almost equally. Belgium and the UK show relatively little change. Although in the former the 40-50% category gains slightly at the expense of the reference category while for the latter the opposite is the case. For all other countries there is a consistent shift towards the below 40% category and away from all others. This is most pronounced in Ireland and the Netherlands. In the Irish case the size of the shift is positively related to the distance between categories. For the Netherlands the shift is also greatest for the other two categories. For Germany and Denmark the shift towards below the 40% line is somewhat weaker and takes is most extreme value for the 50-60% category in the former and for those above the 60% line in the latter. It is these effects which explain most of our cross-national variation.

Table 8: Shift Effects for the Heterogeneous Linear by Linear Median Income Ratio Model

	Poverty Categories		
	<40% v 40%-50%	*<40% -v 50-60%*	*40%v 60% +*
Germany	0.791	0.668	0.830
Denmark	0.881	0.840	0.529
Netherlands	0.582	0.513	0.782
Belgium	1.184	0.953	0.955
Luxembourg	1.162	0.554	0.915
France	1.279	1.106	1.048
UK	0.848	0.988	1.001
Ireland	0.630	0.513	0.462
Italy	1.183	1.619	1.462
Greece	1.391	1.236	1.431
Spain	1.071	1.324	1.400
Portugal	2.001	1.556	1.292

In Table 9 we show the association coefficients for our final model. First we focus on those that are uniform across country. These include the inheritance parameters that

capture the net tendencies towards mobility when we have taken the effects of other variables in the model into account. The net tendency towards immobility is weakest in the 40-50% and 50-60% cells although it is still positive, as shown by the value of 1.76, and highly significant. The magnitude of the below 40% line parameter is slightly higher at 1.91. However, by the largest net tendency towards persistence or immobility is found among those above the 60% line. (The significance levels shown with the parameters relate to deviation from the German value.)

Table 9: Linear by Linear Income Ratio Mode;

	Estimate	*P*
INH1	1.906	***
INH2	1.756	***
INH3	5.057	***
Affinity	0.545	***
β (Germany)	1.299	***
β*Denmark	1.451	***
β*Netherland	1.236	***
β*Belgium	1.105	***
B*Luxembourg	1.231	***
β*France	1.326	
β*UK	1.161	***
β*Ireland	1.184	***
β*Italy	1.155	***
B*Greece	1.164	***
B*Spain	1.221	***
B*Portugal	1.248	***

*** p< .001 ** p< .01 * p< .1

Thus, over and above the effects captured by distance between categories and the other association parameters, the non-poor appear to enjoy additional resources that prevent them falling into poverty. The negative affinity parameter of 0.55 falls significantly below unity and capture this net tendency for the density of movement between the below 40% category and the 50-60% categories to be rather less than we would expect all other things being considered.

6. Conclusions

Research using panel data is highlighting the inadequacy of a static perspective on poverty. The need to understand poverty dynamics has become more pressing as both popular and political discourse has increasingly referred to a new class of 'losers', as reflected in labels such as the A-team and B-team and the 'new underclass'. However, as Esping-Andersen (1997) among others has stressed, the interpretation of such phenomena is dependent on the extent to which people's marginality is only temporary, or involves a degree of permanence which may contribute to a further deterioration in life-chances. In this paper we have addressed the question of whether, over and above cross-national differences in poverty rates and short-term variations in those rates, there are differences in underlying patterns of fluidity which make barriers to exit from poverty more powerful in some rather than other European countries.

Our analysis of twelve European Union countries in the first two waves of the ECHP confirms that substantial mobility into and out of relative income poverty occurs from one year to the next. However, the extent of such mobility is strongly related to the particular income poverty line on which one chooses to focus. For all countries the level of mobility declines sharply as one moves from the 40 per cent to the 60 per cent relative income line. However, no consistent relationship was found between the level of mobility in a country and the poverty rate. Neither was there a transparent relationship between overall movement in the poverty rate over time and degree of persistence of poverty.

In order to address these issues on a sounder analytic basis we made use of log linear and linear by linear association models, commonly applied in the context of social mobility. The results of such analysis show that the model of constant social fluidity can account for the vast bulk of cross-national variation in poverty dynamics. This model allows for cross-national variation in the distribution of poverty in both 1993 and 1994. However, having made allowance for these effects it imposes a uniform pattern of association between origins and destinations. In other words, it is shift rather than association effects which have primary explanatory power. Cross-national differences in poverty dynamics

are predominantly a consequence of corresponding variations in poverty rates and short-term movements in such rates.

Some significant variation across countries is observed. A consistent finding across a variety of models was that level of origin and destination association was relatively strong in Germany, Luxembourg and Portugal and relatively weak in Belgium and the UK. The position of the other countries was affected by whether or not distance between categories was taken into account and the manner in which this was done. Our final model incorporated a set of inheritance and affinity effects held constant across country while allowing for cross-national variability in income differences between poverty categories and in the hierarchy coefficient. Thus variation in poverty dynamics across country is primarily a consequence of the variable impact of shift effects. However, cross-national differences in relative income levels also play a role with Denmark, France and the UK displaying the narrowest differentials. Finally, the strength of the hierarchy effect varies across countries but in a relatively limited manner. Here we find France, Denmark and Germany displaying the highest level of association, the Netherlands, Luxembourg, Spain and Portugal at an intermediate level and Ireland, Italy, Greece, Belgium and the UK displaying the weakest level of association. It is difficult to think of an explanation in terms of welfare regimes that could account for such patterns.

Appendix

Table A1 Poverty Category Median Income Ratios for Destinations By Country for 1993

	< 40%	*40-50%*	*50-60%*	*60% +*
Germany	1.00	1.68	2.07	4.12
Denmark	1.00	1.41	1.73	3.24
Netherlands	1.00	1.77	2.20	4.13
Belgium	1.00	1.82	2.20	4.40
Luxembourg	1.00	1.95	2.33	4.65
France	1.00	1.48	1.78	3.54
UK	1.00	1.48	1.79	3.77
Ireland	1.00	1.63	1.94	4.18
Italy	1.00	1.77	2.13	4.47
Greece	1.00	1.63	2.02	4.29
Spain	1.00	1.54	1.84	3.84
Portugal	1.00	1.65	2.04	4.34

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[i] The Sobel, Hout Duncan,t model suggest their alternative parameterization in the context of a model that offers anew way of effecting the distinction between structural and exchange mobility that requires symmetrical models. However, As Erikson and Goldthorpe (1993:205) note the method of presenting structural shifts is detachable from the model.

[ii] The following discussion draws on Breen (1985)

[iii] The following discussion draws on Agresti (1990:263-265 and Breen (1994)