Poverty entry and exit during old-age: comparative evidence form the European Community Household Panel

by

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Abstract

This paper investigates the determinants of poverty entry and exit of the old-age population in eleven European countries using the European Community Household Panel (1994-2001). Adopting an approach which has become standard in the econometric literature on poverty dynamics, I use a multivariate piece-wise constant discrete-time hazard model to estimate the major determinants of the hazard of both poverty entry and entry for the population in retirement age compared with the working age population, and by taking into account individual unobserved heterogeneity. The methodology enables to assess the impact of personal characteristics, household characteristics, and other labour market factors on individuals' probability to leave and to enter poverty, and to make predictions about the mean durations of poverty spells for specific population subgroups in different countries. Particular attention has been devoted to investigate how changes in households' disposable income composition after retirement and life-time changes impact on poverty spells. The main results show that widowhood and living in single-person households are among the major factors decreasing the hazard of leaving poverty in all the countries considered. Further, the employment status of other household members is another key factor for insuring the elderly against the risk of poverty, in particular in Ireland and Southern European Countries. A pooled estimation across countries of the hazard of entering and leaving poverty has also been pursued, using indicators of social expenditure and of old-age relevant social protection reforms during the late 1990s to identify country fixed effects.

1 Introduction and motivation

The reforms of social protection systems currently ongoing in many European countries and the associated phenomena of early exits from the labour market and of an increasing development of private pensions schemes are at the origin of a growing variability of income sources during later stages of life. These aspects make the analysis of income patterns of the elderly and of the lifetime changes associated to them particularly relevant for both researchers and policy-makers. In Europe, the elderly represent one of the social groups at higher risk of poverty and social exclusion with respect to other population subgroups: the EU has adopted since 2001 an Open Method of Coordination in the field of social policy and social protection, which, in the specific domain of "pensions" (one of the largest items of total social protection expenditure in the European Union), set explicit common objectives to preclude the exclusion of older peole. Figure 1 illustrates the overall picture related to these issues, showing the trends in poverty rates by age groups observed in the second half of the 1990s: in most EU-15 countries, poverty rates for old aged people are well above national poverty rates (the EU-15 average poverty rate in 2001 was around 15%), and, in a number of countries, the elderly are at higher risk of poverty than other traditionally vulnerable population subgroups (e.g. children). Elderly poverty is particularly severe amongst the "oldest old" (this category includes individuals aged 75 and above) and, in some countries (Ireland), exhibits strong gender disparities. This

paper pursues and in-depth analysis of the determinants of the risk of falling into poverty and of poverty persistence during old age across eleven European countries, improving upon the existing literature by using the cross-country comparable longitudinal survey of the European Community Household Panel (ECHP). Poverty entry and exit are modelled using a piece-wise constant discrete-time hazard model taking into account unobseved heterogeneity. The paper shows that low educational attainment, weak labour market participation of household members, poor health status, living in single-households and widowhood are the major factors negatively affecting the probability of leaving poverty as well as the main determinants of poverty entry and discusses their different magnitudes across countries. The chapter is organized as follows: the next section summarizes the related relevant literature; the third section briefly describes the data; the fourth section illustrates the methodology followed in the analysis of poverty spells, while the results are presented and commented in the fifth sections; the last section concludes.

2 Related literature and data

In spite of the number of country-specific studies on poverty persistence (Cappellari and Jenkins, 2002, Devicienti, 2001, Giraldo et. al., 2001) and on the relationship between retirement and incomes in later stages of life (Bardasi, Jenkins and Rigg, 2001, Johnson and Stears, 1995 and 1998), there is no systematic comparative study

on elderly poverty at the European level. The exception are some publications of international organizations (see OECD, 2001) which follow, though, a more descriptive approach. The majority of studies are instead based on the comparison between two or three countries: Zaidi, Frick and Büchel (2003), for instance, compare income mobility patterns during old age in the UK and in West Germany; Zaidi, Rake and Falckingham (2001) provide a set of mobility measures for British pensioners' incomes between 1991 and 1997; Zaidi and De Voos (2002) investigate income mobility among the elderly in the UK and in the Netherlands, while Sefton et. al. (2005) compare penioners' retirement decisions and income arrangements in Denmark, UK and Germany. Fourage and Layte (2005), Fourage and Muffels (2000), and Callens et. al. (2005) are instead examples of comparative studies of poverty dynamics, but do not have a specific focus on the elderly population. In order to tackle the issue of eldely poverty from a European comparative perspective, the paper makes use of the European Community Household Panel (ECHP). The ECHP is a longitudinal survey based on a standardised questionnaire that involves annual interviews of a representative panel of households and individuals, covering a wide range of topics: household and personal incomes (including income sources and composition and social benefits), health, education, housing, demographics and characteristics related to economic activity and labour market participation. The ECHP was developed by Eurostat in association with the Member States starting from 1994 until 2001. The data are

collected at annual intervals, and build up an historical record of 60,500 nationally representative households. For the UK and Germany, the files relative to the British Houshold Panel and to the German Socio-economic Panel have been considered. The analysis has focussed on the following countries: Denmark, Netherlands, Belgium, France, Italy, Ireland, Spain, Greece, Portugal, Germany and United Kingdom, those for which the entire panel dimension is available. An overview of the main features of the ECHP, including sample attrition and rotation, is provided by Nicoletti and Peracchi (2002).

3 Multivariate analysis of poverty entry and exit

The methodology of the study of poverty dynamics is now well consolidated. Originally, it developed from an approach introduced by Bane and Elwood (1986), which focussed on the identification of a number of hierarchically ordered and mutually exclusive "trigger events" associated to transitions in and out of poverty. The pioneering work by Bane and Elwood has been improved by Stevens (1989), who was the first to model the *time* spent into (or out of) poverty as a function of both observable and unobservable individual characteristics and to study their influence on the probability of leaving poverty (or falling back in). The methodology adopted hereby follows closely the works by Jenkins and Rigg (2001) and Devicienti (2001). In this frawework, a crucial concept is the hazard rate. The hazard rate can be intuitively

considered as a conditional probabilty: the probability of leaving poverty at time t conditional on having been poor until time $t-1$, and on the first poverty spell being observed; similarly, the probability of becoming poor at time t conditional on having been non-poor until time $t-1$, and on the first of the spells before poverty occurs being observed. The definition of poverty adopted herby is quite standard: individuals are defined poor if they live in households whose equivalised income is below the 60% of the national median equivalised income; all household members are assigned the same equivalised household income, assuming that resources are equally shared within the household; the modified-OECD equivalence scale has been adopted, which assigns a weight of 1 to the household head, 0.5 to any other adult in the household and 0.3 to children. Given the nature of the data and the methodology of income measurement in the ECHP, true poverty (or out-of-poverty) spells cannot be observed, since it is possible to observe poverty spells occurring within an interval (of length of 1 year). In the real world, transitions in and out of poverty can occur at any time, but in our context, a continuous time model for the hazard rate would be inappropriate, since transitions between different states of interest can be observed only during discrete time intervals and not continuously. Therefore, a discre-time model will be adopted, with the assumption that transitions between sates can occur only once during the calendar year. More formally, omitting for simplicity subscripts relative to individulas, the hazard rate during a given spell j can be defined by $[h(j, X \mid v)]$: it depends

on the current spell j, on a set of individual observable characterisitcs, X, and on individual-specific unobserved characteristic v , with a given parametric distribution, known as unobservered heterogeneity or frailty. More specifically, the model chosen to estimate poverty exit and poverty re-entry is a discrete-time proportional hazard model with Gamma-unobserved heterogeneity. As shown by Jenkins (1995, 2004), the complementary log-log transformation of the proportional discrete-time representation of an underlying continuous hazard rate can be expressed as:

$$\mathrm{c}\log\log[h(j, X \mid v)] = f(j) + \beta' X + u \tag{1}$$

This expression means that the clog-log transformation of the hazard rate during spell j is function of the following elements. $f(j)$ is a general function of duration dependence and represents the baseline hazard, the risk of leaving a given state common to all individuals, which determines how the hazard rate varies over time. $f(j)$ can have different specifications: I will adopt hereby a piece-wise constant specifications of the baseline hazard, according to which $f(j) = \alpha_1 D_1 + \alpha_2 D_2 + \alpha_3 D_3 + ...\alpha_j D_j$ where D_j are dummies corresponding to survival until spell j. $\beta' X$: is the effect of a set of observable characteristics which might vary or not over time; a positive value of the coefficients β' indicates that the relevant characteristics increase the hazard rate (shorten the spells), while a negative value implies that the hazard rate is lower (spells are longer). $u = \log(v)$, where v is th unobserved heterogeneity parameter following a Gamma distribution with mean equal to 1 and variance equal to σ^2.The

choice of the functional form of the heterogeneity is related as well to the need of obtaining a closed functional form of the hazard. Alternative specification of the functional form of individual heterogeneity lead to a different functional form of the hazard: for example, under the assumption of u following a Normal distribution with zero mean , the hazard rate would have a logistic distribution.

The estimation of both the hazard of leaving poverty and re-entering poverty has been performed using the *pgmhaz*8 stata program by Stephen Jenkins. The dependent variable is derived from equation (4.1):

$$\log(-\log[1 - h(j, X \mid v)]) = f(j) + \beta' X + u \tag{2}$$

which is equivalent to:

$$h(j, X \mid v) = 1 - \exp[-\exp(f(j) + \beta' X + u)] \tag{3}$$

The hazard rate is the dependent variable. The program used requires the data to be organized in person-period form, and performs clog-log regression on a binary dependent variable indicating whether the individual is experiencing failure (a transition between states) or not during a given spell. The relevant sample considered consists of all individuals begining a non left-censored spell at the age of 55 or more.

The variables included in X are considered to influence exit from poverty conditional on past poverty experience. In particular, X includes gender, age, and a number of other household and individual specific controls, as follows. A dummy

to indicate whether individuals leave alone in single person households; a dummy to indicate whether individuals live in 2-persons houshold, where both individuals are aged below 65; a dummy to indicate whether individuals live in 2-persons houshold, where one or both are aged above 65; a dummy indicating whether the person has become widow; a dummy for primary education as highest educational attainment verus all other educational levels; a dummy capturing economic activity status: being employed versus non employed; a dummy to take into accoount whether other employed members are living in the houseold; a dummy to indicate whether the person has health problems, illness or disability; a dummy relative to tenure status, indicating whether the person is renting or is owner of its current dwelling; a dummy to capture whether there has been a positive year-to-year change in old-age survivors benefit or invalidity benefits; a number of dummies has also been included to capture duration dependence in a non-parametric form, indicating the length of the poverty spell before poverty exit, from one to four or more years. The same set of variables has been included in the estimation of poverty entry, with the exception of a dummy for "never married" replacing "becoming widow" and negative change in work-income and in sickness/invalidity benefits. A number of alternative specifications were chosen, and the results reported have been selected after sensitiviy analysis (Bayes information criteria).

Finally, it is necessary to point out that this approach suffers from the problem of

left-censoring: since it is not possible to observe the true beginning of poverty spells for individuals who are observed poor at the start of the sample period, the analysis can be limited only to the deteminants of poverty persistence conditional on the first poverty spell being observed. Similarly, since it is not possible to observe for how long individuals have been non-poor before beginning a poverty spell, it is possible only to estimate the probability of entering poverty conditional on the first non-poor spell being observed, which can happen only after a transition out of poverty is observed during the period under study. With this respect, the study of poverty entry can be only based on poverty re-entries of individuals who already left poverty during the period of investigation.

4 Results

The results of the multivariate discrete-time hazard models for poverty exit and entry for the countries considered are shown in Table 2 and Table 3 respectively. For each country, the results of model estimation with and without Gamma-unobserved heterogeneity are reported in the right-column (2) and in the left-column (1) respectively. At the bottom of each table, a likelihood test of the model with versus without unobserved heterogeneity shows that Gamma-unobserved heterogeneity is always significant for both poverty exit and re-entry: for each country in fact, the null hypothesis that the variance of the unobserved heterogeneity parameter is equal

to zero is always rejected by the likelihood ratio test statistic, whose p-value is constantly equal to zero. The results reported under column (2) therefore should be considered corresponding to the correct model. All the coefficients in both table 1 and 2 are reported in their non-exponentiated format.

Let's consider first the results relative to the poverty exit model (table 2). The variables indicating different household typologies are those showing the most significant impact on the hazard rate in nearly all countries. In particular, single-person households and couples where at least one member is aged above 65 exhibit lower hazard rates, and therfore longer poverty spells, than the reference category (the residual other type of households, both with and without children); the magnitute of the coefficients is particularly relevant in Ireland, UK and in Southern European countries. Further, widowhood, defined here as becoming widow during the poverty spell, unambiguously reduces the hazard rate of leaving poverty in all countries, with the exception of Denmark, Belgium and Germany; such finding suggests that survivors' benefits might not represent a sufficient safety net, other things being equal, for individuals already experiencing poverty $before$ such events. Living in households where other members are economically active and employed increases the hazard of leaving poverty in the majority of the countries considered, and its impact is in general more significant than being employed as such. Poor health or disability status reduces the hazard rate of leaving poverty only in a few number of countries such

as France, Ireland and Portugal, while low educational attainment is associated with longer poverty spells in the majority of countries, in particular in Portugal. Among the explanatory variables considered, tenure status seems to impact significantly and negatively on the hazard rate only in Italy, while its association with shorter poverty spells in countries such as Denmark and the UK, does not find a a straightforward explanation and requires further investigations. Finally, another set of explanatory variables has been considered to take into account the impact of the benfits system on the probablity of leaving poverty: the events considered are a positive change registered in income from old age and survivors benefits registered during the poverty spell, and a positive change in the income from disability or sickness benefits. Such events are likely to occur when individuals are moving from work into retirement: a negative coefficients on the above dummies indicates that the income change generated by the benefits is not sufficient to bring individual out of poverty, the opposite if a positive sign is observed. The evidence on the effectiveness of such instruments is mixed: benefits impact positively on the hazard in Belgium and Denmark, while they seem ineffective in the Netherlands, Italy, Irelad,Greece and UK. In nearly all the countries we find evidence of strong negative duration dependence, with the exception of Denmark , Portugal and Germany. In general, poverty persistence decreases the chances of leaving poverty as the time spent in poverty increases, as shown by the absolute value of the coefficients on the dummy "4 to 6 years in poverty".

Table 3 reports the estimates relative to the multivariate discrete-time proportional hazard model of poverty re-entry. The findings parallel the results shown in table 2. In general, the factors hampering the hazard rate of leaving poverty influence also positively the probability of falling back into poverty after having escaped it. Differently form the specification of the hazard rate of leaving poverty, though, I introduced some other specific variables: in place of the dummy "become widowed", I introduced the dummy "never married", which turns out to impact positively on the probability of going back to poverty after having left it, in paticular in Denmark, Italy, and Spain. With respect to the sources of income changes impacting on the risk of poverty re-entry, it is possible to notice now that negative changes in income from work account for an increase of the hazard of re-entering poverty in nearly half of the countries, with the exception of Denmark, Netherlands, Belgium , Greece, Spain , Portugal. Gender and age do not seem instead conditions which reduce the probability of entering poverty as such, once the impact of other factors has been taken into account. In conclusion , it should be added that the significance of unobserved heterogeneity is consistent with the larger coefficients exhibited in general under model (2)

Tables 4a and 4b show the estimated hazard ratio of falling into poverty conditional for having survived out of poverty for a given number of consecutive years, by gender and different age groups in the countries considered (the coefficients used are

those from table 2 in the presence of unobserved heterogeneity). The charts show that the age profile of the hazard exhibit a higher variability than the gender dimension. Interestingly, table 4b points out that in a number of countries, the probability of falling into poverty seems higher when associated to the retirement period and for younger cohorts (age group 55-64): this is true in particular for Belgium, Greece and Denmark; in another group of countries instead (Ireland, Portugal, and the UK), risk of becoming poor is higher for the older cohorts (aged 75+), msot likely stemming from the insufficient coverage of occupational pensions in the anglo-saxon countries, the low levels of the basic state pensions and the weak role of minimum income protection schemes for the elderly as anti-poverty instruments.

Finally, table 5 shows the results of the estimation of the hazard rate of poverty entry obtained by pooling observations across countries and using country specific levels of yearly social expenditure in old age related benefits (as % of national GDP) in order to identify the cross country variability in the hazard of poverty entry imputable to social expenditure. We notice that nearly all country-specific dummies (columns IV and V) have the expected significant and negative sign, and that the coefficients on the other explanatory variables are in line with those obtained in the single-country estimation.

5 Conclusions

Adopting an approach which has become standard in the econometric literature on income poverty, I use a multivariate discrete-time piecewise constant hazard rate model to estimate separately the major determinants of poverty entry and exit focusing on the older age groups. The methodology enables to assess the impact of personal characteristics, household characteritics, and other labour market factors on individuals' probability to leave and to enter poverty, and to make predictions about the mean durations of poverty spells for specific population subgroups. Particular attention has been devoted to investigate how changes in households' disposable income composition after retirement impact on poverty spells. Further, the econometric specification allows to distinguish the impact of observables characteristics from individual unobserved heterogeneity on duration dependence. The main findings show that single-person elderly households are the most exposed to both highest risk of poverty entry and lowest rates of poverty exit in the majority of European countries, in particular in Ireland and other Southern European countries. Further, the labour market attachment of other household members play a major role both in stimulating poverty exit and in preventing poverty re-entry of older people.

6 References

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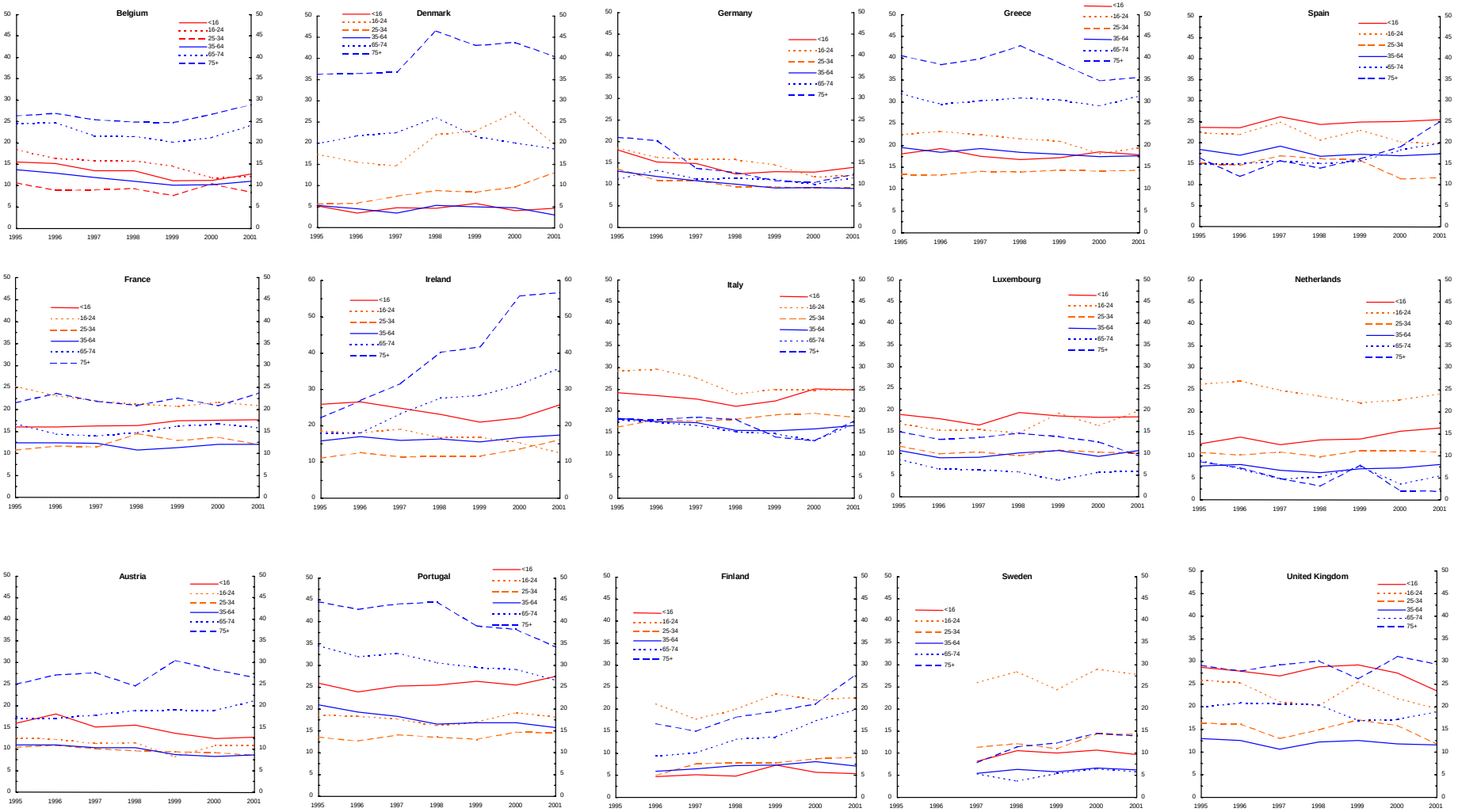
Figure 1: poverty rates by age groups (1995-2001)



Source: EUROSTAT, Newcronos database (2005).

Table 1
Social expenditure in old age and survivors benefits (both cash and in-kind): 2001

	Old age and survivors benefits			
	GDP		Social Expenditure	
	%	Rank	%	Rank
Austria	13	3	49.5	3
Belgium	11.2	5	43.7	7
Denmark	6.5	13	38	13
Finland	8	11	36.6	14
France	11.9	4	43.7	7
Germany	11.2	5	42.4	9
Greece	13.4	2	51.3	2
Ireland	3.2	15	24.8	15
Italy	15.2	1	62.3	1
Luxembourg	8.1	10	39.4	11
Netherlands	6.4	14	41.8	10
Portugal	9.1	7	45.8	5
Spain	8.7	8	45.3	6
Sweden	7.4	12	39.1	12
UK	8.3	9	46.5	4
EU 15 Average	9.4		43.3	

Source: OECD, Social Expenditure Database (2004)

Table 2. Poverty exit equation

	Denmark		Netherlands		Belgium		France		Ireland		Italy	
Explanatory Variables	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Female	-0.025	0.079	0.125	0.135	-0.067	-0.052	0.152	0.164	0.115	0.221	0.016	0.041
	0.14	*0.161*	*0.139*	*0.145*	*0.142*	*0.158*	*0.102*	*0.112*	*0.126*	*0.145*	*0.087*	*0.1*
Age	-0.019 **	-0.03 ***	0.02 *	0.022 *	-0.002	-0.001	0.009	0.012	-0.01	-0.011	-0.002	-0.001
	0.01	*0.011*	*0.011*	*0.011*	*0.01*	*0.011*	*0.007*	*0.008*	*0.01*	*0.011*	*0.006*	*0.007*
Single person household	0.037	0.398	0.392	0.448 *	-0.471 *	-0.614 **	-0.283 *	-0.351 *	-1.066 ***	-1.079 ***	-0.402 **	-0.45 **
	0.351	*0.425*	*0.248*	*0.26*	*0.277*	*0.295*	*0.168*	*0.184*	*0.223*	*0.271*	*0.157*	*0.183*
2-persons household, both aged below 65	0.077	0.27	0.12	0.279	-0.035	-0.157	-0.249	-0.294 *	-1.083 ***	-1.065 ***	-0.47 **	-0.594 **
	0.365	*0.441*	*0.229*	*0.238*	*0.258*	*0.28*	*0.16*	*0.176*	*0.262*	*0.311*	*0.19*	*0.233*
2-persons household, at least one aged above 65	0.496	0.84 **	0.502 **	0.491 **	0.006	-0.192	-0.29 *	-0.303 *	-0.615 ***	-0.407 **	-0.149	-0.16
	0.339	*0.411*	*0.221*	*0.233*	*0.229*	*0.246*	*0.148*	*0.161*	*0.172*	*0.199*	*0.123*	*0.141*
Become widow	-0.462 *	-0.521	-1.467 **	-1.39 *	-0.08	-0.831	-0.676 ***	-1.118 ***	-0.97 **	-1.093 **	0.067	-0.434 *
	0.274	*0.321*	*0.724*	*0.726*	*0.406*	*0.592*	*0.252*	*0.325*	*0.416*	*0.508*	*0.197*	*0.258*
Primary education	0.018	-0.014	-0.262 *	-0.201	-0.119	-0.257	-0.352 ***	-0.318 **	-0.156	-0.36 **	-0.18	-0.19
	0.142	*0.162*	*0.152*	*0.158*	*0.145*	*0.159*	*0.131*	*0.143*	*0.15*	*0.162*	*0.123*	*0.143*
Employed	0.428 *	0.191	0.388 *	0.422 *	-0.201	-0.406	0.25	0.136	0.655 ***	0.601 ***	0.115	0.087
	0.227	*0.269*	*0.235*	*0.241*	*0.24*	*0.281*	*0.157*	*0.176*	*0.158*	*0.181*	*0.115*	*0.131*
Other household members employed	0.446 *	0.619 **	0.484 **	0.584 **	0.137	-0.001	-0.187	-0.271 *	0.313 **	0.557 ***	0.177 *	0.257 **
	0.26	*0.295*	*0.227*	*0.234*	*0.218*	*0.24*	*0.141*	*0.157*	*0.147*	*0.173*	*0.099*	*0.114*
Person with health problems, illness or disability	0.015	-0.097	-0.069	-0.068	-0.158	-0.066	-0.359 ***	-0.43 ***	-0.249 **	-0.258 *	-0.005	-0.046
	0.136	*0.156*	*0.136*	*0.142*	*0.155*	*0.171*	*0.105*	*0.115*	*0.125*	*0.145*	*0.092*	*0.105*
Renting current accomodation	0.563 ***	0.646 ***	-0.099	-0.047	-0.188	-0.129	0.043	-0.106	-0.094	-0.07	-0.202 *	-0.279 **
	0.156	*0.178*	*0.15*	*0.156*	*0.184*	*0.203*	*0.124*	*0.141*	*0.257*	*0.305*	*0.119*	*0.142*
Positive change in old age/survivors benefits	-0.055	-0.237	-0.602 **	-0.59 *	-0.036	0.236	0.14	0.078	0.112	-0.134	0.01	0.07
	0.2	*0.235*	*0.305*	*0.316*	*0.242*	*0.252*	*0.14*	*0.152*	*0.184*	*0.219*	*0.114*	*0.124*
Positive change in sickness/invalidity benefits	0.828 **	0.942 **	-0.246	-0.574	2.142 ***	1.632 ***	-0.555	-0.516	-1.45 **	-10.669	-0.06	0.071
	0.372	*0.39*	*0.388*	*0.436*	*0.666*	*0.587*	*0.417*	*0.457*	*0.586*	*66.385*	*0.298*	*0.322*
1 year in poverty	0.043	0.026	-1.616 **	-2.055 ***	-0.112	-0.328	-0.55	-1.027 *	0.14	-0.277	-0.118	-0.424
	0.706	*0.819*	*0.753*	*0.784*	*0.723*	*0.795*	*0.49*	*0.538*	*0.657*	*0.764*	*0.404*	*0.482*
2 years in poverty	-0.033	0.322	-1.761 **	-2.114 ***	-1.109	-1.16	-0.949 *	-1.151 **	-0.476	-0.435	-0.745 *	-0.768
	0.725	*0.84*	*0.766*	*0.797*	*0.746*	*0.816*	*0.504*	*0.551*	*0.669*	*0.77*	*0.41*	*0.529*
3 years in poverty[1]	-1.006	-0.496	-1.374 *	-1.62 *	-1.678 **	-1.558 *	-1.712 ***	-1.859 ***	-1.042	-0.914	-1.368 ***	-1.262 **
	0.761	*0.875*	*0.803*	*0.83*	*0.815*	*0.877*	*0.541*	*0.584*	*0.713*	*0.809*	*0.445*	*0.577*
4 to 6 years in poverty					-2.54 **	-2.464 **	-1.808 ***	-1.959 ***	-2.863 ***	-2.703 ***	-2.21 ***	-2.104 ***
					0.92	*0.98*	*0.555*	*0.595*	*0.96*	*1.034*	*0.505*	*0.636*
Variance of Gamma		0.00		0.00		0.00		0.00		0.00		0.00
LR test of Variance of Gamma=0 (Chibar2)		95		5.48		53.58		75.98		151.9		70.24
Prob.>=Chibar2		0.00		0.01		0.00		0.00		0.00		0.00
Observations	777	777	446	446	715	715	1239	1239	1443	1443	1822	1822
Log likelihood	-441.81	-393.64	-285.13	-292.47	-387.89	-364.31	-756.19	-716.29	-583.14	-510.86	-1069.9	-1023.3

* p<0.10, ** p<0.05, *** p<0.01

Table 2 (continued)

	Greece		Spain		Portugal		Germany		United Kingdom	
Explanatory Variables	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Female	0.124	0.115	0.043	0.052	0.066	0.016	0.166	0.19	0.12	0.06
	0.082	*0.09*	*0.079*	*0.088*	*0.091*	*0.101*	*0.112*	*0.191*	*0.111*	*0.122*
Age	0.000	0.006	-0.009 *	-0.005	-0.015 **	-0.013 *	-0.009	-0.012	-0.01	-0.005
	0.005	*0.006*	*0.005*	*0.006*	*0.006*	*0.007*	*0.009*	*0.016*	*0.008*	*0.009*
Single person household	0.022	0.003	-0.734 ***	-0.842 ***	-0.053	-0.229	-0.368 *	-0.792 *	-0.857 ***	-1.114 ***
	0.163	*0.176*	*0.147*	*0.169*	*0.167*	*0.192*	*0.21*	*0.425*	*0.213*	*0.231*
2-persons household, both aged below 65	0.114	-0.015	-0.506 ***	-0.494 ***	-0.202	-0.146	-0.331 **	-0.598 *	-0.763 ***	-0.81 ***
	0.136	*0.158*	*0.158*	*0.176*	*0.163*	*0.183*	*0.154*	*0.318*	*0.211*	*0.227*
2-persons household, at least one aged above 65	0.054	0.02	-0.364 ***	-0.431 ***	-0.061	-0.097	-0.073	-0.378	-0.826 ***	-0.999 ***
	0.107	*0.118*	*0.105*	*0.116*	*0.115*	*0.131*	*0.184*	*0.308*	*0.195*	*0.211*
Become widow	-0.408 **	-0.495 **	-0.081	-0.492 **	-0.814 ***	-0.925 ***	-0.731 *	-0.787	-0.397 *	-0.513 **
	0.201	*0.227*	*0.187*	*0.242*	*0.219*	*0.267*	*0.417*	*0.521*	*0.22*	*0.248*
Primary education	-0.215	-0.475 ***	-0.322 *	-0.201	-1.027 ***	-1.348 ***	-0.204 *	-0.246	-0.112	-0.219
	0.171	*0.174*	*0.196*	*0.224*	*0.345*	*0.405*	*0.112*	*0.183*	*0.133*	*0.142*
Employed	0.095	0.028	0.114	0.056	0.092	0.039	0.263 *	0.177	-0.13	-0.115
	0.104	*0.119*	*0.118*	*0.134*	*0.105*	*0.119*	*0.141*	*0.213*	*0.209*	*0.225*
Other household members employed	0.189 *	0.055	0.093	0.059	0.261 **	0.216 *	-0.111	-0.151	-0.078	-0.187
	0.101	*0.113*	*0.089*	*0.099*	*0.108*	*0.126*	*0.146*	*0.214*	*0.204*	*0.224*
Person with health problems, illness or disability	-0.04	-0.049	0.006	-0.05	-0.18 **	-0.229 **	0.033	-0.083	0.09	0.14
	0.083	*0.092*	*0.076*	*0.085*	*0.086*	*0.097*	*0.109*	*0.194*	*0.113*	*0.125*
Renting current accomodation	-0.32	-0.11	-0.051	-0.073	0.016	0.071	-0.031	-0.131	0.249 **	0.286 **
	0.205	*0.21*	*0.144*	*0.162*	*0.116*	*0.131*	*0.107*	*0.182*	*0.117*	*0.129*
Positive change in old age/survivors benefits	-0.203 **	-0.314 ***	-0.06	0.001	-0.224 *	-0.212	0.127	0.002	0.151	0.297 **
	0.094	*0.105*	*0.116*	*0.125*	*0.13*	*0.143*	*0.151*	*0.216*	*0.142*	*0.149*
Positive change in sickness/invalidity benefits	1.052 ***	0.465	0.002	-0.067	0.146	0.34	0.411	1.005	-0.113	-0.836 **
	0.291	*0.363*	*0.26*	*0.297*	*0.228*	*0.237*	*0.385*	*0.736*	*0.307*	*0.422*
1 year in poverty	-0.77 *	-1.206 ***	0.444	-0.267	1.227 **	1.162 *	0.304	1.15	0.568	0.161
	0.397	*0.431*	*0.396*	*0.441*	*0.551*	*0.7*	*0.609*	*1.318*	*0.554*	*0.613*
2 years in poverty	-0.945 **	-1.136 ***	-0.11	-0.585	0.719	0.963	-0.184	1.427	0.25	-0.027
	0.403	*0.438*	*0.404*	*0.451*	*0.56*	*0.765*	*0.617*	*1.731*	*0.568*	*0.629*
3 years in poverty	-1.23 ***	-1.266 ***	-0.364	-0.707	0.373	0.724	-0.633	1.416	0.039	-0.053
	0.417	*0.45*	*0.423*	*0.466*	*0.571*	*0.798*	*0.645*	*2.02*	*0.578*	*0.633*
4 to 6 years in poverty	-1.899 ***	-1.957 ***	-0.953 **	-1.292 ***	0.067	0.425	-2.307 ***	-0.017	-1.158 *	-1.263 *
	0.436	*0.468*	*0.461*	*0.501*	*0.587*	*0.86*	*0.836*	*2.265*	*0.643*	*0.695*
Variance of Gamma		0.00		0.00		0.39		*1.48*		0.00
LR test of Variance of Gamma=0 (Chibar2)		229		222		207		24.4		100
Prob.>=Chibar2		0.00		0.00		0.00		0.00		0.00
Observations	2432	2432	2262	2262	2078	2078	977	977	1285	1285
Log likelihood	-1421	-1309.2	-1334.6	-1237.7	-1144	-1050.5	-602.58	-591.32	-727.14	-671.78

* p<0.10, ** p<0.05, *** p<0.01

Table 3. Poverty entry equation

	Denmark		Netherlands		Belgium		France		Ireland		Italy	
Explanatory Variables	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Female	0.087	0.203	0.289	0.446	0.065	-0.095	-0.037	-0.153	0.096	0.032	0.046	0.00
	0.216	*0.252*	*0.272*	*0.35*	*0.188*	*0.208*	*0.149*	*0.167*	*0.274*	*0.322*	*0.124*	*0.147*
Age	-0.01	0.013	-0.012	0.018	0.017	0.01	0.009	0.014	-0.038 **	-0.028	-0.001	-0.002
	0.014	*0.016*	*0.021*	*0.025*	*0.015*	*0.018*	*0.011*	*0.011*	*0.017*	*0.019*	*0.008*	*0.01*
Single person household	1.461	1.174	-1.962 ***	-1.755 ***	-0.512	-0.774 **	-0.047	0.346	0.167	0.526	-0.411 **	-0.232
	1.065	*1.104*	*0.474*	*0.664*	*0.367*	*0.393*	*0.266*	*0.309*	*0.462*	*0.538*	*0.191*	*0.223*
2-persons household, both aged below 65	1.408	0.822	-0.861 **	0.227	-0.334	-0.809 *	0.106	0.174	0.182	0.255	-1.107 ***	-1.48 ***
	1.081	*1.151*	*0.424*	*0.557*	*0.407*	*0.46*	*0.254*	*0.307*	*0.562*	*0.778*	*0.263*	*0.373*
2-persons household, at least one aged above 65	1.47	1.112	-0.936 **	-0.487	0.025	-0.281	-0.069	0.165	0.495	0.637 *	-0.433 **	-0.462 **
	1.051	*1.082*	*0.365*	*0.532*	*0.309*	*0.33*	*0.242*	*0.284*	*0.315*	*0.38*	*0.172*	*0.204*
Never married	0.517	0.787 **	_	-12.58	0.282	0.497	0.597 **	0.366	0.462	0.301	0.538 **	0.47 *
	0.331	*0.368*		*740.923*	*0.454*	*0.462*	*0.287*	*0.329*	*0.383*	*0.434*	*0.218*	*0.262*
Primary education	-0.129	-0.115	-0.052	0.189	0.02	0.045	0.558 **	0.608 **	0.355	0.404	0.5 **	0.675 **
	0.201	*0.234*	*0.281*	*0.391*	*0.217*	*0.242*	*0.225*	*0.258*	*0.35*	*0.418*	*0.233*	*0.298*
Employed	-0.366	-0.106	-0.626	-0.27	0.236	-0.176	0.251	0.36	-0.298	-0.228	0.419 ***	0.311
	0.386	*0.433*	*0.474*	*0.58*	*0.39*	*0.501*	*0.261*	*0.3*	*0.323*	*0.373*	*0.16*	*0.193*
Other household members employed	-0.284	-0.21	-1.069 **	-0.987 *	0.307	0.241	-0.052	-0.028	-0.518 *	-0.784 **	-0.518 ***	-0.472 ***
	0.475	*0.563*	*0.424*	*0.579*	*0.357*	*0.398*	*0.223*	*0.264*	*0.294*	*0.364*	*0.145*	*0.173*
Person with health problems, illness or disability	0.268	0.348	-0.11	0.159	-0.15	-0.057	0.17	0.131	0.035	0.369	-0.02	-0.085
	0.21	*0.246*	*0.256*	*0.318*	*0.19*	*0.21*	*0.143*	*0.162*	*0.259*	*0.279*	*0.126*	*0.15*
Renting current accomodation	-0.378 *	-0.609 **	-0.246	-0.174	-0.004	-0.087	-0.256	-0.297	0.446	0.583	-0.057	0.118
	0.217	*0.256*	*0.255*	*0.334*	*0.236*	*0.269*	*0.171*	*0.195*	*0.398*	*0.458*	*0.179*	*0.204*
Negative change in income from work	-0.324	-0.242	0.182	0.238	-0.197	-0.377	0.683 ***	0.717 ***	1.167 ***	1.071 ***	0.338 *	0.501 **
	0.415	*0.49*	*0.428*	*0.566*	*0.419*	*0.507*	*0.243*	*0.277*	*0.299*	*0.337*	*0.182*	*0.201*
Negative change in sickness/invalidity benefits	0.273	-0.034	-0.028	0.207	-0.259	-0.315	-0.551	-0.597	0.577	0.634	0.085	-0.01
	0.382	*0.474*	*0.451*	*0.498*	*0.435*	*0.476*	*0.395*	*0.426*	*0.364*	*0.408*	*0.211*	*0.248*
1 year before entering poverty	-1.583	-3.539 **	0.345	-3.573 **	-2.149 **	-1.697	-2.34 ***	-3.265 ***	0.627	-0.851	-1.384 **	-2.116 ***
	1.435	*1.589*	*1.495*	*1.807*	*1.018*	*1.207*	*0.728*	*0.8*	*1.167*	*1.314*	*0.591*	*0.708*
2 years before entering poverty	-2.38 *	-3.923 **	-0.451	-3.517 *	-2.454 **	-1.735	-2.626 ***	-3.298 ***	0.284	-0.735	-1.919 ***	-2.21 ***
	1.446	*1.598*	*1.544*	*1.857*	*1.021*	*1.205*	*0.731*	*0.802*	*1.187*	*1.332*	*0.605*	*0.72*
3 years before entering poverty[1]	-2.539 *	-3.949 **	-0.875	-3.949 **	-2.677 ***	-1.848	-3.924 ***	-4.452 ***	0.202	-0.571	-2.519 ***	-2.619 ***
	1.45	*1.603*	*1.547*	*1.865*	*1.032*	*1.211*	*0.783*	*0.847*	*1.247*	*1.391*	*0.628*	*0.74*
4-6 years before entering poverty					-4.025 ***	-3.189 **	-3.914 ***	-4.456 ***	0.351	-0.42	-3.111 ***	-3.216 ***
					1.093	*1.262*	*0.76*	*0.824*	*1.251*	*1.399*	*0.64*	*0.754*
Variance of Gamma		0.00		0.00		0.00		0.00		0.00		0.00
LR test of Variance of Gamma=0 (Chibar2)		72.4		95.3		67.16		116.4		51		274
Prob.>=Chibar2		0.00		0.00		0.00		0.00		0.00		0.00
Observations	451	451	700	719	606	606	1226	1226	394	394	2314	2314
Log likelihood	-233.64	-202.71	-197.78	-149.05	-290.67	-259.82	-506.99	-450.85	-193.04	-162.61	-858.56	-713.97

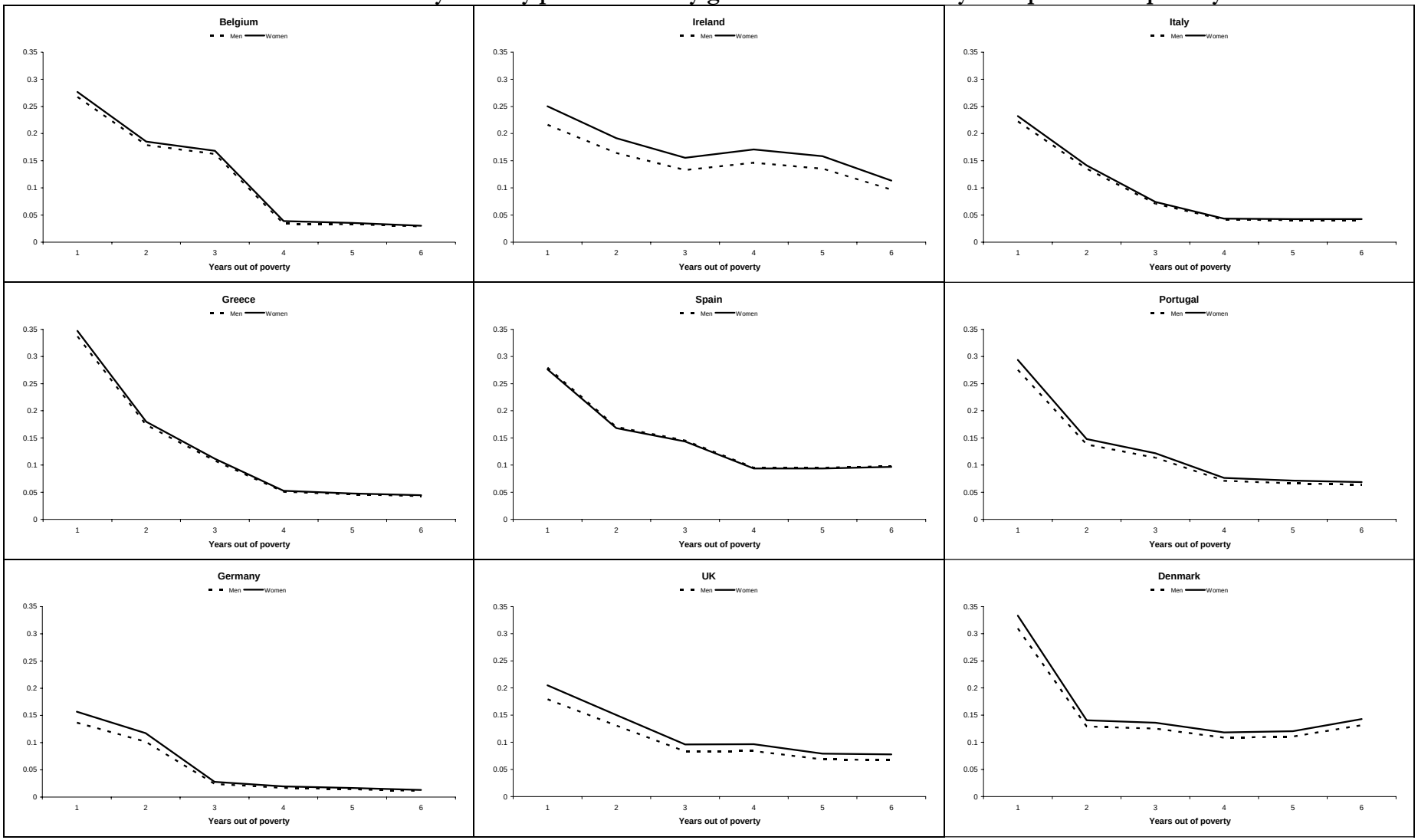
* p<0.10, ** p<0.05, *** p<0.01

Table 3 (continued)

	Greece		Spain		Portugal		Germany		United Kingdom	
Explanatory Variables	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Female	0.021	0.021	-0.014	0.035	0.078	0.068	0.145	-0.04	0.174	-0.015
	0.103	*0.123*	*0.104*	*0.12*	*0.1*	*0.113*	*0.184*	*0.224*	*0.193*	*0.213*
Age	0	0.001	-0.013 *	-0.006	0.009	0.011	-0.001	-0.002	0.003	0.015
	0.007	*0.011*	*0.007*	*0.008*	*0.007*	*0.008*	*0.014*	*0.017*	*0.011*	*0.012*
Single person household	-0.177	-0.26	-0.149	-0.228	-0.266	-0.325	-0.829 ***	-0.469	1.03 **	1.305 **
	0.191	*0.226*	*0.187*	*0.209*	*0.183*	*0.207*	*0.297*	*0.365*	*0.473*	*0.562*
2-persons household, both aged below 65	0.199	0.09	0.031	0.149	0.25	0.268	-0.926 ***	-0.63 **	1.634 ***	2.076 ***
	0.156	*0.189*	*0.211*	*0.245*	*0.169*	*0.191*	*0.253*	*0.315*	*0.483*	*0.572*
2-persons household, at least one aged above 65	-0.144	-0.443 **	0.307 **	0.26	0.052	0.002	-1.041 ***	-0.883 **	0.925 **	1.094 **
	0.146	*0.176*	*0.147*	*0.168*	*0.129*	*0.146*	*0.298*	*0.373*	*0.463*	*0.549*
Never married	0.194	0.313	0.327	0.559 **	0.394 **	0.371	0.702 *	0.678	0.296	0.479
	0.277	*0.312*	*0.214*	*0.225*	*0.199*	*0.229*	*0.395*	*0.456*	*0.271*	*0.303*
Primary education	0.73 **	0.784	-0.079	0.112	-0.027	0.434	0.516 ***	0.686 ***	0.014	0.049
	0.341	*0.53*	*0.27*	*0.329*	*0.507*	*0.712*	*0.173*	*0.211*	*0.216*	*0.241*
Employed	0.009	0.062	-0.418 **	-0.595 ***	0.271 **	0.247 *	-0.409	-0.364	-0.026	-0.226
	0.131	*0.161*	*0.179*	*0.228*	*0.112*	*0.127*	*0.257*	*0.319*	*0.339*	*0.399*
Other household members employed	-0.227 *	-0.317 **	-0.234 *	-0.597 ***	-0.044	-0.116	-0.139	-0.172	-0.427	-0.445
	0.13	*0.154*	*0.135*	*0.163*	*0.12*	*0.136*	*0.234*	*0.297*	*0.4*	*0.428*
Person with health problems, illness or disability	-0.026	0.054	-0.044	-0.106	0.014	0.075	-0.209	-0.007	0.03	0.083
	0.102	*0.119*	*0.103*	*0.119*	*0.096*	*0.108*	*0.173*	*0.216*	*0.185*	*0.211*
Renting current accomodation	-0.658 **	-0.744 **	-0.446 **	-0.278	0.237 *	0.018	0.086	0.1	0.025	-0.292
	0.287	*0.348*	*0.202*	*0.221*	*0.128*	*0.155*	*0.172*	*0.212*	*0.177*	*0.205*
Negative change in income from work	0.154	0.186	0.18	0.212	0.164	0.072	0.47 *	0.428	0.547 **	0.844 ***
	0.183	*0.2*	*0.154*	*0.174*	*0.165*	*0.184*	*0.24*	*0.298*	*0.273*	*0.286*
Negative change in sickness/invalidity benefits	0.066	-0.086	-0.081	0.021	-0.164	-0.247	0.277	0.011	0.3	0.42
	0.169	*0.204*	*0.18*	*0.193*	*0.185*	*0.212*	*0.311*	*0.401*	*0.314*	*0.324*
1 year before entering poverty	-1.385 **	-2.007 *	-0.029	-1.204 *	-1.866 ***	-2.723 ***	-1.184	-2.078 *	-2.91 ***	-4.377 ***
	0.593	*1.065*	*0.536*	*0.632*	*0.7*	*0.896*	*0.925*	*1.12*	*0.865*	*0.999*
2 years before entering poverty	-2.127 ***	-2.368 **	-0.558	-1.252 *	-2.626 ***	-3.239 ***	-1.487	-1.947 *	-3.237 ***	-4.179 ***
	0.605	*1.075*	*0.549*	*0.643*	*0.707*	*0.903*	*0.939*	*1.131*	*0.886*	*1.014*
3 years before entering poverty	-2.595 ***	-2.639 **	-0.72	-1.292 **	-2.858 ***	-3.293 ***	-2.853 ***	-3.038 ***	-3.645 ***	-4.597 ***
	0.62	*1.081*	*0.563*	*0.655*	*0.717*	*0.91*	*0.987*	*1.172*	*0.908*	*1.033*
4-6 years before entering poverty	-3.264 ***	-3.314 ***	-1.194 **	-1.763 ***	-3.33 ***	-3.785 ***	-3.226 ***	-3.418 ***	-3.663 ***	-4.585 ***
	0.634	*1.091*	*0.564*	*0.654*	*0.72*	*0.913*	*0.987*	*1.177*	*0.9*	*1.026*
Variance of Gamma		0.00		0.00		0.00		0.00		0.00
LR test of Variance of Gamma=0 (Chibar2)		253		280		246		141		130
Prob.>=Chibar2		0.00		0.00		0.00		0.00		0.00
Observations	2049	2049	1990	1990	2466	2466	1712	1712	962	962
Log likelihood	-1000.6	-864.03	-949.98	-811.89	-1124	-1002.9	-441.36	-352.44	-400.06	-341.24

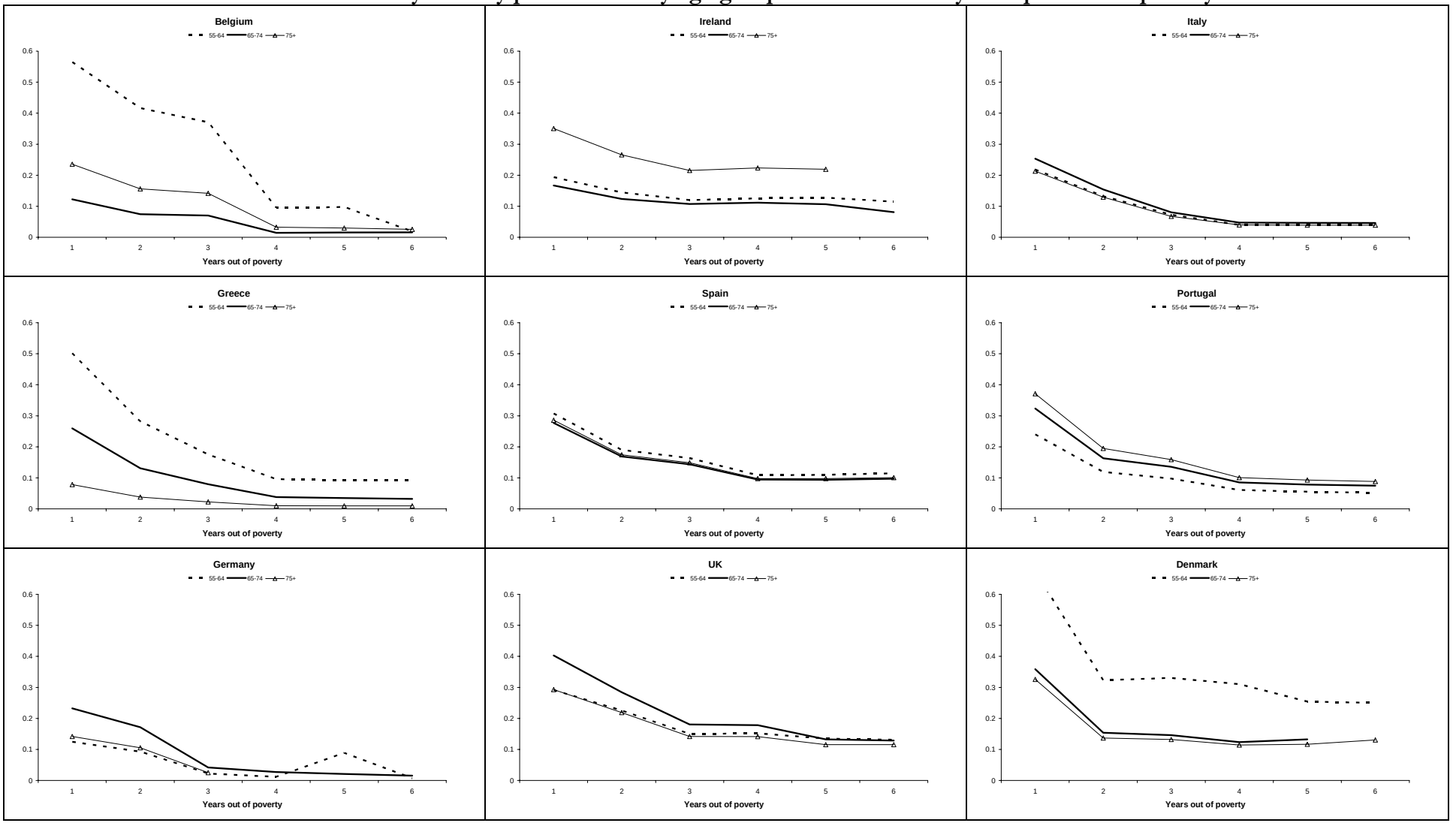
* p<0.10, ** p<0.05, *** p<0.01

Table 4a. Poverty re-entry probabilities by gender and consecutive years spent out of poverty



Sample: individuals aged 55+, poor at the beginning of the period (time 0)

Table 4b. Poverty re-entry probabilities by age group and consecutive years spent out of poverty



Sample: individuals aged 55+, poor at the beginning of the period (time 0)

Table 5
Pooled estimation (all countries): hazard rate of poverty entry

Dependent variable: hazard of poverty entry	**I**	**II**	**III**	**IV**	**V**
Female	0.013	0.03	0.033	0.031	0.033
	-0.32	-0.73	-0.8	-0.75	-0.8
Age 65-74	0.032	0.003	-0.002	0.012	0.007
	-0.65	-0.05	-0.05	-0.25	-0.13
Age 75+	0.014	-0.025	-0.032	-0.014	-0.022
	-0.23	-0.43	-0.54	-0.24	-0.37
Single person household	-0.218	-0.196	-0.196	-0.199	-0.199
	(3.94)**	(3.49)**	(3.49)**	(3.55)**	(3.54)**
2 persons houshold (at least one aged 65+)	-0.076	-0.032	-0.037	-0.034	-0.037
	-1.08	-0.45	-0.51	-0.48	-0.52
Never married	0.421	0.389	0.392	0.397	0.397
	(5.19)**	(4.76)**	(4.80)**	(4.86)**	(4.85)**
Primary education	0.449	0.275	0.277	0.276	0.28
	(7.05)**	(3.85)**	(3.87)**	(3.86)**	(3.92)**
Other household members employed	-0.144	-0.174	-0.183	-0.175	-0.185
	(3.04)**	(3.60)**	(3.78)**	(3.63)**	(3.82)**
Negative change in income from work	0.287	0.283	0.279	0.285	0.279
	(4.38)**	(4.29)**	(4.21)**	(4.33)**	(4.21)**
1 year out of poverty	-1.507	-1.04	-1.531	1.143	0.227
	(20.17)**	(8.85)**	(3.59)**	(2.35)*	-0.38
2 years out of poverty	-2.105	-1.62	-2.55	0.586	0.05
	(25.31)**	(13.08)**	(3.61)**	-1.19	-0.03
3 years out of poverty	-2.565	-2.068	-2.367	0.136	2.301
	(26.56)**	(15.45)**	(9.05)**	-0.27	-1
4 years out of poverty	-3.118	-2.581	-2.863	-0.378	5.228
	(31.25)**	(18.70)**	(4.70)**	-0.76	-1.53
Netherlands		-0.819	-0.672		
		(5.31)**	-1.04		
Belgium		-0.157	0.13		
		-1.2	-0.17		
France		-0.341	-1.031		
		(2.86)**	-1.28		
Ireland		-0.107	0.476		
		-0.74	-0.89		
Italy		-0.487	-0.663		
		(4.31)**	-0.87		
Greece		-0.086	-0.619		
		-0.78	-1.26		
Spain		-0.224	-0.164		
		(2.01)*	-0.34		
Portugal		-0.277	-0.264		
		(2.52)*	-0.35		
UK		-0.766	-0.361		
		(5.97)**	-0.46		
Germany		-0.41	-1.458		
		(3.27)**	-1.8		
Denmark*(expenditure in old-age benefits)				-0.238	-0.473
				(4.43)**	-1.79
Netherlands*(expenditure in old-age benefits)				-0.392	-0.36
				(6.04)**	-1.87
Belgium*(expenditure in old-age benefits)				-0.206	-0.368
				(4.80)**	-1.81
France*(expenditure in old-age benefits)				-0.204	-0.43
				(5.21)**	(2.31)*
Ireland*(expenditure in old-age benefits)				-0.547	-1.98
				(4.64)**	(2.05)*
Italy*(expenditure in old-age benefits)				-0.195	-0.356
				(5.53)**	(2.16)*
Greece*(expenditure in old-age benefits)				-0.191	-0.646
				(4.73)**	(2.39)*
Spain*(expenditure in old-age benefits)				-0.26	-0.855
				(5.00)**	(2.26)*
Portugal*(expenditure in old-age benefits)				-0.3	-0.546
				(5.14)**	(2.00)*
UK*(expenditure in old-age benefits)				-0.252	-0.178
				(6.04)**	-1.44
Germany*(expenditure in old-age benefits)				-0.301	-0.893
				(5.35)**	(2.24)*
Interaction (country dummies)*(duration dependence)	No	No	Yes		
Interaction (dummies expenditure)*(duration dependence)				No	Yes
Observations	14939	14939	14939	14939	14939

* p<0.10, ** p<0.05, *** p<0.01