Thesis Econometrics and Data Science

Research Proposal

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The RVU Exemption and Demanding Jobs: An ML Based Effectiveness Analysis

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1 Introduction

1.1 Motivation

To increase labour market participation of older citizens, the statutory retirement age (SRA) in the Netherlands, also referred to as the AOW age, has stepwise increased from 65 to 67 years over the last years (Rabaté et al., 2024). Additionally, early retirement policies have become stricter, giving fewer people the opportunity to retire retire before the SRA (Visser et al., 2016).

Where these policies help to reduce public costs and increase public income related to retirement, concerns have been raised regarding people with demanding jobs. Many already struggled to reach retirement at the old SRA (Vermeer et al., 2016) and may go into social support programs (Chirikos and Nestel, 1991).

Recently, in 2021, a new (temporary) early retirement policy has been introduced in the form of the RVU-exemption. This regulation gives the possibility for fiscal benefits when retiring up to three years early.[1] As in the Netherlands we have a hard time classifying what is a fruit or vegetable, determining which jobs are "demanding" and which are not does not stand a chance legislation-wise (bron nog zoeken). Therefore, everyone can make use of this law, if agreed upon by the employer and the employee(s).

Because this rule is aimed to support people with demanding jobs to make it to retirement, but everyone is able to use it, one might wonder whether the intended goal is reached. If not, and people with non-demanding jobs are using it to pull forward their indefinite holiday, this could cost the public large amounts of money. As the impact of retirement policy reforms depends on how they affects labour markets (Rabaté et al., 2024), it is important to continuously evaluate the effectiveness of retirement policies.

1.2 Background

1.2.1 The Dutch Pension System

The Dutch pensions system is organized into three pillars: state pension (AOW), sector- or company-specific pension, and own savings.

The first pillar, the AOW, is a fixed monthly contribution that everyone gets from a certain age and is paid for by the current working population. The amount is independent of previous wages and equal to 70% of the social minimum wage (Rabaté et al., 2024). The age from which Dutch citizens are entitled to AOW, the SRA, has increased from 65 in 2012 to 67 at the current day (2025). There are plans to tie the SRA to the life-expectancy (Vermeer et al., 2016).

The second pillar, the sector- or company-specific pension, also pays out monthly amounts. However, this is paid from a big pot which everyone in the pension fund collected together, and you get a bigger share if you put in more money. For people who earned a lot of money during their working life, this can be a big share of the total retirement income (Vermeer et al., 2016)). Whereas the first pillar starts from a fixed age and can not be pulled forward, it is possible to start second pillar payments early, against an actuarially fair reduction(De Vos et al., 2018). Pensions can be either Defined Benefit (DB) or Defined Contribution, but with the "nieuwe pensioenstelsel" all pension funds are moving towards Defined Contribution

[1] A summary can be found here

Lastly, the third pillar consists of voluntary contributions and individual savings from retirement. This pillar gives individuals the opportunity to increase their retirement income above the level provided by the state and their pension fund.

The median replacement rate of the first two pillars together comes to around 68% of their final income, reaching 82% when adding the third pillar (Knoef et al., 2017). See Rabaté et al. (2024) for a more in-depth overview of the Dutch pension system.

1.2.2 Early Retirement

As briefly mentioned, not everyone works until the SRA. Recent data shows that around 30% of the population works until the SRA and about 10% continues working after Knol et al. (2025) (mag ik deze al citen?). People who retire early usually do this through either social security programs (disability insurance or unemployment insurance), early retirement schemes, or by living of savings or the income of a partner until the SRA (Henkens and Tazelaar, 1994; Zwick et al., 2022).

Several studies have investigated what are the biggest drivers for people to retire early. People stop working early for a number of reasons, from being pushed into retirement by negative things like high demanding jobs or poor health, to being pulled into retirement by aspects like a comfortable financial position or positive social and personal factors (Euwals et al., 2010; De Wind et al., 2014; van den Bogaard et al., 2016).

From these, the financial possibility to stop working is often regarded as the biggest driver (De Wind et al., 2014). This can be either because of a generous pension scheme, large pension wealth, a partner with income or enough savings (Euwals et al., 2010).

Social and personal factors can play a role by, for example, a partner having a positive view on early retirement (De Wind et al., 2014; Henkens and Tazelaar, 1994), a non-comfortable work-environment that lacks appreciation and/or challenge (De Wind et al., 2014), or the desire for freedom and leisure (van den Bogaard et al., 2016).

Demanding jobs can push people towards retirement. Regarding physically demanding hobs, particularly for men, repetitive lifting of heavy objects can cause declining health (von Bonsdorff et al., 2023). However, psychologically stress jobs can also cause health-related problems, and is argued to be related to the biggest increase in health after retirement (van den Bogaard et al., 2016).

With the VUT (vervroegde uittreding) schemes, with low eligibility age and actuarially unfairly high replacement rates, the Netherlands used to have extremely favourable early retirement schemes (Euwals et al., 2011). Because these were widely used and accepted, the labour force participation rate among older workers was very low (Henkens and Tazelaar, 1994). From 2006 onwards, these schemes were abolished and social security benefits were tightened, resulting in an increase in labour participation until the SRA (Euwals et al., 2010, 2011).

After the abolishment of the VUT schemes two more early retirement policies were implemented, in the form of Life Course savings (2006-2012) and the Doorwerkbonus (2012-2018), but they were both discontinued (Rabaté et al., 2024).

1.2.3 Demanding Jobs

Supra (duur woord, gelezen in EC paper en nu ook in mijn vocabulair), we touched upon the relation between demanding jobs and early retirement. Bakker and Demerouti (2007) state the definition "jobs that require sustained physical and/or psychological effort". However, this definition of what makes a job "demanding" is still subject to some sense of subjectivity and the Dutch legislature has struggled to consistently categorize jobs accordingly. This brings along the struggle of reaching the right audience with the right policy. For example, Zwick et al. (2022) show that an early retirement scheme for women in Germany did not reach the workers with high job demand, for whom it was intended.

Hooftman and Houtman (2010) and van den Bogaard et al. (2016) argue that also psychologically stressful and psychosocial demanding jobs should be taken into account, not just physically demanding jobs. The Federatie Nederlandse Vakbeweging argues there are three types of demanding jobshttps://www.fnv.nl/werk-inkomen/duurzame-inzetbaarheid-eerder-stoppen-met-werken: 1) Physically demanding jobs that require heavy lifting and repetitive movements, 2) work that required irregular work hours and nightshifts, and 3) mentally demanding work that is emotionally heavy or with verbal abuse.

As early retirement is more common among lower-educated and working-class, the abolishment of the VUT and the discontinuation of other early retirement schemes can hit workers with demanding jobs harder (Visser et al., 2016). Vermeer et al. (2016) shows that the Dutch are willing to contribute towards pension plans for people with demanding work, enabling them to retire early, demonstrating that there is support among the population for early retirement schemes. Enter the RVU-exemption.

1.2.4 The RVU-exemption

In 2021, a new regulation was introduced that allowed for the possibility of tax benefits on early retirement. This temporary RVU-exemption was aimed to support the possibility for people with demanding jobs to retire early. We will introduce the exemption stepwise by answering three questions.

What is an RVU?
A "regeling voor vervroegde uittreding" (RVU) is an early retirement arrangement meant to financially bridge between work and the SRA. That is, the employer pays the employee (either at once or periodically) from when they stop working until the SRA. The arrangement can be made either individually between an employer and employee, or collectively through arrangements like a collectieve arbeidsovereenkomst (cao). The conditions for qualification as RVU, judged on objective conditions and features, not the motives of either the employer or employee, are twofold: 1) The dismissal has to be age related, not dysfunction, reorganization, etc., and 2) the payment has to be large enough such that it can sustain the employee until retirement, determined by the 70%-toets. Details of the requirements can be found on in Artikel 32ba Wet LB. [2]

What is the RVU levy?
In a regular situation, when an RVU is reached, a 52% pseudo final levy (tax) has to be paid over the agreed amount. This levy, known as the RVU levy, is meant to discourage people from agreeing on an RVU and keeping people in the workforce longer.

What is the RVU-exemption?

[2] A summary can be found here

The "drempelvrijstelling RVU-heffing" is a temporary exemption on the RVU levy that was introduced on January 1st, 2021 and was set to last until 2025. The exemption has the requirement that the agreement starts latest December 31, 2025 and at most three years before the SRA. Additionally, the exemption is only valid for the part of the payment that is below the AOW benefit (€2273 in 2025). The aim of this exemption is to that people with demanding jobs are able to retire somewhat earlier. Even though the exemption is meant to be temporary,

1.3 Our Research

To my knowledge there is no existing research regarding the effects of the RVU-exemption. The regulation is meant to support people with demanding jobs, but there is no evidence yet that they are also the ones to benefit from it. Therefore this study aims to answer the question:

How effective is the RVU-exemption to support people with demanding jobs with early retirement?

To answer this question, we will try to answer the following sub-questions: "who makes use of the RVU-exemption?" and "what are drivers for people to make use of the exemption?"

To this end, we will make use the CBS Microdata population. However, as this dataset does not directly contain information about demanding jobs, we will combine it with the Longitudinal Internet Studies for the Social Sciences (LISS) panel. That is, we will use the responses to the "Work and Schooling" survey to classify individuals into either demanding or non-demanding occupation and connect the labels of these individuals to the corresponding subset of the CBS Microdata population. Using machine learning (ML) techniques we will predict labels for the occupation of the individuals not represented in the LISS survey. Combining these labels with RVU exemption usage, we will be able to investigate whether the exemption reached the right audience. Additionally, the labelled population gives many possibilities for additional research.

1.4 Related Literature

There is a wide range of related work investigating the effects of early retirement policy (reforms), many of which are mentioned in the Background section. However, this section touches upon the actual research performed, as the supra discussion did not go in-depth on this matter.

The research closest to ours is by Zwick et al. (2022). They investigate the effects of an ERA policy reform in Germany on women with demanding jobs. The policy reform increased the ERA from 60 to 63 and they researched whether behaviour of women with high-demanding jobs was different from women with low-demanding jobs. They classified women into low-demanding and high-demanding jobs based on the occupations of the workers, and respective occupation-level job demand measures. They did not find significant differences, suggesting only a positive selection of healthy workers leading made it to the ERA, and concluding that policy may not reach it intended target.

Rabaté et al. (2024) quantify the effects of SRA increases using a regression discontinuity design. They investigate the effects on different sectors, but do not go into the distinction between demanding and non-demanding jobs.

Vermeer et al. (2016) investigate the public's opinion on supporting people with demanding jobs with more generous early retirement benefits. They find that the public mainly associates demanding jobs with physical work and they find strong evidence that people are willing to support workers with more demanding jobs.

[[PowerPoint EBB Voorspellingen SEO]] use machine learning (ML) techniques to classify individuals in the CBS microdata population into categories related to work based on survey results of the enquête beroepsbevolking (EBB), similar to how we have to classify individuals as having demanding jobs or not.

Our paper does not only add to the literature by performing novel research regarding the effects of the RVU exemption policy, but is also the first in this field (to my knowledge) to use machine learning techniques to predict high- or low-demanding classification for a dataset.

2 Data

For this study, we will make use of two data sources, the Longitudinal Internet Studies for the Social Sciences (LISS) panel, provided by CentERdata, and the CBS microdata, containing data on individuals in the Netherlands.

From the LISS panel, we will use the "work and schooling" survey. This survey contains around 5000 respondents and focusses on labour market participation, job characteristics, pensions, schooling and courses. Additionally, the survey about robotization of labour might contain relevant information as well. A downside is that only a small part of the survey sample is around the aged around the SRA.

Additionally, we will use CBS Microdata which contains large amounts of anonymized data regarding people, households, companies, and institutions in the Netherlands. This contains several features that could relate to demanding work, such as education level (though not know for everyone), economical activities of companies (standaard bedrijfsindeling, SBI), and pension-related data such as RVU exemption use.

3 Methodology

The evaluation consists of two steps: 1) labelling all individuals in the Microdata population as having either demanding or non-demanding jobs, and 2) using these labelled individuals to analyse RVU exemption usage and other interesting trends regarding demanding jobs and early retirement.

For the first step, we need to determine what jobs we deem "demanding". We will do this by determining combinations of answers to questions that signal one of the three types of demanding work discussed supra. For example, question like "During the course of the week, do you sometimes work at night (after midnight)? If so, how often does that happen?" and "Do you need to lift heavy objects".

When we have labelled individuals based on these rules, we will connect these labels to the CBS Microdata. Based on the 5000 labelled individuals, we will have to make predictions for the other individuals in the dataset, particularly for the ones close to the SRA. This can be done with ML techniques such as a logit model, gradient boosting, or other techniques that perform well in the literature. As always with ML, feature engineering is an important aspect, which can often be improved by creating features that relate to observations in the literature.

When we have obtained (hopefully reliable) predictions about job demandingness, we can inspect the relation with RVU exemption usage. A first step could be making a confusion-type matrix

that showcases the number of people in with versus without RVU exemption against high- versus low-demanding jobs. Depending on the reliability of our predictions, we can answer the main question on whether the RVU exemption is used by people with high-demanding jobs or not.

4 Potential Pitfalls and Continuations

4.1 Potential Pitfalls

The thing I'm most scared of is that the prediction regarding heavy work will not be reliable. If this is the case, we'll have to find another route. However, If the predictions are somewhat reliable, this can heavily influence the validity of our analysis. Perhaps it would be good to investigate whether there is literature on inference with uncertainty of labels.

To ensure that reliability estimates themselves are reliable, it is important to keep a part of the dataset separate from the rest until the final evaluation. Repeated evaluation on the test set will lead to overfitting, decreasing reliability.

4.2 Potential Continuations

When we have predictions of who in de Microdataset have or had demanding work, there are many interesting questions to explore:

- If not into an early retirement scheme, what alternate pathways do people with high-demanding work go into? Do they go into disability insurance more often? How does this compare to people with low-demanding jobs?
- Do people with high-demanding jobs exhibit different behaviour around the SRA age then people with low demanding jobs? Can you split the research by Rabaté et al. (2024) in two categories and inspect differences?
- What combination of questions leads to the best prediction of RVU usage? Does this make sense or is it overfitting?

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