Health status and retirement decisions for older European couples[À]

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ABSTRACT

In this paper we use data the European Community Household Panel (ECHP) to describe and analyse the dynamics of joint labour force behaviour of older couples for the EU12 countries. We focus on three main issues: the relanvance of joint retirement across EU12 countries, the existence of complementarities in leisure and/or assortative matting and the effects of health variables. Concerning the evidence, we first find that a working spouse is more likely to retire the more recently the other spouse has retired; this effect is stronger if the wife is the working spouse. Second, there is evidence of assortative mating and/or complementarities in leisure; the effects of all relevant factors on the retirement decision of one spouse depend strongly on whether the other one is working, unemployed, or retired. Third, besides the standard evidence that poor health increases the retirement probability, we find that the husband´s health affects the couple´s retirement decisions much more strongly than the wife´s health does. Additional asymmetric effects are detected with respect to income related variables.

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Keywords: Joint retirement decisions, labour force transitions, health variables, asymmetric effects.

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1. Introduction

Although the retirement decisions of older workers (especially men) have been widely studied,[1] much less is known about the joint labour force behaviour of older married couples. However this topic becomes important given the growing proportion of married women that approach old age with substantial work histories. A strong evidence of joint retirement patterns will have important implications for the analysis of the effects of any retirement policy. More specifically any policy that increases the incentive for one member of a married (cohabiting) couple to exit the labour force will have additional effects on the labour force behaviour of the other spouse. Among the different determinants of retirement such as economic variables or pension provisions, health related factors are bound to play a crucial role in retirement decisions of older couples.[2] In fact, all the pension systems have specific treatment for people retiring because of health or disability reasons. Health status is particularly relevant in explaining joint retirement since sometimes one spouse has to withdraw from the labour market to care for the other one. Although there are a few studies on this issue using US data,[3] and despite its interest, only Blau and Riphahn (1999) present an analysis about joint retirement in Germany.

Several reasons can justify the existence of joint retirement. First, there could be observable economic factors affecting both members of the couple and causing a positive correlation between retirement dates. Second, poor health or chronic illness may influence not only individual own retirement but may increase the necessity of care giving and, consequently, influence spouses retirement behaviour. Also unobservable factors highly correlated between husbands and wives (*assortative matting*) could originate such a correlation. Finally, strong complementarities between the husband and wife's leisure time would explain why couples tend to retire at the same time.

In this paper we examine whether or not the pattern of joint retirement is a common feature of the European labour market and if so, which are the determinants of such behaviour. To understand retirement decisions and, among them, retirement of couples seems especially important when the sustainability of the actual pension systems is becoming a public debate in Europe.[4] Any retirement policy to implement should account for cross-effects among the members of a couple. The sign of these cross-effects will depend on how the labour supply of the spouses interacts. Strong complementarities in leisure will induce one spouse to retire when the other does it while the opposite effect could be found when leisure for the members of the couple is a substitute. In the latter case if one spouse compulsory retires the other spouse could increase his/her labour supply to keep the household income at the original level

[1] See for instance Stock and Wise (1990), Berkovec and Stern (1994), Blau (1994) or Gruber and Wise (1999).
[2] There are a few studies focusing on the effects of health status in an individual context. Some examples are Sickles and Taubman (1986), Bound *et al* (1999) or Dwyer and Mitchell (1999).
[3] See Blau (1998), Gustman and Steinmeier (1994) or Hurd (1990) as good examples. All of them in one way or another include health-related variables in their models.
[4] See Boldrin *et al* (1999) or Gruber and Wise (1999) as recent examples.

(added worker effect). The European Community Household Panel (ECHP) provides a unique source of comparison across European countries that allow us to exploit individual and country specific differences relating retirement. The ECHP collects information on a wide range of socio-economic characteristics (personal and household demographic characteristics, labour force status, health status, etceteras) as described in the Appendix.

Given the nature of the problem to analyse (uncertainties concerning the magnitude, timing, frequency of job offers and the duration of jobs), labour market histories are best described as realisations of a stochastic process. Within this framework, flow rates between labour market states are the object of study. A household utility function can be derived allowing for dependence of one person's strategy on the employment status of other household members. In such a setting the allocation of time and income is completely determined by the state occupied. A way to take into account the joint labour supply decisions for married couples is to consider the set of possible states the household can be in (for instance: both members working, wife working-husband non working, etceteras). Transitions from and to any of the possible states can be constructed and compared. As an advantage, this approach allows the labour market decisions of both spouses to be endogenous while controlling for observable and unobservable characteristics.

Recent evidence shows that joint retirement is frequent among married couples. In fact, most of the applied papers using either US or European data (see Zweimüller *et al*, 1996 who use Austrian data, Blau, 1998 using US data or Blau and Riphahn, 1999 using German data) show clear indication of joint retirement due to correlation in unobservable effects or "assortative matting" (for instance, the effect of joint leisure or joint wealth in preferences). European evidence (Zweimüller et al, 1996 with US and Austrian data or Blau and Riphahn, 1999 using German data) shows that higher wages or earnings decrease the incentive to withdraw from the labour force. However, Blau (1998) finds contradictory results using US data.

Concerning the effect of health variables on retirement, Blau (1998), using two simple indicators of the health status of both members of the couple, shows that poor health has a significant negative (positive) effect on entry (exit) rates, specially for the husband. Cross-spouse health effects are mainly small but there are interesting exceptions. For instance, when the wife is employed and the husband is not, poor health of the husband reduces the wife's exit rate by 16%. This suggests that the health insurance provided by the wife's employer may be specially valuable to a couple when the husband's is covered by the wife's plan and is in poor health. Bound et al. (1999) show that poor health lead older workers to withdraw from the labour force, but the earlier a health shock occurs, the less likely is to lead to labour force exit. Finally, Blau and Riphahn (1999) find that a subjective health satisfaction variable and the presence and degree of an officially recognised handicap have no impact on transition rates of men and

women. A chronic disease increases the workers' incentives to leave employment. They also found asymmetric cross effects for this variable.

Among our results we find a strong evidence of complementary, but asymmetric, effects between the labour supply decisions of both spouses. It seems that the husband's decision affects more his wife's decision than vice versa, whatever the origin state of the spouse. Furthermore, we do not find evidence supporting the "added worker effect". With regard to health variables, we find, as in most studies, that own poor health provides both members of the couples with incentives to withdraw from the labour force. More importantly, the magnitude of these health effects depend on the labour force status of the spouse suggesting either complementarities in leisure or correlation in the unobservables of both spouses. Additionally, we find important and asymmetric cross-effects. In that sense, it is striking how crucial is the husband's health status in explaining joint retirement. Concerning demographic variables, self-employed or highly educated individuals have lower probabilities of leaving the labour force. Finally, work income also shows asymmetric effects with a general pattern of negative influence on the probability of leaving the labour force.

The rest of the paper is organised as follows. Section 2 describes the characteristics of the ECHP, the pension systems and the behaviour of individuals within the sample. Section 3 presents the empirical model to be implemented and Section 4 analyses the estimation results. The conclusions are elaborated in Section 5.

2. Data and stylised facts on labour force behaviour of married couples in Europe

2.1. The ECHP

The data analysed in this paper comes from the ECHP and contains information for 12 European countries. The focus of the ECHP is on household income and living conditions across EU12 countries. Eurostat achieves comparability across countries through a standardised design of the survey and common technical and implementation procedures, with centralised support and coordination of the national surveys. Time comparability is achieved by keeping the time between successive waves for a given country close to a calendar year and by keeping the questionnaire similar from one wave to another as much as possible. Information about the sample size, response rates and attrition rates is showed in Table 1.

The structure of the data is described in Figure 1. The interviews are collected at some point during the year (1994, for wave 1, and 1995, for wave 2) and the questionnaire concentrates in the current individual and household information as well as on detailed information about previous calendar year. As the interviews were made almost at any month during the year depending on the country and the wave, one way of homogenising the information is to use the retrospective information to analyse the labour market transitions. In this way, transitions from one labour status to another will refer to the same span of

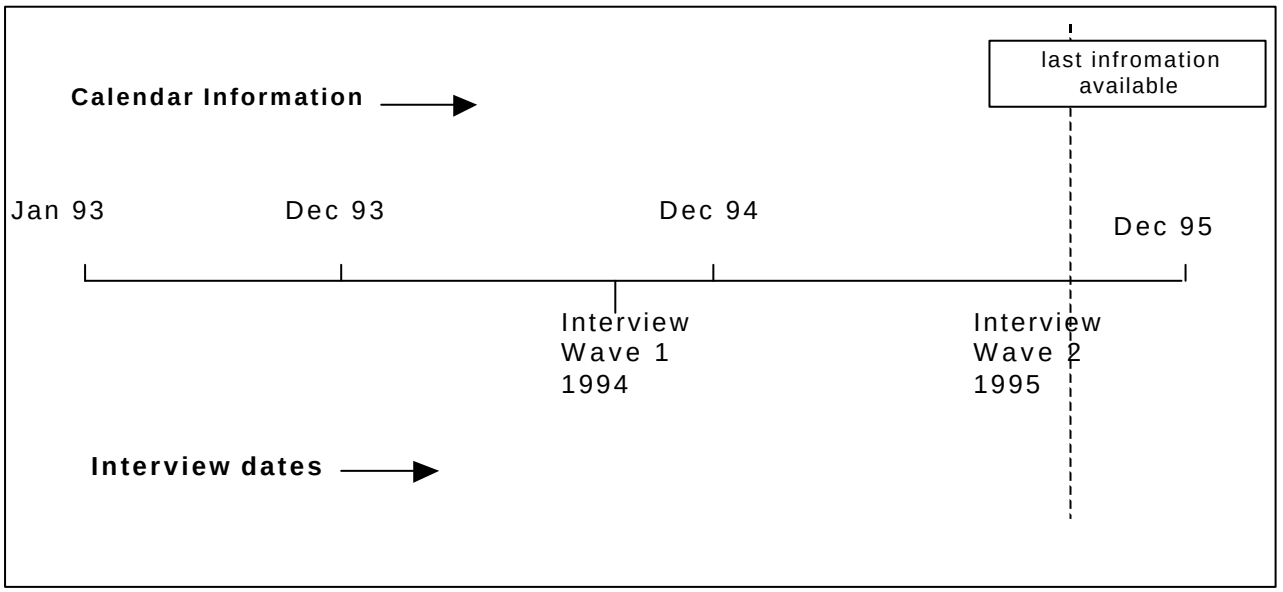
time for every country instead of referring to the interview date that vary across countries and waves. In addition, income variables refer also to the previous calendar year, and therefore concentrating on transitions of this type seems more appropriate.

Table 1. Number of Household, non response and attrition in waves 1 and 2

	Wave 1		Wave 2		
COUNTRY	Sample Size	Response Rate	Sample Size	Response Rate	Attrition Rate
Germany	5054	48	4753	91	8
Denmark	3482	62	3225	83	12
Netherlands	5187	88	5110	89	9
Belgium	4189	84	4012	87	10
Luxembourg	1011	41	962	94	6
France	7344	79	6722	90	11
UK	5779	72	4548	84	23
Ireland	4048	56	3584	82	14
Italy	7115	91	7128	91	5
Greece	5323	90	5219	89	9
Spain	7226	67	6521	87	12
Portugal	4881	89	4955	90	4
EU12	60819	72	56700	87	10
Austria	na	na	3382	68	
EU13	na	na	60062		

Source: ECHP Data Quality (Eurostat)
na: not available. Austria was not part of the sample in 1994.
Response rate: proportion successfully interviewed of households *eligible* for interview in the given wave.
Attrition rate: refers to households as approximation from the attrition rates for longitudinal sample units (individuals)

Figure 1. Data Structure



The paper concentrates on information from waves 1 and 2, the ones available at the moment, and excludes from the analysis two countries: Austria, for which the panel contains only one wave of information, and the Netherlands, which does not contain any retrospective question in its questionnaire.

That gives us two complete years of information about job status transitions, income and individual and household characteristics including health related variables.

2.2. Some lessons from the data

A close observation to the data provides some useful information that should be accounted for when proposing an empirical model to estimate. Evidence on the behaviour of males, females and couples is presented in this section.

In principle, every individual could be in any of three states: working, unemployed or out of the labour force. Figure 2 shows the age profile of the labour force activities in wave 2 (1995) for males and females in the twelve European countries considered. For males (Figure 2.a), the age profiles of labour force activities have similar shapes in all the countries. For females (Figure 2.b) some differences among Northern and Southern countries can be appreciated. Nevertheless, given the similar shapes of the age profiles, the figure suggests that a joint analysis for Europe can be implemented once correcting for country specific factors. It is also interesting to point out how the exit from the labour force is somehow quicker for Europe than for the US (see, for instance, Peracchi and Welch, 1994) as a more stepper age profile predicts.

Figure 3 shows the age profile of labour force transitions for males (Figure 3.a) and females (Figure 3.b) for the joint sample of European countries. As a reference initial point in time is December 1993 and the final point is December 1994. The central line shows the fraction of individuals that actually change labour force status between the two periods. It therefore uses only individuals with valid interviews in both waves. The upper and lower bounds correct for the existence of attrition.[5] Both figures are similar the ones shown in, for instance, Peracchi and Welch (1994), who analyse the case of the US. Transitions from employment and unemployment to out of the labour force show the same age profile. A significant fraction of individuals, especially among males, start leaving the labour force before they are sixty years old. For both males and females, exit from the labour force picks at 60 and 65, showing the age of early and normal retirement for most of the European countries considered. Unemployed individuals tend to retire more than employed. It is also clear from Figures 3.a and 3.b that once an older individual leaves the labour force it tends to remain inactive for the rest of her/his life, there is not much re-entry to the labour force.

From the broad picture presented in previous figures, we can concentrate now in the retirement decisions. Figures 3.a and 3.b suggested that with respect to retirement we can analyse transitions from participation to non-participation since the shape of the transitions from unemployment and employment

[5]The upper bound shows the transition profile if all individuals not interviewed in the second wave will have transit. The lower bound shows the transition profile if none of the individuals not interviewed in the second wave will have change the status.

were similar. Furthermore, it also showed that unemployment, despite being a clear pathway into retirement in most of the countries, could not strictly be considered a form of inactivity for older individuals,[6] since it is a much less absorbing state. Therefore in Figures 4.a and 4.b we present the hazard rates to retirement for EU12 males and females, respectively. The origin state is participation and the destination is to be out of the labour force. Again, the similarities across countries are striking apart from some exceptions and in spite of the small sample size for some of the age ranges in particular countries. In general, the conclusions from the aggregate analysis hold for the disaggregated by country analysis: individuals start retiring before they are 60 although there are exit picks when they are 60 and 65 year old. For females this retirement pattern is less clear, but there are also less observations for older women.

All previous evidence suggest that when analysing exit from the labour force behaviour we need to look also to individuals younger than 60. The age of cut that we select is 55 and 50 years for males and females respectively. In our sample an individual is defined as retired when s/he declares her/himself as so,[7] but also when given the age condition s/he is in another type of economic inactivity (e.g., house keeping). Furthermore, retirement is considered as an absorbing state, that is, once the individual enters in it s/he remains there forever afterwards. Thus we analyse transitions from any form of activity (employment or unemployment) to inactivity, defining this one as retirement. As a first approach we consider two moments in time: t_0, December 1993, and t_1, December of 1994. The reason for such simplification is the scarce and concentrated number of transitions that can be found in every quarter.[8]

Using these criteria we select a sample of couples to analyse joint retirement. As retirement is an absorbing state, for every couple at least one member must be participating in the labour force at t_0. That gives us a sample of 4639 couples with valid values for all variables in the analysis. Figure 5 presents the labour force participation for husbands (top left panel of Figure 5) and wives (top right panel) separately and jointly (bottom panel) for March 1994, a time point in the middle of the observation period, respectively. The profiles for husbands and for wives are similar to those presented in Figures 2.a and 2.b. for respectively the whole sample of males and females. For husbands there is a gradual declination in employment from the age of 55. This declination is sharper for wives after 55. Trends in joint labour force status shown in Figure 5 indicate that the incidence of the husband working and the wife out of the labour force is roughly constant at about 40 per cent until the husband's age of 60, while the rate of both members working declines gradually during these ages. The incidence of wives working while their

[6]Blau (1998) uses this definition of inactivity for older individuals in the US.

[7]Alternative definitions of retirement combining the self-reported labour force status with the reception of old age or invalidity related benefits yield similar results although originate a substantial drop in the number of observed transitions. Approximately a quarter of the sample in self-reported retirement declares not receiving any old age benefit. Results using these alternative definitions are available from the authors on request.

husband are out of the labour force remains almost constant at around 8 per cent until the husband is 70 years old. This could be accounted for by wives considerably younger than their husbands.[9]

It is crucial to answer how often does joint retirement occur. For instance, the probability of retirement is higher for males if their wives are already retired (21.64) than without controlling for the wives' status (18.41). Furthermore, if the wife retires during the period considered (December 1993 to December 1994) the probability of the husband retiring increases up to 27.4 percent. For wives these figures are more striking: if the husband retires during the observation period the probability of retirement for the wife increases 16 percentage points[10] (from 19.7 to 36.1 percent). Note that the influence of one spouse's labour force status in the transition from activity to inactivity of his/her couple is not symmetric, being women more sensible to the condition of their husbands.

2.3. Retirement related to health variables

From previous studies,[11] health has revealed as one of the major determinants of labour force behaviour for older men and women. Poor health leads many older workers to withdraw from the labour force. However how to measure health is not a straightforward question. Retirement studies have commonly used global questions as "Does health limit the amount or kind of work you can perform?" or "How would you rate your health? Is it excellent, very good, good, fair or poor?". Bound *et al* (1999) show for the US that these measures can be endogenous to the labour force status as well as not measuring the actual level of health. Their approach implies the estimation of an unobservable index of health, thorough the observable self-reported health status, using as explanatory variables exogenous factors (as education and age) as well as more detailed health measures available in the data set they use, the Health and Retirement Survey (HRS).

The ECHP does not contain as detailed information as the HRS with respect to functional limitations or specific health conditions. It does however include additional questions to the traditional ones. In particular it records whether the individual has any chronic physical or mental health problem, illness or disability. Individuals are also asked if they have been admitted to a hospital as in-patients[12] and how many times s/he has consulted a doctor a dentist or an optician[13] during the past 12 months. Although all of these measures reflect only partially the actual individual health status they are plausible indicators of it.

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[8]Availability of new data waves will help to overcome this problem allowing a more detailed monthly or quarterly transition analysis. Blau (1998) indicates some advantages and disadvantages of using monthly of quarterly *versus* annual data.

[9]Blau (1998) presented similar evidence for the US.

[10]For the US Blau (1998) found that between 30.3 per cent and 40.6 per cent of couples exit the labour force within 1 year of each other.

[11]See Sickles and Taubman (1986), Blau and Riphan (1999) or Bound *et al* (1999) as examples.

[12]The number of nights spent in a hospital as in-patient are confidential information for Germany and therefore will not be used in this study.

[13]Visits to a doctor, optician or dentist are aggregated for the first wave.

Our reduced form approach here consists on analysing the effect of those indicators on the retirement decisions instead of using them to estimate and predict a health index (see Bound *et al.*, 1999). This makes maximal use of the available information on health status.[14] Additionally, to minimise the possible endogeneity of the health variables all of them refer to the previous year. A detailed description of the variables is contained in the Appendix.

Does health influence joint retirement decisions? Table 4 describes the health status for couples according to the type of transition the couple made between December 93 and December 94. It is noticeable that individuals, especially males, who retire during that period or who are already retired seem to have poorer health than those who remain working. Also poor health condition of the husband is asymmetrically associated with joint retirement when both spouses are initially working. This could suggest that the wives tend to retire to provide care to their husbands. This is confirmed by Table 5, which presents the probability of retirement given the health condition and labour force status of the spouse. There is an increase in the probability of retirement of 2 percentage points for husbands and wives due to the health condition of the other spouse. This probability increases even more when conditioning on retirement of the spouse during the sample period of time and the effect is especially strong for wives. For males, although there is an increase in the probability of retirement, this is smaller than the increase without conditioning on health status of the wife. Undoubtedly, the fact that the husband is often the main contributor to family earnings helps explain this particular evidence.

When the husband is working while the wife is out of the labour force, the proportion of wives with poor health indicators is higher when the husband retires. In fact this is the women's group with the poorest health indicators, suggesting again some kind of care provision from the husband. The reverse is also true when the wife is the one who is working although the differences on their husbands' health status are not that strong, being the wife own health status much worse in relative terms. In general terms, the health status of retired husbands with working wives is poorer than for the rest of males. Then it seems that the wife tend to remain in the labour market until she can, given her own health status, suggesting that health insurance provided by the wife's employer may be especially valuable for these couples.

[14]See Anderson y Burkhauser (1985) for details about measures and problems of health variable.

Table 4. Health status by type of transition

Origin state	Both employed				Husband employed/Wife OLF		Wife employed/Husband OLF	
Destination State	Both employed	Wife retires	Husband retires	Both retire	Remain	Husband retires	Remain	Wife retires
Husband Age	59.66	60.77	61.56	64.20	60.18	63.42	62.76	66.36
In good health	61.45	64.57	43.59	45.45	61.58	49.41	38.96	36.07
Chronic condition	22.80	19.43	40.17	43.94	22.07	35.24	48.88	44.81
Hampered in daily activities	21.45	18.29	31.62	36.36	20.13	34.45	45.57	46.45
Admitted as in-patient	6.86	8.00	14.53	25.76	7.88	18.90	14.09	16.39
Visits to doctor 1-5 times	59.23	62.86	59.83	53.03	55.56	53.35	43.65	44.26
Visits to doctor >5	20.87	14.86	29.91	34.85	21.26	31.10	45.74	47.54
Wife Age	55.50	57.68	57.15	61.09	57.61	60.60	57.2	61.63
In good health	58.74	56.57	60.68	53.03	49.22	36.61	54.09	45.90
Chronic condition	22.80	29.71	28.20	21.21	30.38	35.04	23.48	29.51
Hampered in daily activities	22.03	26.86	23.93	24.24	31.73	39.17	24.00	30.05
Admitted as in-patient	7.73	7.43	6.84	10.61	10.36	11.81	5.04	10.38
Visits to doctor 1-5 times	57.29	53.14	61.54	51.52	51.32	50.00	52.70	48.63
Visits to doctor >5	29.95	31.43	23.93	28.79	35.02	39.76	35.45	37.16
Both chronic condition	9.37	8.00	11.97	13.64	10.90	17.72	15.83	16.39
N. OBSERVATIONS	1035	175	117	66	1853	508	575	183

Table 5. Probability of retirement between December 1993 and December 1994: conditional to spouse retirement and health status

	Wife poor health Retired between Dec 93-Dec 94	Wife poor health	Husband poor health Retired between Dec 93-Dec 94	Husband poor health	Unconditional
Husband	24.36	20.97		27.95	18.41
Wife		22.53	41.30	21.76	19.71

Poor health: individual suffering from a chronic condition or being admitted as in-patient in a hospital

3. Empirical specification

No controls for personal or household characteristics have been considered in the evidence presented in the previous section. To do so, an empirical fully parametric specification is proposed in this one. We assume that preferences are given by a household utility function. Savings behaviour is exogenous in this context given the difficulty of empirically modelling savings and labour supply jointly[15]. In such setting the allocation of time and income is completely determined by the state occupied, as Burdett and Mortensen (1978) showed. Each member of the couple can be participating or not participating in the labour market. Participating must be understood as being working or unemployed but looking for job and not participating collects people in any other situation. Therefore, the household as a whole can be in any of the four following states:

1 = Both spouses participating
2 = Husband participating, wife non participating
3 = Husband non participating, wife participating
4 = Both non participating

Transitions from and to any of the four states can be then constructed producing a matrix of transitions as below.

MATRIX 1

	Joint destination State			
Joint origin state	1	2	3	4
1	--	$p_{12}(X_i b_{12})$	$p_{13}(X_i b_{13})$	$p_{14}(X_i b_{14})$
2	Not considered	--	Not considered	$p_{24}(X_i b_{24})$
3	Not considered	Not considered	--	$p_{34}(X_i b_{34})$
4	Not considered	Not considered	Not considered	--

Transitions implying a re-entry in the labour force from non-participation are not considered here since we assume non-participation (retirement) is an absorbing state. Each element of the matrix, p_{ij}, represents the probability of making a transition from state *i* to state *j* at time *t*. In a reduced form, these probabilities depend on the demographic and economic characteristics (age, education, income, country specific legislation ...), X_i, that shape the latent comparison of utilities that originates a change of status and on a

[15]See Blau (1998) or Martínez-Granado (1998), among others, for similar specifications when dealing with the labour supply of couples. On the other hand, Diamond and Hausman (1984) present an analysis about the relationship between retirement and savings.

vector of parameters, b, which parameterises them. This specification allows for state dependence, that is, the effect of the variables varies with the origin and destination states.

In principle quarterly or monthly transitions could be considered and duration in every state used as an explanatory variable (duration dependence). However, as mentioned above, the span of time is not long enough to avoid the problems derived from the concentration of transitions on some particular months. Therefore we choose a simpler approximation by ignoring the transition time and concentrating only on the destination to which exit took place. We look at the origin state at t_0 (December 1993) and compare it with the destination state at t_1 (December of 1994). Then we have in effect a qualitative response model. Two waves of data are not enough to control by couple specific unobservable heterogeneity, therefore estimation of the matrix above, when assuming transition intensities of the proportional Weibull form, is equivalent to estimate three separated equations conditional on the origin state:

1. When the origin state is that both spouses are on the labour force, identification of b_{12}, b_{13} and b_{14} reduces to estimate a multinomial logit in the second period. We consider the following states: both spouses participating, the husband participating and the wife not, the wife participating and the husband not and both spouses out of the labour force.
2. When the origin state is that the husband is in the labour force while the wife is not, identification of b_{24} comes from estimation of a logit on the second period over two states: the husband in the labour force and the wife out and both retired.
3. When the origin state is that the wife is in the labour force while the husband is out, identification of b_{34} follows the estimation of a logit on the second period over the corresponding two destination states.

An alternative to the family utility model sketched above will be to specify a bargaining model of intrahousehold allocation, as the one in Browning *et al* (1994).[16] This approach imposes much stronger data requirements and will be left for further research. To implement such model two alternatives, among others, can be chosen. From the bargaining model two equations of labour force participation can be derived, one for the husband and one for the wife. There must also be a sharing rule determining the allocation of time and goods between them. As long as the age difference between the spouses or the difference in income expected after retirement could be variables which affect the sharing rule. On the one hand the two equations affected by the sharing rule could be jointly estimated. On the other hand we could leave unspecified the sharing rule and estimate jointly the two equations allowing for correlation and theoretical restrictions among them. This last approach imposes stronger coherence restrictions although is easier to identify. The advantage of this line of research over the model presented in this paper is that it

does not impose a reciprocal influence of the labour force status of both spouses. This would be relevant if for instance the wife labour force decisions are affected by her husband's ones but the reverse is not true.

4. Results

Before presenting the results for couples, we estimate individual retirement models for males and females. In particular, conditional on working at t_o, we estimate, in the second period, a logit separately for males and for females. These results are discussed in Section 4.1, while the results for couples are presented in section 4.2. The Data Appendix gives a detailed discussion and definition of the variables used in the analysis. Although we claim for a reduced form model, we are aware that most of the variables are possibly endogenous[17] and therefore correlated with the error term. We use variables dated at period t_0. This allows us to consider them predetermined at t_0, given the initial labour force status and, under the null of absence of correlation in the errors.

4.1. Individual estimations.

The individual Logit results for males and females are shown in Tables 4 and 5 respectively. Three sets of estimates are presented.[18] First two columns in each table are the estimates for the whole sample of males older than 54 and females older than 49 (5032 and 4171 observations respectively) using country dummies as explanatory variables. The third and fourth columns present the same specification by replacing the country dummies for country specific variables as defined in the Data Appendix. Last two columns show the estimates for a subsample of workers not self-employed.[19]

Starting for the male estimation, results are quite similar whether excluding or not self-employed individuals. First of all there is a strong quadratic (concave) effect of age. However the effect at early ages (before 60) is still of great importance, since the population at risk is larger. Additionally the effect of the dummies for ages 60 and 65 is very strong and significant showing the general pattern of retirement for Europe that we saw in Figure 4. The more the household depends on the male for survival the smaller the probability of retirement is. This can be seen through the negative and significant effect of variables

[16] See Blundell *et al*. (1999) for a collective approach to labour supply, which takes account of participation and heterogeneity.

[17] See Bound *et al* (1998) for an instrumental variable treatment of the endogeneity on self-reported health variables, or Blau (1998) for endogeneity of income variables.

[18] A separate estimation for every country was implemented but most of the variables could not be identified because of the small sample size for many countries. For a comparison grouping the countries by north - south see Jiménez-Martín (1999).

[19] Self-employment represents on average 38 per cent and 20 per cent of the male and female workforce in this range of ages. It is a self reported status and further investigation on this aspect should be done. For some countries like Greece, Portugal or Ireland the figures for self-employed males amount to 65 per cent, 49 per cent and 55 per cent of

such as being the head of the household, household size or individual income relative the household income, whether from work or non-work private sources. Marriage and specially separation/divorce/widowhood seem to have a positive effect on the probability of exiting the labour force.

Self-employment has a negative effect on the probability of retiring. Several explanations could fit that effect: lower replacement rate for self-employed individuals, more attachment to the labour market since they run their own businesses or impossibility of using the early retirement schemes in some countries, etc. To be unemployed in the origin state does not seem to have any effect on the probability of retirement for males. On the other hand, education influences negatively the probability of retirement. A higher degree of education is associated with less physical jobs and with particular preferences about leisure. The occupational dummies work in the same direction, being the manual workers (excluded category) prone to retire.

The potential experience accumulated by the individual increases the probability of leaving the labour force. The more years the individual has already been working the easier to fulfil the requirements to get a pension. These eligibility conditions are hardly satisfied by foreign workers, which have, as a consequence, a lower probability of retiring. To hold a part time job also increases the probability of retirement, reflecting less attachment to the labour market or an intermediate position between full time work and retirement.

Health variables show the expected signs: good health reduces the probability of retirement while a chronic illness or being admitted as in-patient at a hospital increases it. To visit often a doctor is for males a clear sign of poor health, thereby increasing the probability of exiting the labour force. Notice that the self-assessed health variable is not significant after controlling by the remaining health indicators.[20]

With respect to the country specific variables, there are clear differences across countries. The omitted and comparison category when using country dummies is Germany. The results suggest that countries as Luxembourg, France or Italy have a much higher probability of retirement while countries as Portugal, Ireland or Denmark have a much lower one. These differences in countries are basically explained by the different regulations about retirement. When replacing the country dummies for specific characteristics of the countries much of the explanatory power is retained. The more significant effects are those of the normal retirement age and of the Social Protection Expenditure (SPE). The higher the normal retirement age in a country, the lower the probability of exiting the labour market is. On the contrary, the higher the per capita expenditure on Social Protection in a country the higher the probability

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the labour force respectively. These incredible high figures may reflect strong differences in the definition of the self-employment status.

[20]This is an important result since there is evidence on endogeneity of self-assesed health variables in retirement models (see Bound *et al*, 1999).

of retiring. Puzzling enough the higher the life expectancy after 65 the higher the probability of exiting the labour market.[21]

Turning now to the results for females in Table 5 they are in general worse determined than for males. Most of the effects hold apart from some differences that we shall comment now. The effect of marital status has the opposite sing than for males: single women seem to retire more than married or divorced ones. Unemployment in the initial period has now a positive effect on retirement: it is easier to retire once the woman is unemployed (discouragement, loss of contact with the labour market, etc.). Although the health variables work in the same direction than for males, the visits to the doctor do not seem to reflect a poor health condition and therefore have no effect on the probability of retiring.[22] When using country dummies, the effect of country is similar to the one found for males. However these differences across countries are not well explained by regulation differences. When substituting the country dummies for the country specific variables we lose explanatory power as well as find not well defined effects for those variables. Therefore it seems that there are more behavioural differences among women than among men across Europe as was already suggested from Figures 2.a and 2.b in Section 2.

4.2. Joint estimation.

Concerning the joint estimation proposed in section 3, we deal here with a discrete-choice model and therefore the parameter estimates are not directly informative. They appear in the Appendix and we concentrate here on the discussion of Tables 6, 7 and 8 that present simulations of the transition probabilities, based on the estimated parameters. The effects of a given variable on the transition probabilities from a particular state were simulated by computing transition probabilities for a reference couple[23] and allowing changes on the variable which effects we want to assess. Table 6 show the simulation from the estimates of a logit conditional on the case in which the husband is participating and the wife is out of the labour force at period t_0. Table 7 contains the simulations for the logit conditional on the case in which the husband is out of the labour force and the wife is participating at period t_0. And finally, Table 8 present the simulations obtained from the multinomial logit conditional on the case in which both spouses were participating at period t_0 using country dummies. In general results are coherent with

[21]At the moment, results respond to a cross-section perspective. New data waves would make possible to exploit also a time series dimension accounting for changes in the countries regulation across time and improving the results.

[22]Women have reasons for visiting the doctor which are not related to poor health and we cannot distinghish amongst them. Anyway, interations between age and the number of visits to the doctor were included in an initial specification in order to account for the different reasons driving women to visit the doctor (for example, maternity). However they were not significant and therefore are not included in the final specification.

[23]The reference couple has the following characteristics: husband 55 years old and wife 52, none of them with higher education, none unemployed in the initial period, both starting their working lifes at 18, with no part-time job, none working in the public sector, none self-employed, living independently and without any other family member. The shares of the household income for the reference couple are : 25 per cent wife income, 50 per cent husband income and no capital income.

the separate individual estimations presented above, although some new facts reveal from the joint estimation.

Let us start with the retirement decisions of one member of the couple when the other is already retired (Tables 6 and 7). The more relevant effects are found through age, health status, job status in the origin period and the living arrangements of the couple. Age has, as expected, a strong positive effect, especially for women. The probability of the husband retiring increases from 7.2 per cent to 23.3 per cent as he ages from 55 to 60 years and to 55.4 per cent when he reach the 65 years of age. For wives the probability of retiring increases from 2.3 per cent to 28.1 per cent and to 43.4 per cent when she passes from 52 to 60 and 65 years of age respectively. Cross-age effects although positive are relatively small, especially for males.

Poor health influences strong and positively the exit rate from the labour market. For males a chronic health condition, to visit often the doctor and especially to be admitted as in-patient at a hospital are good proxies for poor health. For women, the visits to the doctor do no reflect a poor health condition, as mentioned above. Cross-spouse health effects are mainly insignificant with an interesting exception: when the wife is employed and the husband is not, poor health (a chronic condition) of the husband reduces the wife's exit rate by 24 per cent compared to good health.[24] A close inspection of the data reveals that when the husband is out of the labour force because of health reasons (with a low level of benefits), the wife's work income becomes fundamental for sustaining the household. The positive effect of the dummy reflecting whether the husband receives any type of invalidity income reinforces that hypothesis.

Although to be unemployed during the first period has in principle a negative and small effect, it turns to be positive when the individual is 60 or older. This reflects the prevalence of special early retirement schemes for unemployed individuals from the age of 60. Finally living arrangements influence clearly the probability of retirement for both, males and females. When the couple depends on other family members the probability of retirement increases drastically, especially for husbands. Also, when they cohabit with some family member depending on them there is a reduction in the probability of withdrawing from the labour market.

With respect to the rest of the variables, self-employment, high education and individual work income relative to household work income are disincentives to retirement. A part time job during the first period or a high percentage of the household income coming from non-work sources accelerates the exit from the labour market.

We turn now to the simulation for the probability of retiring when both spouses were working in the initial period (Table 8). There is a strong positive effect of age. Age not only affects own retirement but also the older the husband relatively to the wife the more likely that she retires and vice versa. In particular if the husband is 65 and the wife is 60 the probability of both retiring increases from per

[24]Blau (1998) and Blau and Riphahn (1999) found similar cross-spouses effects for the US and Germany respectively.

thousand to almost 50 per cent. It seems therefore that financial incentives generated by the Social Security system influences the joint retirement decisions: the members of the couple tend to postpone retirement until they are eligible for a pension.[25]

Health status is other major determinant of retirement for working couples. However here we find an asymmetric effect between husbands and wives. While poor health of any the members of the couple increases their own probability of retirement, especially for husbands, poor health of the husband increases also the probability of both retiring. For example if the husband has really poor health (he has a chronic condition, was admitted as in-patient in a hospital during the previous year and visits often the doctor) the probability of both members of the couple retiring increases from 1 per thousand to 5.5 per cent. However, the wife's health status effect on the probability of joint retirement is almost negligible. Therefore when the husband leaves the labour market due to health problems, the wife (because of care-giving reasons) is more likely to leave also the labour market. Finally, the probability of both retiring also increases when both members of the couple enjoy poor health.

Some other variables as the job status at the initial period or the relative work income present interesting asymmetric effects. When one member of the couple is unemployed at the initial period he or she is more likely to retire. However when the husband is the unemployed one, also the wife tends to retire: there is a mild increase on the probability that she retires and a more important increase on the probability of both retiring. This is coherent with the absence of an added worker effect found for several European countries.[26] The income effects go in the same direction. The higher the percentage of the household income any member of the couple earns, the less likely s/he is to retire. However, the husband income has a positive effect on the probability of retirement of his wife while the wife income has a negative effect on the probability of retirement of the husband. In any case, work income as well as non-work income act as a disincentive to joint retirement. The negative sign of the non-work income variable may reflect stronger labour market attachment.

The living arrangements of the couple show a clear example of co-ordinated behaviour: to depend on other family members increases the probability of observing both members of the couple out from the labour market. Self-employment of any of the spouses reduces the probability of observing any of them retiring, in line with the results in Tables 4 and 5.

Potential experience of the husband increases his exit from the labour market and the probability of both of them retiring, while the wife's potential experience increases only the probability of both of them retiring. This effect reflects again the economic incentives of the pension system: when both of them are more likely to be eligible for a pension the chances of joint retirement are higher.

[25]Hidedmann (1998) propose and estimate a model of Social Security acceptance for working couples for the US and obtain similar results.

[26]Several theories try to explain this fact: complementarities in leisure, assortative matting, a stigma effect for husbands depending on their wives and so on. See Martínez-Granado (1998) for an application using UK data.

With respect to the country specific effects, Italy, France and Spain are the countries in which joint retirement is more likely to occur. The country specific variables do not encompass well the differences between countries and further research should be done in this aspect.

Before concluding it is worth to mention that the effect of most variables on the transition probabilities of any spouse depends on the job status of the other member of the couple. For example, a woman with strong health problems has a probability of retiring of 6 per cent when her husband is employed while it increases to 9.6 per cent when the husband is already retired. In the same way, the probability of a male retiring when his wife is working and he has strong health problems is lower than 1 per cent but when his wife is already retired this probability increases to 28.2 per cent. Therefore there is evidence of a propensity among couples to spend leisure time together. Whether this effect is due to some unobservable characteristics affecting both members of the couple or to complementarities in leisure is a question that can not be disentangled with the simple model estimated in the previous section.

6. Conclusions

In this paper we examine individual and couples retirement patterns within the EU12 using information from the first two waves (1994 and 1995) of the European Community Household Panel, a newly released Eurostat longitudinal Survey. In our analysis we pool the data from the different countries and control the differences between their labour markets and pension systems. In more detail, we control these differences by introducing either a set of country specific effects or a set of variables that capture the differences in the regulation and/or the characteristics of the population. Our approach, despite some evident limitations, has important advantages: it permits, specially when more waves become available, to capture the effect of the regulation and to analyse the effect of changes in the regulations for some countries.

Before describing the detailed results we want to stress that there is strong evidence of joint retirement behaviour for the EU12 countries. In particular, we find that a working spouse is more likely to retire the more recently the other spouse has retired. This effect is even stronger if the wife is the working spouse.

At the individual level our results are in line with most of the recent literature in retirement behaviour. In particular, we find some behavioural differences (income and health effects) between males and females; the more the household depends on the male for survival the smaller his probability of retirement is; self-employed people have lower probabilities of leaving the labour force; highly educated individuals stay in the labour market for longer periods; the probability of retirement is important at early ages and peaks twice, at 60 and 65. Health variables, as founded in other recent studies, are very relevant in determining retirement behaviour, especially for males.

As expected, there are strong differences between countries, which are well accounted for by the differences in regulation, specially in the cases of males. For females, the important behavioural differences across countries (essentially the difference North vs South) are not well captured, because of our data limitations.

With respect to couples exiting from the labour force, the following features should be stressed. First, concerning the joint retirement decisions given that both members of the couple are participants at the beginning of the period, we have found, first, strong cross age effects, specially when both spouses reach the entitlement age. Second, as found in other studies, there is strong evidence against the added worker effect at older ages. Third, male health status has strong influence in his own decision and, more importantly, in joint retirement decisions. However, the reverse is not true, since female health status has little influence in all the cases. This issue deserves further investigation since we believe that it may undercover an important income effect. Fourth, as previously commented, the self-employment status discourages retirement in all cases. Finally, we find important asymmetric effects of the relative work income variables.

To finalise, we want to emphasise that the magnitude of the effect of some key variables (health, income or living arrangements) depends on the labour force of both members of the couples suggesting either complementarities in leisure or correlation in the unobservables of both spouses.

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Data Appendix

A. Variables.

The variables included in the analysis can be grouped in four categories:

1) *personal and household characteristics*:
   * marital status: two dummies, one taking value 1 if the individual is married, and the other equalling 1 if the individual is separated/divorced/widowed
   * a dummy for the individual being head of the household, dated in t_0.
   * a dummy reflecting whether the couple lives as dependent in other households or any of the members is the head of the household and therefore they live independently, dated in t_0.
   * age, its square, and two dummies, one for age being 60 and another for age being 65 to pick the exit spikes at those ages
   * education: a dummy for the individual having a third level of education recognised
   * foreigner: a dummy for individuals not being nationals of the country where they are, dated in t_0.
   * household size, dated in t_0.
   * number of children in the household younger than 15, dated in t_0.
2) health variables
   * a dummy if the individual reports himself as having good health, dated in t_0.
   * a dummy for individuals having a chronic physical or mental health problem, dated in t_1 (this information is not available for t_0).
   * a dummy for individual was admitted as in-patient in a hospital during the previous year
   * two dummy variables for visiting the doctor between 1 and 5 times and more than five times in the year, dated in t_0.
3) labour force status characteristics, all dated in t_0.
   * Potential experience: Age-Age at which the person started her/his working life.
   * Dummies controlling for self-employment, unemployment, part-time job and, working in the public sector.
   * Occupational dummies: professionals, clerks, services workers
   * Dummy for the size of the job unit greater than 500
   * Work income relative to household income (it includes employment and self-employment earnings as well as unemployment benefits).
   * Non-work income relative to household income (includes capital and property rental income as well as private transfers)

* Invalidity income: dummy that equals 1 if the individual receives income from sickness pensions. Since this type of income is not directly observable for every country it also includes some other public pensions: educational, family related benefits and other personal benefits.

4) Country specific characteristics
   * 11 national dummies
   * sex specific variables collecting different regulations and characteristics across countries
     i) life expectancy at 65: number of expected years to live over 65
     ii) Early retirement age and Normal retirement age
     iii) Social Protection Expenditure (in Euro per capita)
     iv) Pension eligibility criteria
     v) Minimum pension relative to work income

In Tables A.1 and A.2 below present the mean and the standard deviation for all relevant variables in the individual and joint samples.

Table A1. Descriptive statistics

	Male sample		Female sample		Males in Couples sample		Females in Couples sample	
	5032 Mean	Obs st-dev.	4171 Mean	Obs. st-dev.	4639 Mean	obs. St-dev.	4639 Mean	Obs St-dev.
Transition to retirement	0.173	0.379	0.168	0.374	0.183(*)	0.387	0.197(#)	0.398
Age	60.28	4.826	56.07	5.270	60.99	5.000	57.61	5.181
Unemployment	0.093	0.291	0.086	0.281	0.073	0.260	0.038	0.192
College education	0.158	0.365	0.136	0.343	0.147	0.354	0.073	0.260
Good Health	0.599	0.490	0.569	0.495	0.555	0.497	0.509	0.500
Chronic physical/mental health problems	0.244	0.430	0.244	0.430	0.287	0.452	0.279	0.449
In-patient in a hospital	0.098	0.297	0.082	0.274	0.104	0.305	0.091	0.288
Number of visits to the doctor 1-5	0.563	0.496	0.551	0.497	0.545	0.498	0.530	0.499
Number of visits to the doctor >=6	0.225	0.417	0.322	0.467	0.265	0.441	0.340	0.474
Potential experience	42.38	9.692	35.44	12.11	43.57	9.126	31.82	17.73
Self employment status	0.379	0.485	0.200	0.400	0.330	0.470	0.111	0.314
Part time	0.070	0.255	0.240	0.427	0.067	0.250	0.185	0.389
Public employment	0.216	0.412	0.310	0.463	0.219	0.413	0.162	0.368
Working in a 500+ firm	0.093	0.291	0.070	0.255	0.106	0.308	0.047	0.212
Professional	0.259	0.438	0.270	0.444	0.257	0.435	0.139	0.346
Clerks	0.054	0.227	0.138	0.345	0.056	0.230	0.076	0.266
Services workers	0.053	0.224	0.158	0.365	0.052	0.223	0.103	0.304
Non national	0.015	0.122	0.017	0.128	0.011	0.103	0.011	0.103
Married	0.876	0.330	0.728	0.445	----	----	----	----
Sep-divorced-Widowing	0.061	0.240	0.203	0.403	----	----	----	----
Household size	3.083	1.464	2.682	1.303	3.091	1.351	3.091	1.351
Living independently	----	----	----	----	0.936	0.245	0.936	0.245
Number of children 0-15	0.113	0.447	0.079	0.358	0.080	0.371	0.080	0.371
Head	0.913	0.282	0.444	0.497	----	----	----	----
Work income relative to H'hold income	0.581	0.320	0.368	0.308	0.473	0.356	0.136	0.219
Non-work income rel. To H'hold income	0.027	0.085	0.017	0.067	0.036	0.105	0.036	0.105
Min benefits relative to work income	0.501	0.378	0.658	0.348	0.527	0.373	0.837	0.291

Notes: (*) Over 3881 observations. (#) Over 2207 observations.

Table A2. Analysis of joint transitions within the couples.
[Sample Husband Aged 55+ Wife 50+. Retirement is assumed to be an absorbing state.]

From \ To	Both in	Husband in / Wife out	Husb. Out / wife in	Both out
Both in	1035	175	117	66
	(74.3)	(12.6)	(8.4)	(4.74)
Husband In / wife out	n.c.	1861	nc	514
		(78.4)		(21.64)
Husband Out / wife in	n.c.	n.c.	575	183
			(75.9)	(24.1)
Both out	n.c.	n.c.	n.c.	n.c

Notes: (nc): not considered.

B. Social Protection expenditures and pension systems in EU12 (1994-1995).

Social protection expenditure (SPE), which include a large variety of programs or functions (old-age, survivor, disability, unemployment, etc..) represents a major part of public spending in all EU countries. Overall, in 1995, SPE amounted to 28.4 percent of GDP and 52.2 percent of total government expenditures in the EU. As a share of GDP, SPE is highest in Central and Nordic countries (above 30 per cent) and lowest in the Southern countries and Ireland (around 20 percent). The level of SPE per capita (measured in PPP units) also varies (practically proportionally to GDP per capita levels) between the two groups of countries mentioned (from under 2.500 PPP in Greece and Portugal and about 3.000 PPP in Spain and Ireland, to over 6.000 in Denmark, Luxembourg). The last two columns of Table A3 report the ratio of old age and survivors pension expenditures to SPE and to GDP. Excluding Greece, pension expenditures in 1995 amounted on average to 42.4 percent of SPE and 12.1 percent of GDP. In all EU12 countries, except Ireland (which has the lowest fraction of elderly people), old-age and survivors pensions represent by far the largest component of SPE, ranging from 35.5 percent in Netherlands to 63 percent in Italy (the country with the largest proportion of retired people).

Table A3. Social protection expenditures in the EU, 1995

	SPE	SPE p.c.	Pension Expenditures	
Country	%GDP	PPP '000	% SPE	% GDP
Germany	30.4	5.8	40.8	12.0
Denmark	34.3	6.3	36.6	12.6
Netherlands	31.6	5.8	35.5	11.2
Belgium	29.7	5.6	39.8	11.8
Luxembourg	25.3	7.7	43.2	10.9
France	30.6	5.5	40.7	12.5
UK	28.5	4.5	38.0	10.4
Ireland	19.9	3.2	24.9	5.0
Italy	24.6	4.1	62.7	15.4
Greece	21.0	2.3	n.a.	n.a.
Spain	21.8	2.9	44.1	9.6
Portugal	20.7	2.4	38.6	8.0
EU15	28.4	4.8	42.4	12.1

Notes: SPE: Social Protection Expenditures. In thousands per capita.
Pensions expenditures: Old-age + Survivor functions. Source: Boldrin et al. (1999).

The pension system and its generosity

There are two key types of pension systems: unfounded Pay As You Go (PAYG) and funded systems. All the EU12 are characterised by a first PAYG pillar, which differs across countries in their coverage and generosity. Simultaneously, on the top of this public first pillar, many EU countries have also a second pension pillar (voluntary or compulsory), with defined benefits (DB) or defined contributions (DC). On the top of these two pillars, there is a third private pensions pillar (which is still of limited importance in a vast majority of the countries considered). See, for instance, Boldrin et al (1999) for a comprehensive description of the EU15 situation.

In Table A4 a set of variables that identify some of the differences in terms of the parameters that characterise public pensions and life expectancy (which determines the length of the period in which people receives benefits) in EU12 countries.[27] There are not much differences in retirement ages (being Italy an important exception) or life expectancy (either at birth or at 65). However, there are important differences among countries in contributory rates, eligibility criteria and generosity. It is worth mentioning the differences in generosity of the "guaranteed" benefits. Belgium and Luxembourg provide the elderly with the highest level of guaranteed benefits and Greece, Portugal and Germany with the lowest. A clear relationship between the levels of guaranteed benefits and GDP per capita is found (Germany and Spain are notable exceptions). See Boldrin et al. (1999) or Blondal and Scarpetta (1998) for further comments of public pension replacement rates or generosity.

Table A4. Country data in 1994-1995.

Country	Tax	SPE Euro pc.	Male Life exp.	Female Life exp.	Male life exp at 65	Fem. Life exp at 65	Early (F)	Normal (F)	Elegi-bility	Minimum Benefits
Germany	42.6	5514	73	80	14.7	18.4	63	65	5	2768
Denmark	51.3	6374	73	78	14.3	17.7	60	67	3	3472
Netherlands	45.4	5536	75	80	14.8	19.1	65	65	0	3473
Belgium	46.8	5052	74	81	14.8	19.1	65	60	0	7638
Luxembourg	43.3	6674	74	81	14.6	18.7	60	65	10	10440
France	44.6	5500	74	82	16.2	20.6	60	60	0	5048
UK	34.9	4649	74	79	14.7	18.3	65(60)	65(60)	4	4103
Ireland	36.3	2873	73	79	13.9	17.4	65	65	3	3357
Italy	40.7	4312	75	81	15.5	19.4	56(51)	61(56)	16	4759
Greece	32.8	1645	75	80	16.1	18.4	60	65(60)	15	354
Spain	34.8	3020	73	81	15.7	19.5	60	65	10	5087
Portugal	36.1	2162	71	79	14.4	17.9	60	65(62)	15	1345

Keys: Tax: Income and social contributions taxation. SPE: Social protection expenditure (in Euro per capita). Minimum benefits are given in 1995 PPS units.

[27]The key parameters that characterise public pension systems are the contribution rates, the eligibility criteria, the early (if any) and normal retirement ages, the replacement rate, the indexation rules (to real wages or to nominal inflation), and the amount of survivors and orphans benefits.

Table A.5. Transition to joint retirement from Husband in / Wife out of the LF

Variable	Coef	St-dev	Coef	St-dev
Male age	0.168	0.060	0.160	0.059
Male age-sq	-0.001	0.002	-0.001	0.002
Female age	0.038	0.046	0.042	0.046
Female age-sq	-0.001	0.002	-0.001	0.002
Age 60 (male)	0.643	0.175	0.639	0.174
Age 65 (male)	1.408	0.244	1.418	0.244
Male unemployment	-0.284	0.310	-0.335	0.325
Male unemployment and Age >=60	1.211	0.376	1.221	0.374
Female college education	-0.743	0.325	-0.794	0.324
Male College education	-0.013	0.195	0.002	0.195
Male pot. Experience	0.001	0.008	0.000	0.008
Male part time	0.622	0.203	0.570	0.202
Male working in PS	0.263	0.152	0.259	0.152
Male self-employed	-0.432	0.158	-0.439	0.157
Household Size	-0.249	0.060	-0.244	0.058
Independent	-1.914	0.203	-1.773	0.189
Male Good Health	0.110	0.140	0.088	0.139
Male Chronic physical/mental problems	0.451	0.142	0.447	0.142
Male as in-patient in hospital	1.000	0.174	1.001	0.174
Male 1-5 visits to a doctor	0.175	0.166	0.164	0.165
Male 6+ visits to a doctor	0.271	0.204	0.279	0.202
Female Good Health	-0.254	0.142	-0.270	0.140
Female Chronic physical/mental problems	-0.106	0.248	-0.084	0.247
Female as in-patient in hospital	0.123	0.190	0.101	0.189
Male Work income rel to H'hold income	-0.787	0.420	-0.734	0.430
Couple non-work priv inc. rel. to H'hold inc.	-1.600	0.572	-1.618	0.569
Female chronic problem X Male rel income	-0.033	0.377	-0.068	0.376
Female Age X Male rel. income	-0.026	0.033	-0.027	0.033
Female receiving invalidity income	-0.153	0.189	-0.153	0.190
Female life exp. at 65			0.537	0.188
Male Life exp. at 65			-0.284	0.194
Early retirement age			-0.043	0.027
Normal retirement age			-0.100	0.046
Social Prot. Exp. (in Euro per capita)			0.000	0.000
Male min benefits rel. To work income			0.072	0.279
Denmark	-0.816	0.440		
Belgium	-0.456	0.363		
France	0.744	0.311		
UK	-0.485	0.306		
Ireland	-0.801	0.311		
Italy	0.383	0.266		
Greece	0.102	0.278		
Spain	-0.348	0.265		
Portugal	-0.483	0.276		
Intercept	-0.643	0.748	4.793	4.551
Observations	2361			
Log-L	-941.4		-944.8	
Pseudo-R_sq	23.43		23.15	
Chi-sq	576.0 (38)		569.1 (35)	

Omitted Countries (Germany+Lux)

Table A.6. Transition to joint retirement from Husband out / Wife in the LF

Variable	Coef.	St-dev	Coef.	St-dev
Male age	0.133	0.096	0.126	0.095
Male age-sq	-0.003	0.002	-0.003	0.002
Female age	0.068	0.090	0.059	0.090
Female age-sq	0.002	0.004	0.003	0.004
Age 60 (female)	1.523	0.330	1.522	0.326
Age 65 (female)	1.233	0.494	1.142	0.472
Female unemployment	-0.295	0.464	-0.334	0.468
Female unemployment and Age >=60	0.845	0.684	0.786	0.678
Female college education	-0.138	0.484	-0.092	0.485
Male College education	0.221	0.385	0.307	0.378
Female pot. Experience	0.019	0.009	0.020	0.009
Female part time	0.338	0.232	0.364	0.234
Female working in PS	-0.339	0.291	-0.394	0.293
Female self-employed	-0.401	0.277	-0.463	0.272
Household Size	-0.099	0.106	-0.096	0.104
Independent	-1.367	0.400	-1.298	0.377
Male Good Health	-0.312	0.256	-0.318	0.252
Male Chronic physical/mental problems	-0.588	0.358	-0.577	0.354
Male as in-patient in hospital	0.284	0.295	0.276	0.296
Female Good Health	-0.201	0.243	-0.203	0.238
Female Chronic physical/mental problems	0.490	0.267	0.600	0.259
Female as in-patient in hospital	1.277	0.401	1.240	0.401
Female 1-5 visits to a doctor	-0.299	0.318	-0.338	0.313
Female 6+ visits to a doctor	-0.446	0.357	-0.437	0.352
Female Work income rel to H'hold income	-2.547	1.489	-2.667	1.536
Couple non-work priv inc. rel. to H'hold income	0.828	1.343	0.976	1.326
Male chronic problem X Female rel income	0.373	0.883	0.404	0.879
Male Age X Female rel. income	0.085	0.077	0.082	0.076
Male receiving invalidity income	0.499	0.316	0.602	0.304
Female life exp. at 65			0.723	0.348
Male Life exp. at 65			-0.286	0.273
Early retirement age			-0.031	0.043
Normal retirement age			-0.045	0.050
Social Prot. Exp. (in Euro per capita)			0.000	0.000
Female min benefits rel. to work income			-0.076	0.507
Denmark	-0.765	0.618		
Belgium	-0.720	0.702		
France	0.404	0.432		
UK	0.591	0.504		
Ireland	-1.331	0.948		
Italy	0.536	0.472		
Greece	0.432	0.487		
Spain	0.038	0.464		
Portugal	-0.707	0.501		
Intercept	-2.089	1.212	-3.602	4.435
Observations	758			
Log-L	-310.8		-313.8	
Pseudo-R_sq	25.8		25.1	
Chi-sq	216.2 (38)		210.3 (35)	

Omitted Countries (Germany+Lux)

Table A.7a. Transitions to retirement from the labour force. A 4-state model.

	Husb. In/ Wife out		Husb out/ Wife in		Both of them out	
Variable	Coef.	St-dev	Coef.	St-dev	Coef.	St-dev
Male age	0.071	0.099	0.043	0.121	0.287	0.192
Male age-sq	-0.003	0.003	0.000	0.004	-0.006	0.005
Female age	0.134	0.084	0.044	0.096	0.126	0.139
Female age-sq	0.000	0.003	-0.002	0.004	-0.002	0.004
Age 60 (male)	-0.135	0.322	0.876	0.326	0.452	0.585
Age 60 (female)	-0.409	0.550	1.853	0.433	1.427	0.601
Age 65 (male)	1.055	0.346	-0.085	0.508	1.611	0.482
Age 65 (female)	0.556	0.729	0.391	0.807	-0.590	1.192
Male unemployment	0.251	0.388	0.575	0.407	1.029	0.661
Female unemployment	1.019	0.322	-0.032	0.443	0.089	0.702
Male college education	0.163	0.314	-0.551	0.393	-0.479	0.715
Female college education	-0.376	0.423	-0.279	0.442	0.454	0.769
Female potential experience	-0.006	0.011	0.003	0.013	0.028	0.026
Male potential experience	0.004	0.018	0.032	0.018	-0.003	0.022
Female part time	0.852	0.206	0.274	0.251	0.481	0.388
Male part time	-0.459	0.405	0.447	0.374	-0.102	0.541
Female working in PS	-0.150	0.292	0.378	0.287	0.075	0.509
Male working in PS	-0.506	0.309	0.661	0.296	0.201	0.538
Any of them self-employed	-0.403	0.253	-0.205	0.308	-1.094	0.464
Household Size	-0.010	0.092	-0.067	0.120	-0.645	0.201
Independent	-0.158	0.763	-0.520	0.793	-3.909	0.806
Male Good Health	0.082	0.222	-0.310	0.261	-0.392	0.419
Male Chronic physical/mental problems	-0.331	0.361	1.222	0.382	0.559	0.515
Male as in-patient in hospital	0.318	0.348	0.492	0.351	1.429	0.458
Male 1-5 visits to a doctor	0.171	0.246	0.662	0.359	0.645	0.561
Male 6+ visits to a doctor	-0.184	0.344	0.881	0.424	0.707	0.671
Female Good Health	0.135	0.223	0.373	0.276	-0.194	0.410
Female Chronic physical/mental problems	1.326	0.456	1.084	0.549	-1.641	0.968
Female as in-patient in hospital	-0.333	0.372	-0.090	0.444	0.760	0.574
Female 1-5 visits to a doctor	-0.042	0.279	-0.168	0.340	-1.100	0.481
Female 6+ visits to a doctor	0.066	0.328	-0.608	0.406	-1.452	0.571
Both chronic condition	-0.845	0.480	-1.276	0.505	-0.021	0.822
Female Work income relative to H'hold income	-4.607	1.551	-2.090	1.606	-2.399	3.246
Male Work income relative to H'hold income	0.917	0.739	-0.575	0.979	-4.969	1.676
Couple non-work priv. inc. rel. to H'hold income	-0.661	1.009	-1.528	1.523	-3.793	2.454
Male Age X Female relative income	0.192	0.114	0.170	0.108	-0.236	0.242
Female Age X Male relative income	-0.062	0.067	0.016	0.089	0.201	0.124
Male chronic problem X Female rel income	2.104	1.054	-0.855	1.009	2.321	1.713
Female chronic problem X Male rel income	-0.924	0.662	-0.151	0.872	3.048	1.369
Denmark	-0.846	0.512	0.088	0.544	-0.012	1.175
Belgium	-0.225	0.705	0.835	0.806	-0.501	1.249
France	-1.434	0.702	1.764	0.516	2.400	1.001
UK	0.124	0.406	0.347	0.503	1.007	0.950
Ireland	1.236	0.473	-0.317	0.888	1.391	1.243
Italy	1.286	0.427	1.436	0.529	2.222	0.997
Greece	0.810	0.418	0.598	0.574	1.321	1.008
Spain	0.670	0.472	-0.495	0.782	1.633	1.091
Portugal	-0.231	0.425	0.045	0.536	-0.295	1.019
Intercept	-3.474	1.469	-5.262	1.756	-0.331	2.557
Observations			1393			
Log-L			-870.6			
Pseudo-R_sq			25.1			
Chi-sq			582.0 (144)			

Omitted Countries (Germany+Lux); Omitted state:
Both members working

Table A.7b. Transitions to retirement from the labour force: A 4-state model.

	Husb. In/ Wife out		Husb out/ Wife in		Both of them out	
Variable	Coef.	St-dev	Coef.	St-dev	Coef.	St-dev
Male age	0.051	0.097	0.050	0.122	0.304	0.190
Male age-sq	-0.002	0.003	0.000	0.004	-0.006	0.005
Female age	0.092	0.083	0.045	0.096	0.127	0.139
Female age-sq	0.000	0.003	-0.002	0.004	-0.003	0.004
Age 60 (male)	-0.099	0.319	0.869	0.324	0.510	0.569
Age 60 (female)	-0.252	0.546	1.911	0.430	1.660	0.594
Age 65 (male)	1.052	0.338	-0.085	0.507	1.547	0.474
Age 65 (female)	0.372	0.703	0.595	0.818	-0.860	1.192
Male unemployment	0.166	0.397	0.647	0.431	0.693	0.683
Female unemployment	0.495	0.314	-0.119	0.452	0.026	0.706
Male college education	0.297	0.309	-0.572	0.388	-0.495	0.708
Female college education	-0.220	0.414	-0.298	0.439	0.475	0.777
Female potential experience	-0.013	0.010	0.003	0.013	0.022	0.024
Male potential experience	0.014	0.015	0.032	0.019	-0.005	0.021
Female part time	0.794	0.202	0.261	0.253	0.547	0.391
Male part time	-0.359	0.406	0.480	0.374	-0.017	0.535
Female working in PS	-0.111	0.287	0.437	0.287	0.143	0.501
Male working in PS	-0.449	0.302	0.649	0.295	0.058	0.523
Any of them self-employed	-0.483	0.254	-0.257	0.314	-1.187	0.447
H'old Size	0.115	0.087	-0.101	0.122	-0.560	0.194
Independent	0.133	0.692	-0.162	0.673	-3.011	0.637
Male Good Health	0.082	0.219	-0.287	0.259	-0.260	0.418
Male Chronic physical/mental problems	-0.308	0.348	1.186	0.382	0.562	0.512
Male as in-patient in hospital	0.363	0.345	0.465	0.347	1.433	0.452
Male 1-5 visits to a doctor	0.157	0.243	0.679	0.357	0.703	0.551
Male 6+ visits to a doctor	-0.203	0.340	0.896	0.421	0.747	0.669
Female Good Health	0.176	0.221	0.371	0.272	-0.139	0.413
Female Chronic physical/mental problems	1.231	0.449	1.115	0.549	-1.530	0.938
Female as in-patient in hospital	-0.089	0.361	-0.142	0.442	0.883	0.572
Female 1-5 visits to a doctor	-0.019	0.278	-0.152	0.334	-1.032	0.473
Female 6+ visits to a doctor	0.084	0.327	-0.627	0.401	-1.471	0.568
Both chronic condition	-0.785	0.476	-1.276	0.504	-0.126	0.801
Female Work income relative to H'hold income	-3.678	1.569	-1.544	1.641	-3.000	3.363
Male Work income relative to H'hold income	0.668	0.743	-1.004	1.043	-5.066	1.743
Couple non-work priv. income rel. to H'hold inc.	-0.712	0.991	-1.664	1.512	-4.063	2.480
Male Age X Female relative income	0.216	0.111	0.172	0.109	-0.222	0.238
Female Age X Male relative income	-0.013	0.066	0.011	0.091	0.242	0.121
Male chronic problem X Female relative income	2.045	1.001	-0.816	0.994	2.060	1.699
Female chronic problem X Male relative income	-0.919	0.658	-0.153	0.878	3.147	1.362
Female life exp. at 65	0.435	0.275	0.491	0.406	0.777	0.530
Male Life exp. at 65	-0.615	0.352	-0.411	0.470	0.310	0.611
Early retirement age	-0.021	0.042	-0.032	0.049	-0.027	0.079
Normal retirement age	-0.163	0.091	-0.291	0.116	-0.008	0.153
Social Protection Expenditure (in Euro per capita)	0.000	0.000	0.000	0.000	0.000	0.000
min benefits rel. to female work income	0.103	0.444	-0.660	0.610	0.546	0.833
min benefits rel. to male work income	1.273	0.502	0.777	0.594	-0.824	0.986
Intercept	12.163	9.531	15.041	11.704	-15.668	16.495
Observations			1393			
Log-L			-890.5			
Pseudo-R_sq			23.3			
Chi-sq			542.1 (138)			

Omitted Countries (Germany+Lux); Omitted state:
Both members working

Table 4. Male. Individual transition to retirement

Variable	Coef	St-dev	Coef	St-dev	Coef	St-dev
head	-1.445	0.130	-1.442	0.130	-1.369	0.148
married	0.290	0.188	0.263	0.187	0.263	0.232
Separated-divorced-widowed	0.407	0.237	0.392	0.236	0.468	0.293
Age	0.275	0.037	0.273	0.036	0.193	0.055
Age-sq	-0.004	0.001	-0.004	0.001	-0.001	0.002
Age 60	0.808	0.128	0.813	0.127	0.946	0.149
Age 65	1.469	0.182	1.484	0.182	1.789	0.253
Unemployment	0.229	0.147	0.248	0.157	0.352	0.155
High education	-0.375	0.146	-0.361	0.145	-0.435	0.172
Good Health	-0.089	0.099	-0.073	0.099	0.010	0.125
Chronic physical/mental health problem	0.563	0.100	0.551	0.100	0.707	0.126
In-patient at a hospital	0.647	0.128	0.660	0.128	0.492	0.161
1-5 visits to a doctor	0.139	0.123	0.154	0.122	0.143	0.158
6+ visits to a doctor	0.345	0.148	0.363	0.148	0.306	0.187
Potential experience	0.011	0.006	0.010	0.006	0.007	0.008
Self employment status	-0.389	0.120	-0.363	0.118		
Part time	0.686	0.144	0.674	0.144	0.356	0.207
Public employment	0.467	0.123	0.467	0.123	0.481	0.130
Working in a 500+ firm	0.785	0.150	0.763	0.149	0.821	0.157
Professional	0.080	0.120	0.076	0.120	0.223	0.153
Clerks	0.188	0.190	0.197	0.190	0.235	0.197
Services workers	-0.690	0.235	-0.676	0.234	-0.671	0.286
Non national	-0.983	0.447	-0.936	0.445	-1.621	0.567
Household size	-0.208	0.045	-0.188	0.043	-0.232	0.058
Number of children 0-15	0.234	0.119	0.206	0.117	0.401	0.134
Work income relative to H'hold income	-0.812	0.156	-0.735	0.172	-0.802	0.212
Non-work private income relative	-1.414	0.548	-1.385	0.547	-1.208	0.810
Life exp. At 65			0.522	0.086		
Male early retirement age			0.053	0.037		
Female normal retirement age			-0.105	0.029		
Social Prot. Exp. (in Euro per capita)			0.000	0.000		
Pension elegibility criteria			0.056	0.020		
Minimum benefits rel. to work income			0.044	0.171		
Denmark	-0.368	0.249			-0.502	0.289
Belgium	0.673	0.252			0.672	0.285
Luxembourg	1.194	0.453			1.620	0.510
France	0.861	0.229			0.855	0.254
UK	-0.097	0.212			-0.084	0.238
Ireland	-0.599	0.248			0.147	0.291
Italy	1.056	0.203			1.276	0.235
Greece	0.663	0.211			0.492	0.280
Spain	0.427	0.205			0.353	0.235
Portugal	-0.305	0.213			-0.093	0.253
Intercept	-3.556	0.468	-8.886	3.891	-3.161	0.591
Observations	5032		5032		3123	
Log-L	-1782.2		-1786.5		-1141.3	
Pseudo-R_sq	23.2		23.1		24.2	
Chi-sq	1079.0 (37)		1070.3 (33)		730.0 (36)	

Omitted: Germany Excluded: Nether.

Table 5. Female. Individual transition to retirement

Variable	Coef	St-dev	Coef	St-dev	Coef	St-dev
Head	-0.766	0.123	-0.740	0.122	-0.816	0.148
married	-0.501	0.209	-0.494	0.206	-0.728	0.234
Separated-divorced-widowed	-0.222	0.210	-0.181	0.207	-0.460	0.236
Age	0.140	0.025	0.144	0.024	0.107	0.033
Age-sq	-0.001	0.001	-0.001	0.001	0.001	0.001
Age 60	1.285	0.166	1.169	0.162	1.401	0.188
Age 65	0.855	0.284	0.843	0.278	1.267	0.456
Unemployment	0.553	0.155	0.439	0.155	0.612	0.160
High education	-0.145	0.184	-0.103	0.182	-0.123	0.200
Good Health	-0.205	0.107	-0.077	0.104	-0.314	0.124
Chronic physical/mental health problem	0.229	0.113	0.217	0.110	0.224	0.130
In-patient at a hospital	0.169	0.169	0.268	0.165	0.280	0.190
1-5 visits to a doctor	-0.201	0.141	-0.167	0.139	-0.343	0.163
6+ visits to a doctor	-0.139	0.161	-0.083	0.158	-0.415	0.187
Potential experience	0.006	0.005	0.002	0.004	0.008	0.006
Self employment status	-0.300	0.129	-0.319	0.126		
Part time	0.431	0.106	0.416	0.105	0.432	0.120
Public employment	-0.293	0.133	-0.341	0.130	-0.361	0.142
Working in a 500+ firm	0.165	0.188	0.137	0.185	0.122	0.194
Professional	-0.225	0.145	-0.142	0.144	-0.091	0.174
Clerks	-0.274	0.161	-0.199	0.160	-0.247	0.170
Services workers	-0.425	0.145	-0.408	0.142	-0.315	0.160
Non national	-0.203	0.401	0.058	0.390	-0.418	0.454
Household size	-0.140	0.053	-0.079	0.050	-0.133	0.063
Number of children 0-15	0.302	0.142	0.176	0.139	0.276	0.175
Work income relative to H'hold income	-0.866	0.206	-0.620	0.230	-0.736	0.252
Non-work private income relative	-1.691	0.837	-1.594	0.818	-1.948	1.093
Life exp. At 65			0.051	0.073		
Female early retirement age			-0.028	0.036		
Female normal retirement age			-0.049	0.024		
Social Prot. Exp. (in Euro per capita)			0.000	0.000		
Pension elegibility criteria			-0.017	0.026		
Minimum benefits rel. to work income			0.328	0.193		
Denmark	-0.210	0.266			-0.290	0.281
Belgium	0.662	0.265			0.697	0.279
Luxembourg	1.314	0.451			1.214	0.498
France	0.200	0.222			0.133	0.233
UK	0.491	0.218			0.460	0.227
Ireland	0.760	0.279			0.755	0.305
Italy	1.066	0.224			1.000	0.242
Greece	0.864	0.222			0.708	0.251
Spain	0.632	0.234			0.559	0.260
Portugal	-0.492	0.231			-0.772	0.266
_cons	-1.760	0.402	2.469	3.253	-1.332	0.464
Observations	4171		4171		3353	
Log-L	-1527.9		-1567.1		-1168.2	
Pseudo-R_sq	19.1		17.0		20.1	
Chi-sq	721.5 (37)		643.2 (33)		610.8 (36)	

Omitted: Germany Excluded: Nether.

Table 6. Marginal Effect in Husband Retiring when the wife is already out of the labour force

	Prob.	Effect (%)
Reference	0.072	
Husband Age = 60	0.233	222
Husband Age = 65	0.554	664
Wife Age =60	0.079	10
Wife Age =65	0.080	10
Husband Chronic Condition	0.099	37
Husband in-patient at hospital	0.160	121
Husband visiting doctor >=5	0.084	16
Previous Three	0.282	289
Wife Chronic Condition	0.082	13
Wife in-patient at hospital	0.102	41
H. work history started at 28	0.072	-1
Husband Unemployed at t_0	0.056	-23
H. Unemployed and Age 62	0.345	376
Husband Higher Education	0.072	-1
Wife Higher Education	0.036	-51
Husband Part Time	0.127	75
Husband Public Sector	0.092	27
Husband Self-employed	0.048	-33
Household size = 4	0.045	-37
Not independent	0.346	378
H. relative income = 75%	0.059	-18
H. relative income = 25%	0.088	22
H. relative income = 0%	0.108	48
Couple relative non-work income = 10%	0.108	48
Wife receiving invalidity income	0.063	-13
Denmark	0.033	-54
Belgium	0.047	-35
France	0.141	95
UK	0.046	-37
Ireland	0.034	-53
Italy	0.103	42
Greece	0.080	10
Spain	0.052	-28
Portugal	0.046	-37

Note: the reference couple has the following characteristics: husband 55 years old and wife 52, none of them with higher education, none unemployed in the initial period, both starting their working lifes at 18, with no part-time job, none working in the public sector, none self-employed, living independently and without any other family member. The shares of the household income for the reference couple are : 25% wife income, 50% husband income and no capital income.

Table 7. Marginal Effect in Wife Retiring when the husband is already out of the labour force

	Prob.	Effect (%)
Reference	0.023	
Husband Age = 60	0.034	49
Husband Age = 65	0.043	90
Wife Age =60	0.281	1138
Wife Age =65	0.434	1812
Husband Chronic Condition	0.017	-24
Husband in-patient at hospital	0.040	78
Wife Chronic Condition	0.044	95
Wife in-patient at hospital	0.092	307
Wife visiting doctor >=5	0.018	-21
Previous Three	0.096	324
Wife work history started at 28	0.019	-17
Wife Unemployed at t_0	0.017	-25
Wife Unemployed and aged 62	0.076	235
Husband Higher Education	0.028	24
Wife Higher Education	0.020	-13
Wife Part Time	0.032	39
Wife Public Sector	0.016	-28
Wife Self-employed	0.015	-33
Household size = 4	0.019	-18
Not independent	0.083	268
W. relative income = 75%	0.013	-43
W. relative income = 50%	0.040	74
W. relative income = 0%	0.068	200
Couple relative non-work income = 10%	0.025	8
Husband receiving invalidity income	0.037	62
Denmark	0.011	-53
Belgium	0.011	-51
France	0.034	48
UK	0.040	77
Ireland	0.006	-73
Italy	0.038	68
Greece	0.034	52
Spain	0.024	4
Portugal	0.011	-50

Note: the reference couple has the following characteristics: husband 55 years old and wife 52, none of them with higher education, none unemployed in the initial period, both starting their working lifes at 18, with no part-time job, none working in the public sector, none self-employed, living independently and without any other family member. The shares of the household income for the reference couple are : 25% wife income, 50% husband income and no capital income.

Table 8. Marginal effect for transitions from both working

	Wife Retiring		Husband Retiring		Both Retiring		Both working	
	Prob.	Effect (%)	Prob.	Effect (%)	Prob.	Effect (%)	Prob.	Effect (%)
Reference	0.0377		0.0087		0.0014		0.9522	
Husband Age = 60	0.0478	26.7	0.0381	340.2	0.0042	197.4	0.9099	-4.4
Husband Age = 65	0.0457	21.1	0.1880	2070.1	0.0157	1020.6	0.7506	-21.2
Wife Age =60	0.2430	544.3	0.0097	12.3	0.0425	2929.3	0.7048	-26.0
Wife Age =65	0.2478	557.2	0.0155	78.6	0.0126	800.6	0.7241	-24.0
Husband 65 and Wife 60	0.2942	680.2	0.2112	2337.9	0.4765	33847.1	0.0181	-98.1
Husband Chronic Condition	0.0422	11.9	0.0324	273.6	0.0065	362.3	0.9189	-3.5
Husband in-patient at hospital	0.0477	26.5	0.0193	123.0	0.0087	517.7	0.9243	-2.9
Husband visiting doctor >=5	0.0289	-23.3	0.0285	229.0	0.0042	200.0	0.9384	-1.5
Previous Three	0.0483	28.0	0.1278	1375.0	0.0549	3813.8	0.7690	-19.2
Wife Chronic Condition	0.0781	107.2	0.0164	88.7	0.0015	8.0	0.9040	-5.1
Wife in-patient at hospital	0.0236	-37.4	0.0055	-37.1	0.0036	159.7	0.9673	1.6
Wife visiting doctor >=5	0.0352	-6.7	0.0032	-62.5	0.0004	-71.6	0.9612	0.9
Previous Three	0.0598	58.6	0.0081	-6.1	0.0008	-45.9	0.9313	-2.2
Both Chronic condition	0.0375	-0.4	0.0171	96.8	0.0069	388.6	0.9385	-1.4
H. work history started at 28	0.0361	-4.3	0.0123	42.5	0.0070	401.1	0.9445	-0.8
Wife work history started at 28	0.0398	5.7	0.0165	90.4	0.0052	269.2	0.9385	-1.4
Husband Unemployed at t_0	0.0485	28.6	0.0154	77.7	0.0039	179.8	0.9322	-2.1
Wife Unemployed at t_0	0.1045	177.1	0.0084	-3.1	0.0015	9.3	0.8856	-7.0
Both Unemployed	0.1343	256.2	0.0149	72.1	0.0043	205.8	0.8465	-11.1
Husband Higher Education	0.0444	17.7	0.0050	-42.3	0.0009	-38.1	0.9497	-0.3
Wife Higher Education	0.0259	-31.3	0.0066	-24.4	0.0022	57.4	0.9653	1.4
Both Higher Education	0.0305	-19.2	0.0038	-56.4	0.0014	-2.5	0.9644	1.3
Husband Part Time	0.0238	-36.8	0.0135	56.3	0.0013	-9.7	0.9614	1.0
Wife Part Time	0.0884	134.4	0.0114	31.5	0.0023	61.7	0.8979	-5.7
Both Part Time	0.0558	48.1	0.0178	105.6	0.0020	46.0	0.9243	-2.9
Husband Public Sector	0.0227	-39.7	0.0168	93.7	0.0017	22.3	0.9588	0.7
Wife Public Sector	0.0324	-14.0	0.0126	45.9	0.0015	7.8	0.9534	0.1
Any Self-employed	0.0252	-33.2	0.0071	-18.5	0.0005	-66.5	0.9673	1.6
Household Size = 4	0.0370	-2.0	0.0076	-12.5	0.0004	-72.5	0.9551	0.3
Not Independent	0.0441	17.1	0.0146	68.2	0.0699	4882.9	0.8713	-8.5
H. relative income = 75%	0.0453	20.1	0.0076	-12.4	0.0005	-66.4	0.9467	-0.6
H. relative income = 25%	0.0314	-16.7	0.0099	14.1	0.0042	198.0	0.9545	0.2
H. relative income = 0%	0.0261	-30.7	0.0113	30.2	0.0125	787.8	0.9501	-0.2
W. relative income = 75%	0.0067	-82.2	0.0051	-41.5	0.0002	-85.2	0.9880	3.8
W. relative income = 50%	0.0159	-57.9	0.0066	-23.5	0.0005	-61.5	0.9769	2.6
W. relative income = 0%	0.0895	137.3	0.0113	30.7	0.0036	159.7	0.8956	-6.0
Relative non-work income = 10%	0.0353	-6.4	0.0074	-14.2	0.0010	-31.6	0.9563	0.4
Denmark	0.0162	-57.1	0.0095	9.2	0.0014	-1.2	0.9730	2.2
Belgium	0.0301	-20.2	0.0200	130.5	0.0009	-39.4	0.9491	-0.3
France	0.0090	-76.2	0.0506	483.4	0.0155	1002.2	0.9250	-2.9
UK	0.0427	13.2	0.0123	41.4	0.0038	173.8	0.9412	-1.2
Ireland	0.1297	244.1	0.0063	-27.1	0.0056	301.7	0.8583	-9.9
Italy	0.1364	261.9	0.0364	320.3	0.0130	823.0	0.8142	-14.5
Greece	0.0848	124.8	0.0158	81.9	0.0053	274.6	0.8942	-6.1
Spain	0.0737	95.4	0.0053	-39.0	0.0072	411.8	0.9138	-4.0
Portugal	0.0299	-20.6	0.0091	4.6	0.0010	-25.6	0.9599	0.8

Note: the reference couple has the following characteristics: husband 55 years old and wife 52, none of them with higher education, none unemployed in the initial period, both starting their working lifes at 18, with no part-time job, none working in the public sector, none self-employed, living independently and without any other family member. The shares of the household income for the reference couple are : 25% wife income, 50% husband income and no capital income.

Figure 2.a. Male labour force status by country in 1995.

Figure 2.b Female labour force status by country in 1995.

Figure 3.a. Male labour force transitions in a three state model in EU12 by age.

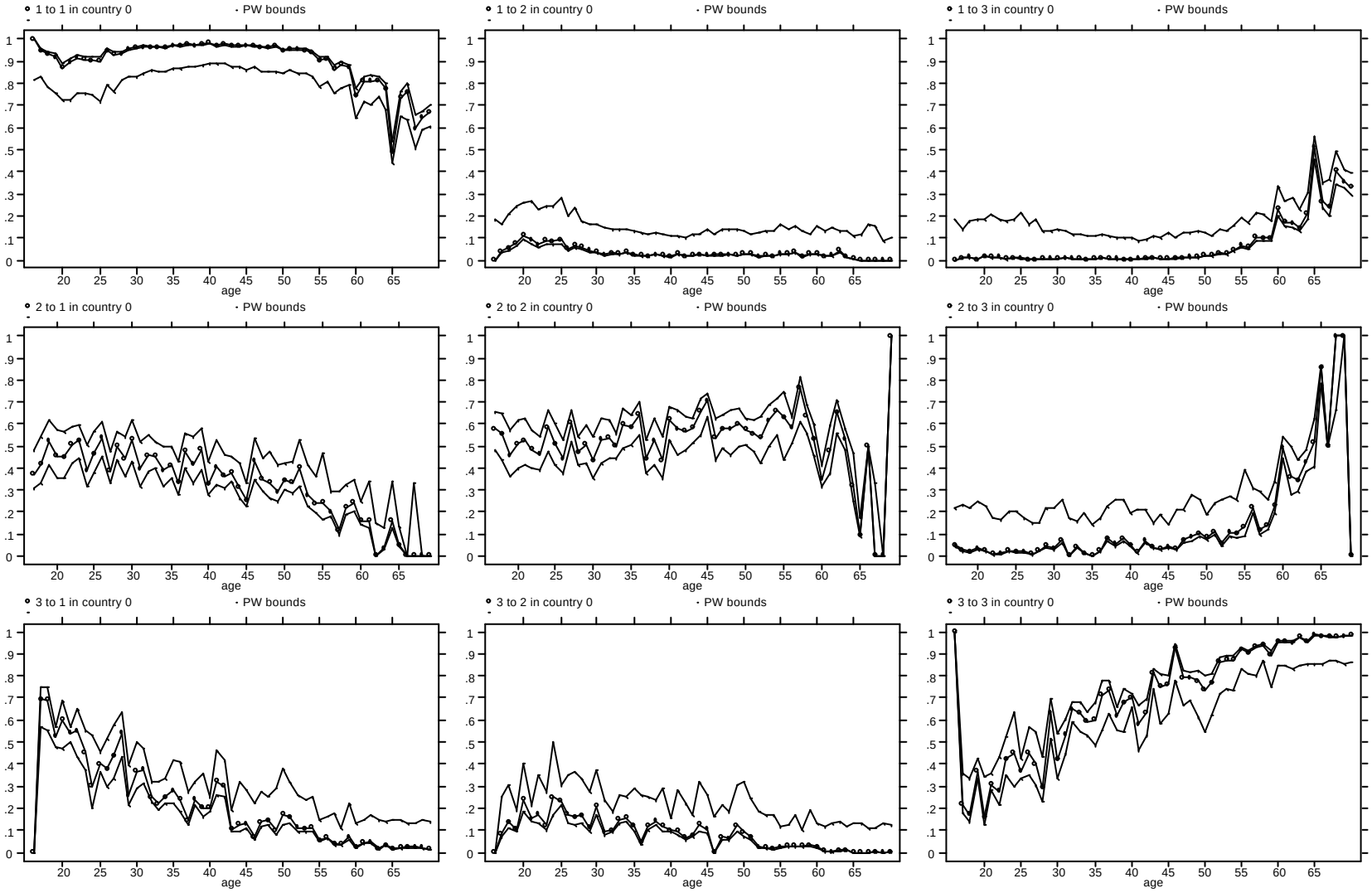


Figure 3.b. Female labour force transitions in a three state model in EU12 by age.

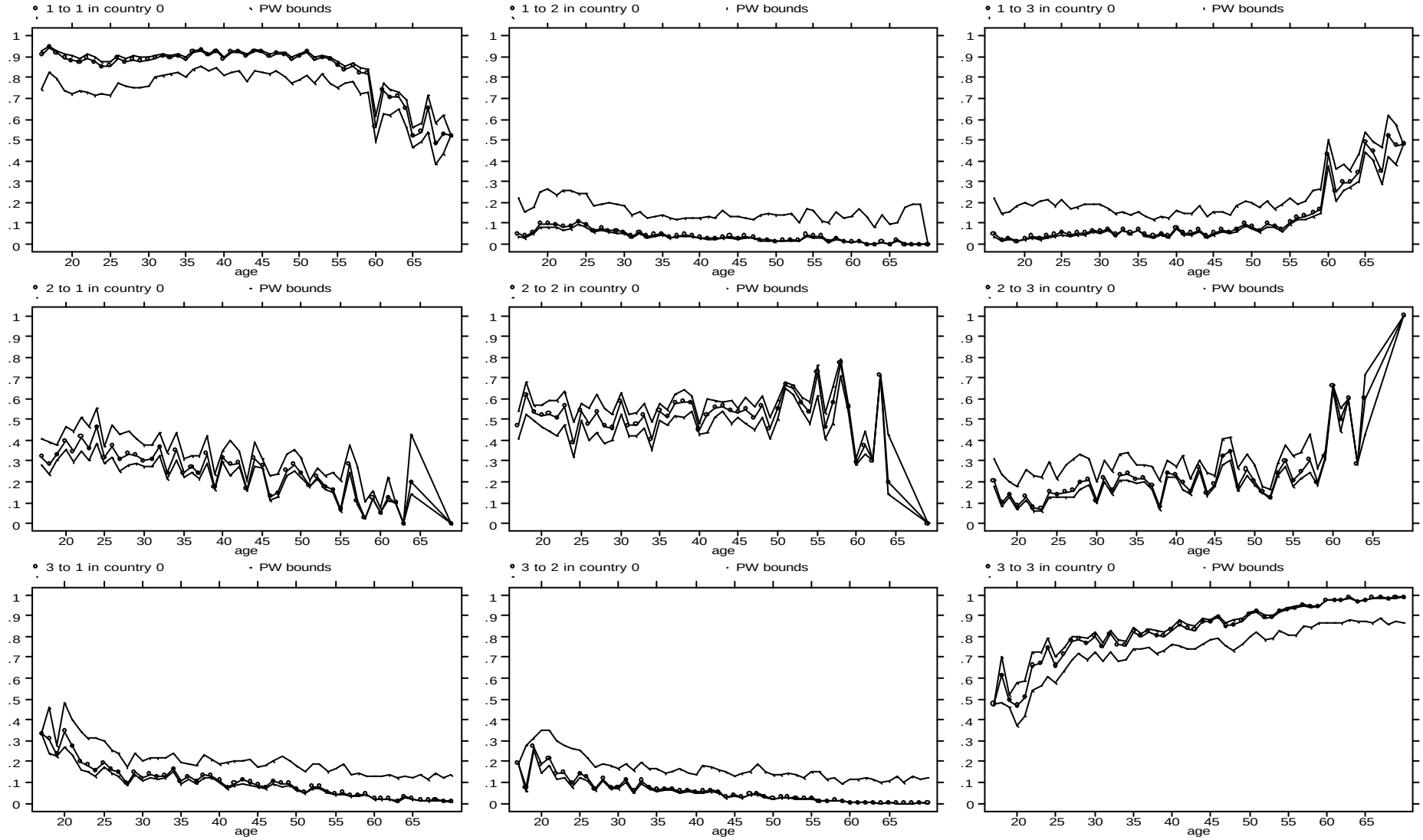
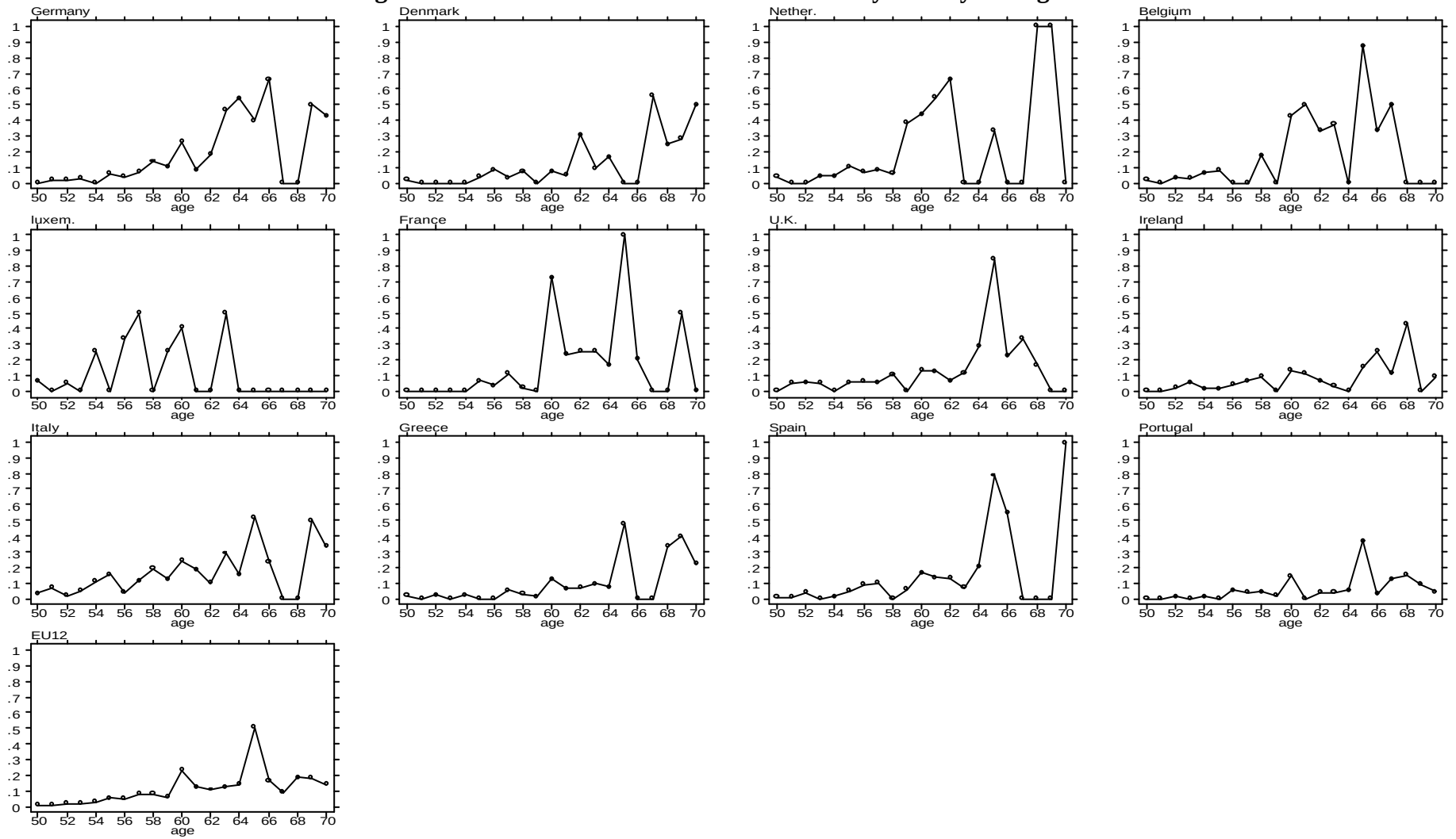
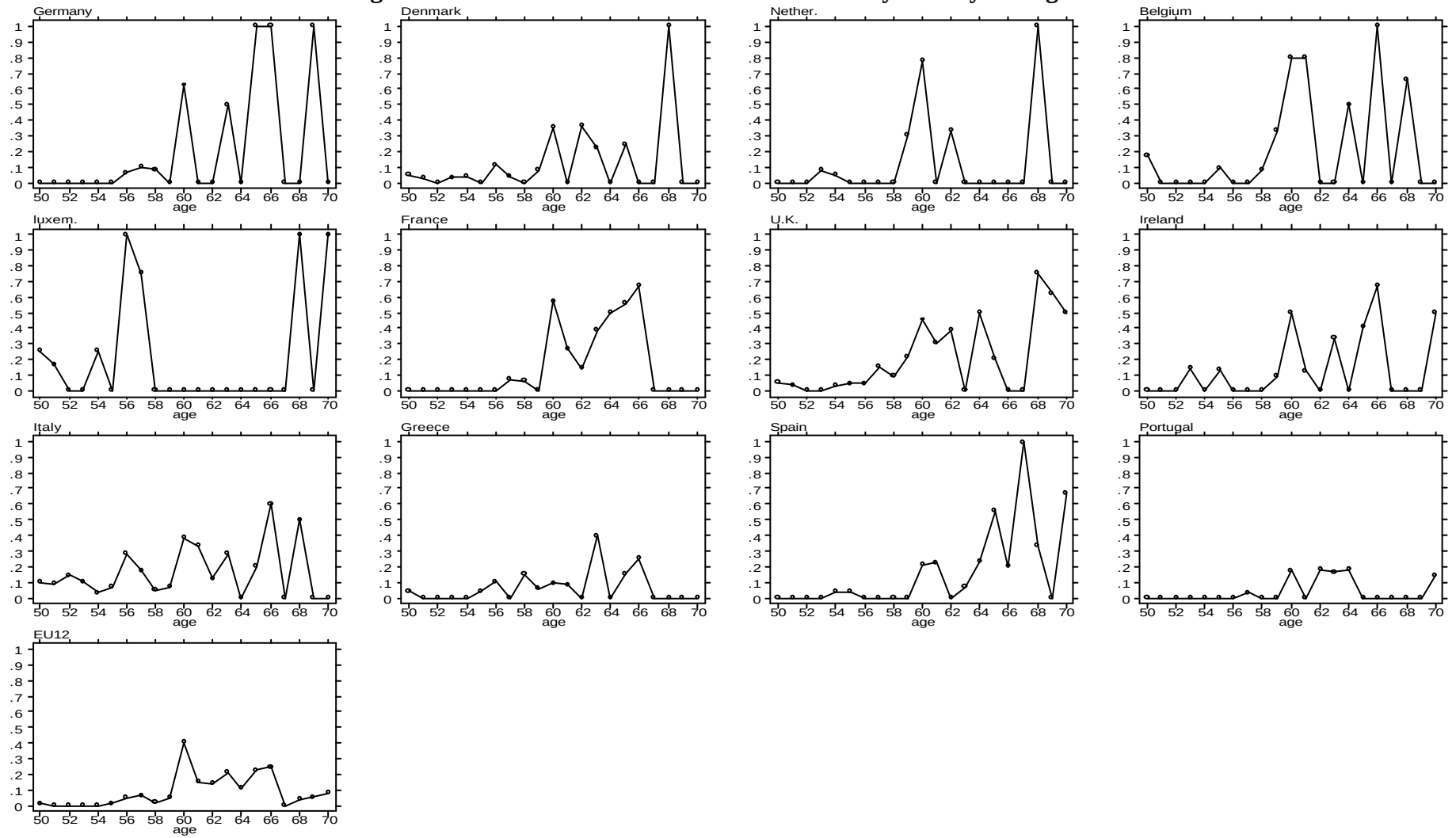


Figure 4.a. Male hazard out of the labour force by country and age.



male hazard to retirement

Figure 4.b. Female hazard out of the labour force by country and age.



female hazard to retirement

Figure 5. Male, Female and joint distribution of activities by age in EU12 in March 1994.