The Dynamics of Economic Vulnerability: A Comparative European Analysis

Christopher T. Whelan and Bertrand Maître

Economic and Social Research Institute, Dublin

21 June 2007

Abstract

A joint concern with multidimensionality and dynamics is a defining feature of the pervasive use of the terminology of social exclusion in the European Union. The notion of social exclusion focuses attention on economic vulnerability in the sense of exposure to risk and uncertainty. Sociological concern with these issues has been associated with the thesis that risk and uncertainty have become more pervasive and extends substantially beyond the working class. We combine features of recent approaches to explicit statistical modelling of poverty dynamics and multidimensional deprivation in order to develop our understanding of the dynamics of economic vulnerability. An analysis involving nine countries and covering the first five waves of the European Community Household Panel shows that, across nations and time, it is possible to identify an economically vulnerable class. This class is characterised by heightened risk of falling below a critical resource level, exposure to material deprivation and experience of subjective economic stress. The application of dynamic analysis shows that cross-national differentials in persistence of vulnerability are wider than in the case of income poverty and less affected by measurement error. Economic vulnerability profiles vary across welfare regimes in a manner broadly consistent with our expectations. Variation in the impact of social class within and across countries provides no support for the argument that its role in structuring such risk has become much less important.

Key words: Social Exclusion, Dynamics, Multidimensionality, Vulnerability, Latent Class

The Dynamics of Economic Vulnerability; A Comparative European Analysis

Introduction

Atkinson (1998) identifies a concern with dynamics and multidimensionality as a key factor underlying the pervasive use of the terminology of social exclusion in the European Union (EU). This concerns is also reflected in Berghman's (1995) understanding of social exclusion as involving a social process in which the creation and reinforcement of inequalities leads to a state of deprivation and hardship from which it is difficult to escape. Similarly, Paugam's (1996) focus on spirals of precariousness involves this joint emphasis.

The notion of social exclusion, as De Haan (1998) observes, goes beyond a concern with current deprivation and focuses attention on vulnerability in the sense of exposure to insecurity and risk. It can also, as Chambers (1989) observes, incorporate people's perceptions of their situation. Our objective is to operationalise the concept of individual economic vulnerability understood as 'heightened risk of multidimensional deprivation'.

Kronauer (1998) notes that the emergence of the concept of social exclusion was directly related to the fact that from the 1980s on, unemployment on a large scale threatened to become a permanent feature. The concept of social exclusion, he argues, has no meaning outside of the history and prosperity of the welfare state after the Second World War and presupposes a shared understanding of what it is to be included. More recently, globalisation has been seen as associated with increased but

much more widely diffused levels of risk. This pattern is thought to arise from the erosion of security deriving from traditional career patterns based on full-time employment over the life-cycle. The threat, if not the reality, of unemployment and resulting poverty are considered to have become more pervasive and to extend substantially beyond the working class (Beck, 2000, Castells, 2000).

In responding sceptically to the latter claims, authors such as Goldthorpe (2007: 106) have pointed to the absence of even a broad consensus on how those socially excluded/vulnerable/at risk are to be enumerated.[1] However, the availability of the European Community Household Panel (ECHP) provides a basis for significant advance. In this paper we combine features of recent approaches to explicit statistical modelling of poverty and dynamics[2] and multidimensional social exclusion[3], in an attempt to understand the dynamics of 'economic vulnerability'.

We will proceed as follows. In Section 2 we describe the ECHP data on which our analysis is based. Section 3 deals with the application of latent class models to cross-sectional data relating to multiple indicators. In section 4 we consider previous studies modelling income poverty and deprivation dynamics. Section 5 extends our analysis to the formal modelling of vulnerability dynamics. In Section 6 we examine cross-national variation in economic vulnerability. Section 7 focuses on variation in economic vulnerability by social class. Finally, in Section 8 we draw our conclusions together.

[1] Goldthorpe's dissenting position is based on much wider range of considerations relating to the consequences of globalisation for the changing nature of work, employment and class relations.
[2] See Rendtel *et al* (1998), Breen and Moisio (2004), Moisio (2004) and Whelan and Maître (2006)
[3] De Wilde (2004), Moisio (2004) and Whelan and Maître (2005).

Data and Measures

The results presented in this paper are based on the ECHP User Data Base (UDB) containing data from waves one to five (1994 to 1998) as released for public use by Eurostat. [4] In our analysis of dynamics we use a balanced panel of survivors who remained in the sample from 1994 to 1998 and we use the base weight as a longitudinal weight for this group as specified by Eurostat.[5] Although the full ECHP UDB data file includes data for 15 countries, the data required for our analysis is available for only nine countries, Denmark, the Netherlands, Belgium, France, Italy, Ireland, Spain, Portugal, Greece. For these countries the total number of individual respondents in the first wave was 139,358 with 95,213 being available for analysis across the five waves from 1994–1998.

The income measure we employ is total annual equivalised household disposable income of the year prior to that in which data collection took place, including transfers and after deduction of income tax and social security contributions.[6] Our analysis distinguishes four income categories; those below 50% of median income, those between 50% and 60%, those between 60% and 70% and those above 70%. Following standard procedures, the individual is chosen as the unit of analysis.

Whelan *et al* (2001) identify thirteen household items to serve as indicators of a concept of life-style deprivation. These items cover a range of what has been termed Current Life-Style Deprivation (CLSD). In each case the measures can be taken to

[4] For a discussion of the quality of the ECHP data see Wirz and Meyer (2002).
[5] Analyses of attrition in the ECHP by Watson (2003) and Behr *et al (2006)* suggest that for the period we are concerned the type of attrition observed will not affect our conclusions.
[6] We use the modified OECD equivalence scale.

represent enforced absence of widely desired items.[7] An index based on a simple addition of these thirteen items gives a Cronbach's alpha reliability coefficient of 0.80. We use a version of this measure in which each individual item is weighted by the proportion of households possessing that item in each country. This measure makes it possible to identify a dichotomous deprivation threshold where the percentage above it corresponds to the number below the 70% median income poverty line.

The measure of subjective economic stress identifies those individuals living in households that experience either 'great difficulty' or 'difficulty' in making ends meet.

Latent Class Analysis of Economic Vulnerability

Our analysis is based on the set of 4x2x2 tables formed by cross-classifying the four-category income variable, the dichotomous CLSD measure of material deprivation and the dichotomous subjective economic stress variable. Our objective is to identify a group that is vulnerable to economic exclusion in the sense of being distinctive in their risk of falling below a critical resource level, exposure to deprivation and experience of economic stress.

The underlying assumption of latent class analysis is that each individual is a member of one and only one such class and that, conditional on such membership, the manifest variables are mutually independent of each other. Given three variables the latent class model for variables A, B, C is

[7] Full details of the construction of the measure are provided in Whelan *et al* (2004).

$$\pi_{ijkt}^{ABCX} = \pi_t^X \pi_{it}^{\bar{A}X} \pi_{jt}^{\bar{B}X} \pi_{kt}^{\bar{C}X} \quad (1)$$

where π_t^X denotes the probability of being in latent class t=1…T of latent variable X; $\pi_{it}^{\bar{A}X}$ denotes the conditional probability of obtaining the ith response to item A, from members of class t, I=1…I; and $\pi_{jt}^{\bar{B}X}$, $\pi_{kt}^{\bar{C}X}$ denote the corresponding probabilities for items B and C respectively.

The sample of countries available to us does not allow us to carry out a systematic statistical analysis in welfare regime terms. However, we can usefully structure our discussion in such terms. We have allocated countries to regimes as follows:

Social-democratic: Denmark, The Netherlands.

Corporatist: Belgium, France.

Liberal: Ireland.

Southern: Italy, Spain, Portugal, and Greece.[8]

The key features of different regimes can be delineated very briefly.[9] The social democratic regime assigns the welfare state a substantial redistributive role, seeking to guarantee adequate economic resources independently of market or familial reliance. The corporatist regime views welfare primarily as a mediator of group-based mutual aid and risk pooling, with rights to benefits depending on being already inserted in the

[8] This largely follows Ferrera (1996), except that the Netherlands is included in the social democratic rather than the corporatist/conservative regime, following the example of Dutch analysts such as Muffels and Dirven in their book with Goodin and Heady (Goodin *et al*., 1999).

[9] See the extended discussions in, for example, Esping-Andersen (1990), Goodin et al. (1999) and Bison and Esping-Andersen (2000).

labour market. The liberal regime acknowledges the primacy of the market and confines the state to a residual welfare role, social benefits typically being subject to a means test and targeted on those failing in the market. The Southern countries constitute a distinctive welfare regime with family support systems playing a crucial role and the benefit system being uneven and minimalist in nature.[10]

We anticipate that variation in levels of inequality between regimes and differences in extent of regulation of the labour market, and the associated insider-outsider divisions, within and between regimes will influence levels of economic vulnerability. Gallie and Paugam (2000:353) concluded that 'high-security' employment centred systems within the corporatist group were highly successful in providing financial protection. We expect to observe generally high levels of economic vulnerability in Southern regime countries. However, rigid labour markets in Spain and Italy involving sharp insider-outsider divisions which operate particularly to the disadvantage of younger workers, combined with high levels of intergenerational co-residence, are likely to differentiate these countries from Portugal and Greece. Since our key variables are measured at the household level, disadvantaged younger people within such households will not be identified as vulnerable. [11] This is likely to be particularly true in Italy where labour market regulation is particularly associated with difficulty in entering employment rather than the Spanish case where insecurity of employment is a stronger feature.[12]

[10] See Ferrera, (1996); Bonoli, (1997); Arts and Gelisen, (2002)
[11] For detailed discussion of cross-national variation in such patterns for the period with which we are concerned see Gallie and Paugam (2000: 13-18), Iacovou (2004).
[12] SeeTohara and Malo (2000) and Ianelli and Soro-Bonamatí (2003)

Table 1 sets out the fit statistics for a two class latent class model of economic vulnerability for all five waves of the ECHP for each of the nine countries included in our analysis. Given the large sample sizes ranging from 21,424 in wave one in Italy to 5,272 in Denmark in wave 5, any highly parsimonious model is unlikely to fit according to conventional statistical criteria. Nevertheless it does well across all nine countries and five observation points in accounting for the patterns of association between the three indicators. The G^2 goodness of fit statistic ranges from 7.7 in wave 1 in Denmark to 107.0 in wave 2 in Italy with 10 degrees of freedom. Focusing on Δ - the proportion of cases misclassified- we find that the level of misclassification ranges from 0.002 in the Netherlands in wave 4 to 0.019 in Ireland in wave 5. No systematic tendency for goodness of fit to vary across waves is observed. The indices of fit for the independence model provide a benchmark for strength of the association between the indicators that requires explanation. The latent class model, which uses six additional degrees of freedom, reduces the independence G^2 by at least 98 per cent in 44 of the 55 cases.

Table 1: Fit Statistics for Economic Vulnerability Two Class Latent Class Models

	1994		1995		1996		1997		1998	
	G^2	Δ	G^2	Δ	G^2	Δ	G^2	Δ	G^2	Δ
Denmark	7.66	0.004	41.69	0.009	17.2	0.007	13.3	0.006	24.77	0.007
Netherlands	15.73	0.005	19.92	0.006	8.0	0.004	6.13	0.002	9.0	0.003
Belgium	42.11	0.009	5.65	0.005	31.53	0.007	24.95	0.008	12.82	0.005
France	13.89	0.004	24.56	0.007	10.38	0.004	41.08	0.009	31.03	0.007
Ireland	30.18	0.008	23.91	0.008	37.7	0.012	33.05	0.011	73.34	0.019
Italy	41.7	0.01	107.03	0.017	74.43	0.014	51.72	0.011	85.54	0.014
Greece	38.16	0.012	12.36	0.005	47.33	0.011	58.56	0.016	42.11	0.015
Spain	71.03	0.014	75.96	0.012	64.22	0.014	92.18	0.016	68.23	0.012
Portugal	64.17	0.012	69.89	0.015	94.12	0.018	17.97	0.006	8.95	0.006

In Table 2 we set out details of the size of the economically vulnerable class for each country for all waves. Focusing on the first wave we find that the lowest levels of

economic vulnerability ranging between 18% and 24% are observed in the social democratic and corporatist countries. The higher level in Denmark rather than the Netherlands is consistent with our knowledge of the degree of labour market flexibility in the former. Similarly, the higher level in France rather than Belgium is consistent with the operation of a 'high-security' employment centred system in the latter. As we would expect, the Irish level of 32% is substantially higher. The average level of vulnerability in the Southern regime countries is similar to the Irish outcome but there is considerable internal variation with the rate varying from a low of 25% in Italy to 38% in Greece. Thus, the mean level is in line with between regime variations in inequality while the lower levels characterising Spain, and in particular Italy, are consistent with the dualistic patterns of labour market regulation in those societies and the interaction of such regulation with of family support systems.

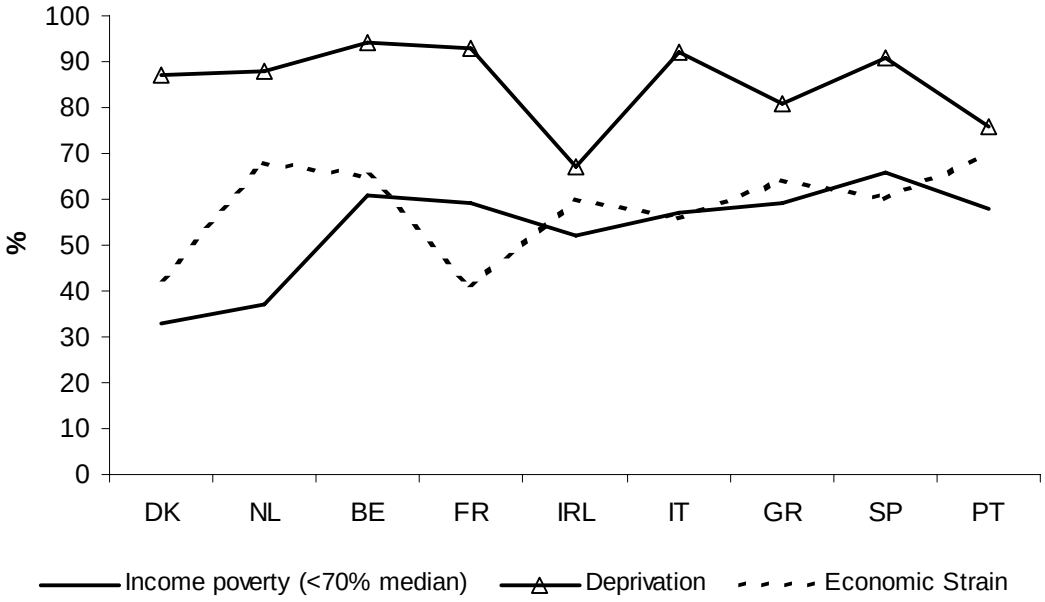
Little systematic variation is observed across time. The one exception relates to Ireland where there is steady decline in the level of vulnerability from 32% in wave 1 to 23% in wave 5. This finding is entirely consistent with the exceptional economic changes affecting the country during that period with the level of unemployment declining from 15% in 1994 to 8% in 1998. For the remaining countries, the largest percentage difference between the first and the fifth waves is 3 per cent and the overall average involves a reduction of 2 per cent. Such variation clearly plays a minor role in structuring vulnerability dynamics.

Table 2: Estimated Levels of Economic Vulnerability in ECHP Waves 1 to 5					
Economic Vulnerability Rates (%)					
	1994	1995	1996	1997	1998
Netherlands	17.5	17.4	16.3	15.5	15.2
Denmark	21.1	21.9	26.3	17.4	21.4
Belgium	18.7	19.2	22.2	21.6	19.2
France	24.3	24.7	24.6	22.3	21.0
Ireland	31.6	30.8	28.0	26.2	22.6
Italy	24.9	23.7	23.6	21.6	26.0
Spain	29.6	27.8	28.3	29.9	29.4
Portugal	32.5	29.5	31.4	29.2	29.2
Greece	37.8	38.2	40.5	41.7	38.2

The general distribution of level of economic vulnerability across countries is consistent with our expectations. In Figure 1 we illustrate the manner in which the vulnerable class is distinguished from the remainder of the population. Variation across waves in such multidimensional differentiation is modest. The key differentiating variable is the risk of being above the deprivation threshold. While the non-vulnerable are largely insulated from such risk, for the vulnerable class the risk level does not fall below three out of four. A distinctive, but somewhat less sharp pattern of differentiation, was observed in relation to subjective economic stress. Membership of the vulnerable class was associated with a probability exceeding 60% of reporting such stress in seven of the nine countries; being highest in the liberal and Southern welfare regimes. In every case a substantial differential was observed between the vulnerable and the non-vulnerable classes but a clear tendency towards higher levels of stress among the non-vulnerable in the Southern regime countries was reflected in narrower within country differentials. For income poverty levels, a relatively uniform but much less sharp pattern of differentiation was observed. Thus, while economic vulnerability was clearly characterised by heightened probability of income poverty, the primary differentiating factor was material deprivation followed by experience of subjective economic stress.[13]

[13] For further details see Whelan and Maître (2005).

Figure 1: Vulnerability to Social Exclusion: Conditional Probabilities for Income Poverty, Deprivation and Economic Stress, 1994



In the dynamic analysis that follows individuals are allocated to a latent class on the basis of the modal assignment rule with each observation in a cell being assigned to the class with the largest conditional probability. [14] The estimated classification error employing this procedure ranges from 3.2% in Denmark in wave 1 to 12.3% in Greece in wave 5. It exceeds 10% cent in only four of our 45 observations and shows modest variation across waves. The proportionate improvement over an approach that

[14] Thus, suppose there are three observed categorical variables A, B, and C, the conditional probability that someone belongs to latent class t given that this person is at level i of A, level j of B, and level k of C is given by the following expression: $\pi_{tijk}^{X\backslash ABC} = \frac{\pi_t^X \pi_{it}^{A\backslash X} \pi_{jt}^{B\backslash X} \pi_{kt}^{C\backslash X}}{\sum_{t=1}^{T} \pi_t^X \pi_{it}^{A\backslash X} \pi_{jt}^{B\backslash X} \pi_{kt}^{C\backslash X}}$

The percentage of cases misclassified is calculated as: $100x \sum_j \left[\left(1-\hat{\pi}_j\right)\cdot n_j / N\right]$ where n_j is the number of respondents giving response pattern j, $\hat{\pi}_j$ is the estimated modal latent class probability given response pattern j, and N is the total sample size. As Chan and Goldthorpe (2007: 16) note the percentage of cases misclassified by latent class models is different from the index of dissimilarity (Δ). It should be understood in terms of measurement error and not as a measure of goodness of fit.

assigns all observations to the largest latent class ranges from 0.85 in Denmark in wave 1 to 0.62 in Spain in wave 5.[15] .

Modelling Income Poverty and Deprivation Dynamics

Descriptive accounts of income poverty dynamics provide a consistent picture. High mobility is observed into and out of poverty. Far fewer people live in persistent poverty than are poor at any given time and a much larger part of the population experiences poverty at some point in time than cross-sectional figures suggest. On the other hand, incidence of poverty tends to be concentrated in the same section of the population.[16] However, as Breen and Moisio (2004) stress, such accounts lack parsimony in that they imply a saturated structural model, and do not take measurement error into account.

Breen and Moisio (2004) and Moisio (2004) addressed these issue by combining structural models of the underlying dynamics and measurement error models. The former ranged in complexity from a simple Markov model to a time-heterogeneous mover-stayer model that allows for error in measurement of the movers' states. The simple Markov chain model assumes that the state occupied at time t depends only on that occupied at time t-1. A mixed Markov model allows for more than one chain. The best known of such models is a mover-stayer where the transition probabilities in the second chain relating to the stayers are assumed to be either one or zero. The model assumes two underlying groups – one stable between successive years and another involving individuals who move in and out of income poverty according to a simple Markov change process. The final structural model applied by Breen and Moisio

[15] See Mc Cutcheon (1987: 36–37) for a discussion of these indices.

[16] Breen and Moisio (2004), Whelan *et al* (2004) and Whelan and Maitre (2006) for details.

(2004) is a mover-stayer model in which the movers' chain is allowed to be heterogeneous over time. The model is specified as follows

$$F_{ijklm} = N\sum_{s=1}^{S}\pi_s\delta_{si}\tau_{s,j|i}\tau_{s,k|j}\tau_{s,l|k}\tau_{s,m|l} \qquad (2)$$

This specifies several Markov processes or chains (indicated by s=1,...,S). The expected frequency is now a sum over these processes, and the new parameter, π_s, indicates the proportions of the sample in each of the S chains. The simple Markov model arises when S=1, but for S >1 the membership of the different chains is defined by latent classes. Another important special case of this model arises when S=2 and, for one of the processes, $\tau_{j|i} = 1$ if state j = state i, 0 otherwise, and similarly for all the other transition probabilities. This is the classic mover-stayer model that specifies that there are two non-mover groups, one never in poverty and one always in poverty and an additional group of movers whose pattern of transitions follow a simple Markov chain in which the state occupied at time t depends only on the state occupied at time t-1. The time heterogeneous version allows the poverty transition probabilities of the mover group to vary over time.

Measurement error is captured by assuming that to each observation of the states there corresponds a latent variable that measures the true distribution over the state. Stayers are assumed to be measured without error. Reliabilities for the movers are constrained to be constant over time. The model is written as

$$F_{ijklm} = N\sum_{a=1}^{A}\sum_{b=1}^{B}\sum_{c=1}^{C}\sum_{d=1}^{D}\sum_{e=1}^{E} \delta_a \rho_{i|a} \delta_b \rho_{j|b} \delta_c \rho_{k|c} \delta_d \rho_{l|d} \delta_e \rho_{m|e} \quad (3)$$

The latent variables are denoted a=1,...,A, b=1,...,B, c=1,...,C, d=1,…,D and e=1,…E. The distribution of each latent variable is given by δ and the relationship between the observed variables *I, J, K,L* and *M* and their latent counterparts, *A, B, C,D* and *E* is described by the conditional response probabilities ρ. The closer the response probability matrix is to an identity matrix (i.e. $\rho_{manifest|latent}$ =1 when the latent and manifest states are the same, 0 otherwise) the smaller is the measurement error of the variable. These ρ parameters can thus be interpreted as measures of reliability.

Finally this measurement model can be combined with the time heterogeneous mover-stayer model. The final model is specified as

$$F_{ijklm} = N\sum_{s=1}^{S}\sum_{a=1}^{A}\sum_{b=1}^{B}\sum_{c=1}^{C}\sum_{d=1}^{D}\sum_{e=1}^{E} \pi_s \delta_{sa} \tau_{s,b|a} \tau_{s,c|b} \tau_{s,d|c} \tau_{s,e|d} \rho_{s,i|a} \rho_{s,j|b} \rho_{s,k|c} \rho_{s,l|d} \rho_{s,m|e} \quad (4)$$

Applying this model to ECHP data, Breen and Moisio (2004) concluded that mobility in poverty dynamics was overestimated by between 25% and 50%.

Modelling Economic Vulnerability

In Table 3 we display the fit statistics for the application of the above model to the five waves of data deriving from the modal allocation of individuals to the vulnerable or non-vulnerable classes. While the models do not provide a strict statistical fit, they account for between 98.1% and 99.2% of the independence model deviance with the

G^2 ranging between 55.0 for Denmark and 413.9 for Spain. The proportion of cases misclassified varies between 0.019 for Denmark and 0.044 cent for Spain. The comparable range for earlier analysis by Whelan and Maître (2006:314) was 0.017 to 0.030 for income poverty and 0.012 cent to 0.038 per cent for deprivation. Thus our preferred model provides a broadly satisfactory account of the dynamics of economic vulnerability.

Table 3: Fit Statistics for the time-heterogeneous mover-stayer model and percentage reduction in G^2 from the independence model

	G^2	Δ	r G^2
Netherlands	164.9	0.022	98.7
Belgium	75.0	0.022	99.2
Denmark	55.0	0.019	99.2
France	294.2	0.034	98.5
Ireland	178.7	0.031	98.6
Italy	383.5	0.033	98.4
Spain	413.9	0.044	98.1
Portugal	337.2	0.041	98.7
Greece	276.4	0/043	98.6

In Table 4 we display cross-national variation in the reliability rates for movers. The modal response probabilities in the diagonals provide separate estimates of reliability for the vulnerable and non-vulnerable classes. Earlier findings showed a pronounced asymmetrical reliability pattern whereby errors levels were much higher for the poor leading to substantial overestimates poverty mobility exits. This asymmetry was even more pronounced in relation to deprivation. While the pattern of reliability for economic vulnerability is also asymmetrical, in six out of the nine cases the difference is negligible and the lowest level of reliability for the vulnerable class is 0.84. The average level of reliability for vulnerability is 0.91 and for non-vulnerability 0.95.

Table 4: Reliability Rates for Movers			
		Observed	
		Not Vulnerable	Vulnerable
	Latent		
Denmark			
	Not Vulnerable	1.00	0.00
	Vulnerable	0.01	0.99
Netherlands			
	Not Vulnerable	0.96	0.04
	Vulnerable	0.06	0.94
Belgium			
	Not Vulnerable	0.93	0.07
	Vulnerable	0.11	0.89
France			
	Not Vulnerable	0.95	0.05
	Vulnerable	0.14	0.86
Ireland			
	Not Vulnerable	0.93	0.07
	Vulnerable	0.09	0.91
Italy			
	Not Vulnerable	0.93	0.07
	Vulnerable	0.09	0.91
Greece			
	Not Vulnerable	0.96	0.04
	Vulnerable	0.05	0.95
Spain			
	Not Vulnerable	0.94	0.06
	Vulnerable	0.16	0.84
Portugal			
	Not Vulnerable	0.96	0.04
	Vulnerable	0.10	0.90
Average[17]			
	Not Vulnerable	0.95	0.05
	Vulnerable	0.09	0.91

In Table 5 we set out the size of the mover/stayer classes and the proportions economically vulnerable in wave 1. The degree of variation is substantially sharper than in the case of income poverty.[18] The highest proportion of stayers is observed in the Netherlands and Belgium where approximately three in four fall into this category. This figure falls to close to six out of ten for Denmark, France and Ireland before declining further to one in two for Italy, Spain and Portugal. Finally the lowest level of four out of ten is observed for Greece.

[17] Throughout this paper when we report averages they are simply the mean of the reported country values.
[18] See Whelan and Maître (2006)

From Column 4 of Table 5 we see the proportion vulnerable in the first wave is in every case substantially higher for movers. The relevant figure ranges from a low of 0.30 in Denmark to a high of 0.57 for Portugal. With the exception of Ireland, the figure for the Northern European countries lies in the narrow range running from 0.30 to 0.37. Ireland in contrast displays a much higher rate of 0.47. Countries with the highest levels of movers also exhibit the highest probability of being vulnerable, conditional on being a mover. Substantially higher levels of vulnerability among their mover segments, which are almost three times higher than for any other country, also contribute significantly to the distinctively higher overall levels of vulnerability in Greece and Portugal. In order to illustrate the combined impact of such effects in the section that follows we consider cross-national variation in economic vulnerability profiles.

Table 5: Class size of movers/stayers and initial proportion economically vulnerable			
		Class Size	Proportion Vulnerable in Wave 1
Netherlands			
	Mover	0.24	0.37
	Stayer	0.76	0.05
Belgium			
	Mover	0.28	0.37
	Stayer	0.72	0.07
Denmark			
	Mover	0.40	0.30
	Stayer	0.60	0.08
France			
	Mover	0.37	0.33
	Stayer	0.63	0.10
Ireland			
	Mover	0.41	0.47
	Stayer	0.59	0.11
Italy			
	Mover	0.48	0.38
	Stayer	0.52	0.08
Spain			
	Mover	0.51	0.48
	Stayer	0.49)	0.12
Portugal			
	Mover	0.49	0.57
	Stayer	0.51	0.28
Greece			
	Mover	0.58	0.44
	Stayer	0.42	0.28
Average			
	Mover	0.42	0.41
	Stayer	0.59	0.13

Cross-national Variation in Economic Vulnerability Persistence

We follow Fouarge and Layte (2005) in constructing profiles that allow us to examine both the persistence and recurrence of vulnerability by distinguishing between:

- The persistently non-vulnerable – never vulnerable during the transient period
- The transient vulnerable – vulnerable only once during the accounting period.
- The recurrent vulnerable – vulnerable more than once but never longer than two consecutive years.

- The persistently vulnerable – for a consecutive period of at least three years.

From Table 6 we can see that overall over 60% of individuals are found in the persistently non-vulnerable category; 22% are equally divided between the transient and recurrent categories and 16% are found in the persistently vulnerable group. Compared to earlier findings relating to income poverty and deprivation, this involves a greater concentration of observations in the intermediate categories with corresponding lower levels of both types of persistence. For social democratic and corporatist countries it is the number persistently vulnerable that is lower than in the income poverty case. In contrast for the Southern regime countries it is the number persistently non-vulnerable that is lower. The foregoing pattern produces sharper contrasts between countries than in the case of income poverty.

Table 6: Latent Vulnerability Profiles by Country

	Persistently Non-Vulnerable	Transient	Recurrent	Persistently Vulnerable
Netherlands	75.3	7.5	6.6	10.5
Belgium	73.6	6.3	7.4	12.8
Denmark	64.6	11.5	11.2	12.7
France	65.3	9.4	7.3	18.0
Ireland	63.1	9.4	8.3	19.2
Italy	64.6	8.3	10.3	16.9
Spain	56.1	8.6	12.0	23.2
Portugal	45.9	10.1	10.5	33.6
Greece	41.3	13.6	15.3	29.8
Average	61.6	11.4	11.0	16.0

The Netherlands and Belgium display by far the highest levels of persistent non-vulnerability with three quarters of respondents falling into this category; while between 11 to 13% are found in the persistently vulnerable category. While Denmark has a lower level of persistent non-vulnerability it differs from the Netherlands and Belgium only in being almost twice as likely to be found in the transient and recurrent categories; a finding that is consistent with its active labour market policy. The social

democratic welfare regimes countries and the corporatist case closest to a "high-security" employment centered system display the lowest levels of economic vulnerability. In France, Ireland and Italy two-thirds of the respondents are located in the persistently non-vulnerable category. However, the levels of persistent vulnerability are somewhat higher than for all of the foregoing countries with rates ranging from 17 to 19%. While the French outcome is consistent with our expectations, the Irish and Italian outcomes might seem more favourable than might be expected. In the Irish case the impact of its liberal regime status is likely to have been moderated by the substantial decline in the overall level of vulnerability during the period we are considering. In Italy the dualistic nature of the labour market and the buffering of potentially vulnerable younger individuals by family support systems, including the scale of multigenerational households, are factors that are likely to have contributed to the outcome. In the Spanish case a lower level of persistent non-vulnerablity and a corresponding increase in the level of persistent vulnerability is observed; the respective figures being 56% and 23%. However, a less potent version of the factors operating in the Italian case contributes to maintaining a clear differentiation between it and the Portuguese and Greek cases. For the later cases the level of persistent non-vulnerability declines to 46% and 41%, respectively, and the scale of persistent vulnerability increase to 34% and 30%.

A summary picture of cross-national variation in economic vulnerability and income poverty is provided in Table 7 where we display the odds ratios for persistent non-poverty and persistent non-vulnerability with the Netherlands as the reference category. For income poverty the range of odds ratios runs from 0.73 in Denmark to 2.65 in Spain. For economic vulnerability a sharper pattern of variation emerges with

the value of the odds ratio varying from 1.00 in the Netherlands to 5.52 in Greece. Three clusters of values emerge with the Netherlands and Belgium at the low end of the continuum Denmark, France, Ireland and Italy occupying an intermediate position with values ranging between 2.06 and 2.27 and Spain, Portugal and Greece at the opposite end of the continuum with respective values of 3.03, 4.59 and 5.52.

Table 7: Cross-National Comparisons of being Persistently Non-Income Poor and Persistently Non Economically Vulnerable with the Netherlands as the Reference Category for Latent Outcomes

	Odds Ratios	
	Income Poverty	Economic Vulnerability
Netherlands	1.00	1.00
Belgium	1.41	1.23
Denmark	0.73	2.07
France	1.27	2.06
Ireland	1.88	2.27
Italy	1.52	2.12
Spain	2.65	3.03
Portugal	2.33	4.59
Greece	2.37	5.52

A Comparison of Latent and Observed Profiles

The foregoing comparisons relate to the latent profiles and the issue arises as to how far our conclusions generalize to the corresponding observed outcomes. In the case of economic vulnerability we are using the term ‘observed’ to refer to the outcomes arising from modal allocation based on the cross-sectional latent class analysis. In Table 8 we compare the divergence of observed and latent distributions for economic vulnerability and income poverty employing the index of dissimilarity. The average value of this index in the case of economic vulnerability is 0.034 while for income poverty it rises to 0.123. In every case the lower value of the index is observed in relation to economic vulnerability. The range of variation for economic vulnerability runs from 0.015 in Denmark to 0.090 in Portugal. For income the lowest value of 0.079 is found for Ireland and the highest of 0.171 for Italy. In every case the

'observed' economic vulnerability profile provides a considerably more accurate picture of the latent vulnerability profile derived than is the case for income poverty.

Additional analysis shows that pattern cross-national difference for observed and latent patterns are similar. In contrast for income poverty there is a significant change in the ranking of countries as one moves from the observed to the latent outcomes.[19]

Table 8: Dissimilarity Indices for Comparisons of Observed and Latent Income, Deprivation and Economic Vulnerability

	Income Poverty	Economic Vulnerability
Netherlands	0.094	0.042
Belgium	0.147	0.016
Denmark	0.121	0.015
France	0.089	0.040
Ireland	0.079	0.053
Italy	0.171	0.051
Spain	0.118	0.066
Portugal	0.119	0.090
Greece	0.136	0.048
Average	0.123	0.034

The Distribution of Economic Vulnerability by Social Class

In analyzing the relationship between social class position and economic vulnerability, we make makes use of an aggregated version of the European Socio-economic Classification (ESeC). The purpose of ESeC, and other social class schemes in the same tradition, as Goldthorpe (2002:213), observes is to bring out the constraints and opportunities typical of different class positions particularly as they bear "on individuals *security, stability and prospects* as a precondition of constructing explanations as of empirical regularities". [20]

[19] Further details of the analysis are available from the authors.
[20] See Rose and Harrison (forthcoming) for a detailed discussion of the rationale underlying the development of ESeC and details of the operationalisation procedures.

We are not in a position to examine trends over time in the impact of social class. However, by using an outcome measure that captures both multidimensional and dynamic aspects and by providing cross-national comparison we hope to add to the evidence base in an area that, as Goldthorpe (2000) notes, has been characterized by a discrepancy between the strength of the claims made and the degree of systematic investigation. Clearly a failure to observe systematic variation by social class in exposure to persistent economic vulnerability would seriously undermine claims for the continuing importance of class based explanations of variation in life-chances.

Our analysis employs a six-category aggregated version of the ESeC. For our present purposes, we assign the social class of the household reference person to all household members. Where a couple are jointly responsible for he accommodation we use a dominance procedure to decide between them.

The six classes with which we operate are

- Employers, higher grade professional, administrative & managerial occupations (ESeC Classe 1 & 2).
- Intermediate occupations - Higher grade white collar workers (ESeC Class 3).
- Lower supervisory & lower technician occupations (ESeC Class 6).
- Small employer and self employed occupations (ESeC Classes 4 & 5).
- Lower services, sales & clerical occupations & lower technical occupations (ESeC Classes 7 &8).
- Routine occupations (ESeC Class 9).[21]

From Table 9 it is clear that in every country, location in the professional managerial class proves to be an enormously effective buffer against economic vulnerability. The

[21] Those who could not be allocated a class position on the basis of their current or previous occupation of the household reference person were excluded from the analysis.

number persistently non-vulnerable ranges from a high of 90% in Spain to a low of 77% in Denmark. Variation in levels of persistent vulnerability is even more modest with the relevant figure going from 2% in Spain to 7% in Ireland. Those in intermediate occupations occupy the next most favourable position with the numbers persistently non- vulnerable ranging from 80% in the Netherlands to 59% in Greece with the corresponding figures for persistent vulnerability running from 4% in Spain to 17% in Denmark. The level of advantage enjoyed by the self-employed classes and the lower supervisory/technician/services categories is broadly similar in most countries. Taken together the level of persistent non-vulnerability goes from 73% in the Netherlands to 48 % in Greece and that for persistent vulnerability from 26% in Ireland to 6% in the Netherlands.

Substantial variation across countries is also observed for the lower services/technical class and for routine occupations. For the former the level of persistent non-vulnerability ranges from 64% in the Netherlands and Belgium to 30% in Greece and for persistent vulnerability from 12 % in Belgium to 34 % in Portugal. Unlike the case for the higher social classes, the levels vary fairly systematically across welfare regimes. A similar pattern is observed for the routine occupation where the level of persistent non-vulnerability runs from 59% in the Netherlands to 28 % in Greece and the scale of persistent vulnerability from 18% to 37%.

Table 9: *Ec*onomic vulnerability profile by *ESeC by Country*

	Large emp, Hi prof + lo prof	Intermediate occupations	Small emp & self emp. (inc. ag)	Lo supervis/ technician	Lo services + Lo technical	Routine occupations
Netherlands						
Persistent non-EV	88.4	80.3	63.4	72.5	64.4	59.0
Transient EV	4.9	8.6	8.1	12.8	8.1	11.7
Recurrent EV	3.7	4.4	6.7	8.6	11.4	11.0
Persistent EV	3.0	6.8	21.8	6.1	16.1	18.3
Denmark						
Persistent non-EV	77.3	60.7	60.4	70.4	54.1	44.8
Transient EV	8.5	13.6	12.9	8.1	16.5	11.9
Recurrent EV	8.3	8.3	12.9	10.0	16.7	23.0
Persistent EV	6.0	17.4	13.7	11.6	12.7	20.3
Belgium						
Persistent non-EV	87.8	75.6	59.1	69.3	64.3	54.4
Transient EV	4.2	3.8	10.6	13.3	13.9	12.6
Recurrent EV	4.5	6.4	13.2	7.1	9.5	10.6
Persistent EV	3.5	14.2	17.1	10.2	12.2	22.5
France						
Persistent non-EV	85.1	67.8	54.7	63.6	46.7	40.7
Transient EV	7.3	14.3	14.7	10.5	13.9	13.7
Recurrent EV	4.0	7.6	12.0	8.6	14.2	16.8
Persistent EV	3.6	10.3	18.6	17.2	25.2	28.8
Ireland						
Persistent non-EV	83.4	69.4	59.5	58.6	42.3	36.2
Transient EV	7.0	10.6	19.1	5.6	14.6	10.0
Recurrent EV	3.0	11.6	12.4	9.9	14.2	19.5
Persistent EV	6.7	8.4	9.0	25.8	28.8	34.2
Italy						
Persistent non-EV	83.6	67.6	58.4	56.5	48.1	44.7
Transient EV	6.8	11.9	13.9	15.4	13.0	15.9
Recurrent EV	6.2	10.2	13.2	12.1	12.1	17.7
Persistent EV	3.5	10.3	14.6	16.0	26.8	21.8
Portugal						
Persistent non-EV	87.5	78.5	46.7	52.4	33.9	32.4
Transient EV	5.3	7.0	13.9	18.8	16.5	16.5
Recurrent EV	4.6	5.1	11.7	13.4	15.1	20.2
Persistent EV	2.6	9.4	27.7	15.4	34.4	30.8
Spain						
Persistent non-EV	89.7	76.1	47.5	53.0	37.9	30.8
Transient EV	5.6	11.9	13.0	18.2	13.3	13.8

Recurrent EV	2.9	8.0	20.4	10.3	20.6	23.8
Persistent EV	1.8	4.0	19.1	18.6	28.1	31.7
Greece						
Persistent non-EV	82.9	58.8	31.3	48.0	29.7	27.9
Transient EV	9.2	21.8	15.7	24.0	18.2	13.7
Recurrent EV	4.4	12.1	19.8	15.5	20.1	21.5
Persistent EV	3.5	7.3	33.2	12.5	31.9	36.9

In Table 10 we set out the results for a set of ordered logistic regressions showing the relationship between economic vulnerability and social class with the professional and managerial category taken as the reference category. The ordered logit allows the intercepts to vary but involves assumption of parallel slopes for the J-1 cumulative logits that can be formed from J categories. The model is a proportional odds model with the odds ratio assumed to be constant for each of the cumulative comparison. [22]

[22] This assumption is not fully justified in this case and the multinomial model provides superior fit. However, focusing on the latter does not alter our central conclusion and we have taken advantage of the parsimony offered by the ordered logit model.

Table 10: Ordinal Logit Coefficients for Relationship between Economic Vulnerability and Social Class

	NL			DK			BE			FR			IRL			IT			PT			SP			GR		
	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)
Int Med Occup	0.62	0.12	1.87	0.83	0.09	2.29	0.92	0.95	2.51	0.98	0.06	2.66	0.77	0.09	2.16	0.89	0.06	2.44	0.70	0.10	2.01	0.98	0.10	2.66	1.13	0.09	3.10
Self-emp	1.61	0.13	4.98	0.81	0.11	2.25	1.60	0.11	4.95	1.58	0.07	4.85	1.10	0.08	3.00	1.29	0.05	3.63	2.16	0.08	8.67	2.30	0.07	9.97	2.45	0.07	11.59
Lo superv	1.01	0.08	2.74	0.41	0.12	1.51	1.11	0.12	3.03	1.26	0.08	3.53	1.45	0.10	4.26	1.35	0.07	3.86	1.78	0.11	5.93	2.05	.08	7.77	1.55	0.10	4.71
Lo serv & Techn	1.50	0.09	4.46	0.99	0.09	2.69	1.33	0.11	3.78	1.93	0.06	6.89	1.94	0.08	6.96	1.80	0.05	6.05	2.61	0.08	13.60	2.73	0.07	15.33	2.44	0.07	11.47
Routine occup	1.69	0.12	5.44	1.44	0.11	4.22	1.81	0.09	6.11	2.17	0.06	8.76	2.24	0.08	9.39	1.81	0.06	6.11	2.59	0.09	13.33	2.98	0.07	19.69	2.63	0.08	13.87
Nagelkerke R Square	0.10			0.06			0.11			0.15			0.16			0.11			0.19			0.23			0.22		
Log likelihood reduction	646.95			252.92			519.61			1687.30			1138.32			1464.00			2049.76			3167.55			2269.95		
Degrees of freefom	5			5			5			5			5			5			5			5			5		
N	8415			4124			5561			11451			7244			13900			10142			12640			9919		

A clear pattern of class advantage emerges across all nine countries. The professional and managerial classes occupy the most favoured position followed by the intermediate occupations. The self-employed and the lower supervisory/technicians come next in line and the lower services/technical are closest to the routine non-manual.

While the routine occupations class is in every case the most disadvantaged, substantial cross-national variation exist in the scale of such disadvantage. Relative modest disparities between the routine occupations class and the professional managerial class are observed for the social democratic or strong corporatist welfare regimes i.e. with the odds ratio varying from 4:1 for Denmark to 6:1 for Belgium. For France, representing a weaker form of corporatist regime and Ireland the figure rises to 9:1. Italy once again proves to be something of an exception to the Southern European pattern with a relatively modest odds ratio of 6:1. For the remaining Southern European countries the odds ratio rises to 13:1 for Portugal and 14:1 for Greece and 20:1 for Spain.

For the lower services and technical group the absolute value of the coefficients are lower than for the lower-services and technical class but the cross-national pattern is similar. For the social democratic and 'high-security' corporatist cases the odds ratio ranges between 3:1 and 4:1. It rises to 7:1.for France and Ireland before reaching 11:1 for Greece, 14:1 for Portugal and 15:1 for Spain.

For the self-employed the major contrast is between the Southern regime countries, excluding Italy, and the remainder. For the former the odds ratio is 10:1 and for the latter 3:1.

Comparing the lower supervisory class with their lower service and technical counterparts, we see a reduction in the values of the odds ratios and the scale of cross-national variation. Thus, the odds ratio relating to the contrast with the professional and managerial group range from less than 2:1 in Denmark to 8:1 in Spain. Finally we observe a further reduction of odds ratio values for the intermediate occupations class accompanied by an extremely modest range of cross-national variation. Thus the level of disadvantage relative to the professional and managerial class runs from 2:1 in the Netherlands to 3:1 in Greece.

Overall a clear hierarchy of class effects emerges across countries. The only qualification to this conclusion is the entirely predictable one that the relative position of the self-employed is worse in the Southern regime countries. The sharpness of class differentials vary across welfare regimes in a manner that is broadly in line with our expectations; being greatest in the Southern regime countries and weakest in the social democratic and employment active regimes. Such variation is most pronounced in the classes at the bottom of the class continuum with ability to insulate oneself from economic vulnerability becoming more evenly spread the further one moves up the hierarchy.

Conclusions

In this paper we have sought to implement an approach to social exclusion that captures both multidimensional and dynamics aspects of social exclusion. Our initial analysis showed that it was possible to identify economic vulnerability at the cross-sectional level. Such vulnerability varies across welfare regimes in a manner broadly consistent with our expectations. Variation in vulnerability levels across waves was extremely modest.

Descriptive accounts of the dynamics of income poverty and deprivation involve significant overestimation of the level of exits from such states. Comparison of observed and latent outcomes reveals a pattern of reliability coefficients that takes a pronounced asymmetrical form; with the coefficients being substantially higher for latent non-poverty and non-deprivation. For economic vulnerability, the pattern was a good deal more symmetrical and the reliability coefficients for latent vulnerability were generally higher than in the case of income or deprivation.

The size of the stayer class varied across welfare regimes broadly in line with our expectations. Vulnerability rates in wave one for both movers and stayers were higher for both liberal and Southern welfare regimes. Consequently levels of persistent vulnerability varied systematically by welfare regime; with a degree of internal variation that was consistent with the influence of insider-outsider labour market arrangements and the mediating role of family support systems.

Cross-national variation in levels of vulnerability persistence was substantially higher than in the case of income poverty. In addition, the extent of divergence between observed and latent income dynamics profile was substantially lower for economic vulnerability than income poverty. As a consequence, estimates of cross-country differences are largely unaffected by the profile on which we focus.

Sociological interest in vulnerability has been associated with the argument that one of the consequences of globalization has been that exposure to risk has become more pervasive and less structured in class terms. While we are not in a position to examine trends over time in class effects, the fact that in every country the higher social classes enjoy very high levels of protection from vulnerability argues against the emergence of a more pervasive distribution of risk. Systematic variation in vulnerability levels was observed across countries and social classes. However, the latter was concentrated among classes at the lower end of the hierarchy; indicating strict limits to cross-national convergence associated with globalization.

Our analysis shows that it is possible to develop an approach to modeling economic vulnerability dynamics that successfully incorporates the concern with multidimensionality and dynamics that is a defining feature of the concept of social exclusion. The findings we have presented suggest that the problems with measurement error associated with earlier efforts to model income poverty and deprivation dynamics can be overcome. As a consequence, it is possible to use models of economic vulnerability to document and develop insights into cross-national and social class variations.

References

Atkinson, A .B. 1998 "Social Exclusion, Poverty and Unemployment" in A. B Atkinson and J. Hills (eds.), *Exclusion, Employment and Opportunity*, Centre for Analysis of Social Exclusion, CASE paper 4, London School of Economics

Arts, W. and Gelissen, J. (2002) 'Three Worlds of Welfare Capitalism or More?', *Journal of European Social Policy* 12, 2, : 137–58.

Beck, U. (2000), *What is Globalisation?*, Cambridge, Polity Press.

Behr, A. Bellgardt, E. and Rendtel, U. (2005), 'Extent and Determinants of Panel Attrition in the European Community Household Panel Study', *European Sociological Review, 21,5: 489-512.*

Berghman, J. (1995) 'Social exclusion in Europe: Policy context and analytical framework', in G. J. Room (ed.), Beyond the Threshold, Bristol: The Policy Press.

Bison, I. and Esping-Andersen, G. (2000) 'Unemployment, Welfare Regime and Income Packaging', in D. Gallie and S. Paugam (eds), *Welfare Regimes and the Experience of Unemployment in Europe*, Oxford: Oxford University Press.

Bonoli, G. (1997) 'Classifying Welfare State: a Two dimensional Approach', *Journal of Social Policy* 26, 3: 351–72.

Breen, R. and Moisio, P.: (2004), Overestimated poverty mobility: Poverty dynamics corrected for measurement error, *Journal of Economic Inequality* 2,3: 171–191.

Castells, M. (2000), *The Rise of Network Society*, 2nd edition, Oxford: Blackwell

Chambers, R. (1989) 'Vulnerability: How the Poor Cope: Editorial', *IDS Bulletin* 20: 2.

Chan, T. W. and Goldthorpe, J. H (2007), 'Social Stratification and Cultural Consumption: Music in England', *European Sociological Review*, 23,1: 1-19.

De Haan, A. (1998) 'Social Exclusion: An Alternative Concept for the Study of Deprivation?', *IDS Bulletin* 29(1): 10–19.

Dewilde, C.: The multidimensional measurement of poverty in Belgium and Britain: A categorical approach, *Journal of Social Indicators* 68(3) (2004), 331–369.

Esping-Andersen, G. (1990) *The Three Worlds of Welfare Capitalism.* Cambridge: Polity Press.

Ferrera, M. (1996) 'The Southern Welfare State in Social Europe', *Journal of European Social Policy* 6,1: 17–37.

Fouarge, D. and Layte, R.: The duration of spells of poverty in Europe, *Journal of Social Policy*, 34(3) (2005), 1–20.

Gallie, D. and Paugam, S. (2000), 'The Experience of Unemployment in Europe: The Debate, D. Gallie and S. Paugam (eds.), *Welfare Regimes and the Experience of Unemployment in Europe*, Oxford; Oxford University Press.

Goldthorpe, J. H. (2002), 'Occupational Sociology, Yes: Class Analysis, No. Comment on Grusky and Weeden's Agenda' *Acta Sociologica*, 45: 211-25

Goldthorpe, J. H. (2007), *On Sociology Second Edition*, *Volume One*: *Critique and Programme* , Stanford, Stanford University Press

Goodin, R. E., Heady, B., Muffels, R. and Dirven, H. J. (1999) *The Real Worlds of Welfare Capitalism*. Cambridge: Cambridge University Press

Iacovou, I. (2004), 'Patterns of Family Living', in R. Bertoud and M. Iacovu (eds), *Social Europe: Living Standards and Welfare States*, Cheltenham, Edwrd Elgar.

Ianelli, C. and Soro-Bonamatí, A. (2003), 'Transition Pathways in Italy and Spain: Different patterns similar vulnerability' in Müller, W. and Gangl. M., *Transitions from Education to Work in Europe*, Oxford University Press.

Kronauer, m (1998), 'Social Exclusion' and 'Underclass' – New Concepts for the Analysis of Poverty', in H-J Andreß (ed.), *Empirical Poverty Research in Comparative Perspective*. Aldershot: Ashgate

Mc Cutcheon, A. and Mills, A. (1998). Categorical Data Analysis; Log-Linear and Latent Class Models. In Scarborough, E. and Tannenbauum, E. (Eds) *Research Strategies in the Social Sciences*. Oxford: Oxford University Press.

Mc Cutcheon, A. (1987). Latent Class Analysis, London: Sage Publications.

Moisio, P.: (2004), *Poverty Dynamics According to Direct, Indirect and Subjective Measures. Modelling Markovian Processes in a discrete time and space with error*, STAKES Research Report 145.

Moisio, P (2005), A latent class application to the multidimensional measurement of poverty, *Quantity and Quality–International Journal of Methodology* 38,6, 703–717.

Nolan, B. and Whelan, C. T (2007), "On the Multidimensionality of Poverty and Social Exclusion", in Micklewright, J and Jenkins, S. *Inequality and Poverty Re-examined*, Oxford: Oxford University Press .

Paugam, S. (1996) 'The Spiral of Precariousness: A Multidimensional Approach to the Process of Social Disqualification in France', in G.J. Room (ed.) *Beyond the Threshold*, Bristol: Policy Press.

Perry, B.: (2002), The mismatch between income measures and direct outcome measures of poverty, *Social Policy Journal of New Zealand* 19, 101–127.

Rendtel, U., Langeheine, R. and Bernstein, R.: (1998), The estimation of poverty dynamics using different household income measures, *Review of Income and Wealth* 44 , 81–98.

Rose, D .and Harrison, E. (forthcoming), the European Socio-economic Classification: A New Social Class Schema for Comparative European Research, *European Societies*

Tohara, L. and Malo, M.(2000), 'The Spanish experiment: Pros and Cons of Flexibility at the Margin', in G. Esping-Andersen and M. Regini (eds). *Why Regulate Labour Markets?* , Oxford: Oxford University Press.

Watson, D. 2003, "Sample Attrition Between Wave 1 and 5 in the European Community Household Panel", *European Sociological Review*, 19, 4, pp. 361-378.

Whelan, C.T.**,** Layte, R., Maître, B., Nolan, B. (2001), Income, Deprivation and Economic Strain: An Analysis of the European Community Household Panel, *European Sociological Review*, 17, 4: 357-37

Whelan, C.T., Layte, R. and Maître, *B.* (2004*),* "Understanding the Mismatch between Income Poverty and Deprivation: A Dynamic Comparative Analysis*", European Sociological Review, 20 (4), 287-302.*

Whelan, C. T. and Maître, B. (2005). Vulnerability and Multiple Deprivation Perspectives on Economic Exclusion in Europe: A Latent Class Analysis, *European Societies*, 7, 423–450.

Whelan, C. T. and Maître, B. (2006), Comparing Poverty and Deprivation Dynamics: Issues of Reliability and Validity, *Journal of Economic Inequality*, 4: 303-323

Wirz, C. and Meyer, L.(2002), The European Community Household Panel (ECHP), *Schmollers Jahburch (Journal of Applied Social Studies*, 112(1) , 43–54.