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Abstract

This paper investigates the determinants of older workers' early retirement behavior in Denmark. Instead of considering dual retirement we recognize the importance of the spouse in the early retirement decision by assessing the effect of a rich number of spousal variables. Given the grouped nature of the data we set up a semi-parametric single risk grouped duration proportional hazard model accounting for right censoring and allows for time-varying covariates, a nonparametric baseline and unobserved heterogeneity. We find that spousal characteristics do influence the retirement decision and significant gender asymmetries also exist in the effects of spouse's characteristics.

JEL Classification: J26, C41.

Keywords: Early Retirement, Gender Asymmetries, Spousal Effects, Duration analysis, Grouped data, Unobserved heterogeneity.

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1 Introduction

Aging populations, progressive retirement behavior, increased flexibility with respect to retirement routes, and declining labor force participation among older workers over the last decades have increased the pressure on government expenses and is causing financial distress to the public pension system. This pattern is not unique to the Danish labor market as other advanced European countries such as France, the Netherlands, Italy, Germany, Britain and Sweden have undergone similar developments, see Bröndal & Scarpetta (1998), Ebbinghaus (2006), Kohli et al. (1991), and O'Rand & Henretta (1999). Thus understanding how individuals choose to time their retirement from the labor force and which factors influence this decision will be critical in understanding how the elderly workforce will evolve in the future and which policies to adopt to deal with the consequences of current retirement programs.

While the early literature on retirement focused primarily on men, relatively few studies examined both men and women in the same framework. However, women's labor market participation rates have continually increased making it possible to analyze women separately and jointly in the retirement question. Research has indeed shown that gender differences exist both in the labor market and in relation to early retirement, see Even & Macpherson (1990,1994), Altonji & Blank (1999), Talaga & Behr (1995), and Dahl et al. (2003). The latter two find clear evidence that the retirement decisions differed between men and women. Studies of early retirement in the Nordic countries find mixed results. Lilja (1996) using Finnish data finds that the propensity for early exits does not differ significantly between males and females whereas Pedersen and Smith (1996) using Danish data and Dahl et. al. (2003) using Norwegian data contrasts this result showing that there are significant gender differences in the decision to retire early. Parallel to this, a growing literature has shifted focus to examine the joint retirement behavior of married couples. This research has indeed demonstrated that married couples exhibit different retirement patterns compared to singles as they tend to time their retirement together. This pattern is found in both US and European data, see Hurd (1990), Blau (1998), Blau and Riphahn (1999), Gustman and Steinmeier (2000), Johnson and Favreault (2001), Coile (2004), and An et al. (2004). These findings clear shows why it is important to consider the role spouse in the early retirement decision.

This paper considers another important issue in relation to early retirement which has not received much attention in the literature: Do the husbands' characteristics affect the retirement behavior of their wives differently than the wives' characteristics affect their husbands'? Among the limited findings on the effect of spousal variables the conclusions are ambiguous. Using Canadian survey data Schellenberg (1994) list four spouse related areas which are likely to influence the individual in the retirement decision; the spouse's health, the timing of the spouse's retirement, the spouse's income, and pressure from the spouse to retire. He finds that men compared to women are less influenced by their spouses' behavior. However, this result is very sensitive to whether the individual was about to retire or had already retired. Jia (2004) using Norwegian register data also finds that women have stronger responses to their spouses' characteristics' than men. On the contrary, Gustman and Steinmeier (2000) using US survey data find evidence that the husband's retirement decision is strongly influenced by the wife's, but wife's decision is not strongly influenced by the husband's. Thus while men in Schellenberg (1994) Canadian survey might report that their wife's decision to retire was or will be

an insignificant factor in their own decision, the Gustman and Steinmeier (2000) U.S. data, based on actual behavior rather than survey responses, suggests they are significantly influenced by their wives' situation. Coile (2004) confirms Gustman and Steinmeier (2000) findings using different US survey data.

We consider the actual early retirement decision of older workers in the time period 1985-2001 by estimating hazard models of duration until retirement. Diamond and Hausman (1984) were the first to estimate a reduced-form hazard model specification for retirement. They argued that unexpected events can seriously interrupt the individual's retirement plan and thus allow for uncertainty as part of the basic decision process, see also Hausman and Wise (1985) for a relevant contribution to this method. The approach is designed to model the probability of making a transition out of work conditional on survival in the current state as employed. Besides incorporating pure economic variables such as age, wage, pension benefits it also designed to capture effects on retirement from non-pecuniary factors such as health, family, employment status, and eligibility criteria for different retirement schemes. Implementation of the model is not perfectly forward looking, but the approach allows for updates of information as the individual ages. Furthermore, it allows for robust and easily replicable estimation of own and cross-effects of the variables of interests in a tractable and parsimonious framework.

There are of course alternatives, but they are more computationally burdensome and not as flexible and robust. One alternative approach is to model the dual retirement problem using a bivariate duration approach, see An et. al. (2004), with nonparametric baselines (as we do in the present paper). However, this approach would not allow the up 80 explanatory variables that we investigate here. Another and even more computationally demanding approach is the structural retirement model suggested by Rust (1989) or the dynamic programming approach suggested by Stock and Wise (1990) and Lumsdaine, Stock and Wise (1990) and later extended by Rust and Phelan (1997). The main advantages of dynamic programming models are the ability to measure the effect of changes in uncertain future economic and social conditions as the models provide a possibility for intertemporal evaluation of opportunities. However, they are complex in nature and lacks nice analytic features. Again, the empirical estimation is not an easy task especially when one uses longitudinal data regarding issues with censoring, time-varying covariates and unobserved heterogeneity. For these reasons we choose the reduced-form hazard approach.

Given the grouped nature of the data we set up a semi-parametric single risk grouped duration proportional hazard model accounting for right censoring and allowing for time-varying covariates and unobserved heterogeneity. The grouped data approach enable us to set up a probability model of time to retirement that summarizes the information on staying in the initial state (employment) or exiting (retirement) in each time interval in a sequence of binary outcomes, see Lancaster (1979), Nickell (1979), Kalbfleisch and Prentice(1973, 1980), Heckman and Singer (1984a,b), Kiefer (1988,1990), Lancaster (1990), and Han and Hausman (1990). The analysis is based on 9,428 workers who are exactly 50 years old in 1985. These individuals are followed until they retire or the end of the sample period in 2001.

We perform separate gender estimation in order to account for gender asymmetries and assess whether exit probabilities may differ due to differences between men and women's background characteristics. Instead of considering dual retirement we recognize the importance of the spouse in the early retirement decision by

assessing the effect of a rich number of spousal variables such as labor market status, health, level of education, age, occupation and sector variables, income, wealth and pension savings. We perform estimation for both singles and married together to examine how the individual early retirement decision is affected by own characteristics as well as married couples separately to examine spousal effects. This rich set of spousal variables is very unique compared to previous studies such as Schellenberg (1994) and Gustman and Steinmeier (2000) which only used a limited number of variables. Furthermore by using yearly register data for an entire population over 17 consecutive years we avoid data issues with small sample sizes, unbalanced panels, measurement errors, and self-report bias related spousal influence faced with, when using survey data.

The rest of this paper is laid out as follows. Section 2 describes the institutional settings and section 3 presents the data. In Section 4 we present the econometric methodology and discuss the empirical results. In section 5 we introduce unobserved heterogeneity and discuss the results. Section 6 concludes.

2 Institutional Settings

The structure of the Danish pension system is composed of tax-financed programs, statutory occupational schemes, voluntary labor market pension schemes and voluntary private pension savings. In this paper we only consider early exit routes for older workers thus disregarding old age pension. Below we describe the exit routes available to the individual, which are disability pay, civil service pension, early retirement pay (Post Employment Wage, PEW), transition pay, unemployment insurance benefits, and social assistance. Regarding the latter two, as pointed out by Heyma (2001), it is not uncommon for older workers to use unemployment as a retirement pathway, even though it is not always voluntary. It is important to note that we only consider the individual as retired early if they enter one of the schemes and do not re-enter the labor market. Furthermore, labor market pension schemes and private pension schemes are also described below but only considered a supplement to the early retirement schemes rather than an independent route.

- Disability benefit is a tax-financed program assigned to individuals between the ages of 18 to 67 who are permanently unable to work and do not receive any other type of pension. It requires specific medical criteria to be met, assessed by a doctor, and conditioned on that all possibilities to improve the applicant's labor market qualifications concerning rehabilitation, treatment, active social policy, etc. have been made. The amount recieved depends on which of the four possible types of disability pay is granted. Ordinary disability pay is granted to individuals between 60 and 66 of age. It can both be health, social and financial contingent. Increased ordinary disability pay is awarded to individuals between the ages of 18 to 59. The benefits eligible criteria are the same as in ordinary early retirement pay but an extra supplement is added. Middle disability pay is awarded to individuals between 18 and 59 years with occupation skills reduced by more than 2/3. The age group 60-66 years old can also be entitled, but only if an insignificant part of the occupational skill is intact. The amount is the same as ordinary disability pay plus a disablement amount. Highest disability pay is awarded to individuals between 18 and 59 years, whose occupation skills are insignificant. The amount is middle disability pay plus an occupation incompetence amount.

- Civil service pension is a labor market pension scheme for civil servants in government service. It is a statutory financed through a PAYG system. As a general rule this program is available from age 60 to age 70, however other rules may apply if the civil servant was injured at work or suffered severe health problems. The size of pension is based on the salary on retirement and the length of the civil servant's employment period. The right to civil service pension starts after ten years of employment as a civil servant and discharge has been caused by age or health. In total a maximum of 37 years can be saved, which will entitle the pensioner to the highest amount of benefits.

- Early retirement pay (PEW) is a voluntary labor market pension schemes that was introduced in 1979 as a labor market policy instrument. It offered workers between the age 60 to 66 the possibility to retire early from the labor market and still maintain a reasonable income. Early retirement pay is not awarded on the basis on health conditions, but depends on the degree of labor market participation, type of memebership of an approved unemployment insurance fund and conditional on regular contributions for 10 to 25 years (depending on year of retirement). Thus, early retirement pay shares similarities with private pension schemes in a number of countries, including the U.S.. Benefits are tied to previous wages, and employers also contribute to this retirement scheme. It is financially attractive, but unavailable once the disability route has been selected. Fully insured will receive 100 percent of the Unemployment Insurance benefit rate for the first two and a half years and afterward a reduced 82%-rate for the rest of the period. By postponing the early retirement until age 63 (from 1992) the member will receive the maximum rate the whole period. Annuity payments from labor market pension schemes will induce a reduction in the early retirement pay by 60 percent, if paid out. For capital pension no reduction is made.

- Transition pay was a tax-financed temporary scheme in place between 1992 and 1996. It was open for long term unemployed (12 of last 15 months) in 1992-1996 for 55-59 years olds and from 1994-1996 for all 50-59 years olds conditional on UI-membership. Thus the government ooffered unemployed to leave the labor force for good and in return get 82% of the highest UI-benefits.

- Unemployment Insurance benefits is a voluntary labor market scheme. Generally, UI benefits can only be received for a maximum of four years, and is then replaced by social welfare. However, during our sample period special rules applied for the age group 55-59, if such an individual was entitled to Post Employment Wage. Thus a member can actually receive benefits for a period of nine years, allowing a smooth transfer to PEW through unemployment, implicitly encouraged by the system.

- Social Assistance (welfare) is a tax-financed program and can be received by non-insured workers.It is controlled by the municipalities and the size of SA-benefits is approxamently 3/4 of the maximum UI-benefits.

- Labor market pension schemes and private pension schemes are considered a supplement to one of the early retirement schemes described above. They can either be in the form of capital or annuity. Annuity pension can either be discontinuous ending after a pre-specified number of years with 10 being the minimum or continuous thereby securing the individual an lifelong income stream independently of how long this

person lives. Depending on the contract, no payments will be made to relatives in the event of death or payments will continue to relatives if the insured person dies. Capital pension is paid as a lump sum from the age of 60 years at the earliest and in the event of death lump sum will be paid out to a pre-specified person (often the spouse). The majority of labor market schemes are annuity based. In this paper we do not consider it as an independent early retirement route since most individuals only have made limited contributions over the entire sample period. Also recall that the individual will be punished financially for cashing out annuity pension schemes when entering the post employment program.

3 Data

In the analysis of early retirement behavior we use register data drawn from the Integrated Database for Labor Market Research, the Income and Tax register, and the Social Statistics all managed by Statistics Denmark thus containing no survey element. The sample is drawn from the full Danish population and contains annual observations with measurement in November each year.

We randomly sample individuals that are active in the labor market at age 50 in 1985 and for each subsequent year we observe a new stream of data until the end of the sample period in 2001. This ensures that we are able to identify individual transitions between the two labor market states retired and non-retired on a yearly basis. An individual is categorized as retired from the labor market when the individual enters an early retirement scheme. The retirement must take place on the basis on labor market participation earlier on in life, where participation is defined as employment or unemployment. We therefore exclude individuals who are outside the labor market the first time we observe them.

The duration variable takes the value one in the base year. We then follow the individual until he or she retires or reaches the age of 66 years in 2001 and thus no longer at risk of retiring early. That implies a maximum duration of 17 years. This leads to one single spell describing the number of years the individual was actively participating on the labor market. E.g. a person could be employed, unemployed, employed and then retire and the total spell will be the sum of years spent in the three first states. Thus, the duration is defined as

$$Duration = Age - 49$$

Right censoring occurs at age 67 or in the event of death. This feature is incorporated in the likelihood function. By definition, spells start at age 50, so there is no left censoring.

The decision to observe one single cohort aged 50 in 1985 is motivated by the ability to follow the individual's labor market history before entering early retirement as well as ensuring that we can observe the individual until old age pension become available in 2001 therefore no longer at risk of entering early retirement. We note that assessing one single cohort implies that we do not account for any business cycle effects which might influence the decision to retire early. However, we are not able to perform robustness check for earlier or later cohorts as we are currently restricted by data availability. By examining the labor force participation rates for ages just prior to 50 as well as rates for the age group 45-54 for males and females separately we see from figure 1 that they remain relatively stable after 1985 for both women at around 80-85 % and men at around 90-95%. This

should help us in convincing that this cohort is representative for a 50 year old individual in the beginning of the 1980s.

Figure 1

Furthermore, since we randomly sample individuals that are active in the labor market at age 50, we have a stock sample. Starting at age 50 and conditioning on labor market participation at this age implies that our results are not representative for the full population. Following Salant (1977) and Ridder (1982), the resulting stock sampling bias may be mitigated by conditioning on the elapsed duration (period of participation) until age 50, or other explanatory variables capturing the difference between individuals with high and low participation rate. In our case, we do not have data on elapsed duration before age 50, but in the empirical analysis we condition instead on wealth, since this includes pension savings and should correlate with past participation. Conditioning on wealth should suffice for selection correction, for several reasons. Firstly, participation at age 50 is high in Denmark (80 % for women and 92% for men in 1985). Secondly, the smaller group that tends to enter non-participation before 50 is less interesting as we want avoid the part of early retirement that is associated with a limited job career and loose labor market attachment. We focus on individuals that actually retire from the labor market after an active career and individuals that retired in the age interval 18-49 is less interesting from point of view of policy reforms intended to keep older workers longer on the labor market. Finally, there is no point considering an alternative flow sampling procedure adding participating individuals who turn 50 in the subsequent years, since this would not alter representativeness.

Due to the annual grouping of the data we only observe that an exit to retirement has occurred sometime within a given year. Therefore in order to avoid that the value of a given characteristic is influenced by the retirement event we use explanatory variables for time $t-1$ to explain the retirement hazard at time t. The final number individuals observed in 1985 is therefore $9,428$ which amounts to $99,034$ observations distributed over the 17 years. In table 1 we see how the different durations are distributed over the sample period.

Table 1

The first column give us the total number of observed spells for all individuals in the sample and the second the number of observed exits to an early retirement program. The difference between the two represents exits due to deaths. The distribution of exit between the different durations is well represented. When we conduct the semi-parametric analysis the first two durations is summarized in order to make the distribution of durations more stable and the last duration length is excluded. From table 1 it becomes clear that the institutional settings strongly influence the length of duration. For instance there is a clear peak at duration 10 corresponding to age 60 which is the age from which early retirement pay becomes available.

Table 2 contains summary statistics of the variables used in the analysis. We report the mean and the standard errors of the explanatory variables over all person years as well as women and men separately. All variables are allowed to vary during the labor market spell and normalized to the $[0,1]$ interval for estimation purpose.

Table 2

The geographical variable city is an indicator variable taking the value one for residence inside the Copenhagen metropolitan area. The variable married takes the value one if the individual has an identified partner. Being married therefore includes individuals that are married or cohabitating. Male is a dummy variable for gender. In our sample, 80% are married or cohabiting. There are more males (57%) than females in the sample, due to conditioning on participation, and thus a slight overweight of married men.

The extent of the labor market attachment is important due to the different rules for the full-time and part-time employed. We construct a dummy variable taking the value one if the individual is working full-time and zero otherwise. Two thirds of the sample consists of full-time workers, but note the severe gender differences; 75% of the males in the sample work full-time whereas only 54% of women are employed full-time. The yearly unemployment rate is based on the number of hours unemployed relative to the number of possible hours worked. On a yearly basis it can indicate one long unemployment spell or several periods of unemployment. The rate is 6% on average, but varies considerably across the sample, with a standard deviation of 19%. The variable experience defines the individual's work experience since 1980. Since durations are measured starting in 1985, we always have a least a five year interval for measurement of the experience variable. A full-time employee can achieve a maximum of 1.00 over the 22 years from 1980 to 2001, and a part-time employee .75. We see that men have slightly more experience than women. Prevalence of poor health, expected to rise with age, will be caputered by the indicator variable sickness pay. It is constructed on the basis of received sickness benefit and takes the value one if the individual has received this type of benefit during the year.[1] Being a member of an UI-fund is relevant in relation to the eligibility criteria for some of the early retirement schemes and takes the value one if such a membership exists. More women than men are members of at UI-fund. Finally, availability of health insurance is normally a crucial factor in a couple's ability to retire jointly, however in light of the Danish welfare system this becomes less relevant.

Education is divided into five categorizes: Basic, Vocational, Short, Medium, and Long and is defined on basis on the individual's highest completed education level. Basic refers to primary or high school only. Short, Medium, and Long are all higher educations beyond the high school level. Long includes all university degrees at the Bachelor level or higher, as well as engineers and architects with 5-year or longer programs. Short and Medium refer to non-university degrees, with Short including less academic programs than Medium, and the latter typically requiring about 4 years after high school. Examples of educations under Short include real estate broker, actor, correspondent, technician with some training beyond vocational, laboratory worker, etc. Medium includes school teacher, journalist, librarian, accountant, nurse, midwife, social worker, some engineering, etc. Since we look at older cohorts, only 4% have long higher education in our sample, which mainly consists of men. Furthermore, nearly half the sample has only basic education, while about one third has vocational training. Women are less educated than men as 55% have basic education compared to 42% of men and 30% have vocational traning compared to 40% for men.

[1] The first two days of illness are covered by the employer, and less than 1% of the sample actually experience longer sickness spells and receive sickness pay, but the variable is nevertheless strongly significant in several of our specifications below.

The age variable has been divided into four age groups: below 55 years, between 55-59 years, between 60-61 years and 62-66 years. Women dominate the younger ages whereas men dominate the older age groups. The age difference between married or cohabitating individuals is also likely to affect the joined retirement decision and has been categorized in the following five groups: Same age, Wife 1-4 years older, Wife more than 4 years older, Husband 1-4 years older, and Husband more than 4 years older. Most often the husband is one to four years older, however when we look at men and women seperately we see that women still actively participating at the labor market mostly have spouses younger than themselves.

Job characteristics are described through occupational indicators: Self-employed, Assisting spouse, Salaried worker at high, medium, and, low level, and Unskilled. These are broad categories with 10-25% in each, except only 3% in Assisting spouse. Among Salaried workers, the high level includes directors, managers, etc., medium level is other office personnel, and low level is skilled blue collar workers. It's mainly men who are self-employed and they dominate the two categories high and low level salaried workers. Women are strongly represented in the medium level salaried workers category and as unskilled and assisting spouses. The sector specific variables are given by Agriculture/fishery, Manufacturing, Construction, Trade, Service, Restaurant/hotel, Transportation, Public and Unknown. The last two variables represent the biggest part in this group. Men are stronger represented in all of the categories except the public sector, which is dominated by women.

There are three financial indicators, all deflated to 2000 levels and measured in logarithms.[2] Own income is the person's own income.[3] Next, we have information about family income defined by the income of the entire family after tax, and family net wealth. Early retirement has large consequences for an individual and his family's economic situation now and in the future and therefore highly relevant for the decision to retire. The latter two are based on calculations from the IRS. For both own income and wealth men have a higher mean.

Finally, we have information about contributions to both labor market pension schemes and private pension schemes. This is a new contribution to the literature as no one to our knowledge have considered the effect of these schemes on early retirement previously. These types of schemes are considered a supplement to one of the early retirement schemes and not an independent early retirement route as the main part of the individuals only have made a limited contribution over the entire sample period. The variables show how much the individual has contributed to the different schemes each year making it a good indicator for how much the individual has put aside to supplement the public retirement schemes. Each type of scheme is divided into three categories indicating how much the individual has saved within a given year: no savings, savings between 1-5000dkk, and above 5000dkk. This grouping is constructed such that we can use the same categorizes for all the different schemes and still keep a reasonable amount of observations within each group. Around 95% of the individuals in our sample have made no contributions within a given year to a labor market pension schemes independently of which of the two types we consider. Very few have made medium contributions, but for high contributions its around 4% for labor market capital pension and 5% for labor market annuity pension. These figures are mainly

[2] In case of zero or negative values, the logarithm is set equal to zero. Various alternative truncation and transformation schemes made little difference to the results.

[3] As an alternative, the hourly wage has also been considered. Due to a relatively large number of missing wage observations, own income is preferred.

driven by the males in the sample. For private schemes the picture looks slightly better since 'only' 70% have no private capital pension and 75% have no private annuity pension. The medium and high contributions to both capital and annuity is around 10–25%, but again we see that men are better represented in these categories.

The summary statistics for spouse variables are also presented in table 2 with mean and standard errors. Note that this is only valid for the part of the sample that is either married or cohabitating amounting to 79,645 individuals. The spouse variables follow a similar pattern for men and women as above however there are differences in the levels. For instance, 56% of women's spouses work full time whereas only 43% of men's spouses work full time. Again this indicates that more men than women work in full-time positions however the full-time employment rate is not as high as for non-spouse individuals above. This is due to the sampling framwork as we conditioned participation on employment or unemployment. This is not the case for the spouses as they also include retired individuals as well as individuals outside the labor force. This also explain why experience and membership of UI-fund is lower and individuals on sickness pay is much higher. Furtermore, we have include a new dummy variable taking the value one if the spouse have already retired.

For the education variables we see the same pattern as above. The age variables are slightly different as they cover a much broader interval. It has been divided into the following groups; between 22-49 years, between 50-54 years, between 55-59 years, between 60-61 years, between 62-64 years, and above 64 years. As expected we see that women tend to marry older men, whereas men tend to marry younger women. For most of the cases the occupation, sector and financial indicators have lower levels which again can be explained by the broader definition of the individuals included as spouses. Finally, around 96-97% of the spouses have no labor market pension savings and above 75% have no saving in private pension.

4 Semi-parametric Estimation - A Single Risk Approach

The econometric analysis will be conducted within the single risk grouped duration framework as we lump all early retirement states together. The reason why the competing risk framework was neglected in this analysis was first of all to get an initial understanding of the spousal effects within the single risk framework. Secondly, convergence issues within in the competing risk model was observed when allowing for 80 explanatory variables in each state. However, the author believes it is highly relevant and the empirical results in Christensen and Kallestrup-Lamb (2010) studying the effect of health on early retirement confirm the importance of the competing risk framework allowing for multiple retirement states.

4.1 Econometric Specifications

The variable of interest is the duration until entering an early retirement program defined by T and assumed to be a non-negative random variable. The distribution of T is characterized by the conditional hazard rate out of employment, given time-varying regressors x_t. It approximates the probability that an individual will leave the state as employed to early retirement in the interval $[t, t + dt)$, given that he or she is employed at time t;

$$h\left(t|x_t\right) = \lim_{dt \to 0} \frac{P\left(t \leq T < t + dt | T \geq t, x_t\right)}{dt}, \tag{1}$$

assuming the limit exists. The hazard function is specified as a proportional hazard as in Cox (1972). We assume that the hazard is the product of a baseline hazard, $\lambda\left(t\right)$, depending only on time, and a function specifying the effect of the explanatory variables. The standard form of the latter is the exponential in $x_t'\beta$, where β are the regression coefficients of interest, yielding

$$h\left(t|x_t\right) = \lambda\left(t\right)\exp(x_t'\beta). \tag{2}$$

We allow for time-varying covariates x_t, so the hazard may vary over time due to changes in both factors in (2). The proportional hazard assumption that the baseline hazard is common to all individuals might be violated as the duration dependence will depend on the eligibility criteria to the different early retirement schemes. For early retirement pay, transition pay and early retirement pay it is membership of an UI-fund, for disability it is certain health criteria and for civil service pension it is occupational specific. This is important to keep in mind when interpreting the results.

Choosing the proper shape of the baseline hazard has a strong bearing on the inference that can be drawn regarding the process under analysis. Accordingly, the shape of the hazard must be specified with caution, see Box-Steffensmeier and Jones (1997). Some duration models assume that the hazard is monotonically increasing or decreasing (Weibull) or that it is constant over time (exponential). In contrast to these parametric models a semi-parametric estimation approach is available, where the baseline hazard remains unspecified and thus is an unknown parameter which has to be estimated. In general, there is little theoretical support for any particular parametric shape and when an incorrect parametric from is used, according to Meyer (1990), serious problems arises with inconsistent estimates of the baseline hazard and the effects of covariates. Even if a nonparametric baseline hazard is used when a particular parametric form is appropriate, the resulting estimates are consistent and the loss of efficiency is limited, see Meyer (1987). Furthermore, the parametric approach uses density functions which are appropriate only for estimation on continuous data. When used to model grouped data, Prentice & Gloeckler (1978) shows that the resulting estimates generally are inconsistent. In Christensen and Kallestrup Lamb (2010) different specifications of the baseline hazard for the early retirement decision is tested and thus in the following we will proceed with an unspecified baseline hazard.

Economic duration data are often grouped into intervals and since we only observe transitions in the labor market on a yearly basis it motivates a grouped duration model. Of course, with grouped data the continuous time hazard function is not nonparametrically identified. The grouped data approach summarizes the information on staying in the initial state or exiting in each time interval in a sequence of binary outcomes, see Kiefer (1988, 1990), Han & Hausman (1990), Lancaster (1990), and McCall (1994). Thus, divide the time line into $K+1$ intervals, $\left[0, t_1\right), \left[t_1, t_2\right), ..., \left[t_{K-1}, t_K\right), \left[t_K, \infty\right)$, where the t_k are known constants. Any duration falling into the last interval, $\left[t_K, \infty\right)$, is censored at t_K. Given explanatory variables at level x_k over the course of the k'th interval, the conditional probability that the duration T is greater than t_k given that it is greater than t_{k-1} is

$$
\begin{aligned}
P\left(T > t_k | T > t_{k-1}, x_k\right) &= \exp\left[-\int_{t_{k-1}}^{t_k} h\left(t|x_t\right) dt\right] \\
&= \exp\left[-\int_{t_{k-1}}^{t_k} \left(\lambda\left(t\right)\exp(x_t'\beta)\right) dt\right] \\
&= \exp\left[-\exp\left(x_k'\beta\right)\cdot\Lambda_k\right] \\
&= \alpha_k\left(x_k,\theta\right)
\end{aligned} \tag{3}
$$

where $\Lambda_k = \int_{t_{k-1}}^{t_k} \lambda\left(t\right) dt$ and $\theta = (\beta, \Lambda_1, ..., \Lambda_K)$. Note that a parameter Λ_k is associated with each interval for the grouped data, i.e., $\theta = (\beta, \Lambda_1, ..., \Lambda_K)$, following Kiefer (1988). Thus by not specifying a functional form for the baseline hazard, then the Λ_k´s are just parameters to be estimated. We allow the regressors x_t to vary across the K intervals, although we take it to be constant within each interval. This enable us to take it outside the integral in (3) above, and as our explanatory variables are only observed at the same frequency as the durations, once per interval (year), it seem like a reasonable assumption. The α_k denotes the interval-specific survivor expression and consequently the probability of observing an exit out of employment in the interval k, conditional on survival until $T > t_{k-1}$, is $1 - \alpha_k$.

The contribution to the likelihood function for an individual with duration in the k'th interval and observed regressors x_j, $j = 1, ..., k$, is

$$
\begin{aligned}
L\left(\theta, k, x\right) &= \left[\left(1-\alpha_k\left(x_k,\theta\right)\right)\prod_{j=1}^{k-1}\alpha_j\left(x_j,\theta\right)\right]^d\left[\prod_{j=1}^{k}\alpha_j\left(x_j,\theta\right)\right]^{1-d} \\
&= \left(1-\alpha_k\left(x_k,\theta\right)\right)^d\alpha_k^{1-d}\left(x_k,\theta\right)\prod_{l=1}^{k-1}\alpha_l\left(x_l,\theta\right),
\end{aligned} \tag{4}
$$

where $d = 1$ if the duration is uncensored and zero otherwise. Thus, uncompleted durations only contribute with the survivor probabilities, while completed durations contribute both to the survivor function and to the hazard function through $\left(1-\alpha_k\left(x_k,\theta\right)\right)\prod_{j=1}^{k-1}\alpha_j\left(x_j,\theta\right)$. Since the sample consists of n individuals we get that

$$
L\left(\theta\right) = \prod_{i=1}^{n}\left\{\left[\left(1-\alpha_{k_i}\left(x_i,\theta\right)\right)\prod_{j=1}^{k_i-1}\alpha_j\left(x_{ij},\theta\right)\right]^{d_i}\left[\prod_{j=1}^{k_i}\alpha_j\left(x_{ij},\theta\right)\right]^{1-d_i}\right\} \tag{5}
$$

and taking logs to (5) give us the log-likelihood function

$$
l\left(\theta\right) = \sum_{i=1}^{n}\left\{\begin{array}{c} d_i\left[\ln\left(1-\alpha_{k_i}\left(x_{i,k_i},\theta\right)\right) + \sum_{j=1}^{k_i-1}\ln\left(\alpha_j\left(x_{i,j},\theta\right)\right)\right] \\ +\left(1-d_i\right)\left[\sum_{j=1}^{k_i}\ln\left(\alpha_j\left(x_{i,j},\theta\right)\right)\right] \end{array}\right\} \tag{6}
$$

The maximum likelihood estimator $\widehat{\theta}$ of θ is obtained by maximizing (6) and given some regularity conditions, the MLE has some useful properties. Firstly, $p\lim\widehat{\theta} = \theta$, that is $\widehat{\theta}$ is consistent.[4] Secondly, it is asymptoti-

[4] The proof is given by Cramér (1948)

cally normal distributed by the Central Limit Theorem: $\sqrt{n}\left(\widehat{\theta}-\theta\right) \overset{a}{\sim} N\left(\mathbf{0},\mathbf{V}\right)$. When defining gradients as $\frac{\partial \ln L(\theta,t)}{\partial \theta}$, it can be shown , that $\mathbf{V}=-\frac{1}{n}E\left[\frac{\partial^2 \ln L(\theta,t)}{\partial\theta\partial\theta'}\right]^{-1}=-\frac{1}{n}\mathbf{I}\left(\theta\right)^{-1}$, where $\mathbf{I}\left(\theta\right)$ is the information matrix.[5] Finally, it is asymptotically efficient, since the variance of the MLE achives the Cramér-Rao lower bound for consistent estimators (the inverse of the information matrix). The MLE for θ is computed by maximizing (6) using the BFGS algorithm (Broyden (1970), Fletcher (1970), Goldfarb (1970), Shanno (1970)), and asymptotic standard errors are based on the diagonal of the inverse of the matrix summing the outer products of the individual score contributions, see Berndt et. al. (1974). The convergence tolerance for the score with respect to each coefficient is set to 1.0e-4.

4.2 Results

In table 3 and 4, we report the maximum likelihood estimates for the parameters of the estimated models. Table 3 summarizes the estimation results for the single risk specification for all the individuals, and women and men considered separately as research has shown that gender differences exist in relation to early retirement, see Talaga & Behr (1995), Dahl et al. (2003) and An et. al. (2004). In table 3, a negative coefficient indicates a lower retirement hazard for the individual we observe and by taking the exponential we get a percentage. For instance, we find that the city variable is -0.0877 and the exponential of that becomes exp(-0.0877)=0.916. This implies that individuals living in the city have an 8% lower probability of entering an early retirement program. In table 4 we report the maximum likelihood estimates for married couples and include information about the spousal variables. The effects of the spouse's characteristics should be interpreted the same way as above. If the coefficient of the spouse's income is positive it indicates the more the spouse earns the higher the retirement hazard is for the individual.

Table 3

General The geographical variable city for residence inside the Copenhagen metropolitan area indicates that living in the city decreases the early retirement hazard however the effect is only sinificant for women. An et. al. (2004) find a similar result; living outside Copenhagen increases the retirement hazard perhaps reflecting higher prices in the capital. Having a spouse has a positive effect on the probability to enter an early retirement program. This result is well supported by the growing research on joint retirement of married couples. Hurd (1990) and Blau (1998) among others, suggest the importance of joint labor market decisions due to complementary leisure habits, and intra-household effects (e.g. pensions may depend on whether the spouse is retired). Finally, men have a lower propensity to enter an early retirement scheme compared to women as found in many studies (e.g. Antolin and Scarpetta (1998) or Heyma (2004)).

Labor Market Working full time has a significant positive effect on the attachment to the labor market, however this effect is only valid for men. The yearly unemployment rate is positively correlated with the early retirement risk. That is, a higher degree of unemployment monotonically increases the instantaneous probability

[5] See Greene (1997)

of early retirement and the effect is gender neutral. This is in accordance with other studies (e.g Pedersen and Smith (1996), Lindeboom (1998), An et. al. (2004)). The latter authors explain this result by two arguments. Firstly increased layoff rates makes it difficult to find alternative employment. Secondly, the result is heavily influenced by the government's attempt to create jobs for the younger generation and thus providing incentives for the older to retire. Lindeboom (1998) uses the number of times that the individual was out of the labor market as a proxy for the relative preference for leisure time.

Experience significantly influences the retirement risk in a positive direction. Therefore, the more experience the individual has in the labor market, the more likely it is that he or she will retire early. This is opposite to Pedersen and Smith (1996), who find that experience in the labor force has a significantly negative effect on the transition into early retirement. However, Heyma (1996) finds similar results as our study and a possible explanation could be that individuals who have participated in the labor market over a long period have possibly contributed to a pension fund and therefore more likely to meet the eligibility criteria for making use of an early retirement scheme. A longer spell of illness in the previous year has the expected positive effect making a transition out the labor market more likely. This seems reasonable, since poor health increases the individual's uncertainty about the future in the labor market and perhaps also lowers the human capital as in the case of a long unemployment spell, and thus strongly affects the probability of leaving employment, see e.g. Diamond and Hausman (1984), Pedersen and Smith (1996) or Antolin and Scarpetta (1998).

Education Considering the full sample we find a significantly negative effect from the length of education compared with no level of education beyond primary school as the reference group. However, the result is only significant for individuals with a long education. Looking at women we also obtain a significantly negative effect for individuals with vocational education and considering mem seperately a negative significantly effect is found for individuals with a short level of education. This is in agreement with the literature, see Heyma (1996) or Diamond and Hausman (1984). People with a higher level of education have a higher replacement rate in relation to the benefits received from entering a retirement scheme. Furthermore, this group has had a delayed entry into the labor market and thereby more likely to postpone retirement. This result was not supported by Lindeboom (1998) who found a positive effect from education on the retirement risk.

Age Most studies find a significant positive effect of age, as we do here. However, for women the coefficient is only significant for the age group 55-59 years compared to people below 55 years. As we saw in the summary statistics fewer women are represented in age groups 60-61 and 62-66, which might explain the lack of significance. More interesting is it to look at the age difference between the individual and his or her spouse. For the full sample the retirement hazard is lower if the husband is older than the wife compared to being the same age. This support the findings that married couples face a joint retirement decision. If the wife is younger than the husbands, she might be willing to leave the workforce at an earlier age to coordinate the passage into retirement with their spouse. Finally we see that if men still in labor market have a wife that are 1-4 years older they also have an increased retirement risk.

Occupation and Sector Compared to high-salary workers every other type of occupation has a higher propensity to enter an early retirement program. This result also holds when we look at women and men separately. Fields and Mitchell (1984) explained this by human capital theory; a person in a high-salary job is likely to have invested a lot in his or her career and is therefore less likely to move to non-employment. The result concerning self-employed is not in line with the literature as most authors find that being self-employed lowers the transition rate to early retirement, see Antolin and Scarpetta (1998).

Depending on which sector an individual work in appears to influence the transition into early retirement differently. The excluded variable is the public sector. Individuals employed in the manufacturing and trade sector differ significantly from the public sector employees by having a significantly lower propensity to retire early. When looking at women separately, we also find that working in the service sector compared to the public sector significantly increases the probability to retire early. As for men, not working in the public sector seems to decrease the probability to enter an early retirement program. Only the sectors restaurant/hotel and transport are insignificant for men. Previous results regarding sectors indicators are relatively mixed, some find that working in the public sector increases the length of time in the workforce see An, Christensen and Gupta (2004), while others find that public sector employees do not seem to have different retirement probabilities than private sector employees, see e.g. Heyma (2001).

Financial Indicators We find that individuals with larger own incomes are less likely to retire early, which is also consistent with Diamond and Hausman (1984). However, the disposal income of the entire family has a significant positive effect on the decision to retire early. That is, if the spouse has a relative high income the individual will have an incentive to enter an early retirement scheme and perhaps supplement the received benefits with the spouse's income. In the own income case the substitution effect dominates the income effect and this result is significant for all three cases. This is similar to the results of An, Christensen and Gupta (2004) who use Danish data and Blau (1998) who use US data. The effect of the wealth on retirement is insignificant for all cases, but probably influenced by the strong effect from the disposal income. Pedersen and Smith (1991) find in their single risk retirement model using a Weibull specification that wealth has a negative effect for both women and men, also when they consider them separately.

Pension Register access to information concerning labor market pension schemes and private pension scheme for an entire population containing no survey element is considered very unique and the effect on the early retirement decision has not previously been examined. When assessing the full sample, compared to not saving at all we find that annual medium contributions to a labor market pension scheme designed as a capital pension increases the probability to retire early, while high contributions to such a scheme lowers the probability. These results only hold at a 10% significance level. On the contrary, both medium and high contributions to labor market pension schemes designed as an annuity increase the transition probability into an early retirement program. Recall this is despite the fact that if individuals get these types of pensions payments paid out when entering the Early Retirement Pay program (PEW) they will be financially punished. None of the results are significant for women, thus males are driving the results in the full sample. Private pension schemes designed as

capital pensions decreases the probability of entering an early retirement program if annual payments are high. This result is driven by the female workers. For private pension schemes with both medium and high annuity payments we find that it decreases the retirement risk and this result holds for both men and women.

We can conclude that both labor market and private pension schemes have significant effects on the decision to enter early retirement programs. This provide useful information for policy makers in terms of maintaining the financial punishment for cashing out labor market annuity pension payments as males paying contributions these types of schemes are more likely to retire early. No significant effects were found for women.

4.2.1 Gender Asymmetries

In accordance with the literature we can confirm that gender differences exist as the retirement hazards differ due to differences between men and women's background characteristics. Overall we find that males are less likely to retire. In several cases we only find significant effects for one of the gender, e.g. married women seem to be more likely to enter early retirement, males working full-time and women with vocational education are less likely retire. For the age variables we only find positive significant effects for males aged 60-61 and 62-66. However, as women tend to retire earlier it is not surprising that we do not get the same result for women. Differences within the sector variables also exist in terms of significance in different areas however for trade and construction we find opposite significant effects. Women are more likely to retire if they work in one of the two sectors whereas men are less likely. Finally we find gender asymmetries within pension plans especially for labor market pension schemes as only significant effects for males are found.

4.3 Results - Married Couples

In this section we report the maximum likelihood estimates for married couples in a single risk model, where variables for the spouse are included. Thus we have excluded all the singles from the original sample. From the literature we expect to find that individuals are influenced by their spouse in the decision to retire early, see Hurd (1990), Blau (1998), Gustman and Steinmeier (2000), Johnson and Favreault (2001), Coile (2004), and An et. al. (2004). We are particular interested in documenting whether husbands' characteristics affect the retirement behavior of their wives differently than the wives' characteristics affect their husbands'. This is done by incorporating the same observable characteristics for the spouse in the estimation. Previous studies such as Schellenberg (1994) and Gustman and Steinmeier (2000) have only considered a limited number of variables. Furthermore by using yearly register data for an entire population over 17 consecutive years we avoid data issues with small sample sizes, unbalanced panels, measurement errors, and self-report bias related spousal influence faced with when using survey data.

First we comment on the changes that occur from excluding the singles and then on the effects from including the spouse variables. Recall having a spouse indicates that the individual is either married or cohabitating, which in general is termed married. The results are shown in table 4.

Table 4

For the general indicators we have only included city in this estimation, since being married become irrelevant and gender has been neglected for estimation purpose. The city variable is still negatively significant but compared to table 3, being a married man and living in the city now becomes significant and decreases the probability of entering a retirement scheme. Thus single men must be dominating the insignificant effect we found in table 3. The labor market indicators changes in two ways. For married individuals we no longer find a negative significant effect on the early retirement hazard from working full-time however the effect remains significant for males. Secondly, the positive effect on entering an early retirement scheme due to more experience is reduced to a 10 percent level of significance. For the education indicators we see that the negative effect on the early retirement hazard for women with a long level of education and men with a short level of education is driven by singles and thereby no longer significant for married individuals.

The level of significance is reduced to 10% for the married men's age variables; 60-61 years and 62-66 years, indicating that it might be the single men driving this effect. For married couples we now find that if the wife is more than four years older it significantly decreases the retirement hazard. As in table 3 this effect is only significant for men. Furthermore, we see a reduction in the level of significance for women who are married to older men. The occupation indicators do not change. The sector indicator trade becomes insignificant in all the three cases implying that a negative effect on the retirement hazard from working in the trade sector compared to the public sector can not be found for married people. Furthermore, for the married women manufacturing and service are only significant at a 10% level however we now find an increased probability of entering retirement when working in construction. The positive effect from family income on the early retirement hazard is still significant as expected for married individuals. The only financial indicator that changes is the effect from married men's wealth as it becomes significant. For the labor market pension schemes only the level of significance changes for some of the variables. In relation to the private pension schemes we find that high contributions to a capital pension no longer decrease the retirement hazard for the full and female population. This indicate that singles have been driving this effect. On the contrary, medium contributions to capital pension now increase the retirement hazard for the married population most likely explained by the males in the sample.

In the rest of table 4 we have included characteristics for the spouse. In this case a significant result will indicate how the individual is affected by the spouse's charateristics in the decision to enter an early retirement program. We find several significant results justifying their presence as well as gender differences in the spousal effects. The sign of these effects will depend on how the labor supply of the spouses interacts. Two hypotheses are usually discussed in the literature; the added worker effect and the complementarities in leisure effect, see Mincer (1962) or Deschryvere (2004). While the complementarities in leisure hypothesis states that couples assign high value to joined leisure it implies that the labor supply of the two spouses is positively correlated. The added worker effect states that when one spouse is not working and thus has limited resources, the other spouse might exhibit a compensating behavior by increasing his or her labor supply to keep the household income at the original level. Below we see that both types of behavior seem to be present and thus no general conclusion is dominant from our estimation results.

Labor Market - Spouse If the spouse is working full-time it lowers the probability for the individual to enter early retirement. However, this effect only holds for women indicating that women actively participating in the labor market have a lower retirement hazard if their husband works full time. Thus women are affected by their husbands but not the other way around. When a spouse has been unemployed during the year it significantly decreases the probability of exit to an early retirement scheme for the individual. A possible explanation could be that having an unemployed spouse increases the uncertainty in the household thus forcing the other to stay in employment longer thus indicating that the added worker effect dominates. However, this effect is only significant for men indicating that only men are likely to stay longer in the labor market when their spouse becomes unemployed. The more labor market experience the spouse has, the more likely it is that the individual will retire early. Looking at men and women separately, this effect is only significant for women indicating that females will retire early the more experience their husbands have.

A longer spell of illness of the spouse significantly increases the retirement hazard indicating that people may leave the labor market earlier in order to take care of their spouse. Looking at the two sub-samples this effect is only significant for men. Thus only men will retire early to take care of an ill spouse thereby supporting the complementarities in leisure effect. In this context it is important to note that free medical care is available to everyone thus not forcing one member of the household to continue working in order to maintain a health insurance. The existing literature presents mixed results in this area. An et. al. (2004) using Danish data find that both husband and wife tend to postpone retirement if the spouse is in poor health. The differences in our results might be explained by the fact that we do not consider old age pension and use a larger sample size over a longer time period. Others using non-Danish data find results more in line with our analysis, see e.g. Clark et. al. (1980).

We also find that retirement probability is positively affected by the spouse's membership of an unemployment insurance fund most likely due to the eligibility criteria for the Early Retirement Program PEW in relation to the joint retirement decision. Finally, we have added a new variable indicating if the spouse has already retired from the labor market. We find that if the spouse has retired, then the individual is also more likely to do so too. This result holds for both men and women and is consistent with earlier empirical studies again supporting the complementarities in leisure effect, see Henkens and Siegers (1991) or Heyma (2001).

Education and Age - Spouse Having a highly educated spouse decreases the probability of early retirement, but as seen in table 4 this effect is only significant for men. This indicates that men married to high educated women tend to retire later. As mentioned previously, this is consistent with the literature that workers with higher levels of education have a lower probability of moving into early retirement programs. The fact that it only holds for men indicates that men's labor supply is positively correlated with a high educated wife indicating continued joined leisure from staying in the labor market. The same effect for women is not found. However, we do find that women who have a spouse with short education are more like to enter early retirement. As the literature has not previously considered such detailed information for the spouse's education we cannot compared these findings. All the age variables for the spouse are significant with a positive coefficient indicating that compared to having a very young spouse, an older spouse increases the probability of early retirement.

Again, the results only hold for men. For similar findings see An et. al. (2004).

Occupation and Sector - Spouse As we consider vey detailed information about the spouse's occupational and sector status we will not be able to compare these results with other studies. Having a spouse working as anything other than a high salaried worker (the reference group) decreases the probability for early retirement. Therefore an individual is likely to stay longer in the labor market if the spouse has a job other than a high salaried one in order to compensate for the spouse's lower income. These findings support the added worker effect. For women decreased retirement risk only holds when the spouse is either self-employed or working as an assisting spouse. In such a case the woman can not rely on the husband to earn enough money to supplement the her pension benefits. The category 'assisting spouse' is very small for men, therefore we do not put much weight on this result. For men the picture is similar to the general case, except when the wife is self-employed no significant effect is found.

Compared to having a spouse working in the public sector, a spouse working in agriculture/fishery, construction, trade or restaurant/hotel decreases the retirement hazard. For women, this only holds for construction. For men we find similar results as in the general case except when the spouse is working in agriculture/fishery sector. A spouse working in manufacturing actually increases the probability of entering an early retirement scheme both for women and men, however only at a 10% level of significance.

Financial Indicators and Pension - Spouse The higher the spouse's own income the more likely it is that the individual retire early. This only holds for the general case and only at a 10% level of significance. This is slightly surprising as we would expect to find a significant effect especially from the spouse's income. However, An et. al. (2004) find a similar result and conclude: "Wife's income is insignificant in the husband's hazard, and not really treated as a household variable. Husband's income does lower the wife's retirement hazard, but the effect is barely significant in the most general BMPH model".

Finally, we look at the pension related variables. If the spouse has a labor market pension scheme designed as a capital pension no significant effect is found for the full sample of married individuals. For women we find an increasing retirement hazard if the husband contributes with high payments, whereas the opposite result is found for men. When the spouse has a labor market scheme with annuity payments compared to no savings, it will increase the individual's instantaneous retirement probability independent of the amount that was saved the previous year. This result is driven by the males. Having a spouse with high contributions to a private capital pension compared to not saving at all increases the retirement hazard. When looking at women separately, we also find a significant positive effect on the retirement probability if the husband has medium or high payments to a private capital pension scheme. The general picture therefore indicates that if the spouse has any type of pension savings it will increase the probability of the individual of moving into an early retirement scheme.

4.3.1 Spousal Asymmetries

We have now shown that the husbands' characteristics do affect the retirement behavior of their wives differently than the wives' characteristics affect their husbands. Within all the variable groups (labor market, education,

age, occupation, sector, financial indicator, and pension) included in the model we find that spousal differences exists. However we never find opposite significant spousal effects, it is always the case that it is only significant for one of them.

Women's retirement hazard is affected positively by the husband's experience, if the husband has a short education compared to basic education, the husband's high contributions to a labor market capital pension scheme and finally medium or high contributions to a private annuity pension scheme. On the other hand women's retirement hazard is affected negatively (thus retire later) if the husband works full time, is self-employed or works in construction compared to the public sector. Men's retirement hazard is affected positively by the wife's age, labor market pension payments or if she receives sickness benefits. Men retire later if the wife has been unemployed, is high educated, not working as a high-salaried worker, is working in the construction, trade or transport sector compared to the public sector.Overall, we find more significant effects for men indicating that they are more influenced by their spouse in the early retirement decision compared to women. This corresponds to the results found in Gustman and Steinmeier (2000) and Coile (2004).

These findings suggest that if the government's goal is to encourage labor market participation among older workers they should promote policy measures that affect the retirement decision of the entire household, as one family member indirectly influence the retirement of the remaining spouse. Furthermore, the direction of this influence is gender specific which therefore encourage changes in existing early retirement programs that account for these spousal specific cross-effects.

5 Unobserved Heterogeneity

In the models considered so far, all differences between individuals were assumed to be captured by using observed explanatory variables. We will now consider a generalisation of the earlier models by allowing for unobserved individual specific effects based on Kiefer (1988) and Lancaster (1990). Here we use the term heterogeneity to refer to differences remaining in distributions after controlling for the effect of observable variables. Thus, heterogeneity is a problem if individuals have differing duration distributions after controling for the explanatory variables. In particular, this may lead to attenuation bias toward zero in estimated coefficients.

We consider unobserved heterogeneity entering via an individual-specific term v, so that the conditional hazard is of the form $h\left(t|x_t, v\right)$. In the proportional hazard case, (2) is generalized to

$$h\left(t|x_t, v\right) = v \cdot \lambda\left(t\right) \exp(x_t'\beta). \tag{7}$$

Consequently, conditionally on the heterogeneity term, the discrete time survivor (3) becomes

$$\begin{aligned} P\left(T > t_k | T > t_{k-1}, x_k, v\right) &= \exp\left[-\int_{t_{k-1}}^{t_k} h\left(t|x_k, v\right) dt\right] \\ &= \exp\left[-v_i \cdot \exp\left(x_{i,k}'\beta\right) \cdot \Lambda_k\right] \\ &= \alpha_k(x_{i,k}, v_i, \theta). \end{aligned} \tag{8}$$

The likelihood function is formed by integrating out the unobserved v_i, using a parametric or nonparametric distributional assumption. Examples of parametric distributions for the unobserved component would be gamma

and Burr distributed heterogeneity. However, the parametric approach have strongly been criticized by Heckman and Singer (1984a,b). They argue that it over-parameterizes the model and an incorrect choice of V leads to inconsistent estimates of the parameters of interest. Instead they suggest a non-parametric maximum likelihood estimate of the mixing distribution based on the results of Lindsay (1983a,b). The idea is to model v as having a discrete distribution. Suppose the distribution is given by $P(V = v_i) = p_i$, where $i = 1, ..., K$, and let the parameter vector $\varrho = (v_{1,}.....,v_K, p_1.....p_K)$, where K defines the number of points in the discrete distribution.[6] These parameters, ϱ, and K can now be estimated by maximum likelihood.

Writing $G(v|x_t, \theta)$ for the conditional heterogeneity distribution, the general form of the individual contribution to likelihood is obtained by substituting (8) in (4),

$$L(\theta, k, x) = \int (1 - \alpha_k(x_{i,k}, v_i, \theta))^d \alpha_k(x_{i,k}, v_i, \theta)^{1-d} \cdot \prod_{l=1}^{k-1} \alpha_l(x_{i,l}, v_i, \theta) G(v|x, \theta)\, dv \tag{9}$$

and again $d = 1$ if the labor market spell is not right censored. We assume that the unobserved component, v, is individual-specific to the unit of observation and in specifying the distribution for the unobservable, we impose one assumption: The unobservable component, v, follow a discrete distribution with two points of support, v^1 and v^2, see Heckman and Singer (1984a,b) for further details.[7]

5.1 Results - Unobserved Heterogeneity

Table 5 shows the results from estimation allowing for unobserved heterogeneity. Including unobserved heterogeneity affects the variables in several ways. In general, all the coefficients move in the right direction (the significant negative coefficients become more negative while the positive become more positive) such that the downward bias goes to zero. The city variable for men becomes significant at a 10% level indicating that both men and women living in the city have a lower hazard of entering an early retirement program. In the general case being married is no longer significant and for women it moves from being significant at a 5% level to a 10% level.

Table 5

All the labor market indicators remain unchanged expect from one. Women working full-time now have a lower probability of entering an early retirement scheme at a 10% level of significance. The effect of different levels of education on the retirement hazard changes in the general case. Vocational education becomes negative significant at a 10% level whereas a short level of education becomes significant at a 5% level. This indicates that the negative effect from the length of education becomes more pronounced when allowing for unobserved heterogeneity. The age variables are affected in several ways. First of all, the age group 60-61 years and 62-66

[6] Heckman and Singer, (1984a), state in propsition 9, that K must be less than the sample size.

[7] There are drawbacks with using this method as it is computationally demanding and multiple local maxima commonly appear. Furthermore, the asymptotic distribution theory for the estimator has not been developed yet.

years no longer significantly increase the retirement hazard neither in the general case or for men considered separately. Furthermore, for women the age variable 55-59 years, the variables husband is between 1-4 years older and the husband is more than 4 years older drop in level of significance to 10%.

The occupation indicators do not change at all except from the size of the coefficients however the sectors indicators are affected. In the full sample, trade is only significant at a 10% level compared to a 5% level in table 3. For women, being employed in the manufacturing sector no longer lowers the probability of entering an early retirement scheme. The coefficient for working in the trading sector is only significant at the 10% level. Looking at men separately construction moves from being significant at a 5% level to a 10% level. The financial indicators remain unchanged in the sign of the coefficient. However, the coefficient of the own income becomes more negative while the coefficient of the disposal income gets more positive.

Again we find strong signifcant effects from both the labor market pension schemes and private pension schemes indicating the importance of including them when modelling the early retirement behavior. In relation to table 3 only one change is observed. The labor market pension schemes designed as a capital pension is now significant at a 5% level for men.

The estimated discrete distribution has a p-value equal to 0.1328 implying the presence of two types of individuals in the population. 13% of the sample has $v1 = 1.55$, which is significantly greater than unity, dividing the sample into a group of employed individuals with high exit rates out of employment and one with low exit rates out of employment.

5.2 Results - Married Couples and Unobserved Heterogeneity

Finally in table 6 we present maximum likelihood estimates for married couples in a single risk model accounting for spouse characteristics and unobserved heterogeneity. Compared to table 4 we will comment on how unobserved heterogeneity effects coefficients of the explanatory variables for the individual's decision to enter an early retirement program.

Table 6

Few changes are observed for the individuals own variables. Experience is no longer significant at a 10% level for men and we now find a positive effect on the retirement risk for individuals with a short level of education. The age variables for males all become insignificant and 55-59 years for women are only significant at a 10% level. Two changes are observed in the variables for age difference. When the husband is more than four years older now have a negative effect on the early retirement risk at a 5% level in the full sample and in the male sample having a wife that is more than for years older now have a negative effect on the early retirement probability at a 10% level. There are no changes in the occupation indicators and the only change in the sector indicators are seen in the female sample where working in the trade industry now negatively affects the retirement risk. Regarding the financial indicators wealth is no longer significant. The changes in the labor market pension variables are all related to levels of signficance and for the private pension variables we see that medium capital savings are no longer significant for men.

Moving on to the spouse variables we see that the labor market variables only change for the male sample. Having a wife that works full-time decreases the probability of entering a retirement scheme, whereas the more experience the wife has increases the probability. Both of these variables were insignificant in table 4. One change is observed for the education variables and it is in the female sample. A male spouse with a short education does no longer significantly increase the probability for the individual to enter an early retirement scheme. We see a few changes in the age variables. In the full sample all the age variables become insignificant and in male sample the level of significance is reduced to 10 percent for the two age groups 55-59 and 60-62, and the age group 62-64 is no longer significant. The occupation and sector indicators only changes for the male sample. Being self-employed becomes significant at a level of 10 percent with a positIve coefficient indicating that having a wife that is self-employed increases the retirement hazard. For the sector variables manufacturing is no longer significant. Finally in the financial and pension indicators a couple of changes are observed. The spouse's income no longer significantly increases the retirement hazard. The same is the case for labor market pension schemes with high annuity payments and private schemes designed as a capital pension with high contributions.

We see that 18% of the sample has a $v_1 = 1.08$ indicating that when including the variables for the spouse the share of people with increased transition is higher (18% compared to 13% before) although the difference between the two subsamples is now estimated to be less as v_1 is closer to one.

6 Conclusion

This paper investigates the determinants of older workers' early retirement behavior in Denmark and performs separate gender estimation in order to assess whether gender asymmetries appear. Instead of considering dual retirement we recognize the importance of the spouse in the early retirement decision by assessing the effect of a rich number of spousal variables. Especially, we identify whether the husbands' characteristics affect the retirement behavior of their wives differently than the wives' characteristics affect their husbands'.

We take advantage of unique register data containing yearly data for the entire population on age, gender, marital status, geographical location, labor market attachment, unemployment rate, experience, UI-fund membership, sickness pay, level of education, type of occupation, sector specific variables, income variables such as own income, family income, wealth, and finally pension savings in labor market pension schemes and private pension schemes. The information about pension savings and the fact that all these characteristics are available for the spouse are unique. Given the grouped nature of the data we set up a semi-parametric single risk grouped duration proportional hazard model accounting for right censoring and allowing for time-varying covariates, a nonparametric baseline and unobserved heterogeneity.

We find several significant effects that influence the individual's decision to enter an early retirement program. In the general case, we confirmed the result that women tend to retire early. Moreover, living in the city or working full time decreases the retirement hazard, while being married, unemployed, member of an UI-fund or a higher degree of labor market experience increases the retirement hazard. As expected, poor health strongly affects the decision to retire early. The negative effect from the length of education is confirmed as workers with

a higher level of education retire later. We find positive effects for all age groups however when the husband is older a lower hazard of entering early retirement is found. The high-salary workers have a tendency to stay longer in employment, while a noticeable higher probability of retiring early is observed among public employees. Individuals with larger incomes are less likely to retire early, whereas a higher family income of the entire family has a significant positive effect on the decision to retire early. Moreover, we find strong signifcant effects from both the labor market pension schemes and private pension schemes indicating the importance of including these variables when modelling the early retirement behavior. If a person has made contributions to a labor market scheme it increases the probability of entering an early retirement scheme, while private pension schemes have the opposite effect. Furthermore, schemes with annuity payments seem to be driving the significant effects. These findings can be useful in designing furture eligibility criteria for various early retirement programs.

In accordance with the literature we can confirm that gender differences exist as the retirement hazards differ due to differences between men and women's background characteristics. Overall we find that males less likely to retire. In several cases we only find significant effects for one of the gender, e.g. married women seem to be more likely to enter early retirement, males working full-time and women with vocational education are less likely retire. For the age variables we only find positive significant effects for males aged 60-61 and 62-66. However as women tend to retire earlier it is not surprising that we do not get the same result for women. Differences within the sector variables also exist in terms of significance in different areas however for trade we find opposite significant effects. Finally we find gender asymmetries within pension plans especially for labor market pension schemes as only significant effects for males are found.

When considering married couples separately and including spousal variables, we find several significant spousal effects justifying their presence. The sign of the spousal effects depend on how the labor supply of the spouses interacts. We find evidence of both the added worker effect and the complementarities in leisure effect however none of them seems to dominating our estimation results. We show that the husbands' characteristics do affect the retirement behavior of their wives differently than the wives' characteristics affect their husbands. Within all the variable groups (labor market, education, age, occupation, sector, financial indicator, and pension) included in the model we find that spousal differences exists. However we never find opposite significant spousal effects, it is always the case that it is only significant for one of them. Women's retirement hazard is affected positively by the husband's experience, if the husband has a short education compared to basic education, the husband's high contributions to a labor market capital pension scheme and finally medium or high contributions to a private annuity pension scheme. On the other hand women's retirement hazard is affected negatively (thus retire later) if the husband works full time, is self-employed or works in construction compared to the public sector. Men's retirement hazard is affected positively by the wife's age, labor market pension payments or if she receives sickness benefits. Men retire later if the wife has been unemployed, is high educated, not working as a high-salaried worker, is working in the construction, trade or transport sector compared to the public sector. Overall, we find more significant effects for men indicating that they are more influenced by their spouse in the early retirement decision compared to women. This corresponds to the results found in Gustman and Steinmeier (2000) and Coile (2004).

Finally, we show that controlling for unobserved heterogeneity is essential in reducing the bias. The negative effect from the length of education compared with no level of education beyond primary school becomes more pronounced. We find that the population consists of two groups with different exit rates out of employment; one group of employed individuals with high exit rates out of employment and one with low exit rates out of employment. By accounting for spousal variables this share increases however the difference between the two types becomes less distinct.

These findings suggest that if the government's goal is to encourage labor market participation among older workers they should promote policy measures that account for the gender differences in the decision to retire early as men and women are affected differently by own characteristics. Moreover, they should design schemes that affect the retirement decision of the entire household as one family member indirectly influence the retirement of the remaining spouse. Furthermore, the direction of this influence is gender specific which therefore encourage changes in existing early retirement programs that account for these spousal specific cross-effects.

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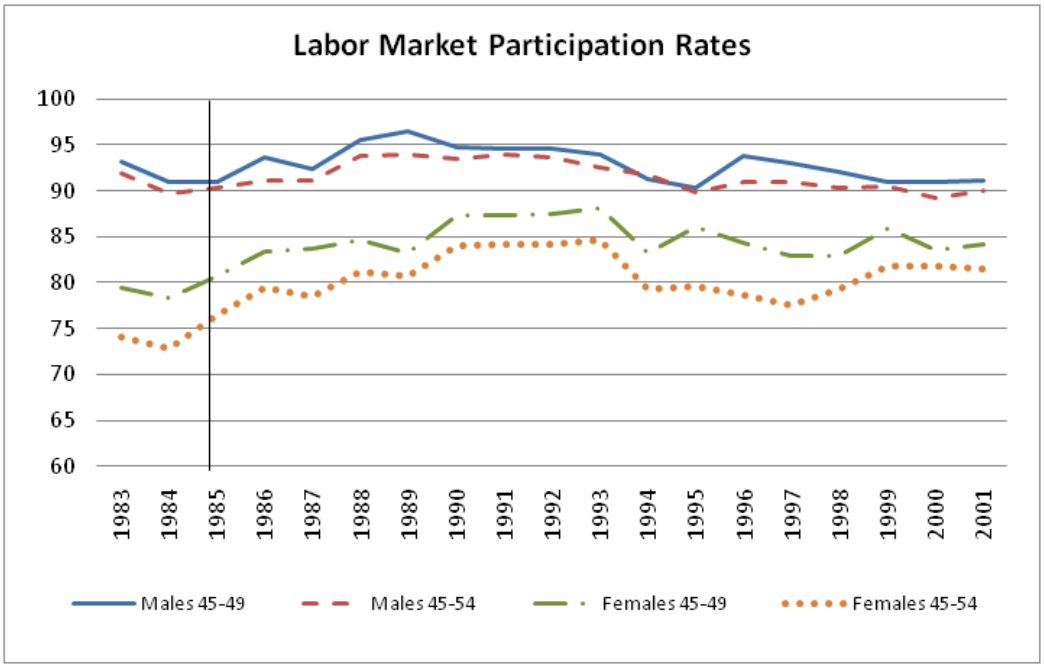

Figure 1: Labor market participation rates for males and females in the age groups: 45-49 and 45-54

Table 1: Number of different durations in the sample

Duration	Obs. spells	# of exit
1	169	128
2	213	169
3	232	187
4	258	215
5	301	259
6	325	288
7	498	474
8	598	566
9	700	651
10	1.612	1.570
11	966	935
12	581	569
13	678	649
14	516	503
15	336	334
16	211	210
17	1.234	161
Total	9.428	7.868

Table 2: Summary Statistics

	All		Women		Men	
Variables	Mean	Std.err	Mean.	Std.err	Mean	Std.err
General						
City	0.3517	0.4775	0.3549	0.4785	0.3492	0.4767
Married	0.8004	0.3997	0.7658	0.4234	0.8266	0.3786
Male	0.5697	0.4951				
Labor Market						
Working full time	0.6603	0.4736	0.5394	0.4984	0.7516	0.4320
Yearly unemp. rate	0.0599	0.1917	0.0697	0.2076	0.0525	0.1784
Experience since 1980	0.3341	0.2370	0.2911	0.2099	0.3666	0.2507
Sicknes pay	0.0023	0.0475	0.0021	0.0466	0.0023	0.0482
Member of UI-fund	0.7753	0.4173	0.7999	0.4001	0.7567	0.4290
Education						
Basic	0.4787	0.4995	0.5532	0.4971	0.4224	0.4940
Vocational	0.3543	0.4783	0.2954	0.4562	0.3988	0.4897
Short	0.0260	0.1592	0.0259	0.1588	0.0262	0.1596
Medium	0.1019	0.3024	0.1066	0.3086	0.0983	0.2977
Long	0.0391	0.1937	0.0188	0.1360	0.0543	0.2266
Age						
50-54 years	0.4528	0.4977	0.4815	0.4997	0.4311	0.4952
55-59 years	0.3673	0.4820	0.3712	0.4831	0.3645	0.4813
60-61 years	0.0812	0.2732	0.0698	0.2549	0.0899	0.2860
62-66 years	0.0985	0.2572	0.0774	0.2672	0.1145	0.3184
Same age	0.0651	0.2468	0.0673	0.2505	0.0635	0.2439
Wife 1-4 years older	0.1841	0.3876	0.3217	0.4671	0.0802	0.2717
Wife $>$ 4 years older	0.1202	0.3252	0.2519	0.4341	0.0207	0.1424
Husband 1-4 years older	0.2544	0.4355	0.0883	0.2838	0.3798	0.4853
Husband $>$ 4 years older	0.1765	0.3813	0.0366	0.1877	0.2823	0.4501
Occupation						
Self-employed	0.1360	0.3428	0.0544	0.2269	0.1976	0.3982
Salaried Worker						
- high level	0.2308	0.4213	0.1556	0.3624	0.2876	0.4526
- medium level	0.1740	0.3791	0.2683	0.4431	0.1030	0.3039
- low level	0.1083	0.3107	0.0372	0.1893	0.1620	0.3684
Unskilled	0.2420	0.4283	0.3190	0.4661	0.1839	0.3875
Ass. spouse	0.0333	0.1794	0.0757	0.2646	0.0012	0.0354
Sector						
Agriculture/fishery	0.0599	0.2373	0.0518	0.2216	0.0661	0.2483
Manufacturing	0.0908	0.2873	0.0767	0.2661	0.1015	0.3020
Construction	0.0525	0.2231	0.0478	0.2134	0.0561	0.2301
Trade	0.1266	0.3325	0.1130	0.3166	0.1369	0.3438
Service	0.0338	0.1807	0.0241	0.1534	0.0411	0.1987
Restaurant/hotel	0.0066	0.0810	0.0054	0.0731	0.0075	0.0865
Transportation	0.0492	0.2163	0.0350	0.1838	0.0599	0.2373
Public	0.3026	0.4594	0.3965	0.4891	0.2318	0.4220
Unknown	0.2777	0.4478	0.2496	0.4328	0.2989	0.4578

Table 2: (continued) Summary Statistics

	All		Women		Men	
	Mean	Std.err	Mean.	Std.err	Mean	Std.err
Financial Indicators						
Own income	0.5040	0.2310	0.4842	0.2307	0.5190	0.2300
Family income	0.4749	0.2237	0.4648	0.2223	0.4827	0.2245
Wealth	0.3833	0.2882	0.3286	0.2690	0.4247	0.2954
Pension						
Labor market scheme						
Capital none	0.9558	0.2055	0.9626	0.1897	0.9507	0.2165
Capital medium	0.0091	0.0949	0.0093	0.0962	0.0089	0.0941
Capital high	0.0350	0.1839	0.0280	0.1651	0.0404	0.1969
Annuity none	0.9334	0.2480	0.9493	0.2194	0.9227	0.2671
Annuity medium	0.0136	0.1162	0.0104	0.1013	0.0162	0.1262
Annuity high	0.0522	0.2224	0.0403	0.1967	0.0611	0.2395
Private scheme						
Capital none	0.6940	0.4608	0.7069	0.4551	0.6843	0.4648
Capital medium	0.0815	0.2736	0.0931	0.2905	0.0727	0.2597
Capital high	0.2202	0.4144	0.1961	0.3970	0.2384	0.4261
Annuity none	0.7521	0.4318	0.8012	0.3991	0.7150	0.4514
Annuity medium	0.1457	0.3528	0.1389	0.3459	0.1508	0.3578
Annuity high	0.1001	0.3001	0.0572	0.2322	0.1324	0.3390
No. of obs.	99.498		42.812		56.686	
	Spouse Variables					
Labor Market						
Working full time	0.4855	0.4998	0.5601	0.4964	0.4335	0.4956
Yearly unemp. rate	0.0583	0.1921	0.0430	0.1649	0.0690	0.2083
Experience since 1980	0.2715	0.2213	0.2909	0.2247	0.2580	0.2179
Sickness Pay	0.0668	0.2497	0.0670	0.2501	0.0666	0.2494
Member of UI-fund	0.6961	0.4600	0.6745	0.4686	0.7111	0.4532
Retired	0.0347	0.1833	0.0383	0.1919	0.0322	0.1764
Education						
Basic	0.5069	0.5000	0.4592	0.4983	0.5402	0.4983
Vocational	0.3433	0.4748	0.3861	0.4869	0.3133	0.4639
Short	0.0251	0.1566	0.0234	0.1511	0.0264	0.1603
Medium	0.0954	0.2938	0.0838	0.2770	0.1004	0.3046
Long	0.0293	0.1687	0.0476	0.2129	0.0165	0.1274
Age						
22-49	0.2017	0.4012	0.0528	0.2236	0.3058	0.4608
50-54	0.2932	0.4552	0.2199	0.4142	0.3444	0.4751
55-59	0.2842	0.4510	0.3486	0.4765	0.2390	0.4265
60-61	0.0782	0.2685	0.1176	0.3221	0.0507	0.2193
62-64	0.0758	0.2648	0.1260	0.3320	0.0407	0.1975
65-87	0.0735	0.2251	0.1366	0.3434	0.0159	0.1253

Table 2: (continued) Summary Statistics

	All		Women		Men	
	Mean	Std.err	Mean.	Std.err	Mean	Std.err
Occupation						
Self-employed	0.1130	0.3165	0.2115	0.4108	0.0415	0.1994
Salaried Worker						
- high level	0.1698	0.3755	0.2460	0.4307	0.1165	0.3209
- medium level	0.1583	0.3650	0.0846	0.2783	0.2098	0.4072
- low level	0.0573	0.2325	0.0954	0.2937	0.0307	0.1727
Unskilled	0.1948	0.3961	0.1217	0.3270	0.2460	0.4307
Ass. spouse	0.0377	0.1901	0.0024	0.0487	0.0624	0.2420
Sector						
Agriculture/fishery	0.0504	0.2189	0.0562	0.2303	0.0465	0.2105
Manufacturing	0.0630	0.2430	0.0733	0.2606	0.0558	0.2295
Construction	0.0405	0.1971	0.0413	0.1989	0.0399	0.1957
Trade	0.0989	0.2985	0.1056	0.3074	0.0942	0.2921
Service	0.0193	0.1379	0.0177	0.1318	0.0205	0.1420
Restaurant/hotel	0.0041	0.0639	0.0028	0.0529	0.0050	0.0706
Transportation	0.0352	0.1844	0.0492	0.2162	0.0255	0.1575
Public	0.2424	0.4285	0.1696	0.3753	0.2934	0.4553
Unknown	0.3732	0.4837	0.3927	0.4884	0.3585	0.4796
Financial Indicators						
Own income	0.4778	0.2365	0.4934	0.2415	0.4669	0.2325
Family income	0.4532	0.2289	0.4563	0.2353	0.4511	0.2244
Wealth	0.3535	0.2827	0.4281	0.2981	0.3013	0.2590
Pension						
Labor market scheme						
Capital none	0.9683	0.1751	0.9837	0.1265	0.9576	0.2016
Capital medium	0.0115	0.1066	0.0035	0.0589	0.0171	0.1297
Capital high	0.0201	0.1406	0.0128	0.1123	0.0253	0.1571
Annuity none	0.9609	0.1938	0.9779	0.1471	0.9490	0.2199
Annuity medium	0.0104	0.1014	0.0059	0.0765	0.0136	0.1157
Annuity high	0.0287	0.1669	0.0163	0.1264	0.0374	0.1897
Private scheme						
Capital none	0.7487	0.4337	0.7451	0.4358	0.7513	0.4322
Capital medium	0.0772	0.2668	0.0612	0.2396	0.0883	0.2838
Capital high	0.1701	0.3758	0.1902	0.3925	0.1561	0.3630
Annuity none	0.8223	0.3822	0.8057	0.3956	0.8339	0.3722
Annuity medium	0.1106	0.3136	0.1002	0.3002	0.1178	0.3224
Annuity high	0.0660	0.2483	0.0925	0.2897	0.0474	0.2126
No. of obs.	79.645		32.787		46.858	

Table 3: Maximum likelihood estimates for a single risk retirement model

	All		Women		Men	
Variables	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
General						
City	**−0.0877**	0.0246	**−0.1457**	0.0365	−0.0293	0.0347
Married	**0.0967**	0.0486	**0.1712**	0.0723	0.0741	0.0664
Male	**−0.1843**	0.0293				
Labor Market						
Working full time	**−0.0959**	0.0353	−0.0462	0.0442	**−0.4456**	−0.0697
Yearly unemp. rate	**1.7946**	0.0516	**1.9197**	0.0755	**1.6636**	0.0747
Experience since 1980	**0.5052**	0.0699	**0.7473**	0.1090	**0.2921**	0.0942
Sickness Pay	**1.0105**	0.1299	**0.9312**	0.1601	**0.8974**	0.2437
Member of UI-fund	**0.5474**	0.0340	**0.4009**	0.0474	**0.7420**	0.0519
Education						
Vocational	−0.0211	0.0264	**−0.0981**	0.0398	0.0365	0.0368
Short	−0.1003	0.0864	−0.0965	0.1234	**−0.1682**	0.1195
Medium	0.0096	0.0487	−0.0222	0.0707	0.0530	0.0701
Long	**−0.2936**	0.0856	**−0.2775**	0.1522	**−0.2625**	0.1056
Age						
55-59	**2.0820**	0.5940	**1.8404**	0.9177	**2.2558**	0.6950
60-61	**1.7348**	0.7217	0.9849	2.1037	**2.0783**	0.7720
62-66	**1.6941**	0.6867	1.1974	1.8683	**1.9649**	0.8179
Wife 1-4 years older	−0.0642	0.0505	−0.0166	0.0712	**−0.2584**	0.0797
Wife $>$ 4 years older	0.0375	0.0541	0.0425	0.0729	−0.1388	0.1246
Husband 1-4 years older	**−0.2002**	0.0503	**−0.1594**	0.0870	**−0.2637**	0.0635
Husband $>$ 4 years older	**−0.3007**	0.0539	**−0.2214**	0.1057	**−0.3652**	0.0659
Occupation						
Self-employed	**1.3196**	0.0717	**1.7535**	0.1022	**0.8625**	0.1082
Salaried Worker						
- medium level	**0.4187**	0.0426	**0.4268**	0.0664	**0.4597**	0.0610
- low level	**0.5686**	0.0458	**0.6048**	0.0892	**0.5469**	0.0540
Unskilled	**0.6300**	0.0411	**0.6760**	0.0666	**0.5820**	0.0543
Ass. Spouse	**1.5666**	0.0892	**1.6601**	0.1095	**1.7207**	0.3875

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 3: (continued) Maximum likelihood estimates for a single risk retirement model

	All		Women		Men	
Variables	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
Sector						
Agriculture/fishery	−0.0617	0.0607	0.0291	0.0836	**−0.1711**	0.0891
Manufacturing	**−0.0991**	0.0416	**−0.0938**	0.0606	**−0.1393**	0.0584
Construction	−0.0464	0.0483	0.0376	0.0733	**−0.1237**	0.0657
Trade	**−0.0774**	0.0378	**−0.1274**	0.0563	*−0.0696*	0.0534
Service	−0.0173	0.0438	**0.1414**	0.0654	**−0.1604**	0.0603
Restaurant/hotel	−0.0183	0.0886	−0.1303	0.1502	0.0507	0.1108
Transport	0.0284	0.0556	0.0625	0.0840	−0.0230	0.0741
Unknown	**−1.1707**	0.0594	**−1.1695**	0.0864	**−1.2559**	0.0849
Financial Indicators						
Own income	**−2.5831**	0.2616	**−2.2649**	0.4648	**−2.5627**	0.3996
Family income	**1.0857**	0.2228	**1.6198**	0.4326	**0.7497**	0.2693
Wealth	0.0077	0.0471	0.0815	0.0711	0.0493	0.0651
Pension						
Labor market scheme						
Capital medium	*0.1044*	0.0706	0.0654	0.1069	*0.1512*	0.0972
Capital high	*−0.0675*	0.0453	−0.0356	0.0691	*−0.0902*	0.0636
Annuity medium	**0.1153**	0.0590	0.0203	0.0968	**0.2164**	0.0790
Annuity high	**0.0992**	0.0419	0.0706	0.0669	**0.1371**	0.0567
Private scheme						
Capital medium	0.0266	0.0409	−0.0208	0.0544	0.0773	0.0646
Capital high	**−0.0492**	0.0275	**−0.0957**	0.0399	−0.0149	0.0390
Annuity medium	**−0.1735**	0.0379	**−0.0998**	0.0530	**−0.2395**	0.0543
Annuity high	**−0.2635**	0.0494	**−0.1685**	0.0772	**−0.3242**	0.0648
No. of obs.	99.498		42.812		56.686	

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 4: Maximum likelihood estimates for a single risk retirement model: Married couples

	All		Women		Men	
Variables	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
General						
City	**−0.1298**	0.0296	**−0.1569**	0.0446	**−0.0920**	0.0418
Labor Market						
Working full time	−0.0277	0.0408	−0.0001	0.0513	**−0.3329**	0.0850
Yearly unemp. rate	**1.8190**	0.0617	**1.9216**	0.0928	**1.6399**	0.0900
Experience since 1980	**0.4915**	0.0843	**0.7916**	0.1404	*0.1766*	0.1131
Sickness Pay	**0.9993**	0.1559	**1.1236**	0.1798	**0.8547**	0.2811
Member of UI-fund	**0.5270**	0.0403	**0.3651**	0.0579	**0.7200**	0.0613
Education						
Vocational	−0.0213	0.0313	**−0.1226**	0.0498	0.0240	0.0424
Short	−0.0973	0.1012	−0.1020	0.1589	−0.1002	0.1317
Medium	0.0059	0.0589	−0.0164	0.0918	0.0195	0.0817
Long	**−0.2246**	0.1037	−0.0465	0.1925	**−0.2424**	0.1295
Age						
55-59	**1.9178**	0.8597	**2.2894**	1.4135	**2.2960**	1.2787
60-61	**1.6584**	1.0478	1.8670	4.8670	*2.0069*	1.3094
62-66	**1.5074**	1.0224	1.6201	2.6820	*1.7201*	1.3287
Wife 1-4 years older	**−0.1025**	0.0535	−0.0491	0.0770	**−0.2286**	0.0871
Wife $>$ 4 years older	0.0006	0.0755	−0.0228	0.1032	−0.0957	0.1576
Husband 1-4 years older	**−0.1336**	0.0520	*−0.1233*	0.0894	**−0.1912**	0.0689
Husband $>$ 4 years older	*−0.0973*	0.0719	*−0.2200*	0.1452	**−0.1610**	0.0945
Occupation						
Self-employed	**1.4480**	0.0854	**1.8254**	0.1232	**0.8821**	0.1345
Salaried Worker						
- medium level	**0.3824**	0.0496	**0.4357**	0.0817	**0.3762**	0.0693
- low level	**0.5452**	0.0531	**0.6331**	0.1134	**0.5171**	0.0619
Unskilled	**0.5979**	0.0482	**0.7161**	0.0814	**0.4744**	0.0639
Ass. spouse	**1.7681**	0.1071	**2.0586**	0.1342	**1.3804**	0.4644
Sector						
Agriculture/fishery	−0.0487	0.0703	0.0794	0.0966	**−0.2376**	0.1047
Manufacturing	**−0.0867**	0.0483	*−0.1017*	0.0720	**−0.1099**	0.0680
Construction	−0.0357	0.0564	*0.1309*	0.0863	**−0.1650**	0.0760
Trade	−0.0494	0.0448	−0.0853	0.0696	−0.0644	0.0612
Service	−0.0527	0.0514	*0.1144*	0.0833	**−0.1903**	0.0689
Restaurant/hotel	0.0545	0.1025	0.0462	0.1796	−0.0194	0.1285
Transport	0.0677	0.0626	0.0606	0.0972	0.0587	0.0843
Unknown	**−1.2049**	0.0699	**−1.1595**	0.1009	**−1.2279**	0.1034

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 4: (continued) Maximum likelihood estimates for a single risk retirement model: Married couples

	All		Women		Men	
Variables	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
Financial Indicators						
Own income	**−2.5952**	0.3126	**−2.8037**	0.6714	**−2.8118**	0.3947
Family income	**0.9572**	0.2493	**1.8284**	0.5962	**0.4866**	0.2734
Wealth	0.0472	0.0548	0.0505	0.0824	**0.1390**	0.0756
Pension						
Labor market scheme						
Capital medium	*0.1294*	0.0829	0.1060	0.1324	**0.2015**	0.1131
Capital high	**−0.1014**	0.0544	−0.1115	0.0911	*−0.0946*	0.0704
Annuity medium	*0.1008*	0.0705	−0.0262	0.1250	**0.1823**	0.0896
Annuity high	**0.1098**	0.0489	0.0329	0.0862	**0.1422**	0.0627
Private scheme						
Capital medium	**0.0922**	0.0503	0.0725	0.0686	*0.1140*	0.0762
Capital high	−0.0094	0.0328	−0.0512	0.0511	0.0384	0.0451
Annuity medium	**−0.2015**	0.0492	**−0.1862**	0.0706	**−0.2146**	0.0707
Annuity high	**−0.2460**	0.0596	**−0.1751**	0.0989	**−0.2531**	0.0774
			Spouse Variables			
Labor Market						
Working full time	**−0.1584**	0.0395	**−0.4241**	0.0680	−0.0430	0.0514
Yearly unemp. rate	**−0.1523**	0.0669	0.0259	0.1131	**−0.2556**	0.0871
Experience since 1980	**0.1753**	0.0788	**0.1902**	0.1181	0.1228	0.1148
Sickness Pay	**0.1068**	0.0482	0.0156	0.0748	**0.1558**	0.0650
Member of UI-fund	**0.1328**	0.0354	*0.0618*	0.0492	**0.1907**	0.0558
Retired	**0.6766**	0.0430	**0.6613**	0.0636	**0.7050**	0.0592
Education						
Vocational	−0.0032	0.0311	0.0318	0.0459	−0.0300	0.0452
Short	0.0001	0.0879	*0.1813*	0.1287	−0.1171	0.1236
Medium	**−0.1317**	0.0575	0.0279	0.0828	**−0.2781**	0.0829
Long	**−0.1463**	0.0876	−0.0702	0.1037	**−0.3557**	0.2098
Age						
50-54	**0.1119**	0.0681	−0.1417	0.1527	0.0962	0.0801
55-59	**0.2278**	0.0834	−0.1636	0.1756	**0.2216**	0.1021
60-61	**0.2249**	0.1043	−0.2119	0.1983	**0.2402**	0.1354
62-64	**0.2200**	0.1156	0.1837	0.2102	*0.2099*	0.1566
65-88	*0.1911*	0.1363	−0.2273	0.2313	*0.3000*	0.2012

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 4: (continued) Maximum likelihood estimates for a single risk retirement model: Married couples

	All		Women		Men	
	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
Occupation						
Self-employed	**−0.2713**	0.0568	**−0.5113**	0.0762	0.1053	0.0948
Salaried Worker						
- medium level	**−0.1894**	0.0519	−0.0619	0.0894	**−0.2407**	0.0694
- low level	**−0.1589**	0.0596	0.0180	0.0806	**−0.3709**	0.0957
Unskilled	**−0.2088**	0.0450	−0.0190	0.0751	**−0.3081**	0.0600
Ass. spouse	**−0.4364**	0.1241	**−1.5298**	0.5890	**−0.4299**	0.1342
Sector						
Agriculture/fishery	**−0.1459**	0.0901	−0.1415	0.1254	−0.0775	0.1330
Manufacturing	*0.0793*	0.0626	*0.1095*	0.0871	*0.1391*	0.0989
Construction	**−0.2326**	0.0799	**−0.2001**	0.1117	**−0.1988**	0.1191
Trade	**−0.1537**	0.0583	−0.0908	0.0828	**−0.1637**	0.0881
Service	−0.0211	0.0666	−0.0324	0.0996	0.0588	0.0939
Restaurant/hotel	**−0.1820**	0.1466	−0.1502	0.2627	−0.1582	0.1843
Transport	−0.0635	0.0890	0.1170	0.1105	**−0.3004**	0.1572
Unknown	0.2359	0.2531	0.3725	0.3847	0.2320	0.3426
Financial Indicators						
Own income	*0.2320*	0.1500	−0.0853	0.4978	0.2012	0.1727
Pension						
Labor Market Scheme						
Capital medium	0.0491	0.0874	0.0479	0.2032	0.0033	0.1027
Capital high	−0.0147	0.0692	*0.1886*	0.1201	*−0.1172*	0.0893
Annuity medium	**0.1671**	0.0819	0.0891	0.1620	**0.2110**	0.0991
Annuity high	*0.0802*	0.0652	−0.0431	0.1155	**0.1881**	0.0848
Private scheme						
Capital medium	0.0262	0.0538	−0.1125	0.0940	0.0762	0.0665
Capital high	*0.0448*	0.0358	0.0592	0.0528	0.0337	0.0510
Annuity medium	0.0287	0.0501	**0.1199**	0.0705	−0.0409	0.0747
Annuity high	0.0394	0.0548	*0.0999*	0.0737	−0.0087	0.0920
No. of obs.	79.645		32.787		46.858	

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 5: Maximum likelihood estimates for a single risk retirement model with unobserved heterogeneity

	All		Women		Men	
Variables	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
General						
City	**−0.1142**	0.0287	**−0.1933**	0.0437	*−0.0594*	0.0390
Married	0.0651	0.0576	*0.1083*	0.0862	0.0577	0.0789
Male	**−0.2251**	0.0350				
Labor Market						
Working full time	**−0.1130**	0.0404	*−0.0630*	0.0513	**−0.5200**	0.0740
Yearly unemp. rate	**1.9729**	0.0615	**2.1302**	0.0903	**1.8528**	0.0876
Experience since 1980	**0.4997**	0.0817	**0.8056**	0.1348	**0.2168**	0.1082
Sickness Pay	**1.1068**	0.1463	**1.2031**	0.1897	**0.9621**	0.2386
Member of UI-fund	**0.5785**	0.0386	**0.3673**	0.0564	**0.7815**	0.0554
Education						
Vocational	*−0.0387*	0.0315	**−0.1387**	0.0482	0.0327	0.0426
Short	**−0.2077**	0.0943	−0.1750	0.1234	**−0.2264**	0.1209
Medium	−0.0479	0.0557	−0.0657	0.0849	−0.0102	0.0761
Long	**−0.3806**	0.0919	**−0.3599**	0.1761	**−0.3510**	0.1120
Age						
55-59	**1.4932**	0.6228	*1.2417*	0.7944	**1.3949**	0.9069
60-61	0.9241	0.8269	−0.1737	4.0992	1.0957	1.0038
62-66	0.6304	0.9155	−0.0116	4.0666	0.3534	1.2266
Wife 1-4 years older	*−0.0709*	0.0604	0.0318	0.0848	**−0.2734**	0.0950
Wife $>$ 4 years older	0.0238	0.0643	0.0886	0.0865	−0.1592	0.1416
Husband 1-4 years older	**−0.2430**	0.0595	*−0.1370*	0.0905	**−0.3135**	0.0756
Husband $>$ 4 years older	**−0.3621**	0.0629	*−0.1888*	0.0647	**−0.4335**	0.0780
Occupation						
Self-employed	**1.4392**	0.0762	**2.0261**	0.1136	**0.8447**	0.1122
Salaried Worker						
- medium level	**0.4075**	0.0452	**0.4594**	0.0719	**0.4296**	0.0637
- low level	**0.6172**	0.0512	**0.6945**	0.1084	**0.5478**	0.0582
Unskilled	**0.6746**	0.0448	**0.7682**	0.0737	**0.5869**	0.0582
Ass. Spouse	**1.6907**	0.0972	**1.8498**	0.1197	**1.2597**	0.3875

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 5: (continued) Maximum likelihood estimates for a single risk retirement model with unobserved heterogeneity

	All		Women		Men	
	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
Sector						
Agriculture/fishery	−0.0709	0.0637	0.0724	0.0898	**−0.2309**	0.0907
Manufacturing	**−0.1019**	0.0459	−0.0746	0.0673	**−0.1485**	0.0643
Construction	−0.0302	0.0534	0.0555	0.0805	*−0.1110*	0.0731
Trade	*−0.0636*	0.0420	*−0.0918*	0.0640	*−0.0825*	0.0571
Service	−0.0112	0.0489	**0.1962**	0.0759	**−0.1954**	0.0654
Restaurant/hotel	−0.0282	0.0948	−0.1661	0.1572	0.0045	0.1211
Transport	0.0021	0.0596	0.0515	0.0913	−0.0604	0.0774
Unknown	**−1.3250**	0.0618	**−1.3274**	0.0904	**−1.4191**	0.0878
Financial Indicators						
Own income	**−2.9726**	0.2951	**−2.9315**	0.5272	**−3.0852**	0.3936
Family income	**1.2124**	0.2325	**2.2193**	0.4612	**0.7917**	0.2745
Wealth	−0.0219	0.0528	0.0666	0.0792	−0.0452	0.0723
Pension						
Labor market scheme						
Capital medium	*0.1231*	0.0846	0.1168	0.1347	**0.1856**	0.1109
Capital high	*−0.0595*	0.0546	0.0438	0.0908	**−0.1181**	0.0722
Annuity medium	**0.1918**	0.0691	0.0573	0.1184	**0.2974**	0.0881
Annuity high	**0.1505**	0.0503	0.0448	0.0846	**0.2344**	0.0654
Private scheme						
Capital medium	0.0078	0.0458	−0.0127	0.0621	0.0505	0.0689
Capital high	**−0.0627**	0.0309	**−0.1040**	0.0463	−0.0181	0.0420
Annuity medium	**−0.2035**	0.0420	**−0.1258**	0.0611	**−0.2810**	0.0588
Annuity high	**−0.2952**	0.0530	**−0.1933**	0.0853	**−0.3444**	0.0685
V_1	1.5507	0.1570	1.7490	0.2051	2.0431	0.4705
P_1	0.1328	0.0325	0.1293	0.0344	0.0864	0.0327
No. of obs.	99.498		42.812		56.686	

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 6: Maximum likelihood estimates for a single risk retirement model with unobserved heterogeneity: Married couples

	All		Women		Men	
Variables	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
General						
City	**−0.1475**	0.0332	**−0.1685**	0.0486	**−0.1315**	0.0455
Labor Market						
Working full time	−0.0347	0.0832	−0.0001	0.0552	**−0.3731**	0.0890
Yearly unemp. rate	**1.9263**	0.0710	**1.9677**	0.1023	**1.8010**	0.1027
Experience since 1980	**0.4825**	0.0938	**0.7934**	0.1505	0.1461	0.1131
Sickness Pay	**1.1608**	0.1675	**1.2632**	0.1965	**0.9816**	0.2665
Member of UI-fund	**0.5485**	0.0446	**0.3656**	0.0626	**0.7620**	0.0613
Education						
Vocational	−0.0318	0.0355	**−0.1338**	0.0539	0.0308	0.0477
Short	*−0.1493*	0.1072	−0.1484	0.1711	−0.1653	0.1351
Medium	−0.0345	0.0659	−0.0359	0.0986	−0.0031	0.0874
Long	**−0.2904**	0.1102	−0.0465	0.1925	**−0.2767**	0.1322
Age						
55-59 years	**2.0049**	0.9191	*2.3863*	1.5338	0.0474	10.4336
60-61 years	**1.4737**	1.1372	1.8348	5.2231	−0.1287	10.2569
62-66 years	**1.1342**	1.1987	1.6124	3.1293	−1.1993	10.3218
Wife 1-4 years older	**−0.1413**	0.0603	−0.0272	0.1086	**−0.2804**	0.0969
Wife > 4 years older	−0.0322	0.0832	−0.0477	0.0821	*−0.2209*	0.1697
Husband 1-4 years older	**−0.2089**	0.0584	*−0.1323*	0.0957	**−0.2488**	0.0756
Husband > 4 years older	**−0.2568**	0.0795	*−0.2446*	0.1544	**−0.2553**	0.1021
Occupation						
Self-employed	**1.5076**	0.0895	**1.9126**	0.1333	**0.8895**	0.1386
Salaried Worker						
- medium level	**0.3657**	0.0521	**0.4458**	0.0866	**0.3701**	0.0717
- low level	**0.5623**	0.0574	**0.6487**	0.1218	**0.5010**	0.0647
Unskilled	**0.6024**	0.0514	**0.7345**	0.0885	**0.4900**	0.0661
Ass. spouse	**1.8505**	0.1130	**2.1368**	0.1440	**1.1834**	0.4883
Sector						
Agriculture/fishery	−0.0655	0.0732	0.0746	0.0993	**−0.2651**	0.1054
Manufacturing	**−0.0954**	0.0518	*−0.1001*	0.0748	**−0.1165**	0.0719
Construction	−0.0324	0.0602	*0.1318*	0.0894	**−0.1534**	0.0822
Trade	−0.0423	0.0481	*−0.0928*	0.0723	−0.0435	0.0650
Service	−0.0606	0.0555	*0.1192*	0.0867	**−0.2045**	0.0731
Restaurant/hotel	0.0132	0.1091	−0.0024	0.1859	−0.0003	0.1363
Transport	0.0534	0.0671	0.0557	0.1015	0.0436	0.0875
Unknown	**−1.3194**	0.0718	**−1.2276**	0.1034	**−1.3335**	0.1057

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 6: (continued) Maximum likelihood estimates for a single risk retirement model with unobserved heterogeneity: Married couples

	All		Women		Men	
	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
Financial Indicators						
Own income	**−2.9001**	0.3282	**−3.2769**	0.6964	**−3.4143**	0.4426
Family income	**0.7274**	0.2536	**2.3116**	0.6101	**0.6437**	0.2898
Wealth	0.0254	0.0594	0.0424	0.0864	0.0749	0.08112
Pension						
Labor market scheme						
Capital medium	**0.1539**	0.0945	0.1185	0.1424	**0.1941**	0.1207
Capital high	*−0.0943*	0.0544	−0.0932	0.0956	**−0.1294**	0.0774
Annuity medium	**0.1308**	0.0779	−0.0394	0.1302	**0.2366**	0.0981
Annuity high	**0.1511**	0.0555	0.0380	0.0908	**0.1975**	0.0711
Private scheme						
Capital medium	**0.0912**	0.0541	0.0719	0.0721	0.0881	0.0787
Capital high	−0.0101	0.0358	−0.0567	0.0536	0.0112	0.0481
Annuity medium	**−0.2333**	0.0534	**−0.1950**	0.0744	**−0.2330**	0.0753
Annuity high	**−0.2680**	0.0629	**−0.1863**	0.1038	**−0.2920**	0.0797
			Spouse Variables			
Labor Market						
Working full time	**−0.1836**	0.0422	**−0.4368**	0.0714	*−0.0707*	0.0541
Yearly unemp. rate	**−0.1549**	0.0701	0.0270	0.1175	**−0.2811**	0.0888
Experience since 1980	**0.2206**	0.0900	**0.2353**	0.1269	**0.2095**	0.1280
Sickness Pay	**0.1076**	0.0500	0.0173	0.0764	**0.1558**	0.0650
Member of UI-fund	**0.1341**	0.0382	*0.0644*	0.0514	**0.1671**	0.0670
Retired	**0.6826**	0.0443	**0.6665**	0.0650	**0.7192**	0.0605
Education						
Vocational	−0.0290	0.0354	0.0193	0.0495	−0.0379	0.0498
Short	0.0043	0.0987	0.1656	0.1406	−0.0998	0.1407
Medium	**−0.1913**	0.0630	0.0131	0.0888	**−0.3438**	0.0873
Long	**−0.2090**	0.0965	−0.0990	0.1110	**−0.4166**	0.2092
Age						
50-54	0.0048	0.0696	−0.1784	0.1565	0.0598	0.0817
55-59	0.0564	0.0834	−0.2036	0.1807	*0.1639*	0.1065
60-61	0.0239	0.1087	−0.2552	0.2040	*0.1973*	0.1404
62-64	0.0081	0.1210	0.2273	0.2163	0.1667	0.1641
65-88	−0.0357	0.1427	−0.2705	0.2384	*0.2859*	0.2128

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

Table 6: (continued) Maximum likelihood estimates for a single risk retirement model with unobserved heterogeneity: Married couples

	All		Women		Men	
	Coeff.	Std.err	Coeff.	Std.err	Coeff.	Std.err
Occupation						
Self-employed	**−0.3008**	0.0616	**−0.5330**	0.0815	*0.1364*	0.1048
Salaried Worker						
- medium level	**−0.2071**	0.0540	−0.0756	0.0921	**−0.2740**	0.0709
- low level	**−0.1731**	0.0634	0.0158	0.0836	**−0.4105**	0.1010
Unskilled	**−0.2235**	0.0476	−0.0341	0.0782	**−0.3445**	0.0620
Ass. spouse	**−0.4949**	0.1288	**−1.5559**	0.5930	**−0.4339**	0.1372
Sector						
Agriculture/fishery	**−0.1578**	0.0914	−0.1494	0.1274	−0.0746	0.1339
Manufacturing	*0.0876*	0.06249	*0.1223*	0.0893	0.1232	0.1007
Construction	**−0.2427**	0.0832	**−0.1961**	0.1154	**−0.2320**	0.1206
Trade	**−0.1596**	0.0613	−0.0850	0.0852	**−0.1642**	0.0910
Service	−0.0354	0.0696	−0.0301	0.1029	0.0331	0.0952
Restaurant/hotel	**−0.2430**	0.1490	−0.2244	0.2688	−0.1933	0.1840
Transport	−0.0821	0.0916	0.1273	0.1134	**−0.2952**	0.1581
Unknown	0.2145	0.2534	0.3361	0.3880	0.1920	0.3404
Financial Indicators						
Own income	0.1512	0.1660	−0.4216	0.5074	0.1143	0.1941
Pension						
Labor Market Scheme						
Capital medium	0.0371	0.0945	0.0449	0.2106	−0.0229	0.1076
Capital high	−0.0429	0.0745	*0.1882*	0.1249	*−0.1493*	0.0944
Annuity medium	**0.1651**	0.0878	0.0632	0.1692	**0.1876**	0.1026
Annuity high	0.0748	0.0709	−0.0604	0.1208	**0.1652**	0.0895
Private scheme						
Capital medium	−0.0038	0.0569	−0.1282	0.0968	0.0588	0.0704
Capital high	0.0364	0.0387	0.0489	0.0550	0.0499	0.0553
Annuity medium	0.0486	0.0554	**0.1320**	0.0751	−0.0333	0.0791
Annuity high	0.0708	0.0502	*0.1179*	0.0772	0.0664	0.1021
V_1	1.0766	0.1757	0.6295	0.2532	3.3464	2.7311
P_1	0.1816	0.0910	0.5168	0.4368	0.0463	0.0263
No. of obs.	79.645		32.787		46.858	

Note: Bold figures indicate significance at 5 percent level, italics indicate significance at 10 percent level.

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