The Effect of Children on Early Retirement Behavior in Europe

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Abstract

Using individual data drawn from the Survey of Health, Ageing and Retirement in Europe, this paper analyzes how having fewer children affects early retirement of the elderly in eleven European countries. To examine the endogeneity of the number of children, I use information on the number of siblings of the respondent as instruments. The estimates indicate that having fewer children increases the probability of early retirement among older workers in Europe. The reasons vary by sex. For men, it is because having fewer children reduces the likelihood of having young children who need financial support from them in later life. For women, it is because women with fewer children are less likely to have employment interruptions during their reproductive phase and thus become vested in pensions earlier than women with more children.

Keywords: fertility, children, early retirement, instrumental variable

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1 Introduction

Across Europe, decreasing birth rates are accelerating the aging of the population and shrinking the workforce. As one of the approaches to alleviate the adverse impacts of low fertility on the economy, increasing the eligibility age for social security benefits has often been discussed. However, the effectiveness of this policy change in raising labor-force participation of the elderly may be dampened if having fewer children, mostly due to low fertility, facilitates early retirement of the elderly. Yet the effect of children on early retirement behavior has received little attention in the retirement literature based on European data (Gruber and Wise 1999, 2004; Dorn and Sousa-Poza 2005; Fischer and Sousa-Poza 2006; Meijer, Kapteyn, and Andreyeva 2007).

Using cross-sectional individual data drawn from the Survey of Health, Ageing and Retirement in Europe (SHARE), this paper analyzes the effects of the number of children on the early retirement behavior of the elderly in eleven European countries. In order to examine the potential endogeneity of the number of children in the cross-sectional retirement analysis, I employ the number of siblings of the respondent as instrument variables. I also examine whether the reasons for the observed effects of the number of children on early retirement vary by gender.

In the following section, I provide a brief review of the literature on children and early retirement. In section 3 I describe the data and econometric specification used in this paper. In section 4 I discuss the instrumental variables for the number of children. Section 5 presents the empirical estimation results. In the final section, I summarize the findings and conclude.

2 Children and Early Retirement

According to the life-cycle model, people save during the prime working years to finance their consumption during retirement, but having more children decreases household wealth (Smith and Ward 1980; Scholz and Seshadri 2006) and thus may hinder early retirement. Smith and Ward (1980), using panel data from the United States, found that family savings decrease mostly due to the child-induced withdrawal of wives from the labor force. Besides family savings, people also depend on public/private pension systems for retirement, which usually require a set period of employment for entitlement. Therefore, women with fewer children might be able to retire earlier because, by having fewer employment interruptions during their reproductive phase, they can accumulate more household wealth and also become vested in public/private pensions earlier than mothers with more children (O'Rand and Henretta 1982; Pienta, Burr, and Mutchler 1994; Pienta 1999; Hank 2004).[1] For example, using various panel data from the United States, O'Rand and Henretta (1982); Pienta, Burr, and Mutchler (1994); and Pienta (1999) found that among women with stronger labor-force attachment—excluding those who have never worked or worked for a very short period throughout their lives—those with children are more likely to be working later in life than childless women. When it comes to European data, Hank (2004) showed that, using panel data drawn from the German Socio-Economic Panel Study, the number of children lowers the probability of retirement among ever-married older women who worked at least one year after the age of 49.

[1] It certainly is possible that women who have weaker attachment to the labor force might have more children. For this reason, by imposing some level of work requirements, all studies have effectively excluded these women with weak attachment to the labor force from their analysis sample.

Scholz and Seshadri (2006), using data from the Health and Retirement Study and social security earnings records in the United States, found that children are costly and families with children accumulate less net worth than families without children because the former are credit constrained for a longer period of time and thus begin asset accumulation later on in life than the latter. Thus, parents with young children or adult children who need financial support are likely to delay their retirement relative to those without children (Holtmann et al. 1994; Szinovacz, DeViney, and Davey 2001). Holtmann et al. (1994, p. 598), in particular, found that the negative effect of the number of adult children (up to the age of 25) on the probability of planning to retire early is larger for men than for women, and concluded that this reflects the greater financial responsibility that men have for their own adult children. Considering that men with more children are likely to still have young children or adult children who need financial support from them in later life, they are likely to delay their retirement relative to their counterparts with fewer children.[2]

The aforementioned explanations suggest that the elderly with fewer children may take early retirement than those with more children. However, the possibility that the number of children may be endogenous in a cross-sectional study of early retirement prevents drawing a causal interpretation of any negative association between the number of children and the probability of early retirement. For example, the negative association could be due to some omitted factors or unobserved individual heterogeneity that may affect both fertility and retirement decisions. In addition, fertility decisions and labor supply decisions, including retirement decisions, could have been made jointly in early

[2] In contrast, if parents could get financial support from their children, they might be able to retire earlier than individuals without children. However, *inter vivos* transfers are mostly from parents to children, and thus unlikely to help parents with children retire early (Attias-Donfut, Ogg, and Wolff 2005).

life. Nevertheless, unlike the case of labor supply of younger parents, the number of children is predetermined and thus may not be endogenous in the early retirement analysis of older workers. To investigate these issues of endogeneity and causality, one needs instrumental variables and I discuss them in section 4.

3 Data and Econometric Specification

To investigate the effect of the number of children on early retirement, this paper uses individual data drawn from the SHARE, which is a longitudinal survey of individuals aged over 50 and their spouses in eleven European countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland) that began in 2004. The SHARE collects detailed information on retirement, health, and economic well-being of a representative sample of older people from each country. I use cross-sectional data of individuals aged 50−80 from eleven countries, drawn from Release 2.0.1 of the SHARE wave 1 data. To be included in the analysis sample, the respondent must have been working at age 50 or over. For couples, an additional requirement is that both spouses should have been interviewed.

Due to its recency, in spite of its richness, the SHARE data have not yet been fully used in retirement analysis. In fact, only two retirement studies that use the SHARE data are available. Using samples of retirees, Fischer and Sousa-Poza (2006) showed that institutional settings provide strong incentives for early retirement in many European countries. Meijer, Kapteyn, and Andreyeva (2007) developed a health index that is comparable across countries and investigated the usefulness of the health index in simple retirement models.

SHARE respondents reported their current job situation as one of the following six categories: retired, employed or self-employed, unemployed, permanently sick or disabled, homemaker, and other. Following Meijer, Kapteyn, and Andreyeva (2007), I define retired persons as respondents who are currently not in the labor force—retired, permanently sick or disabled, and homemaker—but were working at age 50 or later. Regardless of the current self-reported job situation, respondents who either did any paid work during the four weeks prior to the interview date or were temporarily away from work are considered not retired. I do not include those who are currently unemployed in the analysis because unemployment could be a way out of the labor force and thus retirement status is unknown for these people. Finally, similar to Fischer and Sousa-Poza (2006), among retired persons, those who ended their last job before the normal entitlement ages to public old-age pension reported in Table 1 are defined as early retirees.[3] In the end, the analysis sample consists of 15,334 respondents who belong to one of the three mutually exclusive groups: early retirees, normal retirees, and non-retirees. Table 2 shows the distribution of these groups by country and sex. Overall, about 44 percent of both men and women in the sample are early retirees. Austria has the highest percentage of early retirees, about 60 percent, among men and Belgium has the highest percentage of early retirees, about 56 percent, among women. Switzerland has the lowest percentages of early retirees, regardless of sex.

SHARE respondents were first asked about the total number of *living* children they had,[4] and whether all of them were natural children. Then, for every living child, basic information was collected on birth year, sex, and where the child lives. But,

[3] The earliest year of retirement in the sample is 1974.
[4] The question is "How many children do you have that are still alive? Please count all natural children, fostered, adopted and stepchildren (including those of your husband/wife/partner)."

information regarding whether they were natural children, stepchildren, adopted or fostered children was only obtained for up to four children. Consequently, one cannot find out full fertility histories of the female respondents in the SHARE.

However, for the following two reasons, this does not necessarily invalidate any inference about the effect of low fertility on early retirement based on the SHARE data using the number of living children. First, the number of living children per woman in the SHARE relatively well represents fertility histories of female respondents. Among female respondents over the age of 50 who have children in the SHARE, 96 percent of them only have natural children (Martinez-Granado and Mira 2005). Furthermore, at the country level, the following examination shows that the average number of living children of the female respondents in the SHARE is very similar to the average completed fertility of female birth cohorts. Columns (1) through (6) of Table 3 present the completed fertility for female birth cohorts 1930−1955 by country, taken from T3.7 of Council of Europe (2004, p. 88).[5] Column (7) of Table 3 is the simple averages of these completed fertility rates by country. The numbers in column (8) of Table 3 are the weighted averages of the number of living children of all female respondents who were born between 1930 and 1955 in the SHARE. In addition to the sampling variability, the death of any natural children and the presence of stepchildren and adopted/fostered children would inevitably make the values in column (8) differ from those in column (7). Yet the values in the two columns are surprisingly similar. The scatter plot of these two columns shown in Fig. 1 evidently confirms this. The points are located near the 45-

[5] According to Council of Europe (2004, p. 123), completed fertility is the average number of children born to a cohort of women up to the end of their childbearing age (defined as age 49). The bottom row of Table 3 clearly illustrates decreasing birth rates among these cohorts of women over time: during their childbearing age, women who were born in 1955 gave birth to one-half fewer children, on average, than those who were born in 1930.

degree line and the correlation coefficient between the two variables is 0.7336, which is statistically significant at the 5 percent level.

Second, and more importantly, it is not the birth of children *per se* but rather financial and time costs associated with raising children that affect early retirement behavior of parents. In particular, when it comes to early retirement behavior of single men, it is not conceptually plausible to analyze the effect of fertility histories of women. In the analysis of early retirement, therefore, it is more appropriate to use the number of all living children, which takes into account the death of any natural children and the presence of stepchildren and adopted/fostered children, than using fertility histories of women.

As a first step to examining the relationship between the number of living children and the proportion of people retired early in the analysis sample, Fig. 2 and Fig. 3 present scatter plots of the weighted country averages of the two variables for men and women, respectively. Both figures clearly illustrate a negative association between the number of living children and the proportion retired early. For men, presented in Fig. 2, the correlation coefficient is -0.4072; for women, presented in Fig. 3, the correlation coefficient is -0.3499. Nonetheless, these figures also suggest that there are factors other than the number of living children that affect early retirement behavior.

To control for the effects of other factors on early retirement, I conduct separate binomial probit analyses of early retirement by sex and by household living arrangements (i.e. single or couple).[6] In addition to the number of living children, the following individual characteristics are included as regressors: age dummies (the reference group is

[6] Though there are three outcome categories for early retirement, by combining normal retirees and non-retirees as one group, I use the binomial probit, not a multinomial probit or multinomial logit, because of the ease of interpretation of the estimates from the binomial probit.

"50 years old"), three dummy variables for years of education (12 years, between 12 and 16 years, and 16 or more years; the reference group is "less than 12 years of education"),[7] four dummy variables for self-reported health status (excellent, very good, good, and fair; the reference group is "poor health"),[8] a dummy variable for the presence of a health problem that limits the kind or amount of paid work of the respondent, and three employment-sector dummy variables (private-sector employees, public-sector employees and civil servants; the reference group is "self-employment") for the last job for retirees and for the current job for non-retirees. To account for the joint determination of the retirement decisions of couples (Hurd 1990; Kapur and Rogowski 2007), I have additionally included age of the spouse and its square, and three dummy variables for spouse's years of education in the equations for couples. Finally, in order to examine how the effect of the number of living children on early retirement varies by institutional characteristics, I also include ten country dummy variables (the reference group is Austria). These country dummy variables conveniently control for all institutional differences among the eleven countries.

4 Instrumental Variables

To examine the endogeneity of the number of living children in the cross-sectional analysis of early retirement, I have employed information on the number of siblings of

[7] In the SHARE, the question of the highest educational degree obtained varies across countries, mirroring the variation in the education systems across countries. In the analysis, therefore, I have used the years of education that have been provided as one of the generated variables in the SHARE, based on the 1997 *International Standard Classification of Education*.

[8] Meijer, Kapteyn, and Andreyeva (2007) tried to create a health index that is comparable across countries from the SHARE.

the respondent as instruments.[9] Valid instruments should be highly correlated with the number of living children but uncorrelated with the error term in the early retirement equation. It has been well documented that fertility behavior of parents and their children is positively correlated (Murphy and Wang 2001; Murphy and Knudsen 2002).[10] Using the U.S. National Survey of Families and Households, Murphy and Wang (2001) found that even after controlling for various socio-demographic factors such as age, sex, race, and education, there still is a positive relationship between the numbers of children of successive generations. Using the whole population data from Denmark, Murphy and Knudsen (2002) also found that those from larger families have larger families themselves, regardless of whether the sibs are full sibs or half-sibs.

Respondents to the SHARE were first asked whether they have ever had any siblings, including non-biological siblings. If yes, they were also asked to report the number of brothers and sisters that are still alive, including non-biological siblings. Based on the answers to these questions, I have created six dummy variables as instruments for the number of living children: no sibling, 0 living sibling, 1 living sibling, 2 living siblings, 3 living siblings, and 4 or more living siblings.[11] For couples, the instruments include the same set of dummy variables for both spouses. Table 4 presents descriptive statistics of all variables, including these instrumental variables, for the whole sample.

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[9] Twining (Rosenzweig and Wolpin 1980) and the sex-composition of the first two children (Angrist and Evans 1998) have often been used as instruments for the number of children in the literature. These instruments are, however, not employed in this study because twins are not identifiable in the SHARE and using the sex-composition of the first two children excludes all respondents who have fewer than two children.

[10] This positive correlation is due to genetic factors (Kohler, Rodgers, and Christensen 1999; Rodgers et al. 2001), family size values/preferences learned during socialization, and intergenerational transmission of fertility-determining behavior (Thorton 1980; Anderton et al. 1987).

[11] Because the respondents in the sample were between the ages of 50 and 80, some of those who have ever had siblings may have 0 *living* sibling.

5 Estimation Results

5.1 Number of children

Table 5 presents the marginal effects of the early retirement probit estimation by sex and by household living arrangements. Standard errors have been adjusted for clustering by country. In the first row, the marginal effect of the number of living children on early retirement is positive and insignificant for single men, but for other groups it is negative and statistically significant, confirming the negative association presented in Fig. 2 and 3 between the number of living children and the proportion of people retired early. These numbers indicate that an additional child is associated with, on average, about 1.2-1.9 percentage point lower probabilities of early retirement at the mean among the elderly, except single men, in the eleven SHARE countries, holding other things constant.

The marginal effects of other control variables in Table 5 are mostly comparable with those found in the literature. The marginal effects for the age dummy variables show that, regardless of sex and couple status, older birth cohorts are more likely to have retired earlier than younger people but at a decreasing rate. Because the sample is a cross-sectional data, the age dummy variables capture both age and birth-cohort effects. The marginal effects of the three dummy variables for years of education indicate that those with more education are significantly less likely to retire early than those with the least education (less than 12 years), among all groups except for coupled women. These findings on the effects of education on early retirement are similar to those found in Holtmann et al. (1994) based on U.S. data drawn from the Survey of Income and Program Participation. However, these results are contrary to the findings in Dorn and

Sousa-Poza (2005), based on Swiss data, and Fischer and Sousa-Poza (2006), based on the SHARE data, that more educated people are *more* likely to retire early than less educated people.

Not surprisingly the four dummy variables for self-reported health status demonstrate that those in better health are less likely to have retired early, whereas the dummy variable for the presence of a health problem indicates that those having health problems that limit paid work are more likely to have retired early. Those with longer tenure are less likely to have retired early among single men and coupled women, but not among coupled men and single women. Consistent with the findings in Røed and Haugen (2003) and Dorn and Sousa-Poza (2005), the marginal effects of the firm-size dummy variables show that workers from large firms are more likely to have retired early that those in small firm. This result supports the notion that larger firms are more likely to have their own early retirement programs than smaller firms. The marginal effects on the three dummy variables for employment sectors indicate that private/public sector-employees and civil servants are more likely to retire early than those in self-employment.

Corroborating the idea that couples make joint decisions of early retirement, the spousal age variables are statistically significant among coupled women in column (4) and the spousal education dummy variables are statistically significant among coupled men in column (2).[12] Specifically, older spouses/partners are likely to increase the probability of early retirement for coupled women, but more educated spouses/partners are likely to lower the probability of early retirement for coupled men. Finally, the

[12] I have also tried including a set of dummy variables for spousal health only to find that they are statistically insignificant. Therefore, they are not included in the final model reported here.

country dummy variables are mostly statistically significant, indicating the presence of substantial institutional differences among these eleven countries.

5.2 Instrumental variable estimation

The negative effect of the number of living children on early retirement observed in Table 5 does not necessarily imply a causal interpretation because the number of living children could be endogenous. In an effort to examine the potential endogeneity of the number of living children, I have conducted instrumental variable (IV) probit estimation, using the set of dummy variables based on information on the number of siblings of the respondent. In any IV estimation, the validity of the instruments should be examined. By reporting the results of the first stage regressions in IV probit estimation of early retirement, Table 6 facilitates this examination. Here the dependent variable is the number of living children of the respondent. At the bottom of Table 6, one can see that the instrumental variables are correlated with the number of living children in all subsamples. They are mostly statistically significant and most of them have the expected signs: compared with the reference group of "4 or more living siblings," other groups have fewer children. Furthermore, the F-statistics for testing whether the instruments are weak show values greater than 10 in all four subsamples by sex and by couple status, providing evidence that the instruments are not weakly correlated with the number of living children (Stock, Wright, and Yogo 2002). All these results substantiate the validity of these instrumental variables.[13]

[13] The second condition for valid instruments is that they are uncorrelated with the error term in the early retirement equation. Because STATA does not support a test of overidentifying restrictions after maximum likelihood IV probit estimation with the cluster option—the estimation method used in this paper, I have carried out, as an alternative, a test of overidentifying restrictions after two-step IV probit estimation

Table 7 reports the marginal effects from IV probit estimation of early retirement by sex and by couple status, where these instrumental variables have been used. In the first row of Table 7, the marginal effects of the number of living children on early retirement are mostly positive, but none of them are statistically significant. These results seem to suggest that the probit estimates of the number of living children reported in Table 5 are biased due to endogeneity. However, the p-values of Wald test exogeneity of the instrumented variable, reported at the bottom of Table 7, indicate that the Wald test statistics are not statistically significant for none of the four subsamples. This result implies that one cannot reject the null hypothesis that the number of living children is not endogenous in the early retirement equation. It could be because the number of children is determined long before the decision of retirement. In any case, the probit estimates of the number of living children reported in Table 5 are unbiased and one may interpret them as evidence of causality.

5.3 Presence of young children

In Table 8, I additionally include the dummy variable for having children aged 25 or younger to examine whether the negative effects of the number of living children on early retirement found in Table 5 are due to the financial responsibility associated with having young children. Though not reported here, the same set of other control variables as those reported in Table 5 were included in this estimation.

The marginal effects reported in Table 8 exhibit an interesting contrast by gender. In columns (1) and (2) of Table 8, the marginal effects of the number of living children

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without the cluster option. In all four subsamples by sex and by couple status, the resulting Amemiya-Lee-Newey minimum chi-sq statistics have failed to reject the null hypothesis that the excluded instruments are uncorrelated with the error term and correctly excluded from the early retirement equation.

for men, regardless of couple status, are statistically insignificant, while the marginal effects of the dummy variable for a living child aged 25 or younger are negative and statistically significant. Particularly interesting is the result for single men. While the number of living children does not affect the probability of early retirement among single men in column (1) of Table (5), the marginal effect reported in column (1) of Table 8 points out that the presence of young children lowers the probability of early retirement for these men, on average, by 13 percentage points at the mean, holding other things constant. In the results for women reported in columns (3) and (4) of Table 8, however, there is little change in the marginal effect of the number of living children, whereas the marginal effect of the dummy variable for a living child aged 25 or younger is statistically insignificant.

Overall, the results reported in Table 8 are consistent with the interpretation that men with young children are less likely to retire early because they have to financially support their children (Holtmann et al. 1994). For women, it seems that the frequency of interruptions in employment due to childbearing and childrearing, measured by the number of children, lowers the probability of early retirement because it limits their pension opportunities.

5.4 Sensitivity analysis

The age and country dummy variables included in the results reported in Tables 5 and 8 conveniently capture birth-cohort fixed effects and institutional fixed effects, respectively. Yet, these dummy variables do not capture the changes in economic conditions and institutional settings that are likely to have affected birth cohorts in various countries differently over time. In order to control for these effects, I have additionally included the interaction terms between the age and country dummy variables—additional 300 dummy variables in total—in the probit estimation of early retirement.[14] Other than these additional interaction terms, the results reported in Table 9 have the same specification as those reported in Table 5, and those reported in Table 10 have the same specification as those reported in Table 8. For brevity, the marginal effects for other control variables included in the probit estimations are not reported in the tables.

Because some of the age and country interaction dummy variables perfectly predict the outcomes, a few hundred observations in each subsample have not been included in the new estimation. As a result, compared with those in Tables 5 and 8, the sample sizes are smaller for all four subsamples in Tables 9 and 10. Nonetheless, the key findings from Tables 5 and 8 do not change in Tables 9 and 10. In Table 9 the marginal effects of the number of living children have essentially the same magnitude as those reported in Table 5 and statistically significant at the 5 percent level for coupled men and at the 10 percent level for both subsamples of women. Even after additionally controlling for the interaction effects between birth-cohorts and country, an additional child still decreases the probability of early retirement, on average, by about 1.2-2.2 percentage points at the mean among all groups, except single men. In Table 10 the marginal effects of the dummy variable for the presence of children aged 25 or younger also show the same pattern by gender as those observed in Table 8: the presence of young children lowers the probability of early retirement for men but not for women, regardless of couple status.

[14] I am grateful to an anonymous referee for suggesting this.

6 Conclusions

Using micro data drawn from the SHARE, this paper has shown that having fewer children facilitates early retirement in many European countries. The instrumental variable estimation, utilizing the number of siblings of the respondent as instruments, indicates that this effect of the number of children on early retirement is not due to endogeneity in the cross-sectional analysis. Women with fewer children are more likely to take early retirement than women with more children because the latter have to work more years to make up for the loss of earnings and pension opportunities caused by having more children. Men with fewer children are more likely to take early retirement because they are less likely to be required to work more years to make financial contributions to their younger children in later life than men with more children.

Decreasing birth rates during recent decades have accelerated the aging of the population and the shrinking of the workforce across Europe. To mitigate these adverse consequences of low fertility on the economy, many European countries are in the process of increasing the eligibility age for social security benefits and trying to increase the labor-force participation rate of the elderly. The analysis presented in this paper clearly indicates that the effectiveness of such policy changes will be diminished because having fewer children reduces labor-force participation of the elderly and, as a result of decreasing fertility, those who will face retirement decisions in the coming years will have fewer children than before. In order to effectively increase labor-force participation of older workers, in addition to increasing the eligibility age for social security benefits, other institutional incentives that might promote early retirement of older workers with fewer children should be changed at the same time.

Due to the lack of panel data, the analysis in this paper is based on cross-sectional data and thus fails to utilize more detailed institutional and macroeconomic variables. When more waves of data are collected for the SHARE, incorporating all these variables in panel data analysis and possibly in duration analysis would certainly be a productive research agenda.

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Table 1 Normal and early entitlement ages for public old-age pensions

	Men				Women			
	1975 Normal	1995 Normal	2004 Normal	2004 Early	1975 Normal	1995 Normal	2004 Normal	2004 Early
Austria	65	65	65	61.5	60	60	60	56.5
Belgium	65	65	65	60	60	60	63	60
Denmark	67	67	65	60	67	67	65	60
France	65	60	60	-	65	60	60	-
Germany	65	65	65	60	65	65	65	60
Greece	62	62	65	60	57	57	60	55
Italy	60	62	65	-	55	57	60	-
Netherlands	65	65	65	-	65	65	65	-
Spain	65	65	65	-	65	65	65	-
Sweden	67	65	65	61	67	65	65	61
Switzerland	65	65	65	-	62	62	63	-

Source: Values for 1975 and 1995 are from Blöndal and Scarpetta (1999), Table III.1. Values for 2004 are from U.S. Social Security Administration (2004), Table 3.

Table 2 Distribution of retirement status by sex, in percent

	Men			Women		
	Early retiree	Normal retiree	Non-retiree	Early retiree	Normal retiree	Non-retiree
Austria	60.5	4.0	35.6	53.4	14.4	32.3
Belgium	57.8	6.0	36.2	56.0	3.8	40.2
Denmark	36.0	6.1	57.9	44.1	7.9	48.0
France	32.7	27.6	39.7	34.1	23.3	42.6
Germany	46.8	8.4	44.8	55.4	3.7	40.9
Greece	40.1	10.9	49.0	32.4	28.9	38.7
Italy	54.1	9.8	36.1	42.4	21.3	36.3
Netherlands	45.5	5.5	49.9	44.1	5.6	50.3
Spain	40.7	17.4	41.9	33.9	19.1	46.9
Sweden	32.6	12.8	54.6	38.6	12.9	48.5
Switzerland	20.3	12.8	66.9	24.2	13.8	62.0
Total	43.8	13.5	42.7	44.3	13.6	42.1

Note: Weighted results

Table 3 Comparison of the completed fertility for female birth cohorts 1930−1955 and the number of living children for the same cohorts of women in the SHARE

	(1) 1930	(2) 1935	(3) 1940	(4) 1945	(5) 1950	(6) 1955	(7) Average	(8) SHARE
Austria	2.32	2.45	2.21	1.96	1.87	1.77	2.10	1.91
Belgium	2.29	2.27	2.16	1.93	1.83	1.83	2.05	2.17
Denmark	2.40	2.35	2.21	2.06	1.90	1.84	2.13	2.25
France	2.63	2.57	2.41	2.22	2.11	2.13	2.35	2.28
Germany	2.18	2.16	1.97	1.80	1.72	1.67	1.92	1.91
Greece	-	-	2.10	1.98	2.03	2.01	2.03	1.87
Italy	2.28	2.28	2.14	2.07	1.89	1.80	2.08	2.01
Netherlands	2.67	2.49	2.22	2.00	1.89	1.87	2.19	2.35
Spain	2.65	2.63	2.55	2.43	2.15	1.92	2.39	2.49
Sweden	2.12	2.14	2.05	1.98	2.00	2.03	2.05	2.29
Switzerland	2.18	2.18	2.08	1.86	1.79	1.75	1.97	2.09
Total	2.37	2.35	2.20	2.03	1.92	1.86	2.11	2.15

Note: Values for columns (1) through (6) are taken from Council of Europe (2004), T3.7. Values for column (7) are the mean of the values for columns (1) through (6) for each country. Completed fertility is the average number of children born to a cohort of women up to the end of their childbearing age (defined as age 49). Values for column (8) are the weighted averages of the number of living children of the female respondents who were born between 1930 and 1955 in the SHARE.

Table 4 Descriptive statistics for the whole sample

Variable	Mean	Std. Dev.	Min	Max
Retired early	0.442	0.497	0	1
Number of living children	2.087	1.378	0	17
Child age 25 or less	0.236	0.425	0	1
Female	0.440	0.496	0	1
Living with spouse/partner	0.744	0.436	0	1
Age	62.93	8.36	50	80
Years of education:				
Less than 12 years	0.489	0.500	0	1
12 years	0.131	0.337	0	1
Between 12-16 years	0.250	0.433	0	1
16 or more years	0.130	0.337	0	1
Health status				
Excellent	0.121	0.326	0	1
Very good	0.228	0.420	0	1
Good	0.409	0.491	0	1
Fair	0.192	0.394	0	1
Poor	0.050	0.218	0	1
Health limits work	0.368	0.482	0	1
Tenure	24.29	13.34	0	70
Firm size 0-5	0.289	0.454	0	1
Firm size 6-15	0.166	0.373	0	1
Firm size 16-24	0.092	0.289	0	1
Firm size 25-299	0.275	0.446	0	1
Firm size 200-499	0.082	0.274	0	1
Firm size > 500	0.114	0.318	0	1
Public-sector employees	0.183	0.386	0	1
Private-sector employees	0.498	0.500	0	1
Civil servants	0.143	0.350	0	1
Self-employment	0.177	0.382	0	1
Austria	0.073	0.260	0	1
Belgium	0.129	0.335	0	1
Denmark	0.073	0.260	0	1
France	0.123	0.328	0	1
Germany	0.119	0.324	0	1
Greece	0.091	0.288	0	1
Italy	0.076	0.265	0	1
Netherlands	0.101	0.301	0	1
Spain	0.055	0.227	0	1
Sweden	0.126	0.331	0	1
Switzerland	0.035	0.184	0	1
No sibling	0.114	0.318	0	1
0 living sibling	0.055	0.228	0	1
1 living sibling	0.253	0.425	0	1
2 living siblings	0.215	0.411	0	1
3 living siblings	0.143	0.350	0	1
4 or more living siblings	0.220	0.414	0	1
Number of observations		15,334		

Note: Unweighted results.

Table 5 Marginal effects of the control variables on the probability of early retirement: Probit estimation

	(1)	(2)	(3)	(4)
	Men		Women	
	Single	Couple	Single	Couple
Number of living children	0.004	-0.012***	-0.019**	-0.014**
	(0.008)	(0.004)	(0.009)	(0.006)
Age 51	-0.067	0.237	0.144	0.390**
	(0.172)	(0.149)	(0.214)	(0.165)
Age 52	0.154	0.240	0.280	0.331**
	(0.158)	(0.160)	(0.184)	(0.166)
Age 53	-0.011	0.382***	0.318*	0.433***
	(0.198)	(0.109)	(0.178)	(0.109)
Age 54	0.157	0.262*	-0.010	0.419***
	(0.279)	(0.136)	(0.232)	(0.150)
Age 55	0.291*	0.467***	0.415***	0.573***
	(0.169)	(0.099)	(0.102)	(0.098)
Age 56	0.453***	0.520***	0.411***	0.566***
	(0.159)	(0.067)	(0.140)	(0.088)
Age 57	0.389**	0.552***	0.513***	0.589***
	(0.185)	(0.055)	(0.078)	(0.090)
Age 58	0.389**	0.590***	0.530***	0.597***
	(0.178)	(0.035)	(0.086)	(0.081)
Age 59	0.458***	0.609***	0.550***	0.651***
	(0.104)	(0.033)	(0.060)	(0.065)
Age 60	0.600***	0.633***	0.610***	0.684***
	(0.052)	(0.026)	(0.028)	(0.043)
Age 61	0.580***	0.643***	0.611***	0.689***
	(0.069)	(0.018)	(0.024)	(0.035)
Age 62	0.556***	0.650***	0.600***	0.688***
	(0.116)	(0.018)	(0.031)	(0.032)
Age 63	0.609***	0.643***	0.623***	0.702***
	(0.054)	(0.016)	(0.019)	(0.022)
Age 64	0.633***	0.649***	0.621***	0.702***
	(0.033)	(0.019)	(0.023)	(0.021)
Age 65	0.651***	0.657***	0.626***	0.702***
	(0.020)	(0.016)	(0.020)	(0.022)
Age 66	0.612***	0.653***	0.617***	0.699***
	(0.046)	(0.015)	(0.026)	(0.019)
Age 67	0.632***	0.650***	0.622***	0.691***
	(0.028)	(0.018)	(0.025)	(0.020)
Age 68	0.644***	0.646***	0.620***	0.689***
	(0.022)	(0.017)	(0.022)	(0.017)
Age 69	0.632***	0.645***	0.608***	0.678***
	(0.027)	(0.019)	(0.036)	(0.024)
Age 70	0.645***	0.650***	0.614***	0.672***
	(0.023)	(0.014)	(0.030)	(0.020)
Age 71	0.641***	0.637***	0.599***	0.684***
	(0.021)	(0.015)	(0.036)	(0.021)
Age 72	0.597***	0.632***	0.609***	0.672***
	(0.059)	(0.020)	(0.036)	(0.028)
Age 73	0.636***	0.628***	0.616***	0.668***
	(0.028)	(0.020)	(0.029)	(0.030)
Age 74	0.606***	0.632***	0.616***	0.670***

	(0.058)	(0.019)	(0.026)	(0.028)
Age 75	0.583***	0.622***	0.617***	0.663***
	(0.063)	(0.019)	(0.022)	(0.029)
Age 76	0.614***	0.614***	0.602***	0.631***
	(0.044)	(0.024)	(0.039)	(0.047)
Age 77	0.586***	0.611***	0.603***	0.665***
	(0.065)	(0.026)	(0.029)	(0.025)
Age 78	0.602***	0.620***	0.607***	0.636***
	(0.061)	(0.020)	(0.042)	(0.066)
Age 79	0.574***	0.599***	0.593***	0.654***
	(0.074)	(0.028)	(0.044)	(0.029)
Age 80	0.570***	0.611***	0.606***	0.660***
	(0.074)	(0.018)	(0.035)	(0.025)
Years of education				
12 years	-0.177***	-0.001	-0.001	0.031
	(0.045)	(0.022)	(0.047)	(0.035)
Between 12-16 years	-0.106***	-0.042*	-0.073***	-0.049
	(0.029)	(0.024)	(0.023)	(0.033)
16 or more years	-0.243***	-0.156***	-0.126***	-0.046
	(0.039)	(0.033)	(0.045)	(0.029)
Health status				
Excellent	-0.233***	-0.250***	-0.182***	-0.196***
	(0.055)	(0.060)	(0.070)	(0.044)
Very good	-0.221***	-0.207***	-0.150**	-0.141***
	(0.055)	(0.063)	(0.064)	(0.046)
Good	-0.199**	-0.189***	-0.100	-0.119***
	(0.085)	(0.059)	(0.065)	(0.045)
Fair	-0.202***	-0.108**	-0.072	-0.018
	(0.044)	(0.046)	(0.066)	(0.037)
Health limits work	0.124***	0.059**	0.055**	0.019
	(0.034)	(0.029)	(0.023)	(0.020)
Tenure	-0.002**	0.001	0.000	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Firm size 6-15	-0.005	0.039**	-0.008	0.018
	(0.049)	(0.020)	(0.025)	(0.019)
Firm size 16-24	0.046	0.007	-0.037	-0.023
	(0.068)	(0.033)	(0.036)	(0.036)
Firm size 25-199	0.091*	0.063**	-0.019	0.039
	(0.054)	(0.026)	(0.034)	(0.026)
Firm size 200-499	0.143**	0.136***	0.057	0.084*
	(0.069)	(0.037)	(0.050)	(0.044)
Firm size > 500	0.245***	0.178***	0.075**	0.059*
	(0.046)	(0.029)	(0.032)	(0.034)
Public-sector employees	0.167***	0.294***	0.162***	0.157***
	(0.062)	(0.027)	(0.057)	(0.057)
Private-sector employees	0.171***	0.265***	0.186***	0.172***
	(0.051)	(0.027)	(0.049)	(0.037)
Civil servants	0.276***	0.314***	0.138***	0.210***
	(0.050)	(0.039)	(0.037)	(0.059)
Spouse age		0.004		0.051***
		(0.007)		(0.017)
Spouse age squared		0.000		-0.000***
		(0.000)		(0.000)
Spouse: years of education				
12 years		-0.019*		0.040
		(0.011)		(0.031)

Between 12-16 years		-0.049**		0.004
		(0.020)		(0.017)
16 or more years		-0.032		0.017
		(0.028)		(0.031)
Belgium	-0.071***	-0.008	0.197***	0.074***
	(0.017)	(0.013)	(0.012)	(0.015)
Denmark	-0.270***	-0.189***	0.073***	-0.084***
	(0.012)	(0.014)	(0.015)	(0.021)
France	-0.396***	-0.291***	-0.213***	-0.223***
	(0.013)	(0.010)	(0.016)	(0.021)
Germany	-0.234***	-0.139***	0.109***	-0.062**
	(0.032)	(0.018)	(0.024)	(0.028)
Greece	-0.246***	-0.136***	-0.148***	-0.193***
	(0.012)	(0.013)	(0.018)	(0.020)
Italy	-0.152***	-0.087***	-0.118***	-0.040*
	(0.017)	(0.012)	(0.018)	(0.022)
Netherlands	-0.122***	-0.119***	0.045**	-0.015
	(0.023)	(0.013)	(0.020)	(0.020)
Spain	-0.280***	-0.251***	-0.189***	-0.198***
	(0.020)	(0.012)	(0.016)	(0.026)
Sweden	-0.325***	-0.275***	-0.073***	-0.198***
	(0.013)	(0.011)	(0.014)	(0.017)
Switzerland	-0.317***	-0.332***	-0.224***	-0.255***
	(0.011)	(0.007)	(0.008)	(0.012)
Log pseudolikelihood	-647.2	-3186	-1250	-1969
Pseudo R-squared	0.349	0.354	0.266	0.317
Proportion retired early	0.441	0.459	0.460	0.404
Number of observations	1,448	7,145	2,470	4,271

Note: Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6 First stage regression results in IV probit estimation of early retirement

Dependent variable: Number of living children

	(1)	(2)	(3)	(4)
	Men		Women	
	Single	Couple	Single	Couple
Age 51	0.465	0.077	-0.010	-0.059
	(0.300)	(0.110)	(0.220)	(0.090)
Age 52	-0.068	0.172*	0.152	-0.159
	(0.156)	(0.090)	(0.140)	(0.127)
Age 53	0.358***	0.017	0.203	-0.061
	(0.120)	(0.075)	(0.142)	(0.098)
Age 54	0.384*	-0.050	-0.119	-0.107
	(0.197)	(0.119)	(0.301)	(0.083)
Age 55	-0.029	-0.077	0.240	-0.060
	(0.185)	(0.073)	(0.184)	(0.112)
Age 56	0.326**	0.017	0.100	-0.149
	(0.154)	(0.084)	(0.178)	(0.112)
Age 57	0.140	0.157*	-0.023	-0.116
	(0.128)	(0.082)	(0.189)	(0.181)
Age 58	0.857***	0.199**	0.147	-0.200*
	(0.232)	(0.083)	(0.204)	(0.118)
Age 59	-0.201	0.092	0.251	-0.135
	(0.163)	(0.131)	(0.189)	(0.117)
Age 60	0.417***	-0.010	-0.000	-0.063
	(0.158)	(0.091)	(0.242)	(0.112)
Age 61	1.012***	0.083	0.164	-0.072
	(0.363)	(0.130)	(0.202)	(0.142)
Age 62	0.491*	0.321***	0.213	-0.303***
	(0.291)	(0.108)	(0.226)	(0.069)
Age 63	0.318	0.266**	0.370	-0.155
	(0.242)	(0.124)	(0.231)	(0.145)
Age 64	0.533**	0.317**	0.442**	-0.183
	(0.208)	(0.145)	(0.221)	(0.210)
Age 65	0.667**	0.366**	0.116	-0.261**
	(0.320)	(0.152)	(0.212)	(0.120)
Age 66	0.505***	0.317***	0.346*	-0.260*
	(0.187)	(0.107)	(0.185)	(0.147)
Age 67	0.609*	0.446***	0.396*	0.005
	(0.320)	(0.147)	(0.237)	(0.190)
Age 68	0.607**	0.416**	0.267	-0.362
	(0.256)	(0.171)	(0.211)	(0.246)
Age 69	0.906**	0.344***	0.476*	-0.268
	(0.406)	(0.120)	(0.250)	(0.210)
Age 70	0.262	0.508***	0.416**	-0.522**
	(0.203)	(0.177)	(0.184)	(0.221)
Age 71	0.800***	0.554***	0.211	-0.364**
	(0.216)	(0.213)	(0.209)	(0.175)
Age 72	0.749***	0.510***	0.624**	-0.199
	(0.175)	(0.186)	(0.279)	(0.229)
Age 73	1.111***	0.559***	0.745***	-0.292
	(0.285)	(0.189)	(0.236)	(0.280)
Age 74	0.734***	0.528**	0.576**	-0.823***
	(0.145)	(0.220)	(0.271)	(0.293)
Age 75	1.237***	0.605**	0.132	-0.507**

	(0.444)	(0.242)	(0.231)	(0.252)
Age 76	0.929***	0.718***	0.531**	-0.703***
	(0.247)	(0.182)	(0.262)	(0.245)
Age 77	0.981***	0.773***	0.460*	-0.383
	(0.344)	(0.214)	(0.261)	(0.338)
Age 78	0.741***	0.759***	0.410**	-0.858**
	(0.243)	(0.152)	(0.178)	(0.363)
Age 79	0.963***	0.498**	0.271	-0.621***
	(0.277)	(0.219)	(0.187)	(0.190)
Age 80	1.813***	0.766**	0.393	-0.654**
	(0.270)	(0.306)	(0.283)	(0.331)
Years of education				
12 years	0.055	0.069*	-0.292***	-0.028
	(0.146)	(0.040)	(0.080)	(0.095)
Between 12-16 years	0.026	-0.021	-0.274***	-0.064
	(0.095)	(0.061)	(0.071)	(0.046)
16 or more years	0.056	0.134	-0.641***	0.058
	(0.095)	(0.082)	(0.075)	(0.046)
Health status				
Excellent	0.042	0.071	0.152	-0.042
	(0.285)	(0.105)	(0.163)	(0.153)
Very good	-0.063	0.049	-0.008	0.007
	(0.281)	(0.086)	(0.116)	(0.129)
Good	-0.073	-0.016	-0.059	-0.007
	(0.254)	(0.073)	(0.128)	(0.124)
Fair	0.041	0.102	0.011	-0.022
	(0.248)	(0.074)	(0.115)	(0.090)
Health limits work	0.065	0.145***	0.131*	0.108***
	(0.077)	(0.018)	(0.078)	(0.032)
Tenure	-0.002	-0.000	-0.014***	-0.008***
	(0.004)	(0.001)	(0.003)	(0.003)
Firm size 6-15	0.088	-0.076*	0.012	-0.063
	(0.116)	(0.041)	(0.099)	(0.062)
Firm size 16-24	0.121	-0.084*	-0.177**	-0.080
	(0.160)	(0.045)	(0.069)	(0.072)
Firm size 25-199	0.335**	-0.151***	-0.105	-0.094
	(0.160)	(0.053)	(0.081)	(0.070)
Firm size 200-499	0.515**	-0.127	-0.219***	-0.110*
	(0.218)	(0.087)	(0.084)	(0.062)
Firm size > 500	0.143	-0.107	-0.256***	-0.231***
	(0.157)	(0.069)	(0.077)	(0.076)
Public-sector employees	-0.095	-0.074	-0.367**	0.014
	(0.133)	(0.081)	(0.179)	(0.059)
Private-sector employees	-0.103	-0.073	-0.515***	-0.187***
	(0.130)	(0.050)	(0.150)	(0.045)
Civil servants	-0.230*	-0.003	-0.400**	-0.103*
	(0.127)	(0.064)	(0.183)	(0.053)
Spouse age		0.028		-0.003
		(0.034)		(0.032)
Spouse age squared		-0.000		0.000
		(0.000)		(0.000)
Spouse: years of education				
12 years		0.011		-0.017
		(0.037)		(0.035)
Between 12-16 years		-0.005		0.054
		(0.043)		(0.046)

16 or more years		-0.027		0.096
		(0.054)		(0.084)
Belgium	0.192***	0.012	0.066*	0.142***
	(0.046)	(0.019)	(0.038)	(0.032)
Denmark	0.441***	0.179***	0.306***	0.233***
	(0.062)	(0.047)	(0.055)	(0.072)
France	0.195***	0.147***	0.125**	0.246***
	(0.070)	(0.021)	(0.055)	(0.043)
Germany	-0.277***	-0.178***	0.145***	-0.140*
	(0.065)	(0.053)	(0.040)	(0.076)
Greece	-0.363***	-0.228***	-0.185***	-0.127***
	(0.048)	(0.019)	(0.034)	(0.038)
Italy	-0.450***	-0.061**	-0.128***	-0.163***
	(0.071)	(0.030)	(0.049)	(0.048)
Netherlands	0.480***	0.091***	0.076	0.010
	(0.081)	(0.034)	(0.074)	(0.062)
Spain	-0.081	0.377***	0.013	0.526***
	(0.078)	(0.039)	(0.042)	(0.055)
Sweden	0.571***	0.343***	0.036	0.417***
	(0.060)	(0.034)	(0.050)	(0.048)
Switzerland	0.053	-0.013	0.164***	-0.010
	(0.072)	(0.035)	(0.030)	(0.058)
No sibling	-0.511***	-0.462***	-0.489***	-0.437***
	(0.111)	(0.069)	(0.166)	(0.113)
0 living sibling	-0.325**	-0.239***	-0.389***	-0.374***
	(0.156)	(0.057)	(0.151)	(0.083)
1 living sibling	-0.335**	-0.318***	-0.330**	-0.305***
	(0.149)	(0.055)	(0.133)	(0.064)
2 living siblings	-0.083	-0.207***	-0.071	-0.278***
	(0.147)	(0.048)	(0.141)	(0.054)
3 living siblings	0.119	-0.201***	-0.262*	-0.174***
	(0.123)	(0.051)	(0.134)	(0.066)
Spouse: no sibling		-0.522***		-0.341***
		(0.068)		(0.056)
Spouse: 0 living sibling		-0.442***		-0.071
		(0.044)		(0.061)
Spouse: 1 living sibling		-0.345***		-0.228***
		(0.062)		(0.052)
Spouse: 2 living siblings		-0.285***		-0.149***
		(0.045)		(0.046)
Spouse: 3 living siblings		-0.150**		-0.121***
		(0.062)		(0.044)
Constant	0.901***	2.129**	2.531***	2.179**
	(0.340)	(1.016)	(0.205)	(0.951)
F-statistic of instruments	21.4	36.1	10.6	25.1
Number of observations	1,448	7,145	2,470	4,271

Note: Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7 Marginal effects of the control variables on the probability of early retirement: IV probit estimation

	(1)	(2)	(3)	(4)
	Men		Women	
	Single	Couple	Single	Couple
Number of living children	0.036	0.026	-0.048	0.013
	(0.079)	(0.055)	(0.091)	(0.065)
Age 51	-0.084	0.233	0.143	0.390**
	(0.175)	(0.144)	(0.212)	(0.167)
Age 52	0.155	0.233	0.283	0.333**
	(0.159)	(0.156)	(0.185)	(0.163)
Age 53	-0.027	0.380***	0.322*	0.432***
	(0.198)	(0.108)	(0.177)	(0.113)
Age 54	0.142	0.262**	-0.012	0.420***
	(0.283)	(0.132)	(0.232)	(0.149)
Age 55	0.288*	0.468***	0.418***	0.572***
	(0.170)	(0.097)	(0.103)	(0.101)
Age 56	0.441**	0.518***	0.412***	0.566***
	(0.175)	(0.068)	(0.139)	(0.089)
Age 57	0.382**	0.548***	0.511***	0.588***
	(0.192)	(0.057)	(0.077)	(0.090)
Age 58	0.362*	0.585***	0.530***	0.598***
	(0.204)	(0.036)	(0.084)	(0.081)
Age 59	0.460***	0.606***	0.551***	0.651***
	(0.103)	(0.035)	(0.059)	(0.067)
Age 60	0.592***	0.632***	0.609***	0.683***
	(0.064)	(0.027)	(0.030)	(0.047)
Age 61	0.564***	0.641***	0.611***	0.688***
	(0.104)	(0.018)	(0.024)	(0.038)
Age 62	0.546***	0.647***	0.600***	0.688***
	(0.134)	(0.019)	(0.030)	(0.033)
Age 63	0.604***	0.641***	0.623***	0.701***
	(0.065)	(0.017)	(0.018)	(0.024)
Age 64	0.628***	0.647***	0.621***	0.701***
	(0.042)	(0.020)	(0.023)	(0.023)
Age 65	0.648***	0.655***	0.626***	0.702***
	(0.029)	(0.016)	(0.020)	(0.024)
Age 66	0.605***	0.652***	0.617***	0.699***
	(0.062)	(0.015)	(0.025)	(0.020)
Age 67	0.628***	0.647***	0.623***	0.690***
	(0.036)	(0.019)	(0.025)	(0.022)
Age 68	0.641***	0.644***	0.620***	0.689***
	(0.031)	(0.018)	(0.021)	(0.018)
Age 69	0.626***	0.643***	0.609***	0.678***
	(0.043)	(0.020)	(0.035)	(0.025)
Age 70	0.643***	0.647***	0.614***	0.673***
	(0.027)	(0.016)	(0.029)	(0.020)
Age 71	0.637***	0.635***	0.599***	0.684***
	(0.032)	(0.016)	(0.035)	(0.022)
Age 72	0.586***	0.629***	0.610***	0.672***
	(0.080)	(0.021)	(0.035)	(0.029)
Age 73	0.629***	0.625***	0.617***	0.668***
	(0.043)	(0.022)	(0.028)	(0.031)
Age 74	0.598***	0.629***	0.617***	0.672***

	(0.080)	(0.021)	(0.025)	(0.026)
Age 75	0.565***	0.619***	0.617***	0.663***
	(0.108)	(0.021)	(0.022)	(0.029)
Age 76	0.604***	0.608***	0.603***	0.635***
	(0.069)	(0.028)	(0.038)	(0.041)
Age 77	0.575***	0.606***	0.603***	0.666***
	(0.091)	(0.029)	(0.028)	(0.025)
Age 78	0.593***	0.617***	0.607***	0.641***
	(0.073)	(0.023)	(0.041)	(0.056)
Age 79	0.559***	0.594***	0.593***	0.655***
	(0.105)	(0.031)	(0.044)	(0.027)
Age 80	0.545***	0.607***	0.606***	0.661***
	(0.122)	(0.023)	(0.035)	(0.023)
Years of education				
12 years	-0.176***	-0.002	-0.011	0.033
	(0.045)	(0.023)	(0.057)	(0.034)
Between 12-16 years	-0.105***	-0.040	-0.081***	-0.046
	(0.030)	(0.026)	(0.027)	(0.032)
16 or more years	-0.241***	-0.158***	-0.144**	-0.045
	(0.038)	(0.033)	(0.072)	(0.029)
Health status				
Excellent	-0.233***	-0.251***	-0.178**	-0.194***
	(0.053)	(0.059)	(0.070)	(0.040)
Very good	-0.218***	-0.207***	-0.149**	-0.141***
	(0.053)	(0.063)	(0.064)	(0.045)
Good	-0.195**	-0.187***	-0.101	-0.118***
	(0.083)	(0.058)	(0.069)	(0.044)
Fair	-0.202***	-0.110**	-0.071	-0.017
	(0.043)	(0.045)	(0.065)	(0.037)
Health limits work	0.121***	0.053*	0.059***	0.017
	(0.034)	(0.029)	(0.020)	(0.020)
Tenure	-0.002**	0.001	0.000	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Firm size 6-15	-0.009	0.042**	-0.007	0.019
	(0.046)	(0.021)	(0.024)	(0.020)
Firm size 16-24	0.041	0.010	-0.042	-0.021
	(0.067)	(0.034)	(0.039)	(0.039)
Firm size 25-199	0.077	0.068***	-0.022	0.041*
	(0.050)	(0.026)	(0.037)	(0.024)
Firm size 200-499	0.123**	0.139***	0.049	0.086**
	(0.060)	(0.037)	(0.057)	(0.040)
Firm size > 500	0.238***	0.180***	0.067	0.065*
	(0.060)	(0.028)	(0.053)	(0.037)
Public-sector employees	0.170***	0.294***	0.150***	0.155***
	(0.062)	(0.027)	(0.056)	(0.057)
Private-sector employees	0.173***	0.266***	0.171***	0.177***
	(0.051)	(0.027)	(0.058)	(0.039)
Civil servants	0.282***	0.311***	0.126**	0.212***
	(0.047)	(0.036)	(0.053)	(0.061)
Spouse age		0.002		0.051***
		(0.007)		(0.017)
Spouse age squared		0.000		-0.000***
		(0.000)		(0.000)
Spouse: years of education				
12 years		-0.018		0.041
		(0.012)		(0.031)

Between 12-16 years		-0.046**		0.003
		(0.019)		(0.017)
16 or more years		-0.029		0.015
		(0.028)		(0.030)
Belgium	-0.080***	-0.013	0.200***	0.067**
	(0.029)	(0.013)	(0.014)	(0.029)
Denmark	-0.280***	-0.196***	0.083***	-0.091***
	(0.024)	(0.017)	(0.031)	(0.032)
France	-0.399***	-0.296***	-0.209***	-0.229***
	(0.014)	(0.010)	(0.029)	(0.031)
Germany	-0.227***	-0.132***	0.113***	-0.059***
	(0.038)	(0.019)	(0.027)	(0.022)
Greece	-0.238***	-0.130***	-0.151***	-0.192***
	(0.025)	(0.016)	(0.017)	(0.018)
Italy	-0.141***	-0.089***	-0.120***	-0.038**
	(0.037)	(0.012)	(0.018)	(0.019)
Netherlands	-0.139***	-0.129***	0.050	-0.021
	(0.048)	(0.016)	(0.032)	(0.030)
Spain	-0.280***	-0.262***	-0.186***	-0.209***
	(0.021)	(0.016)	(0.021)	(0.045)
Sweden	-0.335***	-0.284***	-0.070***	-0.207***
	(0.025)	(0.012)	(0.015)	(0.032)
Switzerland	-0.319***	-0.333***	-0.219***	-0.256***
	(0.010)	(0.007)	(0.023)	(0.013)
Log pseudolikelihood	-3267	-14933	-5492	-8891
P-value of Wald test of exogeneity	.6865	.4735	.7424	.6798
Number of observations	1,448	7,145	2,470	4,271

Note: Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8 Marginal effects on the probability of early retirement: Probit estimation with the young child dummy variable

	(1)	(2)	(3)	(4)
	Men		Women	
	Single	Couple	Single	Couple
Number of living children	0.012	-0.009	-0.019**	-0.013**
	(0.009)	(0.005)	(0.009)	(0.006)
Child age 25 or less	-0.129**	-0.052*	-0.005	-0.025
	(0.053)	(0.031)	(0.042)	(0.044)
Log pseudolikelihood	-644.4	-3184	-1250	-1968
Pseudo R-squared	0.351	0.354	0.266	0.317
Number of observations	1,448	7,145	2,470	4,271

Note: Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9 Marginal effects on the probability of early retirement: Probit estimation with the age and country interaction dummy variables

	(1)	(2)	(3)	(4)
	Men		Women	
	Single	Couple	Single	Couple
Number of living children	-0.009	-0.013***	-0.022*	-0.012**
	(0.016)	(0.003)	(0.013)	(0.006)
Log pseudolikelihood	-472.8	-2955	-1041	-1681
Pseudo R-squared	0.339	0.366	0.264	0.355
Proportion retired early	0.465	0.486	0.497	0.428
Observations	1,036	6,733	2,041	3,820

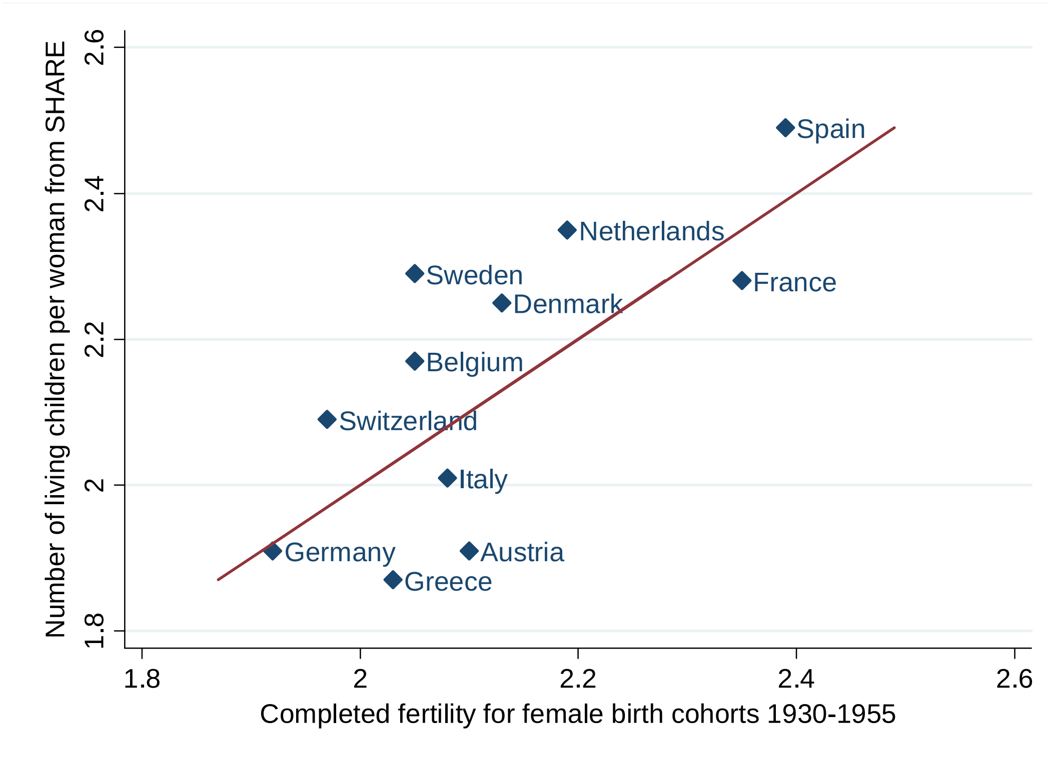
Note: Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10 Marginal effects on the probability of early retirement: Probit estimation with the young child dummy variable and the age and country interaction dummy variables

	(1)	(2)	(3)	(4)
	Men		Women	
	Single	Couple	Single	Couple
Number of living children	-0.001	-0.009*	-0.022*	-0.009*
	(0.017)	(0.005)	(0.012)	(0.005)
Child age 25 or less	-0.142*	-0.067**	0.019	-0.058
	(0.069)	(0.030)	(0.064)	(0.044)
Log pseudolikelihood	-471.1	-2951	-1041	-1679
Pseudo R-squared	0.342	0.367	0.264	0.356
Observations	1,036	6,733	2,041	3,820

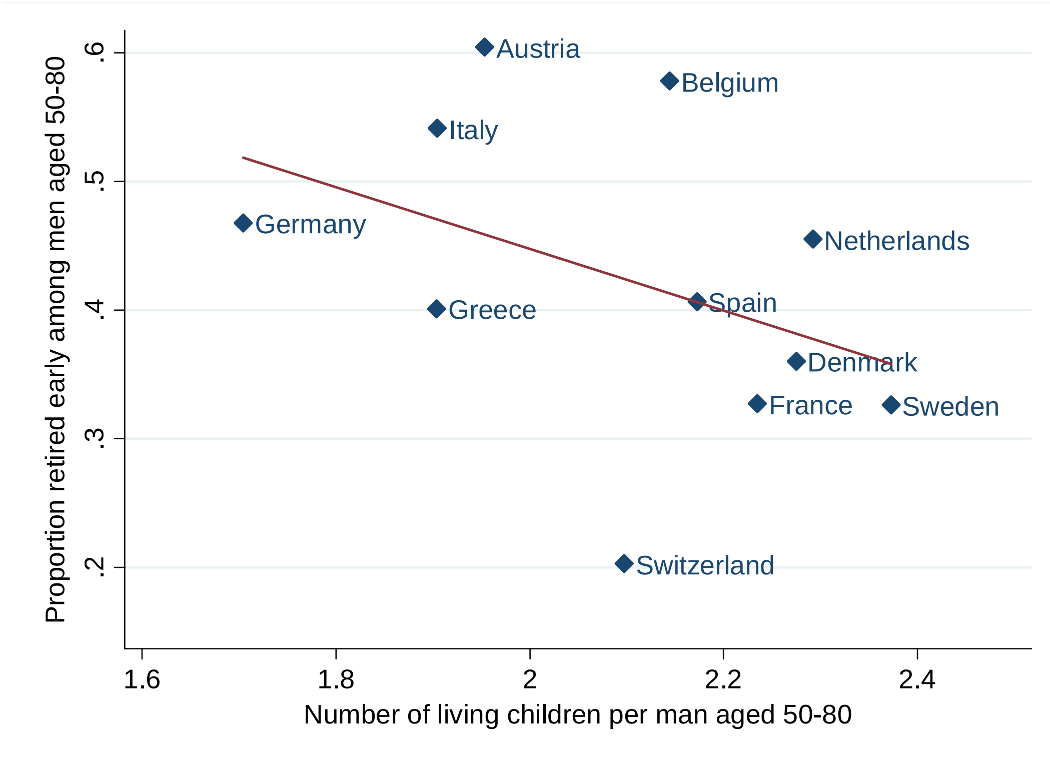
Note: Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Fig. 1 Scatter plot of the completed fertility for female birth cohorts 1930−1955 and the number of living children for the same cohorts of women in the SHARE by country



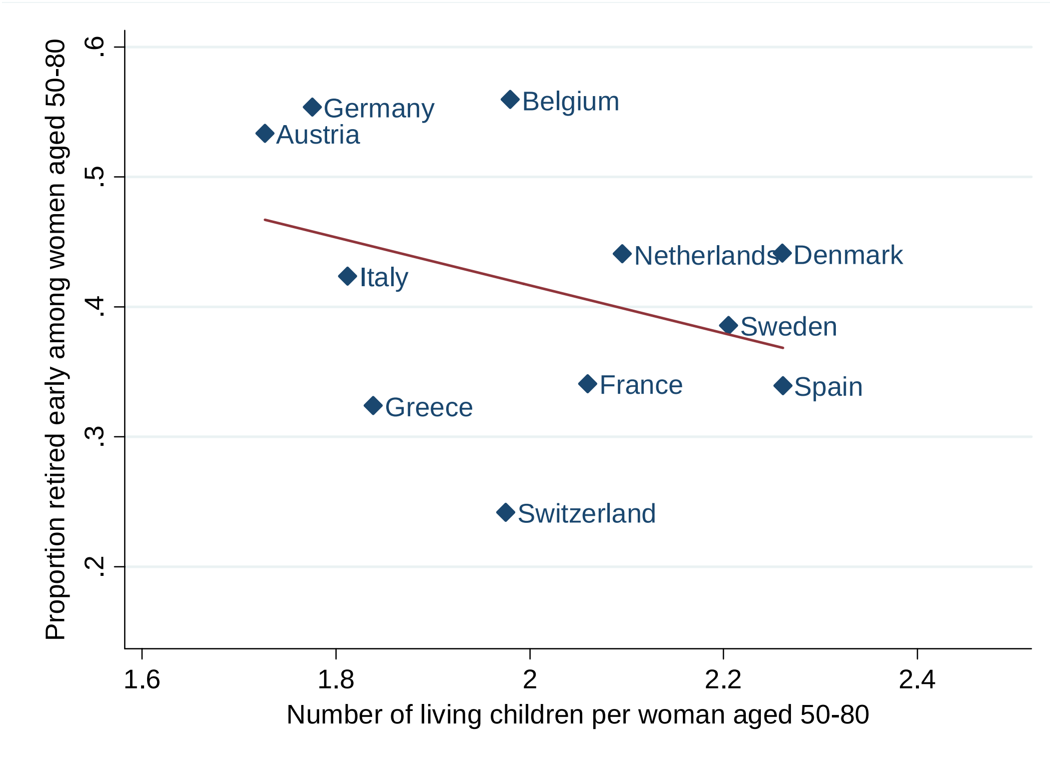
Source: Columns (7) and (8) of Table 3.
Note: The line is a 45-degree line. The correlation coefficient is 0.7295 and statistically significant at the 5 percent level.

Fig. 2 Scatter plot of the number of living children per man aged 50−80 and the proportion retired early among men aged 50−80 by country



Note: Weighted results. The line is a fitted regression line. The correlation coefficient is -0.4072 and statistically insignificant at the 10 percent level.

Fig. 3 Scatter plot of the number of living children per woman aged 50−80 and the proportion retired early among women aged 50−80 by country



Note: Weighted results. The line is a fitted regression line. The correlation coefficient is -0.3499 and statistically insignificant at the 10 percent level.