The effect of a higher pension age on spousal labor supply

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Abstract

We investigate the effect of public pension eligibility on labor force participation in couples. If leisure is complementary within households, then an increase in the pension age may lead to an increase in spousal labor supply. We test this hypothesis by exploiting a cohort wise increase in the public pension age in the Netherlands, starting in 2013. Using variation among cohorts, we identify the effect of a later pension age of the older partner in a household on the labor supply of the younger partner. Indeed we find a positive relation, both in terms of participation (extensive margin) and hours worked. The effects do not differ much between men and women. Results indicate that increasing the public pension age by one year leads to a 3 to 5 percent increase of hours worked by the younger partner.

I Introduction

Given the increasing life expectancy and decreasing fertility rate in most western countries, there is a need for redesigning the pension system. During the last three decades, several labor market reforms were implemented to increase the participation rates of older individuals in various countries (see OECD (2011) for an overview). Focusing on the Netherlands[1], one of those reforms was an increase in the Dutch public pension eligibility age (AOW). Before 2013, every citizen who lived in the Netherlands for at least 50 years[2] received the full amount of these public benefits as of the age of 65. After 2013, the retirement age gradually increased by 1 month during the first 3 years and with three months thereafter.

There are three channels through which the public pension eligibility age affects the labor force participation of the spouse. The first channel focuses on leisure complementarity. Coile (2004), Schirle (2008), and Atalay et al. (2019) discuss how spousal labor supply is affected by pension eligibility of the oldest spouse. The focal point in these analyses is whether the household members view leisure as a complementary good or not. More specifically, this means that if an individual works longer, their partner will work longer as well because they do not have the opportunity to share leisure time. The second channel focuses on financial incentives. Van der Klaauw & Wolpin (2008) model retirement decisions via the household budget constraint, indicating how financial incentives of the pension program affects spousal labor force participation. Lastly, the third channel analyzes how social norms and references points affect the labor force participation around the pension eligibility age. Behaghel and Blau (2012) argue that an increase in pension eligibility age in the US for particular birth cohorts and virtually no change in the uptake of social security cannot be explained by the previously mentioned channels alone. Instead, they argue that the initial pension eligibility age plays an important when workers leave the labor force, making it less obvious at which age it is acceptable to stop working. As a consequence, the social norm at which people stop working becomes blurred.

By making use of monthly Dutch administrative data for the period 2015-2018[3], we test how the above channels jointly affect the household labor supply decision. We do this by exploiting the increase in the

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[1] See Euwals et al. (2012) for a more elaborate overview of reforms implemented in the Netherlands regarding the labor force participation of older workers.

[2] There are some exceptions such as military personnel or workers working abroad at a Dutch embassy.

[3] We cannot take into account the first cohorts that faced a pension eligibility increase as before 2015 younger partners were entitled to partner pension. This means that younger partners received a fiscal payment when the older partner reached the public pension eligibility age. Limiting ourselves to the period after 2014, we can circumvent this possible bias in our result.

public pension eligibility age. In February 2012, the Dutch administration announced that the pension eligibility age would gradually increase towards the age of 67[4]. More precisely, in 2013-2015 the pension eligibility age increased by one month each year and as of 2015, the eligibility age increased by 3 months per year. This gradual increase of the pension eligibility age created cohorts with a different pension eligibility age. By exploiting the different retirement ages for different birth cohorts, we have a unique identification strategy to identify how the youngest spouse decides on their labor supply given the pension (in-) eligibility of their older partner.

To do so, we estimate a double regression discontinuity design with the labor force participation of the youngest partner as the dependent variable. More precisely, we estimate the labor supply of the youngest partner as a function of their own and spousal age, their own and spousal pension eligibility age, and several control variables. Moreover, we are as well able to run similar regressions to investigate a reduction (or increase) of hours worked by considering changes in the part-time factor.

We find that reaching the pension eligibility age negatively affects the labor supply decision of the younger partner. More precisely, we find that the younger partner decreases his (her) labor supply by 1 to 2 percentage points once the oldest spouse reaches the pension eligibility age[5]. We find as well tat leisure complementarity between partners is lower for the cohorts with a higher pension eligibility age. Moreover, when examining spousal labor supply one year after the oldest person in the household receives public pension benefits, we observe that there is a negative effect which is regardless of the gender of the older spouse. Lastly, when using the data on part-time labor supply, we find that there is a small but significant effect on the number of hours worked for the younger partner after the older partner decides to retire in the range of minus 0.5 to minus 2 percentage points. This result does also not depend on the gender of the oldest spouse.

The contribution to the literature is twofold. First, we contribute to the literature of household decision making regarding the retirement decision. By making use of the stepwise increase of the Dutch public pension eligibility age, we have a unique identification strategy to identify how different eligibility ages affect spousal labor supply and analyze whether leisure complementarity increases or decreases over time. Moreover, we can identify different spousal labor supply responses for different pension eligibility

[4] During March 2015, a new administration decided to increase the AOW eligibility age more rapidly when compared to the 2012 reform.
[5] We do not find a significant effect for the cohort where the female is the oldest partner and has a pension eligibility age of 65 years and three months.

ages of the older partner. Papers like Zweimüller, Winter-Ebmer, & Falkinger (1996) and Lalive & Parrotta (2017) do not have this identification possibility and therefore rely on institutional differences in male and female pension eligibility age. Second, we contribute by investigating the part-time factor. By analyzing changes in the part-time factor we are not only able to measure labor supply changes at the extensive margin, but also at the intensive margin.

The setup of the rest of this paper is as follows. Section 2 provides a literature review. Section 3 describes the institutional setting. Section 4 discusses the descriptive statistics and section 5 describes the estimation method and results. Lastly, section 6 provides a discussion of our findings and section 7 concludes.

II Literature Review

This section discusses the literature on household retirement. When considering household retirement decisions in the economic literature, three main channels play an important role. The first channel runs via financial incentives. Blau & Gilleskie (2006) and Van der Klaauw & Wolpin (2008) build theoretical models in which the effect of retirement runs through the household budget constraint. More precisely, both papers carefully explain how financial incentives of pension programs affect the labor force participation decision of the partner. Empircally, Henretta & O'Rand (1983) show that both male and female financial characteristics play a role in the joint retirement decision. They find that husband's and wife's age, hourly wages, and pension coverage all have similar effects on the retirement patterns for both husband and wife.

The second channel runs via leisure complementarities between spouses. Hurd (1990) study joint retirement choices in models without uncertainty, while Casanova (2010) builds a model taking uncertainty into account when explaining how leisure complementarities affect the retirement decision of both household members. Michaud and Vermeulen (2011) build a model in which they incorporate intrahousehold interaction. More precisely, they model household utility as the weighted sum of male and female utility. Using this specification and making use of the Health and Retirement Study, their estimates show that leisure complementarity plays an important role in the retirement decision. Zweimüller, Winter-Ebmer, & Falkinger (1996) draw a similar conclusion by examining how different statutory retirement ages for males and females in Austria affect spousal labor supply. They find that the female retirement age depends on the male's retirement age but not vice versa. Lalive & Parrotta (2017) confirm this finding by exploiting the difference in male and female retirement age in

Switzerland. Coile (2004) finds similar results when examining US dual-earner couples. Besides, Schirle (2008) shows that – due to the increase in retirement age in many G20 countries (see OECD (2011)) – the partner decided to work longer as well. More recently, Atalay et al. (2019) discuss how an increase or decrease in the retirement age affects household labor supply decisions. Exploiting reforms in Austria and Vietnam, she finds that the partner adjusts his or her labor supply regardless of whether there is an increase (Austria) or decrease (Vietnam) in the pension eligibility age. More specifically, the Vietnam veteran pension fund induced veteran's wives to retire around 1.5 to 2.6 years earlier on average, while the estimates for Austria imply that a 5-year increase in female pension eligibility led husbands to retire later by 0.34 to 0.84 years on average.

The third, sociological channel describes how behavioral aspects play a role in the decision-making process. Eismann, Henkens & Kalmijn (2019) discuss two possible channels of how the individual can influence the partner's labor supply decision. First, there is the channel of altruism. This channel states that, since retirement is generally associated with healthier behavior (Syse, 2017), an individual that cares about the partner's health wants that the partner retires. Second, there is the channel of self-interest. This channel states that an individual wants their partner to retire early if it benefits him or herself. This is for instance the case when the quality of the relationship is high or when long working days of the other person negatively affects the well-being of the other person. Another channel focuses on the importance of mental health. Picchio & Van Ours (2019) find that mental health differs between males and females after retirement. Single men tend to experience a drop in mental health. For males with a partner, the effect is positive: they experience a positive effect on their mental health as well as partner's mental health. On the other hand, female retirement hardly has any effect on their mental health or mental health of the partner. Moving away from sociological channels within the household, the initial age at which older workers were eligible for pension benefits may as well play a role in the retirement decision. More precisely, Behaghel & Blau (2012) argue that the initial age of 65 at which social security payments became available is still an important reference point for workers that are eligible at a higher age. The authors argue that a combination of the initial reference point combined with loss aversion of leisure due to an increase of the pension eligibility age may make workers less likely to work longer and instead retire at the age of 65.

Having discussed the most important channels affecting joint retirement decisions, it as well important to discuss what research regarding these channels has already been conducted for the Dutch pension systems. Considering financial incentives, Atav, Jongen, & Rabaté (2019) and Koning, Gelderblom, &

Gravesteijn (2017) show that the gradual increase in the pension eligibility age as of 2013 increased the individual supply older Dutch workers. De Grip, Fouarge, & Montizaan (2019) investigate whether couples would like to share pension benefits. Using data from the largest Dutch second pillar pension fund ABP, they find that both females and males like to redistribute pension income to their partner. However, they find that male preferences are stronger.

Focusing on spousal retirement, Deelen & Van Vuuren (2009) argue that an increase in the education levels resulted in a higher employment rate for both males and females, resulting in a higher earning capacity for both (i.e. higher opportunity costs for not working). Moreover, an increase in the female education level increased the likelihood of being employed at later ages, making it for the partner less attractive to retire early. The reason for this is that males/females postpone their (early) retirement decision as they value leisure time with their spouse. Analyzing the female labor force participation, Euwals, Knoef, and van Vuuren (2011) argue that social norms influence the decision to participate and conclude that cohort effects are important for females borne between 1935-1955. They postulate that the role of social norms and attitudes towards paid employment is important in explaining the development of female labor force participation over successive cohorts. Another study made use of share data to investigate joint retirement decisions in several European countries including the Netherlands (Hospido & Zamarro, 2014). Exploiting the early retirement and official retirement possibilities in those countries, they find a joint retirement effect for women, but not for males. Lastly, a recent paper discusses how incentive induced early retirement affects the retirement behavior of the partner (Bloemen, Hochguertel, & Zweerink, 2019). To do so, they exploit an attractive early retirement policy for civil servants[6]. They find that induced early retirement incentives for male civil servants induced their wives' probability to retire by ten percentage points.

III Institutional Setting

Having discussed the related literature, this section describes the institutional setting in the Netherlands. We first discuss the Dutch pension system and thereafter we discuss other benefits programs that could be used as pathways into early retirement.

[6] This paper is unable to take into account whether the youngest partner that works in another sector is as well eligible for early retirement provisions.

Dutch Pension System

Like most modern pension systems, the Dutch pension system consists of three pillars, which allow workers to accumulate pension rights approximately equal to 70% of their average gross wage over their working life. The first pillar is the pay-as-you-go publicly funded pension benefits (AOW). The policy review of the Ministry of Social Affairs shows that the take-up rate of pension benefits is very high and it successfully eliminates poverty among older individuals[7] (Ministry of Social Affairs (2019)). Each individual that has lived for 50 years or more in the Netherlands receives an amount equal to 70% (50%) of the minimum income when retired[8] when he or she lives alone (with a partner). In case both persons in a couple (married or registered partnership) retire, they receive 100% of the minimum income. Kok, Kroon, Luiten, & Schwartz (2019) find that these different benefit schemes hardly affect the choice of elderly to (de)register as a couple, live together, or separately. Moreover, most elderly support the difference in public pension benefits between couples and singles.

Before January 1st, 2015, individuals that 1) had already reached the pension eligibility age and 2) had a partner that did not yet reach this retirement age received partner pension. The amount of partner pension depended on the partner's income (Van den Berg, et al., 2007). As partner pension provides a financial incentive for the youngest spouse to retire earlier, we focus in our analysis in section IV and V on cohorts for which the oldest partner retires as of 2015. In this way, we make sure that this financial incentive does not influence our identification strategy. There were several reasons for abolishing partner pension. First, the abolition would increase the affordability of the first pension pillar. Second, the increase in the economic independence of female partners made it less necessary to keep a partner pension. Doove, ter Haar, Schalken & Span (2019) discuss the effect of the abolition of the partner pension on the partner's labor supply. They find that partners that were no longer eligible for partner pension had a higher personal income, worked more hours, and have a higher level of labor force participation when compared to the cohort that was still eligible. They found the largest effect for younger partners with a low level of income. Third, the second pillar pension became more important (Ministry of Social Affairs, 2019).

The second pillar pension is the pension that the employer and employee jointly save via a pension fund. Unlike the first pillar, this pension pillar is heavily dependent upon work history and earnings per year and does not take into for how many years someone lived in the Netherlands. Another difference

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[7] The chance of living in poverty is the lowest above the AOW eligibility age when compared to all other age cohorts.

[8] The buildup rate is 2 percent per year.

between the first and second pillar pension is that it is possible to early withdraw second pillar pension benefits before the (first pillar) public pension eligibility age. Early withdrawal happens at the actuarially fair rate. For public pension benefits, this is not possible. Lastly, the third pillar consists of own individual savings on top of the first and second pillar. It is possible to save this tax-free if those savings are labeled as pension entitlements.

It is important to take into account that pre-retirement pension arrangements were heavily restricted after 2006. Until 2006, the Dutch government-subsidized early retirement routes such as the VUT-arrangement (early retirement arrangement). In 2006, this route became gradually more restricted and was replaced by a Life Cycle Saving Scheme ("Levensloopregeling"). This arrangement was introduced to compensate individuals that reached the retirement age before January 1st, 2015. Although this arrangement was less attractive than the VUT-arrangement, it was still financially attractive for younger partners to exit the labor force at a younger age, making it easier for couples to coordinate their joint retirement decision (i.e. when for instance one partner reaches the pension eligibility age). Moreover, this implies that cohorts after 2015 are not comparable to cohorts before 2015 as younger partners can no longer make use of this scheme (Van den Berg, et al. (2007)). We take this into account in section IV and section V when describing different cohorts and our method of identification.

As of February 2012, the Dutch government decided to gradually increase the retirement age. More precisely, up to January 1st, 2013, the public pension eligibility age was 65 years. From January 1st, 2013 up to January 1st, 2016, the pension eligibility age increased by one month each year. As of January 1st, 2016 up to January 1st, 2019 the pension eligibility age increased by three months. The faster increase of the eligibility age was agreed upon in June 2015[9]. The table below provides a precise overview of the pension eligibility age increase in the 2015 agreement.

AOW eligibility age according to 2015 agreement

Year	Pension eligibility age (in years)	Birth Cohort (dd-mm-yyyy)
<2013	65	< 01-01-1949
2013	65 + 1/12	As of 01-01-1948 up to 01-12-1948
2014	65 + 2/12	As of 01-12-1948 up to 01-11-1949

[9] In June 2015, the Dutch administration decided to increase the AOW eligibility age at a faster rate to keep government financing sustainable. This law passed in the House of Representatives in March 2015. In June 2015, the Senate approved this law.

2015	65 + 3/12	As of 01-11-1949 up to 01-10-1950
2016	65 +6/12	As of 01-10-1950 up to 01-07-1951
2017	65 + 9/12	As of 01-07-1951 up to 01-04-1952

Table 1 Source: Rijksoverheid (2019)

Pathways into early retirement and legal changes

The increase of pension eligibility age and the abolition of VUT and the life cycle saving scheme do not necessarily mean that workers work longer. It could be as well possible that workers switch to other social benefits programs to reach the retirement age. In this way, other social security programs may serve as substitutes for the previously mentioned early retirement pathways. Over the last two decades, successive Dutch administrations tried to prevent this form of social support substitution. To start with, at the beginning of the 21st century, the government reduced the attractiveness of disability insurance. As of 2002, they came up with stricter reintegration rules in case of sickness. In 2003, the sickness benefit became less generous for workers employed by small firms and in 2008 it was implemented for all firms. More precisely, the experience rating (i.e. if someone worked longer, the worker received higher benefits) was abolished first for small firms and thereafter for larger firms (see Jongen (2016)).

In terms of unemployment insurance, the maximum duration of unemployment insurance has been gradually decreased. As of 2003, it was no longer possible to receive unemployment benefits up to retirement as of the age of 57.5[10]. In 2006, the maximum benefit duration decreased from 5 years to 3 years and 2 months. As of 2015, the generosity of the unemployment insurance was further reduced. To start with, between January 1st, 2016, and April 1st, 2019 the benefit duration decreases gradually from 38 towards 24 months. Moreover, it takes more working years to get the full amount of benefit duration[11] (de Pijper, et al., 2019). All these measures seem to have affected that substitution pathways via other welfare programs remained very limited (Ministry of Social Affairs, 2019).

Having discussed how it would be possible to retire earlier than the first pension eligibility age, it is as well important to analyze whether it is possible to continue working after a worker reaches the pension eligibility age. First, some labor market sectors have the opportunity to fire workers without any dismissal costs as soon as they reach the first pillar pension eligibility age[12]. As a consequence, workers working in this sector cannot continue in the job they had after reaching the pension eligibility age. A

[10] Although the IOW and IOAW are partially fulfilling this role nowadays, those programs are financially less attractive than the unemployment benefits.
[11] There will be no reduction in the months of unemployment benefits (WW) accumulated before the reform.
[12] The Dutch terminology for this is “functioneel leeftijdsontslag”.

second legal change in the Netherlands in the period 2014-2018 is the "Continuing to work Act[13]", which makes it more attractive for employers to hire workers after they reached the pension eligibility age. For instance, the notice period for dismissal for this group is reduced to 1 month[14] and the obligation to continue wage payment in case of illness is reduced to six weeks (instead of 2 years).

IV Descriptive Statistics

Having discussed the institutional framework, this section discusses the data we use and some descriptive statistics. We make use of administrative microdata from the CBS (Statistics Netherlands). Using these data[15], we can construct household data regarding household retirement decisions for a large number of household characteristics. More precisely, we have data on the monthly earnings of employees, whether they are native, first, or second-generation immigrants, and whether at least one child is living within the household. In our analysis, we only focus on heterosexual couples that either are married or have a registered partnership and stay together over the period 2014-2018[16]. Next to this, household members should not be in the same pension cohort as defined in table 1. Moreover, we exclude couples in which the oldest partner does not work or is self-employed[17]. In other words, the oldest partner should be either an employee or should be retired. For the youngest partner in the couple, there is no restriction other than that he or she cannot be self-employed[18].

We limit ourselves to the households in which the oldest spouse reaches the public pension eligibility age as of 2015. The reason for this is that before this period the VUT and the retirement saving scheme ("levensloopregeling") were still alternative routes into early retirement. Moreover, before 2015 individuals that reached the pension eligibility age and had a partner that did not yet reach this age were eligible for partner pension. Therefore, we focus ourselves on couples for which the oldest partner reached the pension eligibility age as of 2015. In this way, we do not have any bias in our estimates

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[13] The Dutch name is "Wet doorwerken na AOW"

[14] This is the same notice period as for workers that are employed for less than 5 years. For workers that are longer employed, the notice period is in the range of 2 to 4 months, depending on the employment history.

[15] In particular, we make use of the datasets gbahuishoudensbus, spolisbus, gpapersoontab, and inpatab. The part-time factor is constructed with the variables svoltijddagen en sbaandagen from spolisbus.

[16] We take the first month of each year as a reference date to check whether each household is still together or not.

[17] To do so, we make use here of the inpatab dataset who indicates what the most important yearly source of income is for each individual. As we do not observe monthly data for self-employed workers we omit this category.

[18] More precisely, the younger partner may receive unemployment benefits, other forms of social assistance, and/or disability benefits. Lastly, it is as well possible for the younger partner to not receive any income at all. This information is stored in the variable inpsecj from the dataset inpatab.

through VUT, the retirement saving scheme, or partner pension. Table 2 and Table 3 below provide summary statistics for Dutch households. More precisely, table 2 provides summary statistics for couples in which the male is the oldest partner, and table 3 provides summary statistics for couples where the female is the oldest partner.

The upper part of table 2 shows us the monthly mean male and female income, as well as the part-time factor. For male and female income, we report the mean monthly income per year provided that the income is larger than zero. Focusing on the income variables, we observe that average male income is in most cells higher when compared to average female income. This does not hold for all years for the first two cohorts. Moreover, we observe a decline in the average monthly male income over the years. Van Ooijen, Mastrogiacomo, & Euwals (2010) provide a possible explanation for the decline in male labor income. They find that high-income individuals retire earlier than low-income individuals do. In other words, the drop in yearly income may indicate that low-income workers (with low wealth) continue working whereas high-income workers (with higher levels of wealth) retire when they reach the public pension eligibility age.

In brackets below the monthly mean annual income, we report the average annual part-time factor. The part-time factor is the ratio of the number of full-time days worked in a particular month to the number of total days worked in a particular month. For instance, if a particular person worked 15 full-time[19] days and the job existed in a particular month for 30 fays, the part-time factor for this person is equal to 0.5. In case an individual did not work in a particular month, we set the part-time factor equal to zero. The biggest drop in the part-time factor for males is observed one year after (the majority of) a particular cohort reaches the retirement age. For instance, considering the cohort with male pension eligibility age of 65 years and 3 months, the part-time factor drops from 0.32 in 2015 to 0.08 in 2016. For females, who only should be in a younger cohort than their male partner, we do not observe such a strong drop. The most likely reason for this is that the younger female partner does not have to become eligible for pension benefits in the period 2014-2018.

Next to average male and female income, table 2 provides as well information on the age difference between the spouses. Across all cohorts, this is roughly equal to 3.8 years, indicating that the younger female partner is on average 3.8 years younger than the older male partner. Next to this, table 2 gives information on first and second-generation immigrants. The share of first-generation female immigrants

[19] Full-time is defined according to the collective labor agreement. If there is none, CBS defines a full-time workweek as 35 hours a week (see the variable "svoltijddagen" in spolisbus for more information).

is approximately 6.7%. For second-generation female immigrants, this is equal to roughly 4.5%. It is important to take this into account as first-generation immigrants may not be entitled to the full public pension benefit. As was already mentioned in the institutional framework, each person living in the Netherlands accumulates two percent per year for old-age pension benefits[20]. The share of first- and second-generation male immigrants is respectively roughly equal to 6.1% and 5.3% for all cohorts. The percentage of households with children fluctuates between 13.8% and 18.3%, where the presence of children is more frequently when the older male partner has a higher retirement age (i.e. when the male partner is younger). Having children that still live at home (and the corresponding costs associated with it) may have the intention to retire relatively late when compared to couples where this is not the case (Damman, Henkens, & Kalmijn, 2015). In total, we have 61,037 unique household observations.

For couples where the female is the oldest partner, we observe roughly the same pattern (see table 3). We observe here as well that the net labor force participation of the oldest partner declines faster when compared to the net labor force participation of the youngest partner. Moreover, the monthly average annual income is higher for males than for females, and the same holds for the part-time factor. Lastly, the drop in the part-time factor is as well present for females one year after they reached the pension eligibility age. However, there are as well two main differences between these two tables. First, the percentage of households with children is substantially lower in households where the female is older than the male. Second, the mean age difference for couples where the female is the oldest partner is approximately one year less when compared to couples where the male is the oldest partner.

[20] For instance, if a worker migrated to the Netherlands when he was 45 years old and retires at the age of 65.25, that person receives $20 * 2\% = 40\%$ of the total amount of public pension in the first year.

Male = old / pension age male		65+3	65+6	65+9
	2014	3715 (0.50)	3889 (0.60)	4035 (0.70)
	2015	3656 (0.32)	3844 (0.53)	4028 (0.63)
Mean male income (€) (Part-time factor)	2016	2213 (0.08)	3780 (0.35)	3950 (0.56)
	2017	1849 (0.06)	2166 (0.08)	3775 (0.36)
	2018	1641 (0.05)	1837 (0.07)	2228 (0.09)
	2014	1907 (0.29)	1960 (0.32)	1970 (0.35)
	2015	1964 (0.26)	2017 (0.29)	2024 (0.32)
Mean female income (€) (Part-time factor)	2016	1998 (0.22)	2045 (0.26)	2061 (0.30)
	2017	2012 (0.18)	2055 (0.22)	2090 (0.27)
	2018	2029 (0.15)	2056 (0.18)	2096 (0.23)
Mean age difference (age male – age female)		3.84	3.82	3.85
% female immigrant 1st		6.5	6.8	6.7
% female immigrant 2nd		4.4	4.8	4.6
% male immigrant 1st		6.4	6.1	5.8
% male immigrant 2nd		5.0	5.3	5.6
% household with child		13.8	15.3	18.3
Households		21,148	20,224	19,665

Table 2 Summary statistics male (old), female (young)

Female = old / pension age female		65+3	65+6	65+9
	2014	4282 (0.60)	4242 (0.65)	4247 (0.71)
	2015	4352 (0.53)	4261 (0.59)	4293 (0.66)
Mean male income (€) (Part-time factor)	2016	4396 (0.44)	4266 (0.53)	4296 (0.60)
	2017	4200 (0.32)	4135 (0.43)	4205 (0.53)
	2018	3890 (0.24)	3829 (0.33)	4166 (0.43)
	2014	1833 (0.34)	1927 (0.4)	1950 (0.46)
	2015	1877 (0.22)	1931 (0.34)	1953 (0.41)
Mean female income (€) (Part-time factor)	2016	1429 (0.04)	1976 (0.22)	1938 (0.36)
	2017	1326 (0.03)	1259 (0.04)	1974 (0.23)
	2018	1191 (0.02)	1139 (0.03)	1297 (0.04)
Mean age difference (age female – age male)		2.77	2.67	2.69
% female immigrant 1st		9.6	9.9	8.4
% female immigrant 2nd		5.5	5.1	6.7
% male immigrant 1st		6.2	6.0	6.0
% male immigrant 2nd		6.1	5.2	5.5
% household with child		8.9	9.5	12.3
Households		2663	2526	2473

Table 3 Summary statistics Female (old) and male (young)

Graphical evidence

The graphs below show descriptive evidence that corresponds to table 2 and 3. More precisely, we plot the average labor force participation of the youngest spouse 6 months prior, and after the older spouse reaches the pension eligibility age for all couples that are not in the same pension cohort. We do this for both couples where respectively male and female are the oldest spouse. To mitigate the effect of partner pension, VUT, and the life cycle saving scheme – which were available up to 2015 – we choose the cohorts that retire as of 2015. Going back to table 1, this means that we focus on cohorts for which the oldest spouse has retirement age 65 years and three months, 65 years and six months, and 65 years and nine months. In the appendix, we show graphs that visualize how the labor force participation of males and females react to their own pension eligibility. Looking at these graphs, we observe a strong decline in labor force participation at the moment someone is entitled to first pillar pension benefits, indicating that individuals react strongly to their own pension eligibility. In the graphs below we discuss whether there is a similar drop in net labor supply visible for the partner. Vermeer (2016) shows that (retirement) age anchors have an effect on the wife's expected retirement age and therefore we expect that this will alter the female's labor participation.

The graphs below visualize how the younger partner reacts to the pension eligibility age of their older spouse. Looking at figures 1-3**,** we observe a small discontinuity in the labor supply of the younger partner when the older female spouse reaches her pension eligibility. More precisely, the drop in average labor force participation of the younger spouse one month prior and one month after the oldest spouse reaches her pension eligibility age is approximately 1 to 2 percentage points. In figures 4-6 we provide graphical evidence for couples where the male is the oldest spouse. We observe here more or less the same pattern as in figures 1-3.

We as well examine whether there is any discontinuity at the age of 65. The reason for doing this is that the age of 65 has been the initial age at which older workers receive first pillar pension benefits. In line with Behaghel & Blau (2012), this point could still serve as a reference point for workers. The figures 7 and 8 below show that indeed there is a small discontinuity for the oldest spouse at this age in the range of 1%-points. However, this initial pension eligibility age does not seem to influence the labor force participation of the younger spouse. Hence, the younger spouse does not leave the labor force when the older spouse reaches the age of 65. If there is any discontinuity, it is small and in the range of 0.3 to 0.8%-point as is observed in the figures 9 and 10.

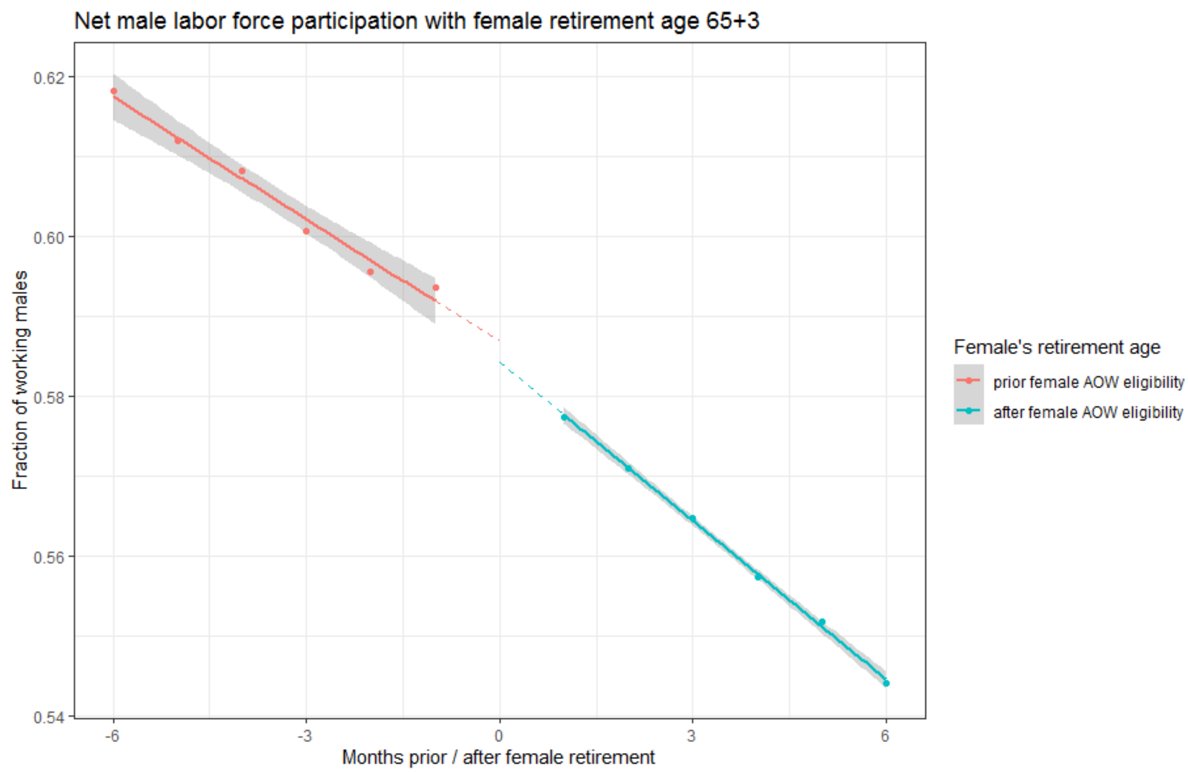


Figure 1 net labor force participation of the younger male spouse with female pension eligibility age of 65 years and 3 months.

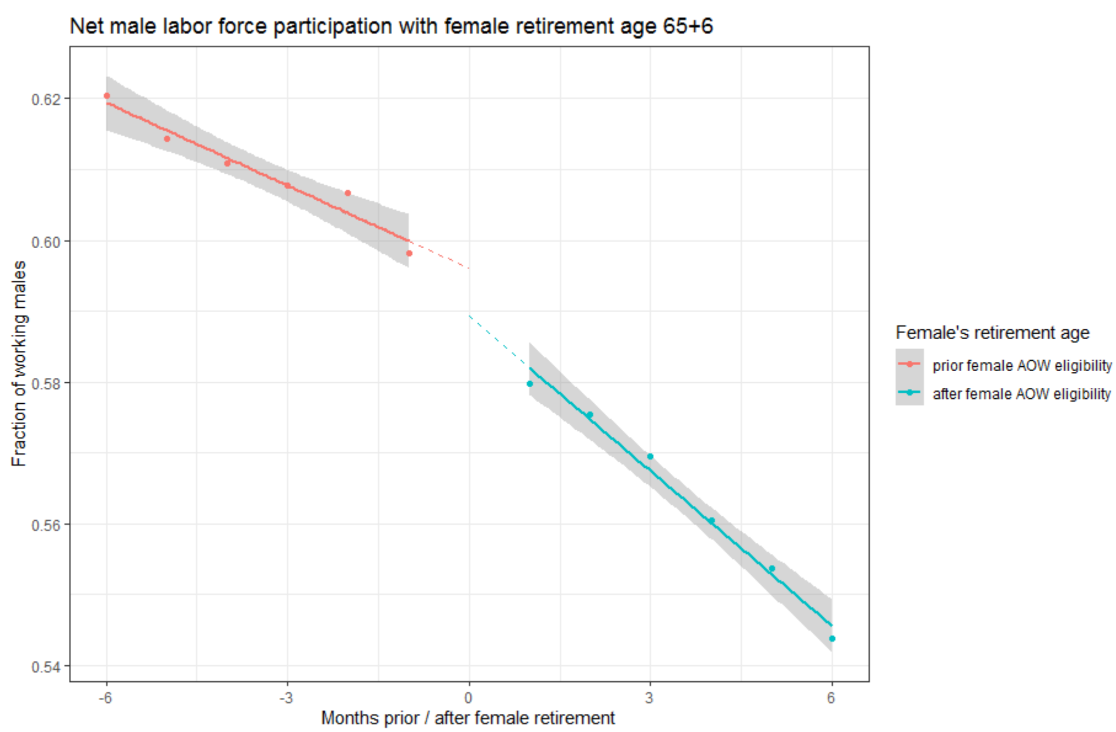


Figure 2 net labor force participation of the younger male spouse with female pension eligibility age of 65 years and 6 months.

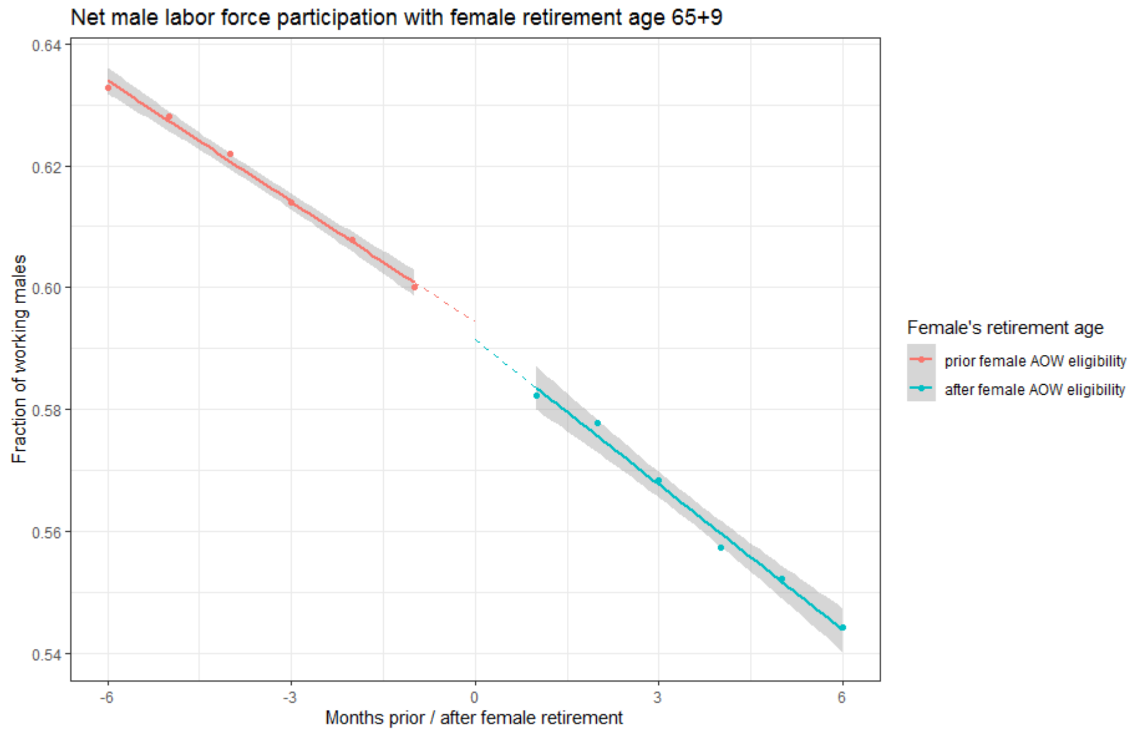


Figure 3 net labor force participation of the younger male spouse with female pension eligibility age of 65 years and 9 months.

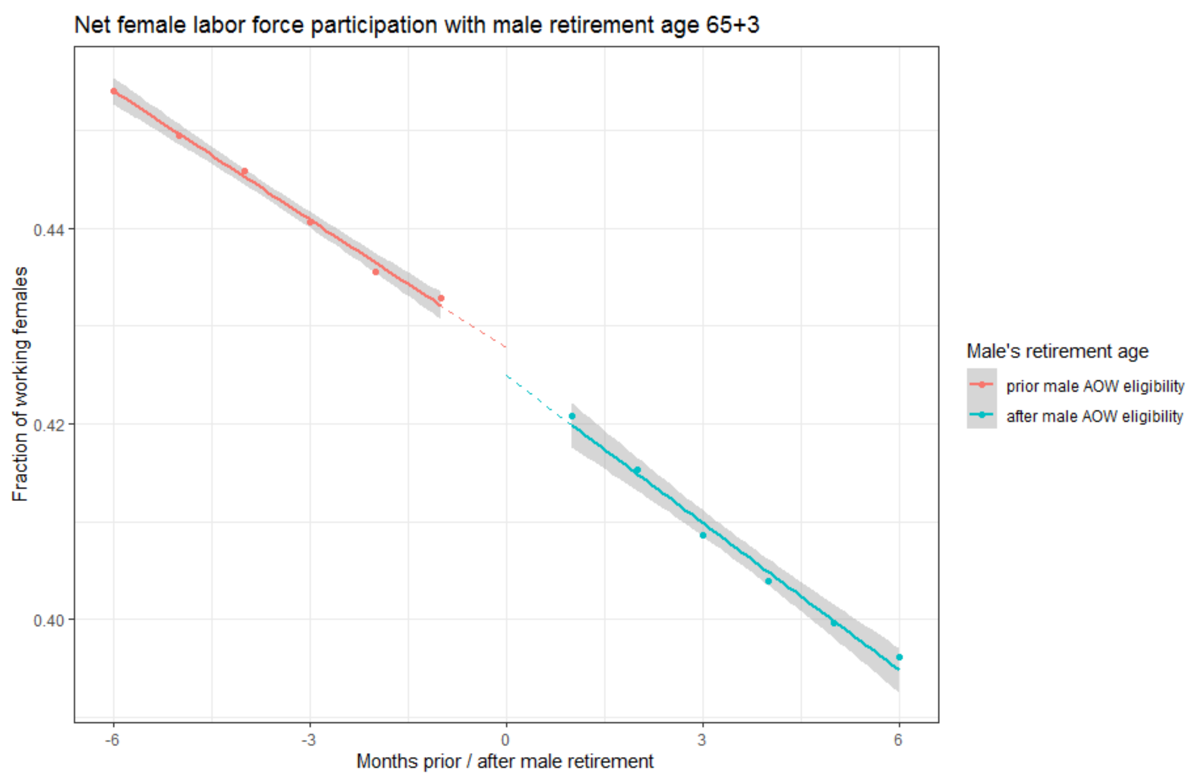


Figure 4 net labor force participation of the younger female spouse with male pension eligibility age of 65 years and 3 months.

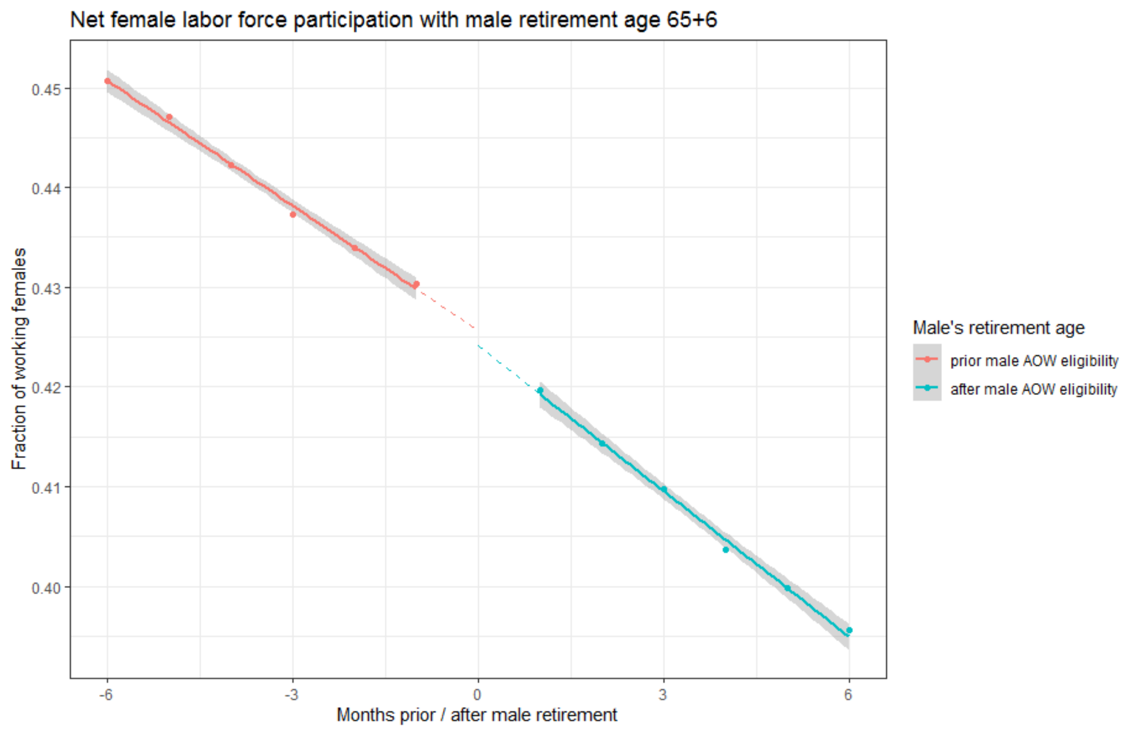


Figure 5 net labor force participation of the younger female spouse with male pension eligibility age of 65 years and 6 months.

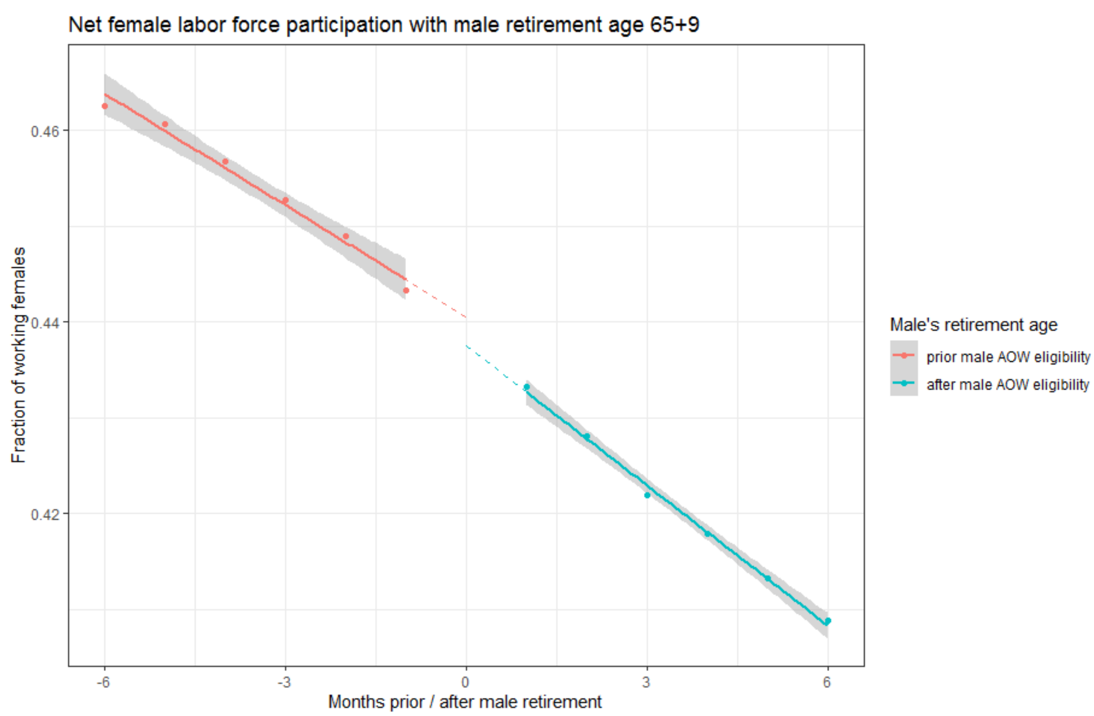


Figure 6 net labor force participation of the younger female spouse with male pension eligibility age of 65 years and 9 months.

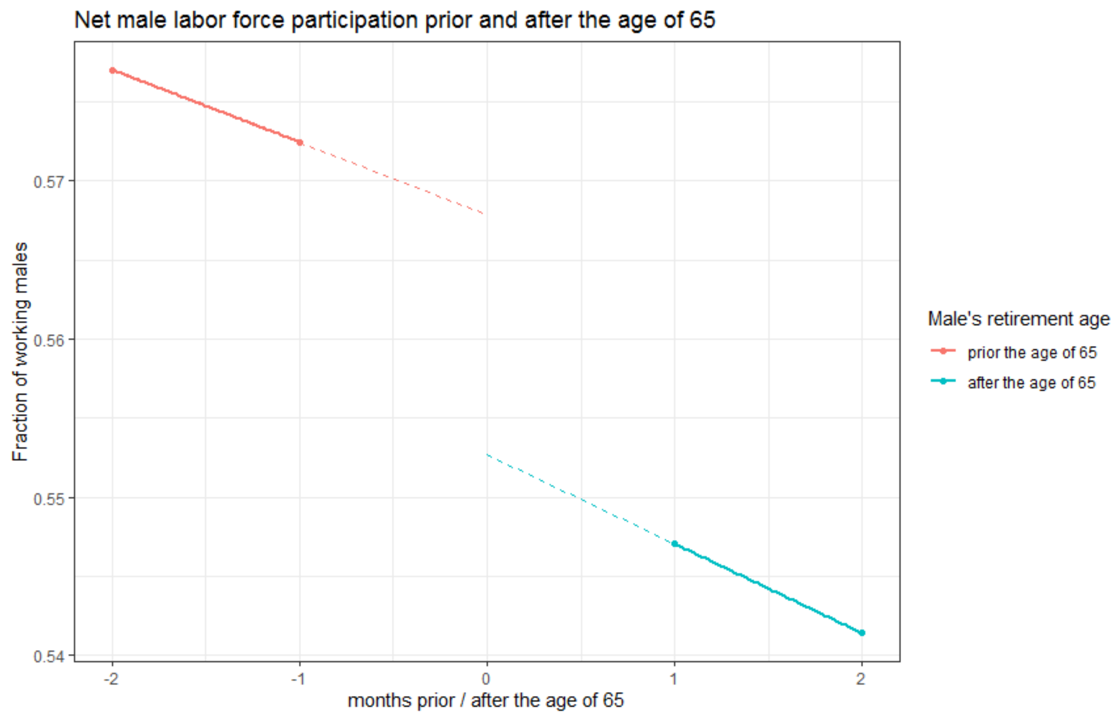


Figure 7 Net male labor force participation (male = oldest spouse) around the age 65.

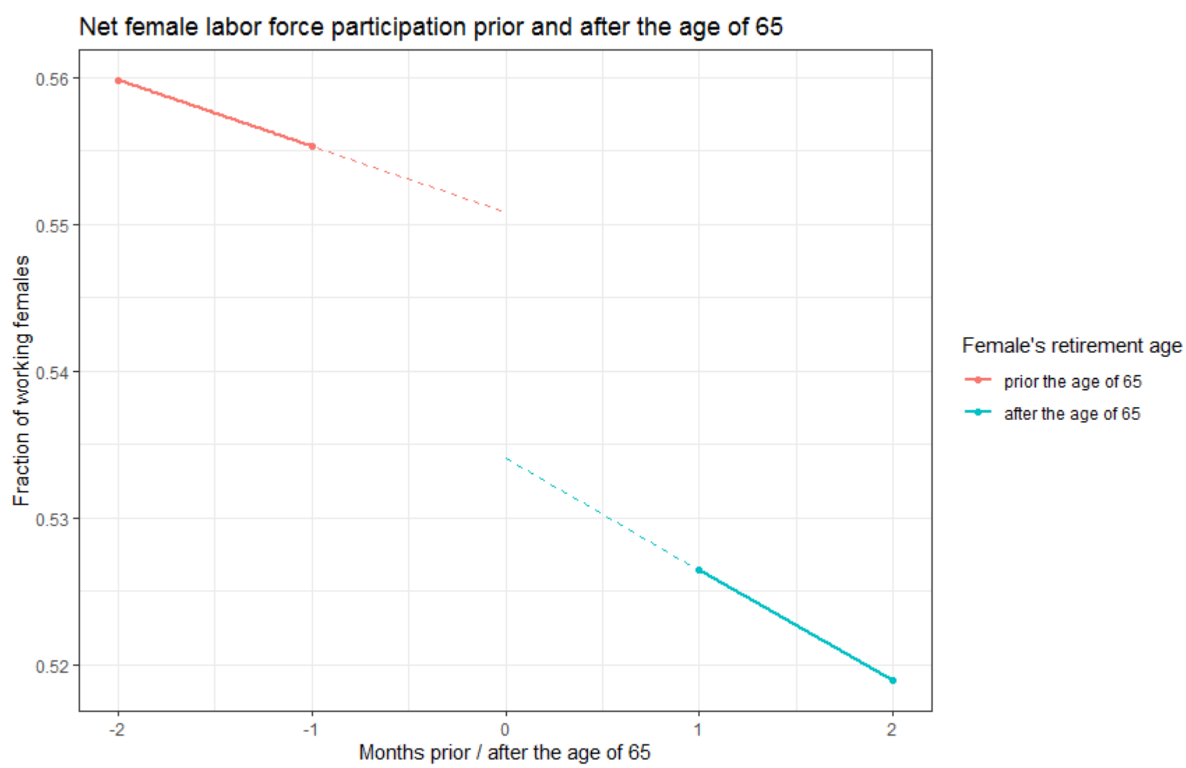


Figure 8 Net female labor force participation (female = oldest spouse) around the age of 65.

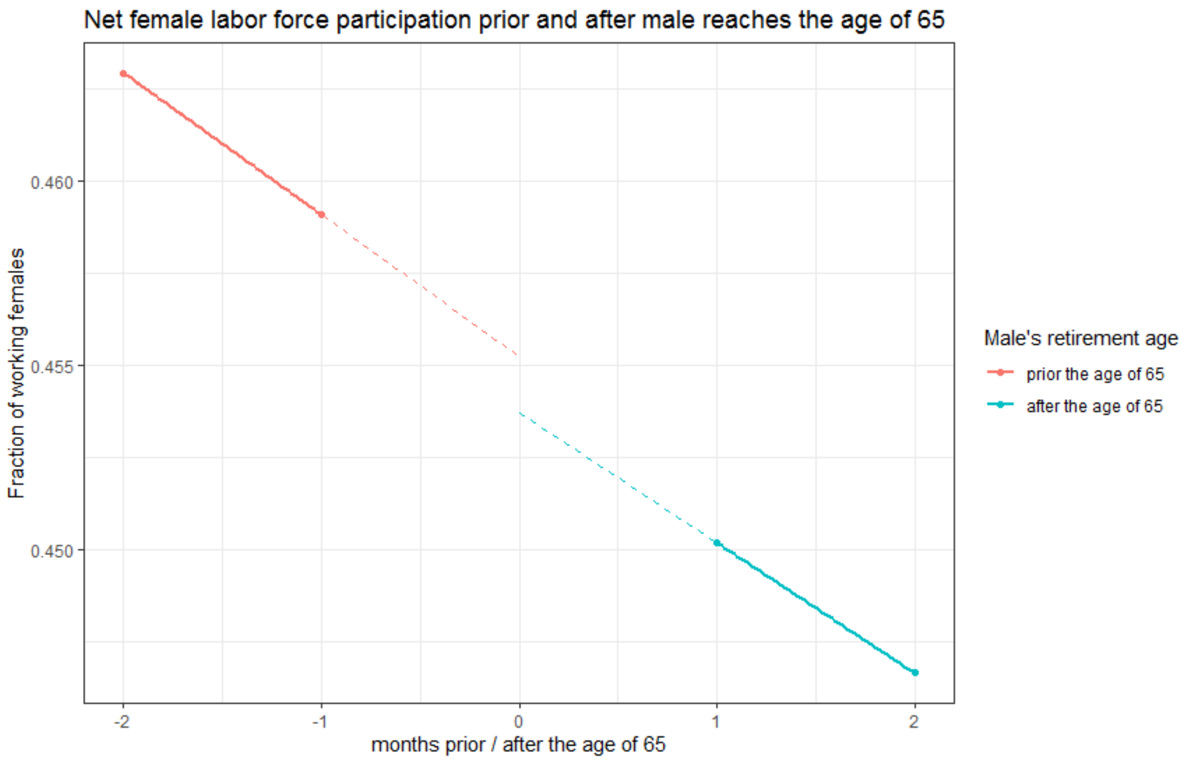


Figure 9 Net female labor force participation around the age 65 of the older male spouse.

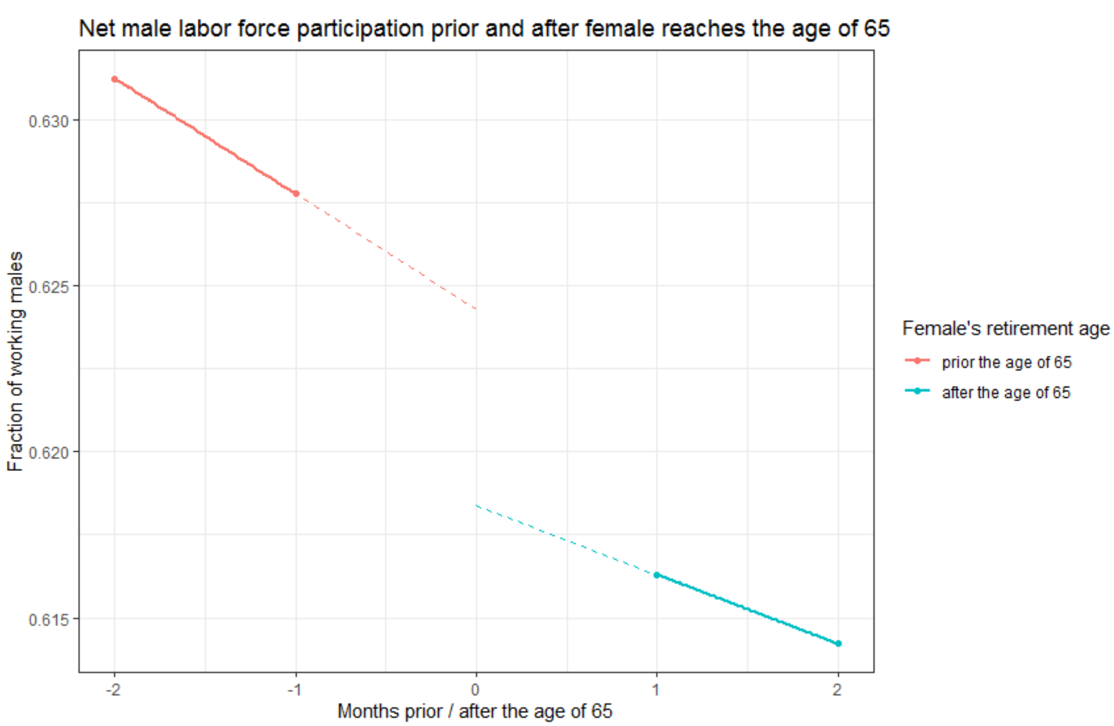


Figure 10 Net male labor force participation around the age 65 of the older female spouse.

V Estimation Method & Results

Having discussed the summary statistics and some graphical evidence, we are now going to estimate the effect of the increase in the Dutch pension eligibility age on the partner's labor supply decision by using a double regression discontinuity design (D-RDD). We restrict our estimation to households in which the oldest person retires after the year 2014. As explained in section IV, we do this to circumvent overlap with other Dutch pension reforms and financial incentives that may influence the labor supply decision of the younger partner. Exploiting the fact that different pension cohorts have a different pension eligibility age, we can determine whether the spousal labor supply reacts stronger when the oldest partner has a higher pension eligibility age. We as well use this regression output to explain whether leisure complementarity between partners increases or decreases over time. Next to this, we can perform some simulations. Lastly, we analyze the part-time factor, which measures the labor-supply of the youngest partner at the intensive margin.

V.A Labor Supply of the Youngest Spouse

We can estimate the effect of retirement on the labor supply decision of the youngest partner. We restrict ourselves to the case where the oldest partner has labor income as their main source of income before retirement. These data are available on a monthly base, making it possible for us to analyze how the labor supply of the youngest partner changes every month. To do so, we estimate a linear probability model using the following regression:

$$Q_y = \alpha + \beta_1 R^y + \beta_2 R^o + \beta_3\big(Age^o - Age(R^o)\big) +$$

$$\beta_4\big(Age^y - Age(R^y)\big) + \beta_5\big(\mathrm{Age^o}\text{-}\mathrm{Age(R^o)}\big)^*\mathrm{R^o} +$$

$$\beta_6\big(Age^y - Age(R^y)\big) * R^y + \beta_7 X + \epsilon \qquad (1)$$

The above regression measures how the labor supply of the youngest partner in a particular month depends on the pension eligibility age of the older partner and his or her own pension eligibility. More precisely, Q_y denotes the labor supply of the youngest partner y, which is equal to unity if the partner works[21] and is equal to zero otherwise. Therefore, we estimate a linear probability model. α denotes a constant. R^o and R^y are dummy variables that indicate whether the oldest (o) and youngest (y) partner

[21] We define an individual working when he or she either has a positive labor income or has a strictly positive part-time factor. Some individuals have a negative income during particular months (due to taxes payable for instance). To determine here whether that person works or does not work, we consider the part-time factor as discussed in the summary statistics.

are eligible for pension benefits in a particular month. If this is the case, the dummy is equal to unity. The terms $Age^o - Age(R^o)$ and $Age^y - Age(R^y)$ denote the difference in years between the age of the oldest and younger partner's age and their corresponding pension eligibility age. Age^o and Age^y are increasing each month as each person's age increases over time. β_5 and β_6 measure the interaction between the pension eligibility dummy and the difference between the current age and the public pension eligibility age. Lastly, X denotes a number of control variables for the household members and ϵ denotes the error term. In this regression, we control for whether one of the individuals is a first- or second-generation immigrant and whether any children living in the household. Lastly, we as well include a set of year dummies as control variables. We run the above regression separately for each pension cohort of the older spouse, meaning that we examine the labor supply effect of the younger partner for different cohorts. More precisely, by analyzing the effect of spousal labor supply for individuals with different pension eligibility ages we can see whether spousal labor supply reacts stronger or weaker when the oldest partner has a higher pension eligibility age.

The main coefficient of interest is β_2. This coefficient captures how the youngest partner reacts to the pension eligibility age of the older partner. A negative sign indicates the younger partner becomes less likely to work when the oldest spouse reaches the pension eligibility age. Therefore, a negative sign would implicate leisure complementarities between household members. A positive sign would indicate that the younger partner is more likely to work. This would imply that the income loss due to the retirement of the oldest spouse[22] gives an incentive for the youngest spouse to increase his or her labor supply. In particular, a higher pension eligibility age means as well more time to increase the amount of second pillar pension accrual, which could make it easier for the younger partner to leave the labor force at a younger age. On the other hand, if the oldest spouse does not adjust his own labor force participation after the increase in the public pension eligibility age, the financial situation of the household may become worse. As a result, the spouse may increase his or her labor supply. The regression output is displayed below for the case where the male is the oldest partner and the female is the oldest partner in table 4 below. The full regression output of regression (1) is displayed in the appendix.

[22] Remember that the first and second pillar combined should in theory add up to 70% of someone's gross wage over the working life. Moreover, wages at the end of someone's career tend to be higher than in the beginning, making the drop in income often even stronger. Therefore, the retirement of one of the spouses negatively affects the household's income.

Pension cohort		(1)		(2)	
		Male = old / Female = young		Female = old / Male = young	
		R^o	R^y	R^o	R^y
$R^o = 65 + 3$	%-point	-1.1*** (0.1)	-17.5*** (0.4)	-0.7 (0.5)	-28.8*** (1.1)
	%-change	-4.5*** (0.6)	-58.9*** (4.1)	-1.7 (1.2)	-70.2*** (6.5)
		$N = 21\ 148$		$N = 2\ 663$	
$R^o = 65 + 6$	%-point	-1.0*** (0.1)	-17.6*** (0.5)	-2.2*** (0.5)	-28.3*** (1.2)
	%-change	-3.5*** (0.5)	-61.5*** (2.6)	-4.5*** (1.0)	-58.5*** (4.0)
		$N = 20\ 224$		$N = \ 2\ 526$	
$R^o = 65 + 9$	%-point	-0.9*** (0.2)	-14.8*** (0.7)	-2.0*** (0.5)	-18.5*** (1.6)
	%-change	-2.9*** (0.5)	-47.0*** (2.4)	-4.0*** (1.1)	-37.2*** (3.3)
		$N = 19\ 665$		$N = \ 2\ 473$	

*Table 4 The effect of pension eligibility of the older spouse on the net labor supply of the younger partner. The regression formula is given by equation (1). We control for first- and second-generation immigrant status, the presence of children in the household, and year effects. Clustered standard errors at the household level are between parentheses. * denotes significance level at 10%, ** denotes significance at 5%, and *** denotes significance at 1%. The full regression output can be found in the appendix.*

Table 4 shows the effect of pension eligibility of the oldest partner on spousal labor supply as well as how the younger spouse is affected by his or her own pension eligibility. The interpretation of the results is as follows. Examining the effect of male public pension eligibility on female labor supply, we find that there is a negative and significant effect of approximately minus one percentage point. When looking at couples where the male is the younger partner the pattern is rather similar. Here the estimates are in a range of minus 0.7 percentage points to minus 2.2 percentage points, although for the first cohort the estimate is insignificant. Overall, the above results indicate that we find a consistently negative and significant effect across pension cohorts regardless of the gender of the oldest spouse. Using the intercept of our regression, it is as well possible to calculate the percentage change in net labor supply for the younger partner after the oldest spouse reaches the pension eligibility age. For couples where the male is the oldest partner, we find that this percentage change is equal to minus 2.9 to minus 4.5 percent, where the effect is smaller for the cohorts with a higher pension eligibility age. For couples where the female is the oldest partner, the effect is approximately equal to minus 4.5 and 4 percent for the last two cohorts.

The results as well show that the younger spouse reacts stronger to their own pension eligibility than to the pension eligibility of the older partner. Overall, this effect is negative and significant at the 1 percent level and ranges from minus 14.8 (18.5) percentage points to 17.6 (28.8) percentage points for couples where the male (female) is the oldest spouse. Looking at the percentage change in labor supply, we find that own pension eligibility decreases labor supply by 47 to approximately 59 percent for couples where the male is the oldest spouse. For couples where the female is the oldest spouse, the effect ranges from minus 37.2 to minus 70.2 percent.

V.B Leisure complementarity

Using part of the results of table 4, it is as well possible to determine whether leisure complementarity increases or decreases over time. As discussed in the literature review, leisure complementarity states that partners like to spend leisure time together. Therefore, the retirement of the oldest spouse may as well incentivize the younger worker to stop working. To check whether leisure complementarity between partners increased or decreased over time, we run a similar regression as equation (1). However, we change the dependent variable into the net labor supply of the older spouse (Q_o)[23]. The results of this regression can be found in the appendix. The main coefficient of interest is here (as well) β_2 as it indicates how the older partner changes his or her labor supply after reaching the pension eligibility age. Doing this for each cohort, we find that these coefficients range from minus 26.7 to minus 27.8 (minus 28.4 to minus 29.8) for couples where the male (female) is the oldest spouse. This means that the effect of pension eligibility of the oldest spouse on the net labor supply of the oldest spouse remains relatively constant over time, showing only a 1.1 (1.4) percentage points difference between cohorts where the male (female) is the oldest spouse.

When we take the ratio of the β_2 coefficients of the regression with Q_y and Q_o as the dependent variable, we can determine whether leisure complementarity over time increased or decreased. More precisely, this means that we divide the coefficients of how the younger spouse reacts to the older spouse pension eligibility by how the older spouse himself (herself) reacts to his (her) own pension eligibility age. The ratios are displayed below in table 5.

[23] Hence, we replace Q_y by Q_o.

	Male = old / female = young	Female = old / male = young
R^o = 65+3	0.042*** (0.005)	0.024 (0.016)
R^o = 65+6	0.035*** (0.005)	0.076*** (0.017)
R^o = 65+9	0.034*** (0.005)	0.071*** (0.018)

*Table 5 The ratio of how the younger and older spouse reacts to pension eligibility of the older spouse. Standard errors clustered at the household level are between parentheses. *** denotes significance at the 1% level.*

We observe that the ratio decreases over time regardless of the gender of the oldest spouse. This indicates that both younger male and female partners are less likely to withdraw from the labor force when their partner reaches the pension eligibility age. In other words, table 5 provides evidence that leisure complementarity between partners is decreasing over time or is outperformed by other effects that play a role in the labor force participation decision of younger partners. A possible explanation is that younger partners face a higher opportunity cost of not working and are therefore less likely to leave the labor force when their older partner reaches the pension eligibility age. Below we provide the real wage increase per year (2015 is the base year) for males and females in the age categories 55-60 and 60-65, respectively. We observe that male workers saw an increase in the real wage increase of approximately 0.2-1.5%, whereas female workers saw an increase of 2.3-3.2%. Given the different real wage increases for different genders, we would expect that younger female partners would be less likely to withdraw from the labor force than younger male partners over the period 2015-2018. As a consequence, we would expect a faster decline in the ratio of leisure complementarity for couples where the female is the younger partner as their opportunity cost of not working increased stronger when compared to males. More precisely, the ratio indicating leisure complementarity decline by 16.7 (19%) for couples for which the oldest spouse has a pension eligibility increase of 65 years and 6 months (65 years and 9 months). For couples where the female is the oldest spouse, there is no significant ratio for leisure complementarity for the cohort with a pension eligibility age of 65 years and 3 months. Calculating the percentage difference between the significant ratios, we find that this ratio declined by 6.6% for couples where the female is the oldest spouse.

Age group	Year	Male	Female
55-60	2016	1,466	2,439
	2017	1,432	2,957
	2018	1,065	3,170
60-65	2016	1,074	2,339
	2017	0,861	2,944
	2018	0,284	2,701

Table 6 Percentage real wage increase with 2015 as base year. Source: CBS (2020) *and own calculations.*

V.C Simulations per pension cohort

Next to the immediate effect, the terms $Age^o - Age(R^o)$, and $(Age^o - Age(R^o) * R^o$ can be used combined with the AOW^o dummy variable to calculate the total effect on the spousal labor supply for each cohort. The term $Age^o - AOW^o$ indicates how the probability that the youngest partner works increases or decreases with the time (in years) towards the oldest spouse's public pension eligibility age. For instance, when looking at the first cohort and the second column[24] where the male is the oldest partner, we observe that one year before the male's pension eligibility age, the probability that the female works increases with 1.0 percentage points (as $Age_1^o - Age(R_1^o) = -1$. Multiplying this number with a negative coefficient yields a positive result). After the male receives pension benefits, the total effect is a combination of the variables AOW_1^o, $Age_1^o - Age(R_1^o)$, and $(Age^m - Age(R_1^o) * R_1^o$. For instance, when the male is the oldest partner and received exactly one year ago for the first time pension benefits, the probability that the female works changes with $-0.020 - 0.010 + 0.010 = -0.020$. In other words, the probability that the female works one year after the older male partner in cohort 3 received for the first time pension benefits decreases on average with 2 percentage points. Table 7 below shows the results for different cohorts per gender of the younger spouse.

[24] We focus on the second column for the simulation exercise as year dummies make it more difficult to perform and interpret the simulation exercise. In particular, the oldest worker of cohort 2 could become eligible for pension benefits in 2015 or 2016 depending on his or her month of birth. The same holds as well for cohort 3 in the years 2016-2017 and 2017-2018, respectively.

Oldest partner's cohort	Female younger partner	Male younger partner
cohort 1: 65+3	-2.0	-2.1
cohort 2: 65+6	-1.8	-1.3
cohort 3: 65+9	-2.1	-4.9

Table 7 Percentage point difference regarding how the labor supply of the youngest partner is affected one year after pension eligibility of the oldest spouse. The effects are calculated by summing significant results at the 10 percent level (or higher) according to robust standard errors of column (2) of the regressions per cohort in the appendix.

The second column of table 5 represents the percentage point's difference that the female works one year after the older male partner became eligible for first pillar pension benefits. As already calculated, when the oldest partner belongs to the first cohort (with retirement age 65 years and three months) the percentage point difference is equal to -2. For the cohort with retirement age 65 years and six months and 65 years and nine months, this percentage point difference is equal to -1.8 and -2.1, respectively. The third column shows the effect when the male is the younger partner. Here we see a similar picture when compared to column 2. All in all, these results indicate that pension eligibility of the oldest spouse negatively affect the labor supply of the younger partner.

V.D Part time factor

We define the part-time factor as the total number of full-time days employed divided by the total days of employment in a particular month. For instance, if a worker has worked an equivalent of 15 full-time days[25] while being employed for 30 days in a particular month, the part-time factor for that month is equal to 0.5. In case an individual does not work, we assign them a value equal to zero[26]. Note that this calculation as well implies that the minimum value of the part-time factor is equal to zero and the maximum value is equal to 1. Using the part-time factor allows us to both examine the effect of the intensive and extensive margin as we can now take into account whether the partner decides to decrease or increase the number of full-time days worked.

In the appendix, we present graphs showing how the part-time factor changes before and after the older partner receives pension benefits for different cohorts for the older partner. They provide a similar

[25] Full-time is here defined according to the collective labor agreements in a particular sector. If there was not a collective labor agreement, Statistics Netherlands assumes that a full-time working week is equal to 35 hours.
[26] For those individuals that only worked overtime in a particular month, the part-time factor is according to our definition of the part-time factor also equal to zero.

image as the grahs we discussed in section IV. The regression we run is equal to regression (1), which we run again per pension cohort. However, now our left-hand-side variable is the part-time factor of the younger spouse. The output of the regression tables is presented in the appendix. Table 8 below shows the percentage point change as well as the percentage change in the part-time factor of the younger partner after pension eligibility of the older spouse and for his or her own pension eligibility. In couples where the male is the oldest spouse, the part-time factor of the younger partner reduces by approximately 0.5% points when the male becomes eligible for pension benefits. This is equivalent to a decrease of 3-5 percent[27]. Analyzing the effect of own pension eligibility on the part-time factor, the result tends to be much stronger. In particular, the part-time factor decreases with 7.1 to 9.3 percentage points (43 to 69) percent depending on the cohort the male individual belongs to. For couples where the female is the oldest partner, we observe a similar pattern as for the couples where the male is the oldest spouse. The biggest difference is that the estimate for couples with a pension eligibility age of 65+3 is not significant at the 5% level.

Pension cohort		(1)		(2)	
		Male = old/ Female = young		Female = old / Male = young	
		R^o	R^y	R^o	R^y
$R^o = 65 + 3$	%-point	-0.6*** (0.1)	-9.3*** (0.3)	-0.8* (0.4)	-27.3*** (1.0)
	%-change	-4.9*** (0.8)	-76.2*** (6.0)	-2.4 (1.3)	-81.25*** (7.9)
		$N = 21\ 148$		$N = 2\ 663$	
$R^o = 65 + 6$	%-point	-0.5*** (0.1)	-9.0*** (0.3)	-1.8*** (0.4)	-27.3*** (1.0)
	%-change	-3.8*** (0.72)	-67.7*** (3.9)	-4.6*** (1.1)	-69.5*** (4.7)
		$N = 20\ 224$		$N = 2\ 526$	
$R^o = 65 + 9$	%-point	-0.5*** (0.1)	-7.1*** (0.5)	-2.0*** (0.5)	-19.5*** (1.2)
	%-change	-3.0*** (0.6)	-43.0*** (2.8)	-4.8*** (1.1)	-46.8*** (3.3)
		$N = 19\ 665$		$N = 2\ 473$	

*Table 8: The effect of pension eligibility on the part-time factor of the younger spouse. We control for first- and second-generation immigrant status, the presence of children in the household, and year effects. Clustered standard errors at the household level are between parentheses. * denotes significance level at 10%, ** denotes significance at 5%, and *** denotes significance at 1%. The full regression output can be found in the appendix.*

[27] We again use the intercept of the regression to calculate the percentage difference.

VI Discussion

In this paper, we analyzed how spousal labor supply is affected by pension eligibility of the oldest spouse. We test how financial incentives and leisure complementarity jointly affect the labor supply decision of the youngest spouse by exploiting the stepwise increase of the pension eligibility age in the Netherlands. Considering the graphical evidence provided in section IV, we saw for most cohorts a small decrease after the oldest spouse reaches the pension eligibility age. However, the decrease in labor force participation is already visible before reaching the pension eligibility age. A possible explanation for this is given by Schippers & Vlasblom (2019). They attribute this to the unwillingness of employers to hire older workers. More precisely, they argue in their paper that the age of older workers is the most important reason why they cannot find a job. This is because their search intensity is not different when compared to younger workers and that reducing their wage standards does not have any effect on the chances of being hired.

Our results show that workers react strongly to their own pension eligibility, which is in line with the paper by Atav, Jongen, & Rabaté (2019). Moreover, we see that the percentage decrease in net labor supply of the oldest spouse is smaller for cohorts with a higher pension eligibility age. The regression results show as well a negative effect on labor force participation regardless of the gender of the oldest spouse. The sign and magnitude do not depend on the gender of the oldest spouse, except for the cohort with a pension age of 65 years and three months. Here we find an insignificant effect on spousal labor supply in case the female is the oldest spouse. We as well observe that the percentage difference is smaller for cohorts with a higher pension eligibility age.

The negative participation effect we found could be caused by both leisure complementarity as well as social norms. Financial incentives seem to play a less dominant role in the Dutch setting. The reason for this is that the labor income of the younger spouse tends to be much higher than the first pillar pension benefits the older partner receives. The latter is equal to fifty percent of the minimum wage, which is most likely inadequate financial compensation to withdraw from the labor force.

According to leisure complementarity, the younger partner stops working when the older partner retires as they like to spend time together. Although our results can be interpreted as evidence for leisure complementarity, we as well showed that the leisure complementarity between partners is lower for cohorts in which the oldest spouse has a higher pension eligibility age. A possible explanation for this is that the opportunity cost of not working is higher than the gains from sharing leisure time with your partner.

Lastly, the increase of the first pillar pension eligibility age may have blurred the social norm at which it is acceptable to stop working. For many decades the pension eligibility age was equal to 65. After 2013, however, each pension cohort is confronted with a different pension eligibility age, making the social norm not as strong as the initial norm of 65 years. Besides, changing legislation made it easier to continue working after someone reaches the pension eligibility age. This development possibly made the oldest spouse less concerned with his official pension eligibility age. As a consequence, the labor supply of the younger partner is as well less sensitive for the pension eligibility of the younger spouse. This line of reasoning corresponds with our findings that the percentage decrease in labor supply for both spouses is weaker for cohorts with a higher pension eligibility age.

In general, this paper adds to the recent literature on Dutch pension reforms. Kapteyn et al. (2018) provide an overview of all the reforms that have been implemented since the 1990s to increase labor force participation rates of older workers. This paper adds to this overview by analyzing how couples' retirement decisions play an active role in sustainable government finances. Other papers discussed how early retirement incentives for one of the partners reduced spousal labor supply (Bloemen, Hochguertel, & Zweerink, 2019 and Hospido & Zamarro, 2014). This paper argues that by increasing the pension eligibility age (as opposed to early retirement incentives), increases the labor supply of the youngest spouse. From a government perspective, this means that an increase in the pension eligibility age may not only have a first-order effect of lower expenditures and higher tax income for the oldest family member but as well a second-order effect of higher tax revenues via the younger partner.

VII Conclusion

In this paper, we discussed how the spousal labor supply is affected after the oldest partner became eligible for public pension benefits. We find that, regardless of the gender of the oldest partner, the probability that the younger partner works decreases significantly after the older partner receives public pension benefits. More precisely, we find a decrease in spousal labor supply of 3-5%. Examining the part-time factor provides us with similar results. Here we find a decrease in the range of minus 2.4 to minus 4.9 percent.

Appendix

Theoretical model

Having discussed the related literature, we now turn to our theoretical model to make predictions regarding household retirement decision. Chiappori (1988) discusses that there are two ways to model household decision making, namely the unitary approach and the non-cooperative approach. The unitary approach assumes that the household consists of one individual whereas the non-cooperative approach addresses each partner in the couple individually. We opt for the former by specifiying the following utility function for the household hh in which the male is the oldest partner[28]:

$$\max_{l_f,c} U^{hh}(c, m^*, l_f) = \left(bc^{\psi} + (1-b)\left(a * m^{*\rho} + (1-a) l(m^*)_f^{\rho}\right)^{\frac{\psi}{\rho}}\right)^{\frac{1}{\psi}} \qquad (1)$$

In the above utility function m^* and l^f denote the leisure of the male m and female f, respectively. $b \in (0,1)$ denotes the weights the household attributes towards consumption c and leisure time. Likewise, $a \in (0,1)$ denotes the weight the household attributes to male and female leisure. We assume that the leisure choice of the male is fixed (as if the male is already (partially) retired) and the female is going to decide whether she will increase or decrease her leisure based on the leisure time of her partner. Therefore, she needs to take into account the budget constraint. We normalize total time equal to 1, such that working time equals one minus the time spend on leisure. The budget constraint of the household is given by

$$c = w_m(1-m^*) + w_f\left(1 - l(m^*)_f\right) + y \qquad (2)$$

In the above equation, w_m and w_f denote male and female wage income when working. Lastly, y denotes the non-labor income. When plugging the budget constraint into the utility function and taking the first order derivative with respect to $l(m^*)_f$ we find

$$\underbrace{\left(w^m(1-m^*) + w^f\left(1-l(m^*)^f\right) + y\right)^{\psi-1}}_{\equiv LHS} = q \underbrace{\left(a * m^* + (1-a) l(m^*)_f^{\rho}\right)^{\frac{\psi-\rho}{\rho}}}_{\equiv RHS},\ q \equiv \frac{(1-b)(1-a)}{w_f b} > 0$$

(3)

[28] The assumption whether the male or female is the oldest partner does not make much of a difference; it is only introduced for notational convenience.

Intuitively, equation (3) states that in the optimum the marginal increase in consumption of the household should be equal to the weighted marginal increase in leisure time. This holds for all m^*, so differentiating with respect to m^* shows us how female leisure choice is affected by the leisure of the partner. Using implicit function theorem we find:

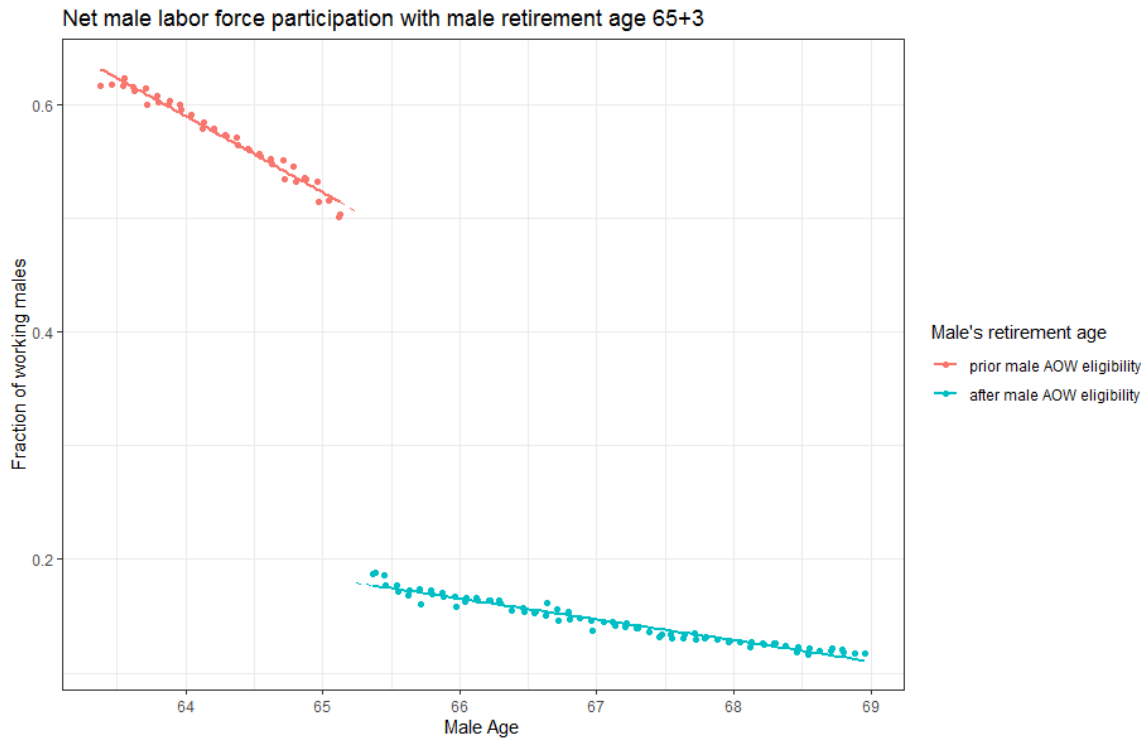
$$\boldsymbol{l'_f(m) = -\frac{q\frac{\partial RHS}{\partial m} - \frac{\partial LHS}{\partial m}}{\frac{\partial LHS}{\partial l_f} - q\frac{\partial RHS}{\partial l_f}}} \tag{4}$$

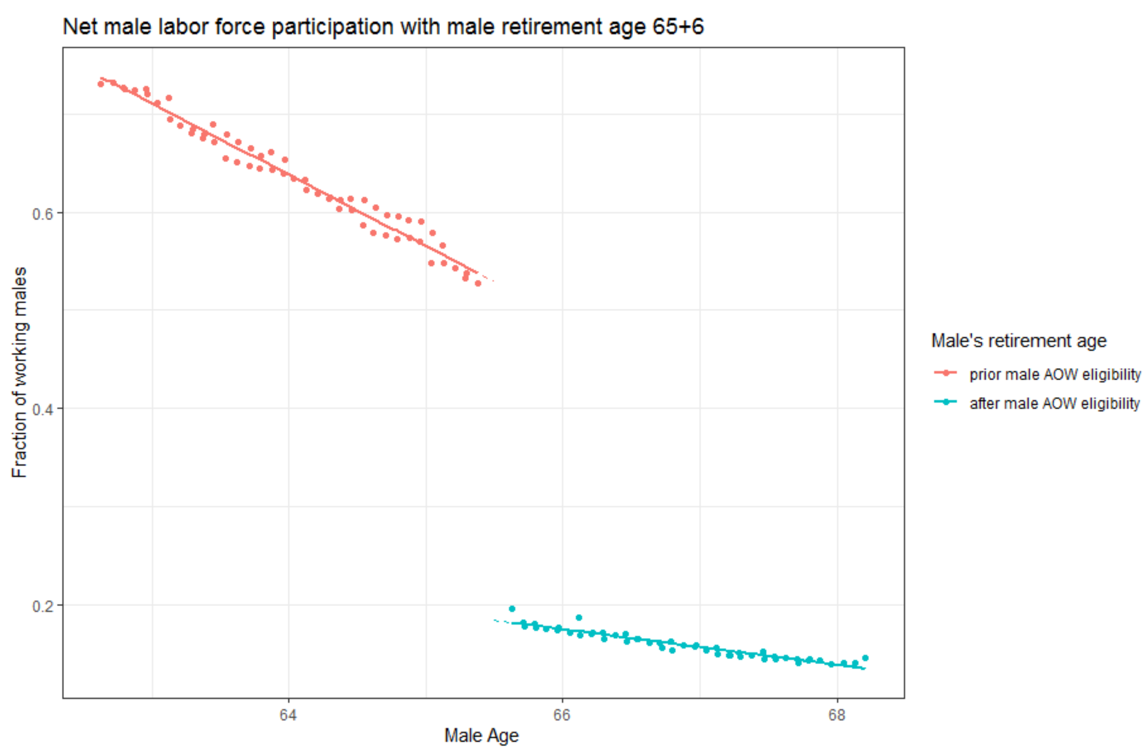
Equation (4) can be either positive or negative, depending on the values of ρ and ψ. Intuitively, the sign of equation (4) depends on whether the female sees i) consumption and leisure as complementary or substitutable goods and ii) whether she sees individual leisure as a complementary or substitutable good within the household. Therefore, we have three cases. First, in case female leisure is complementary with respect to male leisure, we should have that $\psi < 1$ and $\rho = 1$, or $\psi < 1$ and $\rho < 1$, or $\psi = 1$ and $\rho > 1$. Second, in case female leisure can be seen as substitutable for male leisure, we should have that $\psi = 1$ and $\rho < 1$, or $\psi > 1$ and $\rho = 1$, or $\psi = \rho$. In all other cases[29], it is not beforehand clear whether the sign will be positive or negative. We discuss which of these three possibilities is dominant in the Dutch pension reform in section IV and V.

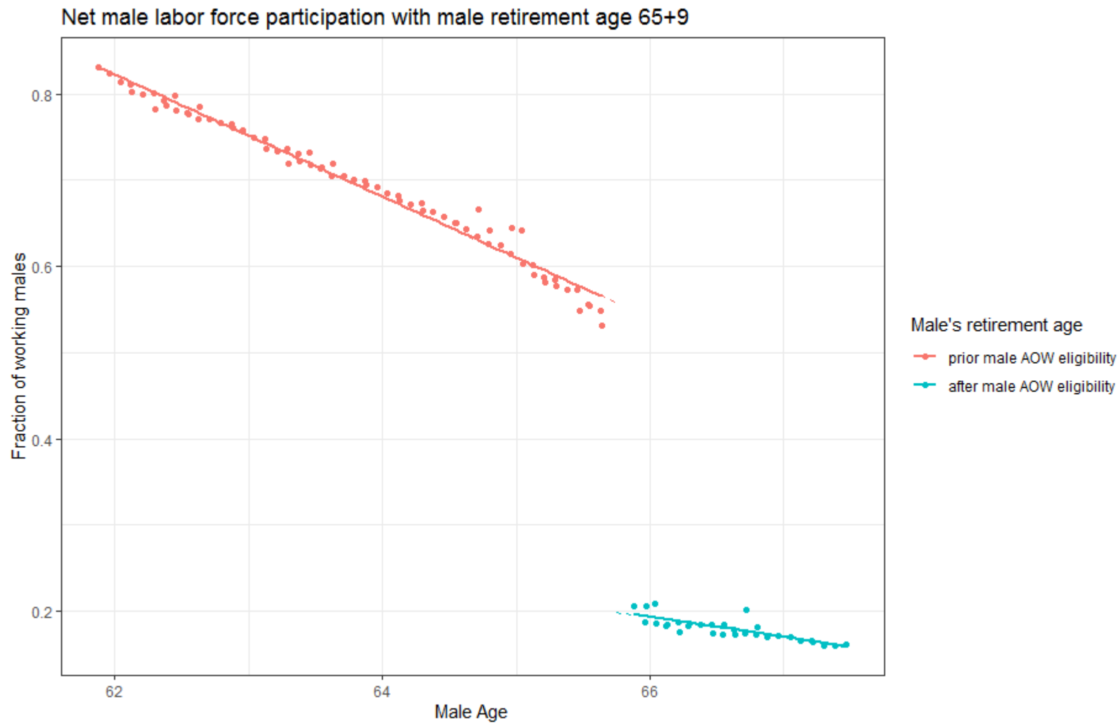
[29] These cases are $\psi < 1$ and $\rho < 1$, or $\psi > 1$ and $\rho < 1$, or $\psi > 1$ and $\rho > 1$, or $\psi < \rho$, or $\psi > \rho$.

Additional graphs and figures

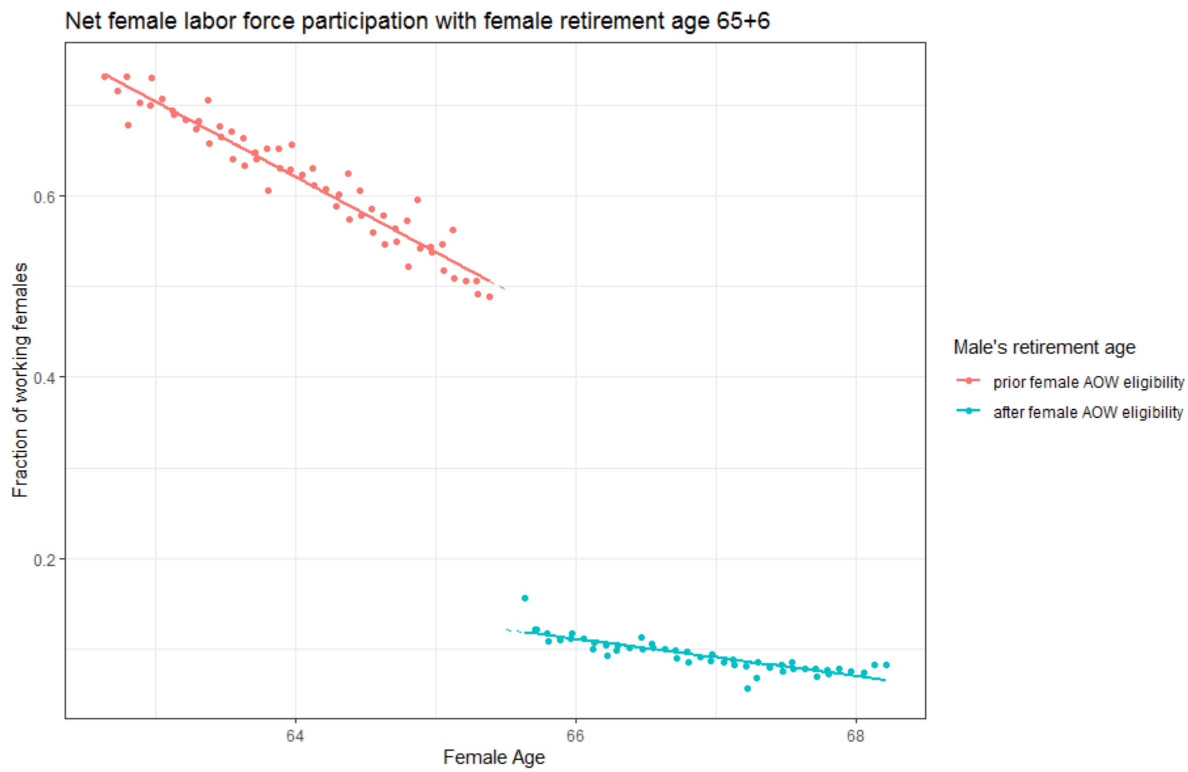
Effect of pension eligibility on own net labor force participation

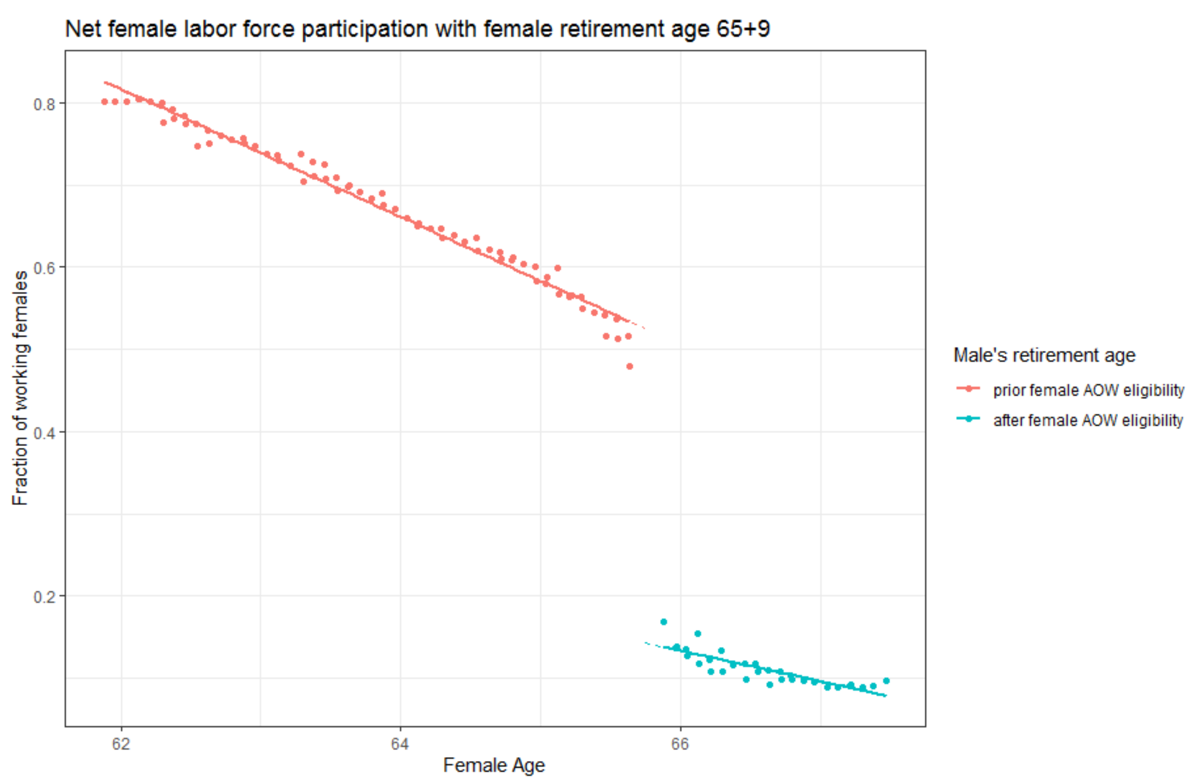





Net male labor force participation with male retirement age 65+9
Fraction of working males
0.8
0.6
0.4
0.2
62
64
66
Male Age
Male's retirement age
prior male AOW eligibility
after male AOW eligibility

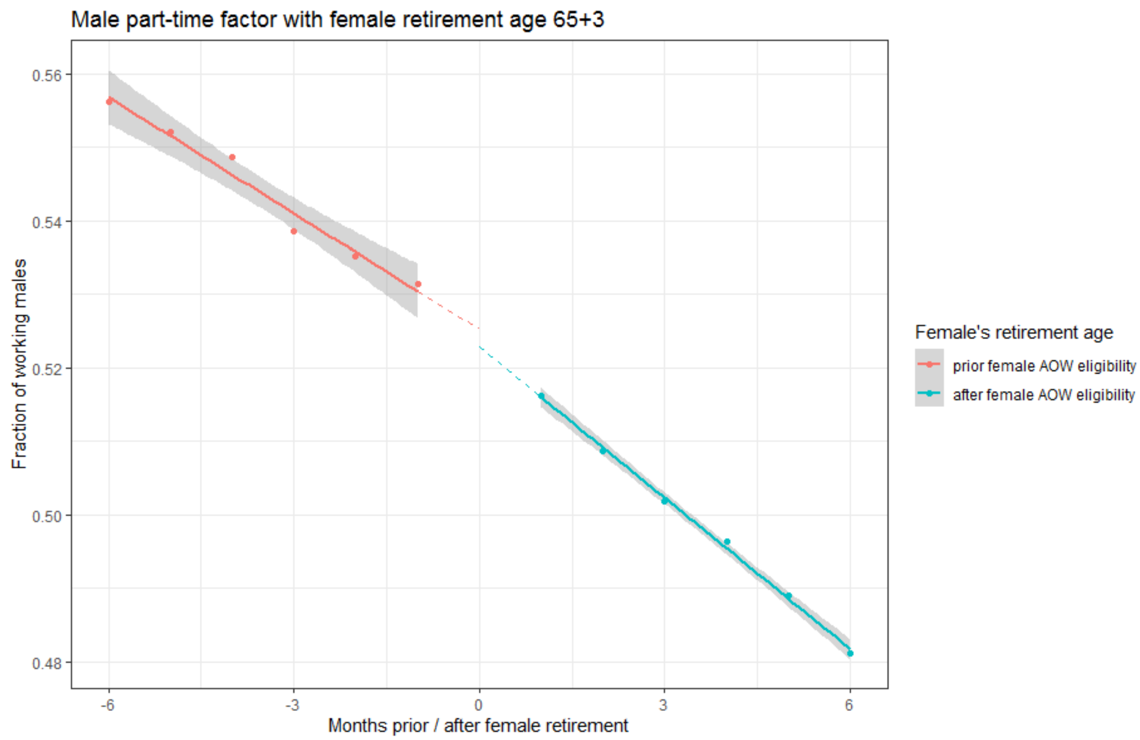

Net female labor force participation with female retirement age 65+3
Fraction of working females
0.6
0.4
0.2
0.0
64
65
66
67
68
69
Female Age
Male's retirement age
prior female AOW eligibility
after female AOW eligibility

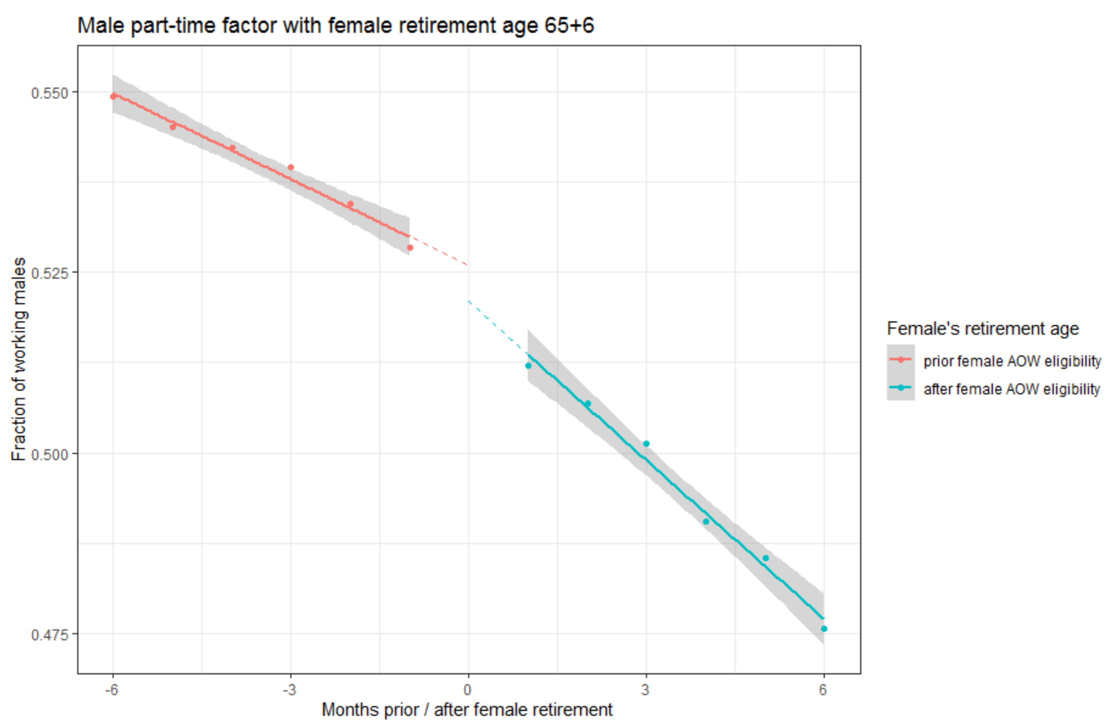

Net female labor force participation with female retirement age 65+6
Fraction of working females
0.6
0.4
0.2
64
66
68
Female Age
Male's retirement age
prior female AOW eligibility
after female AOW eligibility

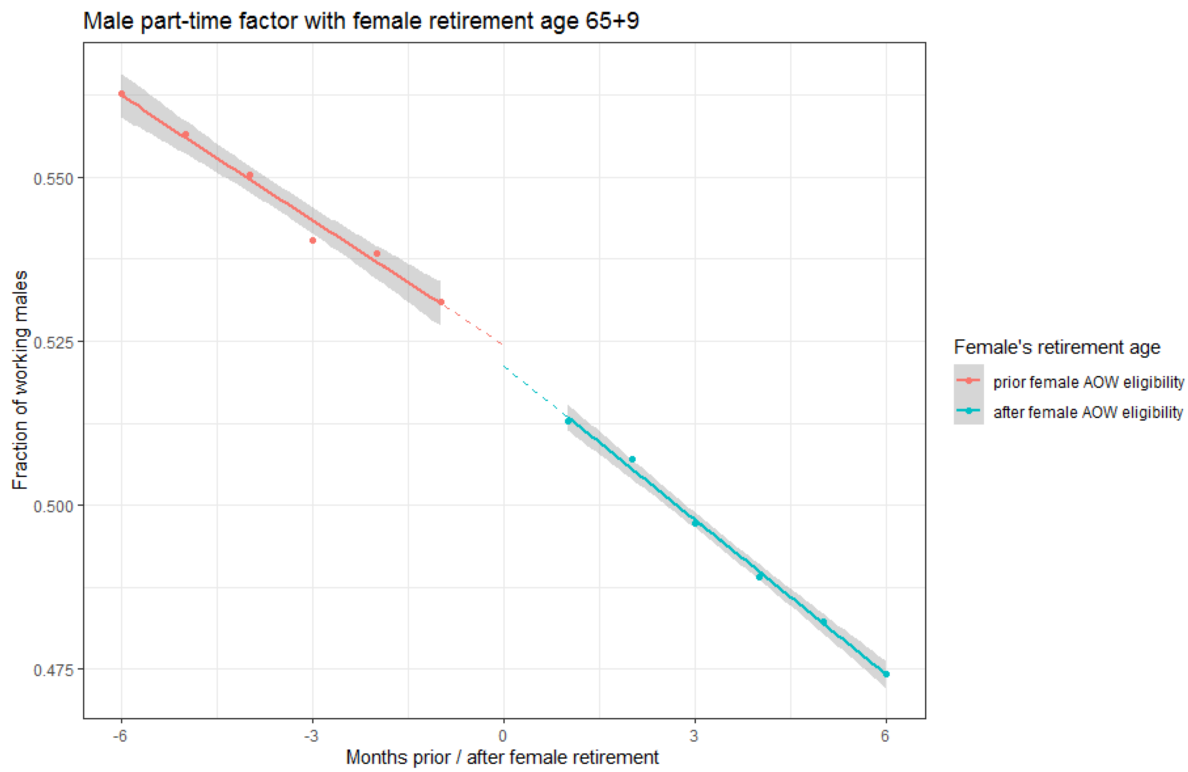

Net female labor force participation with female retirement age 65+9
Fraction of working females
0.8
0.6
0.4
0.2
62
64
66
Female Age
Male's retirement age
prior female AOW eligibility
after female AOW eligibility

Part time factor

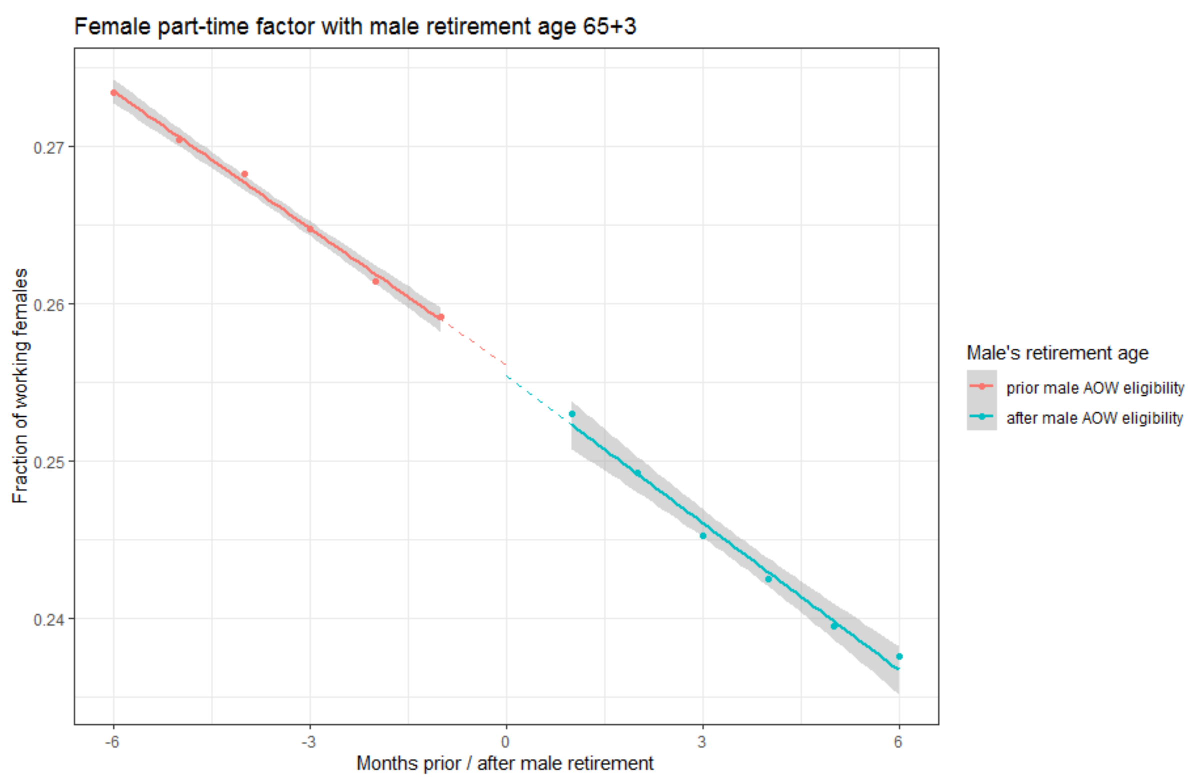
We plot the part-time factor of the youngest person in a couple before and after the oldest person reaches the pension eligibility age. More precisely, we plot the average part-time factor of the youngest partner 6 months prior and after the oldest partners reaches the pension eligibility age.





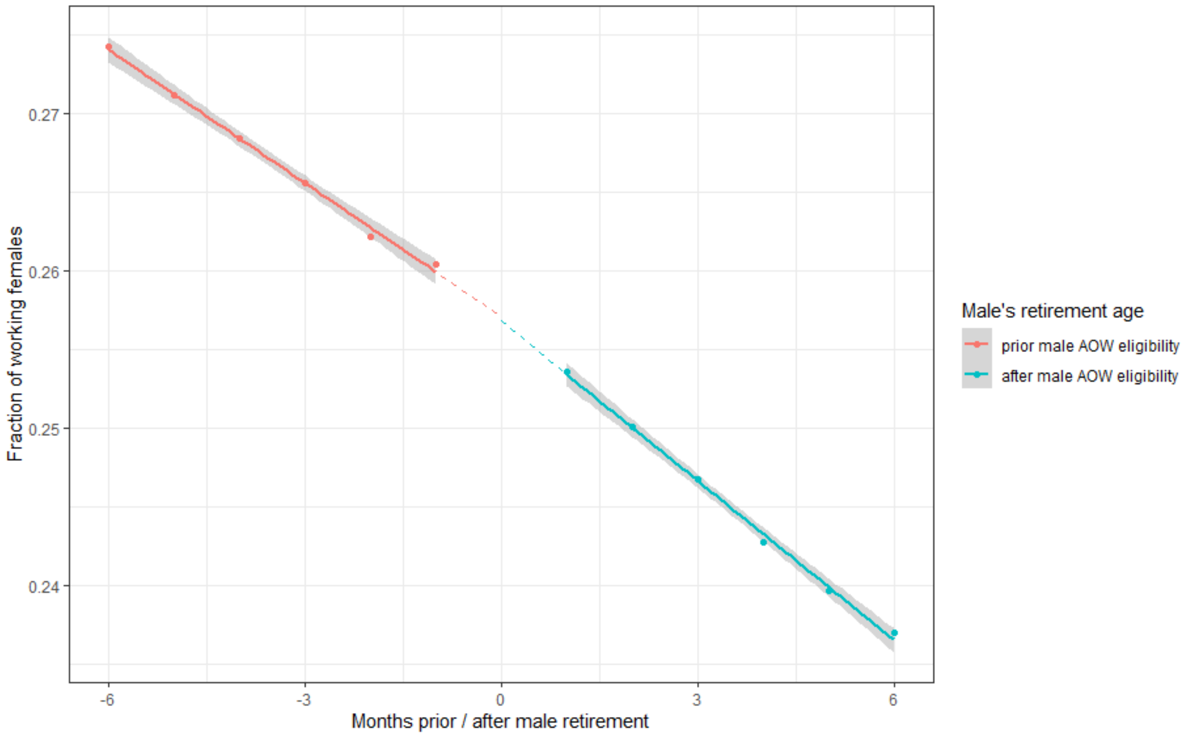


Male part-time factor with female retirement age 65+9
Fraction of working males
0.550
0.525
0.500
0.475
-6
-3
0
3
6
Months prior / after female retirement
Female's retirement age
prior female AOW eligibility
after female AOW eligibility

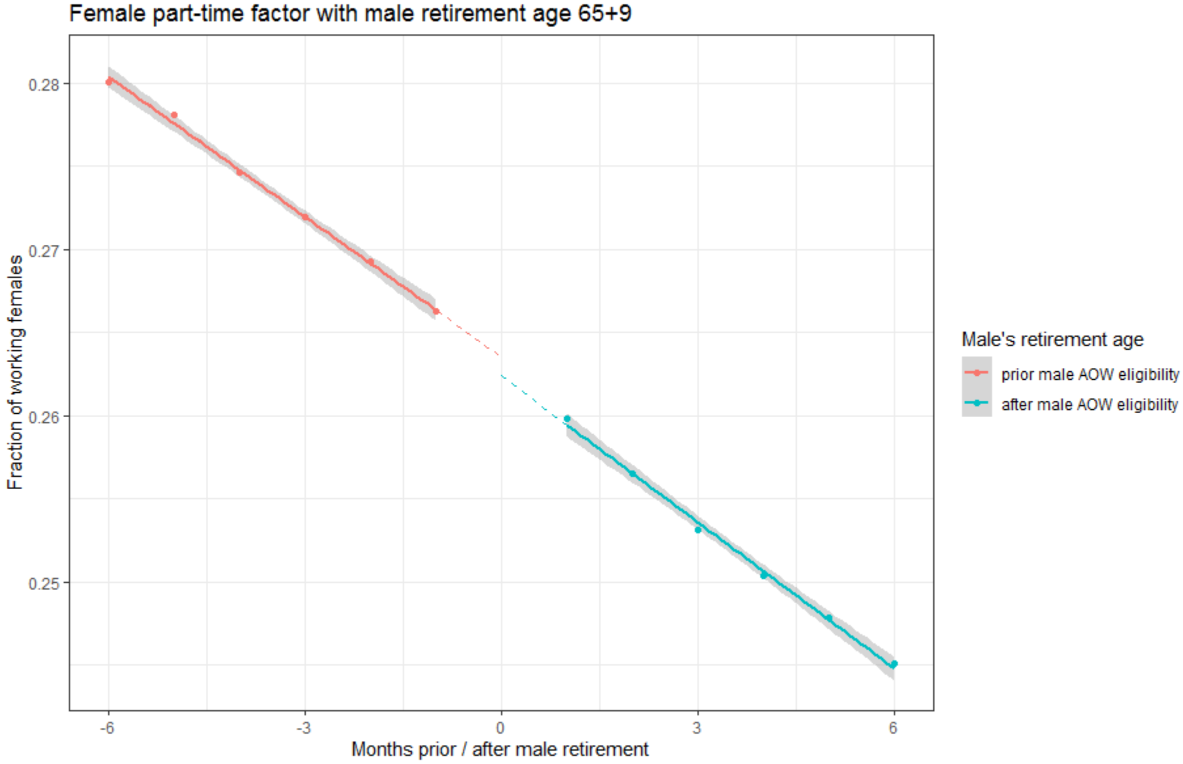


Female part-time factor with male retirement age 65+3
Fraction of working females
0.27
0.26
0.25
0.24
-6
-3
0
3
6
Months prior / after male retirement
Male's retirement age
prior male AOW eligibility
after male AOW eligibility

Female part-time factor with male retirement age 65+6



Female part-time factor with male retirement age 65+9



Additional regression output

Below we provide the regression output per regression cohort of equation (1). Tables with robust standard errors and clustered standard errors at the household level are presented, respectively. The first tables provide the regression output with spousal labor supply of the youngest spouse as the dependent variable. Thereafter we show the regression results for the part-time factor of the younger spouse as the dependent variable. The main variables we use from these tables are the coefficients for R^o and the intercept α. We use the formula $\frac{R^o}{\alpha}$ to calculate the percentage decrease in labor supply or the part-time factor. For the simulation, we use the coefficients of R^o, $R^o - Age(R^o)$, and $(Age^o - Age(R^o)) * R^o$ of the estimation tables for net labor supply.

Lastly, we show the regression output with the net labor supply of the oldest spouse as the dependent variable. Here we use the coefficient of R^o to calculate the ratios to determine whether leisure complementarity increases or decreases.

Male = old in cohort 1	(1)	(2)	(3)
α	0.278*** (0.001)	0.274*** (0.001)	0.247*** (0.004)
R^y	-0.178*** (0.001)	-0.178*** (0.001)	-0.175*** (0.001)
R^o	-0.020*** (0.002)	-0.020*** (0.002)	-0.011*** (0.002)
$R^o - Age(R^o)$	-0.011*** (0.002)	-0.010*** (0.002)	-0.004 (0.002)
$Age^y - Age(R^y)$	-0.033*** (0.0001)	-0.034*** (0.0001)	-0.034*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	0.006*** (0.001)	0.006*** (0.001)	0.004*** (0.001)
$(Age^o - Age(R^o)) * R^o$	0.011*** (0.002)	0.010*** (0.002)	0.011*** (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	12.6%	12.8%	12.8%
Households	21,148	21,148	21,148

*Table 9 The effect of male pension eligibility (male = oldest spouse) on female net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.*

Male = old in cohort 1	(1)	(2)	(3)
α	0.278*** (0.005)	0.274*** (0.005)	0.247*** (0.014)
R^y	-0.178*** (0.004)	-0.178*** (0.004)	-0.175*** (0.004)
R^o	-0.020*** (0.002)	-0.020*** (0.002)	-0.011*** (0.001)
$R^o - Age(R^o)$	-0.011*** (0.002)	-0.010*** (0.002)	-0.004 (0.006)
$Age^y - Age(R^y)$	-0.033*** (0.001)	-0.034*** (0.001)	-0.034*** (0.001)
$(Age^y - Age(R^y)) * R^y$	0.006*** (0.002)	0.006*** (0.002)	0.004** (0.002)
$(Age^o - Age(R^o)) * R^o$	0.011*** (0.002)	0.010*** (0.002)	0.011*** (0.004)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	12.6%	12.8%	12.8%
Households	21,148	21,148	21,148

*Table 10 The effect of male pension eligibility (male = oldest spouse) on female net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 2	(1)	(2)	(3)
α	0.293*** (0.001)	0.293*** (0.001)	0.286*** (0.004)
R^y	-0.178*** (0.002)	-0.177*** (0.002)	-0.176*** (0.002)
R^o	-0.014*** (0.002)	-0.014*** (0.002)	-0.010*** (0.002)
$R^o - Age(R^o)$	-0.016*** (0.001)	-0.016*** (0.001)	-0.017*** (0.002)
$Age^y - Age(R^y)$	-0.030*** (0.0001)	-0.030*** (0.0001)	-0.030*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	-0.023*** (0.002)	-0.023*** (0.002)	-0.024*** (0.002)
$(Age^o - Age(R^o)) * R^o$	0.012*** (0.001)	0.012*** (0.001)	0.015*** (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	8.9%	9.0%	9.0%
Households	20,224	20,224	20,224

*Table 11 The effect of male pension eligibility (male = oldest spouse) on female net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 2	(1)	(2)	(3)
α	0.293*** (0.005)	0.293*** (0.005)	0.286*** (0.011)
R^y	-0.178*** (0.005)	-0.177*** (0.005)	-0.176*** (0.005)
R^o	-0.014*** (0.002)	-0.014*** (0.002)	-0.010*** (0.001)
$R^o - Age(R^o)$	-0.016*** (0.001)	-0.016*** (0.001)	-0.017*** (0.006)
$Age^y - Age(R^y)$	-0.030*** (0.0001)	-0.030*** (0.001)	-0.030*** (0.001)
$(Age^y - Age(R^y)) * R^y$	-0.023*** (0.004)	-0.023*** (0.004)	-0.024*** (0.004)
$(Age^o - Age(R^o)) * R^o$	0.012*** (0.003)	0.012*** (0.002)	0.015*** (0.004)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	8.9%	9.0%	9.0%
Households	20,224	20,224	20,224

*Table 12 The effect of male pension eligibility (male = oldest spouse) on female net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 3	(1)	(2)	(3)
α	0.32*** (0.001)	0.315*** (0.001)	0.315*** (0.003)
R^y	-0.150*** (0.006)	-0.148*** (0.006)	-0.148*** (0.006)
R^o	-0.010*** (0.002)	-0.010*** (0.002)	-0.009*** (0.002)
$R^o - Age(R^o)$	-0.012*** (0.001)	-0.011*** (0.002)	-0.006*** (0.002)
$Age^y - Age(R^y)$	-0.028*** (0.0001)	-0.029*** (0.0001)	-0.029*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	-0.163*** (0.013)	-0.161*** (0.013)	-0.161*** (0.013)
$(Age^o - Age(R^o)) * R^o$	0.001 (0.002)	0.00001 (0.02)	-0.006** (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	6.4%	6.8%	6.8%
Households	19,665	19,665	19,665

*Table 13 The effect of male pension eligibility (male = oldest spouse) on female net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 3	(1)	(2)	(3)
α	0.32*** (0.005)	0.315*** (0.005)	0.315*** (0.003)
R^y	-0.150*** (0.007)	-0.148*** (0.007)	-0.148*** (0.007)
R^o	-0.010*** (0.002)	-0.010*** (0.002)	-0.009*** (0.001)
$R^o - Age(R^o)$	-0.012*** (0.001)	-0.011*** (0.001)	-0.006 (0.006)
$Age^y - Age(R^y)$	-0.028*** (0.001)	-0.029*** (0.001)	-0.029*** (0.001)
$(Age^y - Age(R^y)) * R^y$	-0.163*** (0.02)	-0.161*** (0.015)	-0.161*** (0.016)
$(Age^o - Age(R^o)) * R^o$	0.001 (0.003)	0.00001 (0.003)	-0.006 (0.004)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	6.4%	6.8%	6.8%
Households	19,665	19,665	19,665

*Table 14 The effect of male pension eligibility (male = oldest spouse) on female net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 1	(1)	(2)	(3)
α	0.464*** (0.004)	0.466*** (0.004)	0.410*** (0.012)
R^y	-0.294*** (0.004)	-0.293*** (0.004)	-0.288*** (0.004)
R^o	-0.021*** (0.005)	-0.020*** (0.005)	-0.007 (0.006)
$R^o - Age(R^o)$	-0.024*** (0.004)	-0.023*** (0.004)	-0.0002 (0.006)
$Age^y - Age(R^y)$	-0.038*** (0.0003)	-0.038*** (0.0003)	-0.038*** (0.0003)
$(Age^y - Age(R^y)) * R^y$	0.006** (0.003)	0.005** (0.003)	0.001 (0.003)
$(Age^o - Age(R^o)) * R^o$	0.022*** (0.005)	0.022*** (0.005)	0.014* (0.08)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	22.2%	22.5%	22.6%
Households	2,663	2,663	2,663

*Table 15 The effect of female pension eligibility (female = oldest spouse) on male net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 1	(1)	(2)	(3)
α	0.464*** (0.013)	0.466*** (0.013)	0.410*** (0.037)
R^y	-0.294*** (0.011)	-0.293*** (0.011)	-0.288*** (0.011)
R^o	-0.021*** (0.006)	-0.020*** (0.006)	-0.007 (0.005)
$R^o - Age(R^o)$	-0.024*** (0.006)	-0.023*** (0.006)	-0.0002 (0.015)
$Age^y - Age(R^y)$	-0.038*** (0.002)	-0.038*** (0.002)	-0.038*** (0.002)
$(Age^y - Age(R^y)) * R^y$	0.006 (0.006)	0.005 (0.006)	0.001 (0.007)
$(Age^o - Age(R^o)) * R^o$	0.0216** (0.008)	0.0216*** (0.008)	0.014 (0.013)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	22.2%	22.5%	22.6%
Households	2,663	2,663	2,663

*Table 16 The effect of female pension eligibility (female = oldest spouse) on male net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 2	(1)	(2)	(3)
α	0.493*** (0.003)	0.485*** (0.004)	0.484*** (0.010)
R^y	-0.287*** (0.005)	-0.286*** (0.006)	-0.283*** (0.006)
R^o	-0.031*** (0.005)	-0.031*** (0.005)	-0.022*** (0.006)
$R^o - Age(R^o)$	-0.024*** (0.002)	-0.023*** (0.002)	-0.016*** (0.005)
$Age^y - Age(R^y)$	-0.032*** (0.0004)	-0.032*** (0.0004)	-0.032*** (0.0004)
$(Age^y - Age(R^y)) * R^y$	-0.049*** (0.006)	-0.049*** (0.006)	-0.052*** (0.006)
$(Age^o - Age(R^o)) * R^o$	0.042*** (0.0035)	0.041*** (0.0035)	0.031*** (0.007)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	14.7%	15.3%	15.3%
Households	2,526	2,526	2,526

*Table 17 The effect of female pension eligibility (female = oldest spouse) on male net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 2	(1)	(2)	(3)
α	0.493*** (0.014)	0.493*** (0.014)	0.484*** (0.030)
R^y	-0.287*** (0.012)	-0.287*** (0.012)	-0.283*** (0.012)
R^o	-0.031*** (0.006)	-0.031*** (0.006)	-0.022*** (0.005)
$R^o - Age(R^o)$	-0.024*** (0.005)	-0.024*** (0.005)	-0.016 (0.0014)
$Age^y - Age(R^y)$	-0.032*** (0.0003)	-0.032*** (0.0003)	-0.032*** (0.003)
$(Age^y - Age(R^y)) * R^y$	-0.049*** (0.011)	-0.049*** (0.011)	-0.052*** (0.011)
$(Age^o - Age(R^o)) * R^o$	0.042*** (0.007)	0.042*** (0.007)	0.031*** (0.012)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	14.7%	15.3%	15.3%
Households	2,526	2,526	2,526

*Table 18 The effect of female pension eligibility (female = oldest spouse) on male net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 3	(1)	(2)	(3)
α	0.515*** (0.003)	0.513*** (0.003)	0.497*** (0.008)
R^y	-0.186*** (0.014)	-0.187*** (0.014)	-0.185*** (0.014)
R^o	-0.026*** (0.006)	-0.026*** (0.006)	-0.020*** (0.006)
$R^o - Age(R^o)$	-0.024*** (0.001)	-0.023*** (0.001)	-0.029*** (0.003)
$Age^y - Age(R^y)$	-0.030*** (0.0003)	-0.030*** (0.0003)	-0.030*** (0.0003)
$(Age^y - Age(R^y)) * R^y$	-0.274*** (0.031)	-0.275*** (0.031)	-0.280*** (0.031)
$(Age^o - Age(R^o)) * R^o$	0.006 (0.006)	0.006 (0.006)	0.021** (0.008)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	9.9%	10.4%	10.4%
Households	2473	2473	2473

*Table 19 The effect of female pension eligibility (female = oldest spouse) on male net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 3	(1)	(2)	(3)
α	0.515*** (0.013)	0.513*** (0.014)	0.497*** (0.020)
R^y	-0.186*** (0.016)	-0.187*** (0.016)	-0.185*** (0.016)
R^o	-0.026*** (0.007)	-0.026*** (0.007)	-0.020*** (0.005)
$R^o - Age(R^o)$	-0.024*** (0.003)	-0.023*** (0.003)	-0.029** (0.014)
$Age^y - Age(R^y)$	-0.030*** (0.002)	-0.030*** (0.002)	-0.030*** (0.002)
$(Age^y - Age(R^y)) * R^y$	-0.274*** (0.034)	-0.275*** (0.034)	-0.280*** (0.035)
$(Age^o - Age(R^o)) * R^o$	0.006 (0.010)	0.006 (0.010)	0.021 (0.013)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	9.9%	10.4%	10.4%
Households	2473	2473	2473

*Table 20 The effect of female pension eligibility (female = oldest spouse) on male net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Part-time factor

Male = old in cohort 1	(1)	(2)	(3)
α	0.139*** (0.001)	0.136*** (0.001)	0.122*** (0.003)
R^y	-0.095*** (0.001)	-0.094*** (0.0001)	-0.093*** (0.001)
R^o	-0.010*** (0.001)	-0.010*** (0.001)	-0.006*** (0.001)
$R^o - Age(R^o)$	-0.003*** (0.001)	-0.002** (0.001)	0.001 (0.002)
$Age^y - Age(R^y)$	-0.026*** (0.0001)	-0.026*** (0.0001)	-0.026*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	0.009*** (0.0005)	0.010*** (0.0005)	0.008*** (0.0005)
$(Age^o - Age(R^o)) * R^o$	0.004*** (0.001)	0.004*** (0.001)	0.005** (0.002)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	13.4%	13.5%	13.5%
Households	21,148	21,148	21,148

*Table 21 The effect of male pension eligibility (male = oldest spouse) on female's part-time factor. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 1	(1)	(2)	(3)
α	0.139*** (0.004)	0.136*** (0.003)	0.122*** (0.010)
R^y	-0.095*** (0.003)	-0.094*** (0.003)	-0.093*** (0.003)
R^o	-0.010*** (0.001)	-0.010*** (0.001)	-0.006*** (0.001)
$R^o - Age(R^o)$	-0.003** (0.002)	-0.002* (0.002)	0.001 (0.004)
$Age^y - Age(R^y)$	-0.026*** (0.001)	-0.026*** (0.001)	-0.026*** (0.001)
$(Age^y - Age(R^y)) * R^y$	0.009*** (0.001)	0.010*** (0.001)	0.008*** (0.001)
$(Age^o - Age(R^o)) * R^o$	0.004*** (0.001)	0.004** (0.001)	0.005* (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	13.4%	13.5%	13.5%
Households	21,148	21,148	21,148

*Table 22 The effect of male pension eligibility (male = oldest spouse) on female's part-time factor. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 2	(1)	(2)	(3)
α	0.149*** (0.001)	0.147*** (0.001)	0.133*** (0.002)
R^y	-0.092*** (0.001)	-0.091*** (0.001)	-0.090*** (0.001)
R^o	-0.010*** (0.001)	-0.010*** (0.001)	-0.005*** (0.001)
$R^o - Age(R^o)$	-0.005*** (0.001)	-0.005*** (0.001)	-0.002* (0.001)
$Age^y - Age(R^y)$	-0.024*** (0.0001)	-0.025*** (0.0001)	-0.024*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	-0.008*** (0.001)	-0.008*** (0.001)	-0.009*** (0.001)
$(Age^o - Age(R^o)) * R^o$	0.004*** (0.001)	0.004*** (0.001)	0.007*** (0.002)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	10.1%	10.3%	10.3%
Households	20,224	20,224	20,224

*Table 23 The effect of male pension eligibility (male = oldest spouse) female's part-time factor. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 2	(1)	(2)	(3)
α	0.149*** (0.004)	0.147*** (0.004)	0.133*** (0.007)
R^y	-0.092*** (0.003)	-0.091*** (0.003)	-0.090*** (0.003)
R^o	-0.010*** (0.001)	-0.010*** (0.001)	-0.005*** (0.001)
$R^o - Age(R^o)$	-0.005*** (0.001)	-0.005*** (0.001)	-0.002 (0.003)
$Age^y - Age(R^y)$	-0.024*** (0.001)	-0.025*** (0.001)	-0.024*** (0.001)
$(Age^y - Age(R^y)) * R^y$	-0.008*** (0.002)	-0.008*** (0.002)	-0.009*** (0.002)
$(Age^o - Age(R^o)) * R^o$	0.004*** (0.001)	0.004*** (0.001)	0.007*** (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	10.1%	10.3%	10.3%
Households	20,224	20,224	20,224

*Table 24 The effect of male pension eligibility (male = oldest spouse) female's part-time factor. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 3	(1)	(2)	(3)
α	0.167*** (0.001)	0.164*** (0.001)	0.164*** (0.002)
R^y	-0.072*** (0.004)	-0.071*** (0.004)	-0.071*** (0.004)
R^o	-0.006*** (0.001)	-0.006*** (0.001)	-0.005*** (0.002)
$R^o - Age(R^o)$	-0.004*** (0.0004)	-0.003*** (0.0004)	0.0002 (0.001)
$Age^y - Age(R^y)$	-0.023*** (0.0001)	-0.023*** (0.0001)	-0.023*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	-0.103*** (0.008)	-0.101*** (0.008)	-0.100*** (0.008)
$(Age^o - Age(R^o)) * R^o$	-0.001 (0.001)	-0.002 (0.001)	-0.007*** (0.002)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	7.3%	7.5%	7.5%
Households	19,665	19,665	19,665

*Table 25 The effect of male pension eligibility (male = oldest spouse) on female's part-time factor. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 3	(1)	(2)	(3)
α	0.167*** (0.004)	0.164*** (0.004)	0.164*** (0.005)
R^y	-0.072*** (0.005)	-0.071*** (0.005)	-0.071*** (0.005)
R^o	-0.006*** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)
$R^o - Age(R^o)$	-0.004*** (0.001)	-0.003*** (0.001)	0.0002 (0.004)
$Age^y - Age(R^y)$	-0.023*** (0.001)	-0.023*** (0.001)	-0.023*** (0.001)
$(Age^y - Age(R^y)) * R^y$	-0.103*** (0.009)	-0.101*** (0.009)	-0.100*** (0.010)
$(Age^o - Age(R^o)) * R^o$	-0.001 (0.002)	-0.002 (0.002)	-0.007*** (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	7.3%	7.5%	7.5%
Households	19,665	19,665	19,665

*Table 26 The effect of male pension eligibility (male = oldest spouse) on female's part-time factor. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 1	(1)	(2)	(3)
α	0.40*** (0.004)	0.396*** (0.004)	0.336*** (0.010)
R^y	-0.279*** (0.003)	-0.278*** (0.003)	-0.273*** (0.003)
R^o	-0.021*** (0.005)	-0.021*** (0.004)	-0.008 (0.005)
$R^o - Age(R^o)$	-0.022*** (0.004)	-0.021*** (0.004)	0.002 (0.006)
$Age^y - Age(R^y)$	-0.040*** (0.0003)	-0.040*** (0.0003)	-0.040*** (0.0003)
$(Age^y - Age(R^y)) * R^y$	0.007*** (0.002)	0.006*** (0.002)	0.002 (0.002)
$(Age^o - Age(R^o)) * R^o$	0.022*** (0.004)	0.021*** (0.004)	0.015** (0.007)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	25.4%	25.7%	25.7%
Households	2,663	2,663	2,663

*Table 27 The effect of female pension eligibility (female = oldest spouse) on male's part-time factor. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 1	(1)	(2)	(3)
α	0.40*** (0.011)	0.396*** (0.012)	0.336*** (0.032)
R^y	-0.279*** (0.010)	-0.278*** (0.010)	-0.273* (0.010)
R^o	-0.021*** (0.005)	-0.021*** (0.005)	-0.008* (0.004)
$R^o - Age(R^o)$	-0.022*** (0.006)	-0.021*** (0.006)	0.002 (0.015)
$Age^y - Age(R^y)$	-0.040*** (0.002)	-0.040*** (0.002)	-0.040*** (0.002)
$(Age^y - Age(R^y)) * R^y$	0.007 (0.007)	0.006 (0.004)	0.002 (0.004)
$(Age^o - Age(R^o)) * R^o$	0.022*** (0.007)	0.021*** (0.007)	0.015** (0.012)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	25.4%	25.7%	25.7%
Households	2,663	2,663	2,663

*Table 28 The effect of female pension eligibility (female = oldest spouse) on male's part-time factor. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 2	(1)	(2)	(3)
α	0.418*** (0.003)	0.412*** (0.003)	0.393*** (0.009)
R^y	-0.277*** (0.005)	-0.276*** (0.005)	-0.273*** (0.005)
R^o	-0.026*** (0.005)	-0.026*** (0.005)	-0.018*** (0.006)
$R^o - Age(R^o)$	-0.023*** (0.002)	-0.021*** (0.002)	-0.010** (0.005)
$Age^y - Age(R^y)$	-0.034*** (0.0004)	-0.034*** (0.0004)	-0.034*** (0.0004)
$(Age^y - Age(R^y)) * R^y$	-0.041*** (0.004)	-0.041*** (0.004)	-0.044*** (0.005)
$(Age^o - Age(R^o)) * R^o$	0.033*** (0.003)	0.031*** (0.003)	0.026*** (0.007)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	16.8%	17.5%	17.5%
Households	2,526	2,526	2,526

*Table 29 The effect of female pension eligibility (female = oldest spouse) on male's part-time factor. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 2	(1)	(2)	(3)
α	0.418*** (0.013)	0.412*** (0.013)	0.393*** (0.027)
R^y	-0.277*** (0.011)	-0.276*** (0.011)	-0.273*** (0.010)
R^o	-0.026*** (0.005)	-0.026*** (0.005)	-0.018*** (0.004)
$R^o - Age(R^o)$	-0.023*** (0.004)	-0.021*** (0.004)	-0.010 (0.014)
$Age^y - Age(R^y)$	-0.034*** (0.003)	-0.034*** (0.003)	-0.034*** (0.003)
$(Age^y - Age(R^y)) * R^y$	-0.041*** (0.007)	-0.041*** (0.007)	-0.044*** (0.007)
$(Age^o - Age(R^o)) * R^o$	0.033*** (0.006)	0.031*** (0.006)	0.026** (0.012)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	16.8%	17.5%	17.5%
Households	2,526	2,526	2,526

*Table 30 The effect of female pension eligibility (female = oldest spouse) on male's part-time factor. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 3	(1)	(2)	(3)
α	0.441*** (0.003)	0.439*** (0.003)	0.417*** (0.007)
R^y	-0.197*** (0.011)	-0.197*** (0.011)	-0.195*** (0.006)
R^o	-0.027*** (0.005)	-0.027*** (0.005)	-0.020*** (0.006)
$R^o - Age(R^o)$	-0.026*** (0.001)	-0.025*** (0.001)	-0.022*** (0.004)
$Age^y - Age(R^y)$	-0.031*** (0.0003)	-0.031*** (0.0003)	-0.031*** (0.0003)
$(Age^y - Age(R^y)) * R^y$	-0.230*** (0.023)	-0.232*** (0.023)	-0.238*** (0.023)
$(Age^o - Age(R^o)) * R^o$	0.012** (0.006)	0.012** (0.005)	0.021*** (0.008)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	11.2%	11.5%	11.5%
Households	2,473	2,473	2,473

*Table 31 The effect of female pension eligibility (female = oldest spouse) on male's part-time factor. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 3	(1)	(2)	(3)
α	0.441*** (0.013)	0.439*** (0.013)	0.417*** (0.018)
R^y	-0.197*** (0.013)	-0.197*** (0.013)	-0.195*** (0.012)
R^o	-0.027*** (0.006)	-0.027*** (0.006)	-0.020*** (0.005)
$R^o - Age(R^o)$	-0.026*** (0.003)	-0.025*** (0.003)	-0.022 (0.013)
$Age^y - Age(R^y)$	-0.031*** (0.002)	-0.031*** (0.002)	-0.031*** (0.002)
$(Age^y - Age(R^y)) * R^y$	-0.230*** (0.025)	-0.232*** (0.025)	-0.238*** (0.026)
$(Age^o - Age(R^o)) * R^o$	0.012 (0.009)	0.012 (0.008)	0.021 (0.013)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	11.2%	11.5%	11.5%
Households	2,473	2,473	2,473

*Table 32 The effect of female pension eligibility (female = oldest spouse) on male's part-time factor. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Labor supply of the oldest spouse

Male = old in cohort 1 (own labor supply)	(1)	(2)	(3)
α	0.469*** (0.001)	0.468*** (0.002)	0.451*** (0.004)
R^y	0.002 (0.002)	0.0002 (0.002)	0.005** (0.002)
R^o	-0.301*** (0.002)	-0.301*** (0.002)	-0.267*** (0.002)
$R^o - Age(R^o)$	-0.063*** (0.002)	-0.063*** (0.002)	-0.063*** (0.002)
$Age^y - Age(R^y)$	-0.008*** (0.0001)	-0.006*** (0.0001)	-0.006*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	0.005*** (0.001)	0.004*** (0.001)	-0.003** (0.001)
$(Age^o - Age(R^o)) * R^o$	0.040*** (0.002)	0.040*** (0.002)	0.037*** (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	18.6%	18.8%	18.9%
Households	21,148	21,148	21,148

*Table 33 The effect of male pension eligibility (male = oldest spouse) on male net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 1 (own labor supply)	(1)	(2)	(3)
α	0.469*** (0.005)	0.468*** (0.005)	0.451*** (0.011)
R^y	0.002 (0.004)	0.0002 (0.004)	0.005 (0.004)
R^o	-0.301*** (0.003)	-0.301*** (0.003)	-0.267*** (0.003)
$R^o - Age(R^o)$	-0.063*** (0.002)	-0.063*** (0.002)	-0.063*** (0.006)
$Age^y - Age(R^y)$	-0.008*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)
$(Age^y - Age(R^y)) * R^y$	0.005* (0.003)	0.004 (0.003)	-0.003 (0.003)
$(Age^o - Age(R^o)) * R^o$	0.040*** (0.002)	0.040*** (0.002)	0.037*** (0.006)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	18.6%	18.8%	18.9%
Households	21,148	21,148	21,148

*Table 34 The effect of male pension eligibility (male = oldest spouse) on male net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 2 (own labor supply)	(1)	(2)	(3)
α	0.488*** (0.001)	0.484*** (0.001)	0.452*** (0.003)
R^y	0.001 (0.002)	-0.001 (0.003)	0.004 (0.003)
R^o	-0.304*** (0.002)	-0.304*** (0.002)	-0.278*** (0.002)
$R^o - Age(R^o)$	-0.064*** (0.001)	-0.065*** (0.001)	-0.083*** (0.002)
$Age^y - Age(R^y)$	-0.010*** (0.0001)	-0.008*** (0.0001)	-0.008*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	0.00002 (0.003)	-0.001 (0.003)	-0.011*** (0.003)
$(Age^o - Age(R^o)) * R^o$	0.032*** (0.001)	0.032*** (0.001)	0.055*** (0.002)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	22.3%	22.5%	22.6%
Households	20,224	20,224	20,224

*Table 35 The effect of male pension eligibility (male = oldest spouse) on male net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 2 (own labor supply)	(1)	(2)	(3)
α	0.488*** (0.005)	0.484*** (0.005)	0.452*** (0.009)
R^y	0.001 (0.005)	-0.001 (0.005)	0.004 (0.005)
R^o	-0.304*** (0.003)	-0.304*** (0.003)	-0.278*** (0.003)
$R^o - Age(R^o)$	-0.064*** (0.001)	-0.065*** (0.001)	-0.083*** (0.005)
$Age^y - Age(R^y)$	-0.010*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)
$(Age^y - Age(R^y)) * R^y$	0.00002 (0.005)	-0.001 (0.005)	-0.011** (0.005)
$(Age^o - Age(R^o)) * R^o$	0.032*** (0.002)	0.032*** (0.002)	0.055*** (0.006)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	22.3%	22.5%	22.6%
Households	20,224	20,224	20,224

*Table 36 The effect of male pension eligibility (male = oldest spouse) on male net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 3 (own labor supply)	(1)	(2)	(3)
α	0.509*** (0.001)	0.507*** (0.001)	0.469*** (0.003)
R^y	0.004 (0.007)	-0.0003 (0.007)	0.002 (0.006)
R^o	-0.288*** (0.002)	-0.289*** (0.002)	-0.276*** (0.002)
$R^o - Age(R^o)$	-0.061*** (0.0005)	-0.062*** (0.0005)	-0.076*** (0.001)
$Age^y - Age(R^y)$	-0.011*** (0.0001)	-0.009*** (0.0001)	-0.009*** (0.0001)
$(Age^y - Age(R^y)) * R^y$	0.030* (0.016)	0.029* (0.016)	0.018 (0.016)
$(Age^o - Age(R^o)) * R^o$	-0.018*** (0.002)	-0.018*** (0.002)	0.017*** (0.003)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	21.6%	21.9%	21.9%
Households	19,665	19,665	19,665

*Table 37 The effect of male pension eligibility (male = oldest spouse) on male net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Male = old in cohort 3 (own labor supply)	(1)	(2)	(3)
α	0.509*** (0.005)	0.507*** (0.005)	0.469*** (0.006)
R^y	0.004 (0.008)	-0.0003 (0.008)	0.002 (0.008)
R^o	-0.288*** (0.003)	-0.289*** (0.003)	-0.276*** (0.003)
$R^o - Age(R^o)$	-0.061*** (0.001)	-0.062*** (0.001)	-0.076*** (0.005)
$Age^y - Age(R^y)$	-0.011*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)
$(Age^y - Age(R^y)) * R^y$	0.030 (0.02)	0.029 (0.019)	0.018 (0.019)
$(Age^o - Age(R^o)) * R^o$	-0.018*** (0.003)	-0.018*** (0.003)	0.017*** (0.006)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	21.6%	21.9%	21.9%
Households	19,665	19,665	19,665

*Table 38 The effect of male pension eligibility (male = oldest spouse) on male net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 1 (own labor supply)	(1)	(2)	(3)
α	0.505*** (0.004)	0.498*** (0.004)	0.482*** (0.008)
R^y	-0.014*** (0.003)	-0.013*** (0.003)	-0.002 (0.003)
R^o	-0.346*** (0.005)	-0.346*** (0.005)	-0.298*** (0.005)
$R^o - Age(R^o)$	-0.079*** (0.004)	-0.079*** (0.004)	-0.069*** (0.007)
$Age^y - Age(R^y)$	-0.0003 (0.0003)	0.0002 (0.0003)	0.0003 (0.0003)
$(Age^y - Age(R^y)) * R^y$	0.020*** (0.002)	0.020*** (0.002)	0.008*** (0.002)
$(Age^o - Age(R^o)) * R^o$	0.038*** (0.005)	0.037*** (0.005)	0.022*** (0.007)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	27.7%	27.9%	28.1
Households	2,663	2,663	2,663

*Table 39 The effect of female pension eligibility (female = oldest spouse) on female net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 1 (own labor supply)	(1)	(2)	(3)
α	0.505*** (0.012)	0.498*** (0.012)	0.482*** (0.025)
R^y	-0.014*** (0.007)	-0.013* (0.007)	-0.002 (0.007)
R^o	-0.346*** (0.009)	-0.346*** (0.009)	-0.298*** (0.008)
$R^o - Age(R^o)$	-0.079*** (0.006)	-0.079*** (0.006)	-0.069*** (0.016)
$Age^y - Age(R^y)$	-0.0003 (0.002)	0.0002 (0.002)	0.0003 (0.002)
$(Age^y - Age(R^y)) * R^y$	0.020*** (0.005)	0.020*** (0.005)	0.008 (0.016)
$(Age^o - Age(R^o)) * R^o$	0.038*** (0.007)	0.037*** (0.007)	0.022 (0.023)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	27.7%	27.9%	28.1
Households	2,663	2,663	2,663

*Table 40 The effect of female pension eligibility (female = oldest spouse) on female net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 2 (own labor supply)	(1)	(2)	(3)
α	0.492*** (0.004)	0.484*** (0.004)	0.427*** (0.008)
R^y	-0.023*** (0.004)	-0.023*** (0.004)	-0.015*** (0.004)
R^o	-0.323*** (0.004)	-0.324*** (0.004)	-0.291*** (0.005)
$R^o - Age(R^o)$	-0.086*** (0.002)	-0.084*** (0.002)	-0.066*** (0.005)
$Age^y - Age(R^y)$	-0.001** (0.0003)	-0.0005 (0.0003)	-0.0004 (0.0004)
$(Age^y - Age(R^y)) * R^y$	0.018*** (0.005)	0.018*** (0.005)	0.005 (0.005)
$(Age^o - Age(R^o)) * R^o$	0.040*** (0.003)	0.039*** (0.003)	0.036*** (0.006)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	27.5%	28.0%	28.1%
Households	2,526	2,526	2,526

*Table 41 The effect of female pension eligibility (female = oldest spouse) on female net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 2 (own labor supply)	(1)	(2)	(3)
α	0.492*** (0.012)	0.484*** (0.013)	0.427*** (0.021)
R^y	-0.023** (0.008)	-0.023** (0.008)	-0.015* (0.009)
R^o	-0.323*** (0.009)	-0.324*** (0.009)	-0.291*** (0.008)
$R^o - Age(R^o)$	-0.086*** (0.004)	-0.084*** (0.004)	-0.066*** (0.015)
$Age^y - Age(R^y)$	-0.001** (0.002)	-0.0005 (0.002)	-0.0004 (0.002)
$(Age^y - Age(R^y)) * R^y$	0.018** (0.007)	0.018** (0.008)	0.005 (0.008)
$(Age^o - Age(R^o)) * R^o$	0.040*** (0.006)	0.039*** (0.006)	0.036** (0.016)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	27.5%	28.0%	28.1%
Households	2,526	2,526	2,526

*Table 42 The effect of female pension eligibility (female = oldest spouse) on female net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 3 (own labor supply)	(1)	(2)	(3)
α	0.522*** (0.003)	0.516*** (0.003)	0.471*** (0.006)
AOW^y	-0.022** (0.010)	-0.023** (0.010)	-0.018* (0.010)
AOW^o	-0.301*** (0.010)	-0.302*** (0.005)	-0.284*** (0.006)
$Age^o - Age(AOW)^o$	-0.077*** (0.001)	-0.076*** (0.001)	-0.086*** (0.004)
$Age^y - Age(AOW)^y$	-0.003*** (0.0004)	-0.002*** (0.0004)	-0.002*** (0.0004)
$(Age^y - Age(AOW^y)) * AOW^y$	0.076*** (0.023)	0.075*** (0.023)	0.063*** (0.023)
$(Age^o - Age(AOW^o)) * AOW^o$	-0.038*** (0.004)	-0.038*** (0.005)	-0.006 (0.007)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	24.9%	25.2%	25.3%
Households	2,473	2,473	2,473

*Table 43 The effect of female pension eligibility (female = oldest spouse) on female net labor supply. Robust standard errors are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

Female = old in cohort 3 (own labor supply)	(1)	(2)	(3)
α	0.522*** (0.012)	0.516*** (0.013)	0.471*** (0.016)
R^y	-0.022* (0.012)	-0.023* (0.012)	-0.018 (0.012)
R^o	-0.301*** (0.009)	-0.302*** (0.009)	-0.284*** (0.008)
$R^o - Age(R^o)$	-0.077*** (0.004)	-0.076*** (0.004)	-0.086*** (0.014)
$Age^y - Age(R^y)$	-0.003 (0.002)	-0.002 (0.002)	-0.002 (0.002)
$(Age^y - Age(R^y)) * R^y$	0.076*** (0.026)	0.075*** (0.026)	0.063** (0.027)
$(Age^o - Age(R^o)) * R^o$	-0.038*** (0.008)	-0.038*** (0.008)	-0.006 (0.02)
Controls	NO	YES	YES
Year dummies	NO	NO	YES
Adj. R^2	24.9%	25.2%	25.3%
Households	2,473	2,473	2,473

*Table 44 The effect of female pension eligibility (female = oldest spouse) on female net labor supply. Clustered standard errors at the household level are between parentheses. ***denotes significance at the 1%-level, ** denotes significance at the 5% level, and * denotes significance at the10% level.*

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