Netspar
Network for Studies on Pensions, Aging and Retirement

NETSPAR INDUSTRY SERIES

# The Demand for Retirement Products: The Role of Withdrawal Flexibility and Administrative Burden

*Pim Koopmans*
*Marike Knoef*
*Max van Lent*

DESIGN PAPER 197

**DESIGN PAPERS** are part of the **refereed Industry Paper Series**, which are refereed by the Netspar Editorial Board. Design Papers discuss the design of a component of a pension system or product. A Netspar Design Paper analyzes the objective of a component and the possibilities for improving its efficacy. These papers are easily accessible for industry specialists who are responsible for designing the component being discussed. Authors are allowed to give their personal opinion in a separate section. Design Papers are presented for discussion at Netspar events. Representatives of academic and private sector partners, are invited to these events. Design Papers are published at the Netspar website.

**Colophon**
Netspar Design Paper 197, November 2021

**Editorial Board**
Rob Alessie – University of Groningen
Mark-Jan Boes – VU Amsterdam
Paul Elenbaas – Nationale Nederlanden
Arjen Hussem – PGGM
Bert Kramer – University of Groningen & Ortec Finance
Fieke van der Lecq (Chair) – VU Amsterdam
Raymond Montizaan – Maastricht University
Alwin Oerlemans – APG
Martijn Rijnhart – AEGON
Maarten van Rooij – De Nederlandsche Bank
Peter Schotman – Maastricht University
Koen Vaassen – Achmea
Peter Wijn – APG
Jeroen Wirschell – PGGM
Tim van de Zandt – MN
Marianne Zweers – a.s.r.

**Design**
B-more Design

**Lay-out**
Bladvulling, Tilburg

**Editors**
Frans Kooymans, Frans Kooymans-Text and Translation
Netspar

Design Papers are publications by Netspar. No reproduction of any part of this publication may take place without permission of the authors.

# CONTENTS

*Abstract* 4
*Samenvatting* 5

1. *Introduction* 7
2. *Institutional setting* 10
3. *Vignette design* 11
4. *Data* 15
5. *Results* 22
6. *Discussion and conclusion* 30

*Appendices* 32
*References* 41

**Acknowledgements**
We are grateful to Mark Boumans, Sjoerd Brouwer, Tinka den Arend, Ian Koetsier, Emile Soetendal, and Floske Weehuizen, as this project would not be possible without them. We thank Netspar for funding the experiment. We thank Albert Rutten and Johan Bonekamp for useful comments and suggestions. Finally, we thank seminar and conference participants at: Leiden University, Netspar, New Paper Sessions 2020, The Dutch Economist Week 2020, the 6th Maastricht Behavioral Economic Policy Symposium and the European Association of Labour Economists (EALE) 2021 for useful comments and suggestions.

**Affiliations**
Pim Koopmans – Department of Economics, Leiden University
Marike Knoef – Department of Economics, Leiden University
Max van Lent – Department of Economics, Leiden University

## Abstract

Many people save too little for retirement. In the Netherlands this is particularly the case with self-employed workers. In this paper we study – using a stated choice experiment – whether increasing the flexibility of withdrawals and reducing the administrative burden can increase the demand for retirement products. We find that the self-employed are willing to give up 8% of post-retirement benefits for a lower administrative burden. In addition, they are willing to give up 14% in order to have the option to withdraw money to augment low income or to make mortgage payments. In contrast, the willingness to pay (WTP) for flexibility and a lower administrative burden is much less evident among employees. Employees are willing to give up only 4% for flexible retirement products and are not willing to pay for a lower administrative burden. Our results show that increasing flexibility and reducing the administrative burden associated with acquiring a fiscally attractive pension product will increase demand for such products, especially for self-employed workers.

## Samenvatting

Er is een substantiële groep zelfstandigen van zo'n 40% die na pensionering waarschijnlijk een inkomen heeft dat lager is dan 70% van hun huidige inkomen (Knoef et al. 2017, Zwinkels et al. 2017a en b). Ten opzichte van werknemers bouwen vooral zelfstandigen met middeninkomens relatief weinig vermogen op voor de oude dag. Tegelijkertijd zien we dat zelfstandigen wel relatief veel vrije besparingen en woningvermogen hebben. Er lijkt dus (bij een deel van de zelfstandigen) wel ruimte om te sparen, maar ook belemmeringen om dat in de tweede of derde pijler te doen.

Diverse redenen kunnen hieraan ten grondslag liggen, zoals een lage financiële en/of pensioengeletterdheid, complexiteit, uitstelgedrag en verliesaversie, maar ook administratieve lasten en flexibiliteit (Bruggen en Knoef, 2017). In dit artikel onderzoeken we de rol van administratieve lasten en flexibiliteit met behulp van een vignettenanalyse. We hebben ruim 800 zelfstandigen en 900 werknemers keuzes voorgelegd tussen pensioenproducten met meer en minder administratieve lasten, meer en minder flexibiliteit, en met een verschillende uitk- eringshoogte (bij gegeven premie).

Eerder onderzoek laat zien dat veel ZZP-ers niet weten wat de fiscale jaarruimte is (GfK 2017). Dit kan een drempel vormen bij de opbouw van pensioen in de derde pijler. In de tweede pijler leiden fiscale regels tot kosten en rompslomp, omdat een pensioenuitvoerder informatie bij ZZP-ers moet opvragen (bijvoorbeeld inkomen en urenregistraties van 3 jaar geleden). Onze resultaten laten zien dat zelfstandigen bereid zijn om maar liefst 8% van hun uitkering op te geven als zij niet meer een jaarruimte hoeven te berekenen of niet meer hun inkomenshistorie hoeven door te geven. Administratieve lasten vormen dus een substanti¨ele drempel voor ZZP-ers. Deze resultaten suggereren dat het zou helpen als zelfstandigen een basisruimte krijgen, waarbij ze tot een zeker bedrage fiscaal vriendelijk pensioen kunnen sparen zonder dat er een berekening hoeft te worden gemaakt. Dit is vooral behulpzaam voor ZZP-ers met een laag en middeninkomen helpen. We vinden dat de administratieve drempel minder hoog is voor mensen met een hoog inkomen. Zij kunnen alsnog hun jaar- ruimte berekenen volgens de bestaande regels als zij meer pensioen willen sparen.

Ten aanzien van flexibiliteit onderzoeken we in hoeverre het een drempel is voor ZZP-ers om vermogen vast te zetten in een pensioenproduct. We onderzoeken de mogelijkheid om pensioengeld te onttrekken met een boete (zoals nu in de derde pijler het geval is) en mogelijkheden om pensioengeld te onttrekken onder bepaalde

condities: bij een laag inkomen, voor studie of investeringen, of voor een eigen woning. De resultaten laten zien dat vooral

ZZP-ers behoefte hebben aan flexibiliteit bij een tegenvallend inkomen en voor studie en investeringen. Zij zouden daarvoor zelfs bereid zijn om 12-14% van hun uitkering in te leveren. Werknemers hebben geen behoefte aan flexibiliteit voor investeringen of studie, en willen maar 3% opgeven voor flexibiliteit bij een tegenvallend inkomen. Mensen die een tegenvallend inkomen vanwege Covid verwachtten zijn meer bereid om te betalen voor flexibiliteit bij een tegenvallend inkomen. Verder zien we dat mensen behoefte hebben aan commitment: ze houden niet van de optie om met een boete geld uit hun pensioen te kunnen onttrekken. Een huis is ook een commitment device, in die zin dat je het niet zomaar kan gebruiken voor een vakantie. We zien dat ZZP-ers bereid zijn om 14% van hun uitkering op te geven om pensioengeld te kunnen onttrekken voor een huis, onder werknemers is dit gemiddeld 5%. Dit geldt vooral voor huurders, die het zouden kunnen gebruiken voor de aankoop van een huis. Flexibiliteit is ook meer gewild onder mensen bij wie we gemeten hebben dat zij het heden overwaarderen. Dit kan een valkuil zijn. Flexibiliteit kan dus tot meer pensioenopbouw leiden omdat zelfstandigen dan minder een drempel ervaren om het geld vast te zetten. Echter de condities waaronder een onttrekking mogelijk is moeten goed vormgegeven worden om een te grote onttrekking van het pensioenvermogen te voorkomen.

## 1. Introduction

In western countries many workers have limited retirement savings. This is particularly the case among the self-employed (SE; OECD [2019]). The low level of savings among the self-employed is mainly due to relatively low savings through annuities. In the literature this is called the annuity puzzle (Benartzi et al. [2011]). A recent publication has identified the administrative burden – i.e., the effort it takes to look up information and fill out forms as well as a lack of flexibility when it comes to withdrawals as key explanations for low annuity take-up rates (see e.g., Lusardi and Mitchell [2007]; Galiani et al. [2020]).[1]

In this paper we investigate to what extent more flexible pension products and a lower administrative burden can help to increase the demand for pension annuities. We use a stated choice experiment, which allows us to estimate the willingness to pay (WTP) for flexibility and a reduced administrative burden using a large sample of Dutch workers. We implement the degree of flexibility by reviewing early withdrawal options from pension funds. The administrative burden is decreased by reducing the amount of financial information that needs to be provided to purchase a fiscally attractive pension annuity.

Throughout this paper we focus in particular on self-employed workers' demand for pension products. The reason for this is twofold. First, self-employed workers typically have lower retirement savings and fewer retirement savings products. Zwinkels, Knoef, Caminada, et al. [2017] show that, in the Netherlands, 43% of the self-employed are not able to receive 70% of their current income after retirement, while this figure is 31% for employees. This is likely to be due to institutional differences. For example, employees are much more often covered by mandatory pension schemes. Second, both a lack of flexibility and the administrative burden may have a bigger impact on self-employed workers. The preference for flexibility may be higher among the self-employed because of their higher income volatility. Furthermore, the self-employed may be more aware of the administrative burden involved with tax-facilitated pension products, and the administrative burden may be higher for them than for employees because of their higher income volatility. Therefore, providing products that are both more flexible and reduce the administrative burden on the worker may increase product take-up for the self-employed and thus help restore equivalence in the pension accumulation of self-employed workers and employees. The theoretical literature has provided extensive evidence on demand for a lower administrative burden and more flexibility when it comes to withdrawals during the accumulation phase. Flexibility can increase contributions for people who prefer liquidity. Amador et al. [2006], Davidoff et al. [2005] and Horneff et al. [2015] show that offering liquidity can be optimal and that it increases annuity take-up. On the other hand, flexibility (in the accumulation phase) can reduce retirement wealth because people withdraw their savings before retirement. Empirical evidence is rather limited. We build upon Amromin and Smith [2003], who highlight the demand for willingness to cover liquidity shocks, Beshears et al. [2014], who show that early money withdrawal options as well as framing increase annuity take-up rates, and Beshears et al. [2020], who show that there is demand for commitment (i.e., products with withdrawal penalties). To the best of our knowledge, this is the first paper that directly quantifies the demand for more flexible retirement products with a lower administrative burden. Note that offering pension products with a lower administrative burden and options for early withdrawal – as we propose in our experiment – are currently not permitted in most developed countries including the Netherlands (Beshears et al. [2015]).

---

[1] The Covid-19 pandemic has also increased interest in retirement products with withdrawal flexibility. Several countries have temporarily introduced additional flexibility in retirement products. For example, in France, independent self-employed workers facing financial difficulties can take up (at most) 800 dollars from their retirement accounts.

The key contributions of this paper to the literature are twofold. First, we estimate the willingness to pay for a lower administrative burden and the demand for flexibility in the accumulation phase, using a stated choice experiment. As far as we know, we are the first to distinguish between four types of withdrawal options: 1) withdrawals with a penalty for any reason (as in Beshears et al. [2020]), 2) withdrawals without a penalty that are conditional on low incomes, 3) withdrawals for educational and investment purposes, and 4) withdrawals used to make mortgage down payments. These options have diverse characteristics: whereas retirement savings become liquid under the first option, mortgage down payments are still rather illiquid. Withdrawals for those with a low income help to smooth consumption over time, and education and investments may increase future income. Second, we distinguish between self-employed workers and employees, as there are large institutional differences between these two groups in the Netherlands. We study heterogeneous results for different characteristics and circumstances of people to obtain a better understanding why flexibility and a low administrative burden are more important for some people than for others.

Our paper relates to the numerous publications on the retirement savings and annuity puzzle, which entails workers not annuitizing for retirement despite the fact that this is optimal – and one of the potential solutions to this puzzle. One reason that people don't annuitize more is behavioral biases; see Thaler and Benartzi [2007] and Benartzi and Thaler [2007] for an overview. For instance, inertia Chetty et al. [2014]; Bu¨tler and Teppa [2007], procrastination Beshears et al. [2014], the present bias (Linde [2019]), and a lack of skills Brown et al. [2017]; Shu et al. [2016] and Galiani et al. [2020]. In addition workers with lower financial literacy annuitize less, see Lusardi and Mitchell [2007] and Hershey et al. [2017]. Finally, preferences play a role. For instance (unanticipated) health shocks may be a reason for a low annuitization rate, see e.g. Peijnenburg et al. [2017], a preference to retire later (Parker and Rougier [2007]; Garcıa et al. [2019]), and a preference for lower income during retirement (see Selin [2012] and Joulfaian [2018]). Framing (the text of) pension products has been successfully used to increase annuitization, see e.g. Agnew et al. [2008]; Beshears et al. [2014]; Brown, Kling, et al. [2008]. We contribute to this literature by studying how attributes of pension products affect the demand for these products.

Our main findings are the following. Self-employed workers have a WTP of 8% of post -retirement benefit for not having to provide fiscal information in order to purchase a pension product, while employees have a WTP close to zero. The WTP for flexibility is on average much larger. The self-employed are willing to pay up to 14% of post-retirement benefit. The WTP for withdrawing money in cases where there is low income and for mortgage payments is the highest. Employees are also willing to pay for increased withdrawal flexibility, although less. In this case, employees have a WTP of at most 4%. This difference in WTP for flexibility may be explained by a difference in income uncertainty.

The rest of this paper is organized as follows. Section 2 describes the Dutch retirement system. In section 3, we explain our stated choice experiment design. Section 4 discusses the data, followed by section 5, in which we present and discuss our results. Finally, section 6 concludes the paper.

## 2. Institutional setting

This section describes how the Dutch retirement system is organized and how it differs between employees and the self-employed. One can categorize three sources of retirement contributions in the Netherlands, which we call the three pillars. The first entails state-funded flat rate benefits on a pay-as-you-go basis. These benefits equal 50% to 100% of the net minimum wage, depending on one's living situation (Dutch Law [2020]). Residents of the Netherlands accrue 2% of their state pension every year, for 50 years until they reach the statutory retirement age, irrespective of their work history. Under current plans, the age of entitlement to the state retirement pension (AOW) will increase to 67 years in 2024, and thereafter it will be linked to developments related to life expectancy.

The second pillar entails retirement benefits funded through one's employer. As many as 90% of Dutch employees are compulsorily enrolled in such a pension plan. Most self-employed workers are not in a position to receive these benefits. They can, however, save on a voluntary basis for a maximum of ten years after quitting their job at their last employer. A consequence of the second pillar being employer-provided is that the self-employed typically do not have as many second pillar arrangements. One important feature of the second pillar is that contributions cannot be withdrawn before retirement.

The third pillar entails voluntary individual pension arrangements. As opposed to sec- ond pillar savings, third-pillar pension contributions can be withdrawn after paying income tax and a 20% penalty over the withdrawn amount. There is an exception to this rule when individuals become disabled. In that case, up to €40,000 can be withdrawn with only income tax having to be paid over this amount.

The Dutch pension system is designed to encourage retirement savings in the second and third pillars by offering a tax deduction and such retirement contributions – up to a certain threshold – can be deducted from one's taxable income. The Dutch pension system also has an unofficial fourth pillar. This is comprised of private possessions such as savings, stocks, and the home.

The attributes of our products are embedded in the current Dutch system in the follow- ing way. Our administrative burden attribute simplifies the information that needs to be provided in order to purchase an annuity which receives a tax break related to second and third-pillar baselines. In the second pillar, the burden is reduced by not having to report one's income over the past three years. In the third pillar workers have to compute their tax deductibility thresholds, which requires workers to look up their income over the past year. The flexibility component adds additional exemptions from paying the fine that comes with early money withdrawals in the third pillar.

## 3. Vignette design

This section describes the trade-offs respondents have to make in our stated choice exper- iment. Using sixteen vignettes, respondents are offered hypothetical retirement products which replace any pending pension contributions. To this end, we show two sets of eight vignettes.

In the first set of vignettes respondents choose between two hypothetical annuities. We ask respondents to assign probabilities of buying each product (replacing their existing pension contributions) that sum up to 100% in each vignette. We explicitly make clear that these products replace any current retirement products that the respondent may have.

In the second set of vignettes we offer one product and have respondents assign a prob- ability of buying the said annuity, again making it explicitly clear that this product replaces any current retirement products that the respondent may have. This approach allows us to identify whether demand for our hypothetical retirement products is present.

We prefer this two-step procedure over a design in which one has three options per vignette, where the third option is buying no product. That is because this procedure allows us to estimate the preference between two products, even for respondents who prefer not to buy any product.

Our products vary on three attribute levels. The administrative effort that is needed to purchase a tax-facilitated pension annuity, i.e. the administrative burden, the flexibility to withdraw (part of) the funds early, and the price of the pension product, which is expressed in the form of an annual retirement annuity. The vignettes are constructed such that products with a lesser administrative burden and/or more early withdrawal options entail a lower annuity. An example of a vignette can be found in Appendix 2.

### 3.1 Attribute Levels

*Administrative Burden*

We base the attribute levels on the existing retirement system. Our administrative burden attribute entails the administrative duties that the purchaser has to fulfill in order to purchase the product with tax breaks. For our baseline attribute levels, individuals do not have to provide any fiscal information to buy a product. For our second alternative, they have to provide their income history over the past three years to purchase the product in question. This attribute is based on the second pillar of the

Dutch retirement system[2]. For our last alternative, which is based on the current Dutch third-pillar retirement system, individuals have to compute their annual contribution limit: the maximum amount of pension contributions that can be deducted from their taxable income (Lusardi and Mitchell [2007]).

*Flexibility*

For flexibility we use the status quo of not being able to withdraw savings as the base level, which is based on the current (lack of) flexibility in the second pillar. For the other four attribute levels, we introduce situations in which individuals can withdraw part of their pension contributions. The first alternative allows individuals to withdraw as many retirement contributions as they wish, albeit with a 20% early withdrawal penalty[3]. We additionally introduce three alternatives in which respondents are allowed to withdraw their contributions without any penalty in specific situations. These specific situations are chosen to introduce a commitment mechanism (Beshears et al. [2020]). The alternatives and their conditions are as follows:

- The first alternative allows individuals to supplement their income up to the minimum wage by withdrawing pension savings when their income falls below the minimum wage over a three-month period. We add this attribute level because the self-employed typically have more variable income than employees, in addition to having a lower degree of social insurance to soften the effects of income shocks. This option helps to smooth consumption over the life cycle.
- In contrast with this, the second alternative instead allows individuals to withdraw €15,000 of their retirement savings every five years for investments in education and training. We opt for this attribute level as employees are typically compensated for education and training whereas the self-employed are not.[4]
- Finally, the third alternative allows individuals to withdraw up to €15,000 of their retirement savings every five years to pay off their mortgage. We introduce this attribute as the self-employed tend to save for retirement through the fourth pillar (Zwinkels, Knoef, Caminada, et al. [2017]). In recent decades, there has been strong growth in both pension savings and mortgage debts in the Netherlands. It has often been argued that these long balance sheets have an amplifying effect on the

---

[2] Note that these attribute levels measure whether making it easier to purchase a product increases product demand. We do not alter the fiscal stimulus that is behind the current system.

[3] This alternative is the third pillar in the status quo.

[4] Note that all workers, including the self-employed, will have the option to receive up to €1000 from the government for educational purposes as of March 2022 (Dutch Central Government [2021]).

cyclicality of the Dutch economy (Parlevliet et al. [2015]). That is because the longer balance sheets have made households more vulnerable to fluctuations in interest rates and asset prices. Furthermore, the growth of the mortgage portfolio has increased the financial risks for banks. When individuals are allowed to withdraw part of their retirement wealth to pay off their mortgage, this shortens an individual's balance sheet and reduces vulnerability. On the other hand, wealth becomes somewhat more liquid, as people can sell their house.

*Price*

For the price we first compute an annuity based on a one-time retirement contribution of €1000. This annuity is based on investments in a portfolio of 50% in stocks and 50% government bonds, with said portfolio delivering an annual rate of return of 3.5% (Dijsselbloem et al. [2019]). To construct the annuity, the total value of the investments at retirement are then divided by the discounted life expectation post-retirement, discounted at 1% per year. This annuity then has continuous deviations ranging from -7.5% to 7.5% of the baseline annuity. The consequent annuity closely resembles annuities currently offered by Dutch private pension providers. The vignettes show respondents the annual pension benefit they receive when they become 67 in exchange for a one-time €1.000 contribution now.

### 3.2 Design Characteristics

We use Ngene[5] to translate the attribute levels into vignettes. We use a Bayesian Efficient design to estimate the WTP for flexibility and a lower administrative burden with as few observations as necessary. To this end, we set positive Bayesian priors on the reduced administrative burden, withdrawal options, and the post-retirement benefit.

The experimental design contains three blocks with eight vignettes each. Our sample consisting of 1,741 workers – 822 self-employed workers and 919 employees – was separately randomized into blocks. Subsequently, respondents were shown the eight vignettes within their block in a randomized order. In addition, the order of the attribute levels shown is randomized per respondent.

Our stated choice experiment involved first showing the eight vignettes to respondents, asking them to assign probabilities to two hypothetical retirement products that must add up to 100%. The price is annuitized to an annual retirement benefit. This annuitization distributes the total discounted value of pension contributions over post-retirement life, conditional on the probability of survival. This is to say that the expected benefit payout equals the total retirement buildup when working. For post-retirement life, we discount using a 1% discount rate per year.

---

[5] ChoiceMetrics (2012) Ngene 1.1.1 User Manual Reference Guide, Australia. [2019]

We also use eight randomly drawn hypothetical products (out of each set of products) from our vignettes. Respondents then assign a probability to buying these products as opposed to not buying a retirement product at all. This allows us to test whether respondents who stated a preference for a product would also actually consider buying that product.

Prior to showing the vignettes, we ask questions on background characteristics, financial literacy and whether respondents are currently building up retirement funds. After the vignettes, we ask questions regarding respondents' preferences. Respondents are asked how many hours a week they work, how long they have been self-employed, in which sector they work, individual and household income, their net liquid assets, and whether they bought or rented their house.

We elicit risk and time preferences in addition to subjective life expectancy to tie into our flexibility attribute. We ask respondents for their choice in Dave et al. [2010]'s Eckel- Grossman gamble, albeit with the payouts multiplied by 10. Subsequently, respondents are asked to choose which payout they want in 1 or 10 years, and this makes them indifferent between said payout and receiving €1000 in the present. For time preference, we follow Wang et al. [2016] by giving respondents a hypothetical choice between €1.000 now and €X in 1 and 10 years, respectively, asking how large X should be such that respondents are indifferent between these two choices in both cases. From this, we compute both a long-term discount rate and a present bias. We ask for bequest motives by letting respondents allocate €3000 and €9000, respectively between themselves and their inheritance. Finally, we take the financial literacy questions from Lusardi and Mitchell [2007].[6] In Appendix 1 we describe the model we use to estimate WTP.

---

[6] Note that we have translated all the questions and administered the entire survey in Dutch.

*Table 1: Demographic characteristics of respondents. Diff compares self-employed workers with employees.*

| | Full sample | | Self-employed | | Employees | | Diff |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | P-value |
| Age | 43.06 | 9.96 | 44.20 | 9.84 | 42.04 | 9.95 | 0.00*** |
| Female | 0.38 | 0.48 | 0.50 | 0.50 | 0.26 | 0.44 | 0.00*** |
| Homeowner | 0.73 | 0.45 | 0.71 | 0.45 | 0.74 | 0.44 | 0.10 |
| Works 32 or more hours a week | 0.99 | 0.12 | 0.97 | 0.18 | 1.00 | 0.00 | 0.00*** |
| Works 28 to 32 hours a week | 0.01 | 0.12 | 0.03 | 0.18 | 0.00 | 0.00 | 0.00*** |
| Low education level | 0.12 | 0.32 | 0.09 | 0.29 | 0.14 | 0.34 | 0.00*** |
| Intermediate education level | 0.40 | 0.49 | 0.37 | 0.48 | 0.43 | 0.49 | 0.01** |
| High education level | 0.49 | 0.50 | 0.54 | 0.50 | 0.44 | 0.50 | 0.00*** |
| Observations | 1741 | | 822 | | 919 | | 1741 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

## 4. Data

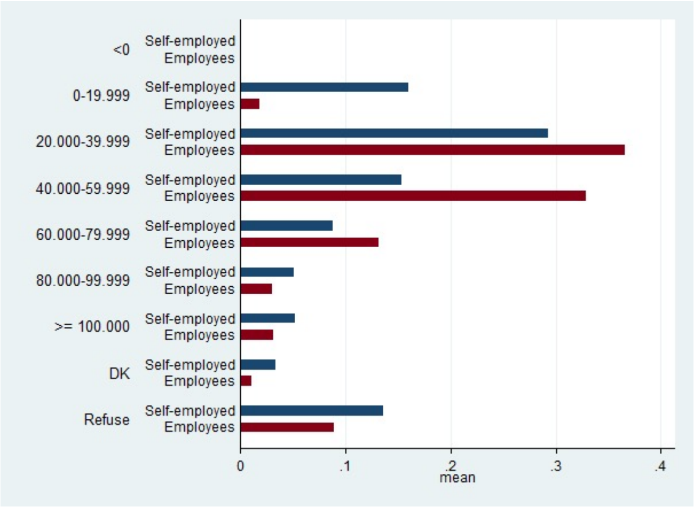
This section provides an overview of the data used for the analysis and shows descriptive statistics. We created a survey and targeted individuals who worked at least 28 hours a week and were between 25 and 60 years old.[7] The hour criterion is chosen so as to solely measure effects for workers who participate substantially on the labor market and whose main source of income is from employment of self-employment. The survey was then administered to a sample of self-employed workers and a sample of employees of about the same size. These restrictions leave us with 1,741 respondents, 822 self-employed workers and 919 employees. (Note that the self-employed are oversampled).

Table 1 presents demographic characteristics of respondents. Respondents are on aver- age 43 years old, 38% are female, nearly three out of four own a house, and nearly everyone works more than 32 hours a week. We see some minor differences between the self-employed workers and employees in terms of home ownership, hours worked and education level. There is a sizable difference in the fraction of female workers between the self-employed and employees. Only 26% of employees in our sample are female, while half of the self-employed workers are female. However, this difference matches fairly closely with the gender distribution of employees and self-employed workers conditional who work 28 hours a week or more, as found by Torre et al. [2019] (they show that conditional on working at least four days a week, 48% of the SE are female). Other demographic characteristics in our sample also fairly

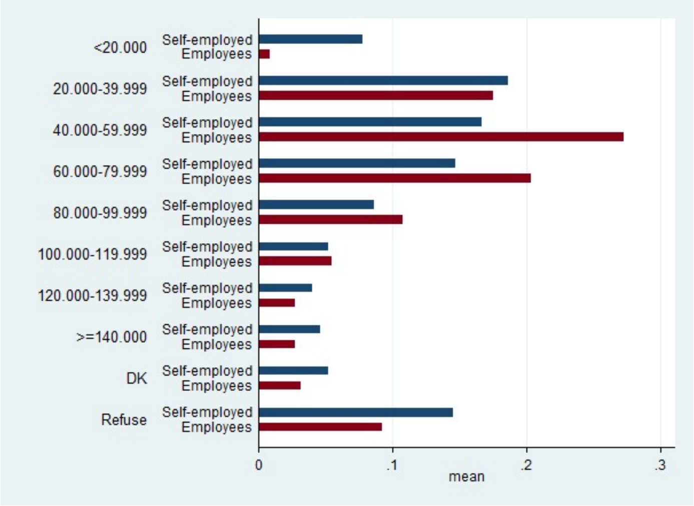
---

[7] The survey was administered by Kien Wizard.

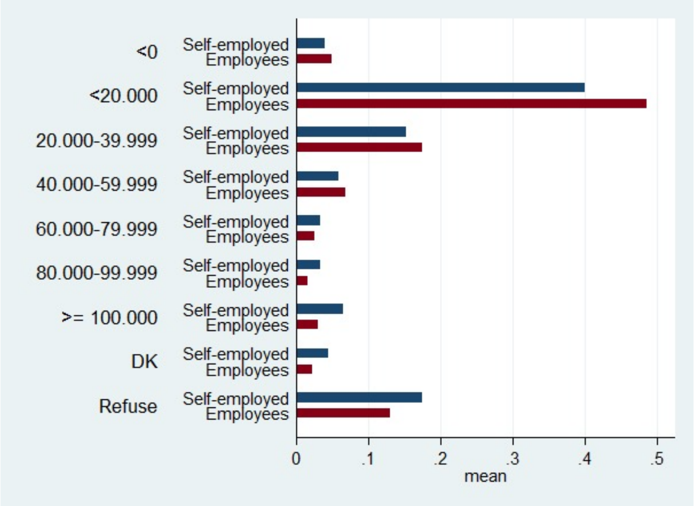
*Figure 1: Distribution of income and assets for the self-employed and employees. DK denotes Don't Know, while Refuse denotes that the respondent refused to answer the question.*



a) Personal income



b) Household income



c) Net liquid assets

*Table 2: Descriptive statistics: Anticipated income fluctuations. Diff compares self-employed workers to employees.*

| | Full sample | | Self-employed | | Employees | | Diff |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | P-value |
| Strongly disagrees anticipated income fluctuations for the next five years | 0.16 | 0.37 | 0.04 | 0.20 | 0.28 | 0.45 | 0.00*** |
| Disagrees anticipated income fluctuations for the next five years | 0.32 | 0.47 | 0.21 | 0.41 | 0.42 | 0.49 | 0.00*** |
| Neutral anticipated income fluctuations for the next five years | 0.18 | 0.38 | 0.23 | 0.42 | 0.13 | 0.34 | 0.00*** |
| Agrees anticipated income fluctuations for the next five years | 0.23 | 0.42 | 0.35 | 0.48 | 0.12 | 0.33 | 0.00*** |
| Strongly agrees anticipated income fluctuations for the next five years | 0.09 | 0.29 | 0.14 | 0.35 | 0.05 | 0.21 | 0.00*** |
| No opinion on anticipated income fluctuations for the next five years | 0.01 | 0.11 | 0.02 | 0.14 | 0.01 | 0.07 | 0.00*** |
| Strongly disagrees income fluctuations due to Covid | 0.13 | 0.33 | 0.05 | 0.23 | 0.19 | 0.39 | 0.00*** |
| Disagrees income fluctuations due to Covid | 0.29 | 0.45 | 0.15 | 0.36 | 0.42 | 0.49 | 0.00*** |
| Neutral on income fluctuations due to Covid | 0.21 | 0.41 | 0.21 | 0.41 | 0.21 | 0.41 | 0.96 |
| Agrees income fluctuations due to Covid | 0.22 | 0.41 | 0.32 | 0.47 | 0.13 | 0.33 | 0.00*** |
| Strongly agrees income fluctuations due to Covid | 0.14 | 0.35 | 0.25 | 0.43 | 0.04 | 0.21 | 0.00*** |
| No opinion on income fluctuations due to Covid | 0.01 | 0.11 | 0.02 | 0.13 | 0.01 | 0.10 | 0.19 |
| Observations | 1741 | | 822 | | 919 | | 1741 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

closely match those found in Torre et al. [2019]. It is worth noting, however, that 54% of our self-employed sample are highly educated whereas (unconditionally on hours worked) 47% of Dutch SE are highly educated according to Torre et al. [2019].

Figure 1 shows income and pension characteristics of our sample. Figure 1 shows that self-employed workers are more represented than employees in the tails of the income and liquidity distributions. Most self-employed respondents have personal incomes between e0 and €60.000, whereas most employees have incomes between €20.000 and €80.000. The pattern for household income is similar, although household incomes are somewhat larger than individual incomes, which indicates that most people also have a working spouse. Both groups have relatively few net liquid assets (see Panel c). The self-employed also seem to not know and more often refuse to state their income and net liquid assets. This is in line with the fact that the income of the self-employed is typically more volatile and less predictable.

*Table 3: Descriptive statistics: preferences for retirement savings. Diff compares self-employed workers to employees.*

| | Full sample | | Self-employed | | Employees | | Diff |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | P-value |
| Strongly wishes to save more for retirement | 0.04 | 0.21 | 0.05 | 0.22 | 0.04 | 0.19 | 0.23 |
| Wishes to save more for retirement | 0.15 | 0.36 | 0.12 | 0.33 | 0.18 | 0.39 | 0.00*** |
| Neutral with respect to saving more for retirement | 0.33 | 0.47 | 0.30 | 0.46 | 0.36 | 0.48 | 0.02** |
| Does not wish to save more for retirement | 0.35 | 0.48 | 0.38 | 0.49 | 0.32 | 0.47 | 0.01** |
| Strongly does not wish to save more for retirement | 0.10 | 0.29 | 0.12 | 0.32 | 0.08 | 0.26 | 0.00*** |
| Does not know if wishes to save more for retirement | 0.03 | 0.16 | 0.03 | 0.16 | 0.03 | 0.16 | 0.82 |
| Strongly disagrees with procrastinates retirement savings | 0.06 | 0.23 | 0.06 | 0.23 | 0.04 | 0.19 | 0.48 |
| Disagrees with procrastinates retirement savings | 0.13 | 0.33 | 0.12 | 0.33 | 0.14 | 0.35 | 0.66 |
| Neutral on procrastinates retirement savings | 0.24 | 0.42 | 0.23 | 0.42 | 0.29 | 0.46 | 0.19 |
| Agrees with procrastinates retirement savings | 0.37 | 0.48 | 0.38 | 0.48 | 0.31 | 0.46 | 0.24 |
| Strongly agrees with procrastinates retirement savings | 0.17 | 0.37 | 0.16 | 0.37 | 0.19 | 0.40 | 0.52 |
| Does not know if procrastinates retirement savings | 0.05 | 0.22 | 0.05 | 0.22 | 0.03 | 0.16 | 0.30 |
| Strongly disagrees anticipated income fluctuations for the next five years | 0.16 | 0.37 | 0.04 | 0.20 | 0.28 | 0.45 | 0.00*** |
| Disagrees anticipated income fluctuations for the next five years | 0.32 | 0.47 | 0.21 | 0.41 | 0.42 | 0.49 | 0.00*** |
| Neutral anticipated income fluctuations for the next five years | 0.18 | 0.38 | 0.23 | 0.42 | 0.13 | 0.34 | 0.00*** |
| Agrees anticipated income fluctuations for the next five years | 0.23 | 0.42 | 0.35 | 0.48 | 0.12 | 0.33 | 0.00*** |
| Strongly agrees anticipated income fluctuations for the next five years | 0.09 | 0.29 | 0.14 | 0.35 | 0.05 | 0.21 | 0.00*** |
| No opinion on anticipated income fluctuations for the next five years | 0.01 | 0.11 | 0.02 | 0.14 | 0.01 | 0.07 | 0.00*** |
| Strongly disagrees income fluctuations due to Covid | 0.13 | 0.33 | 0.05 | 0.23 | 0.19 | 0.39 | 0.00*** |
| Disagrees income fluctuations due to Covid | 0.29 | 0.45 | 0.15 | 0.36 | 0.42 | 0.49 | 0.00*** |
| Neutral on income fluctuations due to Covid | 0.21 | 0.41 | 0.21 | 0.41 | 0.21 | 0.41 | 0.96 |
| Agrees income fluctuations due to Covid | 0.22 | 0.41 | 0.32 | 0.47 | 0.13 | 0.33 | 0.00*** |
| Strongly agrees income fluctuations due to Covid | 0.14 | 0.35 | 0.25 | 0.43 | 0.04 | 0.21 | 0.00*** |
| No opinion on income fluctuations due to Covid | 0.01 | 0.11 | 0.02 | 0.13 | 0.01 | 0.10 | 0.19 |
| Observations | 1741 | | 822 | | 919 | | 1741 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2 shows anticipated income shocks of workers over the next five years as well as as a result of the Covid-19 pandemic. As expected, self-employed workers anticipate much more income uncertainty than employees. This income uncertainty may in turn lead this group to have a higher demand for liquidity.

Table 3 describes workers' preferences for retirement savings. One fifth of our sample (strongly) wishes to save more for retirement than they are currently saving, and this preference is similar for the self-employed workers and employees. Also roughly one in five reports postponing the decision to save more for retirement.

Table 4 shows the preferences of respondents.[8] We find that most respondents are risk averse. Risk preferences vary little between self-employed workers and employees, with the majority of respondents being risk averse. These risk aversion related results are somewhat surprising, as self-employed workers are typically found to be less risk averse than employees (S. Brown et al. [2006]; Masclet et al. [2009]). Respondents overall choose safer gambles than in Dave et al. [2010], which likely stems from the fact that our games have higher stakes. Present bias and discount factors are estimated following Wang et al. [2016]. Most workers are present-biased, but there is no difference in present bias and the long-term discount factor between self-employed workers and employees. Both the degree of present bias and the long-term discount factor are similar to those found in Wang et al. [2016] for a sample of Dutch students. Most respondents have a bequest motive. On average they would spend €2200 themselves if they would receive €3000, and more than €5100 if they would receive €9000. The bequest motives of self-employed workers and employees do not differ. Self-employed workers seem to have a slightly higher subjective life expectancy, but this difference is not statistically significant. Trust in pension funds and insurers is overall neutral to negative. Finally, both self-employed workers and employees consider themselves fairly financially literate. Moreover, around 80% of the sample provided the correct answer to the question regarding inflation as described in Lusardi and Mitchell [2007]. However, less than half of the sample correctly answered what annual fiscal contribution room entails, with self-employed workers providing the correct answer relatively more often.

Respondents are asked to fill in the probability that they will buy a given product in each vignette. Some respondents round all their answers by 5 or 10 percent. This rounding behavior is shown in Appendix 3. Table A2 shows the rounding patterns in

---

[8] The questions behind risk preference, present bias and bequest motives can be found in Appendix 4.

*Table 4: Preferences and expectations of respondents. One-year and 10-year discount rates are winsorized at the 5th and 95th percentile. Diff compares self-employed workers to employees.*

| | Full sample | | Self-employed | | Employees | | Diff |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | P-value |
| **Risk Preference** | | | | | | | |
| RRA coefficient larger than 3.46 | 0.41 | 0.49 | 0.42 | 0.49 | 0.40 | 0.49 | 0.31 |
| RRA coefficient between 1.16 and 3.46 | 0.19 | 0.39 | 0.17 | 0.38 | 0.20 | 0.40 | 0.16 |
| RRA coefficient between 0.71 and 1.16 | 0.17 | 0.37 | 0.16 | 0.37 | 0.17 | 0.37 | 0.70 |
| RRA coefficient between 0.5 and 0.71 | 0.08 | 0.28 | 0.07 | 0.26 | 0.09 | 0.29 | 0.20 |
| RRA coefficient between 0 and 0.5 | 0.06 | 0.24 | 0.06 | 0.24 | 0.06 | 0.24 | 0.70 |
| RRA coefficient smaller than 0 | 0.09 | 0.29 | 0.10 | 0.30 | 0.08 | 0.27 | 0.12 |
| **Time Preference** | | | | | | | |
| Present bias | 0.91 | 0.23 | 0.91 | 0.24 | 0.91 | 0.23 | 0.95 |
| Long-term discount factor | 0.91 | 0.08 | 0.91 | 0.08 | 0.91 | 0.08 | 0.75 |
| **Life Expectancy** | | | | | | | |
| Probability live to 70 | 0.72 | 0.23 | 0.72 | 0.24 | 0.72 | 0.22 | 0.85 |
| Probability live to 80 | 0.52 | 0.26 | 0.53 | 0.28 | 0.51 | 0.25 | 0.20 |
| Probability live to 90 | 0.30 | 0.26 | 0.33 | 0.28 | 0.28 | 0.23 | 0.00*** |
| **Bequest Motives Amount Spent When €3000 Available** | 2174.56 | 811.23 | 2161.05 | 838.52 | 2186.64 | 786.27 | 0.51 |
| Amount spent when €9000 is available | 5121.00 | 2874.03 | 5126.23 | 2956.18 | 5116.32 | 2800.12 | 0.94 |
| **Financial Literacy** | | | | | | | |
| Perceived financial literacy (score out of 10) | 7.55 | 1.45 | 7.52 | 1.52 | 7.57 | 1.38 | 0.47 |
| Correct answer to financial literacy question | 0.79 | 0.41 | 0.77 | 0.42 | 0.81 | 0.39 | 0.02** |
| Correct answer annual contribution question | 0.46 | 0.50 | 0.52 | 0.50 | 0.40 | 0.49 | 0.00*** |
| **Pension Funds And Insurers** | | | | | | | |
| Strongly distrusts pension funds and insurers | 0.15 | 0.36 | 0.17 | 0.38 | 0.13 | 0.34 | 0.03** |
| Distrusts pension funds and insurers | 0.28 | 0.45 | 0.29 | 0.45 | 0.28 | 0.45 | 0.55 |
| Does not trust or distrust pension funds and insurers | 0.37 | 0.48 | 0.36 | 0.48 | 0.37 | 0.48 | 0.82 |
| Trusts pension funds and insurers | 0.16 | 0.36 | 0.11 | 0.32 | 0.19 | 0.39 | 0.00*** |
| Strongly trusts pension funds and insurers | 0.03 | 0.16 | 0.04 | 0.19 | 0.02 | 0.13 | 0.01*** |
| No opinion on trust in pension funds and insurers | 0.02 | 0.14 | 0.03 | 0.17 | 0.01 | 0.12 | 0.04** |
| Observations | 1741 | | 822 | | 919 | | 1741 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

our data. A total of 40% of answers from self-employed workers are multiples of 5 or 10 percent.

A potential concern is that respondents may wish to purchase neither of the retirement products in our first set of vignettes and that we hence falsely attribute the choice for either of the products to the willingness to purchase a product. To rule this concern out, Table A2 shows – using the second set of vignettes – that only a small proportion indicate that they are not interested in purchasing an annuity.[9] This indicates that respondents are not averse to the hypothetical retirement products and may be interested in purchasing such products in practice.

---

[9] Removing these responses from the data yields similar estimates.

## 5. Results

### 5.1 Main Results

This section presents estimates using the model discussed in Appendix 1.
Table 5) shows that the demand for retirement products increases when the administrative burden is lower. The size of the effect is similar for both types of administrative burden. Notably, the entire effect comes from self-employed workers. The self-employed have demand that is 5% higher when they do not need to calculate their annual contribution limit or provide their income history. Employees, on the other hand, do not appear to be interested in a lower administrative burden. This can be explained by the higher complexity of the calculations needed for self-employed workers. In other words, the current administrative burden is larger for the self-employed. Taking this burden away increases the demand for retirement products.

We see a strong demand for flexibility. Being able to withdraw funds in case of an income below the minimum wage and to pay off a mortgage increases demand strongly. This is the case for both the self-employed and for employees. Among self-employed workers there is also a sizable demand for a lower administrative burden. Workers do not have such demand. A possible explanation for this is that most training and education taken up by workers is paid for by their employer. Neither self-employed workers nor employees show any demand for the option to withdraw income when there is a fiscal penalty. Finally, as expected, demand increases when benefits are higher conditional on the administrative burden and flexibility attribute levels.

Our results contrast with those of Thaler and Benartzi [2007]: Only self-employed workers, for whom it is typically much more difficult to compute fiscal information, have a WTP for reducing the administrative burden. In addition to being in line with earlier literature on the demand for early money withdrawal options as in Amromin and Smith [2003] and Beshears et al. [2014], our results highlight the fact that workers with uncertain fiscal positions are willing to give up a substantial amount of their retirement benefits for early money withdrawal options. Furthermore, the aversion toward withdrawing money with a fiscal penalty provides further evidence of a desire for commitment, as found by Beshears et al. [2020]. Withdrawal penalties make respondents less likely to acquire retirement products: Respondents prefer products that do not entail fiscal penalties but rather have certain conditions for early money withdrawal.

To rule out potential concerns as a result of the jittering procedure applied to the data, we repeat our Least Absolute Deviation (LAD) estimates with different amounts of

*Table 5: LAD estimates. Standard errors are clustered at the individual level and in parentheses.*

| VARIABLES | (1)<br>Full sample | (2)<br>Self-employed | (3)<br>Employees |
|---|---|---|---|
| Benefit deviation % | 0.0251***<br>(0.00250) | 0.00671***<br>(0.00176) | 0.0504***<br>(0.00454) |
| Compute annual contribution limit | -0.0612***<br>(0.0121) | -0.0545***<br>(0.0159) | -0.00768<br>(0.0265) |
| Provide income history | -0.0638***<br>(0.0144) | -0.0511***<br>(0.0164) | -0.0309<br>(0.0293) |
| Withdraw with penalty | -0.0146<br>(0.0174) | -0.000695<br>(0.0224) | -0.180***<br>(0.0434) |
| Withdraw low income | 0.168***<br>(0.0217) | 0.0943***<br>(0.0227) | 0.174***<br>(0.0368) |
| Withdraw for investments | 0.0993***<br>(0.0176) | 0.0793***<br>(0.0193) | -0.0866**<br>(0.0344) |
| Withdraw for mortgage | 0.228***<br>(0.0236) | 0.0947***<br>(0.0243) | 0.236***<br>(0.0463) |
| Constant | 0.00919<br>(0.00851) | 0.00531<br>(0.0103) | 0.0564***<br>(0.0200) |
| Observations | 27,856 | 13,152 | 14,704 |
| R-squared | 0.019 | 0.015 | 0.039 |

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

noise applied to the choice probabilities. Appendix 6 shows that halving or doubling the amount of noise we jitter the data with does not change the sign or the rough order of magnitude of our estimates.

Table 6 shows the WTPs for product attributes as compared to a baseline of not having to provide fiscal information (the smallest administrative burden) and not being able to withdraw contributions, respectively.

We find an overall WTP of -2.5% of the post-retirement annuity for having to compute one's annual contribution limit and having to provide one's income history in the full sample. This means that respondents are willing to give up 2.5% of their post-retirement benefit in order to avoid having to compute their own annual contribution limit or to provide an income history. Dividing estimates based on whether respondents are self-employed shows that the entire effect is driven by the self-employed. Self-employed workers have a WTP of 8%, while the WTP for employees is precisely estimated as 0%.

A likely explanation for this finding is that it is more difficult for self-employed workers to find out their past income than for employees. Payrolls are often stored by the employer for employees whereas self-employed workers typically have more uncertain incomes from multiple sources.

*Table 6: WTP estimates measured as a percentage of the post-retirement annuity. Standard errors are clustered at the individual level and in parentheses. WTPs are relative to a pension annuity which does not require any fiscal information and has no early money withdrawal options.*

| VARIABLES | (1) Full sample | (2) Self-employed | (3) Employees |
|---|---|---|---|
| Compute annual contribution limit | -2.443***<br>(0.545) | -8.121**<br>(2.972) | -0.152<br>(0.526) |
| Provide income history | -2.545***<br>(0.576) | -7.625**<br>(2.785) | -0.612<br>(0.580) |
| Withdraw with penalty | -0.583<br>(0.711) | -0.104<br>(3.348) | -3.579***<br>(0.904) |
| Withdraw low income | 6.721***<br>(0.689) | 14.06***<br>(4.236) | 3.456***<br>(0.711) |
| Withdraw for investments | 3.962***<br>(0.619) | 11.82**<br>(3.747) | -1.717*<br>(0.707) |
| Withdraw for mortgage | 9.101***<br>(0.788) | 14.12***<br>(4.050) | 4.681***<br>(0.829) |
| Observations | 27856 | 13152 | 14704 |

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

We find positive WTPs for flexibility, with the exception of the option to withdraw money with a fiscal penalty, for which the WTP is not significantly different from zero. For employees WTP estimates for early money withdrawal options with a fiscal penalty are even negative. This finding reveals that some employees like commitment more than flexibility in the form of options to withdraw money with a penalty. This finding is in line with Beshears et al. [2020], who find – using an online experiment – that some people prefer saving accounts with high withdrawal penalties over accounts with lower withdrawal penalties. This indicates that some of the respondents are partially or fully sophisticated present-biased agents.

Among self-employed workers, a WTP of approximately 14% of the annuity is found for the option to withdraw when income is low and for mortgage payments. Likewise, self- employed workers are willing to give up 12% of their retirement benefits for the option to withdraw for investments. Among employees, WTPs of 3.5% and 4.5% of their post-retirement annuity is found for the option to withdraw money when income is low and to withdraw money for mortgage payments, respectively. As such, both self-employed workers and employees seem to prefer more flexible retirement products, but the effect is much more pronounced for self-employed workers.

These results with respect to flexibility may be driven by self-employed workers facing larger income shocks than employees. As such, the option to supplement income or reduce one's mortgage is probably more valuable for self-employed

*Table 7: WTP estimates measured as a percentage of the post-retirement annuity separated by demographic characteristics. Standard errors are clustered at the individual level and in parentheses. Younger and older people are defined as aged between 25 and 40 and aged between 41 and 60, respectively. WTPs are relative to a pension annuity which does not require any fiscal information and has no early money withdrawal options.*

| | (1) Younger | (2) Older | (3) Male | (4) Female | (5) Renter | (6) Home owner |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | −2.311** | −2.481 | −1.155* | −8.498 | −12.80* | −2.954*** |
| | (0.814) | (1.825) | (0.532) | (4.605) | (5.102) | (0.713) |
| Provide income history | −1.986** | −2.987 | −1.618*** | −7.310 | −7.883* | −1.919** |
| | (0.723) | (1.726) | (0.487) | (4.067) | (3.682) | (0.602) |
| Withdraw with penalty | −1.891 | −2.675 | −1.703* | −6.851 | −0.616 | −1.705* |
| | (1.026) | (2.631) | (0.757) | (5.661) | (4.533) | (0.836) |
| Withdraw to compensate for low income | 5.170*** | 7.014** | 3.622*** | 14.66* | 19.75** | 5.354*** |
| | (0.943) | (2.484) | (0.678) | (6.451) | (6.286) | (0.721) |
| Withdraw for investments | 3.856*** | 2.476 | 1.151 | 9.782 | 12.61* | 1.897** |
| | (0.950) | (2.087) | (0.777) | (5.430) | (5.156) | (0.723) |
| Withdraw for mortgage | 8.229*** | 7.779** | 5.525*** | 14.31* | 15.72** | 8.803*** |
| | (1.146) | (2.584) | (0.828) | (5.999) | (5.347) | (0.887) |
| Observations | 11888 | 15968 | 17392 | 10464 | 7296 | 20272 |

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

respondents. This explanation is further compounded by the self-employed workers in our sample generally being risk averse. For investments, as self-employed workers are responsible for their own training, this may explain why self-employed workers have a positive WTP for investment-related withdrawals whereas employees do not.

### 5.2 Heterogeneity

In order to better understand what drives the differences in demand for retirement products – in particular, between the self-employed and workers – we now estimate heterogeneous effects with respect to demographic characteristics, financial position, and preferences.

Table 7 shows the WTPs separated by demographic characteristics. Younger and older workers have similar WTPs for all product attributes. Comparing men and women shows that women have much larger WTPs for reducing the administrative burden, withdrawals when income is low and withdrawals for mortgage payments. These effects may be driven by our sample of self-employed respondents containing more women.

Finally, renters have much larger WTPs for not having to provide fiscal information as well as low-income withdrawals and mortgage payment withdrawals than homeowners, although WTPs for renters are imprecisely estimated. Renters in our sample generally have less income, are less financially literate, and have fewer net liquid assets. With the increase in housing prices it has become difficult for renters to buy a house. Early withdrawal options may help renters purchase a house.

Table 8 shows the WTPs separated by respondents' financial position. As expected, low-income respondents have a much higher WTP for the option to withdraw money when income is low than high-income respondents. Low-income respondents also have a stronger distaste for having to provide fiscal information and a more pronounced taste for investment- related withdrawals. A similar pattern with respect to the flexibility attributes is found when comparing low and high-liquidity workers. A potential explanation for these findings is that low-income and low-liquidity workers are more affected by financial shocks. Workers who saved for retirement in 2019 have higher WTPs for all attributes except withdrawals with a fiscal penalty. Workers who want to save more for retirement have more pronounced WTPs than workers who do not. Surprisingly, WTPs for flexibility among workers who anticipate income fluctuations do not significantly differ from those for workers who do not anticipate income fluctuations. Moreover, respondents who are uncertain about their income as a result of Covid-19 and therefore consider early money withdrawal options have larger WTPs than those who are not.

Table 9 shows WTPs separated by the preferences of respondents. Risk averse workers have a higher WTP to reduce investment-related withdrawals than workers with low risk aversion, whereas other WTPs are similar. Present-biased respondents as well as respondents with a high discount rate have stronger distastes for having to provide fiscal information and exhibit higher WTPs for low-income, investment-related and mortgage-related withdrawals. Respondents with a self-assessed probability to live to 80 or older are more interested in investment-related withdrawals, but otherwise do not differ substantially from those with a low perceived probability of living to 80 or older. Workers who distrust pension funds have a higher WTP for investment-related withdrawals. Finally, estimates on the basis of annual contribution room are too imprecisely estimated to conclude any differences between the groups.

In order to investigate whether the role of demographic characteristics, preferences, and financial situation in the preferences for flexibility and a lower administrative burden differs for the self-employed as compared to employees, we also carry out the heterogeneity analysis for the self-employed workers separately. Tables A3,

*Table 8: WTP estimates measured as a percentage of the post-retirement annuity separated by income and pension characteristics. Standard errors are clustered at the individual level and in parentheses. Low (High) income is defined as household income being less than (equal to or more than €60.000. Low (High) liquidity defined as less than (equal to or more than) €20.000. (No)Save defined as whether someone saved (did not save) for retirement in 2019. (No)save more defined as answering neutrally or positively (negatively) to whether a respondent wants to save more for retirement. (Dis)Trusts pensionfunds defined as answering neutrally or positively (negatively) to question whether one trusts pension funds. (No)Covid defined as answering neutrally or positively (negatively) as to whether the Covid-19 pandemic makes the respondent's income uncertain. (No)Income fluc defined as answering neutrally or positively (negatively) as to whether the respondent anticipates income fluctuations over the next five years. WTPs are relative to a pension annuity which does not require any fiscal information and has no early money withdrawal options.*

| | (1) Low income | (2) High income | (3) Low liquidity | (4) High liquidity | (5) No save | (6) Save |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | -3.050* | -1.853** | -2.295** | -1.290 | -0.991 | -10.73* |
| | (1.260) | (0.713) | (0.859) | (0.665) | (0.554) | (4.687) |
| Provide income history | -4.580*** | -0.617 | -1.513 | -1.745** | -1.045* | -7.943* |
| | (1.332) | (0.617) | (0.819) | (0.665) | (0.515) | (3.904) |
| Withdraw with penalty | -1.269 | -2.676** | -1.451 | -1.803 | -2.336** | -5.259 |
| | (1.827) | (0.851) | (1.047) | (0.978) | (0.762) | (5.075) |
| Withdraw to compensate for low income | 8.350*** | 3.494*** | 7.638*** | 3.425*** | 3.622*** | 16.70** |
| | (1.815) | (0.787) | (1.087) | (0.835) | (0.727) | (6.335) |
| Withdraw for investments | 4.569** | 1.174 | 4.277*** | 1.506 | -0.0555 | 11.77* |
| | (1.588) | (0.718) | (0.961) | (0.777) | (0.774) | (5.140) |
| Withdraw for mortgage | 8.396*** | 6.905*** | 9.564*** | 6.209*** | 5.361*** | 16.10** |
| | (1.840) | (1.005) | (1.219) | (1.062) | (0.862) | (5.882) |
| Observations | 12368 | 10928 | 13632 | 10032 | 17792 | 10064 |

| | (7) No save more | (8) Save more | (9) No Covid | (10) Covid | (11) Income fluc | (12) Noin-comefluc |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | -2.887* | -3.098*** | -1.806** | -2.879 | -5.179* | -4.255 |
| | (1.142) | (0.750) | (0.669) | (2.002) | (2.244) | (2.779) |
| Provide income history | -0.997 | -2.867*** | -1.269 | -3.588 | -6.198** | -6.281* |
| | (1.267) | (0.651) | (0.715) | (1.990) | (2.090) | (3.040) |
| Withdraw with penalty | -4.825* | -0.901 | -3.868*** | -4.229 | 0.509 | -0.0802 |
| | (2.096) | (0.885) | (1.050) | (2.999) | (2.814) | (3.880) |
| Withdraw to compensate for low income | 3.389** | 6.956*** | 3.438*** | 7.896** | 11.31*** | 11.44** |
| | (1.244) | (0.818) | (0.801) | (2.837) | (3.158) | (4.257) |
| Withdraw for investments | -1.691 | 5.081*** | -1.179 | 6.116* | 11.09*** | 9.723* |
| | (1.467) | (0.888) | (0.811) | (2.537) | (3.156) | (3.999) |
| Withdraw for mortgage | 6.317*** | 9.564*** | 6.571*** | 9.101** | 11.48*** | 11.09** |
| | (1.461) | (0.974) | (0.923) | (2.917) | (3.226) | (3.987) |
| Observations | 5504 | 21632 | 11616 | 15872 | 9360 | 14320 |

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Table 9: WTP estimates measured as a percentage of the post-retirement annuity separated by personal preferences. Standard errors are clustered at the individual level and in parentheses. Low risk defined as a relative risk aversion coefficient between 1.16 and 3.46 ( and 1.16). Present-biased (Time-consistent) defined as a hyperbolic discounting parameter of less than (more than) 0.9. Low discount (High discount) defined as a discount factor of more than (less than) 0.9. Low prob80 (High prob80) defined as 50% or less (more than 50%) perceived probability of living to 80. Trust in pension funds measured for in both pension funds and private insurers. Annual Contribution defined as answering correctly when asked what the annual contribution limit is, No Annual Contribution defined as answering incorrectly when asked what the annual contribution limit is. WTPs are relative to a pension annuity which does not require any fiscal information and has no early money withdrawal options.*

| | (1) Low risk | (2) High risk | (3) Time-consistent | (4) Present-biased | (5) Low discount | (6) High discount |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | -2.500*** | -2.054 | -1.650** | -2.982* | -1.225* | -4.384** |
| | (0.711) | (1.926) | (0.613) | (1.185) | (0.568) | (1.370) |
| Provide income history | -1.649* | -3.912* | -1.358* | -4.721*** | -1.067 | -4.350*** |
| | (0.665) | (1.852) | (0.640) | (1.193) | (0.650) | (1.267) |
| Withdraw with penalty | -2.312** | 1.188 | -1.705 | -1.510 | -1.946* | -3.626* |
| | (0.897) | (2.713) | (0.903) | (1.560) | (0.916) | (1.731) |
| Withdraw to compensate for low income | 6.153*** | 7.217** | 5.354*** | 10.01*** | 5.348*** | 7.684*** |
| | (0.774) | (2.529) | (0.801) | (1.637) | (0.824) | (1.510) |
| Withdraw for investments | 3.935*** | 3.338 | 1.703* | 5.756*** | 1.220 | 7.774*** |
| | (0.744) | (2.140) | (0.789) | (1.347) | (0.767) | (1.569) |
| Withdraw for mortgage | 8.832*** | 8.865*** | 6.892*** | 11.44*** | 6.458*** | 11.71*** |
| | (0.903) | (2.573) | (1.020) | (1.696) | (0.986) | (1.745) |
| Observations | 21280 | 6576 | 18560 | 9296 | 18112 | 9744 |

| | (7) Low prob80 | (8) High prob80 | (9) Trust | (10) Distrust | (11) Annual Contribution | (12) No Annual Contribution |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | -1.572 | -2.936*** | -0.981 | -3.203*** | -0.651 | -4.175 |
| | (2.116) | (0.731) | (1.721) | (0.761) | (0.553) | (3.454) |
| Provide income history | -2.681 | -1.258 | -3.421 | -1.960** | -1.353 | -3.539 |
| | (1.904) | (0.754) | (1.812) | (0.654) | (0.700) | (3.007) |
| Withdraw with penalty | -3.321 | -2.546* | -19.69*** | 0.703 | -1.902* | -3.626 |
| | (3.007) | (1.087) | (5.901) | (0.750) | (0.905) | (4.485) |
| Withdraw to compensate for low income | 7.312* | 5.510*** | 8.828*** | 5.145*** | 5.970*** | 5.872 |
| | (3.024) | (0.840) | (2.625) | (0.723) | (0.793) | (4.358) |
| Withdraw for investments | 2.134 | 4.277*** | 1.686 | 4.277*** | 1.677* | 5.622 |
| | (2.457) | (0.804) | (2.019) | (0.830) | (0.717) | (3.902) |
| Withdraw for mortgage | 8.048** | 8.923*** | 8.286** | 9.092*** | 6.687*** | 10.37* |
| | (3.091) | (0.989) | (2.529) | (1.021) | (0.901) | (4.826) |
| Observations | 14736 | 13120 | 12048 | 15296 | 12832 | 15024 |

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A4, A7 show that roughly similar heterogeneity patterns hold among the subsample of self-employed workers, albeit with higher standard errors: Present bias and high discount rates remain major factors in the demand for a lower administrative burden, whereas income fluctuations and liquidity remain major factors in the demand for early withdrawal options.

All in all, our results suggest certain groups have substantial WTPs for having to reduce the administrative burden. WTPs are more pronounced for self-employed workers but negligible for employees. These results may be driven by the self-employed not having an employer-based income administration and working in several workplaces, thus making it more difficult for them to provide fiscal information. For the option to withdraw retirement savings early, we find sizable effects for both types of workers, although the WTP is more pronounced for self-employed workers. Options to withdraw when income is low and to withdraw for mortgages are especially associated with large WTPs.

## 6. Discussion and conclusion

In this paper we estimate the demand for pension products containing more flexibility and a lower administrative burden. Using a stated choice experiment, we compute the WTP for early flexibility when it comes to withdrawal options and a lower administrative burden when purchasing retirement products. We focus on self-employed workers and compare their demand with a representative group of employees. To account for individual uncertainty in individuals' choices, we follow (Manski [2004]) in eliciting choice probabilities as opposed to purely discrete choices. To this end, we estimate the median WTP of respondents while accounting for tied values that may arise as a result of rounding. Furthermore, we offer single retirement products as opposed to choices between two retirement products in half of our vignettes, so that we can take into account whether respondents are willing to buy retirement products in the first place.

We find that there is significant demand to lower the administrative burden for self-employed workers. Self-employed workers demand an 8% higher post-retirement benefit in exchange for having to provide fiscal information, be it having to compute one's tax- deductible retirement contribution or one's three-year income history, whereas employees are not keen to provide fiscal information. In fact, they are clearly not willing to give up a higher post-retirement benefit in exchange for a lower administrative burden.

The WTP for flexibility attributes is more striking. Both the option to withdraw money contributions to make mortgage payments and withdrawing money when income is low show significant and precisely estimated WTPs. For the option to withdraw money when income is low, WTP estimates range from 3% for employees to 14% of the post-retirement annuity for self-employed workers. For mortgage payments, these WTPs range from 5% to 14% of the post-retirement annuity. For investments, a WTP of 12% of the post-retirement annuity is found for self-employed workers with small positive WTPs. A negative WTP for withdrawals with a penalty is found among employees, indicating that these workers respond to conditions on withdrawing money.

There is substantial heterogeneity in WTPs among other groups. Workers who distrust pension funds, as well as workers who are present-biased and/or have high discount rates have high WTPs for a lower administrative burden. Respondents with few savings, younger respondents and homeowners in particular have a strong demand for liquidity. The willingness to withdraw money when income is low is strongly heterogeneous, with workers who have low incomes valuing this option most. Finally, present-biased respondents and respondents with high discount rates have much higher WTPs for early money withdrawal options than those who are not present-biased and have a low discount rate. One concern is that early money withdrawal options facilitate sub-optimal choices, especially for the former group.

All in all, our results provide grounds for both reducing the administrative burden that is needed to save for retirement while offering early money withdrawal options in exchange for a lower annuity. Both employees and self-employed workers stand to benefit from products that offer these characteristics, but effects are particularly pronounced for self-employed workers. In addition, our heterogeneity analysis can be used to inform policy makers on how to increase retirement savings through annuities, especially for groups that need this most. Specifically, since the self-employed and the lower income workers have a high WTP to reduce the administrative burden, one policy recommendation could be to abolish the need to provide financial information needed to purchase annuities for up to a certain amount per year.

## Appendix 1: Methodology

In this appendix we explain how we estimate the WTP for more flexible retirement products with a lower administrative burden. Our estimation method closely follows that of Ko¸sar et al. [2021]. We estimate logit models with the following bedrock specification:

$$U_j = B_j\alpha + P_j\beta + A_j\gamma + \xi_j \tag{1}$$

Where *j* denotes the alternative chosen. $B_j$ = (*AnnualContribution*$_j$, *IncomeHistory*$_j$) is a row vector with dummy variables describing administrative burden of option *j*, $F_j$ = (*Finej*, *Low Income*$_j$, *Investment*$_j$, *Mortgage*$_j$) is a row vector with dummy variables de- scribing flexibility of option *j*, and $A_j$ the annual annuity. $\alpha$ and $\beta$ denote vectors of coefficients, and $\xi_j$ follows an extreme value type 1 distribution. The baseline for administrative burden is 'not having to provide any financial information'. The baseline of flexibility is 'not being able to withdraw retirement savings.' As such, the assumed utility function is as follows:

$$\begin{aligned} U_j = \alpha_1 AnnualContribution_j + \alpha_2 IncomeHistory_j + \beta_1 Penalty_j \\ + \beta_2 LowIncome_j + \beta_3 Investment_j + \beta_4 Mortgage_j + \gamma Annuity_j + \xi_j \end{aligned} \tag{2}$$

Where Annual Contribution denotes a dummy variable reflection for whether one has to compute one's annual contribution limit, IncomeHistory denotes having to look up one's income over the past three years, Fine denotes the option to withdraw money contributions at a 20% fiscal penalty, *Low Income* denotes the option to withdraw money contributions when one's income falls below the minimum wage for a period of three months, *Investment* denotes the option to withdraw money contributions for investments, *Mortgage* denotes the option to withdraw money for mortgage payments, and Annuity denotes the monthly payout of the annuity after retirement. As our specification is linear and administrative burden and flexibility are measured through dummy variables, the WTP for a given attribute trivially equals the coefficient of said attribute over $\gamma$.

Respondents choose between two alternatives. The consequent conditional probability of an individual choosing alternative *j* over alternative *k* equals:

$$p(j) = Pr(j|B,F,A) = \frac{\exp(B_j\alpha + P_j\beta + A_j\gamma)}{\exp(B_j\alpha + P_j\beta + A_j\gamma) + \exp(B_k\alpha + P_k\beta + A_k\gamma)} \tag{3}$$

From (2) we derive the following log odds ratio:

$$\ln(\frac{p_j}{p_k}) = (B_j - B_k)\alpha + (P_j - P_k)\beta + (A_j - A_k)\gamma + (\xi_j - \xi_k) \ \forall \ j \neq k \quad (4)$$

Notice that respondents tend to round their choice probabilities to the nearest 5% or 10% (Manski [2004]). To take this into account we follow the literature and introduce measurement error into the model. We assume that our observed probabilities are measured with error such that

$$\ln(\frac{\tilde{p_j}}{\tilde{p_k}}) = (B_j - B_k)\alpha + (P_j - P_k)\beta + (A_j - A_k)\gamma + \eta_{jk} \ \forall \ j \neq k \quad (5)$$

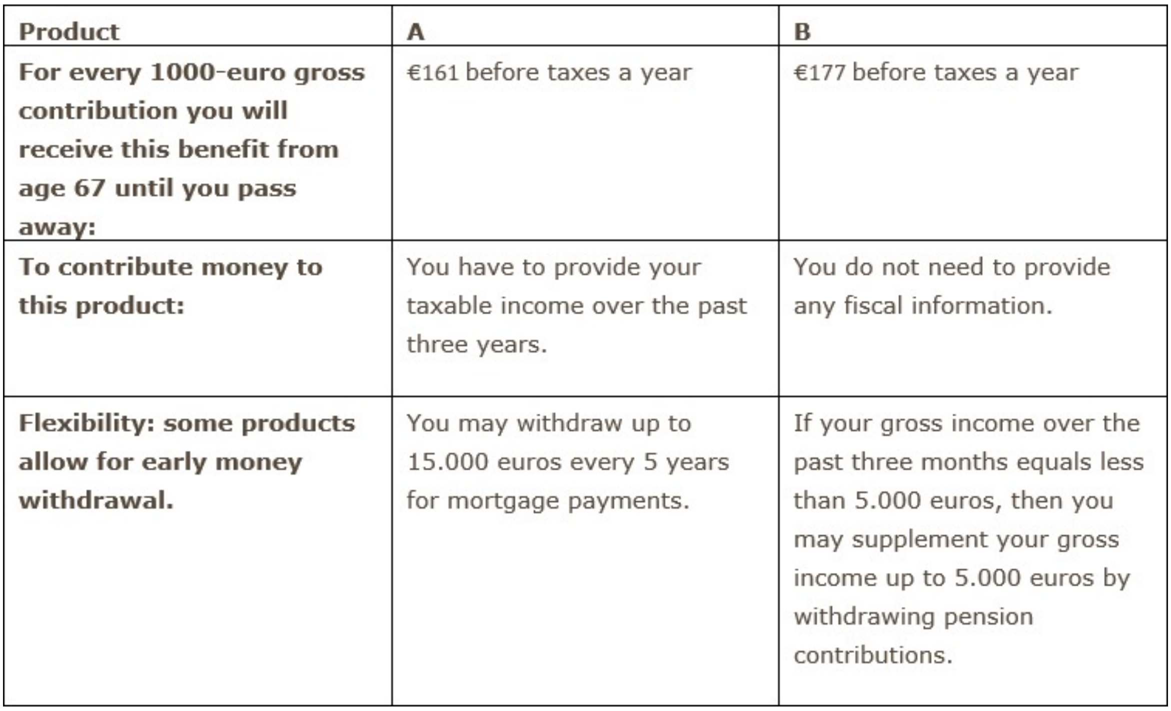
where $\eta_{jk}$ captures (the difference in) measurement errors. Following Blass et al. [2010] we use median regression. Median regression is more robust to outliers, and this is helpful for choice probabilities close to 0 or 1 (which occur in 12% of cases and 9% of cases, respectively), which yield log odds ratios of minus infinity and infinity. Assuming $\eta_{jk}$ is symmetrically distributed around 0 (conditional on $B$, $F$, and $A$), the following equation is estimated using Least Absolute Deviation (LAD):

$$M\Big[\ln(\frac{\tilde{p_j}}{\tilde{p_k}})|B,F,A\Big] = (B_j - B_k)\alpha + (P_j - P_k)\beta + (A_j - A_k)\gamma \ \forall \ j \neq k \quad (6)$$

Rounding, however, remains an issue to some extent, and is common in surveys (Klein- jans and Soest [2014]). First, quantile regression performs poorly when there are many (rounding-induced) tied values (Wilcox and Clark [2013]). While LAD estimation solves the problem of the estimates being strongly influenced by rounding, probabilities of 0 and 1 still need to be adjusted to allow for estimation of (8). To this end, we convert choice probabilities of 0 to 0.001 and choice probabilities of 1 to 0.999. Tied values as a result of rounding continue to cause issues in the median regression model. We follow Machado and Silva [2005] by jittering our data to break the aforementioned ties. We adjust the choice probabilities of respondents who round all of their choice probabilities to multiples of 5% by a uniform distribution between −2.5% and 2.5% and the probabilities of respondents who round all of their probabilities to multiples of 10% (but not 5%) by a uniform distribution between −5% and 5%. Note that adding this uniform noise does not violate the key identifying assumption of our model. Furthermore, different degrees of uniform noise as well as OLS yield roughly the same results as those presented in the results section.

## Appendix 2: Example of a vignette

*Figure A1: Example of a vignette*



| **Product** | **A** | **B** |
|---|---|---|
| **For every 1000-euro gross contribution you will receive this benefit from age 67 until you pass away:** | €161 before taxes a year | €177 before taxes a year |
| **To contribute money to this product:** | You have to provide your taxable income over the past three years. | You do not need to provide any fiscal information. |
| **Flexibility: some products allow for early money withdrawal.** | You may withdraw up to 15.000 euros every 5 years for mortgage payments. | If your gross income over the past three months equals less than 5.000 euros, then you may supplement your gross income up to 5.000 euros by withdrawing pension contributions. |

## Appendix 3: Rounding and zero probabilities

*Table A1: Rounding behavior of respondents*

| | Self-employed<br>Mean | Employees<br>Mean |
|---|---|---|
| All probabilities multiples of 5% | 0.24 | 0.20 |
| All probabilities multiples of 10% | 0.16 | 0.11 |
| All probabilities multiples of 50% | 0.11 | 0.07 |
| Observations | 13152 | 14704 |

*Table A2: Probabilities of zero in second set of vignettes (before rounding adjustments)*

| | Self-employed<br>Mean | Employees<br>Mean |
|---|---|---|
| Probability of zero to buy product A | 0.13 | 0.09 |
| Observations | 6576 | 7352 |

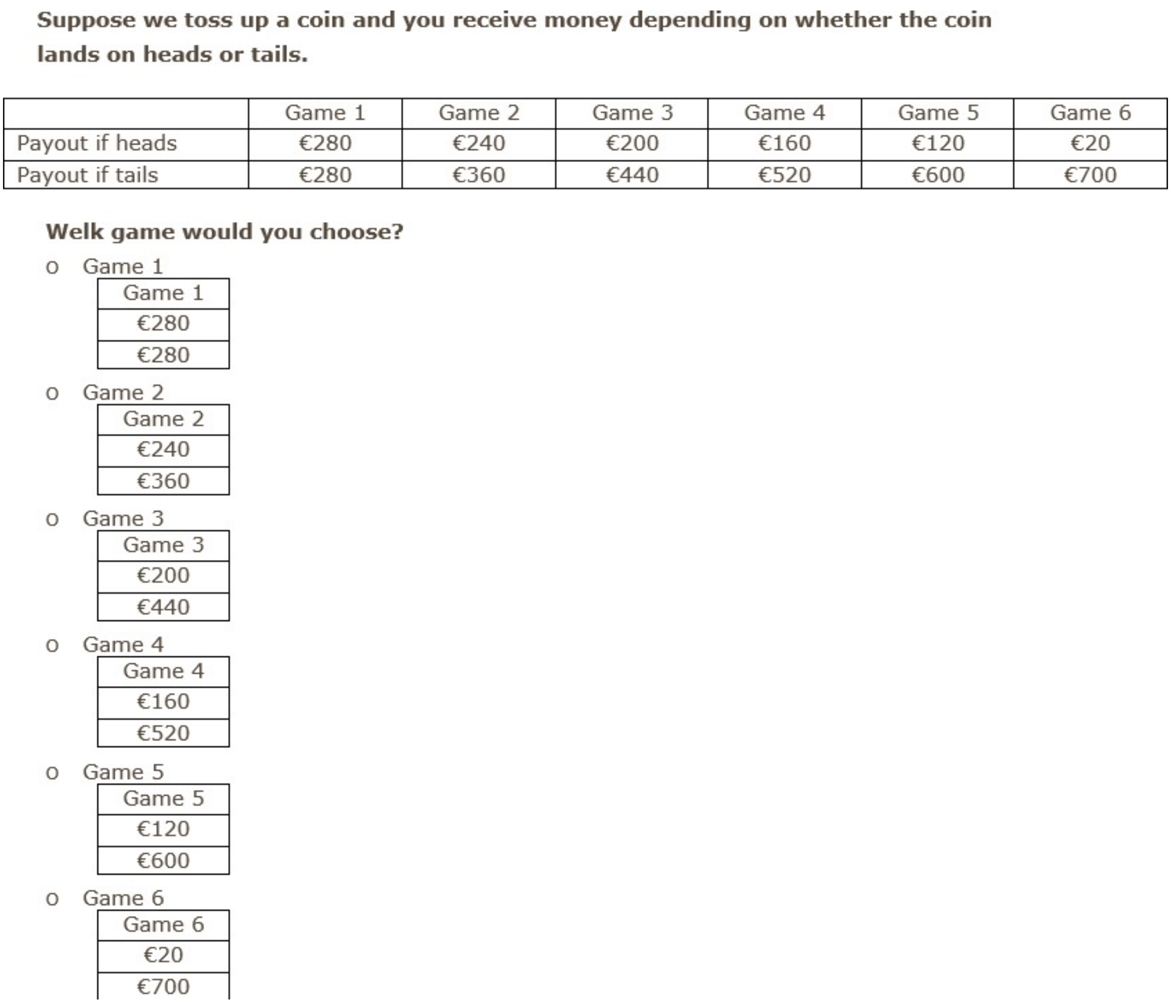
## Appendix 4: risk preference, present bias and bequest motive questions

### Financial Literacy

**On a scale from 1 to 10, how financially literate do you believe yourself to be?**

- (Input integer ranging from 1 to 10)

**Risk preference**



**Suppose we toss up a coin and you receive money depending on whether the coin lands on heads or tails.**

| | Game 1 | Game 2 | Game 3 | Game 4 | Game 5 | Game 6 |
|---|---|---|---|---|---|---|
| Payout if heads | €280 | €240 | €200 | €160 | €120 | €20 |
| Payout if tails | €280 | €360 | €440 | €520 | €600 | €700 |

**Welk game would you choose?**

○ Game 1

| Game 1 |
|---|
| €280 |
| €280 |

○ Game 2

| Game 2 |
|---|
| €240 |
| €360 |

○ Game 3

| Game 3 |
|---|
| €200 |
| €440 |

○ Game 4

| Game 4 |
|---|
| €160 |
| €520 |

○ Game 5

| Game 5 |
|---|
| €120 |
| €600 |

○ Game 6

| Game 6 |
|---|
| €20 |
| €700 |

**Time preference**

**Enter the amount for which option A and option B are equally appealing.**
**Assume prices will not change from today's prices (no inflation)**

- You receive €1.000 now
- You receive €[input] in 1 year

**Enter the amount for which option A and option B are equally appealing.**
**Assume prices will not change from today's prices (no inflation)**

- You receive €1.000 now
- You receive e[input] in 10 years

**Bequest motives**

**You will never face the following choices in real life. We still believe it interesting to know what you would do.**
**Suppose you're 80 years old. You are healthy and do not have any healthcare costs. You know you will suddenly die within a year.**
**Suppose you have a net income of €3.000 per month in your final year of life. Assume you have no other income sources or assets.**
**How much of this €3.000 would you spend yourself and how much would you leave for inheritance every month?**
- Spend: €[input] per month
- Leave for inheritance: €[input] per month

**You will never face the following choices in real life. We still believe it interesting to know what you would do.**
**Suppose you're 80 years old. You are healthy and do not have any healthcare costs. You know you will suddenly die within a year.**
**you have a net income of €9.000 per month in your final year of life. Assume you have no other income sources or assets.**
**How much of this €9.000 would you spend yourself and how much would you leave for inheritance every month?**
- Spend: €[input] per month
- Leave for inheritance: €[input] per month

**Trust in pension funds and insurers**

**Indicate to which degree you agree with the following statement:**
- I trust pension funds and insurers
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
- Don't know / no opinion

## Appendix 5: Heterogeneity among self-employed workers

*Table A3: Heterogeneity in demographic characteristics among self-employed workers*

| | (1)<br>Younger | (2)<br>Older | (3)<br>Male | (4)<br>Female | (5)<br>Renter | (6)<br>Home owner |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | −5.976 | −8.497 | −4.185* | −12.87 | −28.48 | −5.356** |
| | (3.219) | (5.679) | (1.667) | (9.878) | (20.83) | (1.805) |
| Provide income history | −8.001* | −7.417 | −5.759** | −8.803 | −14.63 | −5.639*** |
| | (3.137) | (5.072) | (1.801) | (7.527) | (11.60) | (1.647) |
| Withdraw with penalty | −4.963 | 0.914 | 1.046 | −9.921 | −5.434 | −0.449 |
| | (4.065) | (6.147) | (2.457) | (11.30) | (10.35) | (2.298) |
| Withdraw low income | 11.68** | 15.09 | 9.052*** | 19.71 | 54.42 | 8.748*** |
| | (4.289) | (8.139) | (2.521) | (13.27) | (35.39) | (2.373) |
| Withdraw for investments | 11.56** | 10.60 | 8.720*** | 13.97 | 28.67 | 7.798*** |
| | (4.077) | (6.584) | (2.333) | (10.29) | (19.97) | (2.147) |
| Withdraw for mortgage | 14.76** | 13.42 | 11.93*** | 16.60 | 21.38 | 13.08*** |
| | (4.680) | (7.377) | (2.717) | (11.19) | (15.06) | (2.752) |
| Observations | 5104 | 8048 | 6544 | 6608 | 3680 | 9328 |

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Table A4: Heterogeneity in pension characteristics among self-employed workers*

| | (1) Low income | (2) High income | (3) Low liquidity | (4) High liquidity | (5) No save | (6) Save |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | -11.47** | -3.273* | -12.38*** | -3.769 | -3.331 | -13.87* |
| | (3.955) | (1.525) | (3.211) | (2.602) | (1.949) | (6.489) |
| Provide income history | -9.266** | -2.982* | -6.879** | -5.399* | -4.628* | -8.629 |
| | (3.108) | (1.292) | (2.264) | (2.538) | (2.010) | (4.671) |
| Withdraw with penalty | 1.846 | 0.0245 | 2.315 | -0.641 | 0.628 | -4.890 |
| | (3.416) | (1.957) | (2.503) | (3.541) | (2.498) | (6.175) |
| Withdraw low income | 19.25*** | 7.398*** | 20.32*** | 7.025* | 7.217** | 20.57* |
| | (5.495) | (1.986) | (4.898) | (3.295) | (2.638) | (8.642) |
| Withdraw for investments | 13.25** | 7.774*** | 14.27*** | 6.933* | 7.495*** | 14.12* |
| | (4.376) | (1.869) | (3.573) | (3.208) | (2.260) | (6.683) |
| Withdraw for mortgage | 16.60*** | 10.48*** | 18.86*** | 10.60** | 9.564** | 19.21* |
| | (4.863) | (2.577) | (4.472) | (3.833) | (2.977) | (7.688) |
| Observations | 5664 | 4720 | 5776 | 5088 | 4336 | 8816 |

| | (7) No save more | (8) Save more | (9) No Covid | (10) Covid | (11) Income-fluc | (12) Noin-comefluc |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | -11.38* | -8.857*** | -6.854 | -7.517* | -11.18*** | -8.900 |
| | (5.373) | (2.260) | (3.806) | (3.455) | (3.014) | (4.655) |
| Provide income history | -4.737 | -8.187*** | -5.064 | -7.947* | -9.844*** | -9.330* |
| | (4.056) | (1.925) | (3.478) | (3.421) | (2.370) | (4.738) |
| Withdraw with penalty | -9.488 | 0.161 | -3.555 | 0.840 | -0.885 | -0.381 |
| | (7.199) | (2.326) | (5.188) | (4.033) | (2.884) | (5.304) |
| Withdraw low income | 1.328 | 15.09*** | 8.063 | 14.16** | 14.52*** | 15.09* |
| | (4.189) | (2.974) | (4.888) | (5.068) | (3.531) | (6.706) |
| Withdraw for investments | 0.502 | 12.66*** | 7.940 | 12.45** | 14.40*** | 13.37* |
| | (4.319) | (2.613) | (4.214) | (4.657) | (3.390) | (6.185) |
| Withdraw for mortgage | 8.894 | 14.94*** | 11.77* | 13.82** | 13.19*** | 14.27* |
| | (5.230) | (2.838) | (5.497) | (4.796) | (3.437) | (6.146) |
| Observations | 2256 | 10544 | 2672 | 10256 | 6800 | 9840 |

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Table A5: Heterogeneity in demographic characteristics among self-employed workers*

| | (1) Low risk | (2) High risk | (3) Rational | (4) Na¨ıve | (5) Low discount | (6) High discount |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | −9.603*** | −4.175 | −7.261 | −9.659*** | −3.139 | −12.04** |
| | (2.286) | (33.43) | (5.888) | (2.896) | (3.611) | (4.370) |
| Provide income history | −8.475*** | −4.195 | −6.163 | −8.936*** | −4.661 | −10.13** |
| | (1.816) | (35.35) | (5.305) | (2.500) | (3.595) | (3.518) |
| Withdraw with penalty | −0.0242 | −0.185 | −0.0907 | 1.109 | −0.652 | 0.672 |
| | (2.123) | (53.38) | (6.897) | (2.927) | (5.468) | (3.210) |
| Withdraw low income | 14.56*** | 11.44 | 8.802 | 19.70*** | 10.07 | 20.72** |
| | (2.825) | (53.61) | (7.353) | (4.588) | (5.552) | (6.403) |
| Withdraw for investments | 12.60*** | 8.511 | 11.31 | 14.41*** | 7.473 | 15.76** |
| | (2.610) | (43.08) | (7.734) | (3.688) | (4.889) | (5.026) |
| Withdraw for mortgage | 14.59*** | 13.10 | 13.17 | 17.40*** | 9.736 | 20.06*** |
| | (2.719) | (52.81) | (8.380) | (3.755) | (5.374) | (5.718) |
| Observations | 9984 | 3168 | 8784 | 4368 | 8560 | 4592 |

| | (7) Low prob80 | (8) High prob80 | (9) Trust | (10) Distrust | (11) Annual Contribution | (12) No AnnualContribution |
|---|---|---|---|---|---|---|
| Compute annual contribution limit | −7.521 | −6.506** | −9.294 | −5.810 | −3.303* | −9.782 |
| | (9.444) | (2.266) | (5.451) | (3.461) | (1.461) | (12.25) |
| Provide income history | −8.187 | −6.433** | −8.670 | −5.824 | −3.494** | −10.21 |
| | (8.413) | (2.137) | (5.366) | (3.152) | (1.280) | (11.54) |
| Withdraw with penalty | 1.285 | −5.893 | −30.39 | 2.623 | −5.511* | 2.623 |
| | (10.39) | (3.194) | (17.56) | (3.699) | (2.361) | (11.06) |
| Withdraw low income | 14.52 | 11.67*** | 21.48* | 9.608* | 7.097*** | 18.21 |
| | (14.31) | (2.709) | (9.795) | (4.291) | (1.698) | (18.07) |
| Withdraw for investments | 11.35 | 11.82*** | 12.15 | 10.36* | 6.148*** | 15.14 |
| | (12.32) | (2.614) | (7.167) | (4.323) | (1.551) | (15.99) |
| Withdraw for mortgage | 13.82 | 13.43*** | 17.90* | 12.84** | 9.383*** | 16.51 |
| | (13.26) | (2.984) | (8.288) | (4.609) | (1.987) | (16.16) |
| Observations | 6944 | 6208 | 6032 | 6848 | 6880 | 6272 |

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

## Appendix 6: LAD estimates with varying uniform noise applied

*Table A6: LAD estimates with half the uniform noise applied to rounders*

| VARIABLES | (1) Full sample | (2) Self-employed | (3) Employees |
|---|---|---|---|
| Benefit deviation % | 0.0238***<br>(0.00318) | 0.00339**<br>(0.00168) | 0.0491***<br>(0.00455) |
| Compute annual contribution limit | -0.0574***<br>(0.0123) | -0.0277*<br>(0.0156) | -0.00371<br>(0.0256) |
| Provide income history | -0.0593***<br>(0.0161) | -0.0260<br>(0.0162) | -0.0334<br>(0.0287) |
| Withdraw with penalty | -0.0141<br>(0.0177) | -0.000751<br>(0.0224) | -0.179***<br>(0.0440) |
| Withdraw low income | 0.162*** (<br>0.0246) | 0.0478**<br>(0.0220) | 0.178***<br>(0.0371) |
| Withdraw for investments | 0.0936***<br>(0.0213) | 0.0401**<br>(0.0186) | -0.0900***<br>(0.0338) |
| Withdraw for mortgage | 0.217***<br>(0.0274) | 0.0480**<br>(0.0236) | 0.238***<br>(0.0450) |
| Constant | 0.00792<br>(0.00881) | 0.00278<br>(0.0102) | 0.0606***<br>(0.0197) |
| Observations | 27,856 | 13,152 | 14,704 |
| R-squared | 0.019 | 0.015 | 0.038 |

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

*Table A7: LAD estimates with double the uniform noise applied to rounders*

| VARIABLES | (1) Full sample | (2) Self-employed | (3) Employees |
|---|---|---|---|
| Benefit deviation % | 0.0282***<br>(0.00243) | 0.0119***<br>(0.00222) | 0.0500***<br>(0.00437) |
| Compute annual contribution limit | -0.0665***<br>(0.0154) | -0.0890***<br>(0.0204) | -0.0137<br>(0.0264) |
| Provide income history | -0.0704***<br>(0.0152) | -0.0878***<br>(0.0188) | -0.0314<br>(0.0290) |
| Withdraw with penalty | -0.0355*<br>(0.0203) | -0.00549<br>(0.0255) | -0.191***<br>(0.0419) |
| Withdraw low income | 0.194***<br>(0.0220) | 0.166***<br>(0.0270) | 0.165***<br>(0.0361) |
| Withdraw for investments | 0.109***<br>(0.0186) | 0.141***<br>(0.0256) | -0.0894***<br>(0.0334) |
| Withdraw for mortgage | 0.257***<br>(0.0242) | 0.164***<br>(0.0293) | 0.248***<br>(0.0450) |
| Constant | 0.00794<br>(0.00947) | 0.00578<br>(0.0115) | 0.0595***<br>(0.0192) |
| Observations | 27,856 | 13,152 | 14,704 |
| R-squared | 0.020 | 0.015 | 0.039 |

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## References

Agnew, J. R., Anderson, L. R., Gerlach, J. R., and Szykman, L. R. (2008). Who chooses annuities? an experimental investigation of the role of gender, framing, and defaults. *American Economic Review*, *98* (2), 418–22.

Amador, M., Werning, I., and Angeletos, G.-M. (2006). Commitment vs. flexibility. *Econo- metrica*, *74* (2), 365–396.

Amromin, G., and Smith, P. (2003). What explains early withdrawals from retirement accounts? Evidence from a panel of taxpayers. *National Tax Journal*, 595–612.

Argento, R., Bryant, V. L., and Sabelhaus, J. (2015). Early withdrawals from retirement accounts during the great recession. *Contemporary Economic Policy*, *33* (1), 1–16.

Banks, J., Blundell, R., and Tanner, S. (1998). Is there a retirement-savings puzzle? *American Economic Review*, 769–788.

Benartzi, S., Previtero, A., and Thaler, R. H. (2011). Annuitization puzzles. *Journal of Economic Perspectives*, *25* (4), 143–64.

Benartzi, S., and Thaler, R. (2007). Heuristics and biases in retirement savings behavior. *Journal of Economic perspectives*, *21* (3), 81–104.

Beshears, J., Choi, J. J., Harris, C., Laibson, D., Madrian, B. C., and Sakong, J. (2020). Which early withdrawal penalty attracts the most deposits to a commitment savings account? *Journal of Public Economics*, *183* , 104144.

Beshears, J., Choi, J. J., Hurwitz, J., Laibson, D., and Madrian, B. C. (2015). Liquidity in retirement savings systems: An international comparison. *American Economic Review*, *105* (5), 420–25.

Beshears, J., Choi, J. J., Laibson, D., and Madrian, B. C. (2013). Simplification and saving. *Journal of economic behavior and organization*, *95* , 130–145.

Beshears, J., Choi, J. J., Laibson, D., Madrian, B. C., and Zeldes, S. P. (2014). What makes annuitization more appealing? *Journal of Public economics*, *116* , 2–16.

Blass, A. A., Lach, S., and Manski, C. F. (2010). Using elicited choice probabilities to estimate random utility models: Preferences for electricity reliability. *International Economic Review*, *51* (2), 421–440.

Boyer, M. M., Box-Couillard, S., and Michaud, P.-C. (2019). Demand for annuities: Price sensitivity, risk perceptions, and knowledge. *Journal of Economic Behavior and Organi- zation*.

Brown, Casey, M. D., and Mitchell, O. S. (2008). Who values the social security annuity? new evidence on the annuity puzzle. *NBER Working Paper*(W13800).

Brown, Kapteyn, A., Luttmer, E. F., and Mitchell, O. S. (2017). Cognitive constraints on valuing annuities. *Journal of the European Economic Association*, *15* (2), 429–462.

Brown, Kling, J. R., Mullainathan, S., and Wrobel, M. V. (2008). Why don't people insure late-life consumption? a framing explanation of the under-annuitization puzzle. *American Economic Review*, *98* (2), 304–09.

Brown, S., Farrell, L., Harris, M. N., and Sessions, J. G. (2006). Risk preference and employment contract type. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *169* (4), 849–863.

Browne, S., Milevsky, M. A., and Salisbury, T. S. (2003). Asset allocation and the liquidity premium for illiquid annuities. *Journal of Risk and Insurance*, *70* (3), 509–526.

Brüggen, L., Knoef, M., and Dur, R. (2017). Pensioen: de beperkte aandacht voor sparen voor later. *Preadviezen voor de Koninklijke Vereniging voor Staathuishoudkunde*, 31–37.

Bütler, M., and Teppa, F. (2007). The choice between an annuity and a lump sum: Results from swiss pension funds. *Journal of Public Economics*, *91* (10), 1944–1966.

Chetty, R., Friedman, J. N., Leth-Petersen, S., Nielsen, T. H., and Olsen, T. (2014). Active vs. passive decisions and crowd-out in retirement savings accounts: Evidence from denmark. *The Quarterly Journal of Economics*, *129* (3), 1141–1219.

*Choicemetrics (2012) ngene 1.1.1 user manual reference guide, australia*. (2019).

Dave, C., Eckel, C. C., Johnson, C. A., and Rojas, C. (2010). Eliciting risk preferences: When is simple better? *Journal of Risk and Uncertainty*, *41* (3), 219–243.

Davidoff, T., Brown, J. R., and Diamond, P. A. (2005). Annuities and individual welfare. *American Economic Review*, *95* (5), 1573–1590.

Dijsselbloem, J., De Waegenaere, A., van Ewijk, C., van der Horst, A., Knoef, M., and Steenbeek, O. (2019). Advies commissie parameters.

Dutch Law. (2020). AOW. Retrieved from "https://wetten.overheid.nl/BWBR0002221/ 2020-03-19"

Galiani, S., Gertler, P., and Ahumada, C. N. (2020, February). *Trust and saving in financial institutions* (Working Paper No. 26809). National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w26809 doi: 10.3386/w26809

Garc´ıa, A. N., Rossi, M., and van Soest, A. (2019). Retirement of the self-employed in the netherlands. *Small Business Economics*, 1–18.

Goldin, J., Homonoff, T., Patterson, R., and Skimmyhorn, W. (2020). How much to save? Decision costs and retirement plan participation. *Journal of Public Economics*, *191* , 104247.

Hershey, D. A., van Dalen, H. P., Conen, W., and Henkens, K. (2017). Are "voluntary" self-employed better prepared for retirement than "forced" self-employed? *Work, Aging and Retirement*, *3* (3), 243–256.

Horneff, V., Maurer, R., Mitchell, O. S., and Rogalla, R. (2015). Optimal life cycle portfo- lio choice with variable annuities offering liquidity and investment downside protection. *Insurance: Mathematics and Economics*, *63* , 91–107.

Joulfaian, D. (2018). Saving for retirement by the self-employed. *Journal of Pension Economics and Finance*, *17* (3), 316–334.

Kahn, J. A. (1988). Social security, liquidity, and early retirement. *Journal of Public Economics*, *35* (1), 97–117.

Kim, S., and Koh, K. (2020). Does early access to pension wealth improve health?

Kleinjans, K. J., and Soest, A. V. (2014). Rounding, focal point answers and nonresponse to subjective probability questions. *Journal of Applied Econometrics*, *29* (4), 567–585.

Knoef, M., Caminada, K., Been, J., and Goudswaard, K. (2017). De toereikendheid van pensioenopbouw na de crisis en pensioenhervormingen. *De toereikendheid van pensioenopbouw na de crisis en pensioenhervormingen*.

Koşar, G., Ransom, T., and Van der Klaauw, W. (2021). Understanding migration aversion using elicited counterfactual choice probabilities. *Journal of Econometrics*.

Linde, J. (2019). Voorstel keuzearchitectuur pensioensparen voor zelfstandigen. *Netspar Industry Series*(132).

Lockwood, L. M. (2012). Bequest motives and the annuity puzzle. *Review of economic dynamics*, *15* (2), 226–243.

Lockwood, L. M. (2018). Incidental bequests and the choice to self-insure late-life risks. *American Economic Review*, *108* (9), 2513–50.

Lusardi, A., and Mitchell, O. S. (2007). Financial literacy and retirement planning: New ev- idence from the rand american life panel. *Michigan Retirement Research Center Research Paper No. WP*, *157* .

Machado, J. A. F., and Silva, J. S. (2005). Quantiles for counts. *Journal of the American Statistical Association*, *100* (472), 1226–1237.

Manski, C. F. (2004). Measuring expectations. *Econometrica*, *72* (5), 1329–1376.

Masclet, D., Colombier, N., Denant-Boemont, L., and Loheac, Y. (2009). Group and individual risk preferences: A lottery-choice experiment with self-employed and salaried workers. *Journal of Economic Behavior and Organization*, *70* (3), 470–484.

Mastrogiacomo, M., and Alessie, R. J. (2015). Where are the retirement savings of self- employed? an analysis of 'unconventional'retirement accounts.

OECD. (2019). *pensions at a glance 2019*. Retrieved from "https://www.oecd-ilibrary.org/content/publication/b6d3dcfc-en"

Parker, S. C., and Rougier, J. C. (2007). The retirement behaviour of the self-employed in britain. *Applied Economics*, *39* (6), 697–713.

Parlevliet, J., Kooiman, T., et al. (2015). *Wealth formation of dutch households: a policy assessment* (Tech. Rep.). Netherlands Central Bank, Research Department.

Peijnenburg, K., Nijman, T., and Werker, B. J. (2016). The annuity puzzle remains a puzzle. *Journal of Economic Dynamics and Control*, *70* , 18–35.

Peijnenburg, K., Nijman, T., and Werker, B. J. (2017). Health cost risk: A potential solution to the annuity puzzle. *The Economic Journal*, *127* (603), 1598–1625.

Power, L., and Rider, M. (2002). The effect of tax-based savings incentives on the self- employed. *Journal of Public Economics*, *85* (1), 33–52.

Dutch Central Government (2021). STAP budget. https://www.rijksoverheid.nl/ onderwerpen/leven-lang-ontwikkelen/leven-lang-ontwikkelen-financiele-regelingen/stap-budget.

Dutch Ministry of Social Affairs. (2020). Kamerbrief voortgang individuele leerbudgetten en enkele onderwerpen rond flexibilisering aanbod.

GfK. (2017). Onderzoek GfK kennis jaarruimte. https://files.pressmailings.com/ee/3dea80d13011e7bdf6973b560840f3/Tabellenrapport-GfK---Kennis-Jaarruimte.pdf.

Rossi, M., and Sansone, D. (2018). Precautionary savings and the self-employed. *Small Business Economics*, *51* (1), 105–127.

Selin, H. (2012). Marginal tax rates and tax-favoured pension savings of the self-employed: Evidence from sweden. *The Scandinavian Journal of Economics*, *114* (1), 79–100.

Shu, S. B., Zeithammer, R., and Payne, J. W. (2016). Consumer preferences for annuity attributes: Beyond net present value. *Journal of Marketing Research*, *53* (2), 240–262.

Thaler, R. H., and Benartzi, S. (2007). The behavioral economics of retirement savings behavior.

Torre, W., Lautenbach, H., Ven, H., Janssen, B., Vroome, E. d. T., Janssen, B., . . . Bossche, S. (2019). Zelfstandigen enquˆete arbeid 2019.

Wang, M., Rieger, M. O., and Hens, T. (2016). How time preferences differ: Evidence from 53 countries. *Journal of Economic Psychology*, *52* , 115–135.

Wilcox, R. R., and Clark, F. (2013). Robust regression estimators when there are tied values. *Journal of Modern Applied Statistical Methods*, *12* (2), 3.

Yaari, M. E. (1965). Uncertain lifetime, life insurance, and the theory of the consumer. *The Review of Economic Studies*, *32* (2), 137–150.

Zwinkels, W., Knoef, M., Been, J., Caminada, K., and Goudswaard, K. (2017). Zicht op zzp pensioen. *Zicht op ZZP pensioen*.

Zwinkels, W., Knoef, M., Caminada, C., Goudswaard, K., Been, J., et al. (2017). Zelfs- tandigen zonder pensioen? *Economisch Statistische Berichten*, *102* , 3.

# OVERZICHT UITGAVEN IN DE DESIGN PAPER SERIE

1. Naar een nieuw pensioencontract (2011)
   Lans Bovenberg en Casper van Ewijk
2. Langlevenrisico in collectieve pensioencontracten (2011)
   Anja De Waegenaere, Alexander Paulis en Job Stigter
3. Bouwstenen voor nieuwe pensioencontracten en uitdagingen voor het toezicht daarop (2011)
   Theo Nijman en Lans Bovenberg
4. European supervision of pension funds: purpose, scope and design (2011)
   Niels Kortleve, Wilfried Mulder and Antoon Pelsser
5. Regulating pensions: Why the European Union matters (2011)
   Ton van den Brink, Hans van Meerten and Sybe de Vries
6. The design of European supervision of pension funds (2012)
   Dirk Broeders, Niels Kortleve, Antoon Pelsser and Jan-Willem Wijckmans
7. Hoe gevoelig is de uittredeleeftijd voor veranderingen in het pensioenstelsel? (2012)
   Didier Fouarge, Andries de Grip en Raymond Montizaan
8. De inkomensverdeling en levensverwachting van ouderen (2012)
   Marike Knoef, Rob Alessie en Adriaan Kalwij
9. Marktconsistente waardering van zachte pensioenrechten (2012)
   Theo Nijman en Bas Werker
10. De RAM in het nieuwe pensioenakkoord (2012)
    Frank de Jong en Peter Schotman
11. The longevity risk of the Dutch Actuarial Association’s projection model (2012)
    Frederik Peters, Wilma Nusselder and Johan Mackenbach
12. Het koppelen van pensioenleeftijd en pensioenaanspraken aan de levensverwachting (2012)
    Anja De Waegenaere, Bertrand Melenberg en Tim Boonen
13. Impliciete en expliciete leeftijdsdifferentiatie in pensioencontracten (2013)
    Roel Mehlkopf, Jan Bonenkamp, Casper van Ewijk, Harry ter Rele en Ed Westerhout
14. Hoofdlijnen Pensioenakkoord, juridisch begrepen (2013)
    Mark Heemskerk, Bas de Jong en René Maatman
15. Different people, different choices: The influence of visual stimuli in communication on pension choice (2013)
    Elisabeth Brüggen, Ingrid Rohde and Mijke van den Broeke
16. Herverdeling door pensioenregelingen (2013)
    Jan Bonenkamp, Wilma Nusselder, Johan Mackenbach, Frederik Peters en Harry ter Rele
17. Guarantees and habit formation in pension schemes: A critical analysis of the floor-leverage rule (2013)
    Frank de Jong and Yang Zhou
18. The holistic balance sheet as a building block in pension fund supervision (2013)
    Erwin Fransen, Niels Kortleve, Hans Schumacher, Hans Staring and Jan-Willem Wijckmans
19. Collective pension schemes and individual choice (2013)
    Jules van Binsbergen, Dirk Broeders, Myrthe de Jong and Ralph Koijen
20. Building a distribution builder: Design considerations for financial investment and pension decisions (2013)
    Bas Donkers, Carlos Lourenço, Daniel Goldstein and Benedict Dellaert

21 Escalerende garantietoezeggingen: een alternatief voor het StAr RAM-contract (2013)
Servaas van Bilsen, Roger Laeven en Theo Nijman

22 A reporting standard for defined contribution pension plans (2013)
Kees de Vaan, Daniele Fano, Herialt Mens and Giovanna Nicodano

23 Op naar actieve pensioenconsumenten: Inhoudelijke kenmerken en randvoorwaarden van effectieve pensioencommunicatie (2013)
Niels Kortleve, Guido Verbaal en Charlotte Kuiper

24 Naar een nieuw deelnemergericht UPO (2013)
Charlotte Kuiper, Arthur van Soest en Cees Dert

25 Measuring retirement savings adequacy; developing a multi-pillar approach in the Netherlands (2013)
Marike Knoef, Jim Been, Rob Alessie, Koen Caminada, Kees Goudswaard, and Adriaan Kalwij

26 Illiquiditeit voor pensioenfondsen en verzekeraars: Rendement versus risico (2014)
Joost Driessen

27 De doorsneesystematiek in aanvullende pensioenregelingen: effecten, alternatieven en transitiepaden (2014)
Jan Bonenkamp, Ryanne Cox en Marcel Lever

28 EIOPA: bevoegdheden en rechtsbescherming (2014)
Ivor Witte

29 Een institutionele beleggersblik op de Nederlandse woningmarkt (2013)
Dirk Brounen en Ronald Mahieu

30 Verzekeraar en het reële pensioencontract (2014)
Jolanda van den Brink, Erik Lutjens en Ivor Witte

31 Pensioen, consumptiebehoeften en ouderenzorg (2014)
Marike Knoef, Arjen Hussem, Arjan Soede en Jochem de Bresser

32 Habit formation: implications for pension plans (2014)
Frank de Jong and Yang Zhou

33 Het Algemeen pensioenfonds en de taakafbakening (2014)
Ivor Witte

34 Intergenerational Risk Trading (2014)
Jiajia Cui and Eduard Ponds

35 Beëindiging van de doorsneesystematiek: juridisch navigeren naar alternatieven (2015)
Dick Boeijen, Mark Heemskerk en René Maatman

36 Purchasing an annuity: now or later? The role of interest rates (2015)
Thijs Markwat, Roderick Molenaar and Juan Carlos Rodriguez

37 Entrepreneurs without wealth? An overview of their portfolio using different data sources for the Netherlands (2015)
Mauro Mastrogiacomo, Yue Li and Rik Dillingh

38 The psychology and economics of reverse mortgage attitudes. Evidence from the Netherlands (2015)
Rik Dillingh, Henriëtte Prast, Mariacristina Rossi and Cesira Urzì Brancati

39 Keuzevrijheid in de uittreedleeftijd (2015)
Arthur van Soest

40 Afschaffing doorsneesystematiek: verkenning van varianten (2015)
Jan Bonenkamp en Marcel Lever

41 Nederlandse pensioenopbouw in internationaal perspectief (2015)
Marike Knoef, Kees Goudswaard, Jim Been en Koen Caminada

42 Intergenerationele risicodeling in collectieve en individuele pensioencontracten (2015)
Jan Bonenkamp, Peter Broer en Ed Westerhout

43 Inflation Experiences of Retirees (2015)
Adriaan Kalwij, Rob Alessie, Jonathan Gardner and Ashik Anwar Ali

44 Financial fairness and conditional indexation (2015)
Torsten Kleinow and Hans Schumacher

45 Lessons from the Swedish occupational pension system (2015)
Lans Bovenberg, Ryanne Cox and Stefan Lundbergh

46 Heldere en harde pensioenrechten onder een PPR (2016)
Mark Heemskerk, René Maatman en Bas Werker

47 Segmentation of pension plan participants: Identifying dimensions of heterogeneity (2016)
Wiebke Eberhardt, Elisabeth Brüggen, Thomas Post and Chantal Hoet

48 How do people spend their time before and after retirement? (2016)
Johannes Binswanger

49 Naar een nieuwe aanpak voor risicoprofielmeting voor deelnemers in pensioenregelingen (2016)
Benedict Dellaert, Bas Donkers, Marc Turlings, Tom Steenkamp en Ed Vermeulen

50 Individueel defined contribution in de uitkeringsfase (2016)
Tom Steenkamp

51 Wat vinden en verwachten Nederlanders van het pensioen? (2016)
Arthur van Soest

52 Do life expectancy projections need to account for the impact of smoking? (2016)
Frederik Peters, Johan Mackenbach en Wilma Nusselder

53 Effecten van gelaagdheid in pensioendocumenten: een gebruikersstudie (2016)
Louise Nell, Leo Lentz en Henk Pander Maat

54 Term Structures with Converging Forward Rates (2016)
Michel Vellekoop and Jan de Kort

55 Participation and choice in funded pension plans (2016)
Manuel García-Huitrón and Eduard Ponds

56 Interest rate models for pension and insurance regulation (2016)
Dirk Broeders, Frank de Jong and Peter Schotman

57 An evaluation of the nFTK (2016)
Lei Shu, Bertrand Melenberg and Hans Schumacher

58 Pensioenen en inkomensongelijkheid onder ouderen in Europa (2016)
Koen Caminada, Kees Goudswaard, Jim Been en Marike Knoef

59 Towards a practical and scientifically sound tool for measuring time and risk preferences in pension savings decisions (2016)
Jan Potters, Arno Riedl and Paul Smeets

60 Save more or retire later? Retirement planning heterogeneity and perceptions of savings adequacy and income constraints (2016)
Ron van Schie, Benedict Dellaert and Bas Donkers

61 Uitstroom van oudere werknemers bij overheid en onderwijs. Selectie uit de poort (2016)
Frank Cörvers en Janneke Wilschut

62 Pension risk preferences. A personalized elicitation method and its impact on asset allocation (2016)
Gosse Alserda, Benedict Dellaert, Laurens Swinkels and Fieke van der Lecq

63 Market-consistent valuation of pension liabilities (2016)
Antoon Pelsser, Ahmad Salahnejhad and Ramon van den Akker

64 Will we repay our debts before retirement? Or did we already, but nobody noticed? (2016)
Mauro Mastrogiacomo

65 Effectieve ondersteuning van zelfmanagement voor de consument (2016)
Peter Lapperre, Alwin Oerlemans en Benedict Dellaert

66 Risk sharing rules for longevity risk: impact and wealth transfers (2017)
Anja De Waegenaere, Bertrand Melenberg and Thijs Markwat

67 Heterogeniteit in doorsneeproblematiek. Hoe pakt de transitie naar degressieve opbouw uit voor verschillende pensioenfondsen? (2017)
Loes Frehen, Wouter van Wel, Casper van Ewijk, Johan Bonekamp, Joost van Valkengoed en Dick Boeijen

68 De toereikendheid van pensioenopbouw na de crisis en pensioenhervormingen (2017)
Marike Knoef, Jim Been, Koen Caminada, Kees Goudswaard en Jason Rhuggenaath

69 De combinatie van betaald en onbetaald werk in de jaren voor pensioen (2017)
Marleen Damman en Hanna van Solinge

70 Default life-cycles for retirement savings (2017)
Anna Grebenchtchikova, Roderick Molenaar, Peter Schotman en Bas Werker

71 Welke keuzemogelijkheden zijn wenselijk vanuit het perspectief van de deelnemer? (2017)
Casper van Ewijk, Roel Mehlkopf, Sara van den Bleeken en Chantal Hoet

72 Activating pension plan participants: investment and assurance frames (2017)
Wiebke Eberhardt, Elisabeth Brüggen, Thomas Post en Chantal Hoet

73 Zerotopia – bounded and unbounded pension adventures (2017)
Samuel Sender

74 Keuzemogelijkheden en maatwerk binnen pensioenregelingen (2017)
Saskia Bakels, Agnes Joseph, Niels Kortleve en Theo Nijman

75 Polderen over het pensioenstelsel. Het debat tussen de sociale partners en de overheid over de oudedagvoorzieningen in Nederland, 1945-2000 (2017)
Paul Brusse

76 Van uitkeringsovereenkomst naar PPR (2017)
Mark Heemskerk, Kees Kamminga, René Maatman en Bas Werker

77 Pensioenresultaat bij degressieve opbouw en progressieve premie (2017)
Marcel Lever en Sander Muns

78 Bestedingsbehoeften bij een afnemende gezondheid na pensionering (2017)
Lieke Kools en Marike Knoef

79 Model Risk in the Pricing of Reverse Mortgage Products (2017)
Anja De Waegenaere, Bertrand Melenberg, Hans Schumacher, Lei Shu and Lieke Werner

80 Expected Shortfall voor toezicht op verzekeraars: is het relevant? (2017)
Tim Boonen

81 The Effect of the Assumed Interest Rate and Smoothing on Variable Annuities (2017)
Anne G. Balter and Bas J.M. Werker

82 Consumer acceptance of online pension investment advice (2017)
Benedict Dellaert, Bas Donkers and Carlos Lourenço

83 Individualized life-cycle investing (2017)
Gréta Oleár, Frank de Jong and Ingmar Minderhoud

84 The value and risk of intergenerational risk sharing (2017)
Bas Werker

85 Pensioenwensen voor en na de crisis (2017)
Jochem de Bresser, Marike Knoef en Lieke Kools

86 Welke vaste dalingen en welk beleggingsbeleid passen bij gewenste uitkeringsprofielen in verbeterde premieregelingen? (2017)
Johan Bonekamp, Lans Bovenberg, Theo Nijman en Bas Werker

87 Inkomens- en vermogensafhankelijke eigen bijdragen in de langdurige ouderenzorg: een levensloopperspectief (2017)
Arjen Hussem, Harry ter Rele en Bram Wouterse

88 Creating good choice environments – Insights from research and industry practice (2017)
Elisabeth Brüggen, Thomas Post and Kimberley van der Heijden

89 Two decades of working beyond age 65 in the Netherlands. Health trends and changes in socio-economic and work factors to determine the feasibility of extending working lives beyond age 65 (2017)
Dorly Deeg, Maaike van der Noordt and Suzan van der Pas

90 Cardiovascular disease in older workers. How can workforce participation be maintained in light of changes over time in determinants of cardiovascular disease? (2017)
Dorly Deeg, E. Burgers and Maaike van der Noordt

91 Zicht op zzp-pensioen (2017)
Wim Zwinkels, Marike Knoef, Jim Been, Koen Caminada en Kees Goudswaard

92 Return, risk, and the preferred mix of PAYG and funded pensions (2017)
Marcel Lever, Thomas Michielsen and Sander Muns

93 Life events and participant engagement in pension plans (2017)
Matthew Blakstad, Elisabeth Brüggen and Thomas Post

94 Parttime pensioneren en de arbeidsparticipatie (2017)
Raymond Montizaan

95 Keuzevrijheid in pensioen: ons brein wil niet kiezen, maar wel gekozen hebben (2018)
Walter Limpens en Joyce Vonken

96 Employability after age 65? Trends over 23 years in life expectancy in good and in poor physical and cognitive health of 65–74-year-olds in the Netherlands (2018)
Dorly Deeg, Maaike van der Noordt, Emiel Hoogendijk, Hannie Comijs and Martijn Huisman

97 Loslaten van de verplichte pensioenleeftijd en het organisatieklimaat rondom langer doorwerken (2018)
Jaap Oude Mulders, Kène Henkens en Harry van Dalen

98 Overgangseffecten bij introductie degressieve opbouw (2018)
Bas Werker

99 You're invited – RSVP! The role of tailoring in incentivising people to delve into their pension situation (2018)
Milena Dinkova, Sanne Elling, Adriaan Kalwij en Leo Lentz

100 Geleidelijke uittreding en de rol van deeltijdpensioen (2018)
Jonneke Bolhaar en Daniël van Vuuren

101 Naar een model voor pensioencommunicatie (2018)
Leo Lentz, Louise Nell en Henk Pander Maat

102 Tien jaar UPO. Een terugblik en vooruitblik op inhoud, doelen en effectiviteit (2018)
Sanne Elling en Leo Lentz

103 Health and household expenditures (2018)
Raun van Ooijen, Jochem de Bresser en Marike Knoef

104 Keuzevrijheid in de uitkeringsfase: internationale ervaringen (2018)
Marcel Lever, Eduard Ponds, Rik Dillingh en Ralph Stevens

105 The move towards riskier pension products in the world's best pension systems (2018)
Anne G. Balter, Malene Kallestrup-Lamb and Jesper Rangvid

106 Life Cycle Option Value: The value of consumer flexibility in planning for retirement (2018)
Sonja Wendel, Benedict Dellaert and Bas Donkers

107 Naar een duidelijk eigendomsbegrip (2018)
Jop Tangelder

108 Effect van stijging AOW-leeftijd op arbeidsongeschiktheid (2018)
Rik Dillingh, Jonneke Bolhaar, Marcel Lever, Harry ter Rele, Lisette Swart en Koen van der Ven

109 Is de toekomst gearriveerd? Data science en individuele keuzemogelijkheden in pensioen (2018)
Wesley Kaufmann, Bastiaan Starink en Bas Werker

110 De woontevredenheid van ouderen in Nederland (2018)
Jan Rouwendal

111 Towards better prediction of individual longevity (2018)
Dorly Deeg, Jan Kardaun, Maaike van der Noordt, Emiel Hoogendijk en Natasja van Schoor

112 Framing in pensioenkeuzes. Het effect van framing in de keuze voor beleggingsprofiel in DC-plannen naar aanleiding van de Wet verbeterde premieregeling (2018)
Marijke van Putten, Rogier Potter van Loon, Marc Turlings en Eric van Dijk

113 Working life expectancy in good and poor self-perceived health among Dutch workers aged 55–65 years with a chronic disease over the period 1992–2016 (2019)
Astrid de Wind, Maaike van der Noordt, Dorly Deeg and Cécile Boot

114 Working conditions in post-retirement jobs: A European comparison (2019)
Ellen Dingemans and Kène Henkens

115 Is additional indebtedness the way to increase mortgage-default insurance coverage? (2019)
Yeorim Kim, Mauro Mastrogiacomo, Stefan Hochguertel and Hans Bloemen

116 Appreciated but complicated pension Choices? Insights from the Swedish Premium Pension System (2019)
Monika Böhnke, Elisabeth Brüggen and Thomas Post

117 Towards integrated personal financial planning. Information barriers and design propositions (2019)
Nitesh Bharosa and Marijn Janssen

118 The effect of tailoring pension information on navigation behavior (2019)
Milena Dinkova, Sanne Elling, Adriaan Kalwij and Leo Lentz

119 Opleiding, levensverwachting en pensioenleeftijd: een vergelijking van Nederland met andere Europese landen (2019)
Johan Mackenbach, José Rubio Valverde en Wilma Nusselder

120 Giving with a warm hand: Evidence on estate planning and bequests (2019)
Eduard Suari-Andreu, Raun van Ooijen, Rob J.M. Alessie and Viola Angelini

121 Investeren in menselijk kapitaal: een gecombineerd werknemers- en werkgeversperspectief (2019)
Raymond Montizaan, Merlin Nieste en Davey Poulissen

122 The rise in life expectancy – corresponding rise in subjective life expectancy? Changes over the period 1999-2016 (2019)
Dorly Deeg, Maaike van der Noordt, Noëlle Sant, Henrike Galenkamp, Fanny Janssen and Martijn Huisman

123 Pensioenaanvullingen uit het eigen woningbezit (2019)
Dirk Brounen, Niels Kortleve en Eduard Ponds

124 Personal and work-related predictors of early exit from paid work among older workers with health limitations (2019)
Nils Plomp, Sascha de Breij and Dorly Deeg

125 Het delen van langlevenrisico (2019)
Anja De Waegenaere, Agnes Joseph, Pascal Janssen en Michel Vellekoop

126 Maatwerk in pensioencommunicatie (2019)
S.K. Elling en L.R. Lentz

127 Dutch Employers' Responses to an Aging Workforce: Evidence from Surveys, 2009-2017 (2019)
Jaap Oude Mulders, Kène Henkens and Hendrik P. van Dalen

128 Preferences for solidarity and attitudes towards the Dutch pension system – Evidence from a representative sample (2019)
Arno Riedl, Hans Schmeets and Peter Werner

129 Deeltijdpensioen geen wondermiddel voor langer doorwerken (2019)
Henk-Wim de Boer, Tunga Kantarcı, Daniel van Vuuren en Ed Westerhout

130 Spaarmotieven en consumptiegedrag (2019)
Johan Bonekamp en Arthur van Soest

131 Substitute services: a barrier to controlling long-term care expenditures (2019)
Mark Kattenberg and Pieter Bakx

132 Voorstel keuzearchitectuur pensioensparen voor zelfstandigen (2019)
Jona Linde

133 The impact of the virtual integration of assets on pension risk preferences of individuals (2019)
Sesil Lim, Bas Donkers en Benedict Dellaert

134 Reforming the statutory retirement age: Policy preferences of employers (2019)
Hendrik P. van Dalen, Kène Henkens and Jaap Oude Mulders

135 Compensatie bij afschaffing doorsnee-systematiek (2019)
Dick Boeijen, Chantal de Groot, Mark Heemskerk, Niels Kortleve en René Maatman

136 Debt affordability after retirement, interest rate shocks and voluntary repayments (2019)
Mauro Mastrogiacomo

137 Using social norms to activate pension plan members: insights from practice (2019)
Joyce Augustus-Vonken, Pieter Verhallen, Lisa Brüggen and Thomas Post

138 Alternatieven voor de huidige verplichtstelling van bedrijfstakpensioenfondsen (2020)
Erik Lutjens en Fieke van der Lecq

139 Eigen bijdrage aan ouderenzorg (2020)
Pieter Bakx, Judith Bom, Marianne Tenand en Bram Wouterse

140 Inrichting fiscaal kader bij afschaffing doorsneesystematiek (2020)
Bastiaan Starink en Michael Visser

141 Hervorming langdurige zorg: trends in het gebruik van verpleging en verzorging (2020)
Pieter Bakx, Pilar Garcia-Gomez, Sara Rellstab, Erik Schut en Eddy van Doorslaer

142 Genetic health risks, insurance, and retirement (2020)
Richard Karlsson Linnér and Philipp D. Koellinger

143 Publieke middelen voor particuliere ouderenzorg (2020)
Arjen Hussem, Marianne Tenand en Pieter Bakx

144 Emotions and technology in pension service interactions: Taking stock and moving forward (2020)
Wiebke Eberhardt, Alexander Henkel en Chantal Hoet

145 Opleidingsverschillen in levensverwachting: de bijdrage van acht risicofactoren (2020)
Wilma J. Nusselder, José Rubio Valverde en Johan P. Mackenbach

146 Shades of Labor: Motives of Older Adults to Participate in Productive Activities (2020)
Sonja Wendel and Benedict Dellaert

147 Raising pension awareness through letters and social media: Evidence from a randomized and a quasi-experiment (2020)
Marike Knoef, Jim Been and Marijke van Putten

148 Infographics and Financial Decisions (2020)
Ruben Cox and Peter de Goeij

149 To what extent can partial retirement ensure retirement income adequacy? (2020)
Tunga Kantarcı and Jochem Zweerink

150 De steun voor een 'zwareberoepenregeling' ontleed (2020)
Harry van Dalen, Kène Henkens en Jaap Oude Mulders

151 Verbeteren van de inzetbaarheid van oudere werknemers tot aan pensioen: literatuuroverzicht, inzichten uit de praktijk en de rol van pensioenuitvoerders (2020)
Peter Lapperre, Henk Heek, Pascal Corten, Ad van Zonneveld, Robert Boulogne, Marieke Koeman en Benedict Dellaert

152 Betere risicospreiding van eigen bijdragen in de verpleeghuiszorg (2020)
Bram Wouterse, Arjen Hussem en Rob Aalbers

153 Doorbeleggen met garanties? (2020)
Roderick Molenaar, Peter Schotman, Peter Dekkers en Mark Irwin

154 Differences in retirement preferences between the self-employed and employees: Do job characteristics play an explanatory role? (2020)
Marleen Damman, Dieuwke Zwier en Swenne G. van den Heuvel

155 Do financial incentives stimulate partially disabled persons to return to work? (2020)
Tunga Kantarcı and Jan-Maarten van Sonsbeek

156 Wijzigen van de bedrijfstakpensioenregeling: tussen pensioenfondsbestuur en sociale partners (2020)
J.R.C. Tangelder

157 Keuzes tijdens de pensioenopbouw: de effecten van nudging met volgorde en standaardopties (2020)
Wilte Zijlstra, Jochem de Bresser en Marike Knoef

158 Keuzes rondom pensioen: implicaties op uitkeringssnelheid voor een heterogeen deelnemersbestand (2020)
Servaas van Bilsen, Johan Bonekamp, en Eduard Ponds

159 Met big data inspelen op woonwensen en woongedrag van ouderen: praktische inzichten voor ontwerp en beleid (2020)
Ioulia V. Ossokina en Theo A. Arentze

160 Economic consequences of widowhood: Evidence from a survivor's benefits reform in the Netherlands (2020)
Jeroen van der Vaart, Rob Alessie and Raun van Ooijen

161 How will disabled workers respond to a higher retirement age? (2020)
Tunga Kantarcı, Jim Been and Arthur van Soest

162 Deeltijdpensioen: belangstelling en belemmeringen op de werkvloer (2020)
Hanna van Solinge, Harry van Dalen en Kène Henkens

163 Investing for Retirement with an Explicit Benchmark (2020)
Anne Balter, Lennard Beijering, Pascal Janssen, Frank de Jong, Agnes Joseph, Thijs Kamma and Antoon Pelsser

164 Vergrijzing en verzuim: impact op de verzekeringsvoorkeuren van werkgevers (2020)
Remco Mallee en Raymond Montizaan

165 Arbeidsmarkteffecten van de pensioenpremiesystematiek (2020)
Marike Knoef, Sander Muns en Arthur van Soest

166 Risk Sharing within Pension Schemes (2020)
Anne Balter, Frank de Jong en Antoon Pelsser

167 Supporting pension participants: Three lessons learned from the medical domain for better pension decisions (2021)
Jelle Strikwerda, Bregje Holleman and Hans Hoeken

168 Variable annuities with financial risk and longevity risk in the decumulation phase of Dutch DC products (2021)
Bart Dees, Frank de Jong and Theo Nijman

169 Verloren levensjaren als gevolg van sterfte aan Covid-19 (2021)
Bram Wouterse, Frederique Ram en Pieter van Baal

170 Which work conditions can encourage older workers to work overtime? (2021)
Raymond Montizaan and Annemarie Kuenn-Nelen

171 Herverdeling van individueel pensioenvermogen naar partnerpensioen: een stated preference-analyse (2021)
Raymond Montizaan

172 Risicogedrag na een ramp; implicaties voor pensioenen (2021)
Martijn de Vries

173 The Impact of Climate Change on Optimal Asset Allocation for Long-Term Investors (2021)
Mathijs Cosemans, Xander Hut and Mathijs van Dijk

174 Beleggingsbeleid bij onzekerheid over risicobereidheid en budget (2021)
Agnes Joseph, Antoon Pelsser en Lieke Werner

175 On the Resilience of ESG Stocks during COVID-19: Global Evidence (2021)
Gianfranco Gianfrate, Tim Kievid & Mathijs van Dijk

176 De solidariteitsreserve juridisch ontrafeld (2021)
Erik Lutjens en Herman Kappelle

177 Hoe vertrouwen in politiek en maatschappij doorwerkt in vertrouwen in pensioeninstituties (2021)
Harry van Dalen en Kène Henkens

178 Gelijke rechten, maar geen gelijke pensioenen: de gender gap in Nederlandse tweedepijlerpensioenen (2021)
Suzanne Kali, Jim Been, Marike Knoef en Albert van Marwijk Kooy

179 Completing Dutch pension reform (2021)
Ed Westerhout, Eduard Ponds and Peter Zwaneveld

180 When and why do employers hire and rehire employees beyond normal retirement age? (2021)
Orlaith C. Tunney and Jaap Oude Mulders

181 Family and government insurance: Wage, earnings, and income risks in the Netherlands and the U.S. (2021)
Mariacristina De Nardi, Giulio Fella, Marike Knoef, Gonzalo Paz-Pardo and Raun van Ooijen

182 Het gebruik van data in de pensioenmarkt (2021)
Willem van der Deijl, Marije Kloek, Koen Vaassen en Bas Werker
183 Applied Data Science in the Pension Industry: A Survey and Outlook (2021)
Onaopepo Adekunle, Michel Dumontier and Arno Riedl
184 Individual differences in accessing personalized online pension information: Inertia and a digital hurdle (2021)
Milena Dinkova, Adriaan Kalwij & Leo Lentz
185 Transitie: gevoeligheid voor veronderstellingen en omstandigheden (2021)
Anne Balter, Jan Bonenkamp en Bas Werker
186 De voordelen van de solidariteitsreserve ontrafeld (2021)
Servaas van Bilsen, Roel Mehlkopf en Antoon Pelsser
187 Consumption and time use responses to unemployment (2021)
Jim Been, Eduard Suari-Andreu, Marike Knoef en Rob Alessie
188 Wat is inertie? (2021)
Marijke van Putten en Robert-Jan Bastiaan de Rooij
189 The effect of the Dutch financial assessment framework on the mortgage investments of pension funds (2021)
Yeorim Kim and Mauro Mastrogiacomo
190 The Recovery Potential for Underfunded Pension Plans (2021)
Li Yang, Antoon Pelsser and Michel Vellekoop
191 Trends in verschillende gezondheidsindicatoren: de rol van opleidingsniveau (2021)
Wilma J. Nusselder, José Rubio Valverde en Dorly Deeg
192 Toedeling van rendementen met spreiding (2021)
Anne Balter en Bas Werker
193 Occupational pensions, macroprudential limits, and the financial position of the self-employed (2021)
Francesco G. Caloia, Stefan Hochguertel and Mauro Mastrogiacomo
194 How do spouses respond when disability benefits are lost? (2021)
Mario Bernasconi, Tunga Kantarcı, Arthur van Soest, and Jan-Maarten van Sonsbeek
195 Pension Payout Preferences (2021)
Rik Dillingh and Maria Zumbuehl
196 Naar de kern van pensioenkeuzes (2021)
Jelle Strikwerda, Bregje Holleman en Hans Hoeken
197 The Demand for Retirement Products: The Role of Withdrawal Flexibility and Administrative Burden (2021)
Pim Koopmans, Marike Knoef and Max van Lent

Network for Studies on Pensions, Aging and Retirement

This is a publication of:
Netspar
Phone +31 13 466 2109
E-mail info@netspar.nl
www.netspar.nl

November 2021