How Does Pension Eligibility Affect Labor Supply in Couples?

Rafael Lalive, Pierpaolo Parrotta

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Abstract

Many OECD countries are reforming their pension systems. We investigate how pension eligibility affects labor supply in couples. Inspired by a theoretical framework, we measure how the sharp change in pension eligibility of both partners affects labor force participation. We find that both partners leave the labor force as they become eligible for a pension. This own pension eligibility effect is 12 percentage points for women, and 28 percentage points for men. Women also reduce labor force participation by 2 to 3 percentage points as their partner reaches pension eligibility. The partner eligibility effect is smaller and not significantly different from zero for men. The own eligibility effect is strong for women and men who have attained a low level of education. The partner eligibility effect is strong in homogamous couples, regardless of the level of education. Studying joint labor supply, we find that pension eligibility reduces labor supply in couples by 44 percentage points, about 4 percentage points more than in a model that ignores partner eligibility effects.

JEL Classification: J26, J14, C40, D10.

Keywords: Couple labor supply, pension eligibility, full retirement age, household decisions.

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*We appreciate helpful comments by two referees and the associate editor, Andrea Weber. We have presented an earlier version of the paper to seminar audiences at Universities of Lausanne and Lucerne. Rafael Lalive and Pierpaolo Parrotta gratefully acknowledge the financial support from Swiss NCCR LIVES. Pierpaolo Parrotta also acknowledges the financial support from the Carlsberg Foundation. The usual disclaimer applies.

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1 Introduction

OECD countries are experiencing sweeping changes: ageing population, dropping fertility rates, increasing in female labor supply and improving living conditions. Each of these factors has contributed to moving sustainability of the social security and pension system to one of the top priorities of the public policies. Thus, the increasing dependency ratio – the ratio of retirees to workers – has pushed national authorities to reform their social security legislation: in several cases that mainly resulted into an increase of the full retirement age.

How raising the full retirement age (FRA) translates into an increase in the actual retirement age is an active area of current research. But existing studies tend to neglect effects on pension eligibility of one partner on the spouse. These effects could potentially be large as several studies suggest that retirement is likely to be a joint decision of both partners in a couple. Workers approaching retirement age are typically married or have been living with a partner for a long time, and dual-career couples are quite important among older cohorts. Investigating couples' joint retirement choices can help in evaluating or predicting the effects produced by reforms in pension schemes.

The key challenge to identifying pension eligibility effects is that retirement decisions are jointly planned, and they can be driven by shared tastes for leisure or other typically unobserved determinants of labor supply. Correlating labor force participation across spouses in a couple does not provide a meaningful assessment of joint labor supply.

We analyze couple labor supply decisions triggered by sharp changes in pension eligibility associated with age. Specifically, we analyze joint retirement decision of spouses around the age of full retirement in Switzerland. We address the question in two steps. First, we build a simple static model of labor supply decisions. The model assumes that two partners in a couple have identical preferences with respect to consumption. Partners differ in terms of the weight they attach to partner's leisure. We also assume that all consumption goods are shared between both partners. This simple framework introduces two mechanisms for pension incentives of one partner to affect the other partner as well: leisure complementarities and interactions via the household budget constraint. Second, we build an empirical strategy inspired by the model. Our estimation strategy is a specification that captures the discontinuous change in pension eligibility with respect to age of *both* partners, a so-called double regression discontinuity design (D-RDD). This approach identifies own eligibility effects and partner pension eligibility effects by using standard RDD logic. For instance, the partner eligibility effect is identified by contrasting a partner eligible (PE) group, whose partner has just reached the FRA, to the partner ineligible (PI) group, whose partner has not yet reached the FRA. If partner eligibility to a pension matters, the PE group will be less likely to work than the PI group.

We use data from the Swiss Federal Population Census database covering the years 1990 and 2000. Census data provides information on cohabitant or married individuals, their age, education, mother tongue, labor market participation, religion, place of residence. This data is well suited for analyzing joint retirement as it provides information on several hundred thousand couples in the age bracket of 15 years prior to and 15 year post full retirement. Switzerland is also an interesting case study since pension eligibility rules trigger a sharp reduction in labor supply around the full age of retirement (62 years for women, 65 years for men). The empirical analysis relies on these sharp changes in labor supply to identify partner eligibility effects.

Our results indicate that own eligibility matters. Women are 12 percentage points less likely to be in the labor force once they reach the FRA, the effect for men is 28 percentage points. We also find evidence that partner pension eligibility matters for labor force exit. A women whose partner gets access to an old age pension is 2.3 percentage points less likely to be in the labor force. The partner eligibility effect is not significant for men. The own eligibility effect is largest for women and men who have attained at most lower secondary education. This is in line with financial incentives as the pension replacement rate is largest for this education group. The partner eligibility effect is strongest in couples that are homogamous with respect to education, regardless of its level.

Do partner eligibility effects matter for couple labor supply? To illustrate the consequences, we build an empirical model that takes both own eligibility effects and partner eligibility effects into account. This model suggest that couple labor supply drops by 31 percentage points as the husband reaches the FRA. A model that focuses on the husband alone predicts a reduction in labor force participation of 28 percentage points. The couple labor supply model predicts that couple labor supply decreases by 13.5 percentage points as the wife reaches the FRA. Modeling the wife's labor supply indicates a reduction in labor supply by 12.5 percentage points.

What do these estimates mean for policy? We estimate labor supply effects in the context of the standard RDD. In our context, the RDD provides an estimate of the causal effect of increasing the FRA by a small amount, say one year. Our couple labor supply results indicate that increasing the FRA for both women and men by one year will increase couple labor force participation by a bit more than 44 percent. A model that ignores couple labor supply would predict an increase of a bit less than 41 percent. The effect of raising the FRA is almost 10 percent larger in our joint model than models ignoring partner eligibility effects would indicate.

The existing literature has studied retirement choices and how they can be explained by using individual demographic characteristics, health conditions and insurance, wealth status, labor market experience and social security benefits.[1] However, these analyses typically neglect potential within household interactions: the decision making of a family is represented by a joint utility function for all household members. Instead, there is no room for cross-spouses interactions in individual retirement decision.

The literature started focusing on the spouses' joint labor supply behavior with the growing proportion of married women having substantial work experience and approaching retirement age. This line of research investigating the behavior of couples at the eve of retirement emerges with Hurd (1990). Using the New Beneficiary Survey (NBS) for the period June 1980 - May 1981, he provides evidence on the tendency for wives and husbands to retire together. Hurd states clearly that the causality of such a behavior can be imputed to the structure of financial incentives, similarity in tastes and complementarity of leisure.

Blau (1998), using the Retirement History Survey (RHS) from 1969 to 1979, estimates a structural model and finds strong associations between one spouse's labor market participation and the labor force transitions of the other spouse. Blau argues that financial incentives are not the main determinants explaining the simultaneity in participation decisions. It seems instead more plausibly a result of "preferences for shared leisure". However, the main limitation of the Blau's work is related to the lack of precision in the estimates due to the high degree of complexity of his dynamic multinomial probit model.

An interesting extention of Blau's approach is provided by Michaud (2003). He implements a bivariate dynamic binary choice model with serially correlated errors and unobserved heterogeneity. In particular, using an updated version of RHS and imposing some plausible restrictions on Blau's approach in order to reduce the computational complexities, he provides evidence of cross-spouse state-dependence that "points to indirect effects of social security and pension incentives through complementarity in leisure."

Similar conclusions are drawn by works employing a reduced form approach, like Zweimüller et al. (1996).[2] Zweimüller et al. (1996) study interdependent retirement in Austria (Austrian Mikrozensus 1983) finding complementarity and asymmetries between the couples' labor supply decisions: the husband reacts to changes in wives' legal retirement age but not viceversa (Zweimüller et al., 1996).

A number of papers have also been estimating structural bargaining models of couple's retirement

[1] Gustman and Steinmeier (1986); Burtless (1986); Stock and Wise (1990); Rust and Phelan (1997); French (2005); Blau and Gilleskie (2006); Van der Klaauw and Wolpin (2008), among others.

[2] The reduced form approach is implemented also by Baker (2002), Coile (2004), An et al. (2004). All find evidence of complementarity of leisure between partners.

behavior. Of these, a cooperative game approach is implemented in Michaud and Vermeulen (2004),[3] instead a non-cooperative one in Gustman and Steinmeier (2000, 2004, 2005, 2009). Despite the distinctions between the two theoretical approaches, these studies find that leisure complementarities are crucial to explain coordination in spouses' retirement choices.

Two papers are highly related to ours. Stancanelli and van Soest (2012a,b) adopt a regression discontinuity approach, similar to ours, to identify the effects of partner's retirement on home production or joint leisure using detailed time diary data on about 1000 French couples before and after retirement. Stancanelli and van Soest (2012a) do not find an effect of partner's eligibility to retirement on own retirement or market hours. Stancanelli and van Soest (2012b) find that the female partner's retirement increases hours of joint leisure. There is no corresponding effect for men's retirement on joint leisure.

This paper complements the existing literature in the following aspects. First, like Stancanelli and van Soest (2012a,b), we rely on a transparent quasi-experimental design to identify the effects of own and partner eligibility effects. The RDD approach deals with the key issues that has plagued studies aiming to learn about interactions from joint labor supply decisions. Second, we use a simple theoretical framework to develop our key empirical specification and show how it is linked to the double regression discontinuity design, pioneered by Stancanelli and van Soest (2012a,b). Third, we focus on understanding pension eligibility effects rather than actual retirement decisions. Studying pension eligibility, perhaps more modest, is more credible and policy relevant than studying actual retirement decisions. Pension eligibility effects are policy relevant as they provide the effects of changing access to retirement benefits, raising the FRA for instance. Fourth, we document policy implications of policy spill-overs by proposing a model of couple labor supply. This model highlights that couple labor supply effects can not just be derived from individual labor supply effects.

The remainder of the paper is structured as follows. Section 2 discusses the institutional background. Section 3 outlines a simple model of couple labor supply. Section 4 firstly introduces the data set and provides descriptive evidence and statistics on the sub-sample of older workers. Section 5 develops our empirical strategy. Section 6 presents our results on the role of pension eligibility for labor supply in couples. Section 6 concludes.

[3]Maestas (2001), Jia (2005), Mastrogiacomo et al. (2002), van der Klaauw and Wolpin (2008), Casanova Rivas (2010), and Honoré and de Paula (2010) are also based on cooperative games.

2 Background

This section provides background on the Swiss pension system. The Swiss pension system has three pillars. The first pillar, public old-age insurance, was introduced in 1947 to provide income to cover the basic needs in old age. The pillar is financed by contributions of about 8 % of every employee's wage, and benefits are paid to recipients of old age pensions from the old age insurance fund, a pay-as-you-go system. The first pillar aims at covering basic living expenses, so the yearly pension is capped at about one half of the median income.

Individuals can draw a full pension only when they have reached the full retirement age (FRA). In the period of our study, women can claim retirement benefits at 62 years, whereas men can do so at 65 years. Individuals can not draw pension benefits before the FRA, but can defer claiming benefits for up to five years after the full age, at actuarially fair adjustments. Pension benefits depend on the prior work history, 42 years for women, and 45 years for men, and on insured earnings of the claimant. In 1994, pension benefits range from 11,280 CHF for insured earnings of 11,280 and below (a replacement rate of 1 or higher) to 22,560 CHF per year for insured earnings of 68,000 CHF and up (a replacement rate of 33 % or lower). Individuals can work and claim at the same time, there is no earnings test.

Special rules are in place concerning retirement of spouses. In case the husband claimed a pension before the spouse did, he was eligible for the single pension based on his labor market history. Equivalently, in case the wife claimed a pension before the husband did, she was eligible for a single pension based on her labor market history. Couples became eligible to a joint pension of at most 150 % of the individual pension to which the husband is eligible once husband and wife had reached the full pension age.[4]

The second pillar, created in 1985, consists of a multitude of occupational benefit plans aims to provide retired workers with an appropriate income to guarantee the accustomed (pre-retirement) standards of living. The second pillar is private, regulated by the federal government. Federal law imposes employers to contribute at least as much as employees do: there exists a large degree of flexibility since contribution rates are proposed by pension funds. Early claiming of the second pillar benefits is possible, up to five years before the full age. Earnings below a minimum threshold are not subject to second pillar contributions. Many women in the cohorts of our sample do not have a second pillar pension.

[4] A 1997 reform introduced a possibility for men to claim early retirement, at an actuarially fair rate. The reform also introduced splitting of careers to assess pensions of married couples, leading to a small but negligible improvement, of 1 to 3 %, of the pensions for married couples (Koller 1998).

The third pillar, the individual occupation pension scheme, is voluntary and supplements the state pension with sufficient means to ensure an ultimately comfortable retirement. The contribution rate is decided individually.

Old age pension replacement rates are fairly high compared to other OECD countries (OECD 2011). The first and second pillar together pay out about two thirds of the pre-retirement earnings to the average wage earner with both pillars contributing about the same. The net replacement rate is substantially lower for high earners. For instance, individuals earning twice the average wage see one third of their pre-retirement earnings replaced. High earners rely heavily on the third pillar to guarantee adequate income replacement. Women's pension levels are substantially lower than men's, primarily because of the high prevalence of part-time work.

Our empirical strategy will focus on changes in labor supply as women and men reach the FRA. In theory, there are no sharp changes in financial incentives to induce people to claim pensions or leave the labor force. But in practice, pension claiming and labor force withdrawal may coincide with the FRA for several reasons. First, the default claiming age for the first pillar is the FRA. Individuals who do not actively opt out of claiming at the FRA will start their pension at the FRA. Second, some industries, e.g. the public sector, terminate labor contracts at the FRA. Individuals who want to continue working need to look for a new job at the FRA, not a simple task. Third, the FRA may act as a normal retirement age, coordinating people's actions (Behaghel and Blau, 2012), or people might want to leave the labor force before the FRA but be liquidity constrained. Assessing which of these reasons explain why people leave the labor force at the FRA, while interesting, is challenging. Our objective is to assess whether claiming at the FRA happens, and whether partner eligibility affects own labor supply.

3 Conceptual Framework

We develop a simple static model of retirement decisions in a household context. Our objective is to illustrate the two key behavioral mechanisms that could lead to coordination in retirement of spouses. We keep the model deliberately simple in order to derive our reduced form specification of the model of retirement decisions.

Suppose each spouse in a household has the following utility function over household consumption C and individual leisure L_i (years of retirement)

$$U_i = C + [\frac{1}{2}L_i^{\lambda} + \frac{1}{2}L_j^{\frac{\lambda}{\theta_i}}]^{\frac{1}{\lambda}} \quad (1)$$

where i refers either to the wife, F, or to the husband, M, C is household consumption $C \equiv C_i + C_j$, L_i is i's leisure, L_j is partner's leisure, $0 < \theta_i$ is the i's (dis-)taste for her/his spouse's leisure, and λ is the elasticity of substitution between consumption and leisure.

This framework builds one first key element that might matter in retirement choices, θ_i. The magnitude of θ_i defines how important partner i thinks partner j's leisure is for household well-being. Consider the case of θ_i approaching infinity. This is equivalent to stating partner j's leisure does not count in household well-being from the point of view of partner i. The opposite polar case is θ_i approaching 0. In that case, the other partner's leisure is the only important type of leisure for household well-being. The case $\theta_i = 1$, is the neutral case, both spouse's leisure are equally important for the household.

There are two key approaches to household decision making (Chiappori, 1988). The unitary approach pretends the household consists of just one individual. The non-cooperative approach assumes each partner in the couple individually. Our approach is a hybrid between the two. We assume that each spouse independently maximizes the utility function (1) above by choosing not only her or his years of leisure but also that of his or her spouse. In that sense, our solution follows the unitary approach. But by assuming that both partners do that, we are closer to the bargaining approach.

Spouse M's age at marriage is a_M, spouse F's age at marriage is a_F. Both spouses live for T periods, so life-time hours of work are $h_i \equiv T - l_i$. The life-time budget constraint is

$$C \leq w_M h_M + w_M \rho(h_M + a_M)(T - h_M) + w_F h_F + w_F \rho(h_F + a_F)(T - h_F) + A \quad (2)$$

where $\rho(h + a)$ is the pension replacement rate, i.e. the ratio of pension income to the income that could be earned by working, available to a person who has worked for h years, is a years old at marriage; this person's age at pension claiming is $h + a$. Recall that $\rho(h + a)$ is about two-thirds for the average wage earner, as soon as an individual has crossed the retirement age, zero before that. A represents any joint assets.

The key feature of the budget constraint is the pension replacement rate (PRR), $\rho_i(h_i + a_i)$. Let R_i be the full retirement age. The PRR is zero before the full retirement age R_i, increases in an actuarially fair fashion between the full and the late retirement age ($R_i + 5$), and it stays constant thereafter. In our discussion here, we assume that the PRR is zero before the retirement age, jumps to a positive level and stays constant thereafter, i.e. $\rho_i(h_i+a_i)=0$ if $h_i+a_i<R_i$ and $\rho_i(h_i+a_i)=\rho$ if $h_i+a_i\geq R_i$. This simplification is not correct, but it captures the empirical regularity that fewer than 1 % of all individuals claim pension benefits after the full retirement age (Lalive and Staubli, 2014).

Maximizing (1) subject to the budget constraint (2) produces the following first order condition for the husband

$$\frac{L_M^{\lambda-1}}{\frac{1}{\theta_M}L_F^{\frac{\lambda}{\theta_M}-1}}=\frac{w_M-w_M\rho(h_M+a_M)}{w_F-w_F\rho(h_F+a_F)} \tag{3}$$

The female spouse also maximizes (1) subject to the budget constraint (2) and her optimal leisure choices are characterized by the following condition.

$$\frac{L_F^{\lambda-1}}{\frac{1}{\theta_F}L_M^{\frac{\lambda}{\theta_F}-1}}=\frac{w_F-w_F\rho(h_F+a_F)}{w_M-w_M\rho(h_M+a_M)} \tag{4}$$

Optimal duration of retirement, in logs, from the point of view of the husband is

$$lnL_M=\frac{1}{1-\lambda}\left[ln\theta_M+ln\left(\frac{\tilde{w}_F}{\tilde{w}_M}\right)+\left(1-\frac{\lambda}{\theta_M}\right)lnL_F\right] \tag{5}$$

where $\tilde{w}_F$ and $\tilde{w}_M$ are the numerator and denominator in right hand side of equation (3), respectively, and λ is positive but smaller than 1 according to Merkurieva (2012). Here we see that desired leisure of the husband depends on desired leisure of the wife to an extent that depends on how important the husband assesses the wife's leisure, θ_M. If $\theta_M=1$, then the husband will increase leisure one for one with his wife's leisure. If $\theta_M<1$, the increase will be more than one-for-one. If $\theta_M>1$, the increase will be less than one for one.

The desired leisure combinations from the wife's point of view are the following:

$$lnL_F=\frac{1}{1-\lambda}\left[ln\theta_F+ln\left(\frac{\tilde{w}_M}{\tilde{w}_F}\right)+\left(1-\frac{\lambda}{\theta_F}\right)lnL_M\right] \tag{6}$$

It is obtained just replacing variables referring to the husband M with those refering to the wife F and vice versa.

We now solve for the wife's retirement by combining equations (5) and (6). By doing so, we solve for optimal retirement consistent with the point of view of both partners. This constitutes an equilibrium since no partner has an incentive to deviate. The equilibrium solution for the wife is

$$lnL_F = \frac{(1-\lambda)ln\theta_F + (1-\frac{\lambda}{\theta_F}) - (\lambda - \frac{\lambda}{\theta_F})ln\frac{\tilde{w}_M}{\tilde{w}_F}}{(1-\lambda)^2 - (1-\frac{\lambda}{\theta_F})(1-\frac{\lambda}{\theta_M})} \qquad (7)$$

Equation (7) shows that both labor supply incentives of the husband and his or her spouse matter for the wife's labor supply decision.[5] The change in the pension replacement rate at the full age, captured by $\tilde{w}_M$ and $\tilde{w}_F$, affects the demand for leisure for both wife and husband. How much wives discount their husband's years of retirement in household well-being matters. Wives who discount their husband's leisure a lot, $\theta_F > 1$, demand more leisure if their husband's net wage, $\tilde{w}_M$, increases relative to their own net wage, $\tilde{w}_F$, presumably because their husband works more. In contrast, wives who think their husband's retirement years are important for couple welfare will reduce their demand for leisure as the labor market opportunities of their partner improve.

4 Data and Descriptive Analysis

The analysis is based on the data from the Swiss Federal Population Census covering the years 1990 and 2000, respectively. Census data includes information on whether an individual is the head of household, spouse, or child, the number of people in the household, her age, education, mother language, labor market status, religion, and further details about place of work and residence.

We focus on a sample of married couples with the male partner in the age bracket 50 to 80 years and the female partner in the age bracket 47 to 77 years.[6] This sample ensures we observe an age range of 15 years prior and 15 years post full retirement age. The key outcome variable is labor force participation. The census allocates all individual to the employed category who have been working for at least one hour in the week of the census (December 1990 or 2000). This category includes self-employed and individuals who are working in the family business without pay. Unemployed individuals are those who are out of a job but have been looking for a job within the previous four weeks. Labor force participants are those who are either employed or unemployed. We focus on labor force participation rather than on retirement because labor force participation (or non-participation) will reflect all forms of inactivity. Thus, labor force participation will also capture a transition from employment to non-employment in cases where people do not enter retirement right away.

The running variable in our regression discontinuity analysis is age. Census data contains information on age in years rather than in a continuous fashion. We account for this by clustering all

[5] Extending our analysis to the case of the second spouse, we end up with a reduced form specification of her labor supply that is conceptually very similar to equation (7).

[6] We found no cohabitant couples in our estimation sample.

our analysis at the level of age and age of partner, as recommended by Lee and Card (2008), using two-way clustering (Cameron, Gelbach and Miller, 2011).

4.1 Descriptive statistics

Table 1 and 2 respectively report descriptive statistics for women and men in our sample. Columns 1-3 report mean values and t-tests for mean differences of observable characteristics comparing individuals whose spouse exceeds the full retirement age (treated) to individuals whose spouse does not exceed the full retirement age (controls). Columns 4 and 5 present a test for balancing of the co-variates at the retirement age thresholds (see below).

Our list of observables refers to the highest level of education achieved, languages spoken and religious affiliation, and cantons where surveyed people live. Tables 1 and 2 depict a part of the Swiss population over the period 1990-2000, so the majority of people holds a secondary education, speaks German, French or Italian as mother tongues and is member of the Evangelical Reformed or Roman Catholic Church.

Table 1 about here

Column 4 of Tables 1 and 2 shows whether observed characteristics are balanced at the age threshold making the spouse eligible for retirement. This column compares the mean of each characteristic for individuals whose spouse has just reached the full retirement age to the mean that would be expected from individuals whose partner has not yet reached the full retirement age.[7] Column (4) therefore tests whether there are differences in the mean of covariates between women whose partner has reached full retirement age compared to women whose partner has not yet reached it, a key test of the validity of the RDD (Hahn et al. 2001; Lee and Lemieux, 2010). Interestingly, many of the significant differences between treated and control women in column 3 disappear at the threshold. The only remaining significant differences for women refer to the proportion French speakers (0.75 percentage points higher), the proportion living in Vaud (0.48 percentage points higher), and the proportion of immigrants (1.6 percent lower).

Table 2 about here

[7] Specifically, column 4 reports the point estimate of γ in the following regression:

$$x_i = \alpha + \gamma D_j + \beta_{01}(S_j - R_j) + \beta_{02}(S_j - R_j)^2 + \beta_{11} D_j (S_j - R_j) + \beta_{12} D_j (S_j - R_j)^2 + \epsilon_i$$

where S_j is the age of the spouse, R_j is the full retirement age of the spouse, and $D_j = 1$ if $S_j \geq R_j$, and zero otherwise. Column 5 reports the standard error on γ.

For men, we find that the proportion of Jewish (0.06 percentage points higher) is not balanced (see Table 2 Column 4). Yet, while the number of non-balanced characteristics is somewhat larger than one would expect from mere chance, these imbalances are not quantitatively important to an extend that could bias results. In addition, the imbalances for both women and men refer to a piece of information we will control for. We conclude from this analysis that key background characteristics are balanced between individuals whose partner is eligible and individuals whose partner is not eligible. This is a key requirement for the RDD in partner age to be valid.

4.2 Descriptive evidence

We are interested, first, in understanding how pension eligibility rules affect labor supply patterns of individuals around the retirement age. Figures 1 and 2 show how the individual's labor supply varies with respect to her/his age. Figure 1 illustrates how women's labor force participation evolves with own age. Labor force participation strongly decreases from a level of about 68 % at age 47 years to a level of about 35 % at age 61 years. Interestingly, labor force participation drops sharply between 61 and 62 years. Fewer than 20 % of the women who are 62 years work or are currently looking for work whereas the corresponding share is about 35 % for women who are 61 years old. This sharp drop can plausibly be attributed to women reaching the full retirement age and thereby gaining access to pension payments. Labor force participation rapidly decreases thereafter and reaches a level of about 5 % or less at age 70 and higher.[8]

Figure 1 about here

Interestingly, retirement decisions display sharp discontinuities at the full retirement age. This pattern of evidence can not be rationalized in a life cycle labor supply with full access to financial markets. But the pattern is in line with the fact that labor contracts in some industries end on the full retirement age. Behaghel and Blau (2012) argue that loss aversion also triggers early retirement in the U.S. We expect similar reasoning to apply in Switzerland. Access to loans are less than fully developed.

Figure 2 displays labor supply near retirement age for men. Strikingly, almost 100 % of all men in the age bracket from 50 to 59 years report to be employed or looking for work. Labor supply nonetheless decreases quite rapidly from 60 to 64 years reaching a level of 60 % at age 64 years.

[8] Note that labor supply of women near the full retirement age has substantially increased in the period between 1990 and 2000 (not shown in the figure). Whereas 60 % of the 47 year old women worked in 1990, almost 75 % of all 47 year old women worked in 2000.

Labor supply falls again substantially for men who gain access to old age pensions. Only about one in five men aged 65 years reports still being part of the labor force whereas the corresponding figure is three out of five of the men aged 64 years. Men reduce labor supply much stronger upon reaching the retirement age than women do, because fewer women still work close to the retirement age, and retirement pensions are a smaller part of pension wealth for women than for men. Labor supply rapidly decreases with age to reach a level of 5 % or less by age 75 years.[9]

Figure 2 about here

Figure 3 reports labor force participation of women as a function of the age of their spouse. The key idea is that we should observe a discontinuous change in labor supply of women triggered by retirement access of their spouse if spousal pension eligibility matters. The figure displays that labor supply of women falls rapidly as their spouse ages. This is predominantly because of similarity in age for spouses. The figure also shows a relatively small but abrupt reduction in labor supply of women whose spouse is 64 years old compared to women whose spouse is 65 years old. Whereas about 30 % of all the women in the former group are economically active, only 25 % of the latter group still are active.

Figure 3 about here

In order to isolate the effect of the spouse reaching full retirement age, Figure 4 presents residuals of a regression of the women's labor force participation on a dummy taking the value 1 if the women has reached the full retirement age threshold, and a quadratic in age on both sides of the threshold. This regression cleans the data from any effect of the spouse's age on labor force participation. Results in Figure 4 indeed indicate a sizeable drop in labor force participation of women exactly when their partner reaches the full retirement age. The residuals are about 2.5 percentage points lower for a women whose spouse is 65 years old compared to women whose spouse is 64 years old.

Figure 4 about here

Figure 5 discusses manipulation at the age threshold, a key concern with the RDD (Lee and Lemieux, 2010). While it is difficult to envision how individuals would manipulate their own age or the age of their partner in a stable partnership, manipulation might still be a concern if retirement affects marital stability.

[9] Unlike for women, labor supply has actually decreased between 1990 and 2000 for men. Whereas 70 % of all men aged 64 years were still active in 1990, the corresponding figure had dropped to 50 % in 2000.

Figure 5 about here

Figure 5 displays the number of women observed in partnerships with men aged 50 to 80 years. Results indicate that the higher number of women observed in couple with men aged 63 to 69 years is somewhat higher than would be expected from a linear regression over the entire age range. But the increase in number of observations appears gradual and is by no means related to the age 65 years threshold. We conclude from evidence in Figure 5 that manipulation of the age of the spouse (the running variable in the RDD) is not a concern.

Figure 6 about here

Figures 6 to 8 discuss effects of women's access to retirement on their men's labor supply. Figure 6 shows that labor force participation of men drops sharply in the age of their women, again mostly due to their own age increasing as well. There appears to be a discontinuous drop in labor force participation of men whose partner is 62 years compared to men whose partner is 61 years old.

Figure 7 about here

Figure 7 reports the residuals of male labor force participation after dependence on own age has been removed.[10] Figure 7 indicates a reduction in male labor supply associated with the wife getting eligible for an old age pension but the corresponding effect is only a reduction of about one percentage point, i.e. substantially smaller than the one for women. This substantially smaller reduction could be due to two reasons. First, women reduce labor force participation less once they get access to old age pensions than men (Figure 1 vs Figure 2). Second, men could coordinate labor supply with their spouse less than women do.

Figure 8 about here

Figure 8 shows the possibility of manipulation at the threshold finding no substantial departure from a linear fit through the number of observations in the age bracket 52 years to 72 years.

5 Empirical Strategy

In our empirical approach we do not observe the number of years in retirement, L, but we have cross section information on labor force participation. Inspired by the theoretical framework, we build

[10] We project labor supply of men on a dummy indicating that the man has reached the full retirement age threshold, and a quadratic polynomial in own age that is allowed to differ on either side of the threshold.

models of whether an individual is in the labor force, or not, on survey data. Our main estimation approach is the following double regression discontinuity (D-RDD) specification

$$Y_i = \alpha + \gamma D_i + f_i(S_i - R_i) + \delta D_j + f_j(S_j - R_j) + \epsilon_{ij} \quad (8)$$

where $Y_i = 1$ if i participates in the labor market, and $Y_i = 0$ otherwise.[11] S_i is i's age, R_i is the full retirement age, and $D_i = I(S_i \geq R_i)$ is the pension eligibility indicator. The unknown functions $f_i(\cdot)$ and $f_j(\cdot)$ describe how labor force participation evolves with own age and partner age, relative to own and partner full retirement age.[12] Unlike a standard RDD, this model includes a full RDD specification for both partners in the couple.

Our specification is directly inspired from the theoretical framework we sketched earlier. That framework makes clear that both partner's pension eligibility matters for their optimal labor market exit age. The two key parameters of interest are γ and δ. γ measures how my own pension eligibility affects the decision to leave the labor force. δ measures how my partner's pension eligibility affects my own decision to leave at my partner's eligibility age.

Many people leave the labor force at the FRA, in many countries and contexts (Gruber and Wise, 1999), a phenomenon related to bunching. A novel feature of our approach is to study bunching at the partner's retirement age. Bunching at the partner's retirement age can occur if you would work longer than your partner's retirement age, but, upon your partner passing the retirement age, you would like to leave the labor force. Our conceptual framework, discussed in section 3, suggests bunching could happens since both partner's incentives matter. Optimal joint leisure requires that partners in a couple be sensitive to all incentives facing the household.

We will contrast results that use the double RDD specification above with the following approach

$$Y_i = \alpha + \gamma D_i + f_i(S_i - R_i) + \epsilon_{ij} \quad (9)$$

This approach models labor supply as a function of own pension access, ignoring labor supply effects from pension access of the partner. We will discuss below to what extent the simple specification (9) or the extended specification (8) can be used to assess the effects of pension reform.

[11] Our empirical model of couple labor supply bears some resemblance to peer effects models. See Angrist (2014) for an overview specification of peer effects models.

[12] We approximate $f_i(\cdot)$, and $f_j(\cdot)$ using polynomials and with local linear regression, see below in the results section, and we test manipulation and balancing of covariates in the next section.

6 Results

We start presenting results from the simple model (9). Table 3 reports estimates for women (top panel), and men (bottom panel), relaxing functional form assumptions as we move from column (1) to (4). Column (1) results are based on wide age brackets, 15 years on either side of the FRA, assuming linear trends in labor force participation around the retirement age. Column (2) keeps the age bracket, but allows for a quadratic trend in age. Column (3) adds control variables. Column (4) focuses on couples no further than 5 years from the FRA, keeping controls, and allowing for quadratic trends. Column (4) reports the most flexible estimates.

[Table 3 about here]

The most flexible standard RDD estimates indicate that labor supply drops sharply at the retirement age (column 4 of Table 3). Women are 12.4 percentage points less likely to work upon reaching the FRA. Men are 28.3 percentage points less likely to work upon reaching the FRA. These own pension eligibility effects are sizeable and suggest a significant proportion of women and men time labor force exit to coincide with reaching the FRA.

How do results change as own pension and partner pension access is taken into account? Table 4 reports estimates of our key empirical model, equation (1), column (1) adopting a linear specification of f_i and f_j on either side of the full retirement age. Results indicate that a woman whose spouse has reached the full retirement age is 5 percentage points less likely to participate in the labor market compared to the prediction based on women whose spouse has not yet reached the full retirement age (coefficient "Spouse's pension eligibility"). Women who have reached the full retirement age are 22 percentage points less likely to be economically active (coefficient "Own pension eligibility").

[Table 4 about here]

Columns (2) to (4) discuss the sensitivity of this baseline finding with respect to the functional form in the terms reflecting the deviation from the full retirement threshold. Column (2) adopts a quadratic specification on either side of the retirement threshold. Results are sensitive to functional form. Women whose partner has reached full retirement age are less likely to participate in the labor market. The corresponding effect is a reduction by 2.5 percentage points – about half the size measured in column (1). Moreover, women who turn eligible to retirement pensions reduce labor supply by 15 percentage points – about two thirds the size predicted in column (1). Results in column (2) indicate that finding an appropriate functional form is important. Column (3) shows sensitivity of the results to the inclusion of control variables. Adding those variables literally does not change estimates of the spouse's access to retirement pensions nor the estimate concerning a women's own access to a retirement pension. Column (4) reduces the age bracket substantially, to five years above and five years below the FRA. Results indicate a 2.3 percentage point reduction in labor supply of women, due to pension access of their men. Women who reach retirement age reduce labor supply by 12.5 percentage points.

Our first explorations into functional form show that results are fairly sensitive to choice of the polynomial order, but less to the bandwidth. At present, we are not aware of how to choose bandwidth choice in the double RDD. Choice of bandwidth is not standard in our setting because imposing a bandwidth on one spouse will select also on the partner. Imbens and Kalyanaraman (2012) discuss optimal bandwidth choice in the standard RDD, featuring only one running variable and one threshold. Figure 9 shows the local polynomial smoothed version of the data, using the Imbens-Kalyanaraman-optimal bandwidth of 1.8 years. Women clearly reduce labor force participation at their partner's FRA.[13]

Figure 9 about here

Table 4 shows results for men in the bottom panel. Columns (1) to (4) illustrate that functional form choices in the double regression discontinuity design is very important. Column (1), with linear trends, no controls, and large age brackets, shows a strong effect of the spouse reaching the retirement age on men, a reduction of 6.7 percentage points. The effect of the own retirement age is also strong, a reduction in labor supply of 49 percentage points. With higher order trends, controls, and a five year age bracket on either side, the cross effect of the spouse becomes small and is not significantly different from zero. Women's eligibility affects men less because women have access to small pensions, and fewer women leave the labor force at the FRA. Men's eligibility to a pension reduces labor supply by 28 percentage points, about double the effect of women's own effect, in the preferred specification (column 4).

Partners in a couple typically do not reach retirement at the same time. Does it matter whether a women reaches the retirement age before her spouse does? Table 5 discusses this issue. Column (1) reports the baseline result for all couples. Column (2) shows results for women who reach the retirement age before their spouse does (at most two years younger than their spouse). Results for the partner eligibility effect are very much in line with the baseline. But the own eligibility differs

[13] We have also explored methods developed in Calonico et al. (2014). These methods require continuous assignment variables, so they are not adapted to our discrete assignment variable.

somewhat. Women who reach the retirement age before their partner does reduce labor supply by 14 percentage points, 2 percentage points more than the average. Column (3) shows results for women who reach the retirement age after their spouse does (at least four years younger). Women who reach the retirement age after their partner reduce labor supply by 10 percentage points, or 2 percentage points less than the average.[14]

[Table 5 about here]

Results are similar for men. The partner eligibility effect is small and insignificant regardless of whether a man reaches retirement age before or after his wife. But men who reach the retirement age before their spouse does reduce labor supply by 30.6 percentage points, somewhat more than average, whereas men who reach retirement after their spouses does reduce labor supply by 27 percentage points, or less than the average. These results indicate that the spouse who reaches the retirement age first reacts more strongly to pension eligibility than the trailing spouse.

Access to a retirement pension might matter for both own and partner eligibility effects. A women who has access to a retirement pension, but is still working, may react more strongly to her spouse reaching retirement than a women who has no access to a retirement pension. Table 6, top panel, presents results that limit the sample to women who are very close to the retirement age. Column (1) reproduces baseline results, from Table 4 column (4). Column (2) shows results for women who are about three years from retirement age, none of them eligible for a retirement pension. Having a pension eligible spouse, reduces labor supply by 4.4 percentage points, somewhat more than average. Column (3), based on women about one year before retirement, shows an effect of 2 percentage points, insignificant, and column (4) shows an effect of 2.4 percentage points, significant. The partner eligibility effect does not appear to depend on own access to a retirement pension for women who are close to the regular retirement age.

[Table 6 about here]

We might also ask the effect of becoming eligible for a retirement pension depends on the presence of a pension eligible spouse. Column (5), in Table 6, measures the retirement access effect for women whose spouse is about three years from retirement age. Women who reach the retirement age reduce labor supply by 14.6 percentage points when living with a partner who is close to but not yet eligible for retirement, slightly but insignificantly larger than the effect in column (1). Columns (6) and (7)

[14] We exclude couples who reach pension eligibility at the same time, with an age difference of three years.

report an own effect of 13 percentage point also for women whose spouse is one year before, or one year after retirement. The own incentive effect does not depend on pension access of the spouse.

How do own and partner incentive effects play out for men? The bottom panel of Table 6 reports the results for men, following the same layout as for women. Partner eligibility effects are imprecisely estimated, and somewhat larger than in the baseline. The partner eligibility effect for men who are at the FRA or older is significantly different from zero, -1.5 percentage points. But the partner eligibility effects are not sensitive to pension access of the spouse. How about own incentive effects? The own incentive effect is very much in line with our baseline estimate, a reduction of 28 to 30 percentage points. The results for men are coherent with the results for women.

Table 7 explores the role of education, a proxy for earnings potential. Column (1) reproduces baseline estimates, columns (2) to (5) report women labor supply results, grouped by whether the women as a high or low education, and her spouse has high or low education. High education refers to people with degrees at the upper secondary or tertiary level, whereas low education refers to people with degrees at the primary or lower secondary level. Consider first the own eligibility effect. Pension eligibility reduces labor supply of women with a high education by 12 percent (column 2), or 10.9 percent (column 3). Pension access has a stronger effect on women with a low level of education, the reduction is 14.7 percentage points (column 5) or 11.2 percentage points (column 4). This pattern is consistent with replacement rates being larger for low educated individuals. Interestingly, the smallest point estimate is for highly educated women married to a spouse with low education. This is consistent with the cap, at 150 % of the man's pension, that applies to couple pensions.

[Table 7 about here]

Consider now the cross incentive effects on women. As for the own incentive effects, the cross incentive effect is somewhat, but not significantly, stronger for women with a low educated spouse compared to a women with a highly educated spouse. Interestingly, the partner incentive effect is stronger for homogamous couples, where both partners have either a high education, or a low education, than for heterogeneous couples.

The bottom panel of Table 7 shows results for men. Low educated men who get access to a retirement pension tend to leave the labor force at a rate of 35.2 percentage points (column 5), or 28.1 percentage points (column 4). The effect on highly educated men is on average somewhat weaker, a reduction of labor supply by 22.8 percentage points (column 2), or 30.3 percent (column 3). The pattern of own eligibility effects for men mirrors that for women.

Consider now the partner incentive effects for men (Table 7 bottom). Interestingly, cross incentive effects are strongest for men who live with a women of the same level of education. Men with high education will reduce labor force participation by 1.3 percentage points if their highly educated spouse gets pension access (column 2). Men with low education will, not significantly, reduce labor force participation by 1.6 percentage points as their low educated spouse enters pension age (column 5). The partner effect estimate is close to zero, or even positive for mixed couples.

What do our analyses imply for pension reforms that change the full retirement age (FRA)? Our results so far suggest that labor supply decisions around the full retirement age are interconnected. Assessments of pension reform need to take this into account. A simple way for taking couple interactions into account is to model joint labor supply. Specifically, we estimate the following model

$$Y_F + Y_M \quad = \quad \alpha + \gamma D_F + f_F(S_F - R_F) + \delta D_M + f_M(S_M - R_M) + \epsilon_{F,M} \qquad (10)$$

This model follows the exact same specification as our baseline. But the dependent variable is the combined labor force participation of both spouses in the couple, rather than just one partner in the couple.[15] The parameter γ captures the effect of a women reaching the FRA on couple labor supply. This effect arises for two reasons. A women may decide to leave the labor force because she is becoming eligible for a pension, or her husband may leave the labor force because she becomes eligible for a pension. The parameter δ captures the effect of a man reaching the FRA on couple labor supply. This effect captures the effect of pension eligibility on the man's labor supply, as well as on his wife's labor supply.[16]

[Table 8 about here]

Table 8 shows the results of our empirical exercises. Results indicate that pension eligibility of the wife reduces couple labor supply by 13.5 points, almost all of this due to the wife leaving the labor market. Pension eligibility of the husband reduces couple labor supply by 30.7 points, most of this due to the effect on the husband, but some also due to the effect on the wife.

Columns (2) to (5) explore the role of education. Pension eligibility of women reduces labor supply most strongly for couples with a low educated husband and wife. Surprisingly, the second most

[15] Interpretation of parameter estimates is slightly non-standard. The dependent variable takes the values 0 if both partners in the couple left the labor force, 1 if exactly one partner works, and 2 if both partners work. We will refer to the parameter estimate multiplied by one hundred as points, bearing in mind, that these are not points out of 100, percentage points, but points out of two-hundred.

[16] This specification allows for any cross partner correlations in the error terms of a couple.

important effect is in couples with highly educated partners. This is because the partner eligibility effect is largest for highly educated couples (Table 7). The effect of raising women's retirement age is smallest for mixed couples, where the cross incentive effect is absent. Pension eligibility for men is most effective in low educated couples, lowering labor supply by 38.1 points, and least effective for highly educated couples, lowering labor supply by 25.5 points. Mixed couples respond to an intermediate extent.

Consider the effects of raising the full retirement age for men. RDD estimates can be used to simulate small changes in the assignment threshold (Lee and Lemieux, 2010). Raising the retirement age is exactly such a policy. We use our estimates of the reaching the retirement age to assess the effects of increasing the FRA by a small amount, say one year. Results from Table 8 show that raising the FRA for the wife increases couple labor supply by 13.5 points, by 30.7 points when raising the FRA for the husband, and by 44.2 points when raising the FRA for everyone.

Our results allow for partner eligibility effects in couple labor supply. A simpler, alternative approach to couple labor supply would model each partner's labor force participation with each partner's pension eligibility. The model in Table 3, reported earlier, adheres to this simpler, alternative approach. Standard estimates of the own eligibility effect can be used to predict couple labor supply. Couple labor supply will increase by 12.4 points if the FRA is increased for women, or by 28.3 points if the FRA is increased for men (Table 3). Adding the two effects yields a total effect of 40.7 points, notably 3.5 points less than in the joint scenario. Accounting for partner eligibility effects in labor supply is important.

7 Conclusions

This paper discusses the pension eligibility for couple labor supply. Adopting a double discontinuity design for both partners in a couple, we find that both men and women react strongly to crossing the full retirement age. Upon reaching the full retirement age, men are 28 percentage points less likely to be in the labor force, and women are 12 percent less likely to remain in the labor force. Women react significantly and qualitatively importantly to access to retirement pensions in Switzerland. No corresponding effect is found for men whose spouse gains access to retirement pensions. Low educated men and women react strongest to becoming eligible for a pension. Spouses in homogamous couples, regardless of education level, are most strongly affected by their partner's pension eligibility.

These results have important implications for policies aiming to increase the full retirement age.

Our analysis suggests that changes to women's retirement age will not affect male spouses of the affected women much. In contrast, raising the retirement age for men will carry a double dividend since this increase spills over to the female spouses. This analysis therefore shows that a policy targeted to one partner in a couple may well also change the behavior of the other partner in the couple. Assessing a reform without taking partners into account misses a small but potentially important part of its labor supply effect.

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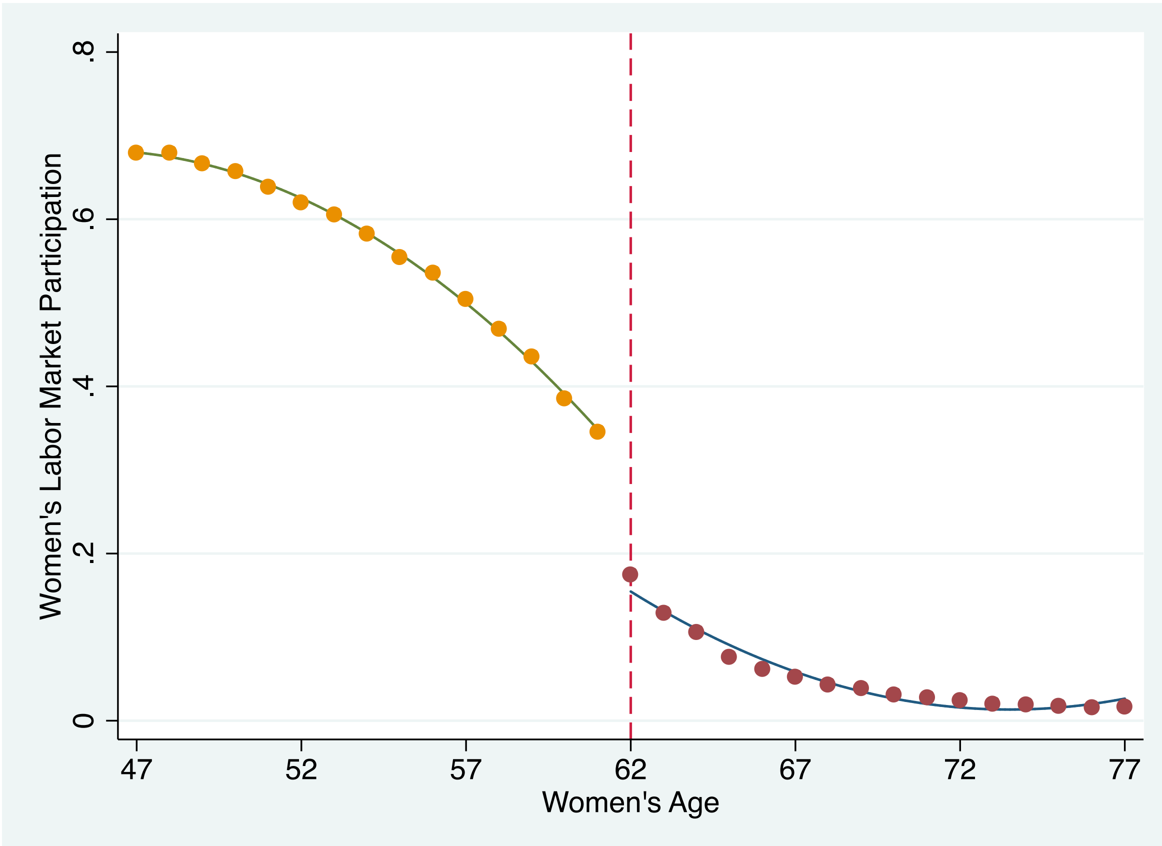
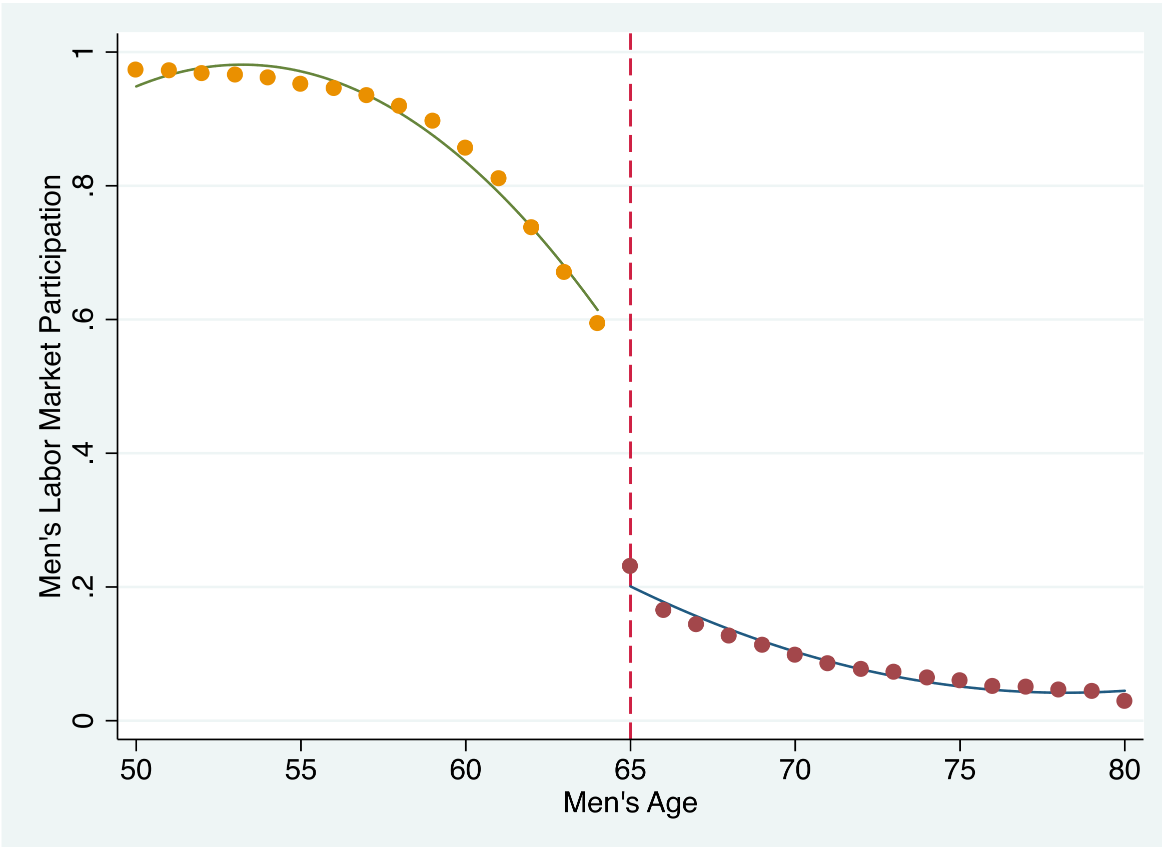
Figure 1: Women's labor market participation over their own age.



Source: Swiss Census data.

Legend: The dashed vertical line indicates the female full retirement age.

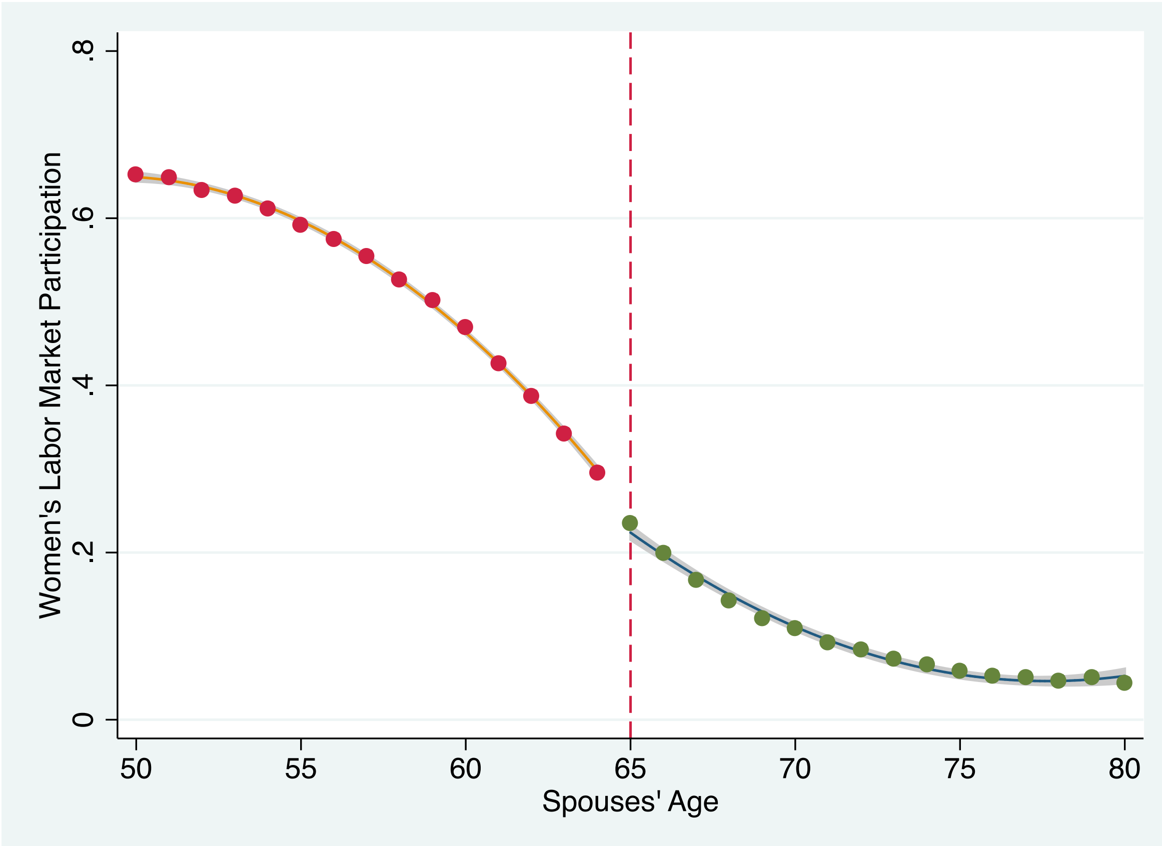
Figure 2: Men's labor market participation over their own age.



Source: Swiss Census data.

Legend: The dashed vertical line indicates the male full retirement age.

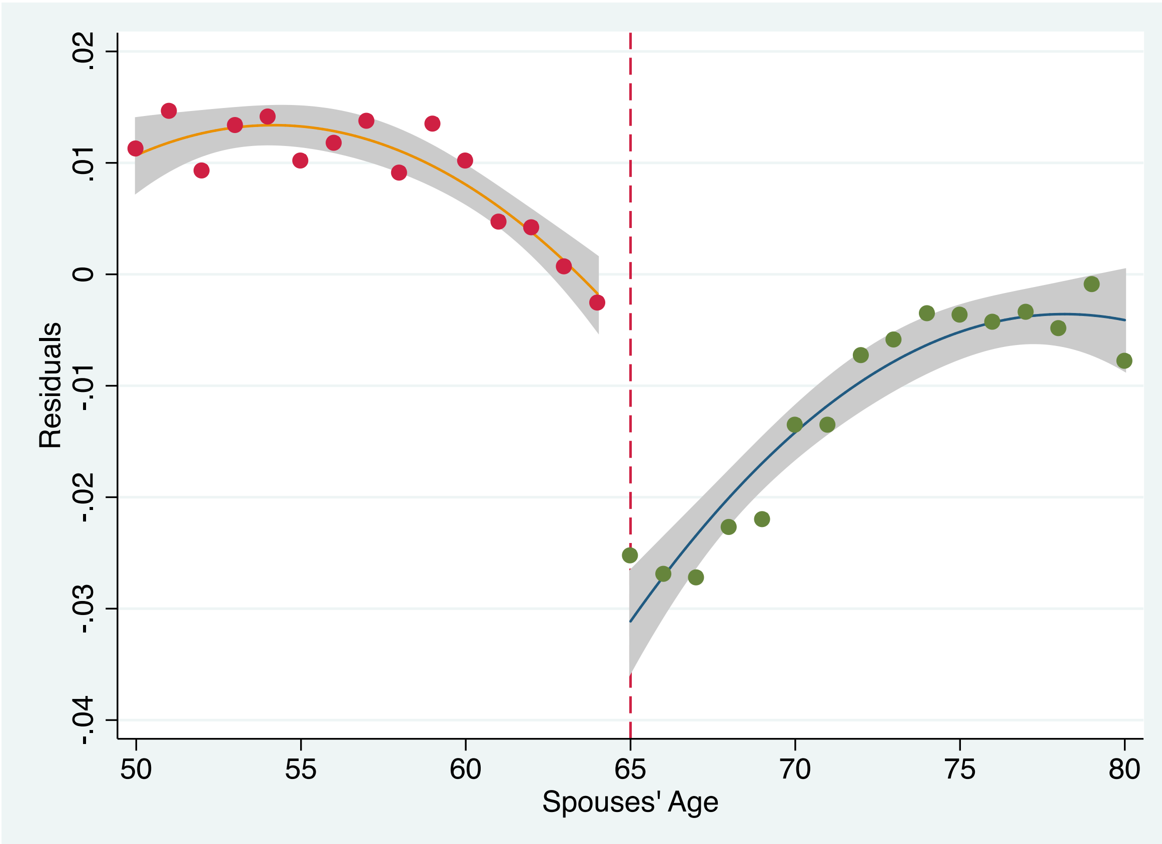
Figure 3: Women's labor market participation over their spouses' age.



Source: Swiss Census data.

Legend: Quadratic fit, 95% confidence interval and scatter plot. The dashed vertical line indicates the male full retirement age.

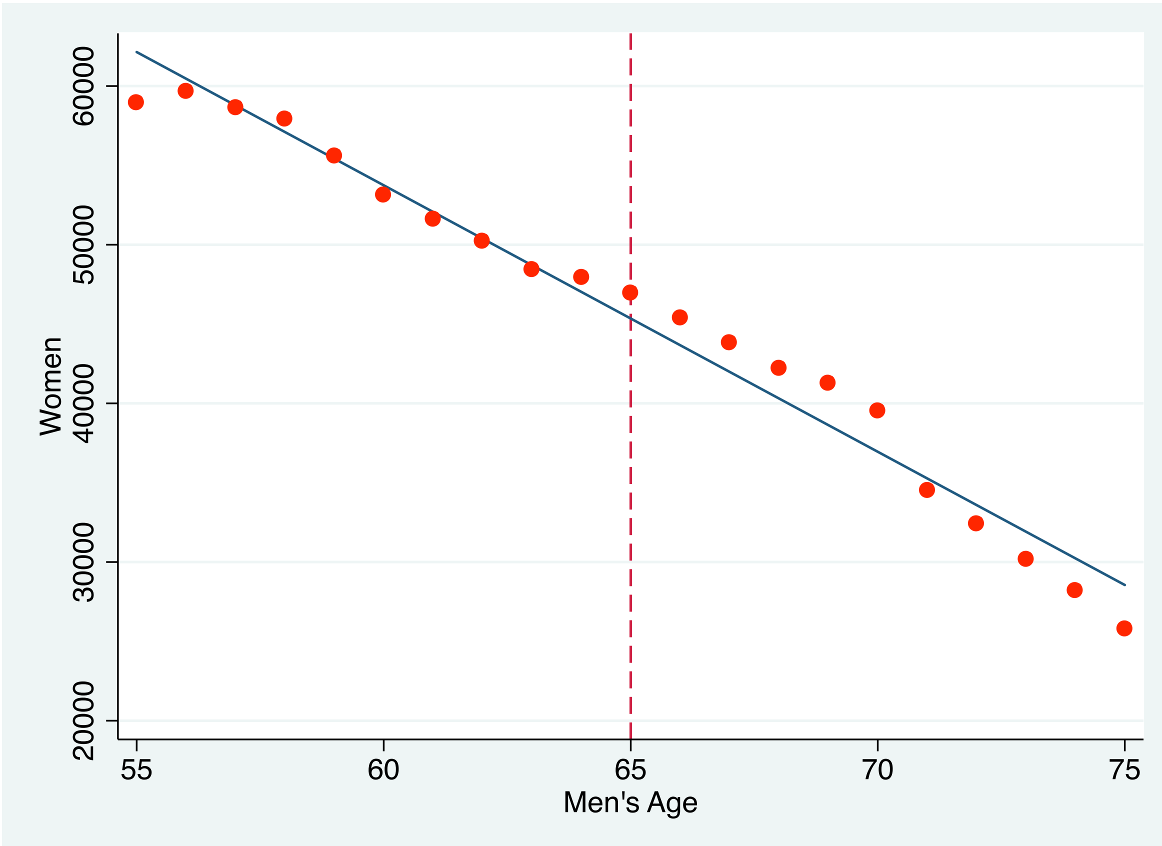
Figure 4: Women: Residuals from a quadratic RDD on own full retirement age over their spouses' age.



Source: Swiss Census data.

Legend: Quadratic fit, 95% confidence interval and scatter plot. The dashed vertical line indicates the male full retirement age.

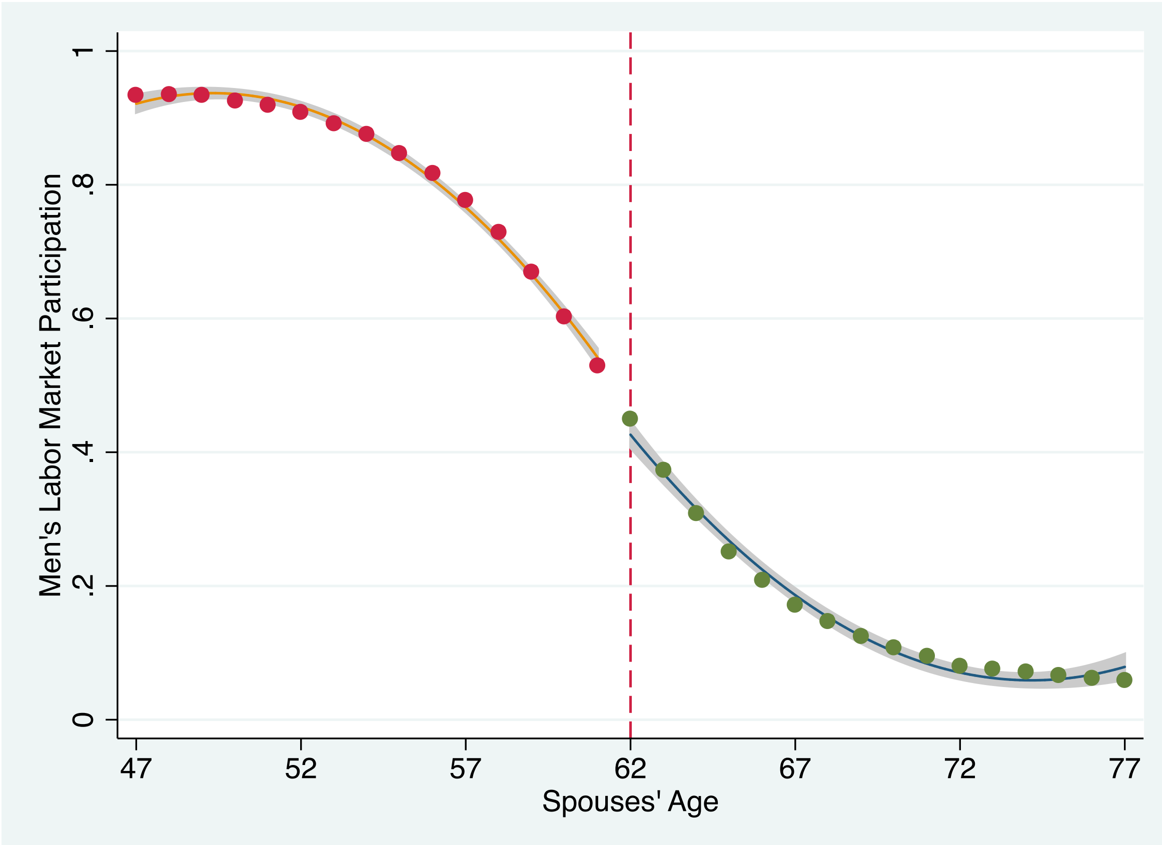
Figure 5: Number of women over their spouses' age.



Source: Swiss Census data.

Legend: The dashed vertical line indicates the male full retirement age.

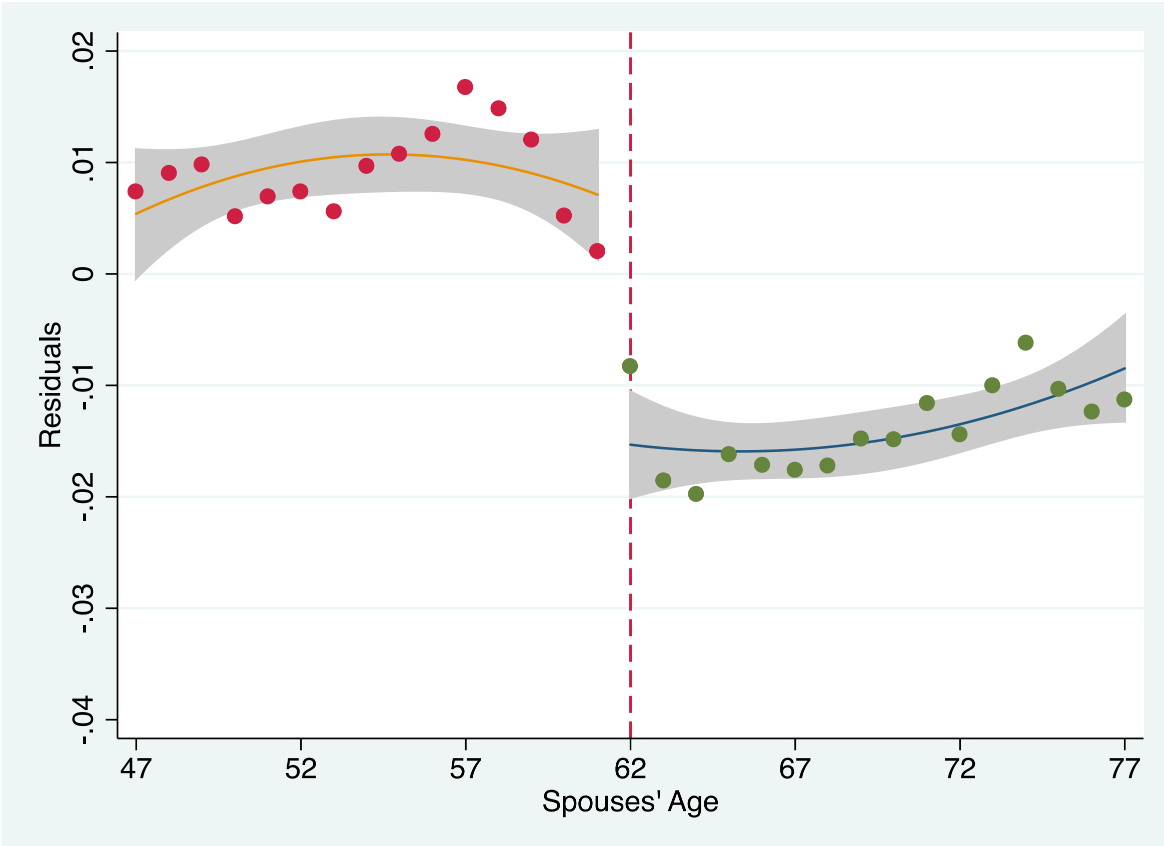
Figure 6: Men's labor market participation over their spouses' age.



Source: Swiss Census data.

Legend: Quadratic fit, 95% confidence interval and scatter plot. The dashed vertical line indicates the female full retirement age.

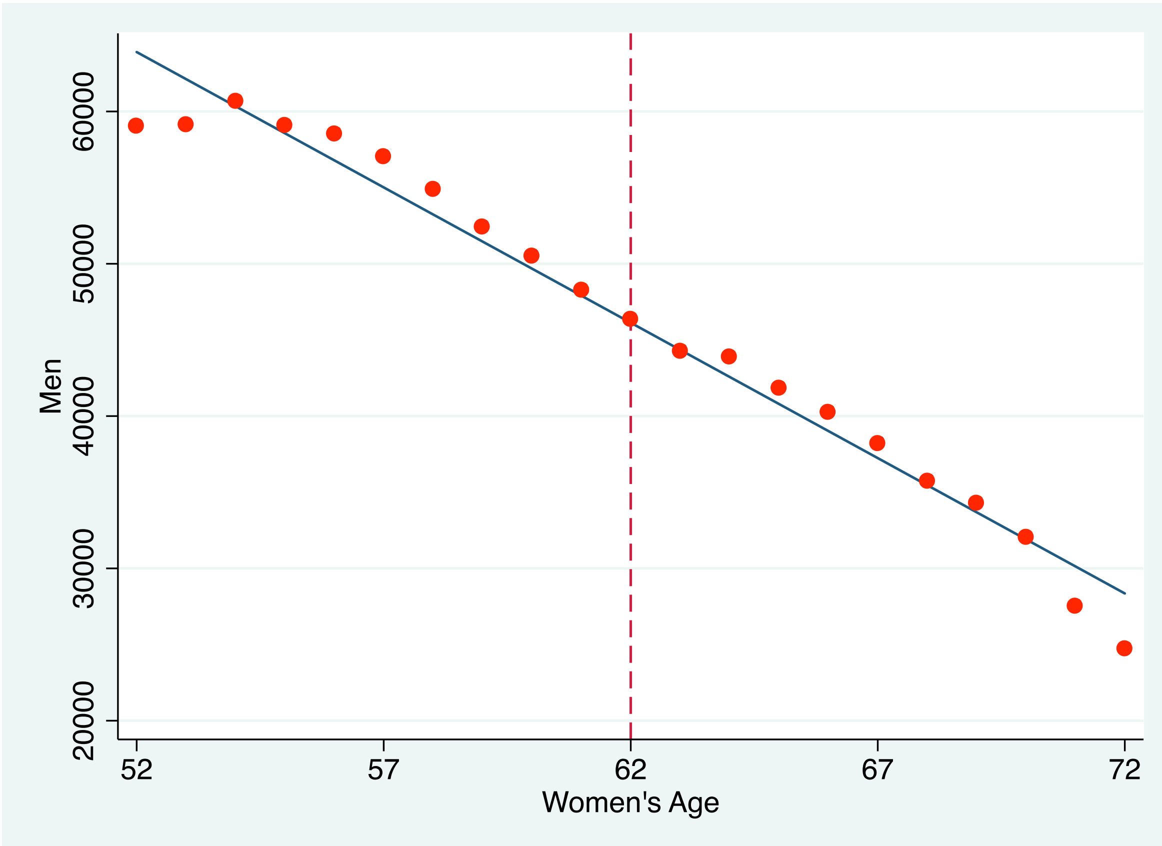
Figure 7: Men: Residuals from a quadratic RDD on own full retirement age over their spouses' age.



Source: Swiss Census data.

Legend: Quadratic fit, 95% confidence interval and scatter plot. The dashed vertical line indicates the female full retirement age.

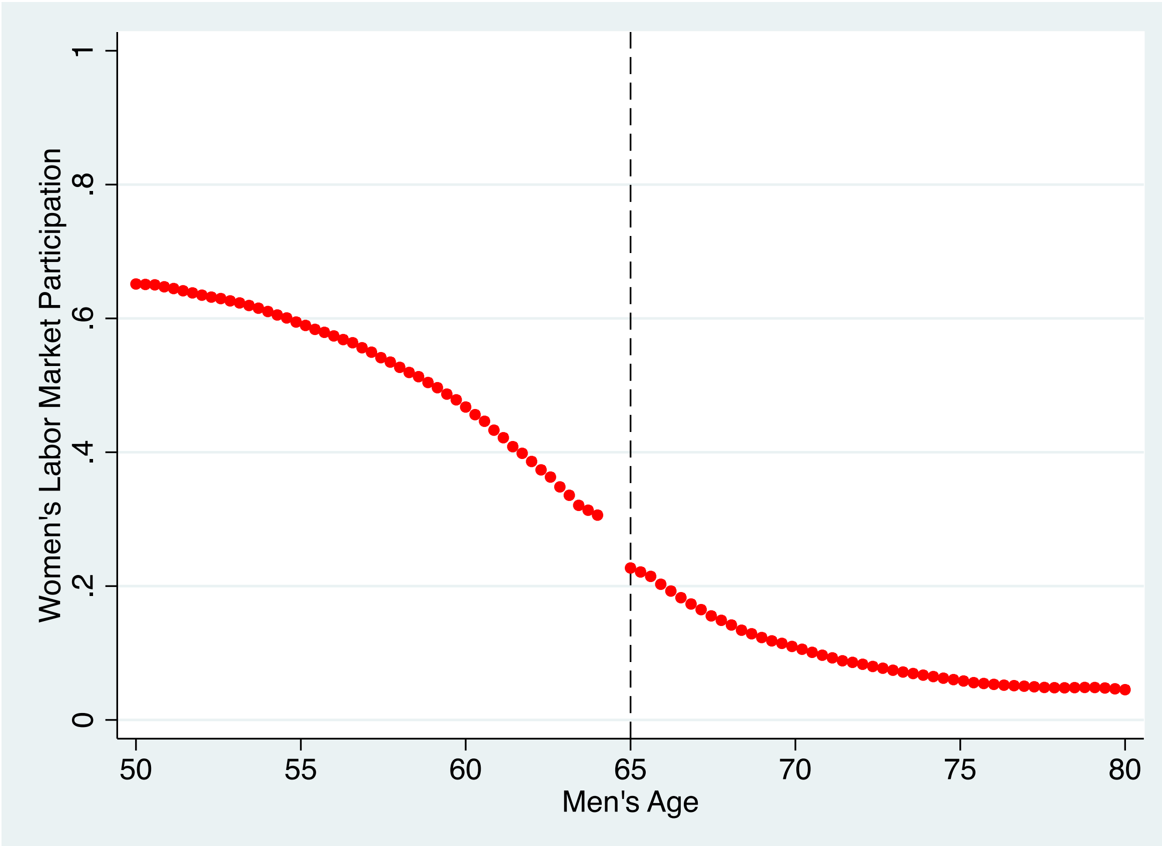
Figure 8: Number of men over their spouses' age.



Source: Swiss Census data.

Legend: The dashed vertical line indicates the female full retirement age.

Figure 9: Women: Local polynomial regression.



Source: Swiss Census data.

Legend: The dashed vertical line indicates the female full retirement age. We use an optimal confidence bandwidth (1.41) as suggested by Imbens and Kalyanaraman (2012).

Table 1: Women - Descriptive Statistics

Spouse's Age	*50-64*	*65-80*		*50-80*	
	Mean	*mean*	*difference*	*coefficient*	*std.error*
Education					
Tertiary	0.0690	0.0448	0.0242***	-0.0016	0.0026
Secondary II	0.4729	0.3760	0.0969***	0.0017	0.0085
Secondary I	0.3926	0.4745	-0.0819***	0.0001	0.0074
Other	0.0656	0.1047	-0.0391***	-0.0002	0.0029
Language					
German	0.6544	0.7024	-0.0480***	0.0011	0.0066
French	0.1820	0.1991	-0.0171***	0.0075***	0.0023
Italian	0.0961	0.0681	0.0280***	-0.0081	0.0059
Romansh	0.0061	0.0071	-0.0010***	0.0007	0.0005
Other	0.0615	0.0232	0.0383***	-0.0012	0.0024
Religion					
Evangelical Reformed Church	0.3987	0.4671	-0.0684***	0.0074	0.0068
Roman Catholic Church	0.4654	0.4252	0.0401	-0.0058	0.0066
Jewish	0.0023	0.0030	-0.0007***	-0.0002	0.0002
Muslim	0.0095	0.0025	0.0070***	-0.0006	0.0008
Other	0.1242	0.1023	0.0219***	-0.0008	0.0023
Canton					
Zurich	0.4716	0.4832	-0.0116***	-0.0015	0.0020
Vaud	0.1743	0.1663	0.0080***	0.0048***	0.0004
Bern	0.1392	0.1498	-0.0104***	-0.0011	0.0021
Aargau	0.0790	0.0702	0.0088***	-0.0008	0.0011
Geneva	0.0525	0.0465	0.0060***	0.0001	0.0016
Other	0.0833	0.0840	-0.0007	-0.0015	0.0024
Wave					
Year 2000	0.5367	0.5360	0.0007	0.0097	0.0089
Status					
Immigrant	0.1346	0.0561	0.0785***	-0.0159**	0.0066
Own Age Bracket	47-77	47-77		47-77	
Observations	793,387	500,401		1,293,788	

Notes: Mean values and t-test differences are reported. Coefficient and standard error are referred to the spouse's pension eligibility age (dummy variable) of our the quadratic RDD. Standard errors are clustered by own and spouse's deviation from pension elegibility age. Significance levels: ***1%, **5%, *10%.

Table 2: Men - Descriptive Statistics

Spouse's Age	*47-61*	*62-77*		*47-77*	
	Mean	*mean*	*difference*	*coefficient*	*std.error*
Education					
Tertiary	0.2517	0.1907	0.0610***	-0.0025	0.0066
Secondary II	0.4950	0.4620	0.0330***	-0.0013	0.0040
Secondary I	0.2020	0.2610	-0.0590***	0.0017	0.0081
Other	0.0513	0.0863	-0.0350***	0.0021	0.0020
Language					
German	0.6523	0.7073	-0.0550***	-0.0018	0.0052
French	0.1809	0.1980	-0.0171***	-0.0030	0.0028
Italian	0.1072	0.0683	0.0389***	0.0053	0.0046
Romansh	0.0065	0.0071	-0.0006***	-0.0003	0.0004
Other	0.0530	0.0193	0.0337***	-0.0001	0.0018
Religion					
Evangelical Reformed Church	0.3945	0.4785	-0.0840***	0.0004	0.0069
Roman Catholic Church	0.4523	0.4036	0.0487***	0.0031	0.0066
Jewish	0.0028	0.0027	0.0001	0.0006*	0.0004
Muslim	0.0109	0.0025	0.0084***	-0.0013	0.0009
Other	0.1395	0.1127	0.0268***	-0.0028	0.0030
Canton					
Zurich	0.4756	0.4770	-0.0014	0.0010	0.0017
Vaud	0.1727	0.1690	0.0037***	-0.0010	0.0014
Bern	0.1382	0.1516	-0.0134***	0.0028	0.0027
Aargau	0.0782	0.0717	0.0064***	-0.0010	0.0010
Geneva	0.0523	0.0468	0.0055***	-0.0008	0.0012
Other	0.0833	0.0841	-0.0008	-0.0009	0.0035
Wave					
Year 2000	0.5360	0.5373	-0.0013	0.0103	0.0095
Status					
Immigrant	0.1684	0.0774	0.0910***	-0.0000	0.0058
Own Age Bracket	50-80	50-80		50-80	
Observations	796,264	497,524		1,293,788	

Notes: Mean values and t-test differences are reported. Coefficient and standard error are referred to the spouse's pension eligibility age (dummy variable) of our quadratic RDD. Standard errors are clustered by own and spouse's deviation from pension elegibility age. Significance levels: ***1%, **5%, *10%.

Table 3: Simple RDD – Women (top panel) and men (bottom panel)

	(1)	(2)	(3)	(4)
Own pension eligibility	-0.2393***	-0.1473***	-0.1474***	-0.1239***
	(0.0234)	(0.0075)	(0.0078)	(0.0034)
Time	yes	yes	yes	yes
Controls	no	no	yes	yes
Polynomial order	1	2	2	2
Spouse's age bracket	50-80	50-80	50-80	60-70
Own age bracket	47-77	47-77	47-77	57-67
Adj R-squared	0.2856	0.2875	0.2995	0.1546
Observations	1,293,788	1,293,788	1,293,788	351,537

	(1)	(2)	(3)	(4)
Own pension eligibility	-0.5127***	-0.3383***	-0.3383***	-0.2832***
	(0.0437)	(0.0205)	(0.0206)	(0.0067)
Time	yes	yes	yes	yes
Controls	no	no	yes	yes
Polynomial order	1	2	2	2
Spouse's age bracket	47-77	47-77	47-77	57-67
Own age bracket	50-80	50-80	50-80	60-70
Adj R-squared	0.6147	0.6219	0.6271	0.3676
Observations	1,293,788	1,293,788	1,293,788	351,537

Notes: The dependent variable is the individual labor market participation. Variables of interest is own pension elegibility age. Specifications (3) - (6) include also own and spouse's education, mother tongue, religion, county, immigrant and wave dummies. Standard errors are clustered by own and spouse's deviation from pension elegibility age. Standard errors are reported in parentheses. Significance levels: ***1%, **5%, *10%.

Table 4: Main results – Women (top panel) and men (bottom panel)

	(1)	(2)	(3)	(4)
Spouse's pension eligibility	-0.0499***	-0.0247***	-0.0239***	-0.0231***
	(0.0065)	(0.0037)	(0.0035)	(0.0046)
Own pension eligibility	-0.2209***	-0.1467***	-0.1468***	-0.1245***
	(0.0196)	(0.0090)	(0.0090)	(0.0063)
Time	yes	yes	yes	yes
Controls	no	no	yes	yes
Polynomial order	1	2	2	2
Spouse's age bracket	50-80	50-80	50-80	60-70
Own age bracket	47-77	47-77	47-77	57-67
Adj R-squared	0.2878	0.2892	0.3011	0.1576
Observations	1,293,788	1,293,788	1,293,788	351,537

	(1)	(2)	(3)	(4)
Spouse's pension eligibility	-0.0671***	-0.0190***	-0.0188***	-0.0100
	(0.0126)	(0.0011)	(0.0030)	(0.0062)
Own pension eligibility	-0.4902***	-0.3385***	-0.3385***	-0.2840***
	(0.0399)	(0.0205)	(0.0206)	(0.0095)
Time	yes	yes	yes	yes
Controls	no	no	yes	yes
Polynomial order	1	2	2	2
Spouse's age bracket	47-77	47-77	47-77	57-67
Own age bracket	50-80	50-80	50-80	60-70
Adj R-squared	0.6172	0.6234	0.6285	0.3690
Observations	1,293,788	1,293,788	1,293,788	351,537

Notes: The dependent variable is the individual labor market participation. Variables of interest are the spouse's and own pension eligibility age. Specifications (3) and (4) include also own and spouse's education, mother tongue, religion, county, immigrant and wave dummies. Standard errors are clustered by own and spouse's deviation from pension eligibility age. Standard errors are reported in parentheses. Significance levels: ***1%, **5%, *10%.

Table 5: Entitlement and Retirement Timing– Women (top panel) and men (bottom panel)

	(1)	(2)	(3)
Spouse's pension eligibility	-0.0231***	-0.0214***	-0.0301***
	(0.0046)	(0.0038)	(0.0097)
Own pension eligibility	0.1245***	-0.1446***	-0.1088***
	(0.0063)	(0.0146)	(0.0079)
Time	yes	yes	yes
Controls	yes	yes	yes
Polynomial order	2	2	2
Spouse's age bracket	60-70	60-70	60-70
Own age bracket	57-67	57-67	57-67
Adj R-squared	0.1576	0.1480	0.1378
Observations	351,537	168,455	133,066

	(1)	(2)	(3)
Spouse's pension eligibility	-0.0100	-0.0080	-0.0141
	(0.0062)	(0.0068)	(0.0140)
Own pension eligibility	-0.2840***	-0.3060***	-0.2712***
	(0.0095)	(0.0123)	(0.0135)
Time	yes	yes	yes
Controls	yes	yes	yes
Polynomial order	2	2	2
Spouse's age bracket	57-67	57-67	57-67
Own age bracket	60-70	60-70	60-70
Adj R-squared	0.3690	0.3089	0.3426
Observations	351,537	133,066	168,455

Notes: The dependent variable is the individual labor market participation. Variables of interest are the spouse's and own pension eligibility age. Column (1) reports our baseline specifications. Specifications (2) refer to whether the individual is or was eligible for pension before her/his spouse is or was. Specifications (3) refer to whether the individual is or was eligible for pension after her/his spouse is or was. All specifications include also own and spouse's education, mother tongue, religion, county, immigrant and wave dummies. Standard errors are clustered by own and spouse's deviation from pension eligibility age. Standard errors are reported in parentheses. Significance levels: ***1%, **5%, *10%.

Table 6: Own and Partner Eligibility Effects – Women (top panel) and men (bottom panel)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Spouse's pension eligibility	-0.0231***	-0.0435*	-0.0196	-0.0244***	-	-	-
	(0.0046)	(0.0232)	(0.0152)	(0.0031)	-	-	-
Own pension eligibility	-0.1245***	-	-	-	-0.1464***	-0.1283***	-0.1314***
	(0.0063)	-	-	-	(0.0053)	(0.0133)	(0.0053)
Polynomial order	2	2	2	2	2	2	2
Spouse's age bracket	60-70	60-70	60-70	60-70	61-62	63-64	65-66
Own age bracket	57-67	58-59	60-61	62-63	57-67	57-67	57-67
Adj R-squared	0.1576	0.0511	0.0447	0.0273	0.1029	0.1225	0.1398
Observations	351,537	63,885	73,624	71,812	69,191	73,689	71,947

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Spouse's pension eligibility	-0.0100	-0.0293	-0.0037	-0.0154***	-	-	-
	(0.0062)	(0.0262)	(0.0069)	(0.0037)	-	-	-
Own pension eligibility	-0.2840***	-	-	-	-0.3001***	-0.2809***	-0.2916***
	(0.0095)	-	-	-	(0.0089)	(0.0071)	(0.0092)
Polynomial order	2	2	2	2	2	2	2
Spouse's age bracket	57-67	57-67	57-67	57-67	58-59	60-61	62-63
Own age bracket	60-70	61-62	63-64	65-66	60-70	60-70	60-70
Adj R-squared	0.3690	0.0516	0.0445	0.0422	0.3093	0.3298	0.3299
Observations	351,537	183,082	168,455	69,191	63,885	73,624	71,812

Notes: The dependent variable is the individual labor market participation. Variables of interest are the spouse's and own pension eligibility age. Column (1) reports our baseline specifications. All specifications include the full set of controls. Specifications (2)-(4) refer to specific 1-year own age bracket either before, at or after own full retirement age. Specifications (5)-(7) refer to specific 1-year own age bracket either before, at or after own full retirement age. Standard errors are clustered by own and spouse's deviation from pension eligibility age. Standard errors are reported in parentheses. Significance levels: ***1%, **5%, *10%.

Table 7: Robustness checks on education – Women (top panel) and men (bottom panel)

	(1)	(2)	(3)	(4)	(5)
Spouse's pension eligibility	-0.0231***	-0.0267***	-0.0222	-0.0130	-0.0284***
	(0.0046)	(0.0061)	(0.0203)	(0.0087)	(0.0085)
Own pension eligibility	-0.1245***	-0.1197***	-0.1085***	-0.1122***	-0.1472***
	(0.0063)	(0.0095)	(0.0346)	(0.0071)	(0.0094)
Spouse's education	all	high	low	high	low
Own education	all	high	high	low	low
Spouse's age bracket	60-70	60-70	60-70	60-70	60-70
Own age bracket	57-67	57-67	57-67	57-67	57-67
Adj R-squared	0.1576	0.1547	0.1744	0.1348	0.1693
Observations	351,537	149,369	14,242	95,977	91,949

	(1)	(2)	(3)	(4)	(5)
Spouse's pension eligibility	-0.0100	-0.0129**	-0.0066	0.0274	-0.0164
	(0.0062)	(0.0062)	(0.0066)	(0.0174)	(0.0114)
Own pension eligibility	-0.2840***	-0.2283***	-0.3034***	-0.2810***	-0.3523***
	(0.0095)	(0.0125)	(0.0104)	(0.0257)	(0.0139)
Spouse's education	all	high	low	high	low
Own education	all	high	high	low	low
Spouse's age bracket	57-67	57-67	57-67	57-67	57-67
Own age bracket	60-70	60-70	60-70	60-70	60-70
Adj R-squared	0.3690	0.3301	0.3881	0.3608	0.3984
Observations	351,537	149,369	95,977	14,242	91,949

Notes: The dependent variable is the individual labor market participation. Variables of interest are the spouse's and own pension eligibility age. Column (1) reports our baseline specifications. All specifications include a quadratic design and the full set of controls. Standard errors are clustered by own and spouse's deviation from pension eligibility age. Standard errors are reported in parentheses. Significance levels: ***1%, **5%, *10%.

Table 8: Joint analysis – Summing labor force participation of both spouses.

	(1)	(2)	(3)	(4)	(5)
Wife's pension eligibility	-0.1346***	-0.1326***	-0.1188***	-0.0812***	-0.1636***
	(0.0094)	(0.0126)	(0.0119)	(0.0202)	(0.0147)
Husband's pension eligibility	-0.3071***	-0.2550***	-0.3164***	-0.3032***	-0.3808***
	(0.0102)	(0.0143)	(0.0152)	(0.0433)	(0.0165)
Wife's education	all	high	low	high	low
Husband's education	all	high	high	low	low
Wife's age bracket	57-67	57-67	57-67	57-67	57-67
Husband's age bracket	60-70	60-70	60-70	60-70	60-70
Adj R-squared	0.3216	0.2955	0.3242	0.3143	0.3482
Observations	351,537	149,369	95,977	14,242	91,949

Notes: The dependent variable is the sum of husband's and wife's labor market participation. Variables of interest are the wife's and husband's pension eligibility age. Column (1) reports our baseline specification. All specifications include a quadratic design and the full set of controls. Standard errors are clustered by own and spouse's deviation from pension eligibility age. Standard errors are reported in parentheses. Significance levels: ***1%, **5%, *10%.