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## Abstract

Higher labor force participation is an important policy objective in many western countries, especially in the light of ageing and the sustainability of government finances. In addition to classic policies such as raising the statutory retirement age, flexible combinations of work with first- and second-pillar pension schemes may stimulate participation among older workers. We analyse stated preference data to investigate how pension incentives, the increasing retirement age, and provision of a partial retirement scheme affects the individual retirement decisions, in particular the decision of working beyond the effective or statutory retirement ages in the Netherlands. Two in five prefer partial retirement over early or delayed full retirement. Individuals more often want to use partial retirement to work longer if the deferred pension income is higher than it would be on an actuarially fair basis. Increasing the retirement age beyond age 65 induces individuals to work part-time instead of full-time. Provision of a partial retirement plan at a retirement age of 63 increases total labor supply by a net amount of 0.9 months. If the wage rate is lower in partial retirement, individuals prefer full retirement. We validate that these stated preferences are representative of both expected and the revealed retirement ages, and type of retirement (partial and full retirement).

Keywords: aging, gradual retirement, phased retirement, pensions, stated preferences

## 1 Introduction

Ageing societies face the challenge of financing pension benefits of an increasing population of older workers and making the pension systems more responsive to individual needs and preferences. Later retirement implies lower social security expenditures and more tax revenues. There are different ways to stimulate employment among older workers: pension incentives, a higher legal retirement age, or health investments. In addition to such classic policies, flexible combinations of work and second-pillar pension schemes may also stimulate the labour market

attachment of older workers. Widespread participation in the labor market beyond the standard retirement ages depends on the workers willingness to work longer than they have expected.

In this study we investigate how pension incentives, increasing retirement age, and provision of a partial retirement scheme affects the individual preferences to work beyond the legal and effective retirement ages in the Netherlands. The effects of such labor market incentives are typically analysed using counterfactual policy simulation analysis conducted with structural retirement models, or by employing natural experimental methods that exploit exogenous variation from actual policy reforms. However, both methodologies have important drawbacks. In simulation analysis, one can only infer the likely labor supply responses to hypothetical pension incentives since agents are not subjected to actual pension incentives. Experimental methods overcome this drawback by comparing the labor supply responses of workers who are affected by actual retirement reforms with those who are not affected. However, it is difficult to observe retirement reforms, or reforms that provide sufficiently large or varied incentives that generate labor supply responses.

In this study, we also employ an experimental method, but instead of a natural experiment, we employ a stated preference experiment. We conduct the experiment among the respondents of an Internet panel survey in the Netherlands. The sample consists of about 4,000 respondents who are 40 years old or older.

We present the respondents with retirement scenarios where three hypothetical employees fully retire at a given age, continue to work full-time, or continue to work part-time until a later retirement age. Each retirement plan has its own earnings and pension income trajectory. The scenarios focus on the trade-off between working more years or more hours with a higher pension versus working less with a lower pension. Respondents make leisure versus income trade-offs to choose their favourite plan, but also rate each plan on a 10-point scale to indicate how attractive they find each plan.

We implement a controlled randomised experiment where we randomly assign survey respondents different amounts of pension income and different ages of retirement in the hypothetical full and partial retirement scenarios presented to them in the stated preference question. This allows to study the impact of the pension incentives and increasing retirement age on the preferences for retiring full-time or part-time at a later age. We vary the pension income amounts either in terms of the incentives for delaying retirement, to study the substitution effect of higher pensions, or in terms of the generosity irrespective of the retirement age, to study the income effect of higher pensions. As we increase the ages of retirement in the full and partial retirement scenarios, the level of the pension income and the actuarial increase in pension rights for delayed claiming increase, which reflect the stylised pension rules of the occupational and state pension schemes in the Netherlands.

After respondents evaluate the three retirement scenarios, in a second question they are presented with the same retirement scenarios except that the partial retirement scenario is omitted. We then analyse if those respondents who choose the partial retirement scenario in the first stated preference question choose the early retirement scenario in the second question to investigate whether partial retirement can increase total labour supply.

Furthermore, we present respondents with similar retirement scenarios, but instead of randomising the retirement age, we condition on the expected or realised retirement age of the respondent asked in an earlier question in the survey. That is, respondents evaluate three retirement scenarios where hypothetical workers continue to work full-time, continue to work part-time, or to retire fully at the actual or planned retirement age of the respondent. Coupled with the analysis on pension incentives, this allows to explore a wide range of retirement conditions under which respondents are willing to extend their working lives.

The most important drawback of the stated preference analysis is that it is not clear if stated

preferences for hypothetical retirement plans are predictive of actual labor market behaviour. Therefore, we ask survey respondents to outline their expected or realised partial and full retirement trajectories. We then correlate the expected or actual retirement decisions of the respondents to their stated preferences for hypothetical retirement scenarios to analyse whether their stated preferences are in line with their expected or actual retirement decisions.

We use the described stated preference analysis to address a number of key questions in the current retirement policy debate in the Netherlands or other ageing societies. A potential policy tool to stimulate employment among older workers is to increase the legal retirement age. However, it is not clear whether workers are willing to continue to work full-time until or beyond the legal retirement age. We analyse whether individuals want to work full-time or part-time beyond an early, the effective, and the new legal retirement ages. We also analyse whether those who want to work part-time want to change their jobs, and whether they want to reduce hours in one or several steps in a gradual manner. Pension incentives can also stimulate employment among older workers. However, it is not clear how older workers react to exogenous shocks in terms of the pension incentives. We analyse whether individuals are responsive to two different types of pension incentives: whether they are responsive to increasing rewards for later retirement, or whether they are responsive to a shock to their retirement income irrespective of the age they plan to retire. We also analyse the labour supply effects of different amounts of changes in these pension incentives. Third, among the European countries, the Netherlands has the highest fraction of part-time workers in total employment. This suggests that the Dutch labor market and the institutional setting could accommodate older workers to work on a part-time basis. In fact, the labour market participation of the workers between the ages of 65 and 69 has more than doubled over a decade: from 6 percent in 2001 to 13 percent in 2012. 80 percent of this group works part-time, and 40 percent works even less than 12 hours. We analyse whether the provision of a partial retirement scheme with the career or a different employer can stimulate labor market participation beyond the traditional retirement ages to increase total labour supply.

We find that two in five prefer partial retirement over early or delayed full retirement. Individuals more often want to use partial retirement to work longer if the deferred pension income is higher than it would be on an actuarially fair basis. Increasing the retirement age beyond age 65 induces individuals to work part-time instead of full-time. Provision of a partial retirement plan at a retirement age of 63 increases total labor supply by a net amount of 0.9 months. If the wage rate is lower in partial retirement, individuals prefer full retirement. We validate that these stated preferences are representative of both the expected and revealed retirement ages, and the type of retirement (partial and full retirement).

The paper proceeds as follows. Section 2 describes the data and the experimental design. Section 3 presents descriptive statistics on the stated preferences for full and partial retirement plans. Section 4 describes the econometric model, and Section 5 presents the estimation results. Section 6 conducts sensitivity analyses. Section 7 validates the stated preferences using revealed preferences. Section 8 discusses policy implications and concludes.

## 2 Data and experimental design

The survey is fielded in 2017 in the Longitudinal Internet Studies for the Social Sciences (LISS) panel administered by CentERdata at Tilburg University in the Netherlands. The panel is based on a true probability sample of households drawn from the population register, and hence is representative of the population. It consists of 5000 households comprising 8000 individuals who participate in monthly Internet surveys of about 15 to 30 minutes in total, and are paid for each completed survey. One member in the household provides the household data, and updates

this information at regular time intervals. Households that could not otherwise participate are provided with a computer and Internet connection. A longitudinal survey is fielded in the panel every year, covering a large variety of topics including work, education, income, housing, time use, political views, values and personality. Details on the survey can be found at [http://www.lissdata.nl/dataarchive/study\\_units/view/1](http://www.lissdata.nl/dataarchive/study_units/view/1). The sample is restricted to the respondents ages 40 and older which generated 3263 responses. Table 1 presents summary statistics on the background characteristics.

The survey consisted of two main parts. The first part included questions on background characteristics and several aspects of work and social life. The questions in the second part aimed at measuring preferences for abrupt and partial retirement scenarios.

Figure 1 shows the question on preferences for retirement scenarios as they appeared on the screens of the respondents. The question aims to elicit preferences for full and partial retirement at different ages, for partial retirement that involves changing jobs or not, and for partial retirement that lasts four or five years. The question starts with an introductory text explaining the topic and then describes three retirement scenarios. Each scenario is described by means of a short text followed by a timeline showing the number of hours worked and the amounts of work and retirement income earned by a hypothetical employee at the corresponding ages on the timeline. Respondents are asked to choose their favourite retirement scenario, and in the follow-up screen they are asked to rate each scenario on a 10 point scale where 1 denotes “not interesting at all” and 10 denotes “perfect”. Prior to the question, an instructions page is presented where the layout of the retirement scenarios is described in detail.

The retirement scenarios take the form of a vignette. A vignette is 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 for an early example [van Beek et al. \(1997\)](#). Our vignettes are short descriptions of hypothetical retirement scenarios of hypothetical people. The main reason for using vignettes with hypothetical people is that respondents for whom some of the retirement scenarios seem rather unrealistic in their actual situation can still answer the questions. For example, the long-term unemployed may get upset and not respond if we ask them to imagine they have a permanent job until retirement age, but will take it less personal if we describe a hypothetical person and ask them to evaluate this person’s retirement plan from the point of view of their own preferences.

Each of the retirement scenarios presented is characterised by four attributes: age of retirement, number of hours worked, work income, and pension income. The age at which the employee retires is fictitious, that is, completely independent of the respondent’s own employment situation, age, or other characteristics. The number of hours worked is also fictitious where we assume that the employee works 40 hours a week during full-time work and 20 hours a week during partial retirement.<sup>2</sup>

The work income and pension income take realistic values considering the respondent’s own employment situation. Work income in the vignette questions is based upon the actual work income of the respondent,<sup>3</sup> which is asked in an earlier categorical question on last monthly income from work. The pension income is computed as a percentage of work income, starting from a given replacement rate. In the scenarios as they are presented to the respondents, however, pension income and work income are shown in absolute amounts and the replacement rates are not shown.

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<sup>2</sup> In the Netherlands, in 2014 the average full-time worker worked about 41 hours a week and the average part-time worker worked about 23 hours a week among the respondents of the DNB Household Survey 40 years old and older.

<sup>3</sup> This is done to avoid the alienation bias that might arise if respondents have problems evaluating choices that are too far from their own situation ([Hanemann, 1994](#); [Whittington, 2002](#)).

The replacement rates are based upon the typical replacement rates in full and partial retirement in the Netherlands computed by [Kantarci et al. \(2013\)](#). However, the replacement rates are scaled down to account for the fact that replacement rates in the Netherlands might get lower in the near future due to the policy measures currently being taken to individualise the pension income. For example, in the case of abrupt retirement at age 65, the net replacement rate is reduced from 102% to 70% which is approximately the net replacement rate of an American worker with average earnings participating in the public pension scheme as well as in a voluntary defined benefit pension scheme ([OECD, 2009](#), pp. 119-121). In the hypothetical scenarios, the replacement rate increases by an average of 8% for each year full retirement is delayed, which is the same as the reward in the US for delaying Old Age Social Insurance benefits.

Each respondent is asked to evaluate three sets of vignette scenarios in three questions. The vignette scenarios presented to a respondent in the three sets of questions differ from each other with respect to the ages of abrupt and partial retirement in these scenarios. In particular, for retirement age, we define three regimes and denote them as 65, 63, and 61. Each regime defines particular ages of abrupt and partial retirement in a given set of three retirement scenarios that a respondent is asked to compare; see [Table 2](#). For example, in retirement age regime 65, in a first abrupt retirement scenario the full retirement age is 65, in a second abrupt retirement scenario the full retirement age is 70, and in the partial retirement scenario the partial retirement age is 65 and the full retirement age is 70. Evaluations of the three sets of retirement scenarios with different (partial) retirement ages by a same respondent aim to create variation in the scenario choices (within or between respondents) with respect to the timing of retirement.<sup>4</sup>

When asked to evaluate a set of three vignette scenarios, if a respondent chooses the partial retirement scenario, in a follow-up screen he is asked to evaluate an extra set of two retirement scenarios. These two retirement scenarios are the same two abrupt retirement scenarios presented in combination with a partial retirement scenario in the previous screen. The respondent is asked to evaluate an extra set of two scenarios each time he chooses the partial retirement scenario in the three questions where he is presented with three vignette scenarios. Evaluations of the early and late retirement scenarios in the presence of the partial retirement scenario, and then in the absence of it can be used to investigate whether partial retirement increases labor force participation. In fact, the impact of the provision of a partial retirement scheme on total labour supply is a key policy question that cannot be answered using revealed preference data because in the revealed preference data it is unknown if the agents who have retired at a given age would have instead retired partially if they had the option.

The following two attributes of the vignette scenarios are randomised: the pension income and the wage rate during partial retirement. Furthermore, we randomise the years spent in partial retirement.<sup>5</sup> For the first attribute, pension income (or replacement rate), one of nine regimes are assigned, where each regime is characterised by low, middle or high replacement rates in all three scenarios and by low, middle, or high rewards for retiring later. The variation in the level of the replacement rates, irrespective of the retirement age, is used to estimate the *income effect* of retirement income on the retirement decision. If leisure is a normal good, higher replacement rates are expected to lead to less labor supply and therefore to earlier full retirement or partial retirement instead of late retirement. This randomised regime allocation

<sup>4</sup> The order of the three sets of retirement scenarios (which differ by the three retirement age regimes) presented to a respondent depends on the answer given to a question asked earlier in the survey. In particular, survey respondents are asked about their expected or realised retirement age. If they state a retirement age of 62 or earlier, they are first presented with the set of vignette scenarios associated with the retirement age regime 61. The order of the remaining two sets of vignette scenarios is randomised. Similar orderings of presentation apply to the respondents who expect to retire, or state to have retired, at the ages of 63 or 64, and at age 65 or later.

<sup>5</sup> Moreover, the order in which the first and the last retirement scenarios were presented are randomised.

is referred to as the “income effect” regime. The replacement rates in the middle income effect regime assume a pension accrual rate of 2.05% which is the effective accrual rate in the Netherlands. The “low income effect regime” considers a lower accrual rate and the “high income effect regime” considers a higher accrual rate which, respectively, lead to lower and higher replacement rates. The variation in the rewards for retiring later changes the price of leisure and can therefore be used to estimate a *substitution effect*. This regime choice is therefore referred to as the “substitution effect regime”. The middle substitution effect regime gives approximately actuarially fair rewards for later retirement (and actuarially fair penalties for early retirement). In other words, the changes in the expected net present value of total pension income are approximately equal to the net present value of the additional premiums that are paid. The “high substitution effect regime” gives more than actuarially fair rewards for later retirement, or positive “accruals”. The “low substitution effect regime” gives less than actuarially fair rewards for later retirement, or negative accruals.

Table 2 presents the replacement rates for the nine regimes, the combinations of the three income and the three substitution effect regimes. The first, second and third row always indicates a low, middle or high substitution, and the first, second and third column correspond to the low, middle, or high income. For example, the group low (accruals)/low (income) with retirement age regime 65 has replacement rates 60% for early retirement, (as of age 70) 75% for partial retirement, and 90% for late retirement. For the group high (accruals)/low (income), the replacement rates are 60%, 85% and 110%, respectively. The group high/low therefore gets a much higher reward for retiring later, or, in other words, pays a higher price for more leisure (in the form of retiring early). This group is therefore expected to substitute expensive leisure for relatively cheap consumption and in analogy to the labor supply literature, the difference between choices in the first row and the third row are referred to as the (uncompensated) substitution effect. On the other hand, if the replacement rates for the group low/low are compared with those of the group low/high (first row, last column: 80%, 95%, 110%), the compensation (in %-points) for retiring later (the “price of leisure”) is the same, but the pension income levels are much higher for the low/high group. Following the labor supply literature, the difference between the choices of low/high and low/low group are referred to as an income effect.<sup>6</sup>

The levels of the replacement rates associated with a particular pension income regime depend on the retirement age regime in two respects. First, the replacement rates decrease through earlier retirement age regimes 63 and 61 because pension benefits are actuarially adjusted for earlier claiming and because those who retire earlier accumulate less pension rights. Second, at the earlier retirement age regimes, the increase in the replacement rates for delaying retirement is smaller because the actuarial increase for delaying benefits is smaller at earlier retirement ages (due to the fact that life expectancy is longer at earlier ages).

Several studies showed that labor market rigidities force employees to partially retire outside their main job where they work at a lower wage rate (Gordon and Blinder, 1980; Gustman and Steinmeier, 1984, 1985; Hutchens, 2010; Latulippe and Turner, 2000; Ruhm, 1990). For example, it is more costly that a particular job is performed by an older worker than by a younger worker, or by a part-time worker than by a full-time worker, which discourage employers to offer partial retirement opportunities. Therefore, employers are more likely to agree on a partial retirement arrangement if the hourly wage of the partial retiree is lower than that of an average worker performing the same or a similar job. We investigate how the elderly evaluate partial retirement when it is associated with a reduced wage rate or not. To this purpose, for the second attribute, wage rate in partial retirement, two regimes are defined. In the first regime the employee

<sup>6</sup> The substitution effect can be compared to the *price effect* of pension benefits and the income effect can be compared to the *wealth effect* of pension benefits in Euwals et al. (2010). The income effect can also be compared to the effect of a wealth shock through inheritance receipt on retirement behaviour in Brown et al. (2010).

reduces hours in the same job and for the same wage rate (phased retirement), while in the second regime he reduces his hours by changing to a different but less demanding job with a wage rate that is 20 percent lower than the wage rate at the old job (partial retirement, in the narrow definition; see Section 1).

Finally, we investigate how the elderly evaluate partial retirement when the time spent in partial retirement changes. To this purpose, two regimes are defined. In the first regime partial retirement is five years, while in the second regime it is four years. When the number of years spent in partial retirement changes, two attributes change in both vignettes of partial and late retirement. When partial retirement is four years, the full retirement age is one year earlier, and accordingly the pension income during full retirement is lower due to accruing pension rights for one year less. In particular, the replacement rates during full retirement are 5 and 10 percentage points lower in the the partial retirement and late retirement scenarios, respectively.

As described above, respondents evaluate partial and abrupt retirement scenarios in three questions. The retirement scenarios presented to a respondent in the three questions differ from each other with respect to the ages of full and partial retirement in these scenarios (retirement age regimes). Respondents who choose the partial retirement scenario in one of these questions receive two additional questions that aim at measuring preferences for particular aspects of partial retirement. In the first question, three vignettes of partial retirement are presented where three employees work 12, 20, and 28 hours per week during partial retirement. On the basis of a 40 hours of work per week schedule, these numbers of hours correspond to 1.5, 2.5, and 3.5 days per week. Those employees who work more hours earn a higher wage income and receive a lower pension income during partial retirement, and receive a higher pension income during full retirement. The pension income amounts in the three vignettes are randomised. In particular, one of three pension income regimes are assigned to a respondent, where each regime is characterised by low, middle or high replacement rates in all three scenarios. Table 3 presents the replacement rates for the three regimes. Respondents choose their favourite retirement scenario, and in the follow-up screen they rate each scenario on a 10 point scale.

In the second question, two vignettes of partial retirement are presented where an employee works 20 hours per week for a period of four years during partial retirement, and another employee works 20 and subsequently 10 hours per week during two periods of two years each during partial retirement. While working part-time employees earn wage income and receive pension income during partial retirement. In latter vignette the employee receives a lower pension income during full retirement due to earning less and receiving a higher pension income during the second phase of partial retirement. The pension income in the two vignettes are randomised. In particular, one of three pension income regimes are assigned to a respondent, where each regime is characterised by low, middle or high replacement rates in all three scenarios. Table 4 presents the replacement rates for the three regimes. Respondents choose their favourite retirement scenario, and in the follow-up screen they rate each scenario on a 10 point scale.

### 3 Descriptive results

This section provides univariate descriptive analysis of the preferences for partial and abrupt retirement plans. First, it analyses the choices and ratings given to each retirement plan. It then analyses how pension incentives, increasing retirement age affects these choices. Furthermore, it analyses the effect of the provision of a partial retirement plan on total labour supply. Finally, it analyses the features that makes partial retirement attractive.



## Competing retirement scenarios

In the question that presents respondents with the scenarios of early retirement, partial retirement, and late retirement, merging all age and pension income regimes, 29.0% choose the early retirement scenario, 40.5% the partial retirement scenario, and 30.5% the late retirement scenario. This shows that partial retirement is the most favourable choice, but also that individual preferences for retirement are heterogeneous in terms of both the age and the type of retirement. The three retirement scenarios are respectively rated 5.3, 6.1, and 5.4 on average. The differences between the mean ratings are statistically significant.

To check if respondents consistently rate the three retirement scenario they choose higher than the other two retirement scenarios, we check the average ratings given to each scenario conditional on scenario choice. The average ratings for early retirement, partial retirement, and late retirement are 7.3, 5.1, and 4.1 for those who choose early retirement; 4.9, 7.5, and 5.0 for those who choose partial retirement; and 4.0, 5.0, and 7.4 for those who choose late retirement. These figures show that, on average, respondents give the highest rating to the retirement scenario of their choice, suggesting that, on average, respondents are consistent in their answers.

## Increasing retirement age

Table 5 shows the fraction of respondents who choose a particular retirement scenario, and the average of the ratings given to a scenario under the regimes defined for retirement age (see Table 2). A main finding is that respondents prefer partial retirement over early and late retirement in all retirement age regimes. This indicates that agents have a strong preference for partial retirement independent of the age they plan to retire. On the other hand, respondents choose partial retirement more often when partial retirement starts at the age of 63 compared to when it starts at the ages of 65 or 61. The mean ratings given to partial retirement at the three retirement age regimes are also statistically significantly different from each other, while the corresponding mean differences for early or late retirement are not significant. A potential explanation is the following. In the Netherlands, the average effective retirement age was 63.5 among men and 62.5 among women in 2016. On the other hand, the state pension age was 65 and 5 months in 2016 while it is planned to reach 67 years in 2021. These trends suggest that respondents want to retire earlier than the state pension age while they face an increasing state pension age at the same time. The preference for partial retirement at the age of 63 could reflect the desire of agents to reduce work effort before they reach the state pension age and comply at the same time with the inescapable increase in the state pension age.

A second but less pronounced effect of the retirement age treatment is that respondents more often choose late retirement in the retirement age regime 61 compared to the other retirement age regimes. The retirement age in the late retirement scenario in retirement age regime 61 corresponds to about the state pension age. Therefore, late retirement might correspond to either the expected or the realised retirement age of the respondents driving the preference for the late retirement scenario in retirement age regime 61.

## Pension incentives

Table 6 shows the fraction of respondents who choose a particular retirement scenario, and the average of the ratings given to a scenario under the regimes defined for retirement age and retirement income (see Table 2). In the left hand panel, the columns with the three income levels (low/middle/high) are merged so that the differences reflect substitution effects. The columns “choice” and “rating” show the fraction of respondents who choose a retirement scenario and

the average rating given to that scenario. The differences due to substitution effect regimes show that as the incentives to work beyond age 63 or 65 increase, more people choose partial retirement over early and late retirement. At the retirement age regime 61 the differences are much smaller. Apart from an age effect, these are in general the substitution effects we would expect. The differences in the average ratings are in line with these results. In the right hand panel, we do not find notable differences due to income effect regimes. In particular, we do not find the expected negative income effect for leisure, i.e. that leisure is a normal good.

The randomisation of the wage rate in partial retirement reveals the following result (not presented in the table). When partial retirement involves a 20% reduction in the wage rate, the fractions of people who choose early retirement, partial retirement, and late retirement are 30.0%, 38.6%, and 31.5%, respectively. When partial retirement does not involve a reduction in the wage rate, the corresponding fractions are 28.0%, 42.6%, and 29.4%. This shows that a change to a less demanding job in partial retirement, accompanied by a decrease in the wage rate, deters a large fraction of 10.4 percent of the respondents who otherwise would have participated in partial retirement so that they instead prefer to stop working, or to continue to work full-time without changing jobs. The average ratings under the two wage rate regimes are in line with the choice percentages. When partial retirement involves a reduction in hourly wage, the average ratings are 5.3, 6.0, and 5.5, respectively. When partial retirement does not involve a reduction, the corresponding average ratings are 5.4, 6.1, and 5.4. The null hypothesis of the equality of the average ratings across the two groups is rejected at the 0.01 significance level for partial retirement. The null is not rejected at the 0.30 level in the cases of early or late retirement as expected since these scenarios are the same in the two cases (the wage reduction only applies during partial retirement).

### **The effect of introducing partial retirement on total labour supply**

As described in Section 2, when asked to choose among the scenarios of early retirement, late retirement and partial retirement, if a respondent chooses the partial retirement scenario, in the follow-up screen he is asked to choose between the same early and late retirement scenarios presented in the previous screen. Here we analyse the choices of early and late abrupt retirement scenarios among those respondents who choose partial retirement in the previous screen. Table 6 presents the fractions of scenario choices, and the average of the ratings given to each scenario, under the regimes defined for retirement age and retirement income. With few exceptions, respondents choose the early retirement scenario more often than the late retirement scenario. The mean ratings are in line with the choice fractions. This suggests that providing agents with the partial retirement option deters agents from retiring early more often than it deters agents from retiring late. This means that the net effect of introducing a partial retirement scheme on total labour supply is positive.

Table 7 presents the net effects in terms of the number of months worked under the regimes defined for retirement income and retirement age. For example, providing agents with the option of partial retirement at the age of 63 increases total labor supply by 1.2 months if this plan gives more than actuarially fair rewards for retiring later than the age of 63. However, at the ages of 65 or 61, agents prefer to continue working full-time over working part-time apparently because at these ages respondents find the high rewards for retiring later attractive. This shows that the effect of introducing a partial retirement scheme on total labour supply depends on the age of partial retirement, as well as on the generosity of the rewards for retiring later.

As described in Section 2, each respondent evaluates three sets of retirement scenarios at three different retirement age regimes. Each retirement age regime presents respondents with three retirement scenarios with particular ages of abrupt and partial retirement. Here we exploit

the variation in scenario choices by a same respondent at different retirement age regimes. In particular, in Table 8 we condition on the scenario choice in a given retirement age regime, and analyse the scenario choices in the other two retirement age regimes by a same respondent. This allows to investigate in particular how those who want to retire early or late at an early retirement age evaluate partial retirement at a later retirement age. Considering the choices among the early, late, and partial retirement scenarios, when respondents choose the early retirement scenario in a given retirement age regime, they more often choose early retirement over partial or late retirement in the other retirement age regimes. We observe similar patterns of scenario choices when we condition on the choice of the partial retirement or the late retirement scenario in a given retirement age regime. These are the conditional scenario choices we would expect.

Considering the evaluations of early and late retirement when partial retirement is omitted, when respondents choose early retirement among the three scenarios in a given retirement age regime, they more often choose early retirement over late retirement in the other retirement age regimes. Likewise, when respondents choose late retirement among the three scenarios in a given retirement age regime, they more often choose late retirement over early retirement in the other two retirement age regimes. The comparison of the two groups of respondents, who choose early and late retirement among the three scenarios, shows remarkably that in the absence of the partial retirement option, the propensity to choose early retirement over late retirement among the former group of respondents is stronger than the propensity to choose late retirement over early retirement among the latter group of respondents. This suggests that providing agents with the partial retirement option deters agents who would otherwise retire early much more often than it deters agents who would otherwise retire late. These results suggest that partial retirement increases labour supply among the agents who want to retire early and have no access to partial retirement. Furthermore, allowing agents to access partial retirement increases total labor supply.

Table 11 presents the net effect of introducing partial retirement on labour supply in terms of the number of months worked conditional on the choice of the early, partial, or late retirement scenario in a given retirement age regime. Among the agents who choose early retirement in a given retirement age regime, introducing the partial retirement option increases labor supply by up to 3.9 months. The net effect is negative, although very small, under retirement age regime 65 among the agents who choose early retirement in retirement age regime 61. It might be that the replacement rate level at the age of 70 is high enough to shift individual preferences towards later retirement.

The left hand panel of Table 10 lists the possible orderings of the three scenario choices that can be made respectively at the retirement age regimes 61, 63, and 65 by a same respondent. The different possibilities are ranked from the most frequently occurring to the least in respondent evaluations. A first finding is that repeated choices of a same retirement scenario at the three retirement age regimes account for 41.9 percent of all orderings of the three scenario choices made respectively at the three retirement age regimes 61, 63, and 65. This suggests that, for many agents, the preference to retire in an abrupt or gradual manner does not depend on the age of retirement. The repeated choice of a same retirement scenario at the three retirement age regimes occurs most often for the partial retirement scenario. This finding is in line with our earlier finding that partial retirement is the most preferred retirement scenario regardless of the retirement age or the retirement income level in Table 6. Other orderings of scenario choices show two distinct patterns for retirement preferences. A first group of respondents choose late retirement in the earlier retirement age regimes but partial or early retirement in the later retirement age regimes. This suggests that work becomes onerous at older ages and agents want to retire fully or partially as they approach the statutory or preferred retirement

age. Another group of respondents choose early or partial retirement in the earlier retirement age regimes but partial or late retirement in the later retirement age regimes. A potential reason is that agents are sensitive to the retirement income level which are higher at the older retirement age regimes (see Table 2).

The right hand panel of Table 10 shows the fractions of choices made in the question asking respondents to evaluate the early and late retirement scenarios. Since this question is only asked to the respondents who choose partial retirement in the preceding question where respondents evaluate three scenarios, the fractions are shown only when partial retirement is chosen in a given retirement age regime. A first finding is that the agents who choose early retirement when they are provided with the option of partial retirement more often choose early retirement over late retirement when the partial retirement option is omitted. Likewise, the agents who choose late retirement when they are provided with the option of partial retirement more often choose late retirement over early retirement when the partial retirement option is omitted. The propensity to choose early retirement over late retirement is stronger among the former group of respondents compared to the propensity to choose late retirement over early retirement among the latter group of respondents. These scenario choices show that agents are consistent in their choices for early and late retirement when they evaluate scenarios that include and exclude partial retirement. More importantly, these results are in line with our earlier finding that providing agents with the partial retirement option deters agents who would otherwise retire early much more often than it deters agents who would otherwise retire late. These results suggest that partial retirement increases labour supply among the agents who want to retire early, but it also increases total labor supply.

### **What makes partial retirement attractive?**

We analyse three features that could make a partial retirement scheme attractive: the number of years spent in partial retirement, the number of hours worked per week during partial retirement, and the number of steps partial retirement consists of. With respect to the number of years spent in partial retirement, we analyse the choices and ratings for early, partial, and late retirement, under the two regimes defined for the time spent in partial retirement. When partial retirement lasts five years, the fractions of respondents who choose early, partial, and late retirement are 28.6%, 41.0%, and 30.4%, respectively. When partial retirement lasts four years, the corresponding fractions are 29.4%, 40.1%, and 30.5%. This shows that decreasing the number of years spent in partial retirement by one year, accompanied by a 5 percentage points reduction in the net replacement rate during full retirement, makes partial retirement only slightly less attractive. This suggests that changes in the final pension income due to spending different numbers of years in partial retirement is a very weak determinant of the number of years agents want to spend in partial retirement. The average ratings given to each retirement scenario under the two regimes are as follows. When partial retirement lasts five years, the average ratings are 5.3, 6.0, and 5.4, respectively for early, partial, and late retirement. When partial retirement lasts four years, the corresponding average ratings are 5.4, 6.1, and 5.5. The null hypothesis of the equality of the average ratings given to partial retirement across the two regimes of duration is not rejected at the 0.05 significance level.

Table 12 presents the fractions of choices and the average ratings given to each of the three partial retirement scenarios that differ with respect to the number of hours worked per week during partial retirement. A large share of the respondents prefer a workload of 20 hours per week during partial retirement. The strong preference for 20 hours shifts slightly towards 28 hours in the middle and high retirement income regimes, in retirement age regime 61. This result is apparently due to that agents find the level of final pension income low in this retirement

age regime so that they prefer to work more hours especially at the higher retirement income regimes which provide higher levels of pension income.

Table 13 presents the fractions of choices and the average ratings given to each of the two partial retirement scenarios that differ with respect to the number of steps partial retirement consists of. More than half of the respondents prefer partial retirement that consists of two steps although the net replacement rate during full retirement is 5 percentage points lower in this case. This suggests that, among the agents who favour partial retirement over abrupt retirement, most prefer that partial retirement is a gradual process where they reduce work effort increasingly, and claim increasingly more partial pension rights as they make a transition to full retirement.

## 4 Empirical approach

As described in Section 2, respondents choose one of the three scenarios presented to them. We assume that the choice is based upon a random utility model, with the utility from retirement scenario  $s$  for respondent  $i$ , given by:

$$U_{is} = z_i' \gamma_s + x_i' \beta_s + u_{is}. \quad (4.1)$$

$z_i'$  is a vector of seven treatment variables (the scenario characteristics). In particular, it includes dummies for the low and high substitution effect and income effect regimes (the medium one is the base category), and for the retirement age regimes 61 and 65 (with 63 as the base category), and a dummy indicating that the hourly wage in partial retirement is lower than before partial retirement (the base category is that the hourly wage remains the same).  $x_i'$  includes the variables on respondent's background characteristics and socio-economic status.  $u_{is}$  is a random utility term.

It is assumed that the respondent chooses the scenario with the highest utility  $U_{is}$ . Under the assumption that the random terms  $u_{is}$  are multivariate normal distributed, this leads to the standard multinomial probit model (Cameron and Trivedi, 2005; Winkelmann and Boes, 2006). Since only one choice (among three vignettes) of each respondent is analysed, in this model the unit of observation is the respondent; there are no multiple observations per respondent. The model is estimated with maximum likelihood.

Note that the  $z_i$  in Equation (4.1) are 'individual specific' and not alternative specific;  $\gamma_s$  measures the effect of a change in one of the randomised treatment variables on the utilities of scenario  $s$ . However, attributes of the retirement scenarios are by definition 'alternative specific'. This makes the model different from a conditional logit model, where the explanatory variables would reflect the characteristics of the scenarios. The modelling approach therefore has the advantage that  $\gamma_s$  immediately gives the effect of a treatment variable upon the utility of scenario  $s$ . For example, take a dummy for the high reward for later retirement (the high substitution effect regime), which is one of the variables in  $z_i$ . Respondents who are randomised into this regime pay a higher price for retiring earlier. Therefore, it is expected that they choose late retirement more often, but also choose partial retirement (starting at the early retirement age) over early retirement more often than in the benchmark case with less than actuarially fair rewards. This implies that the parameters in  $\gamma_{LR}$  and  $\gamma_{PR}$  on the dummy for the high substitution effect regime are expected to be positive. Note that these parameters are assumed to be the same for all respondents, so the model imposes uniform treatment effects for all respondents in terms of utility differences.

After respondents have made their choice, they rate each scenario on a ten point scale from 1 (not interesting at all) to 10 (perfect). The ratings given to each scenario are analysed using

a standard linear regression model estimated by ordinary least squares. It is then analysed whether the effects of the covariates on the probability of choosing a retirement scenario are in line with the effects on the ratings given to that retirement scenario.

## 5 Estimation results

Table 17 presents the marginal effects of the explanatory variables on the probability of choosing a particular retirement scenario. Marginal effects are based on the estimates from a multinomial probit regression evaluated at the mean values of the explanatory variables (discrete changes from 0 to 1 for dummy variables). Note that the marginal effects for the three retirement scenarios add up to zero by construction.

There is no universally accepted goodness of fit measure for discrete choice models (Kennedy, 2009). To assess the model fit, we consider two measures. The count R-squared indicates the proportion of correctly classified observations. We obtain a value of 0.402. As a second indicator, the minimum and maximum of the predicted probabilities of a given outcome are analysed. A wider range between the two quantities indicates that the model performs better in predicting the outcome (Cameron and Trivedi, 2005). In case of a perfect fit, the model would correctly predict all cases of 0 when a given outcome is not chosen, and all cases of 1 otherwise, so that the range would be at its maximum. We find that the predicted choice probabilities range between 0.009 and 0.680 for early retirement, between 0.164 and 0.640 for partial retirement, and between 0.091 and 0.789 for late retirement. This shows that there is substantial variation in the predicted probabilities of all choice alternatives suggesting that the model performs reasonably well in predicting the observed choices. Table 15 shows small values for the R-squared which indicates a poor fit for the linear regression model explaining the ratings given to each retirement scenario.

Model significance is assessed using the Wald statistic which shows that the regressors are jointly significant at the 0.01 level. The standard F-statistic leads to a similar conclusion in the linear regression model.

### Treatment effects

Table 17 shows the effects of the substitution effect regimes, in particular the effects of low and high rewards for late retirement (and delayed claiming) compared to the reference of actuarially fair rewards. Respondents less often choose partial retirement when deferring pension claims is rewarded with less than actuarially fair increases in pension rights compared to when it is rewarded with actuarially fair increases. The effect is plausible and significant at the 0.05 level. This suggests that agents are responsive to a less than fair increase in the pension rights for deferred claiming at the intensive margin. The table quantifies the effect as follows. The probability of delaying retirement partially at a given early retirement age by four or five years decreases on average by 4.2 percentage points if the actuarial increase in final pension rights due to delaying retirement is 5 percentage points lower than if the actuarial increase was fair. We find no significant effect for early and late retirement. These results suggest that agents are responsive to increasing rewards to defer retirement until the normal retirement age or beyond but only at the intensive margin. To assess whether the magnitudes of these effects are large, they can be compared to the amounts of the changes in the fractions of respondents choosing the partial retirement scenario across the substitution effect regimes shown in Table 15. The table shows that, merging retirement age regimes, when going from the middle to the low substitution effect regime, the fraction of respondents choosing partial retirement decreases from 41.4% to 30.0%. This suggests that the found marginal effect represents a notable shift in

the labor supply preferences. The existing literature shows that individuals are responsive to incentives for retiring later (Burdidge and Robb, 1980; Euwals et al., 2010; Fields and Mitchell, 1984; French and Jones, 2012; van Soest and Vonkova, 2014). Our results show that individuals are responsive to incentives for retiring later but only at the intensive margin and not at the extensive margin when they are provided with the option to retire partially.

By our experimental design, the increase in the replacement rates for delaying retirement is smaller at the earlier retirement age regimes (see Table 2). Therefore, we allow the substitution effect regimes low and high, which reward delayed retirement respectively with actuarially less than fair and generous increases in pension rights, to interact with the three retirement age regimes 61, 63, and 65. The substitution effect regime middle is considered as the base category in our regression. In this specification we also allow other treatment variables to interact with the three retirement age regimes. We find that (not presented in a table) less than actuarially fair increases in pension rights decreases the probability of partial retirement by magnitudes of 6.2 and 5.6 percentage points at the retirement age regimes 65 and 63 respectively. Both effects are significant at the 0.01 level. This suggests people are particularly responsive to pension incentives to delay retirement partially at the age of 65 or 63. We do not observe any other significant effect at the other retirement age regimes.

Agents might stop working all together, and not continue to work part-time or full-time, if the level of their pension income is higher than they have planned for or expected at a given retirement age. This might happen because agents consider that their pension income is sufficient to meet their ends. This is the expected negative income effect shown by previous studies. Fields and Mitchell (1984) showed that an increase in the worker's pension income available for retirement at the age of 60 induced earlier retirement in the US. Brown et al. (2010) and Euwals et al. (2010) showed that an increase in pension wealth or a positive wealth shock through inheritance receipt increase the odds of retirement. However, these studies analysed the income effect on the binary decision of working versus full retirement. Table 17 shows no evidence of an income effect at the extensive or the intensive margin. This suggests that agents do not want to use partial retirement to adjust their labour supply in a flexible manner in response to a change in the generosity of the pension accruals or in the level of their pension income for some other reason.

Table 17 shows significant marginal effects for the retirement age regimes. Respondents more often choose partial retirement while they less often choose early and late retirement in retirement age regime 63 compared to retirement age regime 61 or 65. This result is a clear indication that agents want to participate in partial retirement that starts at the age 63 and ends at about the state pension age. It might be that at these ages the disutility of part-time work due to (expected) health is small, or because agents consider that the level of pension income at the age of 63 is not as high as they would have liked it to be and want to remain employed part-time to accrue additional pension rights.

Table 17 shows that a decrease in hourly wage, accompanied by a change to a less demanding job, in partial retirement has a significant effect on the choice probabilities of partial retirement and late retirement. In particular, when the hourly wage decreases by 20 percent, the probability of choosing partial retirement decreases by 4.8 percentage points while the probability of choosing late retirement increases by 2.8 percentage points. This shows that a reduced wage rate, accompanied by a job change, in partial retirement deters many agents to participate in partial retirement so much so that they prefer to remain employed full-time. This result is in line with the stylised empirical fact of the previous studies conducted in the US that partial retirement often involves a reduction in the wage rate and a change in employer or type of work (Gustman and Steinmeier, 1983, 1984, 1986; Honig and Hanoach, 1985; Hutchens, 2010; Johnson and Neumark, 1996; Quinn and Burkhauser, 1993; Ruhm, 1990; Siegenthaler and Brenner, 2000;

Aaronson and French, 2004).

The effect of a decrease in the wage rate in partial retirement might depend on the retirement age. When we allow the wage rate regime to interact with the three retirement age regimes, we find that in retirement regime 61 respondents prefer late retirement over partial retirement. The marginal effects are  $-7.4$  and  $5.1$  percent for partial and late retirement respectively, and both are significant at 0.01 level.

The results on the choice probabilities presented above are in general in line with the results on the average scenario ratings presented in Table 15. For example, the wage rate is lower in partial retirement, as respondents less often choose the partial retirement scenario Table 17, they give significantly lower ratings to the partial retirement.

## Background characteristics

The lower panel of Table 17 shows the effects of a set of socio-economic and other background characteristics. We find significant effects with intuitively plausible signs for a number of variables. Older respondents less often prefer partial retirement and more often prefer late retirement. A model with dummies for age categories 50-59, 60-69, and 70-96 shows that the age effect is large and significant for all age categories when compared to the reference category 40-49. The marginal effects at the age categories 50-59, 60-69, and 70-96 are respectively  $-0.076$ ,  $-0.082$ , and  $-0.109$  for partial retirement, and  $0.046$ ,  $0.062$ , and  $0.082$  for late retirement. These effects are almost always significant at the 0.01 level.

Compared to women, men less often choose partial retirement and more often choose late retirement. It might be that the types of work done by men are not suitable for part-time jobs, or that male workers do not need to combine work and family responsibilities as much as females, making them less likely to opt for a flexible work schedule.

We asked survey respondents to which extent they agree with the statement *I would keep working even if money were not needed*. Higher levels of agreement with the statement decrease the odds of early and late retirement and increase the odds of remaining employed in a part-time job. This suggests that individuals who are attached to the labor market for non-economic reasons are significantly more likely to remain employed by means of a part-time job.

The lower panel of Table 15 presents the results on scenario ratings which confirm the significant effects found on the choice probabilities in the lower panel of Table 17. For example, male respondents significantly give lower ratings to partial retirement confirming the gender effect on the probability of choosing partial retirement.

To be completed.

## 6 Sensitivity analysis

### Baseline pension incentives and retirement age

Section 5 analysed the effects of the pension incentives on partial and full retirement behaviour. The retirement effects of actuarially less than fair and generous increases in pension rights for delayed claiming are compared to the effects of an actuarially fair increase, to investigate the substitution effect of higher pensions. Furthermore, the retirement effects of accruing pension rights with low and generous accrual rates are compared to the effect of accruing rights with a moderate accrual rate, to study the income effect of higher pensions. Table 2 shows that each type of increase in the pension rights correspond to a 10 percentage points increase in the replacement rates in full retirement when compared to the baseline replacement rates. Based on these changes in the replacement rates, Table 17 presented evidence for the substitution



effect. Here we check how the substitution effect changes when pension rights increase in an actuarially generous manner compared to when they increase in an actuarially less than fair manner, or how the income effect changes when pension rights grow with a generous accrual rate compared to when they grow with a low accrual rate, where each type of increase in the pension rights correspond to a 20 percentage points increase in the replacement rates in full retirement when compared to the new baseline replacement rates. Section 5 also analysed the impact of increasing retirement age on the preferences to delay retirement fully or partially. The labour supply effects of delaying retirement at ages 61 and 65 are compared to the effect of delaying retirement at age 63. Table 17 showed significant effects at retirement ages 61 and 65. Here we check how the presented effects of increasing retirement age changes when delaying retirement at age 65 is compared to delaying retirement at age 61.

We find that actuarially generous increases in pension rights, compared to actuarially less than fair increases, increases the odds of choosing partial retirement and decreases the odds of choosing late retirement. The marginal effects for partial and late retirement are 0.049 and  $-0.026$ , which are significant at the 0.01 and 0.10 levels, respectively.

We find no significant income effect when we allow that pension rights grow with an actuarially generous accrual rate compared to when they grow with an actuarially less than fair accrual rate.

The treatment with respect to the retirement age shows no significant effect in scenario choices when delaying retirement at age 65 is compared to delaying retirement at age 61.

## Exogeneity of the treatment effects

Section 5 presented regression results on the treatment effects based on the field experiment where individuals are randomly assigned to regimes of retirement income and retirement age to analyse the effects of financial incentives and increasing retirement age on the choice of delaying retirement fully or partially beyond the traditional retirement ages. Random assignment of the respondents to the treatment regimes ensures that differences in outcomes can be attributed to the treatment effects only, and hence are independent of any respondent characteristic. This means that the magnitudes and significance of the treatment effects should remain unaffected when other controls on respondent characteristics are omitted from the regression equation. However, note that the treatments with respect to the retirement income depend on the actual labor income of the respondent by our experimental design. That is, in the vignettes presented to a respondent, the levels of the work income and retirement income assigned to a respondent, according to the randomisation of the respondent into a retirement income regime, depend on the actual labor income of that respondent (see Section 2). This means that we should control for the labor income, and other income related variables, in the regression equation to obtain unbiased estimates for the treatment effects. Here we check whether the estimated treatment effects are sensitive to omitting the background characteristics of the respondent, except the labor income and income related correlates. That is, we compare the results from the estimation of the regression model given by Equation (4.1) with the results from an estimation based on the same model but with background characteristics omitted from the model except the labor income and home ownership.

To be completed.

## 7 Validation of the stated preferences

We have taken a stated preference approach to analyse partial retirement behaviour. Our stated preference analysis can be criticised because respondents who prefer the hypothetical partial

retirement scenario over other scenarios may not actually participate in partial retirement due to labor market restrictions. Our analysis also ignores the role of work status, work type, health status, partners situation, or other unanticipated policy interventions or life events. Indeed, [Siegenthaler and Brenner \(2000\)](#) indicate that, in longitudinal data, many workers behave as they say they prefer reducing work hours, but this depends on the availability of flexible retirement options.

Here we analyse whether the stated preferences for partial and full retirement based on the vignettes are representative of the expectations and made decisions for partial and full retirement. Among the respondents of our survey, we check whether their stated preferences for the hypothetical retirement scenarios are in line with their actual intentions and made decisions for retirement. To find out the expected and revealed retirement decisions, in the survey we have asked the respondents to indicate their past and expected future work status at given ages on a time line that intended to outline their employment path from age 55 and onwards. At eight age categories respondents select, from respective drop down menus, among four work status alternatives. The age categories are 55-56, 57-58, 59-60, 61-62, 63-64, 65-66, 67-68, and 69 plus, and the work status alternatives are full-time work, part-time work, retirement, and other. When choosing a future work status, we have asked respondents to take account of what their opportunities will allow them to do. We provided them with the example that if their employer prohibits part-time work, they should avoid choosing part-time work in the drop down menus. Furthermore, we have asked them to indicate at drop down menus beneath the corresponding drop down menus for work status alternatives if their hourly wage has decreased, if their employer, type of work, and the industry they used to work in have changed at the corresponding work status they have chosen.

Table 16 presents the most common retirement sequences that result from the work status choices of the respondents at eight age categories. Retirement sequences of type ‘A’ correspond to 19.4 percent of all different types of retirement sequences, while retirement sequences of type ‘P’ correspond to 22.3 percent. Analysing the retirement sequences by labor market status, among the respondents who are retired, 30.6 percent follow the abrupt retirement sequence while 13.1 percent follow the partial retirement sequence. For those working for an employer the corresponding figures are 17.3 and 35.2 percent, respectively. For those who are self-employed, the corresponding figures are 6.7 and 31.6 percent. These figures show that partial retirement is more prevalent among workers than among retirees. A possible reason is that younger cohorts have greater access to partial retirement schemes, demand such schemes more, or are more aware of their opportunities for reducing work hours before retirement. Compared to abrupt retirement, partial retirement is more common among the self-employed. This is plausible because self-employed workers are likely to have more discretion over their work schedule compared to those working for an employer ([Parker and Rougier, 2007](#)).

Among the respondents who follow the retirement sequence of type ‘P’, 22.4 percent indicate that their hourly wage has decreased at their part-time job. 15.7, 8.1, and 7.3 percent indicate, respectively, that the type of work they do, their employer, and their sector have changed at the part-time job.

In general, these figures show that a substantial fraction of the respondents who are currently working have made use of or expect to make use of part-time work as they make a transition from full-time work to full retirement. They face a part-time wage penalty when making this transition but do not appear to face significant restrictions from their employer or do not need to change the type of work or sector for doing this. These figures are in line with the previous studies based on national household surveys which provide evidence that substantial fractions of older workers take a part-time job with their career or a different employer before they fully retire but at a reduced hourly wage (see e.g. [Cahill et al. \(2015\)](#) or [Aaronson and French \(2004\)](#)).

The presented high fractions of respondents expecting to participate in partial retirement are in line with the high fractions of respondents choosing the partial retirement scenario in our stated preference question (see Table 5). We take this finding as an indication that stated preferences for partial retirement are predictive or actual retirement decisions.

Given the abrupt and partial retirement sequences outlined by the respondents, we further analyse whether the respondents who outline an abrupt retirement sequence are more likely to choose either the abrupt early retirement scenario or the abrupt late retirement scenario, and less likely to choose the partial retirement scenario, when asked to choose among the three hypothetical retirement scenarios. In particular, we define an indicator variable that takes a value of 1 if the respondent’s retirement sequence is of the abrupt retirement type, and a value of 0 if it is of the partial retirement type (types ‘A’ and ‘P’, respectively, in Table 16). We then check in the baseline multinomial probit regression (Table 17) whether the indicator of abrupt retirement has a positive effect on the odds of choosing the early and late retirement scenarios, and a negative effect on the odds of choosing the partial retirement scenario. We find that the marginal effect of the abrupt retirement indicator is 0.09 and 0.04 for early and late retirement, respectively, and  $-0.13$  for partial retirement. The marginal effects are significant at the 0.01 level for early and partial retirement, and at the 0.10 level for late retirement.<sup>9</sup> These effects are large in magnitude, e.g. compared to the effects of the other correlates in the baseline regression, and provide evidence that the stated preferences are representative of the actual intentions or made decisions for retirement.

## 8 Conclusion

To be completed.

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<sup>9</sup> The effect sizes remain largely robust to accounting for incomplete or irregular retirement patterns (of the type ‘O’ in Table 16) in our definition of abrupt retirement. The effects remain significant at the conventional significance levels.

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Table 1: Background characteristics

Characteristic	Attribute	Fraction (%)
Age	40-49	20.35
	50-59	25.25
	60-69	31.14
	70+	23.26
Gender	Female	51.06
	Male	48.94
Marital status	Married or living with partner	71.71
	Single (divorced, widowed, etc.)	28.29
Education level	Primary school	6.26
	Secondary and prep. uni./high school	35.03
	Vocational education/college	49.74
	University	8.97
Work status	Working for an employer	37.85
	Working self-employed	6.22
	(Partially) disabled	5.12
	Retired	33.53
	Other	17.22
Income level	0	7.00
	1-1000	20.18
	1001-2000	39.68
	2001-3000	25.23
	3001-4000	5.93
	4001-5000	1.20
	5000+	0.78
House owner	Owns a house	74.38
	Doesn't own a house	25.62

Notes: 1. Number of observations is 3263. 2. Income levels represent self-reported last monthly net income from work. 3. Totals may not add due to rounding error.

Table 2: Competing retirement scenarios with associated replacement rates

Ret. age regime	Type of ret.	Ret. age	Rep. rate during partial. ret.	Rep. rate during full ret.
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	0.75/0.85/0.95
			0.25/0.35/0.45	0.80/0.90/1.00
			0.30/0.40/0.50	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	0.60/0.70/0.80
			0.20/0.30/0.40	0.65/0.75/0.85
			0.25/0.35/0.45	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	0.45/0.55/0.65
			0.15/0.25/0.35	0.50/0.60/0.70
			0.20/0.30/0.40	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 respectively early retirement, partial retirement, and late retirement. 2. Looking at the replacement rates row-wise, the first, second and third rows refer, respectively, to the low, middle and high substitution effect regimes. Looking at the replacement rates column-wise, the first, second and third columns refer, respectively, to the low, middle and high income effect regimes. 3. The replacement rates shown are for the long duration regime, and those for the short duration regime are not shown.

Table 3: Competing numbers of hours worked during partial retirement with associated replacement rates

Ret. age regime	Partial ret. age	Hours worked during partial ret.	Rep. rate during partial ret.	Rep. rate during full ret.
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. Looking at the replacement rates, the first, second and third columns refer, respectively, to the low, middle and high income effect regimes. 2. The replacement rates shown are for the long duration regime, and those for the short duration regime are not shown.

Table 4: Competing numbers of steps partial retirement consists of with associated replacement rates

Ret. age regime	Partial ret. age	Number of steps partial ret. consists of	Rep. rate during the first step of partial ret.	Rep. rate during the second step of partial ret.	Rep. rate during full ret.
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: Looking at the replacement rates, the first, second and third columns refer, respectively, to the low, middle and high income effect regimes.



Table 5: Fraction of choices and average ratings under the retirement age regimes

Ret. age regime	Type of retirement	Ret. age	Choice (%)	Rating (avg.)
65	E	65	29.9	5.3***
	P	65-69	40.8	6.1***
	L	70	30.2	5.4***
63	E	63	27.6	5.4***
	P	63-67	43.1	6.2***
	L	68	29.2	5.4
61	E	61	30.2	5.3***
	P	61-65	37.7	5.9***
	L	66	32.0	5.5

Notes: 1. E, P, L denote respectively early retirement, partial retirement, and late retirement. 2. About 3650 respondents choose among the early, partial, and late retirement plans, and rate each plan, under each retirement age regime. 3. \*\*\*, \*\*, \* indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively, based on the test of the null hypothesis that the mean rating is equal to 5.5. The null hypothesis that the means of the ratings given to the three retirement scenarios are equal to each other is rejected at the 0.01 level in all of the 3 cases associated with the retirement age regimes.

Table 6: Fraction of choices and average ratings under the substitution and income effect regimes

Ret. age regime	Type of ret.	Ret. age	Subst. effect regime	Replacement rate	Choice 3 sc. (%)	Rating 3 sc. (avg.)	Choice 2 sc. (%)	Rating 2 sc. (avg.)	Income effect regime	Replacement rate	Choice 3 sc. (%)	Rating 3 sc. (avg.)	Choice 2 sc. (%)	Rating 2 sc. (avg.)
65	E	65	L	0.60/0.70/0.80	32.2	5.5	53.7	5.8***	L	0.60/0.60/0.60	29.0	5.3***	51.1	5.5
	P	65-69		0.75/0.85/0.95	36.0	6.0***				0.75/0.80/0.85	42.0	6.1***		
	L	70		0.90/1.00/1.10	31.7	5.5	46.3	5.6		0.90/1.00/1.10	29.0	5.3**	48.9	5.5
65-69	E	65	M	0.60/0.70/0.80	28.7	5.3**	51.8	5.9***	M	0.70/0.70/0.70	28.9	5.4	50.6	5.8***
	P	65-69		0.80/0.90/1.00	41.1	6.1***				0.85/0.90/0.95	40.9	6.0***		
	L	70		1.00/1.10/1.20	30.2	5.4	48.2	5.6		1.00/1.10/1.20	30.1	5.5	49.4	5.8***
63	E	65	H	0.60/0.70/0.80	26.1	5.3***	47.0	5.6	H	0.80/0.80/0.80	29.2	5.4	50.1	5.9***
	P	65-69		0.85/0.95/1.05	45.3	6.2***				0.95/1.00/1.05	39.4	6.2***		
	L	70		1.10/1.20/1.30	28.6	5.4	53.0	5.8***		1.10/1.20/1.30	31.4	5.5	49.9	5.7**
63-67	E	63	L	0.50/0.60/0.70	29.0	5.5	54.0	6.0***	L	0.50/0.50/0.50	28.1	5.4*	54.0	5.9***
	P	63-67		0.60/0.70/0.80	39.1	6.1***				0.60/0.65/0.70	42.5	6.1***		
	L	68		0.70/0.80/0.90	32.0	5.6	46.0	5.9***		0.70/0.80/0.90	29.4	5.4*	46.0	5.7**
61	E	63	M	0.50/0.60/0.70	27.0	5.4	52.3	5.8***	M	0.60/0.60/0.60	26.5	5.4*	53.2	5.9***
	P	63-67		0.65/0.75/0.85	45.0	6.2***				0.70/0.75/0.80	43.5	6.2***		
	L	68		0.80/0.90/1.00	28.0	5.4*	47.7	5.7**		0.80/0.90/1.00	30.0	5.6	46.8	5.8***
61-65	E	63	H	0.50/0.60/0.70	26.8	5.4	54.8	5.8***	H	0.70/0.70/0.70	28.3	5.6	54.0	5.9***
	P	63-67		0.70/0.80/0.90	45.4	6.2***				0.80/0.85/0.90	43.4	6.3***		
	L	68		0.90/1.00/1.10	27.8	5.5	45.2	5.7*		0.90/1.00/1.10	28.3	5.5	46.0	5.8***
61-65	E	61	L	0.40/0.50/0.60	28.8	5.4	53.0	6.0***	L	0.40/0.40/0.40	30.8	5.3**	49.1	5.7**
	P	61-65		0.45/0.55/0.65	37.3	5.9***				0.45/0.50/0.55	36.9	5.7***		
	L	66		0.50/0.60/0.70	33.9	5.6	47.0	5.8***		0.50/0.60/0.70	32.3	5.4	50.9	5.8***
61-65	E	61	M	0.40/0.50/0.60	31.1	5.4*	54.0	5.9***	M	0.50/0.50/0.50	29.5	5.4**	51.0	5.9***
	P	61-65		0.50/0.60/0.70	38.0	6.0***				0.55/0.60/0.65	37.4	6.0***		
	L	66		0.60/0.70/0.80	31.0	5.4	46.0	5.7**		0.60/0.70/0.80	33.1	5.6	49.0	5.8***
61-65	E	61	H	0.40/0.50/0.60	31.0	5.4	47.9	5.8***	H	0.60/0.60/0.60	30.5	5.5	54.6	6.1***
	P	61-65		0.55/0.65/0.75	37.9	6.0***				0.65/0.70/0.75	39.0	6.1***		
	L	66		0.70/0.80/0.90	31.1	5.5	52.1	5.9***		0.70/0.80/0.90	30.6	5.5	45.4	5.8***

Notes: 1. E, P, L denote respectively early retirement, partial retirement, and late retirement. L, M, H respectively refer to low, middle, high regimes. 2. For the partial retirement scenario, the replacement rates during the period of partial retirement are not shown but only those during full retirement. 3. About 1200 respondents choose among the early, partial, and late retirement plans, and rate each plan, under each substitution effect or income effect regime, under each age regime. The corresponding number is 500 for respondents who choose between the early and late retirement plans. 4. Presented figures merge the regimes defined for retirement age and duration of partial retirement. 5. Totals of choices may not add due to rounding error. 6. \*\*\*, \*\*, \* indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively, based on the test of the null hypothesis that the mean rating is equal to 5.5. The null hypothesis that the means of the ratings given to the three retirement scenarios are equal to each other is rejected at the 0.01 level in all of the 18 cases associated with the substitution and income effect regimes in the table. The null hypothesis that the means of the ratings given to the two retirement scenarios are equal to each other is not rejected in all 18 cases.

Table 7: The net effect of introducing partial retirement on labor supply at different retirement ages

Retirement age regime	Substitution effect regime	Net effect in monhts	Income effect regime	Net effect in monhts
65	L	0.7	L	0.2
	M	0.4	M	0.1
	H	-0.7	H	0.0
63	L	0.8	L	0.9
	M	0.6	M	0.7
	H	1.2	H	0.9
61	L	0.6	L	-0.2
	M	0.8	M	0.2
	H	-0.4	H	1.0

Notes: 1. L, M, and H respectively refer to low, middle, and high regimes. 2. The net effects are based on the scenario choices in Table 6. 3. Each figure is based on about 1200 observations.

Table 8: Fraction of choices conditional on the choice in a given retirement age regime (%)

Ret. age regime evaluated	Ret. age regime chosen			Ret. age regime			Ret. age regime			Ret. age regime		
	Type of ret. chosen	Ret. age	Type of ret.	Ret. age	Type of ret.	Ret. age	Choice 3 sc.	Choice 2 sc.	Choice 3 sc.	Type of ret.	Ret. age	Choice 2 sc.
65	E	65	E	63	E	59.6	71.9	61	E	61	47.3	54.6
			P	63-67	P	29.3			P	61-65	33.3	
			L	68	L	11.1	28.1		L	66	19.3	45.4
65-69	P	65-69	E	63	E	17.6	53.1	61	E	61	24.1	51.0
			P	63-67	P	64.0			P	61-65	50.3	
			L	68	L	18.4	46.9		L	66	25.6	49.0
70	L	70	E	63	E	11.0	37.2	61	E	61	21.1	51.0
			P	63-67	P	28.4			P	61-65	28.5	
			L	68	L	60.6	62.8		L	66	50.5	49.0
63	E	63	E	65	E	63.0	61.4	61	E	61	66.7	70.7
			P	65-69	P	25.0			P	61-65	24.0	
			L	70	L	12.0	38.6		L	66	9.3	29.3
65	P	65	E	65	E	20.2	51.6	61	E	61	20.5	50.0
			P	65-69	P	59.5			P	61-65	59.9	
			L	70	L	20.3	48.4		L	66	19.6	50.0
68	L	68	E	65	E	11.2	32.9	61	E	61	8.9	39.5
			P	65-69	P	25.1			P	61-65	21.2	
			L	70	L	63.7	67.1		L	66	69.8	61.5
61	E	61	E	63	E	46.6	49.8	63	E	63	62.1	74.9
			P	65-69	P	31.9			P	63-67	29.3	
			L	70	L	21.5	50.2		L	68	8.7	25.1
65	P	65	E	63	E	25.6	48.3	63	E	63	17.4	52.2
			P	65-69	P	51.8			P	63-67	66.6	
			L	70	L	22.6	51.7		L	68	16.0	47.8
66	L	66	E	65	E	18.2	52.5	63	E	63	8.3	36.1
			P	65-69	P	32.5			P	63-67	26.8	
			L	70	L	49.3	47.5		L	68	64.9	63.9

Notes: 1. E, P, L denote respectively early retirement, partial retirement, and late retirement. 2. Respondents evaluate three sets vignette scenarios associated with three retirement age regimes, and make a choice among three scenarios in each set of vignette scenarios. Presented are respondents choices in two retirement age regimes, conditional on choice made in the remaining retirement age regimes. 3. The number of observations used to calculate the choice fractions depend on the number of respondents who choose among early retirement, partial retirement, and late retirement under a given retirement age regime. The minimum number of observations is 837, and the maximum is 1285. 4. Presented figures merge the regimes defined for duration of partial retirement. 5. Totals of choices may not add due to rounding error.

Table 9: The net effect of introducing partial retirement on labour supply conditional on the preferences for early, partial, and late retirement

Ret. age regime evaluated	Type of ret. chosen	Ret. age	Net effect in months in ret. age regime 65	Net effect in months in ret. age regime 63	Net effect in months in ret. age regime 61
65	E	65		3.5	0.8
	P	65-69		1.1	0.3
	L	70		-2.0	0.1
63	E	63	1.5		2.7
	P	63-67	0.5		0.0
	L	68	-2.3		-1.3
61	E	61	-0.0	3.9	
	P	61-65	-0.5	0.8	
	L	66	0.4	-2.0	

Notes: 1. E, P, L denote respectively early retirement, partial retirement, and late retirement. 2. The net effects are based on the conditional scenario choices in Table 8. 3. The number of observations used to calculate the net effects depend on the number of respondents who choose among early retirement, partial retirement, and late retirement under a given retirement age regime. The minimum number of observations is 837, and the maximum is 1285.

Table 10: Frequencies of the orderings of three scenario choices made respectively at the retirement age regimes 61, 63, and 65, and fractions of choices for early and late retirement (%)

Rank	Ordered sc. choices at ret. age regimes 61, 63, 65	Frequency	Cumulative	Choice		Choice		Choice	
				2 sc. at ret. age regime 65		2 sc. at ret. age regime 61		2 sc. at ret. age regime 63	
				E	L	E	L	E	L
1	PPP	16.44	16.44	49.0	51.0	49.4	50.6	51.0	49.0
2	LLL	13.57	30.01						
3	EEE	11.90	41.91						
4	LLP	4.81	46.72	34.0	66.0				
5	PPE	4.71	51.44			44.0	56.0	75.2	24.8
6	EPP	4.55	55.98	41.9	58.1			80.2	19.8
7	PPL	4.51	60.49			58.8	41.2	32.6	67.4
8	LPP	4.51	65.01	70.4	29.6			33.3	67.7
9	EEP	4.41	69.42	58.3	41.7				
10	PEE	4.41	73.83			68.2	31.8		
11	PLL	3.58	77.41			38.3	61.7		
12	EPL	2.71	80.11					58.0	42.0
13	LPE	2.41	82.52					55.6	44.4
14	EEL	2.34	84.86						
15	LLE	1.97	86.83						
16	PLP	1.87	88.70	25.0	75.0	41.1	58.9		
17	PEP	1.67	90.37	68.0	32.0	78.0	22.0		
18	EPE	1.54	91.91					89.1	10.9
19	LPL	1.50	93.42					13.3	86.7
20	ELL	1.40	94.82						
21	LEE	1.34	96.16						
22	LEP	0.87	97.03	61.5	38.5				
23	PLE	0.74	97.76			40.9	59.1		
24	ELP	0.64	98.40	47.4	52.6				
25	PEL	0.64	99.03			68.4	31.6		
26	ELE	0.57	99.60						
27	LEL	0.40	100.00						

Notes: 1. E, P, L denote respectively early retirement, partial retirement, and late retirement. An ordered scenario choice results from the types of retirement scenarios chosen respectively at the retirement age regimes 61, 63, and 65 by a same respondent. 2. The ordered scenario choices are ranked according to the fractions of respondents who make choices at the retirement age regimes 61, 63, and 65. 3. Presented figures are based on a total number of about 3400 observations. 4. The respondent is asked to evaluate the extra set of two scenarios (early retirement and late retirement) each time he chooses the partial retirement scenario in the three questions where he is presented with three vignette scenarios (early retirement, late retirement, and partial retirement).

Table 11: Fraction of choices in retirement age regimes conditional on the realised or expected retirement age (%)

Actual or expected ret. age	Ret. age regime	Type of ret.	Ret. age	Choice 3 sc.	Choice 2 sc.
65	65	E	65	27.3	50.2
		P	65-69	44.7	
		L	70	27.8	49.8
	63	E	63	26.8	53.1
		P	63-67	45.1	
		L	68	28.1	46.9
	61	E	61	30.7	51.0
		P	61-65	38.5	
		L	65	30.8	49.0
63	65	E	65	31.2	52.8
		P	65-69	34.7	
		L	70	34.0	47.2
	63	E	63	25.6	56.4
		P	63-67	43.2	
		L	68	31.2	43.5
	61	E	61	29.0	53.8
		P	61-65	39.0	
		L	65	32.0	46.1
61	65	E	65	32.7	51.0
		P	65-69	33.2	
		L	70	34.0	49.4
	63	E	63	31.5	53.6
		P	63-67	37.3	
		L	68	31.1	46.4
	61	E	61	30.0	52.0
		P	61-65	34.4	
		L	65	35.6	48.0

Notes: 1. E, P, L denote respectively early, partial, and late retirement.

Table 12: Fraction of choices and average ratings under the income effect regimes for hours worked during partial retirement

Ret. age regime	Partial ret. age	Hours worked during partial ret.	Income effect regime	Rep. rate during partial ret.	Rep. rate during full ret.	Choice (%)	Rating (avg.)
65	65-69	12	L	0.45	0.75	29.5	5.9***
		20		0.25	0.80	42.9	6.3***
		28		0.05	0.85	27.7	5.6
	65-69	12	M	0.55	0.85	27.6	5.8***
		20		0.35	0.90	40.5	6.4***
		28		0.15	0.95	31.9	5.9***
	65-69	12	H	0.65	0.95	27.7	5.9***
		20		0.45	1.00	44.8	6.5***
		28		0.25	1.05	27.4	5.9***
63	63-67	12	L	0.40	0.60	28.1	5.8***
		20		0.20	0.65	40.0	6.4***
		28		0.00	0.70	31.9	6.0***
	63-67	12	M	0.50	0.70	31.5	5.9***
		20		0.30	0.75	43.0	6.4***
		28		0.10	0.80	25.5	5.6
	63-67	12	H	0.60	0.80	31.4	5.9***
		20		0.40	0.85	42.9	6.5***
		28		0.20	0.90	25.7	5.7
61	61-65	12	L	0.35	0.45	29.3	5.6
		20		0.15	0.50	43.3	6.2***
		28		0.00	0.55	27.3	5.5
	61-65	12	M	0.45	0.55	30.2	5.6
		20		0.25	0.60	37.2	6.1***
		28		0.05	0.65	32.6	5.6
	61-65	12	H	0.55	0.65	34.2	5.9***
		20		0.35	0.70	34.2	6.3***
		28		0.15	0.75	31.6	5.6

Notes: 1. L, M and H respectively refer to low, middle and high regimes. 2. In the table, the work income during the period of partial retirement are not shown but only pension income. 3. For age regime 65, for each income effect regime, about 315 respondents choose one of the three retirement plans and rate each plan. For age regime 63 and 61, for each income effect regime, about 170 respondents choose one of the three retirement plans and rate each plan. 4. The retirement ages and the replacement rates shown are for the long duration regime, and those for the short duration regime are not shown. 5. Totals of choices may not add due to rounding error. 6. \*\*\*, \*\*, \* indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively, based on the test of the null hypothesis that the mean rating is equal to 5.5.



Table 13: Fraction of choices and average ratings under the income effect regimes when partial retirement consists of one and two steps

Ret. age regime	Partial ret. age	Number of steps partial ret. consists of	Income effect regime	Rep. rate during the first step of partial ret.	Rep. rate during the second step of partial ret.	Pen. income during full ret.	Choice (%)	Rating (avg.)
65	65-68	1	L	0.25		0.75	45.2	6.2***
	65-68	2		0.25	0.50	0.70	54.7	6.3***
	65-68	1	M	0.35		0.85	46.4	6.4***
	65-68	2		0.35	0.60	0.80	53.6	6.5***
	65-68	1	H	0.45		0.95	47.1	6.4***
	65-68	2		0.45	0.70	0.90	52.9	6.5***
63	63-66	1	L	0.20		0.60	49.2	6.2***
	63-66	2		0.20	0.45	0.55	50.1	6.4***
	63-66	1	M	0.30		0.70	45.0	6.3***
	63-66	2		0.30	0.55	0.65	55.0	6.5***
	63-66	1	H	0.40		0.80	48.4	6.3***
	63-66	2		0.40	0.65	0.75	51.6	6.4***
61	61-64	1	L	0.15		0.45	43.0	5.9***
	61-64	2		0.15	0.40	0.40	57.1	6.2***
	61-64	1	M	0.25		0.55	45.3	6.0***
	61-64	2		0.25	0.50	0.50	54.7	6.1***
	61-64	1	H	0.35		0.65	44.4	6.2***
	61-64	2		0.35	0.60	0.60	55.6	6.4***

Notes: 1. L, M and H respectively refer to low, middle and high regimes. 2. In the table, the work income during the period of partial retirement are not shown but only pension income. 3. For age regime 65, for each income effect regime, about 315 respondents choose one of the three retirement plans and rate each of them. For age regime 63 and 61, for each income effect regime, about 170 respondents choose one of the three retirement plans and rate each of them. 4. When partial retirement consists of one step the agent works 20 hours per week for a period of four years in partial retirement. When partial retirement consists of two steps the agent works 20 hours for a period of two years and 10 hours for another period of two years in partial retirement. 5. Totals of choices may not add due to rounding error. 6. \*\*\*, \*\*, \* indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively, based on the test of the null hypothesis that the mean rating is equal to 5.5.

Table 14: Multinomial probit model explaining the probability of choosing a retirement scenario

	Early retirement		Partial retirement		Late retirement	
	Mar. eff.	S. E.	Mar. eff.	S. E.	Mar. eff.	S. E.
Treatment effects						
Substitution effect low	0.015	0.017	-0.042**	0.017	0.028	0.017
Substitution effect high	-0.009	0.016	0.008	0.017	0.000	0.017
Income effect low	0.004	0.016	0.001	0.017	-0.005	0.017
Income effect high	-0.002	0.016	0.004	0.016	-0.001	0.016
Retirement age 61	0.019**	0.009	-0.042***	0.010	0.023***	0.009
Retirement age 65	0.021**	0.009	-0.036***	0.011	0.014	0.009
Wage rate low	0.020	0.013	-0.048***	0.014	0.028**	0.014
Partial retirement is four years	0.001	0.013	-0.008	0.014	0.007	0.014
Background characteristics						
Age	0.002	0.001	-0.004***	0.001	0.002**	0.001
Male	0.021	0.014	-0.056***	0.014	0.034**	0.014
Married or living with partner	-0.018	0.020	0.001	0.020	0.017	0.020
Household size	0.012	0.008	-0.003	0.008	-0.009	0.008
Highly educated	-0.010	0.015	0.030*	0.015	-0.020	0.015
High income earner	0.024	0.026	-0.012	0.026	-0.013	0.026
Home owner	-0.018	0.017	0.017	0.017	0.001	0.017
Self-employed	0.009	0.033	0.022	0.033	-0.031	0.032
Retired	0.006	0.023	0.037	0.024	-0.042*	0.024
Unemployed	0.009	0.036	0.003	0.036	-0.012	0.035
Homemaker, disabled, etc.	0.054**	0.022	-0.018	0.022	-0.037*	0.022
Value work more than money	-0.005	0.004	0.016***	0.004	-0.011***	0.004
Observations	8223					
Log likelihood	-8842.725					
Count R-squared	0.402					
Wald test of model significance	180.51***					

Notes: 1. Choices are based on pooling multiple observations of respondents in their evaluations of the three sets of retirement scenarios at the three retirement age regimes. 2. Standard errors are robust to heteroskedasticity and clustering on repeated observations of survey respondents. 3. \*\*\*, \*\*, \* indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively.

Table 15: Linear regression model explaining the ratings given to a retirement scenario

	Early retirement		Partial retirement		Late retirement	
	Coef.	S. E.	Coef.	S. E.	Coef.	S. E.
Treatment effects						
Substitution effect low	0.073	0.055	-0.077	0.048	0.178***	0.054
Substitution effect high	-0.018	0.055	0.113**	0.049	0.107**	0.055
Income effect low	-0.115**	0.055	-0.134***	0.048	-0.178***	0.054
Income effect high	0.158**	0.054	0.066	0.048	-0.040	0.054
Retirement age 61	-0.019	0.053	-0.152***	0.048	-0.005	0.053
Retirement age 65	0.033	0.055	0.144***	0.048	0.004	0.055
Wage rate low	-0.041	0.044	-0.183***	0.039	0.052	0.044
Partial retirement is four years	0.139***	0.045	0.055	0.039	0.140***	0.044
Background characteristics						
Age	0.000	0.003	0.000	0.002	0.010***	0.003
Male	-0.050	0.047	-0.230***	0.041	-0.044	0.046
Married or living with a partner	0.013	0.064	0.092	0.057	0.148**	0.063
Household size	0.071***	0.026	0.030	0.022	0.013	0.025
Highly educated	-0.078	0.049	0.178***	0.043	-0.137***	0.049
High income earner	0.068	0.090	-0.009	0.074	0.090	0.088
Home owner	-0.050	0.056	0.142***	0.050	-0.045	0.055
Self-employed	0.012	0.101	-0.081	0.091	-0.026	0.100
Retired	0.309***	0.079	0.148**	0.070	0.054	0.078
Unemployed	0.301**	0.122	0.099	0.109	-0.057	0.123
Homemaker, disabled, etc.	0.272***	0.070	-0.111*	0.062	-0.046	0.070
Value work more than money	0.087***	0.012	0.137***	0.011	0.059***	0.012
Constant	4.669***	0.213	5.499***	0.194	4.465***	0.212
Observations	8223					
R-squared	0.013		0.037		0.009	
F test of model significance	2.507***		8.888***		1.816**	

Notes: 1. All the treatment variables are dummy variables to indicate respective regimes of the retirement income, retirement age, and wage rate in partial retirement. 2. Ratings are based on pooling multiple observations of respondents in their evaluations of the three sets of retirement scenarios at the three retirement age regimes. 3. Standard errors are robust to heteroskedasticity and clustering on repeated observations of survey respondents. 4. \*\*\*, \*\*, \* indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively.

Table 16: Most common self-reported retirement sequences (%)

Rank	Sequence	Type	Freq.	Cumulative	Rank	Sequence	Type	Freq.	Cumulative
1	22222333	O	6.68	6.68	26	13333333	A	1.04	73.27
2	22222233	O	6.30	12.97	27	11223333	P	0.98	74.24
3	44444444	O	5.35	18.32	28	22333333	O	0.91	75.16
4	11111133	A	4.35	22.67	29	11123333	P	0.88	76.04
5	44444333	O	3.97	26.64	30	11111122	O	0.85	76.89
6	11111333	A	3.87	30.51	31	11122223	P	0.82	77.71
7	22223333	O	3.75	34.26	32	11222233	P	0.72	78.43
8	22233333	O	3.75	38.00	33	23333333	O	0.72	79.16
9	11113333	A	3.65	41.66	34	11111222	O	0.66	79.82
10	11133333	A	2.83	44.49	35	11112223	P	0.66	80.48
11	33333333	O	2.68	47.17	36	11111112	O	0.63	81.11
12	11122333	P	2.61	49.78	37	11144333	O	0.63	81.74
13	11112233	P	2.52	52.30	38	11444333	O	0.63	82.37
14	44444433	O	2.49	54.79	39	12223333	P	0.60	82.97
15	22222223	O	2.24	57.02	40	12222333	P	0.57	83.53
16	11111233	P	2.08	59.10	41	22244333	O	0.57	84.10
17	11122233	P	1.95	61.05	42	22444333	O	0.50	84.60
18	11112333	P	1.89	62.94	43	11233333	P	0.41	85.01
19	11111113	A	1.67	64.61	44	12233333	P	0.41	85.42
20	11111123	P	1.48	66.09	45	12222233	P	0.35	85.77
21	11333333	A	1.35	67.44	46	22224333	O	0.35	86.11
22	11111223	P	1.32	68.77	47	44444443	O	0.35	86.48
23	22222222	O	1.32	70.09	48	11114333	O	0.31	86.78
24	11222333	P	1.10	71.19	49	11122222	O	0.31	87.09
25	11111111	O	1.04	72.23					

Notes: 1. 1: Full-time work, 2: Part-time work, 3: Retired; 4: Other. 2. A: Retirement sequences where full-time work is followed immediately by abrupt full retirement. P: Retirement sequences where full-time work is followed by part-time work, and subsequently by full retirement. O: Retirement sequences of other types than of type A or P. 3. Retirement sequences are ranked according to the percentage of respondents who reported the sequence. 4. Observations are based on 3176 self-reports. 5. 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 17: Multinomial probit model explaining the probability of choosing a retirement scenario among respondents who have retired or expect to retire at an early, normal, or late retirement age under the three retirement age regimes

Retired or expect to retire at a normal or late ret. age	Comparison group	Ret. age regime	Type of ret.	Ret. age	Choice 3 sc.	
					Mar. Eff.	S. E.
N	E	65	E	65	-0.042*	0.022
			P	65-69	0.067***	0.025
			L	70	-0.024	0.023
L	E		E	65	-0.064**	0.025
			P	65-69	0.133***	0.028
			L	70	-0.068**	0.026
	N		E	65	-0.021	0.020
			P	65-69	0.066***	0.021
			L	70	-0.044**	0.020
N	E	63	E	63	-0.029	0.022
			P	63-67	0.045*	0.025
			L	68	-0.015	0.023
L	E		E	63	-0.006	0.025
			P	63-67	0.060**	0.028
			L	68	-0.053**	0.026
	N		E	63	0.023	0.019
			P	63-67	0.015	0.021
			L	68	-0.038*	0.020
N	E	61	E	61	0.007	0.023
			P	61-65	0.036	0.025
			L	66	-0.044*	0.023
L	E		E	61	0.083***	0.026
			P	61-65	-0.043	0.028
			L	66	-0.040	0.027
	N		E	61	0.075***	0.020
			P	61-65	-0.079***	0.021
			L	66	0.003	0.020

Notes: 1. E, N, L denote respectively the respondents who state to have retired or expect to retire at an early retirement age between 55 and 62, at about the effective or normal retirement age between 63 and 66, and at a late retirement age as of 67. 2. E, P, L denote respectively early, partial, and late retirement. 3. Standard errors are robust to heteroskedasticity. 4. \*\*\*, \*\*, \* indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively.

Veel werknemers gaan volledig met pensioen na fulltime gewerkt te hebben; de leeftijd waarop ze met pensioen gaan kan verschillen. Andere werknemers gaan met deeltijdpensioen, waarbij ze parttime werken voordat ze volledig met pensioen gaan.

Hieronder beschrijven we de pensioenplannen van drie werknemers. Alle drie werken ze momenteel 40 uur per week en verdienen € 4000 per maand. De pensioenplannen verschillen in de volgende opzichten:

- de pensioeringsleeftijd
- het pensioeninkomen (incl. eventuele AOW)
- de wijze van met pensioen gaan (gedeeltelijk of volledig)

Vergelijkt u alstublieft de plannen die hieronder worden gepresenteerd.

**Judith** is van plan met pensioen te gaan als zij 65 wordt. Haar pensioeninkomen zal € 2400 per maand bedragen. Dit plan kan als volgt worden samengevat:

Leeftijd	62 - 63 - 64	65 - 66 - 67 - 68 - 69 - 70 - 71 - 72
	Werk	Pensioen
Gewerkte uren	40 uur	0
Arbeidsinkomen	€ 4000	0
Pensioeninkomen	0	€ 2400

**Maria** is van plan om haar werkuren te verminderen tot 20 uur per week, en hetzelfde werk te blijven doen van haar 65<sup>e</sup> tot haar 70<sup>e</sup>. Zij gaat € 2000 per maand verdienen en zal € 1000 ontvangen vanuit haar gedeeltelijk pensioen. Wanneer zij parttime blijft werken, zal zij pensioen blijven opbouwen voor wanneer zij volledig met pensioen is. Zij zal volledig met pensioen gaan wanneer zij 70 wordt. Haar pensioeninkomen zal € 3200 per maand zijn. Dit plan kan als volgt worden samengevat:

Leeftijd	62 - 63 - 64	65 - 66 - 67 - 68 - 69	70 - 71 - 72
	Werk	Deeltijdpensioen	Pensioen
Gewerkte uren	40 uur	20 uur	0
Arbeidsinkomen	€ 4000	€ 2000	0
Pensioeninkomen	0	€ 1000	€ 3200

**Nicole** is van plan met pensioen te gaan als zij 70 wordt. Haar pensioeninkomen zal € 4000 per maand bedragen. Dit plan kan als volgt worden samengevat:

Leeftijd	62 - 63 - 64 - 65 - 66 - 67 - 68 - 69	70 - 71 - 72
	Werk	Pensioen
Gewerkte uren	40 uur	0
Arbeidsinkomen	€ 4000	0
Pensioeninkomen	0	€ 4000

Op basis van uw eigen voorkeuren, welk plan vindt u het meest aantrekkelijk?

- Het plan van **Judith**  
 Het plan van **Maria**  
 Het plan van **Nicole**

Vorige

Verder



Figure 1: Survey representation of the competing retirement scenarios.