The influence of living arrangements, marital patterns and family configuration on employment rates among the 1945–1954 birth cohort: evidence from ten European countries

Jim Ogg · Sylvie Renaut

Published online: 28 August 2007
© Springer-Verlag 2007

Abstract As they approach retirement, Europeans in mid-life display a range of living arrangements and marital patterns. These configurations influence labour force participation for men and women in different ways and these differences are accentuated between countries. Using data from the first Wave (2004) of the Survey on Health, Ageing and Retirement in Europe (SHARE), the paper examines the relationship between living arrangements, marital patterns, family configurations and participation in the labour force for the birth cohort of 1945–1954. The data show that the probability of being in paid employment was higher for respondents living in a couple in northern Europe than in southern Europe. In all countries, men in a couple had significantly higher employment rates than women in a couple, but employment rates of women in a couple differed significantly between countries. Multivariate analysis with country effects confirmed the negative influence of age, poor health, lower levels of education and household income on the probability of being in paid employment, but the effect of variables concerning living arrangements, marital patterns and family configurations varied according to country. A multilevel analysis showed that the between country variance of being in paid employment could not be explained by individual characteristics alone, that a large part of the country variance could be explained by the country specific effect of women in a couple, and that the

level of ‘modern’ life styles in each country (rates of cohabitation outside marriage, divorce or separation and recomposed families) had a significant effect on employment rates, especially for women in a couple.

Keywords Employment · Older workers · Living arrangements · Marital patterns · Europe

Introduction

Living arrangements have important consequences for financial security and well-being. Research on labour force participation has therefore included studies on the impact of marriage on labour supply and productivity (Waite 1995; Grossbard-Shechtman 2003). The overall findings of this research is that for men, living in a couple and being married increases labour force participation, whereas the opposite effect is observed for women (Lissenburgh and Smeaton 2003; Banks and Casanova 2003; Whiting 2005). As Grossbard-Shechtman (2003) notes, ‘*marriage is an institution that organizes household production, and work in household production is a major alternative to paid employment*’ (p. 222). Household production by women in many countries is promoted through public measures such as tax incentives, family allowances and transferable welfare rights, which in turn influence choices made by couples concerning labour market participation (Gruber and Wise 1999). The relationship between marriage and labour force participation is generally well established.

Although married couples living together is the most common form of living arrangement in adult life before retirement, changes in the behaviour of individuals, leading to increased patterns of divorce, marital separation, remarriage, cohabitation outside of marriage, and remaining

J. Ogg
Young Foundation, 18, Victoria Park Square,
E2 9PF London, UK

J. Ogg (✉) · S. Renaut
Direction des Recherches sur le Vieillessement,
Caisse Nationale d’Assurance Vieillesse, 49 rue Mirabeau,
75160 Paris, France
e-mail: jim.ogg@cnav.fr

single, are increasing the configurations of domestic living arrangements. These changes impact on labour force participation and require new ways of examining the relationship between living arrangements, marital patterns and labour force supply. For example, greater labour force participation among women and the pursuit of a career may take precedent over marriage choices and represent a counter-trend to the traditional role of women in household production. Also, as Hoffman and Duncan (1988) have shown, when couples divorce or separate, there are important financial consequences which in turn have implications for labour force participation.

In some European countries, individuals in the generation born immediately after the Second World war and who are now approaching retirement are the epitome of these new life styles. Many have personal histories that set them apart from previous generations. They were the first to practice cohabitation outside of marriage on a large-scale. As young women, they were the first generation to massively enter the labour market. Moving through the life-course, divorce and separation became more common, leading to new patterns of living arrangements and family forms created by re-marriage. Life style choices for these individuals, such as remaining single, have also been made in the context of career decisions, notably for women who are now in mid-life. These changes have led some commentators to identify a 'baby boomer' type of behaviour, characteristic of today's mid-lifers. As Harkin and Huber (2004) note, *'for those who can afford it, a new 'experience economy' of travel, food, learning and life style is growing rapidly. Baby boomers used to working work full time are preoccupied with re-establishing sovereignty over their own routines, and with making use of flexibility to enjoy themselves. Those released from decades of full-time work are hungrily searching out new cultural and consumption experiences'* (p. 13). Although this description may be stretching the cultural shift somewhat, as they enter mid-life, many individuals in the post-war generation have had personal and family histories leading to living arrangements that extend beyond more traditional forms of living together as a couple within a first marriage. These new forms of living arrangements among mid-lifers, like marriage, also influence labour force participation, but the dynamics of this relationship are less well known.

Whereas new life style patterns among mid-lifers may be discernable in northern and central Europe, in other European countries, the revolution in living arrangements and marriage practices has not been so marked. This is especially the case for the southern Mediterranean countries, where cultural practices and traditions, often reinforced by public policy, have resulted in life styles that, at least for people in mid-life, have remained more or less the same over time. Culturally prescribed gender roles

explain not only marital practices but also differentials in rates of women's paid employment. With higher rates of extended family cohabitation than central and northern Europe, mid-life women in southern Mediterranean countries are mostly involved in domestic production rather than paid employment.

Europe therefore contains a diversity of living arrangements and marriage patterns that may have different influences on the choices that individuals make concerning labour force participation. Since some Europeans in mid-life have been at the forefront of new life style choices whereas others have pursued more traditional forms, it is important to assess the impact not only of living arrangements and marital status of individuals on labour force participation, but also the wider context of the specific cultural and socio-political situation unique to each country. Today, this is even more important in the context of ageing populations and the need to extend working lives.

Ageing populations and the sustainability of pension systems mean that the living arrangements, marital patterns and employment situation of mid-lifers are becoming increasingly important. Although employment policy on older workers differs, the European Union has set a target of 50% for employment rates between the age of 55 and 64 by 2010 (Lisbon European Council 2000) and a rise in the pension age to 65 (Barcelona European Council 2002). Whilst most countries have started to take measures to meet these objectives, rates of older worker labour force participation vary considerably. This diversity can be explained by a mixture of micro factors that incite individuals to continue in, or leave the labour force, as well as the different cultural and institutional contexts that affect labour force participation at the macro level. Pension regulations, policies on early retirement, and unemployment and disability insurance schemes play a large role in the labour force participation of persons above the age of 50, and all these measures differ substantially between countries. In addition, many mid-life women have been working long enough to have built up pension rights, a factor that should influence retirement decisions, not only for themselves but also for their partners.

Whilst the influence of social policy and business practices on increasing the labour force participation of older workers has been extensively researched, there have been fewer studies on the role of personal characteristics and in particular the influence of living arrangements and marital patterns. These studies have again mostly focused on the employment decisions made within couples (Blau 1998; Hurd 1990). Research from the USA, for example, has suggested that recent upturns in employment rates among older married men are in part due to increased employment rates among their wives (Blau and Goodstein 2006). Similar findings have been made in Australia, where

women approaching retirement age have increasingly longer work histories and pension rights, leading their partners to postpone any early retirement plans (Kennedy and Da Costa 2006). To our knowledge, there has been no systematic European research to date that examines the relationship between the labour force participation of older workers, their living arrangements and marriage patterns, although there have been several studies that have examined the relationship of other socio-demographic factors on paid employment in mid-life. Health factors are mostly cited as having the greatest impact (Banks and Casanova 2003; Blanchet and Debrand 2005; Phillipson and Smith 2005; OECD 2006; Barnay and Debrand 2006). Individuals in paid employment after the age of 50 are in better health, whether measured subjectively or objectively (Banks and Casanova 2003). Satisfaction with the job is also an important factor (Blanchet and Debrand 2005). Higher levels of education and income are positively associated with remaining in the labour force after the age 50. Taken collectively, these factors are generally well-known, despite the fact that the interaction between them and social policies such as early retirement measures or eligibility for invalidity benefits, are more complex. However, the influence of living arrangements, marital patterns and family configurations on work-life decisions after 50 are less known.

One way of examining the complex relationship between living arrangements, marriage patterns and labour force participation is through a comparison of different countries. Such a comparison should shed light on the impact of different socio-political systems as well as more elusive cultural traditions. In the European context, different systems of welfare provision, in particular the development of pension rights, may in part explain the labour force participation of older workers. Esping-Andersen's classic distinction of welfare states is based on the relationship between labour markets and social protection systems and it is a useful paradigm to understand the impact of public policy on labour force participation (Esping-Andersen 1990, 1999). This typology distinguishes welfare states by the degree to which they have institutionalised processes of 'de-commodification'—the extent to which individuals are able to survive without selling their labour—and the degree to which de-commodification is institutionalised in different countries. Esping-Andersen distinguishes three types of welfare states: 'market liberal', 'conservative-corporatist' and 'social-democratic'. However, as several commentators have noted the typology has some inconsistencies which limit its full application. Among these are the failure to account for different forms of living arrangements and transfers that occur within households (Iacovou 2000; von Kondratowitz 2003). The sharpest European contrasts in living arrangements are

between the north and south (Rehr 1998). Inter-generational co-residence and proximity tend to be much more common in southern European countries, and these patterns in turn influence labour market participation. Notwithstanding these conceptual difficulties, Esping-Andersen's typology, together with the more culturally defined differences of family forms described by Rehr, provide a good starting point to examine the context of the labour force participation of European mid-lifers.

In the analysis that follows, ten European countries provide the basis for this analysis. These countries are Sweden, Denmark, The Netherlands, France, Germany, Switzerland, Austria, Spain, Italy and Greece. Denmark, Sweden, and to a lesser extent The Netherlands, represent countries with a social democratic welfare regime and an emphasis on individual rather than family based rights. Mid-lifers in these countries have been at the forefront of changing traditional gender roles, living arrangements and marital patterns. Men and women among these mid-lifers should therefore display converging characteristics with regard to their participation in the labour market. The comprehensiveness of these country's welfare systems should also result in greater uniformity of labour force rates observed between men and women, with living arrangements playing only a minor role in determining labour force participation. In Austria and Germany, classified as conservative-corporatist in the Esping-Andersen typology, we expect to find a more mixed combination of traditional gender roles and marriage patterns among mid-lifers. Germany in particular has long supported the home production role of women. Living arrangements tend to be more traditional and therefore we expect to find less convergence in the participation of men and women in the labour force. In the three Mediterranean countries, Spain, Italy and Greece, the combination of high intergenerational cohabitation, traditional marriage patterns and low divorce rates among mid-lifers, should result in low labour force participation rates for married mid-life women. The remaining countries, France and Switzerland, are perhaps more difficult to classify, displaying elements of both social democratic and conservative-corporatist regimes. Nevertheless, in both countries, many mid-lifers have experienced at first hand new life style and marriage patterns and the country's institutions have responded accordingly, as for example extending the rights and social protection coverage of unmarried individuals.

Method

The data source to examine these questions is the first Wave (Release 1) of the Survey on Health, Ageing and Retirement in Europe (SHARE, see Börsch-Supan et al.

2005).¹ This longitudinal survey began in 2004, and aims to be a representative sample of households with adults aged 50 and above in each participating country. Although probability samples were drawn in all countries, sampling procedures differed. In some countries, a simple random selection of households was made from a central population register, in other countries more complex multi-stage designs were used. Despite this shortcoming, design weights have been calculated based on each country's sample design and calibrated to adjust for non-response (for a full explanation see Börsch-Supan and Jürges 2005). For this paper a sub-selection of respondents born between 1945 and 1954 was selected, ($n = 7,887$).

The aim of the paper is therefore to study the rates of labour force participation of mid-life European men and women in the context of their living arrangements, marriage patterns and family configurations. The central questions that are posed are as follows: have changing patterns in marital status and living arrangements affected the labour participation of European mid-lifers? To what extent does living in a couple in mid-life affect the labour force participation of men and women? Do single, divorced and separated mid-lifers show labour force participation rates that are significantly different from mid-life couples? What are the possible effects of different family configurations, in particular the existence of children and parents on the labour force participation of mid-life adults? And finally, what is the effect of country membership on the relationship between employment and living arrangements, marriage patterns and family configurations?

Although research has often treated the dual questions of employment and unemployment simultaneously (including early retirement and unemployment due to long-term illness), the focus in this paper is uniquely on the state of being in paid work as observed in the ten selected European countries. To have also examined situations of unemployment would have multiplied the number of possible configurations from both the perspective of respondents as well as the different countries. Additionally, the EU Directives on older workers referred to above evoke

employment rates rather than activity rates. As far as living arrangements are concerned, all of the information provided in SHARE concerning marital patterns and household composition have been utilised. Although SHARE does not contain detailed information on marital histories, one question combines legal marital status and living arrangements, producing a variable with six categories—'married and living together with spouse', 'registered partnership', 'married but living separately from spouse', 'never married', 'divorced' and 'widowed'. SHARE also contains information on all persons resident in the household and their relationship with the reference person, as well as children from previous relationships. A combination of these characteristics are used to construct derived variables to test the effect of living arrangements, marital patterns and family formation on labour force participation.

The paper begins by a brief description of the employment rates of respondents born between 1945 and 1954 (between the age of 50 and 59 at the time of the first Wave of SHARE in 2004) in the ten European countries, together with a presentation of different living arrangements, marital patterns and family configurations. The impact of these variables on labour force participation is then tested within a series of multivariate analyses, with the aim of determining the relative influence of belonging to a particular country. For the first of this series, the entire sub-sample of the ten participating SHARE countries is used (respondents born between 1945 and 1954, $n = 7,887$) with the different countries entered into the model as categories of a single explanatory variable. In order to compare countries, the same model is then applied separately to each country.

For the final stage of the analysis, a multilevel statistical model is constructed. Multilevel models are effective tools to examine systems in which individuals are subject to the influences of grouping, the groups in this instance being countries. Because it is clear that belonging to a particular country influences individual behaviour, the analysis of the relationship between labour force participation and living arrangements needs to take this into account. Possible explanations of inter country differences are therefore explored by examining the relative influence of *both* individual and country based characteristics on the probability of working between the age of 50 and 59. The aim of this final part of the analysis is to see whether it is possible to isolate the collective effects of the countries examined (macro level) from the personal characteristics of individuals (micro level). The hypothesis that belonging to a particular country exerts a significant influence on the labour force participation rates of men and women observed in different living arrangements, marital patterns and family configurations is tested.

¹ This paper uses data from the early release 1 of the Survey of Health and Retirement in Europe (SHARE) 2004. This release is preliminary and may contain errors that will be corrected in later releases. The SHARE data collection has been primarily funded by the European Commission through the fifth framework programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life programme area). Additional funding came from the US National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, Y1-AG-4553-01 and OGHA 04-064). Data collection in Austria (through the Austrian Science Foundation, FWF), Belgium (through the Belgian Science Policy Administration) and Switzerland (through BBW/OFES/UFES) was nationally funded. The SHARE data set is introduced in Börsch-Supan et al. (2005); methodological details are contained in Börsch-Supan and Jürges (2005).

Results

Descriptive findings

As expected, the employment rates for the birth cohort of 1945–1954 varied significantly between countries (Table 1). Three groups emerged: northern Europe and Switzerland with rates around 75%, continental Europe with rates around 66% and southern Europe and Austria, where about half of the sample population were in paid employment. These country differences were much less marked for men than for women. Rates of female employment were much lower in the southern than in the northern European countries. Rates of employment in all the countries differed according to whether individuals lived in a couple or not. For example, in Denmark, the proportion in employment was significantly greater among respondents living in a couple (approximately 80%) compared to respondents not living in a couple (less than 60%). But in Italy and Spain, rates of employment among respondents *not* living in a couple were higher than for those in a couple. These differences can be explained mostly by gender. For men, the proportion in paid employment among those in a couple was greater than among those not living in a couple. Only in Italy was this finding reversed, and this could be due to the earlier average age of retirement present in this country. For women, the fact of being in a couple had the opposite effect than for men. Women in a couple were less likely to be in paid employment than women not living in a couple, with the exception of Denmark and Austria.

Table 2 presents descriptive findings of the living arrangements, marital patterns and family configuration

variables used in the multivariate analyses. Given the strong interaction observed in Table 1 between gender, living in a couple and employment rates, a four category variable was created (labelled ‘gender and couple status’). These categories are man living in a couple, woman living in a couple, man not living in a couple, woman not living in a couple. Most respondents, whether men or women lived in a couple (77%), but a higher proportion of women did not live in a couple (13%) compared to men (10%). There were large country differences in the types of household of the respondents. The variable ‘type of household’ is a binary variable indicating those respondents who lived alone (i.e., a one person household) *or* those living with a spouse/partner only (i.e., a two person household consisting of a couple) compared to respondents who were cohabiting (a household with two persons or more). These latter concern mostly households with children, with a small proportion of more complex households. In southern Europe, 66% of respondents cohabited with other generations compared to only 25% in northern Europe.

Since a crucial part of the analysis involves assessing the impact of more complex marital patterns and living arrangements that are common to some members of the 1945–1954 birth cohort, a variable combining marital status and living arrangements was created distinguishing ‘traditional’ and ‘modern’ life styles. This variable, labelled ‘life style’, contains two categories. All not married or widowed respondents who were living with a partner, all divorced or separated respondents, and respondents having a child from a previous relationship or a child of their current partner from a previous relationship (‘modern’) were distinguished from all other respondents, i.e., married

Table 1 Employment rates in 2004 of 1945–1954 birth cohort (%)

	Total	Men	Women	Not in couple	In couple	Men in a couple	Women in a couple	Men not in a couple	Women not in a couple
Sweden	79.5	83.1	75.8	74.4	81.6	86.8	75.5	71.3	76.6
Denmark	73.5	74.2	72.8	57.1	78.7	81.5	75.5	46.8	65.3
The Netherlands	62.5	76.3	48.3	57.6	63.6	79.8	45.9	58.5	56.9
Germany	69.0	75.8	62.2	70.2	68.6	76.0	60.4	75.0	66.6
Switzerland	75.0	84.7	65.6	69.8	76.6	86.3	65.8	77.3	65.0
Austria	50.8	63.3	38.7	42.0	53.8	67.0	39.2	49.1	37.4
France	64.4	68.8	60.1	67.5	63.6	70.5	55.9	59.1	72.1
Italy	46.9	58.8	35.5	53.7	45.1	56.9	33.5	66.6	42.8
Spain	54.6	71.3	38.1	62.1	52.1	72.8	31.7	66.8	57.6
Greece	55.4	77.7	33.6	54.0	55.6	78.1	29.9	74.7	44.9
Ten countries	61.1	70.7	51.7	63.5	60.4	71.5	48.4	67.2	60.9
Min	46.9	58.8	33.6	42.0	45.1	56.9	29.9	46.8	37.4
Max	79.5	84.7	75.8	74.4	81.6	86.8	75.5	77.3	76.6

Source: Share 2004, 7,887 respondents born during 1945–1954

Table 2 Living arrangements, marital patterns and family formation of the 1945–1954 birth cohort in 2004 (%)

<i>n</i>	Total 7,887	Sweden 1,065	Denmark 654	The Netherlands 1,203	Germany 1,000	Switzerland 365	Austria 593	France 704	Italy 828	Spain 739	Greece 745
Gender and couple status											
Man living in a couple	40.0	38.2	39.7	42.2	39.5	40.7	39.1	41.9	39.4	37.5	43.8
Woman in a couple	37.3	33.0	36.4	38.5	35.5	36.1	35.3	37.6	39.6	37.9	38.3
Man not in couple	9.6	12.3	10.6	8.4	10.6	8.9	10.1	7.3	9.6	12.0	5.5
Woman not in couple	13.1	16.6	13.3	10.8	14.4	14.3	15.4	13.2	11.3	12.6	12.4
Type of household											
Living alone or with spouse/partner only	51.9	69.7	75.0	64.7	66.0	74.2	65.5	54.5	32.7	31.3	34.4
Cohabitation	48.1	30.3	25.0	35.3	34.0	25.8	34.5	45.5	67.3	68.7	65.6
Life style											
‘Traditional’	80.1	55.4	65.2	79.7	74.1	74.4	78.0	80.3	89.2	86.1	90.7
‘Modern’	19.9	44.6	34.8	20.3	25.9	25.6	22.0	19.7	10.8	13.9	9.3
Number of children											
No child or one child	33.4	23.8	26.2	25.5	44.4	23.5	35.5	27.1	34.5	30.6	25.1
1 or 2 children	38.7	36.3	43.7	44.6	35.2	47.4	37.3	35.2	44.1	35.0	57.4
3 or more children	27.8	39.9	30.1	29.9	20.5	29.1	27.2	37.7	21.4	34.4	17.6
Parents											
No parents	40.8	34.9	38.7	46.1	40.3	35.3	46.4	32.5	46.9	46.6	37.2
Having a parent alive	59.2	65.1	61.3	53.9	59.7	64.7	53.6	67.5	53.1	53.4	62.8

Source: Share 2004, 7,887 respondents born during 1945–1954

respondents living in a couple, widowed or never married respondents not living in couple (‘traditional’). Most respondents lived a ‘traditional’ life style, although it should be noted that one in five respondents were ‘modern’.² Moreover, country differences were large, ranging from 45% of Swedish respondents living a ‘modern’ life style compared to only 9% of Greek respondents. A variable detailing the number of children was operationalised in three categories (no children or one child only, two children, three or more children), with rates reflecting a mixture of fertility rates, age differentials and sample bias.³ The majority of respondents (66%) had two or more children. A variable indicating whether respondents had a living parent was also created. These two variables—number of children and existence of parents—give some indication of potential family commitments (care of elderly parents and grandchildren) which are common to individuals in mid-life and which may influence employment rates.

² Previous analyses by the authors (not shown here) also revealed the extent to which a ‘modern’ life style was a feature of the 1945–1954 birth cohort—among older cohorts these rates fell to below 10%.

³ Age differentials among couples in SHARE were particularly high for Greece.

Multivariate analyses

In the first stage of the multivariate analysis, binary logistic regression models were used to explore the effect of living arrangements, marital patterns and family configurations on the probability of being in paid employment. In addition to these key explanatory variables (shown in Table 2), other variables known to be associated with employment rates were entered into the models. These included age (standardised), subjective health, education and gross household income (adjusted for household size using a standard equivalence scale).⁴ The variable for subjective health was reduced from two questions⁵ and grouped on three categories, ‘good’, ‘intermediate’, ‘poor’ for each country. Education was classified as a six category variable corresponding to the international standard of education (ISCED), subsequently collapsed into three categories—‘lower’,

⁴ The measure of gross income was calculated centrally by the SHARE team and included an imputation procedure for missing values. Net income measures were not calculated because of the problems of measurement related to the many different fiscal schemes operating among the countries.

⁵ Would you say that your health is very good, good, fair, bad, very bad; would you say that your health is excellent, very good, good, fair, poor.

‘intermediate’, ‘high’ for each country. Following Hank and Jürges (2006), household income was measured by the relative income group in each country and grouped in quintiles.

The first model (Table 3, model 1a) confirmed the findings of the descriptive statistics shown in Table 1. The probability of the response variable ‘being in paid employment’ was significantly lower for women in a couple relative to men in a couple (reference category). Respondents not living in a couple, whether men or women, had the same probability of being in paid employment. Each explanatory variable of the model was significant. Respondents with a ‘modern’ life style significantly increased the probability of being in paid employment. Cohabiting households that contained more than one generation (mostly children, but in some cases parents as well) exerted a negative effect on the probability of being in paid employment, as did being childless, having one child only or having three children. For explanatory variables other than family life, the well known trends associated with a lower probability of being in paid employment were confirmed—increasing age, poor health, lower educational levels and lowest household incomes.

The inclusion of the countries in a second model (Table 3, model 1b) also confirmed the trends presented in the descriptive statistics, with the probability of being in employment significantly higher in the northern European countries (Sweden, Denmark) and in Switzerland compared to southern European countries (Italy, Spain and Greece) and Austria. Compared to the reference category, France, the coefficient observed in The Netherlands was not significantly different. As far as the coefficients of other explanatory variables are concerned, the inclusion of the country variable changed the results on two other variables—the type of household and life style, where the effects were no longer significant.

To summarise the results of these first two regression models, each explanatory variable in the first model was significant in the probability of being in paid employment. In the second model (1b), the introduction of country as an explanatory variable did not change the direction and strength of the coefficients for age, gender and couple status, the existence of parents, subjective health, level of education, or household income. However, the coefficients of two explanatory variables, type of household and life style, changed and were no longer significant. In other words, these variables appear to have a different effect among countries.

In the next stage of the analysis the same logistic regression model was applied separately for each country to examine in detail whether there was any important variation between countries.

The results of the separate logistic models for each country (Table 4) confirm the previous results for the negative effect of age, poor health, lower levels of education and household income on the probability of being in paid employment for all countries. However, it should be noted that the relative strength of the effects for these variables differed between countries. Among this group of variables, in Sweden and in The Netherlands, health status was the most discriminant. In Austria and Italy, the level of education was more discriminant. The effect of income was the most discriminant in Denmark, Germany, Switzerland and in France. Importantly, in some countries, some coefficients were no longer significant, such as age in Sweden, Denmark and Switzerland, level of education in Sweden, Switzerland and Greece, and health status in Switzerland and Austria.

As far as the variables summarising living arrangements, marital patterns and family configurations are concerned, the derived variable combining gender and whether the respondent was living in a couple (gender and couple status) was the most discriminant in each of the separate country models to explain the probability of being in paid employment. But the effects of the categories of this explanatory variable differed strongly for some countries. In Sweden, only the category ‘women in a couple’ was significant, whereas in Denmark only the category ‘man not in couple’ was significant—both of these coefficients indicated a significant lower probability of being in paid employment compared to the reference category of ‘man in a couple’. In Italy, Spain and in Greece, women, whether they were in a couple or not, had a significant lower probability of being in paid employment, whereas for men, being in couple or not made no difference to the probability of being in employment. The coefficients for the categories ‘cohabitation’ and a ‘modern’ life style were no longer significant for all countries. Coefficients for having a living parent were positive for all countries but significant only in Denmark, France, Austria and Greece. The effect of the number of children was only just significant in Sweden, The Netherlands, Germany and Greece. In The Netherlands, the probability of being in employment was significantly less for people who had three children or more (compared to the reference category of two respondents who had two children). Sweden, Germany and Greece stood out from other countries with a significant negative effect for childless respondents or respondents with one child only (compared to the reference category of respondents who had two children).

How is it possible to explain the finding that these individual explanatory variables concerning living arrangements, marital patterns and family configurations, which appear to be highly significant in the first model containing respondents from all countries, are less

Table 3 Binary logistic regression models: probability of being in employment in 2004 in ten European countries, 1945–1954 birth cohort

	Parameters	Model 1a Beta (SE)	Model 1b Beta (SE)
Age	Intercept	1.406 (0.098)***	1.480 (0.132)***
	(standardized)	–0.346 (0.028)***	–0.345 (0.029)***
Gender and couple status	<i>Man living in a couple (ref)</i>		
	Woman in a couple	–1.193 (0.060)***	–1.215 (0.062)***
	Man not in couple	–0.733 (0.113)***	–0.700 (0.115)***
	Woman not in couple	–0.791 (0.094)***	–0.714 (0.097)***
Type of household	<i>Living alone or with spouse/partner only (ref)</i>		
	Cohabitation	–0.320 (0.057)***	0.022 (0.063)
Life style	<i>‘Traditional’ (ref)</i>		
	<i>‘Modern’</i>	0.257 (0.069)***	–0.025 (0.073)
Number of children	No child or one child	–0.225 (0.066)***	–0.174 (0.069)
	<i>2 children (ref)</i>		
	3 or more children	–0.134 (0.064)**	–0.256 (0.067)***
Parents	<i>No parents (ref)</i>		
	Having a parent alive	0.328 (0.054)***	0.271 (0.055)***
Subjective health	Good health	0.371 (0.064)***	0.308 (0.066)***
	<i>Intermediate health (ref)</i>		
	Poor health	–0.749 (0.062)***	–0.843 (0.065)***
Education	Low educational level	–0.223 (0.061)***	–0.207 (0.066)***
	<i>Intermediate educational level (ref)</i>		
	High educational level	0.683 (0.068)***	0.633 (0.070)***
Household income (equivalence scale)	1st quintile	–0.743 (0.081)***	–0.812 (0.083)***
	2nd quintile	–0.410 (0.081)***	–0.460 (0.083)***
	<i>3rd quintile (ref)</i>		
	4th quintile	0.158 (0.085)	0.191 (0.087)**
	5th quintile	0.074 (0.086)	0.125 (0.089)
Country	Sweden		0.966 (0.123)***
	Denmark		0.562 (0.135)***
	The Netherlands		–0.077 (0.111)
	Germany		0.215 (0.118)
	Switzerland		0.728 (0.162)***
	Austria		–0.609 (0.127)***
	<i>France (ref)</i>		
	Italy		–0.805 (0.122)***
	Spain		–0.495 (0.123)***
	Greece		–0.604 (0.123)***

Source: Share 2004, 7,887 respondents born during 1945–1954

Key *** < 0.001 ** < 0.05

discriminant in the second model when the country explanatory variable is introduced and totally ‘diluted’ when separate regression models are created for each country? One possible answer is that the effects that are relevant at the individual level are not distinguished from those that are related to a group—in this case a country (Ray 2002). In order to make this distinction between individual and group effect, the final stage of the analysis

passes to multilevel models. Since participation in the labour force is in part determined by the fact of belonging to a particular country, it can be hypothesised that all the respondents belonging to a particular country ‘share’ some of the same characteristics. For example, they belong to the same system of social protection and may have more or less the same cultural practices. Therefore, within a particular country, observations are not independent and

Table 4 Binary logistic regressions: probability of being in 2004 in employment, 1945–1954 birth cohort

	Sweden Beta (SE)	Denmark Beta (SE)	The Netherlands Beta (SE)	Germany Beta (SE)	Switzerland Beta (SE)	Austria Beta (SE)	France Beta (SE)	Italy Beta (SE)	Spain Beta (SE)	Greece Beta (SE)
Intercept	2.185(0.342)***	1.532(0.392)**	1.779(0.267)***	1.906(0.296)***	2.719(0.594)***	0.264(0.334)	0.872(0.310)**	0.755(0.331)**	1.524(0.371)***	1.312(0.358)***
Age (standardized)	-0.154(0.093)	-0.165(0.108)	-0.294(0.077)***	-0.327(0.087)***	-0.211(0.134)	-0.613(0.104)***	-0.463(0.095)***	-0.630(0.093)***	-0.236(0.090)**	-0.449(0.102)***
<i>Man living in a couple (ref)</i>										
Woman in a couple	-0.493(0.204)**	-0.401(0.245)	-1.600(0.162)***	-0.737(0.172)***	-1.307(0.335)***	-1.171(0.230)***	-0.610(0.192)**	-1.326(0.187)***	-1.813(0.209)***	-2.443(0.220)***
Man not in couple	-0.552(0.351)	-1.171(0.349)***	-0.941(0.332)**	-0.013(0.352)	-0.839(0.572)	-0.887(0.366)**	-0.564(0.364)	-0.398(0.379)	-0.723(0.374)	-0.197(0.507)
Woman not in couple	-0.246(0.309)	-0.395(0.348)	-1.030(0.302)***	-0.147(0.289)	-1.348(0.462)**	-1.189(0.310)***	0.237(0.305)	-0.813(0.319)**	-0.769(0.326)**	-1.528(0.329)***
<i>Living alone or with spouse/partner only (ref)</i>										
Cohabitation	0.343(0.220)	0.504(0.283)	0.133(0.169)	-0.049(0.175)	-0.541(0.33)	0.217(0.212)	0.122(0.196)	-0.175(0.191)	-0.044(0.215)	-0.104(0.222)
<i>Life style 'Traditional' (ref)</i>										
Life style 'Modern'	-0.157(0.184)	-0.081(0.221)	0.151(0.197)	-0.250(0.200)	-0.064(0.341)	-0.257(0.247)	0.131(0.233)	0.183(0.310)	0.001(0.318)	0.200(0.358)
No child or one child	-0.394(0.244)	0.130(0.274)	0.111(0.184)	-0.356(0.178)**	0.164(0.368)	-0.043(0.236)	-0.017(0.229)	-0.284(0.206)	-0.172(0.245)	-0.573(0.240)**
<i>1 or 2 children (ref)</i>										
3 or more children	-0.462(0.214)**	-0.356(0.247)	-0.378(0.168)**	-0.118(0.220)	-0.452(0.311)	0.145(0.251)	-0.196(0.203)	-0.267(0.221)	-0.135(0.213)	-0.353(0.253)
<i>No parents (ref)</i>										
Having a parent alive	0.262(0.183)	0.450(0.210)**	0.210(0.144)	0.096(0.160)	0.464(0.299)	0.366(0.198)	0.344(0.183)*	0.038(0.171)	0.225(0.182)	0.476(0.193)**
Good health	0.924(0.246)***	0.862(0.303)**	0.517(0.165)	0.045(0.200)	0.072(0.405)	0.445(0.234)	0.024(0.205)	0.140(0.207)	0.402(0.216)*	-0.129(0.214)
<i>Intermediate health (ref)</i>										
Poor health	-1.320(0.196)***	-0.420(0.249)	-1.177(0.176)**	-1.072(0.186)***	-0.529(0.385)	-0.315(0.238)	-0.468(0.215)**	-0.538(0.198)**	-1.225(0.213)***	-0.745(0.251)**
Low level of education	-0.115(0.214)	-0.302(0.284)	-0.269(0.166)***	-0.637(0.246)**	-0.543(0.339)	-0.684(0.255)**	-0.047(0.191)	-0.223(0.211)	-0.150(0.208)	-0.036(0.227)
<i>Intermediate (ref)</i>										
High level of education	0.426(0.235)	0.527(0.236)**	0.651(0.208)**	0.658(0.189)***	-0.557(0.389)	0.866(0.235)**	0.738(0.257)**	1.246(0.213)***	0.521(0.237)**	0.321(0.234)
1st quintile income	-1.207(0.261)***	-1.727(0.316)***	-1.058(0.221)	-1.034(0.234)***	-0.292(0.427)	0.551(0.303)	-0.866(0.276)**	-0.533(0.268)**	-0.934(0.282)***	-0.710(0.285)**
2nd quintile	-0.290(0.275)	-0.627(0.326)	-0.640(0.217)	-0.716(0.235)**	-0.939(0.419)**	-0.481(0.308)	-0.246(0.268)	-0.523(0.263)**	-0.683(0.276)**	0.039(0.285)
<i>3rd quintile (ref)</i>										
4th quintile	0.473(0.308)	0.098(0.371)	0.331(0.234)	-0.047(0.251)	0.511(0.478)	0.375(0.306)	-0.093(0.278)	0.099(0.258)	-0.109(0.279)	0.780(0.293)**
5th quintile	0.034(0.306)	-0.173(0.360)	-0.279(0.231)	0.348(0.278)	0.043(0.446)	0.295(0.302)	-0.250(0.288)	0.130(0.267)	0.274(0.284)	0.694(0.291)**

Source: Share 2004, 7,887 respondents born during 1945–1954

Key *** < 0.001 ** < 0.05

simple regression models even with a country variable do not take this effect into account. In other words, the coefficients relate to fixed effects only and do not take into account variance that is randomly dispersed (Singer 1998; Courgeau 2004; Goldstein 2003).

The multilevel analysis was constructed in the following way. Variables that were entered in the previous regression models (Tables 3, 4) were retained. In addition to the fixed effects of the respondents' characteristics (for example, the probability of being in paid employment is less for women in a couple), the random effects due to belonging to a particular country were then examined. In the next stage, contextual variables relating to the different countries were added. The first series of contextual variables relating to the living arrangements, marital patterns and family configuration were constructed from the data. Each respondent in a particular country was attributed the same value, corresponding to a summary measure of the variable in question. These were the mean number of children, mean number of children in a household, proportion living in households other than a one person household or a household with a couple only (two-person household), and the proportion living a 'modern' life style. The second series of contextual variables were constructed from Eurostat indicators, irrespective of the population age, using scores that ranged from 0 to 1 (Hank and Jürges 2006). These included the mean number of persons in households, gross domestic product, life expectancy at age sixty, risk of poverty before and after social transfers, public expenditure on labour market policy measures and total expenditure on social protection measures relevant to employment.⁶

The results of the multilevel analysis were as follows. The zero model contained only the variable to be explained (in paid employment) and the variable country (Table 5, model 3a). In this model, the coefficient of the random variation attributed to the country variable was 0.213, and since this result was significant a full model was constructed. In this second stage the explanatory variables were introduced, representing the fixed effects of the individual categories of explanatory variables entered in the previous regression analyses. The results showed that the coefficients did not differ much from those observed in Table 3, model 1b. However, the random variance rose, suggesting that the effect of certain variables differed according to country membership. Above all, the results showed that individual characteristics alone cannot explain the variance between

countries. The next step of the multilevel analysis consisted of examining the combination of the fixed and random effects of each variable. The random effects of each category of the variables relevant to the living arrangements, marital patterns and family configurations of respondents were first tested. The results showed that there was no random effect for type of household, life style, number of children, or having parents alive on the variance of the probability of being in paid employment by country. However, the category of 'woman in a couple' for the variable 'gender and couple status' exerted a different effect according to country, a finding that was already implicit in the regression analyses by country. In multilevel analyses, when there is a random effect of a category at the second level, there is a strong rise in the standard error of the coefficient (Courgeau and Baccaïni 1997). This was the case as is shown in Table 5, where the final model retained is presented (i.e., the most parsimonious after having tested all the fixed and random effects of each category of the explanatory variables). In model 5b, the coefficient was -1.150 , and the standard error 0.061 ; in model 5c, the coefficient was the same (-1.148) but the standard error was raised threefold to 0.167 . The value of between country variance fell sharply from 0.268 to 0.150 .

The final step in the multilevel analysis consisted of testing the combination of the random effect for a woman in a couple to be in paid employment with other contextual variables. Among the first group of contextual variables tested, the one corresponding to the proportion of respondents in a 'modern' life style (model 5d) had the most significant effect. The between country variance of the probability of being in paid employment was reduced when this contextual variable was added to the model. In other words, some of the between country variance can be explained by country specific modern life style rates which were positively associated with being in paid employment. The effect of a modern life style was more important for 'woman in couple' because the between country variance fell by 80%, compared to only 25% for the other situations (man living in a couple, man or woman not living in a couple). In the same way, among the variables extracted from Eurostat figures, the one giving the proportion of GDP on labour market policy measures in 2003 was the most significant (model 5e). Pro-active employment policies led to a 38% reduction in the between country variance for 'woman in a couple' compared to a 34% reduction for other situations.

Whereas the contextual variable public expenditure on labour market policy measures helps to explain a part of the different employment rates observed between countries for *all* respondents, the contextual variable 'modern

⁶ All these contextual variables are recoded so that the country with the lowest score has the value zero and the country with the highest score the value 1.

Table 5 Multilevel analysis, two-level models: probability of being in employment in 2004 in nine European countries, 1945–1954 birth cohort

Parameters	Model 3a Beta (SE)	Model 3b Beta (SE)	Model 3c Beta (SE)	Model 3d Beta (SE)	Model 3e Beta (SE)
<i>Fixed parameter</i>					
Intercept	0.417(0.156)**	1.285(0.199)***	1.302(0.163)***	0.723(0.175)***	0.891(0.244)**
Individual characteristics (level 1)					
<i>Man living in a couple (ref)</i>					
Woman in a couple		−1.150(0.061)***	−1.148(0.167)***	−1.156(0.174)***	−1.160(0.170)***
Man not in couple		−0.651(0.114)***	−0.627(0.114)***	−0.641(0.117)***	−0.636(0.115)***
Woman not in couple		−0.647(0.096)***	−0.636(0.096)**	−0.644(0.099)***	−0.641(0.096)***
Macro variables (level 2, country)					
Modern life style				1.646(0.242)***	
Public expenditure on labour market					0.889(0.407)**
<i>Random parameter (level 2, country)</i>					
σ_{u0}^2 (intercept)	0.213(0.103)**	0.268(0.129)**	0.150(0.076)*	0.112(0.058)**	0.099(0.053)
σ_{u30} (covariance)			0.079(0.070)	−0.124(0.076)	−0.001(0.056)
σ_{u3}^2 (woman in a couple)			0.218(0.115)*	0.237(0.125)	0.224(0.118)
Residual country variance for 'woman in a couple' $\sigma_{u0}^2 + 2\sigma_{u30} + \sigma_{u3}^2$			0.526	0.101	0.323
Reduction of country variance (in %) (variation with the model 4c)					
For a man or woman not in couple, or a man in a couple (%)				25	34
For a woman in a couple (%)				80	38

Source: Share 2004, 7,531 respondents born during 1945–1954 (Switzerland excepted). From model 5b to model 5f, all explanatory variables are introduced in turn, representing the fixed effects of the individual characteristics entered in the previous regression analyses (Tables 3, 4); however, only the most parsimonious model is shown in the table

Key *** < 0.001 ** < 0.05

life style' had a very important effect in explaining the difference in employment rates observed for women in a couple. Returning to the results of the regression models in Table 3, the effect of the variable 'life style' had a significant effect at the individual level (model 3a). In model 3b this effect disappeared, i.e., when the variable country was entered in the model as an explanatory variable at the individual level. Even when the regression models were run separately country by country, the effect of a 'modern' life style was not apparent for all countries. Yet in the multilevel analysis the effect of a 'modern' lifestyle at the country level was very significant for women living in a couple. To summaries, these results showed that the between country variance of being in paid employment could not be explained by individual characteristics only, and that a large part of the country variance could be explained by the country specific effect (random effect) of women in a couple. A 'modern' life style within a country had a significant effect on the employment rates, especially for women in a couple.

Discussion

In the context of the European Union's objectives of increasing the labour force participation of older workers, emphasis is frequently placed on a range of measures aimed at employers or public policy. For employers, these measures include improving the working conditions of older workers, by encouraging mobility and re-training and promoting flexible working hours. Policies to accompany these measures including redesigning access to disability benefits and adjusting eligibility criteria for pensions (generally a reduction in early retirement schemes and incentives for workers to continue to work beyond retirement age). Whilst it is generally acknowledged that these measures are essential components in an overall strategy to increase the labour force participation of older workers, the increasingly complex arena of living arrangements, marital patterns and family configurations is an area that is much less researched. However, birth cohorts that are currently approaching retirement age often have complex family histories which also influence

decisions about whether to continue working, and these micro-factors differ substantially between European countries.

The analysis of the labour force participation of mid lifers in several European countries undertaken using the SHARE data has implications in the overall strategy of increasing the employment rates of older workers and older women in particular. Previous research from the USA that has examined the relationship between marriage, divorce and the work careers of spouses has found that the employment careers of women are becoming much less responsive to marriage than for older generations of women (Lillard and Waite 2000). It has also been suggested that the dramatic increase in the probability of divorce between the mid-1960s and the late 1970s may explain, in part, the increase in female labour force activity during this period. These trends can also be observed in Europe. In northern European countries, where a modern lifestyle is more usual, as reflected by increasing complex living arrangements, marital patterns and family formations, differences in employment rates between men and women are largely neutralised. But in countries where a modern lifestyle is less common, strong differences remain between men and women, with much lower rates of women living in a couple participating in the labour force. This leads us to suppose that there is a strong effect of institutions, policies and culture on the employment prospects of mid-life women, and gives some support to the more general conclusion that differences in welfare states and cultural practices continue to exert an important influence on labour force participation.

These findings however need to be offset against several limitations inherent in the analysis as well as the SHARE data. A more systematic assessment of the impact of living arrangements, marital patterns and family configurations on the labour force participation of mid lifers would need to include more comprehensive measures, taken from retrospective histories. More accurate measures of family commitments, such as the care of older parents or looking after grandchildren would also shed more light on how these family obligations and decisions concerning paid employment among mid-lifers differ between European countries. Confronting the respective employment situations among couples, whilst taking into account the marital histories and respective family obligations would also enhance an understanding of the importance of micro-factors on extending working lives. Finally, the ‘simple’ state of being in paid employment versus not being in paid employment which has been examined here needs to be nuanced by the important impact of flexible and reduced working hours. These considerations provide the

avenues for future exploration in this field, which should be improved upon since the SHARE survey is longitudinal.

As far as possible policy implications are concerned, in addition to incentives based on pension rights and working conditions, policies to increase employment rates after the age of 50, in certain European countries, may therefore need to take into account the situations of women living in a couple. Distortions in pension and social transfer programmes and how they are applied to different forms of marital status and living arrangements make it financially uninteresting for a large number of older workers to remain in the labour force. Policies designed to help women participate in the labour market whilst at the same time not detracting from their family commitments, particularly towards older and younger family members, should also be more widespread. It is well-known that marriage and living arrangements affect the labour force participation of younger women, and that this participation is affected by the flexibility of work-time arrangements, taxation systems, and support to families with young children. However, such public policy considerations are equally important for mid-life women. In addition to work-time flexibility and the organisation of pension rights based on marriage, support to the carers of older parents must be a major consideration in achieving the Lisbon objectives. Many northern European countries have externalised these family care activities whilst in southern Europe they continue to be the responsibility of women. Until there are more concerted efforts to link these public and private spheres of family life, it is difficult to see how the Lisbon objectives can be achieved.

Acknowledgments The authors would like to thank Arnaud Bringe and Eva Lelièvre, Institut National d’Etudes Démographiques, Paris, France and the two anonymous referees for their comments on earlier drafts of this paper.

Appendix 1: Steps in the multilevel analysis

Multilevel models for discrete response data: notation for two-level models

Explanatory variables: X

Fixed parameters of explanatory variables

- Individual characteristics: X_{ij} for level 1, individual i ;
- Macro variables: X_j for level 2, country j

Random parameters of individual characteristics, level 2 (country j).

Model 5a, we observed that the probability of being in employment varies across the countries.

$$\text{Logit}(\Pi_{ij}) = Y_{ij} = \beta_{0j}$$

$$\beta_{0j} = \beta_0 + u_{0j} \quad \sigma_{u0}^2 = \text{Var}(u_{0j})$$

→ between country variance: $\sigma_{u0}^2 = 0.213$.

β_{0j} the random intercept consists of two terms: β_0 a fixed component and u_{0j} the random effect (country specific component). u_{0j} follows a normal distribution with mean zero and variance σ_{u0}^2 .

Model 5b, we observed that explanatory variables have an effect on the probability of being in employment, but we conclude that these effects were the same for each country.

$$Y_{ij} = \beta_{0j} + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_3 X_{3ij}(\text{woman in a couple}) \\ + \dots + \beta_n X_{nij}$$

$$\beta_{0j} = \beta_0 + u_{0j} \quad \sigma_{u0}^2 = \text{Var}(u_{0j})$$

→ between country variance: $\sigma_{u0}^2 = 0.268$.

The fixed parameter (level 1) for individual characteristic ‘woman in a couple’ is: $\beta_3 = -1.150$ (0.061).

Model 5c consisted in allowing a random effect for ‘woman in a couple’; in others words, the difference between the category ‘woman in a couple’ and the other three categories within a country varies across the countries.

$$Y_{ij} = \beta_{0j} + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_{3j} X_{3ij}(\text{woman in a couple}) \\ + \dots + \beta_n X_{nij}$$

$$\beta_{0j} = \beta_0 + u_{0j} \quad \sigma_{u0}^2 = \text{Var}(u_{0j})$$

$$\beta_{3j} = \beta_3 + u_{3j} \quad \sigma_{u3}^2 = \text{Var}(u_{3j})$$

→ between country variance: $\sigma_{u0}^2 = 0.150$.

The fixed parameter (level 1) for individual characteristic ‘woman in a couple’ is: $\beta_3 = -1.148$ (0.167) (there is a strong rise of the standard error from 0.061 to 0.167 which means there is a random effect (for country, level 2): $\beta_{3j} = \beta_3 + u_{3j}$).

Because of this random effect for ‘woman in a couple’, the parameter σ_{u30} was introduced: it is the covariance between u_{0j} and u_{3j} .

The residual variance between countries is a function of explanatory variables that have random coefficients: $\text{Var}(u_{0j} + u_{3j}) = \text{Var}(u_{0j}) + 2\text{Cov}(u_{0j} + u_{3j}) + \text{Var}(u_{3j})^2 = \sigma_{u0}^2 + 2\sigma_{u30} + \sigma_{u3}^2$.

→ residual country variance for ‘woman in a couple’: $\sigma_{u3}^2 = 0.526$.

So there is a greater country level variation in the probability of being in employment for ‘woman in a couple’ ($\sigma_{u3}^2 = 0.526$) than in other situations (‘person not in a couple, man in a couple’) ($\sigma_{u0}^2 = 0.150$).

Model 5d, we added a country level explanatory variable (contextual variable) to see whether ‘modern life style’ explains some of the country level variation for ‘woman in a couple’ and others.

$$Y_{ij} = \beta_{0j} + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_{3j} X_{3ij}(\text{woman in a couple}) \\ + \dots + \beta_n X_{nij} + \beta_{n+1} X_{n+1j}(\text{Modern style})$$

$$\beta_{0j} = \beta_0 + u_{0j} \quad \sigma_{u0}^2 = \text{Var}(u_{0j})$$

$$\beta_{3j} = \beta_3 + u_{3j} \quad \sigma_{u3}^2 = \text{Var}(u_{3j})$$

→ between country variance: $\sigma_{u0}^2 = 0.112$.

The fixed parameter (level 2, country) for the macro variable ‘modern life style’ is: $\beta_{n+1} = 0.1646$ (0.242).

The proportion of ‘Modern life style’ within countries has a positive and significant effect on the probability of being in employment.

→ residual country variance for ‘woman in a couple’: $\sigma_{u3}^2 = 0.101$.

So there is a large decrease in country level variation between the probability of being in employment for ‘woman in a couple’, from $\sigma_{u3}^2 = 0.526$ in model 3c to $\sigma_{u3}^2 = 0.101$ in model 3d.

The reduction of country variance is 80% for the category ‘woman in a couple’ and 25% for the others.

Model 5e, in the same way, we observed another contextual variable—‘the public expenditure on labour market’ to see whether it explains some of the country level variation for ‘woman in a couple’ and other categories.

$$Y_{ij} = \beta_{0j} + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_{3j} X_{3ij}(\text{femme en couple}) \\ + \dots + \beta_n X_{nij} + \beta_{n+2} X_{n+2j}(\text{public expenditure on labour market})$$

$$\beta_{0j} = \beta_0 + u_{0j} \quad \sigma_{u0}^2 = \text{Var}(u_{0j})$$

$$\beta_{3j} = \beta_3 + u_{3j} \quad \sigma_{u3}^2 = \text{Var}(u_{3j})$$

→ between country variance: $\sigma_{u0}^2 = 0.099$.

The fixed parameter for the macro variable public expenditure on labour market is: $\beta_{n+2} = 0.889$ (0.407).

→ residual country variance for ‘woman in a couple’: $\sigma_{u3}^2 = 0.323$.

In this last model, the reduction of country variance is 38% for the category ‘woman in a couple’ (from $\sigma_{u3}^2 = 0.526$ in model 4c to $\sigma_{u3}^2 = 0.101$ in model 4e) and 34% for the others ($\sigma_{u3}^2 = 0.150$ in model 4c fell to $\sigma_{u3}^2 = 0.099$ in model 4e).

Appendix 2

Table 6

Table 6 Binary logistic regression model and multilevel analysis, two-level models: probability of being in employment in 2004 in nine European countries, 1945–1954 birth cohort

Parameters	Logistic model 1a Beta (SE)	Multilevel model 3b Beta (SE)	Multilevel model 3d Beta (SE)
<i>Fixed parameter</i>			
Individual characteristics (level 1)			
Intercept	1.375 (0.100)***	1.285 (0.199)***	0.723 (0.175)***
Age (standardized)	−0.351 (0.029)***	−0.330 (0.028)***	−0.355 (0.029)***
Gender and couple status			
<i>Man living in a couple (ref)</i>			
Woman in a couple	−1.193 (0.061)***	−1.150 (0.061)***	−1.156 (0.174)***
Man not in couple	−0.731 (0.116)***	−0.651 (0.114)***	−0.641 (0.117)***
Woman not in couple	−0.772 (0.069)***	−0.647 (0.096)***	−0.644 (0.099)***
Type of household			
<i>Living alone or with spouse/partner only (ref)</i>			
Cohabitation	−0.288 (0.058)***	0.029 (0.061)	0.029 (0.061)
Life style			
<i>‘Traditional’ (ref)</i>			
‘Modern’	0.268 (0.071)***	−0.012 (0.071)	0.018 (0.071)
Number of children			
No child or one child	−0.224 (0.068)***	−0.174 (0.068)**	−0.178 (0.068)**
<i>2 children (ref)</i>			
3 or more children	−0.114 (0.065)**	−0.224 (0.065)***	−0.240 (0.066)***
Parents			
<i>No parents (ref)</i>			
Having a parent alive	0.324 (0.055)***	0.258 (0.055)***	0.261 (0.055)***
Subjective health			
Good health			
	0.370 (0.066)***	0.308 (0.065)***	0.307 (0.065)***
<i>Intermediate health (ref)</i>			
Poor health	−0.790 (0.064)***	−0.801 (0.064)***	−0.818 (0.065)***
Education			
Low educational level			
	−0.239 (0.062)***	−0.191 (0.065)**	−0.194 (0.065)**
<i>Intermediate educational level (ref)</i>			
High educational level	0.717 (0.069)***	0.636 (0.069)***	0.634 (0.069)***
Household income (<i>equivalence Scale</i>)			
1st quintile			
	−0.779 (0.083)***	−0.795 (0.082)***	−0.805 (0.083)***
2nd quintile			
	−0.397 (0.083)***	−0.419 (0.082)***	−0.437 (0.082)**
<i>3rd quintile (ref)</i>			
4th quintile	0.145 (0.086)	0.166 (0.085)	0.157 (0.086)
5th quintile	0.061 (0.088)	0.106 (0.087)	0.090 (0.088)
Macro variables (level 2, country)			
Modern life style			1.646 (0.242)***
<i>Random parameter (level 2, country)</i>			
σ_{u0}^2 (intercept)		0.268 (0.129)**	0.112 (0.058)
σ_{u30} (covariance)			0.124 (0.076)
σ_{u3}^2 (woman in a couple)			0.237 (0.125)

Source: Share 2004, 7,531 respondents born during 1945–1954 (Switzerland excepted)

Key *** < 0.001 ** < 0.05

References

- Banks J, Casanova M (2003) Work and retirement. In: Marmot M, Banks J, Blundell R, Lessof C, Nazroo J (eds) *Health, wealth and life styles of the older population in England: the 2002 English longitudinal study of ageing*. The Institute for Fiscal Studies, London, pp 127–166
- Barnay T, Debrand T (2006) L'impact de l'état de santé sur l'emploi des seniors en Europe. *Questions d'économie de la santé*, IRDES, no 109, juin
- Blanchet D, Debrand T (2005) Aspirations à la retraite, santé et satisfaction au travail: une comparaison européenne. *Questions d'économie de la santé*, IRDES, no 103, décembre
- Blau DM (1998) Labour force dynamics of older married couples. *J Labor Econ* 16(3):595–629
- Blau R, Goodstein R (2006) Accounting for trends in the labour force participation rates of older men in the United States. http://www.iza.org/conference_files/TAM2006/blau_d787.pdf
- Börsch-Supan A, Jürges H (2005) Survey of health, ageing and retirement in Europe—methodology. MEA, Mannheim
- Börsch-Supan A, Brügiavini A, Jürges H, Mackenbach J, Siegrist J, Weber G (2005) Health, ageing and retirement in Europe—first results from the survey of health, ageing and retirement in Europe. MEA, Mannheim
- Courgeau D (2004) *Du Groupe à l'Individu. Synthèse multiniveau*. Editions de l'Ined, Paris
- Courgeau D, Baccaïni B, (1997) *Analyse multi-niveaux en sciences sociales*. Population 4:831–861
- Esping-Andersen G (1990) *The three worlds of welfare capitalism*. Polity, Cambridge
- Esping-Andersen G (1999) *Social foundations of post-industrial economies*. Oxford University Press, Oxford
- Eurostat (2005) *Europe in figures*, Eurostat Yearbook 2005 http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1334_49092079_1334_49092702&_dad=portal&_schema=PORTAL
- Goldstein H (2003) *Multilevel statistical models*. Arnold, London
- Grossbard-Shechtman S (2003) *Marriage and the economy. Theory and evidence from advanced industrial societies*. Cambridge University Press, New York
- Gruber J, Wise D (eds) (1999) *Social security and retirement around the world*. Chicago University Press for the NBER, Chicago
- Hank K, Jürges H (2006) Gender and the division of household labor in older couples: a European perspective. *J Fam Issues* 28(3):399–342
- Harkin J, Huber J (2004) *Eternal youth: how the baby boomers are having their time again*. Demos, London
- Hoffman S, Duncan, G (1988) What are the economic consequences of divorce? *Demography* 25:641–645
- Hurd M (1990) The joint retirement decision of husbands and wives. In: Wise D (ed) *Issues in the economics of ageing*. The University of Chicago Press, Chicago, pp 231–254
- Iacovou M (2000) *The living arrangements of elderly europeans*. Institute for Social and Economic Research, University of Essex, February. Available online at <http://www.iser.essex.ac.uk/pubs/workpaps/pdf/2000-09.pdf>
- Kennedy S, Da Costa A (2006) Older men bounce back: the re-emergence of older male workers. Domestic Economic Division, The Australian Treasury http://www.treasury.gov.au/documents/1190/PDF/04_men.pdf
- von Kondratowitz H (2003) Comparing welfare states. In: Lowenstein A, Ogg J (eds) *OASIS final report (old age and autonomy: the role of service systems and intergenerational family solidarity)*. Center for Research and Study of Aging, The University of Haifa, Haifa. ISBN: 965-90602-0-3
- Lillard LA, Waite L (2000) *Marriage, divorce and the work and earning careers of spouses*. Working Paper WP 2000–2003, University of Michigan Retirement Research Center
- Lissenburgh S, Smeaton, D (2003) *Employment transitions of older workers: the role of flexible employment in maintaining labour market participation and promoting job quality*. Policy Press/Joseph Rowntree Foundation, Bristol/York
- Organisation for Economic Co-operation and Development (OECD) (2006) *Ageing and employment policies—“Live Longer, Work Longer”*
- Phillipson C, Smith A (2005) *Extending working life: a review of the research literature*. Department of Work and Pensions, Research Report 29, HMSO, Norwich
- Presidency Conclusions—Lisbon European Council (2000) 23 and 24 March 2000 http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm
- Presidency Conclusions—Barcelona European Council (2002) 15 and 16 March 2002 http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/71025.pdf
- Ray JC (2002) Les gains d'activité des jeunes adultes européens sont-ils liés à la générosité des transferts sociaux ? Une analyse au moyen des modèles multi-niveaux CEPS/INSTEAD, Document PSELL, no 132
- Rehr D (1998) Family ties in Western Europe: persistent contrasts. *Popul Dev Rev* 24:203–234
- Singer J, (1998) Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *J Educ Behav Stat* 24(4):323–355
- Waite LJ (1995) Does marriage matter? *Demography* 32:483–508
- Whiting E (2005) The labour market participation of older people. *Labour Market Trends* 113:285–296