



Partial retirement opportunities and the labor supply of older individuals[☆]

Tunga Kantarci^{a,b} , Jim Been^{c,b} , Arthur van Soest^{d,b} , Daniël van Vuuren^{e,b}

^a Department of Economics, Econometrics and Finance, University of Groningen, P.O. Box 800, 9700 AV, Groningen, The Netherlands

^b Netspar, The Netherlands

^c Department of Economics, Leiden University, P.O. Box 9520, 2300 RA, Leiden, The Netherlands

^d Department of Econometrics and Operations Research, Tilburg University, P.O. Box 90153, 5000 LE, Tilburg, The Netherlands

^e Department of Economics, Tilburg University, P.O. Box 90153, 5000 LE, Tilburg, The Netherlands

ARTICLE INFO

Keywords:

Lief cycle model
Survey experiment
Phased retirement
Time allocation and labor supply
Public policy

ABSTRACT

We evaluate partial retirement options as an instrument to increase labor participation among older individuals. In a stated choice experiment, Dutch survey respondents were asked to choose among early, late and partial retirement scenarios purged from restrictions on part-time work and gradual retirement. Retirement scenario characteristics were randomized, generating rich variation in the choice options. The stated choices are validated using revealed preference data on (planned) retirement decisions. Using the stated choice data, we estimate a model that makes the trade-offs between leisure and income over the life cycle explicit, and use the estimated model for counterfactual policy simulations. We find that, as expected, higher (full) pension eligibility ages make actuarially fair (abrupt) early retirement more attractive and make late retirement less attractive, while about one in three respondents prefer partial retirement irrespective of the eligibility age. Early retirement becomes more attractive than late retirement when individuals do not have the partial retirement option. Moreover, the partial retirement decision is sensitive to financial incentives so that subsidizing partial retirement with higher wages or with more than actuarially fair pension increases for delaying retirement increases total labor supply. These findings demonstrate the potential of partial retirement as a policy instrument to stimulate labor participation, especially when pension eligibility is delayed.

1. Introduction

Many countries take policy measures to prolong working lives. The main measure is increasing the age at which individuals can receive a full pension, often referred to as the statutory retirement age (SRA). A higher SRA implies higher labor participation, a longer period of tax and social security contributions, and a shorter period of pension claims. However, not everyone is willing or able to work full-time until this higher SRA. Some may retire and claim an early occupational pension or use their accumulated non-pension wealth to maintain their standard of living. Others may want to partially retire before they completely leave the labor market. During partial retirement employees can combine part-time earnings with a partial pension, especially because early claiming of a full pension can reduce the pension substantially (Kantarci et al., 2013). Gradual retirement is

in line with standard labor supply models that predict that employees smoothly adjust leisure and consumption over the life cycle (Ameriks et al., 2020). Partial retirement has gained importance over time, as an alternative to abrupt retirement, or a switch to self-employment with flexible work hours (Bloemen et al., 2016; Parker and Rougier, 2007).

Many employees state an interest in working part-time before retirement. According to US survey data from 2015, about 60% of non-working respondents would be willing to return to work if they could choose the number of hours worked instead of having to work the same number of hours as in their last job, and 20% of them would be willing to accept a 20% hourly wage reduction to do so (Ameriks et al., 2020). Fig. 1 analyzes Dutch individuals in paid employment who are asked to state whether they want to work more hours, fewer hours, or the same number of hours they work now. The figure distinguishes

[☆] This research is supported by the Netherlands Organization for Scientific Research (NWO) under grant number MaGW 400-04-088 and by the Network for Studies on Pensions, Aging and Retirement (Netspar), Netherlands under grant number LMVP 2014.03 and LMVP 2019.01. Its contents are the sole responsibility of the authors. We thank the staff of Centerdata, and in particular Miquelle Marchand, for their assistance in setting up the survey and the fieldwork. We thank Hans Bloemen and Stefan Hochguertel for their helpful comments and suggestions on an earlier version of the paper. We thank the anonymous referees for helpful comments which improved the paper.

* Corresponding author at: Department of Economics, Econometrics and Finance, University of Groningen, P.O. Box 800, 9700 AV, Groningen, The Netherlands.

E-mail addresses: t.kantarci@rug.nl (T. Kantarci), j.been@law.leidenuniv.nl (J. Been), a.h.o.vansoest@tilburguniversity.edu (A. van Soest), d.j.vanvuuren@tilburguniversity.edu (D.v. Vuuren).

<https://doi.org/10.1016/j.labeco.2025.102739>

Received 17 June 2024; Received in revised form 22 May 2025; Accepted 24 May 2025

Available online 23 June 2025

0927-5371/© 2025 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

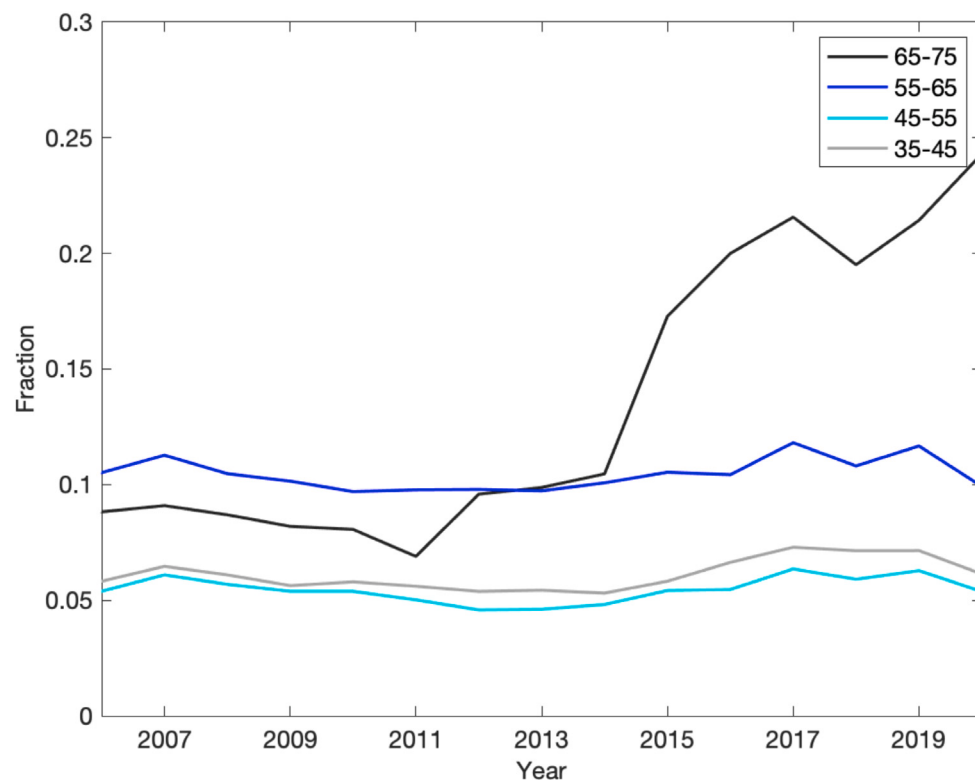


Fig. 1. Fraction of employees who want to work fewer hours in employees who want to work more hours, fewer hours or continue to work the same number of hours by age and year.

Source: Labor Force Survey of Statistics Netherlands.

four age categories and shows the fraction of respondents who want to work fewer hours over 15 years. The fraction is very stable over the observation period for all age groups except that the oldest group shows a notable increase as of 2013, the year when the Dutch state pension eligibility age (the SRA) started increasing beyond age 65. It suggests that many individuals want to work fewer hours after age 65.

The policy debate often focuses on the total labor supply effect of partial retirement. Partial retirement may extend employment years by facilitating work after the SRA or by restraining early labor market withdrawal, for example for employees with demanding occupations (Vermeer et al., 2016). This implies extending pension contribution periods and reducing years of full benefit claiming, which helps to sustain pension systems. This also seems to be the main reason why many countries consider ways to remove impediments to partial retirement, as part of a package of policy measures to increase retirement flexibility. Indeed, in the US, Ameriks et al. (2020) find that older individuals would work longer if they had opportunities to work in jobs that would allow them to choose how much to work. In Germany, Huber et al. (2016), Berg et al. (2020), and Haan and Tolan (2019) also conclude that encouraging partial retirement can lead to positive labor supply effects. However, partial retirement schemes might also reduce total labor supply, if older workers more often use them instead of full-time work rather than full retirement.¹ Based on data from nine OECD countries, Börsch-Supan et al. (2018) show that flexible retirement schemes have produced zero to negative effects on total labor supply.

The mixed evidence on the total labor supply effect of partial retirement from different countries is not surprising. Most of this evidence is based on observational data on retirement behavior. Observational data

pose challenges since it is difficult to observe reforms that introduce or change the incentives for partial retirement that could induce older workers to prolong their working lives. In observational data, it is also difficult to identify an individual's available retirement options. This particularly applies to partial retirement plans, since it is often unclear whether an employer offers such a plan, and, if so, which trajectory of earnings and pension incomes it implies. Indeed, partial retirement arrangements are often informal agreements negotiated between employer and employee (Hutchens, 2010). A comparison of survey data on actual and preferred working hours shows that older workers often want to work part-time, but actually work full-time or not at all, suggesting that data on actual work hours substantially underestimate preferences for partial retirement (Ameriks et al., 2020). In the current paper we focus on labor supply and the interest of the workers in different types of phased retirement, but the findings above make clear that our results should be complemented with evidence from the side of the employers to get a complete picture of how phased retirement policies can be optimally shaped in practice. Heterogeneity in the type of job will also play a role here, since particularly with technological change and the increasing role of ITC, the demand for older workers develops differently for cognitively versus manually skilled workers (Albinowski, 2024; Albinowski and Lewandowski, 2024).

To analyze the labor supply effects of partial retirement while accounting for restrictions on part-time work or gradual retirement, we draw on stated choice data, following several earlier studies like Ameriks et al. (2020), Van Soest and Vonkova (2014), Elsayed et al. (2018), and Michaud et al. (2020). As argued by Louviere et al. (2000), such data can capture a wider and broader array of preference-driven behaviors than data on actual behavior, allowing for choice opportunities that do not yet exist in the market. This also applies to our study: we analyze retirement plans that do not yet exist or are not available to many workers. Moreover, Michaud et al. (2020) find that stated retirement preferences align well with planned retirement ages, supporting the validity of the stated preference data.

¹ There might also be spill-over effects, if employers use partial retirement to rejuvenate their aging workforce. We do not analyze it in the current study.

Our stated choice survey was fielded in the Longitudinal Internet Survey for the Social Sciences (LISS) panel in 2017. We presented choice sets of hypothetical full and partial retirement plans, irrespective of whether the respondent's own employer actually offered partial retirement or not. Each retirement plan has its own income trajectory. The labor market states considered are working full-time, working part-time with a partial pension, and full retirement; alternative exit routes such as unemployment or disability do not play a role. To choose their favorite plan, respondents trade-off between working more hours or more years with a higher pension versus working less with a lower pension. Respondents are randomly assigned plans with different pension income levels and retirement ages. We vary the rewards for later retirement (to estimate the "price effect" of pensions) and the overall generosity irrespective of the retirement age (to estimate the "pension wealth effect"). We also vary the wage rate during partial retirement and duration of partial retirement. We then estimate a structural model to analyze individuals' decisions to work full-time or (gradually) retire. We use this model to simulate policies aimed at increasing labor participation, introducing partial retirement or subsidizing partial retirement with higher wages or with more than actuarially fair pension increases for delaying retirement. We validate the structural model by comparing its predictions to those estimated by a reduced form model.

Our study is most closely related to [Van Soest and Vonkova \(2014\)](#) who conduct a stated choice experiment and estimate a structural model to analyze the impact of pension incentives on retirement decisions, including partial retirement. Like [Van Soest and Vonkova](#), we estimate a structural model. We use more recent data, exploit more systematic and richer variation in choice options, and explore much richer aspects of partial retirement. More importantly, we designed the stated choice experiment accounting for the actuarial rules of the Dutch pension system. Making the survey realistic is important because surveys are not only a way of collecting data, but they involve creating the process that generates the data ([Stantcheva, 2023](#)). The more realistic the hypothetical market setting is, the more likely that stated choice behavior looks like real choice behavior ([McFadden, 1998](#)). Moreover, as the value of the stated choice data depends on whether they are predictive of real behavior, we relate the stated choices with revealed preference data: We show that estimated labor supply preferences correlate in plausible ways with, among others, peoples' actual or predicted retirement plans and with a subjective question on whether respondents value work just for money or for its intrinsic value.

We make three contributions to the literature. First, we focus on preferences for partial retirement versus abrupt retirement at, for example, the public pension eligibility age. We show that, at ages between 60 and 66, more than one in three respondents prefer partial retirement over early or late abrupt retirement, showing a preference for a smooth life-cycle profile of leisure and consumption and implying a low intertemporal elasticity of substitution for many individuals ([Ameriks et al., 2020](#)). It also points at restrictions that hamper partial retirement in revealed preference data ([Rogerson and Wallenius, 2013](#)). We also consider how individuals value the characteristics of a partial retirement plan, showing, for example, that they often prefer half time work during partial retirement instead of less or more hours.

Second, we add to the findings on the net labor supply effect of partial retirement. We show that early retirement becomes more attractive than late retirement when individuals do not have the partial retirement option, especially when the SRA increases and pension eligibility is delayed. This demonstrates the potential of partial retirement as a policy instrument to stimulate older individuals to remain active in the labor force. Moreover, we show that subsidizing partial retirement schemes with higher wages or with more than actuarially fair increases in pensions for delaying retirement convince people to continue working part-time instead of retiring and has a positive effect on total labor supply, particularly at later pension eligibility ages.

Third, we contribute to the literature analyzing the sensitivity of retirement decisions to financial incentives. We disentangle the wealth and price effects of pensions. We study these effects both at the extensive and intensive margin while many earlier studies consider retirement as a binary outcome ([Van der Klaauw and Wolpin, 2008](#); [Danzer, 2013](#); [Atalay and Barrett, 2015](#); [Delavande and Rohwedder, 2017](#)). Compared to earlier studies, we also consider smaller changes in pension incentives which are much more within the reach of policy makers who have to consider sensitive pension interventions. We find that the partial retirement decision is sensitive to a price effect of pensions but not to pension wealth.

This paper proceeds as follows. Section 2 describes the Dutch pension system. Section 3 describes the stated choice experiment. Section 4 describes the data and presents descriptive statistics. Section 5 presents the structural model and the estimation method. Section 6 presents the estimation results and Section 7 conducts policy simulations. Section 8 presents reduced-form estimates to validate the structural model predictions. Section 9 concludes.

2. The Dutch pension system

Retirement income in the Netherlands mainly stands on two main pillars: the state pension and the occupational pension.² The General Old-Age Pensions Act (AOW) is the state pension scheme, paying a flat-rate benefit when people reach the state pension age, independent of earnings, income or premiums paid. The benefit level depends on the number of years of residence in the country and on household composition. For those who always resided in the country, it provides households older than the state pension age with a subsistence-level income. The scheme is unfunded and based on the pay-as-you-go principle: current state pensions are financed from the current premiums paid by workers. The premiums are paid through income tax. The state pension eligibility age (the SRA) was fixed at age 65 for many years, until birth cohorts reaching age 65 in 2013. Since then, it is gradually delayed to, for example, age 67 for those born between March 1 1957 and December 31 1959. It will be age 67 and three months for those born in 1962 and will be delayed further in the long run, with eight months for each additional year of life expectancy. It does not allow flexible claiming of pension rights.

Participation in the fully funded occupational pension scheme is mandatory for a large majority of all employees. The scheme is essentially individual, but incorporates a widow(er) and orphan provision. From the early 1990's until 2005, many employees with an occupational pension scheme could benefit from generous early retirement arrangements (VUT), allowing them to retire much earlier than the SRA without any reduction in life-cycle income, which made early retirement a very common option. These arrangements have slowly disappeared since 2006 when a tax reform (RVU) essentially made them very unattractive. Today many occupational pension funds do allow maximum flexibility, allowing for early, late or partial retirement and pension claiming, but with actuarially fair trade-offs and a fair price for retiring early or working longer. As a consequence, the average retirement age rose from 61 in the early 2000's to almost 65 in the late 2010's.³

The rising SRA and the disappearance of generous early retirement schemes hampered early retirement for many older workers, including those with health issues and/or demanding occupations. In response, employer and employee organizations agreed upon new arrangements that subsidized partial retirement schemes. These were introduced in collective labor agreements in the late 2010's, allowing employees to

² The third pillar is private pension savings and its share in retirement income is much smaller.

³ Retirement age in 2021 is more than 4 years higher than in 2006. Source: Statistics Netherlands (cbs.nl).

Many employees retire fully after working full-time; the age they retire can differ. Other employees go into partial retirement, where they work part-time for several years before full retirement.

Below we describe the retirement plans of three employees. All employees are 64 years old, work 40 hours a week, and earn €2,000 a month. Their retirement plans differ in the following respects:

- Age of retirement
- Pension income
- Type of retirement (partial or full retirement)

Please compare the plans presented below.

Amy plans to continue to work the same number of hours in the same job from age 65 to 69. She will retire at age 70. Her pension income will be €2,200 a month. This plan can be summarized as follows:

Age	62	63	64	65	66	67	68	69	70	71	72
	Work			Work					Retirement		
Hours worked	40 hours			40 hours					0		
Work income	€ 2,000			€ 2,000					0		
Pension income	0			0					€ 2,200		

Mary plans to reduce her hours to 20 hours a week and continue in the same job from age 65 to 69. She will earn €1,000 a month, and receive a partial pension income of €700 a month. While working part time, she will continue to build pension benefits for full retirement. She will retire fully at age 70. Her pension income will be €1,800 a month. This plan can be summarized as follows:

Age	62	63	64	65	66	67	68	69	70	71	72
	Work			Partial retirement					Retirement		
Hours worked	40 hours			20 hours					0		
Work income	€ 2,000			€ 1,000					0		
Pension income	0			€ 700					€ 1,800		

Linda plans to retire at age 65. Her pension income will be €1,400 a month. This plan can be summarized as follows:

Age	62	63	64	65	66	67	68	69	70	71	72
	Work			Retirement							
Hours worked	40 hours			0							
Work income	€ 2,000			0							
Pension income	0			€ 1,400							

Which plan do you find the most attractive?

- ☐ Amy's plan
- ☐ Mary's plan
- ☐ Linda's plan

[See the instructions page again](#)

<< Back Next >>

Fig. 2. The stated preference question asking to choose among early, partial and late retirement.

work fewer hours in the years before reaching their SRA with a less than proportional decrease in earnings and a pension accrual based on full-time earnings (see, e.g., [Rutten et al., 2025](#)). Details differ by sector; an example is the 60/70/100 arrangement: work 40% less than full-time, receive 70% of the full-time wage, and accumulate occupational pension rights as if working full-time.

3. The stated choice experiment

The survey consists of two main parts. The first has questions on background characteristics and aspects of work and social life. The second aims at measuring preferences for abrupt and partial retirement. Prior to the second part, an instructions page is presented where the layout of the retirement scenarios is described in detail – see [Fig. 13](#) in [Appendix](#). Several stated choice questions are asked, inviting respondents to make trade-offs between working more with a higher pension versus working less with a lower pension. [Fig. 2](#) shows an example. It starts with a short introduction and then briefly describes three retirement scenarios, followed by a timeline giving the number of hours worked and the earnings and pension income at each age. Respondents are asked to choose their favorite retirement scenario among the three, based on their own preferences. Each retirement scenario is characterized by several attributes: the ages of partial and full retirement, the number of hours worked during partial retirement, the wage rate when working full-time or part-time, and pension income during partial and/or full retirement (determined by replacement rates).

Each retirement scenario takes the form of a vignette: a short description of a hypothetical situation. Vignettes have been used for a long time in the social sciences and more recently also in economics, see, e.g., [Van Beek et al. \(1997\)](#) for an early example. We use hypothetical people so that respondents for whom the retirement scenarios seem unrealistic can still answer the questions. For example, unemployed or disabled workers are often reluctant to respond if asked to imagine they have a permanent job until retirement age but will take it less personal if asked to evaluate a hypothetical person's retirement plan.

Each respondent got three choice questions like the one depicted in [Fig. 2](#), varying some of the attributes for each of the scenarios the respondent could choose. The three questions use, respectively, age 65, age 63 and 61 as the age of early or partial retirement, and age 70, age 68 and 66 as the age of late retirement. Moreover, to increase experimental variation, some attributes were varied randomly across respondents: pension income (i.e., the replacement rate), earnings (or the wage rate) during partial retirement, and the duration of partial retirement; see [Table 6](#) in the [Appendix](#) for details.

Earnings of the vignette persons when working full-time are based upon the respondent's actual earnings in the current or last job, asked in a question on last or current earnings in part one of the survey. This is done to bring the standard of living of the vignette persons in the same range at the standard of living of the respondent, making it easier for the respondent to decide what he or she would do in the vignette person's situation.⁴ On the other hand, the age at which the hypothetical employee retires partially or fully is independent of the respondent's own employment situation, age (at the time of the survey), or other characteristics. The hypothetical employee works 40 h a week during full-time work and 20 h a week during partial retirement. Since the questions are about hypothetical people, they can also be answered by respondents who do not work and do not intend to work in the future, e.g. due to permanent disability.

Several studies showed that labor market rigidities force employees to partially retire outside their main job for a lower hourly wage rate,

due to, e.g., a part-time wage penalty or due to switching to a less demanding job ([Hutchens, 2010](#); [Aaronson and French, 2004](#); [Ameriks et al., 2020](#)). To investigate how individuals value partial retirement associated with a reduced wage rate with different work, we also use scenarios where the wage rate in partial retirement is 20% lower than the wage rate in the previous full-time job, and it is made clear that the new tasks are less demanding.⁵

We randomly vary the duration of partial retirement between four and five years. In the former case, full retirement comes earlier, and in accordance with the assumed actuarial fairness, replacement rates during full retirement are somewhat lower.

Pension income is computed from earnings, using a given (net) replacement rate. Pension and work income are presented in absolute amounts (rather than replacement rates). To increase experimental variation, replacement rates are randomized across respondents. The benchmark replacement rates for full and partial retirement are based on the replacement rates calculated by [Kantarcı et al. \(2013\)](#), using the actual pension rules of the National Civil Pension Fund (ABP), the largest pension fund in the Netherlands. In most cases the replacement rates are lower than the benchmark replacement rates since the latter do not account for career gaps and jobs that do not have automatic pension savings. For example, in the case of abrupt retirement at age 65, the benchmark net replacement rate we use is 70%, but we also show scenarios with replacement rates 60% and 80%.

We use choice sets in which all three scenarios someone can choose have higher or lower replacement rates than the benchmark, but we also use choice sets where the rewards for retiring later are higher or lower than the benchmark that give actuarially fair increases in pensions for retiring later. While the former aims at analyzing the effect of changing the overall pension generosity (the pension wealth effect), the latter aims at analyzing the effect of a change in the price of leisure (a price effect).

We asked several follow-up questions if respondents chose the partial retirement scenario in the three questions on the choice among early, partial or late retirement. First, at every retirement age regime respondents chose the partial retirement scenario, we asked them to choose between early and late (abrupt) retirement only (the second best option). Second, the first time respondents chose the partial retirement scenario at a retirement age regime, we asked them (at that retirement age regime) to choose among partial retirement scenarios with working hours 12, 20, and 28 h per week during partial retirement (where more hours of work come with higher earnings and lower pensions during partial retirement, and higher pensions during full retirement; see [Table 7](#) in the [Appendix](#) for details). Furthermore, we asked to choose between two scenarios with partial retirement: one with 20 h of work per week during partial retirement for four years, the other one with 20 h of work for two years, and 10 h in the subsequent two years (with adjusted earnings and (actuarially fair) pensions; see [Appendix Table 8](#)).

All in all, each respondent got between three and eight stated choice questions, depending on how often the respondent chose partial retirement and therefore on how many follow-up questions were asked. [Table 1](#) presents the values of all the attributes used in any of these questions.

The variation of the scenario attributes within and across respondents makes it possible to estimate a model in which respondents maximize their lifetime utility, which depends on leisure and income in each year after age 60 (and therefore varies with the attributes of each scenario the respondent can choose). See [Section 5](#).

⁵ The exact wording is “Mary plans to reduce her hours to 20 h a week and change to a different job from age 65 to 69. In this job her tasks will be less demanding, but she will earn less per hour”.

⁴ It avoids alienation bias; see, e.g., [Hanemann \(1994\)](#), [Whittington \(2002\)](#).

Table 1
Attribute values used in the vignettes.

Attribute	Values
Early retirement age	61, 63, 65
Partial retirement age range	61–64, 63–66, 65–68, 61–65, 63–67, 65–69
Late retirement age	65, 66, 67, 68, 69, 70
Replacement rate during partial retirement (% of foregone earnings)	5, 10, 15, ..., 65, 70
Replacement rate during full retirement (% of foregone (full-time) earnings)	40, 45, 50, ..., 105, 110, 120, 130
Hours worked per week during partial retirement	10, 12, 20, 28
Steps in which work hours are reduced	No partial retirement, partial retirement is 20 h per week, partial retirement is first 20 and later 10 hours of work per week
Full-time net monthly earnings	1000, 1500, ..., 10,000 (based upon respondents' net earnings in current or last job)
Wage rate during partial retirement	100% or 80% of full-time wage rate

Table 2
Sample composition.

Attribute	Percent
Age	
40–49 years old	19.52
50–59 years old	24.81
60–69 years old	32.26
70 years old or older	23.41
Gender	
Male	52.09
Education	
Has higher vocational or academic education	34.98
Marital status	
Married or living with partner	72.69
Employment status	
Working for an employer	38.38
Retired	35.32
Working self-employed	5.91
Unemployed	3.40
Fully or partially disabled	4.95
Homemaker	8.04
Other	4.00
Home ownership	
Owner	75.19
Last monthly net labor income in euros	
0	5.06
1–1000	20.60
1001–2000	39.75
2001–3000	26.48
3001 or more	8.11
Would work even if money was not needed	
Strongly disagree	22.89
Disagree	21.06
Somewhat disagree	7.52
Not agree, not disagree	16.24
Somewhat agree	14.72
Agree	13.21
Totally agree	4.36
Experienced or expects early retirement	16.89

Note: Based on the responses of 3,233 individuals.

4. Data

The survey was fielded in 2017 in the Longitudinal Internet Studies for the Social Sciences (LISS) panel administered by Centerdata at Tilburg University in the Netherlands. The LISS panel is based on a true probability sample of households drawn from the population register, covering the Dutch non-institutionalized population. It consists of approximately 5,000 households comprising 8,000 individuals who participate in monthly Internet surveys of about 15 to 30 min in total, and are paid for each completed survey. Households that could not otherwise participate are provided with a computer and Internet

connection. An annual longitudinal core survey covers a large variety of topics including work, education, income, housing, time use, political views, values and personality. In line with earlier studies, we did not interview individuals younger than 40 years of age — Ameriks et al. (2020) used respondents of ages 55 and older; Elsayed et al. (2018) used respondents of ages 40 to 63. The survey generated 3,233 responses.

Although the LISS panel is based upon a true probability sample of the population of interest, unit nonresponse leads to over- and under-representation of specific groups (Rekker et al., 2020). This also applies to our estimation sample. To account for this, we computed sampling weights.⁶ Unweighted and weighted descriptive statistics of the stated preferences for phased, early and late retirement are very small, suggesting that selective unit nonresponse in the LISS panel does not substantially bias our results. Since there is some arbitrariness in how the weights are constructed (which variables to use, how to truncate very large weights, etc.) we use unweighted statistics in the paper.

Table 2 presents figures on the sample composition. More than half are 60 years of age or older. About one third have higher vocational education or a university degree. Most are married or living together with a partner, and own the house they live in. More than one third are working for an employer, and about one third are retired. About half of the sample earns a net monthly income of 1,000 to 3,000 euros.

The bottom part of the table concerns two variables related to preferences for leisure and early or late retirement, and will be used in the empirical analysis to proxy variation in preferences that is normally unobserved. The first is the answer to the question “To what extent do you agree with the statement *I would work even if the money is not needed*, on a scale from 1 (strongly disagree) to 7 (fully agree)”. The second is to construct a proxy for planned (for those who did not yet retire) or realized (for those who retired) retirement behavior. We asked respondents to construct the sequence that corresponds as much as possible to their actual behavior or their current plans. For each two years age category 55–56, ..., 67–68, 69-plus, we asked them to indicate their main labor market status, choosing among full-time work, part-time work, or (fully) retired. See Appendix Fig. 14 for the exact question and Appendix Table 9 for the most reported sequences. In the model we will use a dummy “early retirement” defined as 1 if for the age categories 55–56, ..., 61–62, the respondent chooses “retired” at least once; for 16.89% of the sample, this dummy has value 1.

⁶ Weights are constructed using the Stata command *ipfraking*, comparing the sample distribution of gender, age, education level, degree of urbanization, and net household income with national figures provided by Statistics Netherlands.

Table 3
Competing retirement scenarios.

Scenario	Percent	Number of respondents	Number of observations
E	28.75	3,233	2,788
P	40.42		3,920
L	30.84		2,991
E	50.99	2,146	1,999
L	49.01		1,921
P: 12 hrs/wk	28.98	2,146	622
P: 20 hrs/wk	41.66		894
P: 28 hrs/wk	29.36		630
P: 20 hrs/wk for 4 years	49.02	2,146	1,052
P: 20 and 10 hrs/wk in 2 successive periods of 2 years each	50.98		1,094

Notes: 1. E: Early retirement. P: Partial retirement. L: Late retirement. 2. E, P, L are competing retirement scenarios evaluated by all respondents three times (at three retirement age regimes). Respondents who chose P are asked to evaluate other competing retirement scenarios in follow-up questions. Competing retirement scenarios E and L are asked every time P is chosen. Other competing retirement scenarios are asked the first time P is chosen at one of the three retirement age regimes.

Table 4
Competing retirement scenarios by (randomized) regimes.

Regime	Regime type	Scenario	Percent	Number of respondents	Number of observations
Retirement age	61	E	19.05	3,233	616
		P	37.70		1,219
		L	43.24		1,398
	63	E	25.95	3,233	839
		P	43.09		1,393
		L	30.96		1,001
	65	E	41.23	3,233	1,333
		P	40.46		1,308
		L	18.31		592
Wage rate in P	Same as in full-time work	E	27.62	3,233	1,324
		P	42.72		2,048
		L	29.66		1,422
	20% lower than in full-time work	E	29.85	3,233	1,464
		P	38.17		1,871
		L	31.99		1,569
Duration of P	4 years	E	27.62	3,233	1,214
		P	39.59		1,740
		L	32.79		1,441
	5 years	E	29.68	3,233	1,574
		P	41.10		2,180
		L	29.22		1,550

Notes: 1. E: Early retirement. P: Partial retirement. L: Late retirement. 2. All respondents evaluate E, P, L at three retirement age regimes. At each retirement age regime, wage rate during partial retirement and duration of partial retirement are randomized across respondents. (Partial) pension income is also randomized across respondents. Disaggregated fractions by pension income regimes are available upon request.

Table 3 presents choice fractions for competing retirement scenarios in the stated preference questions. Respondents more often choose partial retirement than early or late retirement, demonstrating a preference for a smooth life-cycle profile of leisure and consumption. When the partial retirement option is omitted, slightly more of those who first chose partial retirement now choose early rather than late retirement. This suggests that partial retirement might have a (modest) positive effect on total labor supply. We will analyze this more thoroughly in Section 7, where we also discuss how the effect varies depending on the ages of partial and full retirement.

Among those who prefer partial retirement with 20 h to early or late abrupt retirement, partial retirement with 20 weekly hours worked is commonly preferred to partial retirement with 12 or 28 h. This seems plausible since this group already prefers partial retirement. In Section 7, we will simulate choice probabilities for the complete sample

and a choice set including all the options of early retirement, late retirement, and partial retirement with 12, 20 or 28 h worked. That will give a better picture of how many hours individuals generally prefer to work during phased retirement. Whether hours worked is reduced in one or two steps hardly makes a difference.

In Table 4 we disaggregate the choices among early, partial and late retirement by the ages of early, partial and full retirement in the questions, and by the other (randomized) characteristics of partial retirement in these questions. As expected, more people choose early retirement and fewer people choose late retirement when the retirement ages are higher, but the number of people choosing partial retirement does not change much. When the wage rate in partial retirement is 20% lower than before (and partial retirement involves different, less demanding, tasks), partial retirement becomes less attractive. More

people choose partial retirement if the duration of partial retirement is five instead of four years.

5. Econometric model

Our model resembles the model used by Van Soest and Vonkova (2014). It is designed to use the stated preference questions to analyze the potential consequences of a higher retirement age, pension incentives, and partial retirement for the labor supply decisions of older individuals. In line with the stylized stated preference scenarios, it does not explicitly incorporate uncertainty about future health, unemployment, wage growth, or savings. We assume that the total utility, U_i^q , of retirement trajectory q for individual $i = 1, \dots, n$ has the following form:

$$U_i^q = \sum_{t=60}^{100} \rho^{(t-60)} \pi_t U_{it}^q \quad (1)$$

where ρ is the discount factor. π_t is the probability of surviving from one age to the next, given survival up to age 60.⁷ U_{it}^q is the utility at age $t = 60, \dots, 100$. The time horizon is fixed at 100 years of age. q is an early abrupt retirement trajectory (E), a partial retirement trajectory (P), or a late abrupt retirement trajectory (L). In all trajectories, the agent is working full-time at age 60. At later ages t , leisure l_{it}^q and net income y_{it}^q vary across trajectories⁸.

Within period utility is specified as follows:

$$U_{it}^q = \alpha_{it}^l \ln(l_{it}^q) + \alpha^y \ln(y_{it}^q) + \alpha^{ly} \ln(l_{it}^q) \ln(y_{it}^q) \quad (2)$$

$$\alpha_{it}^l = X_i \beta^l + \eta^l t + e_i^l \quad (3)$$

$$e_i^l \sim N(0, \sigma_e^2) \text{ and } e_i^l \text{ independent of } X_i \quad (4)$$

$$l_{it}^q = T - h_{it}^q \quad (5)$$

T is the number of hours available for work and leisure in a working week and is a parameter to be estimated. h_{it}^q denotes hours of paid work per week. At each age t , the person can work full-time ($h_{it}^q = 40$), can be partially retired ($h_{it}^q = 10, 12, 20$, or 28), or can be fully retired ($h_{it}^q = 0$).

During full retirement, net income y_{it}^q is after tax pension income, replacing part of preretirement after-tax earnings according to a replacement rate. Independent of individual characteristics, replacement rates vary by design of the trajectories. During partial retirement, y_{it}^q consists of (part-time) earnings as well as (partial) pension income.

It is assumed that consumption is equal to income so that $c_{it}^q = y_{it}^q$. Following Van Soest and Vonkova (2014) and Michaud et al. (2020), we do not account for private savings for three reasons. First, as savings are of the hypothetical persons in the retirement scenarios, incorporating them in the scenario descriptions would make the scenarios much more complicated and difficult to compare. In fact, in the survey, to choose their favorite retirement scenario, respondents focus on the trade-off between leisure and (wage or pension) income. Second, in the Netherlands, Knoef et al. (2016) show that mandatory pension savings constitute 72%, and the present value of housing wealth constitutes 12.6% of all income available at age 65. The remaining fraction is private savings meaning that they are of little importance to retirement income. Indeed, due to the adequacy of pension savings, people neither reduce their consumption (Been and Goudswaard, 2023) nor do they liquidate housing wealth (Van Ooijen et al., 2015) during retirement.

⁷ Survival probabilities apply to 2017 (the year of the survey) and were retrieved from Statistics Netherlands.

⁸ The model does not incorporate the fact that the disutility of work might be less if the job is less challenging. The data suggest that this is less important than wage rate differentials (see Section 4).

Third, for the respondents, to take into account the potential importance of savings through housing wealth, we allow the marginal utility of leisure to differ between homeowners and renters.

The preference parameters α_{it}^l and α^{ly} drive the marginal utility of leisure time for respondent i at age t . α_{it}^l depends on observed characteristics X_i such as age, gender and home ownership, and, through e_i^l , on respondent i 's unobserved characteristics. The effect of age t is captured by $\eta^l t$. We expect $\eta^l > 0$, since respondents' valuation of leisure will typically increase with age due to, e.g., expected health deterioration. A nonzero parameter α^{ly} implies that the marginal utility of leisure also varies with income.

Together with α^{ly} , the parameter α^y determines the marginal utility of income. Both parameters are treated as constants, to avoid multicollinearity and imprecise estimates.

Introducing errors terms u_i^q as in a standard random utility model (McFadden, 1998), the model takes the following form:

$$V_i^q = U_i^q + u_i^q \quad (6)$$

$$u_i^q \sim \text{i.i.d. type I extreme value and independent of } X_i, e_i^l \quad (7)$$

$$F(u_i^q) = e^{-e^{-u_i^q}} \quad (8)$$

where F denotes the cumulative distribution function.

The observed choice in question Q is given by

$$C_i^Q = q \text{ if } V_i^q > V_i^p \text{ for all } p \neq q. \quad (9)$$

As described in Section 3, respondents choose among retirement trajectories in a minimum of three and maximum of eight questions.

Define $u_i^q - u_i^p \equiv u_i^{qp}$. The assumptions on u_i^q imply that u_i^{qp} has a standard logistic distribution and that the probability of choosing scenario q among alternative scenarios j in question Q , given all individual and scenario characteristics and preference parameters (including the unobserved preference term e_i^l), is given by

$$P(C_i^Q = q | A_i, e_i^l) = \frac{e^{U_i^q}}{\sum_j e^{U_i^j}} \quad (10)$$

where $A_i = \{l_{it}^q, y_{it}^q, X_i, t, \beta^l, \eta^l, \alpha^y, \alpha^{ly}\}$ is the set of all relevant individual and trajectory characteristics and parameters.

Note that the unobservables e_i^l and u_i^q play different roles. The e_i^l are individual specific and remain the same over all questions and possible choices. They can be seen as unobserved heterogeneity in preferences. The u_i^q are independent across individuals, choice sets, and alternatives in each choice set. Their presence makes it possible that individuals make inconsistent choices and they can be interpreted as optimization error due to imprecise evaluation of the utility of each alternative. As a consequence, the distinction between the two is well identified, like the distinction between individual effects and error terms in a panel data model.

Model estimation is similar to estimation of a mixed logit or other random coefficient models as in, e.g., Revelt and Train (1998), using maximum simulated likelihood. The (unconditional) likelihood contribution for individual i can be written as a one-dimensional integral over the unobserved heterogeneity e_i^l of the product of the conditional probabilities of the observed outcomes C_i^Q :

$$L_i = \int_{-\infty}^{\infty} \prod_{Q=1}^{K(i)} P(C_i^Q = q | A_i, e_i^l) \frac{1}{\sigma_i} \phi\left(\frac{e_i^l}{\sigma_i}\right) de_i^l \quad (11)$$

where $K(i)$ is the number of questions answered by respondent i (which varies from 3 to 8, due to the design of the survey). We approximate the integral using simulated values of the random coefficient e_i^l .⁹

⁹ We use 50 draws per individual and Halton draws (Train, 2009). Standard errors etc. are based upon asymptotic results; see, e.g., Gouriéroux and Monfort (1990).

Table 5
Estimation results.

Parameter	Estimate	Standard error	t value
β^l : constant	-7.948	0.640	-12.421
β^l : age	-1.022	0.141	-7.262
β^l : male	-0.240	0.034	-7.080
β^l : high education	-0.046	0.028	-1.648
β^l : household with no children	0.025	0.037	0.673
β^l : with partner	0.074	0.032	2.301
β^l : home owner	0.063	0.037	1.685
β^l : had a health problem in the last six months	0.075	0.026	2.866
β^l : would work even if money was not needed	-0.095	0.010	-9.264
β^l : experienced or expect early retirement	0.284	0.046	6.148
η^l	0.108	0.007	15.347
σ_l	0.502	0.036	13.987
T	47.694	0.863	55.238
α^y	-0.389	0.155	-2.513
α^{ly}	0.313	0.042	7.527
ρ	0.931	0.006	161.967

Note: Estimation is based on the responses of 3,233 individuals who participated in the survey.

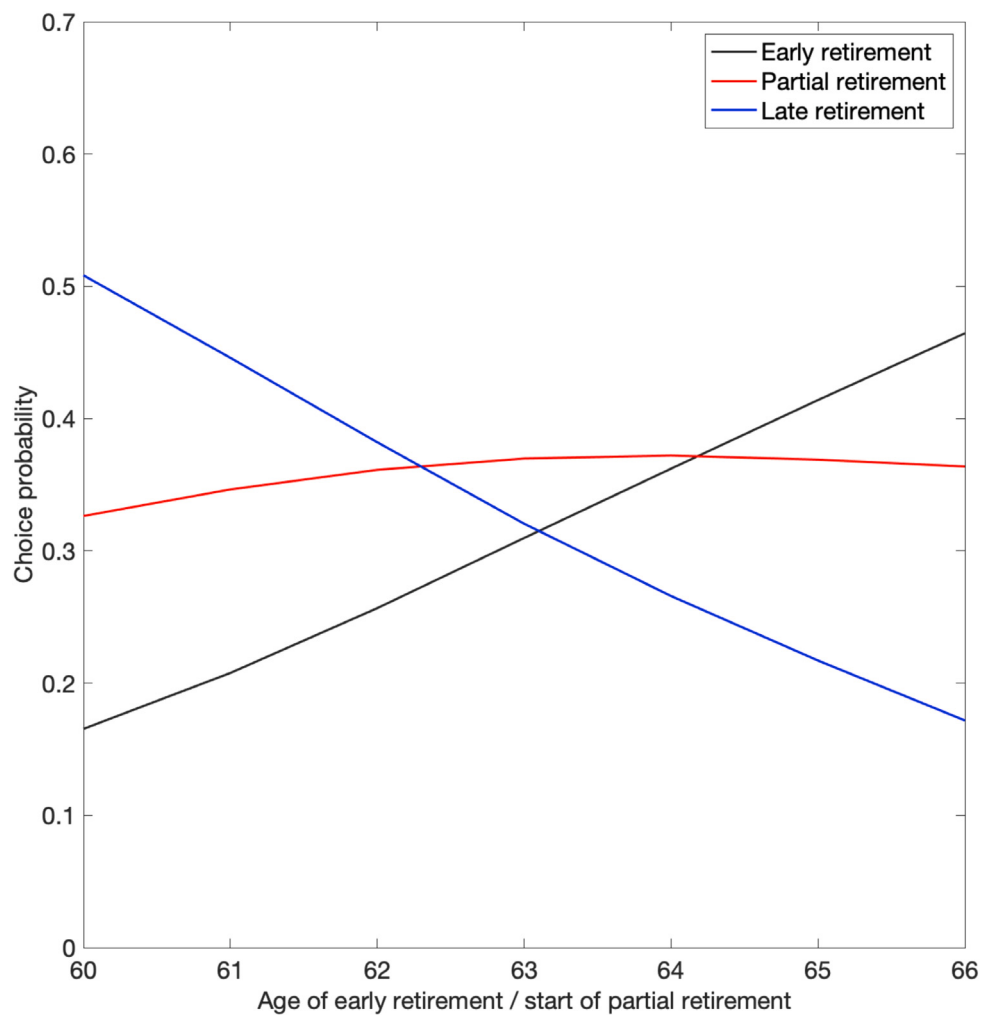


Fig. 3. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement.

6. Estimation results

Table 5 presents the estimation results. The first ten rows present the coefficients β^l determining how the marginal utility of leisure varies with respondent characteristics (through the random coefficient α_{it}^l). Many of the β^l parameters are significant, implying substantial observed heterogeneity in leisure preferences. The large and significant estimate of the standard deviation of e_i^l implies there is also substantial

variation in preferences that is not captured by observed respondent characteristics.

The significant negative estimate of age at the time of the survey suggests that older cohorts of respondents attach less utility to leisure (relative to consumption) at any given age. This could be a cohort effect, but might also mean that older individuals more often realize the risk of not being able to meet their consumption needs in retirement, revealing the need to work longer. In fact, when we estimate the model

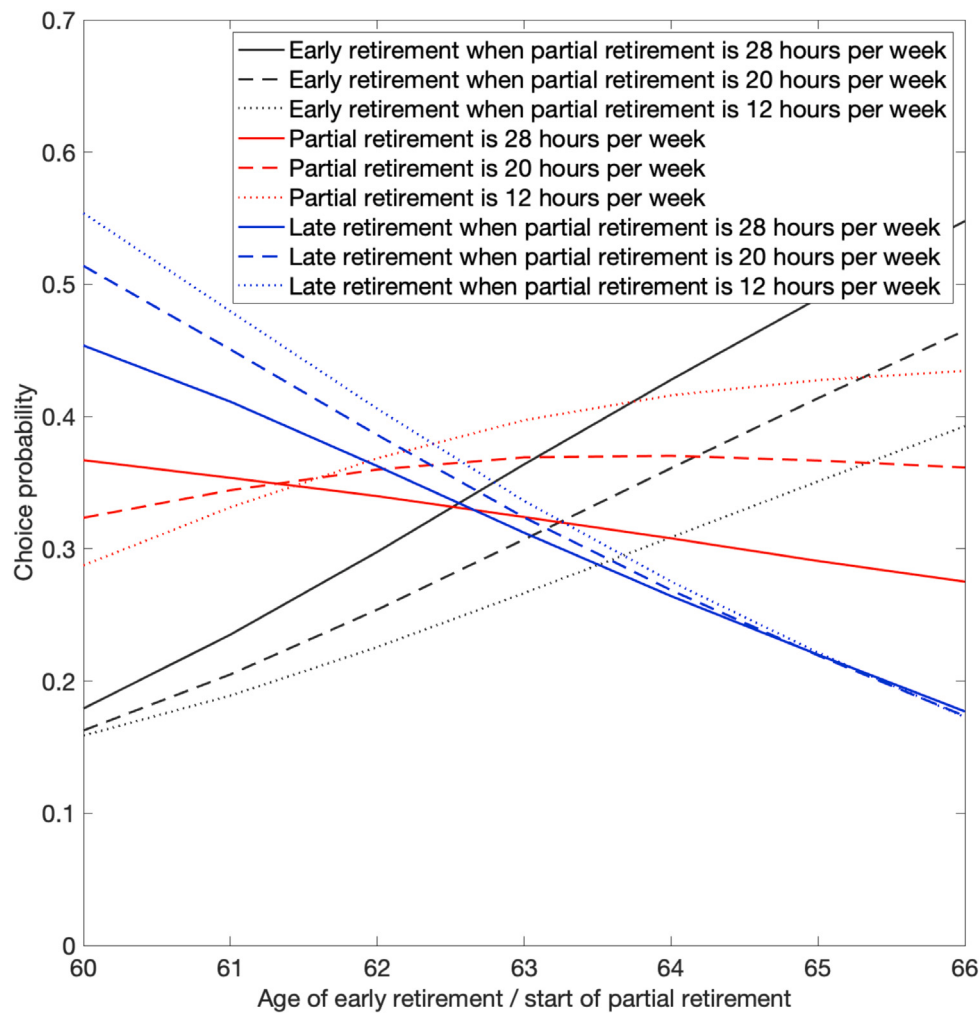


Fig. 4. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement, distinguishing among partial retirement with 28, 20 and 12 hours worked per week.

for respondents who are at most 60 years old, the effect size is 0.21 with t value of 0.53, whereas for those who are older we find an effect size of -1.19 with t value of -3.83 . Thus, we find that older respondents drive this age effect.¹⁰

Men attach more value to income and less to leisure than women do, reflecting the fact that on average, Dutch men work more hours than women do. Respondents who are highly educated attach less value to leisure, possibly because their skills are valued more, increasing their labor market attachment. Respondents with a partner attach more value to leisure than singles, possibly due to a desire for joint leisure activities. Those with more housing wealth derive more utility from leisure, possibly because they can better afford it. Those who had a health problem during the six months prior to the survey also attach more value to leisure, probably since they also expect health issues in the future, implying an increasing disutility of working longer.

The variable “would work even if money was not needed” can be seen as a proxy for a low disutility of work, or even a positive marginal utility of working at least a few hours, keeping income and other variables constant.¹¹ In line with what one would expect, individuals

with a low disutility of work tend to prefer later retirement and have a lower marginal utility of leisure (keeping other variables constant). Finally, those who expect or experienced early retirement tend to choose scenarios with more leisure, corresponding to a higher marginal utility of leisure, showing a significant positive relation between revealed preferences ((planned) actual retirement) and stated preferences. It indicates that our stated choice questions have predictive value for actual choices, confirming the usefulness and relevance of the stated preference questions (cf. Michaud et al., 2020).

The significant positive estimate of η^l , the coefficient of “running age”, age in the future period for which the contribution to lifetime is calculated, implies that respondents attach increasing utility to leisure at older ages, probably because they expect that health deterioration will increase the disutility of working. It could also be that a social norm or the expected labor market position of the partner or their reference group makes working at an older age less and less attractive.

The estimates of α^y and α^l cannot be interpreted directly. They determine the shape of the within period utility function and (together with α^l), drive the sensitivity of retirement decisions for financial incentives. The estimate of the discount factor ρ is 0.93 with a standard error of only 0.006.

The estimate of T suggests that available leisure time is about 10 h in a typical 38 h of working week in collective labor agreements in the Netherlands.

We evaluate model fit based on a comparison of the choice probabilities in the survey with the average of the probabilities predicted

¹⁰ The other estimates, significance levels, and effect sizes are similar across the two age groups, demonstrating the robustness of results with respect to respondent age (results available upon request).

¹¹ See, e.g., Börsch-Supan and Schuth (2014), who argue that early retirement negatively affects social networks and cognitive functioning.

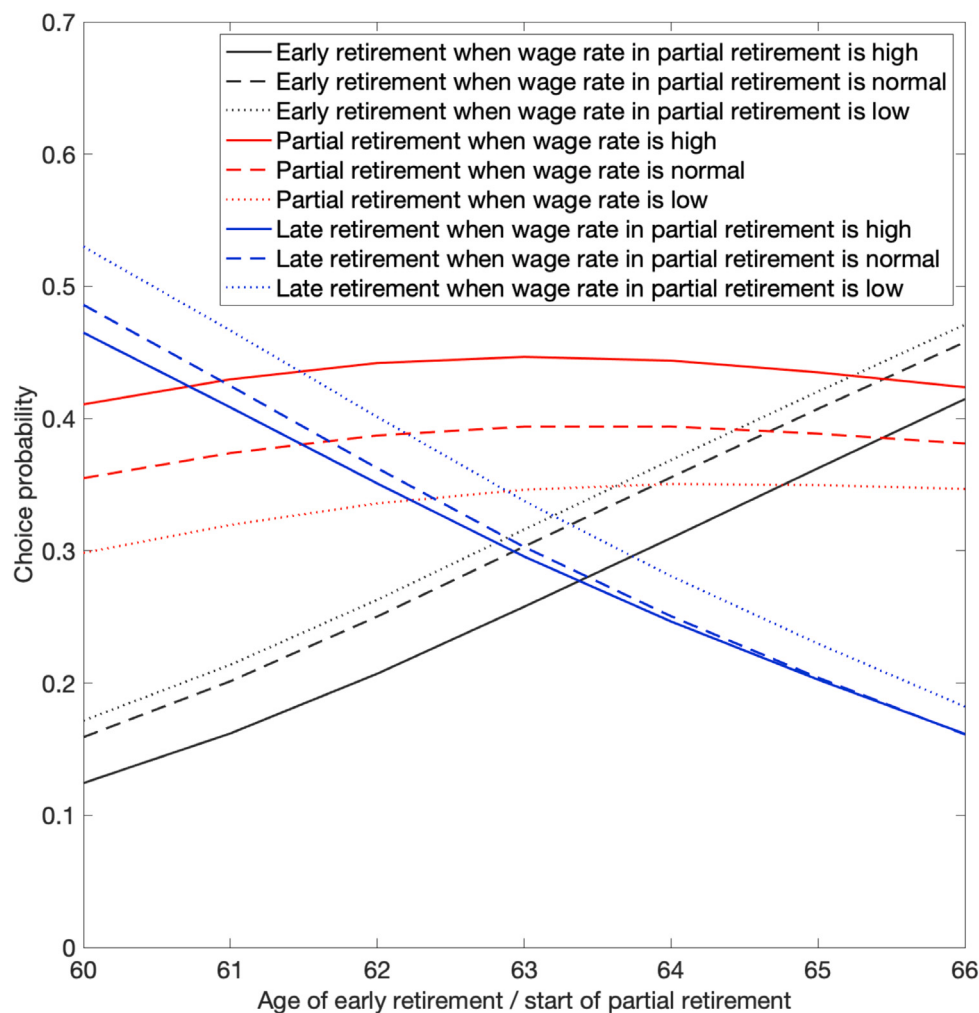


Fig. 5. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement, when the wage rate during partial retirement changes.

by the model for each individual. We consider only the questions asking to choose among early, partial and late retirement, asked three times changing the retirement ages in the retirement scenarios, since these questions are asked to all respondents. (Model predictions are based on the estimates using all questions asked in the survey.) Table 10 shows that many observed and predicted choice probabilities are fairly close to each other but partial retirement is underestimated by about 5 pp, on average. Further analysis shows that this owes to the fact that we fit the model to data from all questions, which is apparently somewhat demanding (to get maximum precision). When we only use the questions asking to choose among early, partial and late retirement in the estimation, the observed and predicted choices for partial retirement differ by only 2.2 pp.¹²

7. Simulations

We use the estimated model to simulate the effects of potential policy changes on retirement decisions, focusing on partial retirement. In these simulations, we sometimes consider the same choice set of early, late and partial retirement as in the survey questions (such as the question in Fig. 2), but more often, we use alternative choice sets (with, e.g., different retirement ages) or we extend the choice sets

to include more options and options not considered in the survey. Moreover, we explore the consequences of many different changes in partial retirement arrangements that are not reflected in the survey questions (such as subsidizing phased retirement).

Replacement rates in the scenarios used in the simulations are adapted to the alternative retirement ages, accounting for total years of pension accrual and expected years of pension receipt. As described in Section 3, three attributes of the retirement scenarios are randomized: the pension income, the wage rate during partial retirement, and the duration of partial retirement. In each simulation, we pool individuals assigned to the regimes defined for these attributes, unless the simulation concerns changing a specific attribute. Furthermore, hours worked per week is 20 during partial retirement unless stated otherwise. Simulated choice probabilities are averaged over the complete sample, and take into account observed and unobserved heterogeneity as well as optimization errors.

Increasing pension eligibility ages

Increasing the age at which individuals can claim a (full) pension reduces interest in late abrupt retirement and increases interest in early retirement, but hardly affects the (substantial) interest in partial retirement.

Fig. 3 shows simulated average probabilities of choosing early, partial and late retirement as a function of the age of abrupt retirement or the start of partial retirement: the first point on the left is a choice among abrupt (early) retirement at age 60 (with a low pension), partial

¹² Using the latter estimates for the simulations in the next section did not change any of the qualitative conclusions (details available upon request).

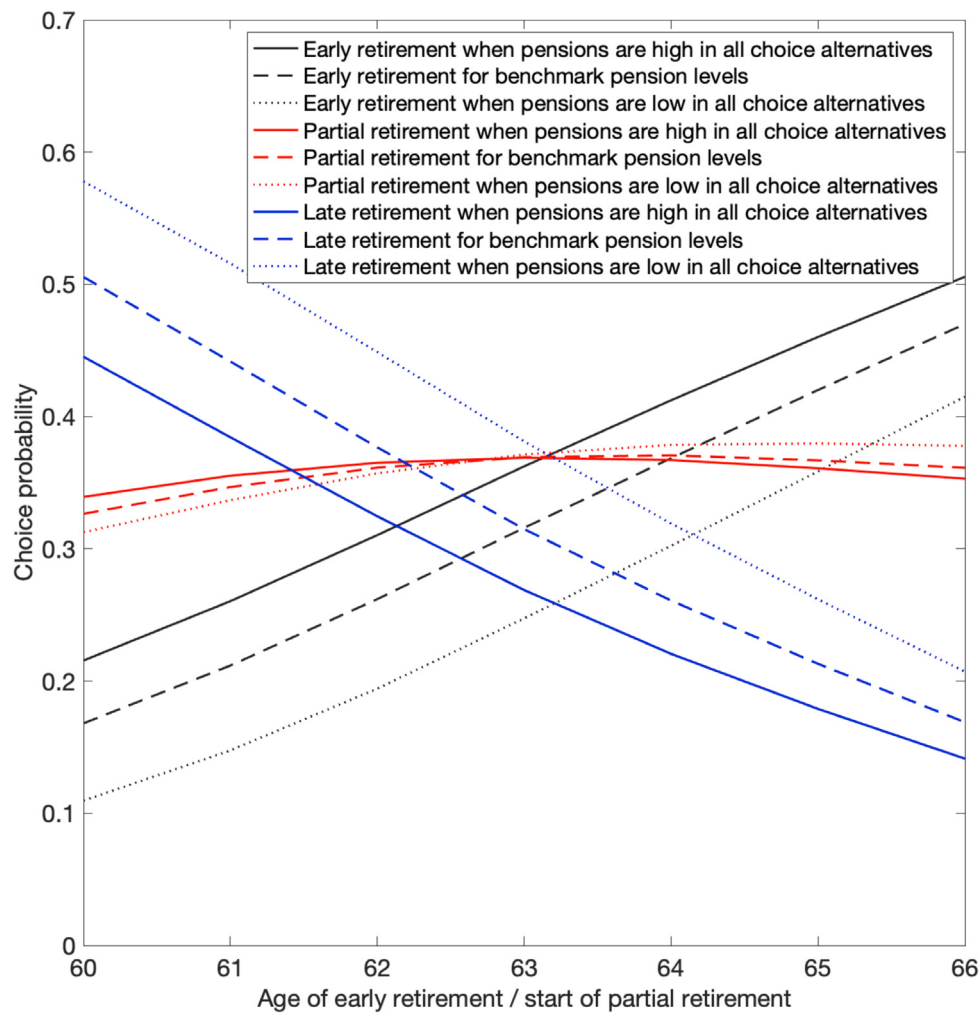


Fig. 6. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement, when pension benefit levels change with the same percentage at all retirement ages for all choice alternatives.

retirement from age 60 to age 64 (or 63 if duration of partial retirement is 4 years) and full retirement thereafter, or abrupt (late) retirement at age 65 (or 64 if duration of partial retirement is 4 years). Moving along the horizontal axis gives the same probabilities if all these ages increase by 1 to 6 years. Hence, on the right-hand side, the choice is among abrupt early retirement at age 66, partial retirement from age 66 until age 70 (or 69), or abrupt retirement at age 71; the three choice probabilities always add up to 100%.

When the eligibility ages increase, the probability of early retirement increases and the probability of late retirement falls. For example, increasing the retirement age from 61 to 63 increases the probability of early retirement from 20 to 30%. The probability of partial retirement, however, is always between 32 and 35%, demonstrating the potential of partial retirement schemes, particularly if full-time working becomes unattractive due to an increase of the eligibility ages. Note that even if the age of partial or full retirement is raised to 66, about half of the respondents would still want to work after that age. This result is in line with Ameriks et al. (2020), who find a substantial interest in the US in working longer if jobs were flexible.

In the context of the life-cycle labor supply and retirement model of Rogerson and Wallenius (2013), Ameriks et al. (2020) demonstrate that those with a low intertemporal elasticity of substitution (IES) highly value the option of part-time work for a smooth life-cycle profile of leisure and consumption, while those with a high IES will often choose abrupt retirement. The strong interest in partial retirement suggests that there is a substantial group of individuals who in principle

would prefer a smooth life-cycle profile of leisure, gradually reducing paid work hours and increasing hours spent on other activities (“leisure”, in our model) instead of abruptly changing from full-time paid work to full retirement. The probabilities to choose partial retirement are much larger than the fractions of workers who actually choose partial retirement (Ameriks et al.), pointing at other factors that hamper the combination of part-time work and partial retirement in practice. Such factors, not incorporated in our vignettes, could be, e.g., restrictions imposed by the employer, health issues and (partial) disability, or the role of the partner.

Changing the characteristics of the partial retirement plan

The interest in partial retirement would increase a lot if partial retirement would imply fewer hours of work, 12 instead of 20 per week. Partial retirement would become much less popular if it comes with a reduced wage rate.

Fig. 4 shows the choice probabilities for three different numbers of hours worked during partial retirement: 12, 20 or 28 h. The differences in the choice probabilities are notable. At a low retirement age, partial retirement with 28 h of work per week is an often chosen alternative for full retirement. At higher retirement ages, the situation reverses and working 28 h is often not attractive, like full time work. At a high retirement age, partial retirement with a small part-time job is often chosen as a good alternative for early retirement.

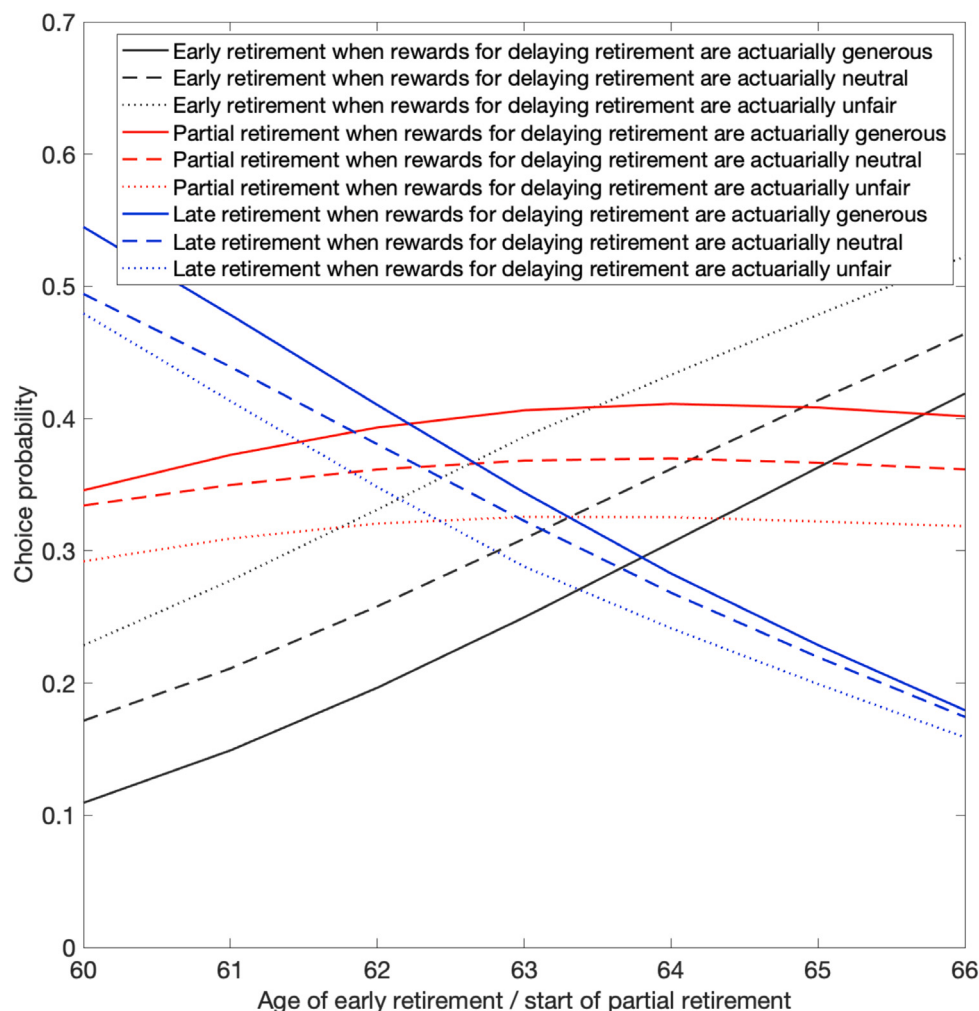


Fig. 7. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement, when the actuarial valuation of the pension benefit for delaying retirement changes.

Existing studies provide evidence that older workers who take a part-time job before they fully retire often work at a reduced hourly wage, due to a part-time wage penalty or to switching to a less demanding job (Gordon and Blinder 1980, Gustman and Steinmeier 1985, Ruhm 1990, Aaronson and French 2004, Rogerson and Wallenius 2009). Fig. 5 shows simulated choice probabilities when hourly wages in partial retirement are the same as when working full-time prior to partial retirement, and when they are 20% lower or higher (and partial retirement also implies a change to a different job with less demanding tasks). The partial retirement option clearly becomes more attractive for a higher wage during partial retirement, irrespective of the retirement age. A reduction in the hourly wage mainly induces many individuals to choose to continue working full-time. On the other hand, an increase in the hourly wage rate (e.g., induced by a subsidy of gradual retirement) induces many people who otherwise would have stopped working early to participate in partial retirement.¹³

Financial incentives

The interest in partial retirement is not sensitive to the overall generosity of pensions, but does increase with generous rewards for working longer.

¹³ Additional simulations show that the probability to choose partial retirement is not sensitive to the duration of partial retirement or the number of partial retirement steps. Results are available upon request.

Fig. 6 shows simulated choice probabilities when pension accruals are based on a benchmark accrual rate of 2.05% and alternative accrual rates of 1.85% and 2.25%. The alternative accrual rates of 1.85% and 2.25% imply, in all choice alternatives, replacement rates that are, respectively, 10 pp lower and higher than the replacement rates implied by the benchmark accrual rate (Table 6). The benchmark accrual rate corresponds to the accrual rate used by the National Civil Pension Fund in 2024.

The effects we find are in line with the notion that leisure is a normal good: a higher replacement rate implies more early retirement and less late retirement. The probability to choose partial retirement does not change much. The effects are sizable compared to the existing literature. For example, for the US, Van der Klaauw and Wolpin (2008) find that a 25% reduction in Social Security benefits reduces labor participation of both husbands and wives aged 51–61 to a limited extent but increases labor participation of individuals aged 62–69. Delavande and Rohwedder (2017) find that individuals would expect to work longer and reduce spending if their Social Security benefits were cut by 30%. For Ukraine, Danzer (2013) found that a 10% rise in the minimum pension level increases the probability of retiring by 1.2% for women and 1.9% for men. In their stated preferences study for the Netherlands, Van Soest and Vonkova (2014) also found a substantial income effect: reducing replacement rates by 10 percentage points would increase the average retirement age by 3.24 months.

Fig. 7 shows what happens if rewards for later retirement are based on higher or lower actuarial factors than the actuarially fair ones

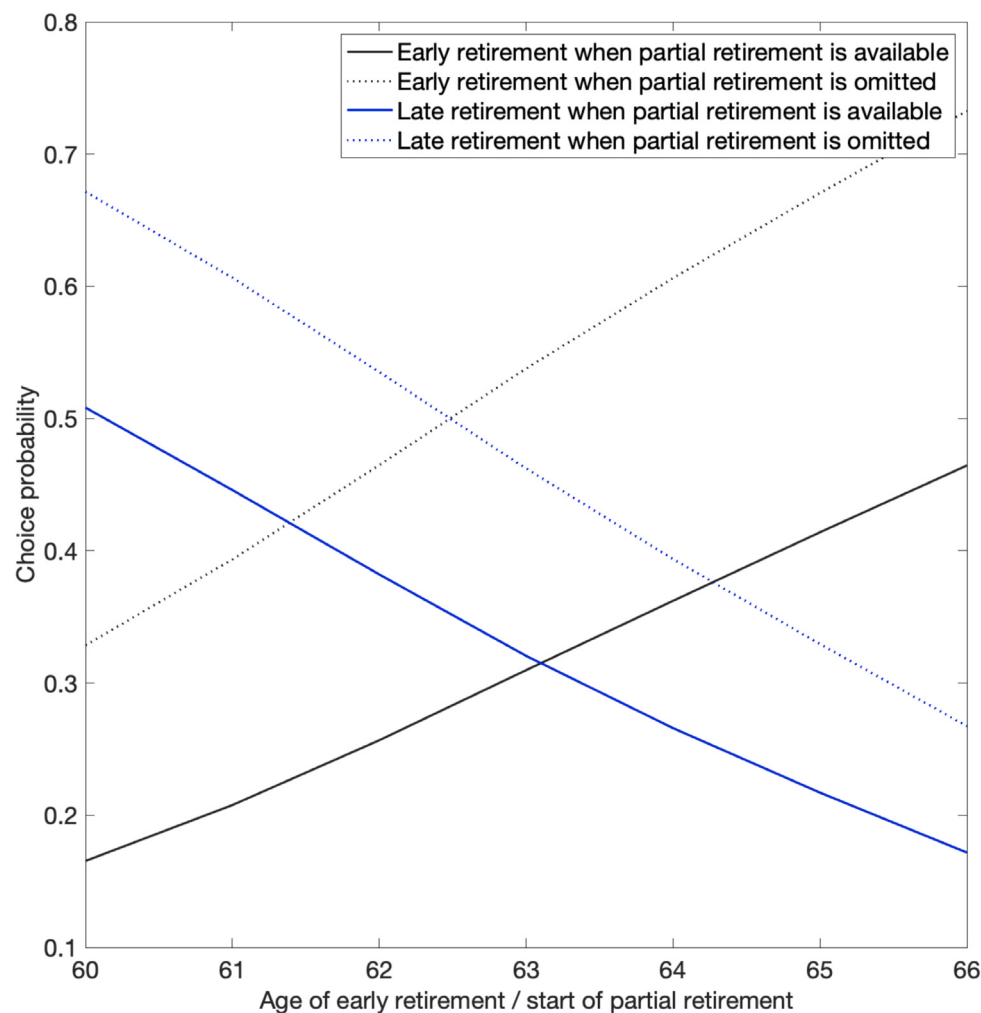


Fig. 8. The effect of introducing partial retirement on total labor supply: Probabilities of choosing early or late retirement at given ages of early retirement and start of partial retirement, if partial retirement is/is not available.

used in practice by the National Civil Pension Fund. Appendix Fig. 15 presents all actuarial factors. The yellow line represents benchmark actuarial factors that underlie the replacement rates that give actuarially fair rewards for later retirement. The flatter red line and steeper green line underlie the replacement rates that give less and more than actuarially fair rewards for later retirement, respectively. With actuarially fair rewards for later retirement, the replacement rates increase, on average, by 8% for each year retirement is delayed from age 65 to 70. In the scenarios that feature less and more than actuarially fair rewards for delaying retirement, this increase is 6% and 10%, respectively (Table 6). For earlier eligibility ages, the increase in the replacement rates for delaying retirement is smaller (actuarial factor is nonlinear across retirement ages in Fig. 15).

Fig. 7 demonstrates that higher rewards for later retirement substantially reduce the probability to choose early retirement. This is in line with earlier studies such as Van Soest and Vonkova (2014), who found that the retirement age would fall by 9.72 months if the rewards for retiring later would be halved. Particularly at high eligibility ages, higher rewards for delaying retirement increase the probability of partial retirement more than the probability of late (abrupt) retirement. Apparently, the higher rewards are not enough to make people work full-time until high age, but they do convince people to continue working part-time. To the best of our knowledge this is the first evidence on the price effect of pensions on the partial retirement decision.

The added value of partial retirement

Introducing partial retirement schemes not only increases labor force participation but also has the potential to increase total labor supply.

Fig. 8 shows how the choice probabilities for early and late retirement change when the partial retirement option is omitted. Choice probabilities for early and late retirement both increase at every retirement age, and the increase is always larger for early retirement than for late retirement. Since in this simulation partial retirement always means working half-time, this suggests that introducing the option of partial retirement has a positive impact on total labor supply. This positive effect is larger at later eligibility ages. This is plausible: since the propensity of early retirement increases when eligibility ages shift upward, partial retirement more often becomes an attractive alternative to early retirement.

This result is in line with Ameriks et al. (2020) who find that older individuals in the US would work longer if they had opportunities to work in jobs that allow them to choose hours worked per week or weeks worked per year. For Germany, Huber et al. (2016), Berg et al. (2020), and Haan and Tolan (2019) also conclude that encouraging partial retirement can lead to positive labor supply effects. These findings differ from those of several other studies. Börsch-Supan et al. (2018) exploited cross-country variation in pension systems with respect to whether they adopted partial retirement schemes, to explain differences in annual labor force participation and work hours between these countries. Van Soest and Vonkova (2014) and Elsayed et al. (2018)

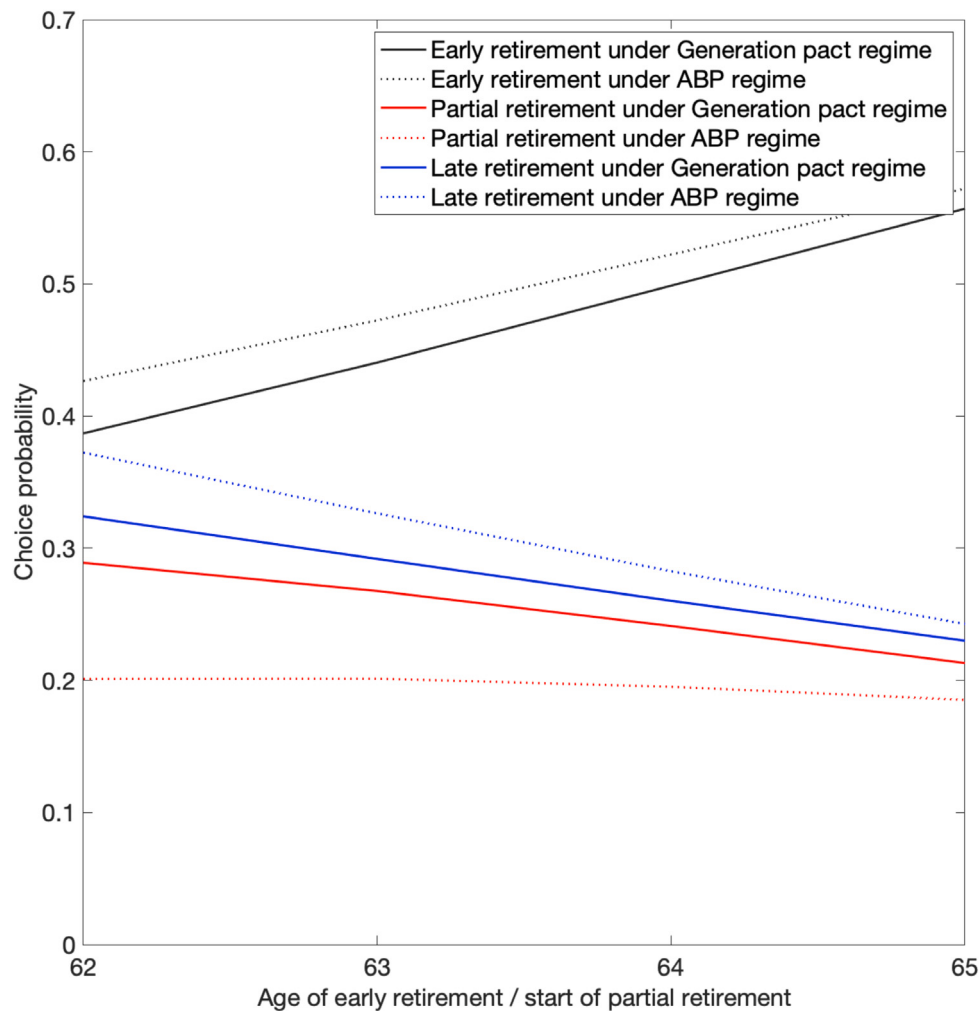


Fig. 9. Generation pact: 60% work, 70% compensation and 100% pension accrual. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement, for benchmark (ABP regime) and for subsidized partial retirement (Generation pact regime).

conduct stated choice experiments including partial retirement in the Netherlands. These studies find that partial retirement reduces total labor supply. A possible explanation is that the aggregate labor supply effect depends on the details of the partial, early and late retirement scenarios that individuals can choose.

Subsidizing partial retirement

Subsidizing gradual retirement arrangements can make gradual retirement substantially more attractive.

Until now, we essentially assumed that partial retirement was rewarded in an actuarially neutral manner. Individuals have maximum flexibility and pay a fair price for retiring partially. Recently, however, labor unions and employers introduced subsidized partial retirement schemes (“Generation pact”) in collective labor agreements; see, e.g., Rutten et al. (2025) for details on how this is implemented in parts of the public sector. At any age from, for example, five years before the state pension eligibility age until this age, these schemes allow a worker to reduce work hours with a less than proportional decrease in salary and no reduction in pension accruals. The schemes do not allow to claim pension rights during partial retirement. Sector agreements differ in how much weekly hours can be reduced and how much they subsidize the salary and often offer multiple options. Here we consider one simple example: employees can work 60% of their former hours and earn 70% of their former wage, but still accrue pension rights over 100% of their original (full-time) wage.

Fig. 9 presents the choice probabilities for this arrangement, comparing them to the benchmark of the standard actuarially neutral partial pension arrangement without pension during partial retirement (hence 60% of hours, earnings, and pension accruals during partial retirement). We consider decisions at each age from 62 to 65, each lasting until age 67 (the state pension eligibility age in 2024). Therefore, duration of partial retirement depends on the age partial retirement starts. The figure shows that the subsidy makes partial retirement substantially more attractive, particularly if offered at an early stage so that individuals can benefit for a longer period (five years).

Heterogeneous retirement preferences

Partial retirement preferences are substantially heterogeneous with respect to gender and education.

Table 5 showed evidence of substantial observed heterogeneity in leisure preferences. Here we analyze the implications of this for the scenario choices, focusing on three background characteristics. Figs. 10 to 12 disaggregate choice probabilities presented in Fig. 3 by age, gender and education groups. Fig. 10 shows that at early retirement ages, older individuals (older than 60 years) prefer to work full-time until a given age, instead of retiring partially or fully at that age. The difference between the two groups, however, dissipates at higher retirement ages. We find a similar pattern for men compared to women in Fig. 11. Fig. 12 shows that for individuals with higher education, partial retirement is a more attractive option as opposed to early

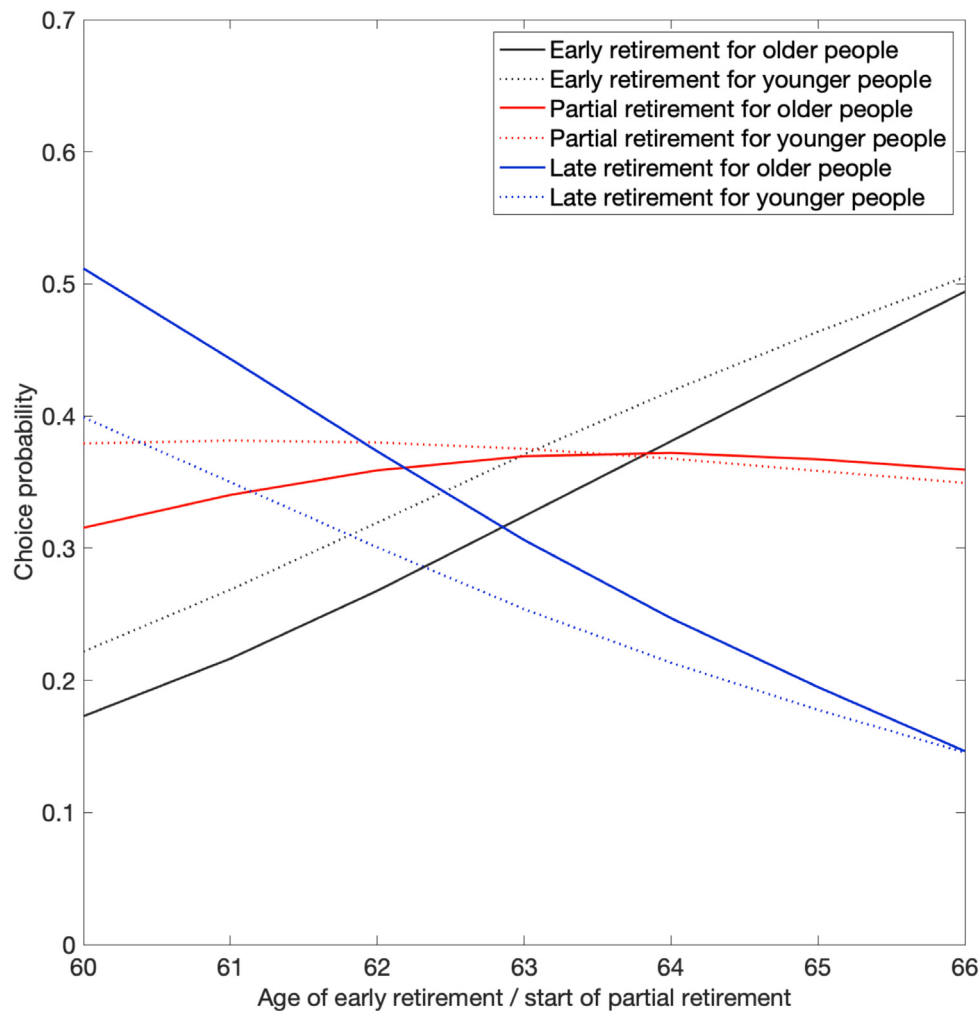


Fig. 10. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement among individuals ages at most 60 and older than 60.

retirement compared to those with lower levels of education. This implies that partial retirement opportunities have a bigger potential to increase the total number of hours worked among highly educated individuals. This seems particularly relevant for the future, since the higher educated will often have non-routine jobs for which the demand is increasing more than for routine jobs, due to technological development (Albinowski and Lewandowski, 2024).

8. Model validation

We estimated a structural model that made the trade-offs between leisure and income over the life cycle explicit, and used the estimated model for counterfactual policy simulations. We utilized rich experimental variation in retirement scenario characteristics to aid the estimation of the structural model. Experimental variation can also be used to validate a structural model (Low and Meghir, 2017). Here we estimate a reduced-form model for respondents' choice of a retirement scenario where randomized retirement scenario characteristics enter the model explicitly. We then check if the predictions of this model are in line with the predictions of the structural model.

We consider the questions asking to choose among early, partial and late retirement, asked three times using scenarios with three different retirement ages. We estimate a multinomial probit model where the outcome is a retirement scenario choice. The controls include the same observed characteristics considered in Eq. (3) and a set of dummy variables that indicate treatment regimes. For example, dummies for low

and high price effect regimes indicate randomized choice sets where the actuarial rewards for retiring later are, respectively, lower and higher than the actuarially fair rewards (the base regime). Dummies for low and high pension income level regimes indicate randomized choice sets in which all three scenarios someone can choose have lower and higher replacement rates than the middle income regime (the base regime), respectively — see Table 6 where the first, second and third rows indicate the low, middle and high price effect regimes, and the first, second and third columns indicate the low, middle, and high income effect regimes.

Table 11 presents the estimation results. The signs and statistical significance of the effects of the observed characteristics in Tables 11 and 5 are very similar. For example, those who expect or experienced early retirement more often choose scenarios with more leisure in Table 11 while they exhibit a higher marginal utility of leisure in Table 5. The effects of the treatment variables in Table 11 are also in line with the simulated responses to counterfactual policy simulations in Figs. 5, 6, and 7. For example, a lower hourly wage in partial retirement reduces the probability of choosing partial retirement by about 5 percentage points in both Table 11 and Fig. 5. Or, both Table 11 and Fig. 3 show that partial retirement is more often preferred at age 63 than at earlier or later retirement eligibility ages.

9. Conclusion

Partial retirement seems an attractive way to gradually withdraw from the labor market, avoiding the sudden change in time use and

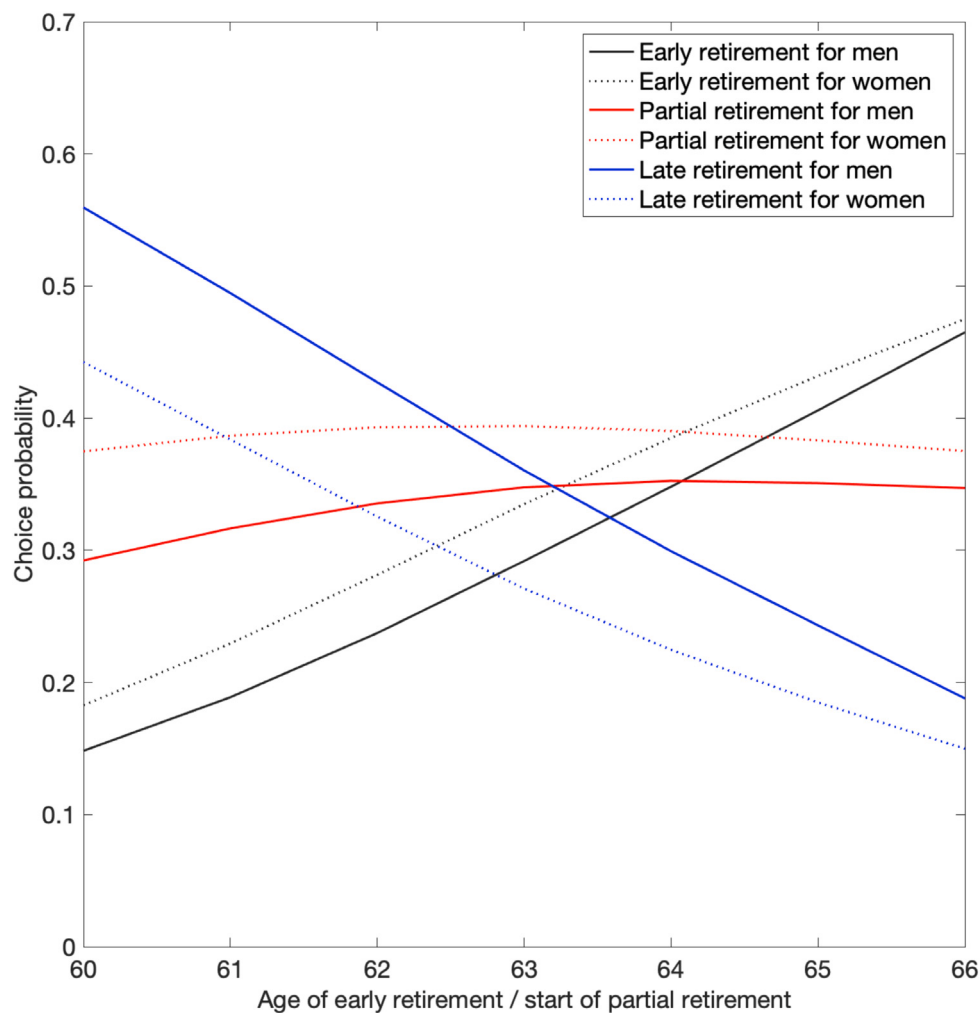


Fig. 11. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement among men and women.

activities of abruptly switching from full-time work to no paid work at all. This is in line with standard models of labor supply in which individuals prefer to smooth leisure and consumption over the life cycle. In practice, however, partial retirement is less common than one might expect on the basis of preferences alone, due to demand side restrictions or institutional constraints. In this paper, we have followed several recent papers and studied partial retirement using stated choice survey questions, aiming at an analysis of labor supply preferences only, purged from the restrictions that someone's actual labor market position may impose. Our questions provide a more detailed picture of partial retirement than existing studies by considering several properties of the partial retirement option, such as the starting and ending age and the hourly wage rate when working part-time. We use vignette questions asking respondents to make choices based upon their own preferences but for hypothetical individuals, making it possible to ask respondents to make choices that are not realistic in their own situation. We account for the standard actuarial rules of pension systems, making the trade-offs between income and leisure as realistic as possible. We randomly vary retirement plan characteristics in several questions across respondents, generating rich variation in choice sets and stated choices. We exploit this variation to obtain accurate model estimates and conduct credible counterfactual policy simulations. The labor supply preferences that we estimate correlate in plausible ways with peoples' actual or predicted retirement plans and with a subjective question on whether they value work just for money or for its intrinsic value, lending credibility to our stated choice data.

We find substantial interest in partial retirement, with more than one third of the respondents choosing partial retirement rather than early or late abrupt retirement trajectories with income adjusted in an actuarially fair way. The probability to choose partial retirement hardly varies with the pension eligibility age. This suggests a strong preference to smooth leisure and consumption over the life cycle in line with the predictions of standard labor supply models. The fact that stated interest in partial retirement is stronger than the actual prevalence of partial retirement confirms that actual partial retirement decisions are often hampered by other factors, like demand side restrictions. For the practical implications, the findings in this paper should be complemented with an analysis of the demand side and other restrictions. Findings for the US show that phased retirement programs are popular only in specific sectors like higher education, where it is easy to organize part-time work or job sharing (Clark and Ritter, 2020). Hutchens and Grace-Martin (2006) find that firms that impose minimum hours constraints are reluctant to offer part-time jobs in general, and they also tend to be less willing to allow for phased retirement. This finding is confirmed for Europe by Albinowski (2024). Hutchens (2010) finds that also within a firm, phased retirement is often offered to a selective group of employees rather than as a general policy of the company. For Norway, Hermansen and Midtsundstad (2015) find that less than one in four companies offered a phased retirement program in 2010. Analyzing how the characteristics of workers that are interested in phased retirement match the demands of the firm seems a useful topic for future research.

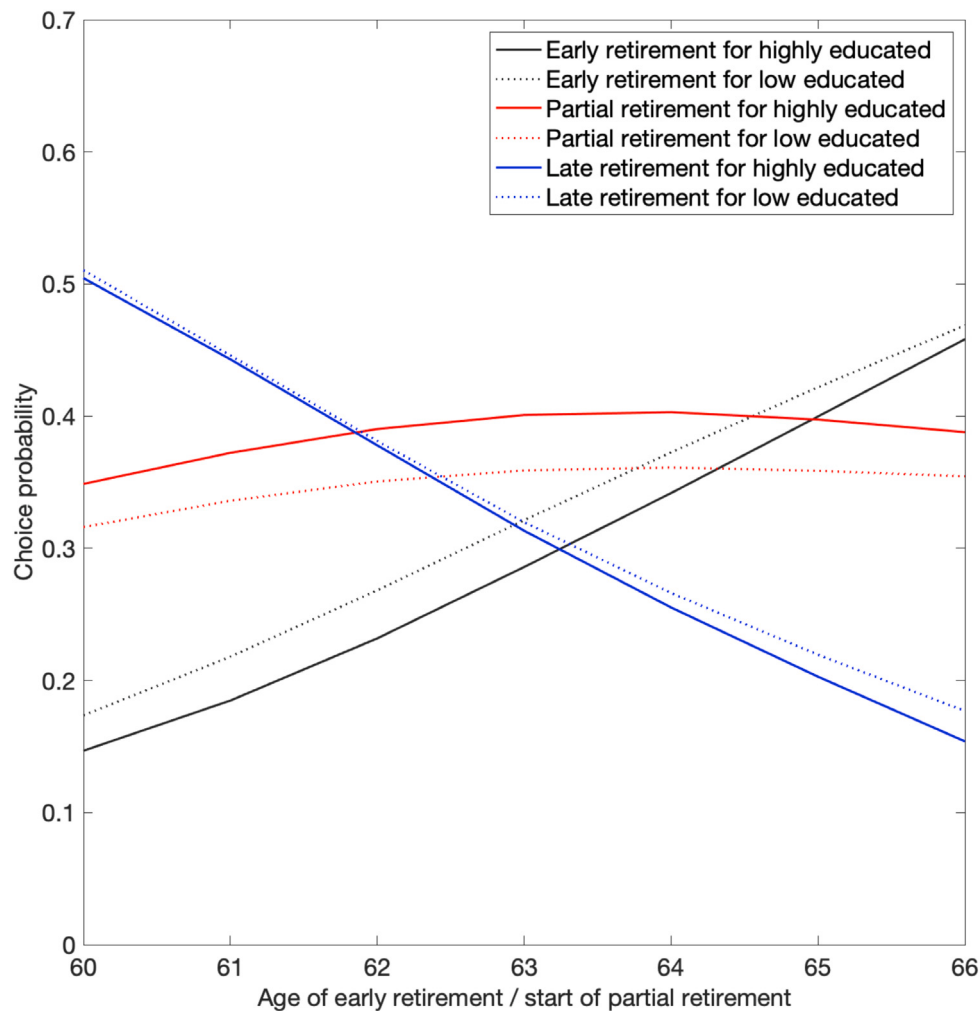


Fig. 12. Probabilities of choosing among early, partial and late retirement at given ages of early retirement and start of partial retirement among individuals with high and low education.

We find some evidence of differences in the interest in partial retirement across socioeconomic groups. Interestingly, the potential for partial retirement as a policy to increase the total number of hours worked is highest among those with high education. In future work, it would be of interest to investigate if this is due to the differences in the type of occupation, on which the currently available data did not provide any information.

We find that if individuals do not have the partial retirement option, early abrupt retirement more often becomes the best alternative than late retirement, demonstrating the potential of partial retirement as a policy instrument to stimulate older individuals to remain in the labor force. Moreover, subsidizing partial retirement schemes with higher wages or more than actuarially fair pension increases for delaying retirement has a positive effect on total labor supply. Introducing or subsidizing partial retirement schemes therefore creates potential instruments for policy makers who consider increasing pension eligibility ages to keep pension systems sustainable because in fact we show that the effects of these policy options are more pronounced when eligibility is delayed.

We disentangle wealth and price effects of pensions at the intensive and extensive margin at various retirement ages. We find that the partial retirement decision is much less sensitive to the wealth effect of pensions than are the early or late abrupt retirement decisions. On the other hand, the partial retirement decision is sensitive to the price effect of pensions. Responses to these pension incentives, for both abrupt and partial retirement, are sizable compared to those found in earlier

studies, considering that the sizes of the incentives we consider are much smaller. This is important because small pension incentives are much more within the reach of policy makers who have to consider sensitive pension interventions. We also show that the partial retirement decision strongly depends on the specific financial incentives for retiring partially. Interest in partial retirement would fall substantially if partial retirement came with a lower wage (and a less challenging job).

CRediT authorship contribution statement

Tunga Kantarcı: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Jim Been:** Writing – review & editing, Investigation, Funding acquisition. **Arthur van Soest:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Daniël van Vuuren:** Writing – review & editing, Supervision, Resources, Project administration, Funding acquisition, Conceptualization.

Appendix

See Figs. 13–15 and Tables 6–11.

In the questions that follow we describe retirement plans of hypothetical people. Please assume as much as possible that these people...

- work for an employer who fully cooperates with the described retirement plans
- work in the same type of job and under similar work conditions as you (might) work or worked
- have a level of job satisfaction much the same as you (might) have or had
- have social and family lives and a health condition like yours

The described retirement plans **may not apply to your situation** because your work status, work type, health status, or partner's situation are or were not suitable for these plans. Still, we would like you to evaluate each retirement plan **based on your own preferences**.

The retirement plans are shown on a timeline. Here is an example, the retirement plan of Mary:

Age	62	63	64	65	66	67	68	69	70	71	72
	Work			Partial retirement					Retirement		
Hours worked	40 hours			20 hours					0		
Work income	€ 3,000			€ 1,500					0		
Pension income	0			€ 1,200					€ 2,700		

- Above the colored panes you see Mary's **age** over time.
- The colored panes indicate Mary's **work status at the indicated ages**. Respectively:
 - the **BLUE** pane indicates that she works full-time
 - the **RED** pane indicates that she is retired part-time and works part-time
 - the **GRAY** pane indicates that she is fully retired
- Below the colored panes we indicate, for the corresponding ages:
 - the **hours** per week that Mary works
 - the **work income** per month she earns
 - the **pension income** per month she receives (including eventual state pension income)

Note: Assume that the period of full-time work (blue pane) starts before age 62, and the period of full-time retirement (gray pane) continues after age 72. Hence, in the example, Mary also earns €3,000 before age 62, and receives a pension income of €2,700 after age 72.

- Several terms are used. They are defined below.
 - 'Work income' means monthly income from work.
 - 'Pension Income' means monthly income in euros from AOW and, if applicable, from supplementary pension (e.g. from ABP or PGGM).
 - All incomes are after taxes and other deductions, and they are adjusted for future inflation.

<< Back Next >>

Fig. 13. Instructions page.

People follow different employment paths. Some work full-time and then retire, some retire only partially, others do something else.

Below is a timeline that intends to outline your employment path from age 55 and onwards. The line indicates eight age categories. Below each category is a drop-down menu which lists four work status choices. Please choose your **past and expected future** work status at each age category. Please note:

- Choose 'Full-time' for 35 or more hours of work per week.
Choose 'Part-time' for less than 35 hours of work per week.
Choose 'Fully-retired' for full retirement.
Choose 'Other' if unemployed, sick, on other leave, or homemaker.
- If you had more than one work status during the two years of an age category, choose the one in which you spent most of the time.
- When choosing a future work status, consider what your opportunities will allow you to do. For example, if your employer prohibits part-time work, avoid choosing part-time from the list.

Age	55-56	57-58	59-60	61-62	63-64	65-66	67-68	69+
Work status	Full-time ▾	Full-time ▾	Full-time ▾	Full-time ▾	Part-tim ▾	Part-tim ▾	Fully-ret ▾	Fully-ret ▾

<< Back Next >>

Fig. 14. Question asking to outline past and expected future work status from age 55 onwards.

Table 6
Replacement rates in competing retirement scenarios.

Retirement age regime	Type of retirement	Full or partial retirement age	Replacement rate during partial retirement	Replacement rate during full retirement
65	E	65		0.60/0.70/0.80
				0.60/0.70/0.80
				0.60/0.70/0.80
	P	65–69	0.20/0.30/0.40 0.25/0.35/0.45 0.30/0.40/0.50	0.75/0.85/0.95
				0.80/0.90/1.00
				0.85/0.95/1.05
	L	70		0.90/1.00/1.10
				1.00/1.10/1.20
				1.10/1.20/1.30
63	E	63		0.50/0.60/0.70
				0.50/0.60/0.70
				0.50/0.60/0.70
	P	63–67	0.15/0.25/0.35 0.20/0.30/0.40 0.25/0.35/0.45	0.60/0.70/0.80
				0.65/0.75/0.85
				0.70/0.80/0.90
	L	68		0.70/0.80/0.90
				0.80/0.90/1.00
				0.90/1.00/1.10
61	E	61		0.40/0.50/0.60
				0.40/0.50/0.60
				0.40/0.50/0.60
	P	61–65	0.10/0.20/0.30 0.15/0.25/0.35 0.20/0.30/0.40	0.45/0.55/0.65
				0.50/0.60/0.70
				0.55/0.65/0.75
	L	66		0.50/0.60/0.70
				0.60/0.70/0.80
				0.70/0.80/0.90

Notes: 1. E, P, L denote early, partial, and late retirement, respectively. 2. The first, second, and third rows refer to the low, middle and high price effect regimes, respectively. The first, second, and third columns refer to the low, middle and high income effect regimes, respectively. 3. For pension income (i.e., the replacement rate), one of nine regimes is assigned, with each regime characterized by low, middle or high replacement rates in all three scenarios, and by low, middle, or high rewards for retiring later. 4. The replacement rates for the short duration regime where partial retirement is 4 instead of 5 years, are 5 pp lower when fully retired in the scenario of partial retirement, and 10 pp lower when fully retired in the scenario of late retirement (due to working part-time or full-time one year less). 5. In each question, three attributes of the scenarios were randomized: pension income, the wage rate during partial retirement, and the duration of partial retirement. The order in which the first and the last retirement scenarios were presented was also randomized.

Table 7
Replacement rates in competing partial retirement scenarios with different numbers of hours worked per week during partial retirement.

Retirement age regime	Partial retirement age	Hours worked during partial retirement	Replacement rate during partial retirement	Replacement rate during full retirement
65	65–69	12	0.45/0.55/0.65	0.75/0.85/0.95
	65–69	20	0.25/0.35/0.45	0.80/0.90/1.00
	65–69	28	0.05/0.15/0.25	0.85/0.95/1.05
63	63–67	12	0.40/0.50/0.60	0.60/0.70/0.80
	63–67	20	0.20/0.30/0.40	0.65/0.75/0.85
	63–67	28	0.00/0.10/0.20	0.70/0.80/0.90
61	61–65	12	0.35/0.45/0.55	0.45/0.55/0.65
	61–65	20	0.15/0.25/0.35	0.50/0.60/0.70
	61–65	28	0.00/0.05/0.15	0.55/0.65/0.75

Notes: 1. Considering the replacement rates column-wise, the first, second, and third columns refer, respectively, to the low, middle and high income effect regimes. 2. The replacement rates for the short duration regime where partial retirement is four years, instead of five years here, are 5 pp lower when fully retired in scenarios of partial retirement, and 10 pp lower when fully retired in scenarios of late retirement, due to working, respectively, part-time and full-time one year less.

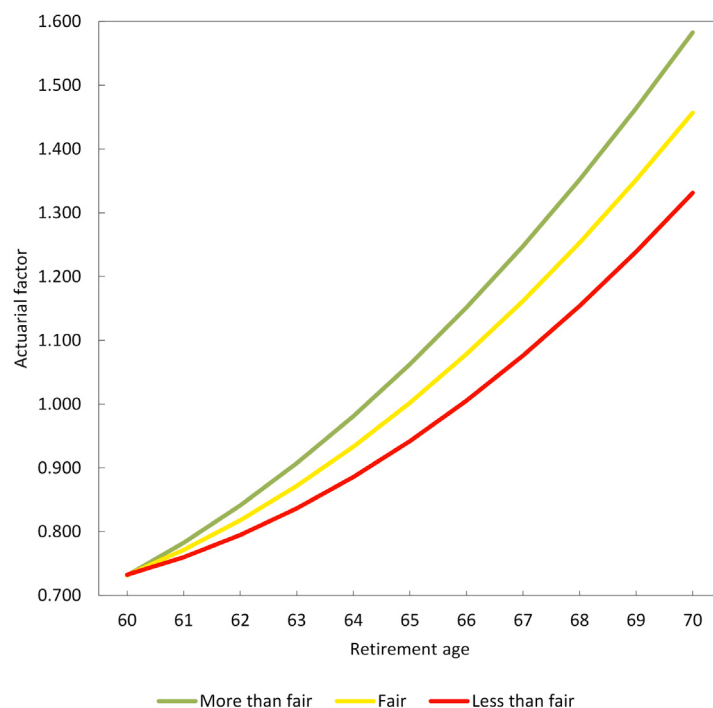


Fig. 15. Actuarial factors that adjust pension rights due to claiming at different retirement ages. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Table 8

Replacement rates in competing partial retirement scenarios where hours are reduced in one or two steps during partial retirement.

Retirement age regime	Partial retirement age	Partial retirement in one or two steps	Replacement rate during the first step of partial retirement	Replacement rate during the second step of partial retirement	Replacement rate during full retirement
65	65–68	1	0.25/0.35/0.45		0.75/0.85/0.95
	65–68	2	0.25/0.35/0.45	0.50/0.60/0.70	0.70/0.80/0.90
63	63–66	1	0.20/0.30/0.40		0.60/0.70/0.80
	63–66	2	0.20/0.30/0.40	0.45/0.55/0.65	0.55/0.65/0.75
61	61–64	1	0.15/0.25/0.35		0.45/0.55/0.65
	61–64	2	0.15/0.25/0.35	0.40/0.50/0.60	0.40/0.50/0.60

Notes: Considering the replacement rates column-wise, the first, second and third columns refer, respectively, to the low, middle and high income effect regimes.

Table 9

Most common self-reported retirement sequences.

Sequence	Percent	Sequence	Percent
22222333	6.68	11111111	1.04
22222233	6.30	13333333	1.04
44444444	5.35	11223333	0.98
11111133	4.35	22333333	0.91
44444333	3.97	11123333	0.88
11111333	3.87	11111122	0.85
22223333	3.75	11122223	0.82
22233333	3.75	11222233	0.72
11113333	3.65	23333333	0.72
11133333	2.83	11111222	0.66
33333333	2.68	11112223	0.66
11122333	2.61	11111112	0.63
11112233	2.52	11144333	0.63
44444433	2.49	11444333	0.63
22222223	2.24	12223333	0.60
11111233	2.08	12222333	0.57
11122233	1.95	22244333	0.57
11112333	1.89	22444333	0.50
11111113	1.67	11233333	0.41
11111123	1.48	12233333	0.41
11333333	1.35	12222233	0.35
11111223	1.32	22224333	0.35
22222222	1.32	44444443	0.35
11222333	1.10	11114333	0.31

Notes: 1. 1: Full-time work, 2: Part-time work, 3: Retired; 4: Other. 2. Retirement sequences are ranked according to the percentage of 3,176 respondents who reported the sequence. 3. The eight elements of a given sequence refer to the self-reported work status at eight age categories given by 55–56, 57–58, 59–60, 61–62, 63–64, 65–66, 67–68, and 69 plus.

Table 10

Model fit.

Retirement age regime	Type of retirement	Full or partial retirement age	Percent of choices in the survey	Percent of choices predicted by the model
61	E	61	19.05	19.81
	P	61–65	37.70	33.62
	L	66	43.24	46.56
63	E	63	25.95	29.76
	P	63–67	43.08	35.05
	L	68	30.96	35.19
65	E	65	41.23	41.22
	P	65–69	40.45	36.42
	L	70	18.31	22.36

Note: E: Early retirement. P: Partial retirement. L: Late retirement.

Table 11
Multinomial probit model explaining the probability of choosing a retirement scenario.

	Early retirement			Partial retirement			Late retirement		
	M.E.	S.E.	z value	M.E.	S.E.	z value	M.E.	S.E.	z value
Treatment effects									
Price effect regime is low	0.064	0.014	4.53	-0.041	0.015	-2.79	-0.022	0.01	-1.57
Price effect regime is high	-0.029	0.014	-2.14	0.014	0.015	0.99	0.015	0.01	1.08
Income effect regime is low	-0.047	0.014	-3.44	0.005	0.015	0.31	0.042	0.01	2.91
Income effect regime is high	0.021	0.014	1.53	-0.003	0.014	-0.22	-0.018	0.01	-1.28
Retirement age regime is 61	-0.071	0.007	-9.51	-0.045	0.009	-4.79	0.116	0.01	14.87
Retirement age regime is 65	0.147	0.008	18.18	-0.021	0.010	-2.26	-0.124	0.01	-15.59
Wage rate in partial retirement is low	0.026	0.011	2.32	-0.047	0.012	-3.92	0.021	0.01	1.87
Duration of partial retirement is 4 years	-0.017	0.011	-1.50	-0.011	0.012	-0.88	0.027	0.01	2.39
Observed characteristics									
Age	-0.003	0.001	-4.22	-0.002	0.001	-2.94	0.005	0.00	7.36
Male	-0.051	0.011	-4.41	-0.055	0.012	-4.49	0.106	0.01	9.15
High education	0.003	0.012	0.22	0.031	0.013	2.40	-0.034	0.01	-2.78
Household with no children	0.012	0.015	0.81	-0.001	0.017	-0.04	-0.012	0.02	-0.75
With partner	0.036	0.014	2.68	-0.009	0.015	-0.60	-0.027	0.01	-1.92
Home owner	0.028	0.014	2.09	0.033	0.015	2.17	-0.061	0.01	-4.10
Had a health problem in the last six months	0.034	0.012	2.75	-0.004	0.013	-0.29	-0.030	0.01	-2.42
Would work even if money was not needed	-0.051	0.003	-16.74	0.016	0.003	5.09	0.034	0.00	11.56
Experienced or expect early retirement	0.146	0.017	8.38	-0.043	0.017	-2.57	-0.103	0.01	-7.09
Observations	10 197								
Log-likelihood	-10 132.841								
Count R-squared	0.497								
p value of Wald test of model significance	0.000								

Notes: 1. All the treatment variables are dummy variables that indicate regimes of retirement income, retirement age, wage rate in partial retirement, and duration of partial retirement. 2. M.E: Average marginal effect. S.E: Standard error. 3. Standard errors are robust to heteroskedasticity.

Data availability

Data will be made available on request.

References

- Aaronson, D., French, E., 2004. The effect of part-time work on wages: evidence from the social security rules. *J. Labor Econ.* 22 (2), 329–352. <http://dx.doi.org/10.1086/381252>.
- Albinowski, M., 2024. Part-time employment opportunities and labour supply of older workers. *J. Econ. Ageing* 28, 100504.
- Albinowski, M., Lewandowski, P., 2024. The impact of ICT and robots on labour market outcomes of demographic groups in Europe. *Labour Econ.* 87, 102481.
- Ameriks, J., Briggs, J., Caplin, A., Lee, M., Shapiro, M.D., Tonetti, C., 2020. Older Americans would work longer if jobs were flexible. *Am. Econ. J.: Macroecon.* 12 (1), 174–209. <http://dx.doi.org/10.1257/mac.20170403>, <https://www.aeaweb.org/articles?id=10.1257/mac.20170403>.
- Atalay, K., Barrett, G., 2015. The impact of age pension eligibility age on retirement and program dependence: Evidence from an Australian experiment. *Rev. Econ. Stat.* 97 (1), 71–87.
- Been, J., Goudswaard, K., 2023. Intertemporal and intratemporal consumption smoothing at retirement: micro evidence from detailed spending and time use data. *J. Pension Econ. Financ.* 22 (1), 1–22.
- Berg, P., Hamman, M.K., Piszczek, M., Ruhm, C.J., 2020. Can policy facilitate partial retirement? Evidence from a natural experiment in Germany. *ILR Rev.* 73 (5), 1226–1251.
- Bloemen, H., Hochguertel, S., Zweerink, J.R., 2016. Gradual retirement in the Netherlands: an analysis using administrative data. *Res. Aging* 38 (2), 202–233.
- Börsch-Supan, A., Bucher-Koenen, T., Kutlu-Koç, V., Goll, N., 2018. Dangerous flexibility - retirement reforms reconsidered. *Econ. Policy* 33 (94), 315–355.
- Börsch-Supan, A., Schuth, M., 2014. Early retirement, mental health, and social networks. In: Wise, D.A. (Ed.), *Discoveries in the Economics of Aging*. University of Chicago Press, pp. 225–250.
- Clark, R.L., Ritter, B.M., 2020. Employer responses to an aging workforce. *Public Policy Aging Rep.* 30 (3), 113–118.
- Danzer, A.M., 2013. Benefit generosity and the income effect on labour supply: quasi-experimental evidence. *Econ. J.* 123 (571), 1059–1084.
- Delavande, A., Rohwedder, S., 2017. Changes in spending and labor supply in response to a Social Security benefit cut: Evidence from stated choice data. *J. Econ. Ageing* 10, 34–50. <http://dx.doi.org/10.1016/j.jeoa.2017.09.001>.
- Elsayed, A., de Grip, A., Fouarge, D., Montizaan, R., 2018. Gradual retirement, financial incentives, and labour supply of older workers: evidence from a stated preference analysis. *J. Econ. Behav. Organ.* 150, 277–294. <http://dx.doi.org/10.1016/j.jebo.2018.01.012>.
- Gordon, R.H., Blinder, A.S., 1980. Market wages, reservation wages and retirement. *J. Public Econ.* 14 (2), 277–308.
- Gouriéroux, C., Monfort, A., 1990. Simulation based inference in models with heterogeneity. *Ann. Econ. Stat.* 20/21 (69–107).
- Gustman, A.L., Steinmeier, T.L., 1985. The effect of partial retirement on wage profiles of older workers. *Ind. Relations* 24 (2), 257–265.
- Haan, P., Tolan, S., 2019. Labor supply and fiscal effects of partial retirement – The role of entry age and the timing of pension benefits. *J. Econ. Ageing* 14 (100187).
- Hanemann, M.W., 1994. Valuing the environment through contingent valuation. *J. Econ. Perspect.* 8 (4), 19–43.
- Hermansen, A., Midtsundstad, T., 2015. Retaining older workers - analysis of company surveys from 2005 and 2010. *Int. J. Manpow.* 36 (8), 1227–1247.
- Huber, M., Lechner, M., Wunsch, C., 2016. The effect of firms' phased retirement policies on the labor market outcomes of their employees. *ILR Rev.* 69 (5), 1216–1248.
- Hutchens, R., 2010. Worker characteristics, job characteristics, and opportunities for phased retirement. *Labour Econ.* 17 (6), 1010–1021.
- Hutchens, R., Grace-Martin, K., 2006. Employer willingness to permit phased retirement: Why are some more willing than others? *Ind. Labor Relations Rev.* 59 (4), 525–546.
- Kantarcı, T., Smeets, I.A.J., van Soest, A., 2013. Implications of full and partial retirement for replacement rates in a defined benefit system. Geneva Pap. Risk Insur. - Issues Pr. 38 (4), 824–856. <http://dx.doi.org/10.1057/gpp.2013.25>.
- Knoef, M., Been, J., Alessie, R., Caminada, K., Goudswaard, K., Kalwij, A., 2016. Measuring retirement savings adequacy: developing a multi-pillar approach in the Netherlands. *J. Pension Econ. Financ.* 15 (1), 55–89. <http://dx.doi.org/10.1017/S1474747214000341>.
- Louvière, J.J., Hensher, D.A., Swait, J.D., 2000. *Stated Choice Methods: Analysis and Applications*. Cambridge University Press.
- Low, H., Meghir, C., 2017. The use of structural models in econometrics. *J. Econ. Perspect.* 31 (2), 33–58.
- McFadden, D., 1998. Measuring willingness-to-pay for transportation improvements. In: Gärling, T., Laitila, T., Westin, K. (Eds.), *Theoretical Foundation of Travel Choice Modeling*. Elsevier Science, Amsterdam, pp. 339–364.
- Michaud, P.C., van Soest, A., Bissonnette, L., 2020. Understanding joint retirement. *J. Econ. Behav. Organ.* 173, 386–401.
- Van Oijnen, R., Alessie, R., Kalwij, A., 2015. Saving behavior and portfolio choice after retirement. *Econ.* 163, 353–404. <http://dx.doi.org/10.1007/s10645-015-9254-z>.
- Parker, S.C., Rougier, J.C., 2007. The retirement behaviour of the self-employed in Britain. *Appl. Econ.* 39 (6), 697–713. <http://dx.doi.org/10.1080/00036840500447807>.
- Rekker, R., Meer, T.V.D., van der Brug, W., 2020. Dutch Parliamentary Election Study 2017: A Comparison of Three Different Survey Modes. University of Amsterdam, Amsterdam, Netherlands.
- Revelt, D., Train, K., 1998. Mixed logit with repeated choices: Households' choices of appliance efficiency level. *Rev. Econ. Stat.* 80 (4), 647–657.
- Rogerson, R., Wallenius, J., 2009. Micro and macro elasticities in a life cycle model with taxes. *J. Econom. Theory* 144 (6), 2277–2292.
- Rogerson, R., Wallenius, J., 2013. Nonconvexities, retirement, and the elasticity of labor supply. *Am. Econ. Rev.* 103 (4), 1445–1462.

- Ruhm, C., 1990. Bridge jobs and partial retirement. *J. Labor Econ.* 8 (4), 482–501.
- Rutten, A., Knoef, M., van Vuuren, D., 2025. Employment effects of incentivized gradual retirement plans. *Work. Aging Retire.* 11 (1), 47–63.
- Stantcheva, S., 2023. How to run surveys: A guide to creating your own identifying variation and revealing the invisible. *Annu. Rev. Econ.* 15, 205–234.
- Train, K., 2009. *Discrete Choice Methods with Simulation*. Cambridge University Press.
- Van Beek, K.W.H., Koopmans, C.C., van Praag, B.M.S., 1997. Shopping at the labour market: A real tale of fiction. *Eur. Econ. Rev.* 41 (2), 295–317.
- Van der Klaauw, W., Wolpin, K.I., 2008. Social security and the retirement and savings behavior of low-income households. *J. Econometrics* 145 (1–2), 21–42. <http://dx.doi.org/10.1016/j.jeconom.2008.05.004>.
- Van Soest, A., Vonkova, H., 2014. How sensitive are retirement decisions to financial incentives? a stated preference analysis. *J. Appl. Econometrics* 29 (2), 246–264. <http://dx.doi.org/10.1002/jae.2313>.
- Vermeer, N., Mastrogiacomo, M., van Soest, A., 2016. Demanding occupations and the retirement age. *Labour Econ.* 43, 159–170.
- Whittington, D., 2002. Improving the performance of contingent valuation studies in developing countries. *Environ. Resour. Econ.* 22 (1), 323–367.