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Physically demanding jobs and early retirement in the Netherlands and Austria: a cross country comparison

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MSc 07/2019-004

Master Thesis

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a cross country comparison

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Submission date:	23.07.2019
Defence date:	23.08.2019

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Summary

Background: Given the rise in retirement age and the stricter eligibility criteria for early retirement I analyze the intention to retire early of people in physically demanding jobs in Austria and the Netherlands. Austria has a heavy occupation early retirement system in place while the implementation of a similar system is being discussed for the Netherlands. Since 2007, Austria maintains a 'list of heavy occupations' (see appendix) which classifies certain professions as heavy occupations, allowing workers in these jobs to retire early. Therefore, workers' intention to retire before and after the implementation of the early retirement system is analyzed. Furthermore, workers' intention to retire in the same time period is observed for the Netherlands.

Methods: Baseline data from the 'Survey of Health, Aging and Retirement in Europe' (SHARE) was obtained for 3.342 Austrian men and 4.682 Austrian women as well as 3.812 Dutch men and 4.628 Dutch women. The waves 1 (2004/2005), 2 (2006/2007) and 4 (2011) were analyzed. Data on intended early retirement and whether a current job is physically demanding was obtained from structured interviews and questionnaires. Samples are analyzed separately for Austria and the Netherlands using OLS regressions.

Results: In the Netherlands in all waves for age groups above 55, being in a physically demanding job is significantly associated with intending to retire early. The results for workers below the age of 55 differ between waves but most significant results have not proven to be robust. In Austria, wave 1 and 2 show no robust significant effects of being in a physically demanding job on the intention to retire early. In wave 4 being in a physically demanding job in Austria can be associated with intending to retire early. The results for Austria tend to be constant for the age groups below and above 55.

Conclusion: Being in a physically demanding job is associated with intending to retire early for subjects above the age of 55 in the Netherlands and for subjects in wave 4 in Austria, but not in waves 1 and 2. Since 2007, Austria has early retirement system for heavy occupations in place which enables workers to do so. Since the demand for early retirement for heavy occupations exists in the Netherlands, the implementation of a similar scheme to the Austrian one is worth analyzing.

1. Introduction

The increase in life expectancy in western European countries creates the need to reform pension systems so that people's well-being and the sustainability of the systems can be secured. This thesis analyzes the intention to retire early in Austria and the Netherlands. Like in many western European countries the retirement age in these countries is rising and the options for early retirement are being tightened.

Currently, there is much public discussion about the Dutch pension system, especially the possible implementation of a heavy occupation early retirement system. For example, newspaper articles have been discussing its implementation (i.e. de Volkskrant 2019) and researchers conduct studies in this field (i.e. Vermeer, Mastrogiacomo, and van Soest 2014). In Austria, a functioning heavy occupation early retirement system has been in place since 2007. A list published by the Austrian social insurance, identifies jobs which count as heavy occupations (Sozialversicherung 2018) and workers in these jobs have the right to retire at a younger age than the regular statutory retirement age. This way, even with an increase in the regular statutory retirement age, it is possible to offer the option of an early retirement for workers in heavy occupations. The classification of heavy occupations is difficult, usually physically demanding jobs are included, but other demanding jobs can also be classified as heavy occupations. Since physically demanding jobs can be clearly classified as heavy occupation, this thesis focuses on these jobs.

A possible implementation of such a system for the Netherlands makes it interesting to analyze the situation of workers there and in Austria. This thesis aims to answer the question how working in a physically demanding job influences the intention to retire early in Austria and the Netherlands. Even though this is a non-causal study, it is interesting to analyze if the intention to retire early for people in physically demanding jobs changed in Austria between years with and without the heavy occupation early retirement system in place. To find an answer, I worked with the 'Survey of Health, Aging and Retirement in Europe' (SHARE), using data from waves 1 (2004/2005), 2 (2006/2007) and 4 (2011). The time periods were chosen due to the implementation of the heavy occupation early retirement system in Austria in the year 2007. Since the questionnaire for wave 3 differs from the other

questionnaires, it was excluded from the analysis. Even though this is a non-causal study, changes in institutions can be associated with changes in the intention to retire early of workers in physically demanding jobs.

The thesis is structured as follows; section 2 gives an overview of the existing literature. Section 3 describes the pension systems of the two countries with a focus on the pension reforms that took place in the analyzed time period and early retirement systems. Section 4 describes the data and methodology. Section 5 shows the results of the conducted analyses, section 6 shows the discussion and section 7 concludes.

2. Literature review

Since this thesis focuses on analyzing the intentions of early retirement of people in physically demanding jobs in Austria and the Netherlands, it is of interest to identify factors that influence the retirement behavior. Factors that influence retirement can be broken up into three categories: micro (such as personal characteristics), meso (such as family, and health), and macro (such as labour market regulations).

Financial incentives play an important role in the retirement decision. Fitzpatrick and Lovenheim (2014) investigate a natural experiment in Illinois where older employers were offered financial incentives to retire early. Specifically, teachers in public schools were offered an allowance to purchase an extra five years of age and experience to be counted as creditable service for calculating their retirement benefit. The condition was teachers' immediate retirement and with that financial incentive, the Illinois school system lost ten percent of its teachers over a two-year time span.

Furthermore, there are multiple non-financial factors that influence people's intention to retire early. Siegrist et al. (2007) conduct analyses in ten European countries and find that especially people with low socioeconomic status and reduced well-being, indicators of a poor quality of work, have a significant intention to retire early.

Like in this thesis, Komp (2018) also bases her analysis on the SHARE data and she describes non-financial factors on a micro-, meso- and macro-level that motivate people to retire early. Characteristics of the older people themselves, of their families and workplaces as well as characteristics of pension regulations and historical events are central. Furthermore, in her article she investigates the shifts in realized retirement ages in Europe and influences on it.

Van Vuuren (2014) describes that social norms play a significant role in the retirement decisions of individuals. He finds that a change in the social norm will lead to an adjustment in the individual behavior, i.e. if a social norm of early retirement at the age of 60 no longer applies, then this can have far-reaching consequences not only for participation rates of elderly, but also for their productivity and wages.

Looking at the macro-level, French and Jones (2012), analyze how reforms of public pension systems affect labour supply over the lifecycle. Analyzing how individual's wages and hours change over the course of their lives, they find that hours decline rapidly after the age of 59. Their results suggest that wages, pensions and social security play a strong role in determining the age of retirement.

Järvholm et al. (2014) specifically focus on the situations of workers in physically demanding jobs. They look at disability pensions over time among workers with physically demanding jobs. Their analysis was conducted among Swedish construction workers and the risks for disability pension and years lost of working life were compared among multiple physically demanding occupational groups. Their findings show that most working years lost due to disability pensions concern older male workers due to musculoskeletal and cardiovascular diseases. Their findings suggest that the work environment is an important predictor for disability pension among construction workers with those in physically heavy jobs having the highest burden of disability.

Oude Hengel et al. (2012) conduct a similar study where they analyze the ability and willingness of construction workers in the Netherlands to continue working until the age of 65. They find that workers were often more able but less willing to continue working until the age of 65. Their study uses data from the time period 2007 – 2009 which is during the same time period as the time period analyzed in this thesis.

Vermeer, Mastrogiacomo, and van Soest (2014) conducted a survey in the Netherlands to try an answer the question if there should be an option for early retirement for workers in physically demanding jobs. They analyze, whether individuals are willing to contribute to retirement schemes for certain occupations. Furthermore, they distinguish between self-interested individuals and altruistic individuals. Their findings show that respondents attach large weight to physically demanding jobs, rather than non-physically demanding heavy occupations. This implies a lower reasonable retirement age and a higher willingness to contribute to an early retirement scheme for construction workers than for other occupations. Respondents who did not identify with construction workers were still willing to contribute to early retirement schemes for the said occupation.

Currently, there is no specific system in place that allows workers in heavy jobs to retire early. The pension system in the Netherlands has undergone multiple reforms which changed the options of early retirement. Euwals, van Vuren, and van Vuuren (2011) look at the example of early retirement pathways in the healthcare sector and their analysis supports the hypothesis that due to the reforms in the Dutch early retirement system, the labour market participation of elderly increased. Furthermore, they find that disability pensions are not used as an alternative early retirement route in the Netherlands anymore.

Euwals, van Vuuren, and Wolthoff (2010) look at pension reforms which took place in an earlier time period in the Netherlands. They analyze the transformation of the actuarially unfair early retirement schemes into less generous and actuarially fair schemes in the 1990. Their focus lies on the possible changes in retirement behavior due to the implementation of the new system and they find that the new system led workers to postpone retirement.

Montizaan, Cörvers and De Grip (2010) investigate how the effects of an exogenous change in future pension benefits influences workers' training participation. They look at a natural experiment in the Dutch public sector since in 2006 a major pension reform took place, that treated two very similar groups of employees differently. The new pension plan indicates strong incentives to continue working beyond the normal retirement age. The results show that this exogenous shock to pension rights propones expected retirement and increases participation training courses among older employees.

Austria's pension system has also undergone multiple reforms in the last decade. Staubli and Zweimüller (2013) look at the effects of pension reforms on employment. During Austria's 2000 and 2003 pension reforms, the retirement age was raised, increasing employment but additionally leading to spillover effects to the unemployment and disability insurance programs. The employment effects were the largest among high-wage and healthy workers while low-wage and less healthy workers either continued to retire early via disability benefits or bridged the gap to the early retirement via unemployment benefits.

Knell, Köhler-Töglhofer, and Prammer (2006) also discuss Austria's 2000, 2003 and 2004 pension reforms, which led to an increased sustainability of the system due to an increase in the effective retirement age and a reduction in the generosity of the mandatory state pension system.

Looking at a reform of the system that took place in earlier years, Staubli (2011) analyzes the effect of a large-scale policy change in Austria's disability insurance program, which tightened eligibility criteria for men above a certain age. His results show a significant decline in disability enrollment, an increase in employment spillover effects into the unemployment and sickness insurance programs.

The previous literature analyzes financial as well as non-financial incentives for early retirement. Furthermore, disability pensions and working conditions have been studied and the early retirement situation in Austria and the Netherlands have been observed. This thesis contributes to the existing literature by focusing on physically demanding jobs as central factor for retirement behavior and compares the situation in Austria and the Netherlands in a time period before and after the implementation of the heavy occupation early retirement system in Austria.

3. Background

In order to analyze workers' job situations and intention to retire early, it is important to look at the pension systems in Austria and the Netherlands. The following section briefly describes the pension systems of these countries and pension reforms, that overlap with the SHARE waves which are the basis of this thesis' analysis.

3.1. Austria's pension system

Austria's pension system is bismarckian and its strongest element is a public pay-as-you-go system. The pension system covers all public and private sector workers and provides early retirement, old-age, and disability pensions. The public pension is the main income provided for individuals after retirement. Individuals are entitled to old-age benefits if they reach the required age and if they have completed the necessary number of insurance periods. Currently, the required age is 60 for women and 65 for men and the required insurance period is 180 months (European Commission 2019). Despite the reforms undertaken in Austria during the past decades also within the second and third pension pillars, public pensions are still the primary source of income for retirees (European Comission 2009).

Pension reforms

The pension system has undergone multiple reforms and changes over the years. Some of the reforms overlap with the SHARE waves used in the analysis of this thesis. In general, the reforms during these years led to a planned increase of the regular statutory retirement age and tighter eligibility criteria for early retirement. Other results of the reforms are a more uniform pension system and the implementation of the heavy occupation early retirement system. To improve the fiscal health of Austria's public pension system, reforms were conducted in the years 2000, 2002, 2003 and 2005. In the 2002 and 2003 reforms the eligibility age for the early retirement pension was increased in a stepwise fashion. Individuals eligible for the long-term insurance pension were excluded from the reforms. Furthermore, the 2002 reform increased the penalties for retiring before, and the bonuses for working beyond the normal statutory retirement age. The 2003 pension reform became active on January 1st, 2004, increasing the age for early retirement pensions from 61.5 to 65 for men and from 56.5 to 60 for women, which is the

regular statutory retirement age and therefore, eliminating the early retirement scheme. With that, the corridor pension was introduced starting on January 1st, 2005. The corridor pension can be claimed between 62 and 65, which will become relevant for women in 2028. The 2003 reform also reduced the generosity of benefits changing the assessment basis from the best 15 years to the best 40 years which is phased in between 2004 and 2028 (Staubli and Zweimüller 2013). Furthermore, the minimum age for early retirement on account of long-term insurance contributions will be increased in steps until 2017 to the regular statutory retirement age (Knell et al. 2006).

In order to harmonize the different schemes of blue- and white-collar workers, a standardized more actuarily-orientated pension account system was introduced in 2005 established in the 'Act on Harmonization of Austrian Pension Systems'. This pension system will gradually replace the different pension schemes over the long run (Finanzministerium 2014). In this act, the implementation of the heavy occupation early retirement system on January 1st, 2007 was decided (Austrian Federal Chamber of Labour 2019). Since then, Austria maintains a 'list of heavy occupations' (see appendix) which classifies certain professions as heavy occupations, allowing workers in these jobs to retire early. The statutory pension age for workers in said jobs is 60 instead of 65. Since women's regular statutory retirement age is 60, the heavy occupation early retirement system will become relevant for them in the year 2024, since their regular statutory retirement age is currently being raised. The other condition for retiring via the heavy occupation early retirement system is that individuals need to be insured for 540 months, working in a heavy occupation for 120 of these months (Pensionsversicherungsanstalt 2018).

Early retirement

In Austria it is possible to retire early by making use of the corridor pension, the long-term insurance pension or the heavy occupation pension. Individuals can apply for a corridor pension at the age of 62 and if they have completed 40 insurance years. Since women's retirement age is 60, this option will become relevant for them in 2028, due to the rise of the regular state pension age. Opting for a corridor pension leads to a reduction in benefits of 5.1% per year. Individuals can claim the corridor pension until they reach the regular statutory retirement age. Therefore, men can receive a corridor pension between the age of 62 and 65 (Austrian Federal Chamber of Labour 2019). The long-term insurance

pension is an option for men born before January 1st, 1954 and women born before January 1st, 1954. Further conditions for men are having reached the age of 60 and having an insurance period of 45 years. Women need to have reached the age of 55 with an insurance period of 40 years. Individuals born after said time period need to have reached the age of 62 with an insurance period of 45 years (Pensionsversicherungsanstalt 2018). Since 2014, the pension benefits, when opting for a long-term insurance pension are reduced by 4,2% per year, compared to the regular pension benefits (Ministry of Social Affairs Austria 2019). The third option to retire early is the heavy occupation early retirement pension. This system has been in place since January 1st, 2007. Heavy occupation work includes irregular night work between 22h and 6h in the amount of at least 6 hours and at least 6 working days in the calendar month. Furthermore, regular activities under extreme heat or cold as well as in the care area and heavy physical work are recognized as heavy occupation. The Austrian system uses a list to identify said jobs; heavy occupation activities in the physical sense occur when individuals work for eight hours a day and men consume at least 2,000 working kilocalories and women at least 1,400 working kilocalories (Austrian Federal Chamber of Labour 2019). The early retirement age for individuals opting for this pension is 60 and they must have an insurance period of 45 years, doing a heavy occupation job for at least the last 10 years, until up to 20 years before the time of the application. Since women's regular retirement age is 60, this option will become relevant for them in 2024, due to the raise of the state pension age. The benefits individuals receive for the heavy occupation pension are 1,8% less per year than the regular pension (Austrian Federal Chamber of Labour 2019).

3.2. The Netherland's pension system

The Dutch pension system combines a pay-as-you-go element with individual saving in pension funds. It consists of three pillars; the state pension (AOW), the supplementary collective pensions and the private individual pension products (Maatman 2014). Individuals who live and/or work in the Netherlands are insured under the 'General Old Age Pensions Act' entitling them to receive the state pension when reaching the retirement age of 65. The state pension is a flat basic income. In addition, individuals who work in the Netherlands can be insured for a supplementary pension. Approximately, 90% of employers have a supplementary pension scheme granting retired employees an additional payment on top of their AOW benefit. The employer's pension funds know about the amount of pension

that the employee has built up so far. With a variety of individual pension products, individuals can save for an extra pension, for example in order to retire early (European Commission 2019).

Pension reforms

Like in Austria, the Dutch pension system has undergone multiple reforms and changes. Some of the reforms overlap with the SHARE waves and therefore, the relevant pension reforms are described in the following section. After the implementation of the Dutch pension and disability insurance systems in 1957 and 1967, additional early retirement schemes were introduced during the 1980 economic crises. The schemes were funded on a pay-as-you go basis and actuarily unfair and unsustainable, which triggered multiple reforms starting in 1990. Since 2006, early retirement schemes are integrated in the occupational pension system leading to an actuarily fair system (Euwals, van Vuuren, and Wolthoff 2010). Since the disability insurance used to be a common early exit route of the labour market, relevant reforms are briefly explained. The public disability insurance system ensures workers who do not recover from sickness within two years. During the 1970s the annual growth of the number of people receiving disability insurance was about 11%. Reforms were conducted to reduce the inflow and the number of people receiving these benefits. In 2002, the 'Gatekeeper improvement Act' was implemented, leading to more stringent reintegration obligations of the employer and its employees. Furthermore, in 2004 the sickness period was extended to two years instead of one, which was a financial incentive for the employer to prevent disability. In 2006, the existing disability insurance scheme was replaced by the 'Income According to Capacity for Work Act' (WIA), differentiating between long-lasting disabled and temporarily or partially disabled. With these reforms, the disability pension is no longer commonly used as a pathway into early retirement (Euwals, van Vuuren, and Wolthoff 2010).

Early retirement

Early retirement is possible in the current system but must be financed independently up until the individual reaches the official retirement age. Another possibility is to request to have the retirement pension paid from a younger age, but this reduces the benefits substantially, since they have to last longer, and the pension system is actuarily fair (European Commission 2019).

4. Data and methodology

Data

To analyze the intention to retire early of workers in physically demanding jobs in Austria and the Netherlands data from the SHARE waves 1 (2004/2005), 2 (2006/2007) and 4 (2011) was used. These waves have been chosen because in the time periods of wave 1 and 2, the heavy occupation early retirement system in Austria was not in place. It was implemented on January 1st, 2007 and therefore, wave 4 shows a time period where the system was already in place. Wave 3 (2008/2009) was excluded from the analysis since the questionnaire is different from the other waves and it is therefore, not possible to compare the results. To be able to compare the situation of workers in heavy jobs in Austria and the Netherlands, data for both countries for the same time period was used for the analysis. SHARE is the first cross-national research project exploring topics related to working conditions, health, well-being and socioeconomic status across Europe. The number of observations in wave 1 for Austria is 647 men and 922 women and for the Netherlands it is 1363 men and 1605 women. In wave 2 the number of observations for Austria is 486 men and 714 women and for the Netherlands it is 1219 men and 1464 women. In wave 4 the number of observations for Austria is 2209 men and 3046 women and for the Netherlands it is 1230 men and 1559 women.

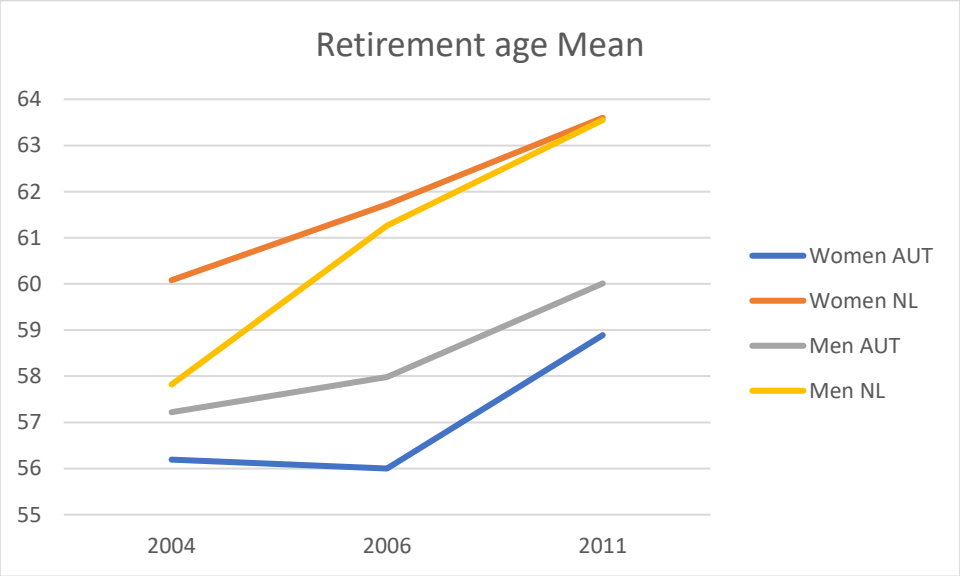
Measures

The variable 'intention to retire early' is a binary variable answering the following question: 'Thinking about your present job, would you like to retire as early as you can from this job?' If the answer is 'Yes' the variable has the value of 1 and 0 otherwise. The main independent variable is the 'heavy job' variable. It is a binary coded variable answering the following question: 'My job is physically demanding. Would you say you strongly agree, agree, disagree or strongly disagree?' If the answer is 'strongly agree' or 'agree' the binary variable has the value of 1 and 0 otherwise. The covariates, included in the analysis are gender (binary variable), education (categorical variable), age (continuous variable), age squared (continuous variable), wage satisfaction (binary variable) and long-term illness (binary variable).

Summary statistics

The following section gives an overview of the main variables used in the analysis. Table 1 shows the mean of the retirement age in the years 2004-2011 for men and women in Austria and the Netherlands. The variable for retirement age was constructed using the SHARE data. The questionnaire includes the following questions: 'In which month and year were you born?' and 'In what month and year did you retire?' The 'birth date' variable was subtracted from the 'retirement date' variable. The obtained variable was called 'retirement age'. It can be observed that the retirement age for men and women in the Netherlands is higher than in Austria. Furthermore, the retirement age for women in the Netherlands is higher than for men while in Austria, men retired later than women. In the year 2006 a steep increase of the retirement age for men and women in both countries can be observed. This could be due to pension reforms in each country in the years before.

Table 1: Retirement age



Source: 'SHARE' data, waves 1,2 and 4, own elaboration

As described before, the regular statutory retirement age in Austria during the observed years was 65 for men and 60 for women. In the Netherlands it was 65 for men and women. Figure 1 shows that even though the regular statutory retirement age for men is the same for Austria and the Netherlands, men in the Netherlands retired later than men in Austria in each year. This could be because exiting the labour market early was easier in Austria than in the Netherlands in the observed years.

Table 2 shows the variable ‘intention to retire early’ for the age groups below and above 55. It is shown for different years, both countries and the number of observations, mean and the standard deviation can be observed. The change in number of observations is of special interest and has an influence on the interpretation of the results which is described in section 6.

Table 2: Dependent variable

Intention to retire early						
	below 55			above 55		
Year	n	Mean	S.D.	n	Mean	S.D.
Austria						
2004	172	0,5407	0,4998	97	0,4639	0,5013
2006	92	0,5109	0,5260	75	0,4800	0,5030
2011	632	0,4636	0,4990	464	0,4051	0,4915
Netherlands						
2004	482	0,2573	0,4376	398	0,3216	0,4677
2006	381	0,3570	0,4797	360	0,3611	0,4810
2011	293	0,3857	0,4876	469	0,2942	0,4562

Table 3 shows the dependent variable ‘intention to retire early’ for the age group below 55. It is shown separately for people in heavy and non-heavy jobs. For each year, the number of observations, mean and the standard deviation can be observed. The number of observations for the intention to retire early is higher for workers in physically demanding jobs in Austria in each year compared to workers in non-physically demanding jobs. In the Netherlands on the other hand, the number of observations for the intention to retire early was higher for people in non-physically demanding jobs in all years compared to people in physically demanding jobs.

Table 3: Dependent variable/ heavy job: below 55

Intention to retire early below 55						
	heavy job			non-heavy job		
Year	n	Mean	S.D.	n	Mean	S.D.
Austria						
2004	99	0,6061	0,4911	73	0,4521	0,5011
2006	47	0,4468	0,5025	45	0,5778	0,4995
2011	337	0,5460	0,4986	293	0,3686	0,4833
Netherlands						
2004	196	0,2959	0,4576	284	0,2289	0,4208
2006	153	0,4771	0,5011	228	0,2763	0,4481
2011	111	0,4144	0,4949	182	0,3681	0,4836

Table 4 shows the dependent variable 'intention to retire early' for the age group above 55. In contrast with table 3, the number of observations for the intention to retire early is lower for workers in physically demanding jobs in Austria in each year compared to workers in non-physically demanding jobs. In the Netherlands the number of observations for the intention to retire early was lower for workers in physically demanding jobs as well.

Table 4: Dependent variable/heavy job: above 55

Intention to retire early above 55						
	heavy job			non-heavy job		
Year	n	Mean	S.D.	n	Mean	S.D.
Austria						
2004	46	0,4782	0,5050	51	0,4510	0,5025
2006	36	0,5560	0,5040	39	0,4103	0,4983
2011	226	0,4734	0,5004	236	0,3390	0,4743
Netherlands						
2004	180	0,3778	0,4861	217	0,2765	0,4483
2006	116	0,4483	0,4995	244	0,3197	0,4673
2011	180	0,4222	0,4953	287	0,2160	0,4123

Table 3 and 4 show that there are more observations for workers in physically demanding jobs who intend to retire early in Austria below the age of 55. For workers above the age of 55 there are more observations for workers in non-physically demanding jobs and this can also be seen for the Netherlands in both age groups.

Method of analysis

The relevant variables are in the data files dn, ph, ep, ex, cv_r and gv_isced which exist in each of the described SHARE waves. These data files have been merged for each wave, all countries except Austria and the Netherlands and variables irrelevant for this analysis have been excluded from the datafiles. The variables used in the models are similar to the ones used by Komp (2018), who also works with the SHARE date in her analysis. Her dependent variable is the realized retirement age. The explanatory variables include gender (male/female), educational level (representing the International Standard Classification of Education – ISCED), self-reported health and whether people where self-employed before retirement.

In this thesis, I use similar variables. The dependent variable is the intention to retire early. The included explanatory variables are self-reported heavy-job and also gender (male/female), educational level (representing the International Standard Classification of Education – ISCED), whether subjects suffer from a long-term illness, age and age squared. The age variables are included since it is believed that the attitude concerning early retirement can change with progressing age. Furthermore, the explanatory variable of self-reported wage-satisfaction is included. They hypotheses is that a satisfying wage can enable workers to retire early.

The following models have been conducted for subjects below and above the age of 55, each country and wave separately:

Model (1):

$$Int\ Ret\ Early_i = Heavy\ Job_i + Education_i + Male_i + u_i$$

Model (2):

$$Int\ Ret\ Early_i = Heavy\ Job_i + Education_i + Male_i + Illness_i + Wage\ sat_i + Age_i + Age\ squared_i + u_i$$

5. Results

The following section presents the results of the conducted analysis and it shows, how working in a physically demanding job influences the intention to retire early in Austria and the Netherlands in different time periods.

Wave 1 – 2004/2005

Table 5 shows the treatment effects of working in a physically demanding job on the intention to retire early in Austria and the Netherlands for individuals below the age of 55. Model 1 includes the variables 'education' and 'male' as control variables. The treatment effects for model 1 show statistically significant effects at a 10% level. Working in a physically demanding job in Austria increases the probability that subjects intend to retire early by 13,96%, in the Netherlands by 6,84%. Model 2 shows no statistically significant effects for both countries. The covariate 'education' is statistically significant in all models and shows a negative effect; at a 1% level for model 1 for Austria and model 2 for the Netherlands. Model 1 for the Netherlands and 2 for Austria shows a statistically significant effect of the covariate at a 5% level. The covariate 'male' is statistically significant for the Netherlands at a 1% level. For Austria, the covariates 'long-term illness' and 'wage satisfaction' show statistically significant effects at a 10% and 5% level. Model 2 for the Netherlands shows statistically significant effects for the covariates 'male' and 'wage satisfaction' at a 1% significance level.

Table 5: Wave 1, subjects below age 55

VARIABLES	(1) AUT IER	(1) NL IER	(2) AUT IER	(2) NL IER
Heavy job	0.1396*	0.0684*	0.0761	0.0481
	(0.0774)	(0.0406)	(0.0802)	(0.0405)
Education	-0.0066***	-0.0029**	-0.0056**	-0.0040***
	(0.0024)	(0.0012)	(0.0023)	(0.0013)
Male	0.0975	0.1674***	0.1081	0.1389***
	(0.0756)	(0.0395)	(0.0808)	(0.0405)
LTI			0.2191***	-0.0101
			(0.0818)	(0.0432)
Wage satisfaction			0.1757**	0.1177***
			(0.0826)	(0.0423)
Age			0.1368	-0.0770
			(0.1948)	(0.0838)
Age squared			-0.0015	0.0010
			(0.0020)	(0.0009)
Constant	0.4375***	0.1585***	-2.8141	1.3862
	(0.0733)	(0.0292)	(4.6677)	(1.9099)
Observations	172	480	172	478
R-squared	0.0430	0.0449	0.1195	0.0813

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 shows the treatment effects of working in a physically demanding job on the intention to retire early in Austria and the Netherlands for individuals above the age of 55. Model 1 and 2 show no statistically significant effects of 'heavy job' for Austria. In both models, the covariate 'education' shows a statistically significant negative effect. Furthermore, in model 2 the covariate 'wage satisfaction' shows a statistically significant effect at a 10% level. For the Netherlands, model 1 and 2 show statistically significant effects at a 5% significance level. Working in a physically demanding job in the Netherlands increases the probability that subjects intend to retire early by 10,37% (1) and 10,46% (2). In both models, the covariate 'male' shows a statistically significant effect at a 1% level. Furthermore, the covariate 'long-term illness' shows a statistically significant effect in model 2 at a 10% level.

Table 6: Wave 1, subjects above age 55

VARIABLES	(1) AUT IER	(1) NL IER	(2) AUT IER	(2) NL IER
Heavy job	0.0059	0.1037**	0.0717	0.1046**
	(0.1012)	(0.0463)	(0.1028)	(0.0464)
Education	-0.0802**	0.0008	-0.0769**	0.0013
	(0.0402)	(0.0018)	(0.0387)	(0.0018)
Male	0.0781	0.2089***	0.0161	0.2141***
	(0.1125)	(0.0450)	(0.1127)	(0.0448)
LTI			-0.1427	0.0975*
			(0.1029)	(0.0511)
Wage satisfaction			0.1902*	-0.0032
			(0.1087)	(0.0537)
Age			-0.1465	-0.0375
			(0.2020)	(0.0332)
Age squared			0.0009	0.0001
			(0.0015)	(0.0002)
Constant	0.7039***	0.1491***	6.3043	1.8034
	(0.1596)	(0.0383)	(6.4784)	(1.1928)
Observations	97	397	97	397
R-squared	0.0416	0.0601	0.1524	0.0878

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Wave 2 – 2006/2007

Using the same models as for wave 1, table 7 shows no statistically significant effects of being in a physically demanding job on the intention to retire early for Austria for subjects below the age of 55. The covariate ‘wage satisfaction’ shows a statistically significant effect in model 2 at a 5% significance level. Both models for the Netherlands show statistically significant treatment effects at a 1% level for being in a physically demanding job. Working in a physically demanding job in the Netherlands increases the probability that subjects intend to retire early by 19,36% (1) and 18,45% (2). In both models, the covariate ‘male’ shows a statistically significant effect at the 5% level. Furthermore, in model 1 the covariate ‘education’ shows a negative statistically significant effect at a 10% level. In model 2 the covariate ‘wage satisfaction’ shows a statistically significant effect at a 5% level.

Table 7: Wave 2, subjects below age 55

VARIABLES	(1) AUT IER	(1) NL IER	(2) AUT IER	(2) NL IER
Heavy job	-0.1472	0.1936***	-0.1008	0.1845***
	(0.1064)	(0.0504)	(0.1113)	(0.0517)
Education	-0.0590	-0.0030*	-0.0192	-0.0026
	(0.0439)	(0.0015)	(0.0460)	(0.0016)
Male	-0.0533	0.1190**	-0.0645	0.1203**
	(0.1126)	(0.0490)	(0.1121)	(0.0492)
LTI			0.0878	-0.0170
			(0.1178)	(0.0514)
Wage satisfaction			0.2747**	0.1015**
			(0.1135)	(0.0511)
Age			-0.1795	0.0283
			(0.2544)	(0.1267)
Age squared			0.0020	-0.0003
			(0.0027)	(0.0013)
Constant	0.8060***	0.2345***	4.4232	-0.5903
	(0.1715)	(0.0354)	(5.9503)	(3.0193)
Observations	90	377	90	377
R-squared	0.0365	0.0541	0.1356	0.0650

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8 shows the effects of working in a physically demanding job on the intention to retire early for subject above the age of 55. No statistically significant treatment effects can be seen for Austria in both models. The covariate ‘education’ shows a negative statistically significant effect at a 10% level in model 1. In model 2, the covariate ‘’wage satisfaction’ shows a statistically significant effect at a 10% level. Both models for the Netherlands show statistically significant effects; at a 5% level for model 1 and at a 10% significance level for model 2. Working in a physically demanding job in the Netherlands increases the probability that subjects intend to retire early by 12,33% (1) and 10,46% (2). In both models, the covariates ‘education’ and ‘male’ show statistically significant effects at a 1% level. Furthermore, model 2 shows a statistically significant effect for the covariate ‘wage satisfaction’ at a 10% level.

Table 8: Wave 2, subjects above age 55

VARIABLES	(1) AUT IER	(1) NL IER	(2) AUT IER	(2) NL IER
Heavy job	0.1097	0.1233**	0.0084	0.1046*
	(0.1190)	(0.0552)	(0.1216)	(0.0561)
Education	-0.0893*	-0.0045***	-0.0584	-0.0046***
	(0.0458)	(0.0008)	(0.0462)	(0.0009)
Male	0.1610	0.1602***	0.1571	0.1674***
	(0.1238)	(0.0498)	(0.1279)	(0.0503)
LTI			0.1387	0.0604
			(0.1144)	(0.0554)
Wage satisfaction			0.2192*	0.0982*
			(0.1212)	(0.0561)
Age			-0.1987	-0.0842
			(0.2104)	(0.0940)
Age squared			0.0014	0.0005
			(0.0015)	(0.0007)
Constant	0.6282***	0.2453***	7.2853	3.3623
	(0.2097)	(0.0392)	(6.9821)	(3.0521)
Observations	73	353	73	350
R-squared	0.0920	0.0463	0.1832	0.0750

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Wave 4 – 2011

Using the same models as in waves 1 and 2, table 9 shows the effects of working in a physically demanding job on the intention to retire early for Austria and the Netherlands for subjects below the age of 55. Statistically significant effects at a 1% level can be seen for Austria in both models. Working in a physically demanding job increases the probability that subjects intend to retire early by 17,92% (1) and 17,16% (2). Model 2 shows statistically significant effects for the covariates ‘long-term illness’, ‘age’ and ‘age squared’ at a 1% level. Both models for the Netherlands show no statistically significant effects of working in a heavy job. The covariates ‘education’ and ‘male’ show statistically significant effects at a 1% level in both models. The effect of ‘education’ is negative. Furthermore, model 2 shows statistically significant effects of the covariates ‘long-term illness’ at a 5% and ‘wage satisfaction’, ‘age’ and ‘age squared’ at a 1% level. The effect of the covariate ‘age’ is negative.

Table 9: Wave 4, subjects below age 55

VARIABLES	(1) AUT IER	(2) NL IER	(3) AUT IER	(4) NL IER
Heavy job	0.1792***	0.0282	0.1716***	-0.0297
	(0.0395)	(0.0583)	(0.0396)	(0.0561)
Education	-0.0019	-0.0045***	-0.0023	-0.0045***
	(0.0044)	(0.0012)	(0.0038)	(0.0011)
Male	0.0540	0.1882***	0.0562	0.2354***
	(0.0395)	(0.0596)	(0.0397)	(0.0573)
LTI			0.1304***	0.1188**
			(0.0483)	(0.0555)
Wage satisfaction			0.0631	0.2503***
			(0.0419)	(0.0567)
Age			0.1689***	-0.6410***
			(0.0587)	(0.1804)
Age squared			-0.0017***	0.0066***
			(0.0007)	(0.0019)
Constant	0.3541***	0.3167***	-3.8586***	15.5312***
	(0.0382)	(0.0439)	(1.3009)	(4.3952)
Observations	626	287	624	287
R-squared	0.0362	0.0436	0.0634	0.1403

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 shows the effects of working in a physically demanding job on the intention to retire early for subject above the age of 55. Both models show statistically significant effects for both countries. Working in a physically demanding job in Austria increases the probability that subjects intend to retire early by 13,93% at a 1% (1) and by 9,36% at a 5% (2) significance level. The covariate 'education' shows a negative statistically significant effect at a 1% level in both models. Furthermore, the covariate 'male' shows a statistically significant effect in both models. In model 2, additionally, the covariates 'long-term illness', and 'wage satisfaction' show statistically significant effects. Working in a physically demanding job in the Netherlands increases the probability that subjects intend to retire early by 20,65% (1) and 19,40% (2) at a 1% significance level. The covariate 'male' is statistically significant in both models. Furthermore, model 2 shows statistically significant effects for the covariates 'age' and a negative effect of 'age squares' at a 5% level.

Table 10: Wave 4, subjects above age 55

VARIABLES	(1) AUT IER	(1) NL IER	(2) AUT IER	(2) NL IER
Heavy job	0.1393***	0.2065***	0.0936**	0.1940***
	(0.0455)	(0.0444)	(0.0458)	(0.0442)
Education	-0.0073***	0.0030	-0.0063***	0.0035
	(0.0028)	(0.0029)	(0.0023)	(0.0029)
Male	0.0802*	0.1132***	0.0942**	0.1224***
	(0.0456)	(0.0414)	(0.0444)	(0.0410)
LTI			0.0848*	0.0263
			(0.0483)	(0.0420)
Wage satisfaction			0.1273**	0.0715
			(0.0498)	(0.0478)
Age			-0.0744	0.3901**
			(0.0561)	(0.1747)
Age squares			0.0004	-0.0034**
			(0.0004)	(0.0014)
Constant	0.3247***	0.1389***	3.2828*	-11.2143**
	(0.0422)	(0.0329)	(1.8802)	(5.3599)
Observations	458	454	457	453
R-squared	0.0303	0.0626	0.0874	0.0880

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Overall results

Table 11 summarizes the treatment effects of working in a physically demanding job on the intention to retire early for both models, both countries, all years and subjects below and above the age of 55.

For Austria, the table shows one statistically significant effect for the year 2004; for subjects below the age of 55 in model 1. So, in the year 2004 for subjects below the age of 55 working in a physically demanding job increases the probability of intending to retire early by 13,96% at a 10% level. For the year 2006, no statistically significant effects for Austria can be observed. Between those two years, the number of observations for subjects below the age of 55 dropped from 176 to 94 (see table 2). For subjects above the age of 55, the number of observations dropped from 161 to 97 (see table 2). The fact that the sample size dropped by approximately 10% could explain why the statistically significant effect disappeared between the year 2004 and 2006. In the year 2004, the significance of the treatment effect disappears when including covariates. The variable ‘wage satisfaction’ shows a statistically significant

effect at a 10% level in model 2, while the statistically significant effect of the main independent variable 'heavy job' disappears. Since including this covariate made the significance of 'heavy job' for Austria disappear, it could mean that the significant treatment effect in model 1 could be explained by omitted variable bias. For Austria, the treatment effects for the year 2011 are statistically significant to the 1% level for subjects below the age of 55. For people above the age of 55, model 1 shows a statistically significant effect at a 1% level. Model 2 shows a statistically significant effect at a 5% level. The drop in the size of the effect form 13,93% to 9,36% and the drop in the significance could be caused by the inclusion of certain covariates. In model 1, the covariate 'male' shows a statistically significant effect at a 10% level. In model 2 the covariate 'male' shows a statistically significant effect at a 5% level. Furthermore, the covariates 'long-term illness' and 'wage satisfaction' show statistically significant effects at a 10% and 5% significance level. The number of observations rose from 94 (2006) to 654 (2011) for subjects below the age of 55 and from 97 (2006) to 622 (2011) for subjects above the age of 55 (see table 2). The increase of number of observations could be associated with the increase in significance of the treatment effects.

For the Netherlands in the year 2004 for subjects below the age of 55 model 1 shows a statistically significant effect at a 10% level which disappears in model 2 when covariates are included. The covariate 'education' is statistically significant at a 5% level in model 1 and it is significant at a 1% level in model 2. Furthermore, the covariate 'wage satisfaction' is significant at a 1% level. For subjects above the age of 55 the treatment effects are statistically significant at a 5% level in both models. Including covariates decreases the treatment effect by 3,2%. For the year 2011 the treatment effects for the Netherlands for subjects below the age of 55 are statistically significant at a 1% level in both models. Including covariates decreases the treatment effect by 0,91%. For subjects above the age of 55, model 1 shows a statistically significant treatment effect of 12,33% at a 5% significance level. Model 2 shows a statistically significant treatment effect of 10,46% at a 10% level. The decrease in the effect size and the level of significance can be due to the inclusion of the covariate 'wage satisfaction' which is statistically significant at a 10% level. The number of observations for subjects below the age of 55 dropped from 401 (2006) to 305 (2011) (see table 2). For subjects above the age of 55 it rose from 449 (2006) to 615 (2011) (see table 2). This could partly explain the difference in significance between the age groups. An

important difference between the two age groups is the effect of the covariate ‘wage satisfaction’. For subjects below the age of 55, a statistically significant effect at a 1% level can be observed for the years 2004 and 2011. For the year 2006, the covariate ‘wage satisfaction’ is statistically significant at a 5% significance level. For subjects above the age of 55, the covariate ‘wage satisfaction’ shows no statistically significant effects for the years 2004 and 2011. For the year 2006, it shows a statistically significant effect at a 10% significance level. This could mean that for subjects below the age of 55, the wage has a strong influence on the intention to retire early, while it is less important for subjects above the age of 55. To sum up, for subjects above the age of 55 in the Netherlands, working in a physically demanding job always shows statistically significant treatment effects on the intention to retire early.

Table 11: Coefficients 'heavy job': cutoff 55

	below 55				above 55			
	(1) AUT	(1) NL	(2) AUT	(2) NL	(1) AUT	(1) NL	(2) AUT	(2) NL
2004	0.1396*	0.0684*	0.0761	0.0481	0.0059	0.1037**	0.0717	0.1046**
	(0.0768)	(0.0399)	(0.0779)	(0.0404)	(0.1020)	(0.0460)	(0.1007)	(0.0461)
2006	-0.1472	0.1936***	-0.1008	0.1845***	0.1097	0.1233**	0.0084	0.1046*
	(0.1086)	(0.0494)	(0.1096)	(0.0501)	(0.1184)	(0.0539)	(0.1237)	(0.0551)
2011	0.1792***	0.0282	0.1716***	-0.0297	0.1393***	0.2065***	0.0936**	0.1940***
	(0.0395)	(0.0584)	(0.0396)	(0.0569)	(0.0455)	(0.0428)	(0.0452)	(0.0427)

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Robustness of the results

Table 12: Coefficients 'heavy job': cutoff 50

	below 50				above 50			
	(1) AUT	(1) NL	(2) AUT	(2) NL	(1) AUT	(1) NL	(2) AUT	(2) NL
2004	-0,0670	-0,0221	-0,0730	-0,2600	0,0796	0,0918***	0,0469	0,0860***
	(0.1971)	(0.8547)	(0.2059)	(0.9202)	(0.0648)	(0.0016)	(0.0646)	(0.0329)
2006	0,0152	0,2732*	0,2678	0,1937	0,0113	0,1500***	-0,414	0,1424***
	(0.2835)	(0.1591)	(0.3857)	(0.1875)	(0.0815)	(0.0377)	(0.0817)	(0.0381)
2011	0,0472	0,0690	0,0742	0,0164	0,1922***	0,1369***	0,1588***	0,1201***
	(0.0976)	(0.2092)	(0.9925)	(0.2064)	(0.0308)	(0.0356)	(0.0310)	(0.0354)

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As a robustness check, the regressions have been conducted separating for subjects below and above the age of 50 instead of 55. The results for wave 1 for subjects below the age of 50 show no statistically significant treatment effects. For subjects above the age of 50, the treatment effects for the Netherlands are significant at a 1% level while the results for Austria are not statistically significant. The results for wave 2 for subjects below the age of 50 show no statistically significant effects for Austria and for the Netherlands model 1 shows a statistically significant effect at a 10% level. For subjects above the age of 50 no statistically significant effects can be observed for Austria, while both models for the Netherlands show statistically significant effects at a 1% level. For wave 4 no statistically significant effects can be seen for subjects below the age of 50 in Austria and the Netherlands. For the age group above 50 the treatment effects of all models and for both countries show statistically significant effects at a 1% significance level. The significant treatment effect for the year 2004 and age group below 55 appears to be non-robust for Austria and the Netherlands. The results for subjects above the age of 55 seem to be robust, showing no statistically significant effects for Austria but significant effects for the Netherlands. In wave 2 for subjects below 55, the non-statistically significant results for Austria seem to be consistent, the statistically significant effect for the Netherlands in model 1 seems to be robust. For subjects above the age of 55 the results of no significance for Austria and significant effect for the Netherlands in both models seems to be consistent. The results for wave 4 for subjects below the age of 55 seem to be non-robust. For the age group above the age of 55, the statistically significant results are consistent.

It can be concluded that not all of the results are robust, and a possible explanation could be the relatively small sample size. Nevertheless, a tendency can be observed that workers' intention to retire early for workers in physically demanding jobs in Austria did not differ from workers in non-physically demanding jobs in the years 2004 and 2006. In the year 2011, workers in physically demanding jobs were statistically more likely to intending to retire early, compared to workers in non-physically demanding jobs. In the Netherlands, the tendency can be observed that below the age of 55, the intention to retire early for workers in physically demanding and non-physically demanding jobs does not differ. In the age group above 55 on the other hand, workers in physically demanding jobs are statistically more likely to intending to retire early, compared to workers in non-physically demanding jobs.

6. Discussion

For Austria, it can be observed that in the years 2004 and 2006 people in physically demanding jobs did not have a higher probability to intending to retire early than people in non-physically demanding jobs. In the year 2011 the results paint a different picture and subjects working in physically demanding jobs have a higher probability of intending to retire early. To understand this change it is important to look at the changes in institutions in said time period.

In Austria, before the year 2007, options for early retirement existed but no distinction between workers in physically and non-physically demanding jobs was made. The long-term insurance pension system was in place for men born before 1954 who are insured for 45 years and women who are insured for 40 years. It enabled workers who entered the labour market in an early stage of life to retire earlier than the regular statutory retirement age. Workers could have also retired early via the corridor or disability pension. The implementation of the heavy occupation early retirement system in 2007 could be associated with workers in physically demanding jobs intending to retire early. The implementation of the system created new opportunities for people in physically demanding jobs, allowing them to leave the labour market early. This change in institutions could be correlated with the non-significant results for the years 2004 and 2006 and the significant results for the year 2011.

The Netherlands do not have a heavy occupation early retirement system in place and even though the system has undergone multiple reforms in the analyzed time period, there are no robust results which make it possible to clearly distinguish between the different years. A trend that can be observed, is that for Dutch workers, the differentiation between age groups is an important factor. Workers in the age group above 55 in physically demanding jobs have higher probabilities of intending to retire early in all analyzed years. The results show that a demand of a heavy occupation early retirement system in the Netherlands does exist. This results are in line with a study from Oude Hengel et al. (2012). They find that construction workers in the Netherlands intend to retire early. The study analyses the time period 2007 – 2009 which is also a part of the time period analyzed in this thesis. Even though workers above the age of 55 have a higher probability on intending to retire early, compared to workers in non-physically demanding jobs, there is no system in place that enables them to do so.

7. Conclusions

The results of this thesis show that working in a physically demanding job can be associated with intending to retire early in Austria and the Netherlands; with differences in years and age groups. In Austria a tendency can be observed that workers in wave 1 and 2 did not have a higher probability of intending to retire early, compared to workers in non-physically demanding jobs. In wave 4, workers in physically demanding jobs have a higher probability of intending to retire early compared to workers in non-physically demanding jobs. This tendency can be observed for workers below and above the age of 55. Even though this is a non-causal study, the change in results can be associated with the implementation of the heavy occupation early retirement system in Austria in the year 2007.

In the Netherlands there is a tendency that workers in physically demanding jobs above the age of 55 have a higher probability of intending to retire early compared to workers in non-physically demanding jobs. For workers below the age of 55, the significant results in wave 1 and wave 2 model 2 have not proven to be robust. Another interesting finding of this study is that the covariate 'male' shows statistically significant effects in all years and models for the Netherlands, leading to the conclusion that Dutch men have a higher probability of intending to retire early compared to Dutch women. This finding is in line with table 1, which shows that Dutch women have a higher retirement age than men in the observed years.

Furthermore, the results show that subjects with a lower education are statistically more likely to intend to retire early and vice versa. This tendency can be observed for both countries in different waves. Another finding is that workers who are satisfied with their wage have a higher probability of intending to retire early compared to workers who are not satisfied with their wage and vice versa. Statistically significant effects can be observed for all waves, differing between countries and age groups.

A limitation of this study is that even though changes in institutions can be associated with changes in the results, causality is not proven. Furthermore, the relatively small sample size of some regression limits the robustness of some results. The main dependent variable 'intention to retire early' could be biased, since it must not necessarily reflect the realized retirement. For future research it could be interesting to make use of the panel character of the SHARE data, to analyze the situation of people who

are retired in the latest wave and worked in a physically or non-physically demanding job in a previous wave. Furthermore, it could be interesting to conduct difference-in-differences analysis that allow for a causal interpretation of the changes in institutions and the results. To start it could be interesting to conduct a design for Austria that controls for the time period in which the heavy occupation early retirement system was implemented. Constructing a calendar year dummy that separates observations before and after January 1st, 2007 would be useful. With this design, observations before said date could function as a control group. Further interesting analysis would be to test the common trend assumptions for Austria and the Netherlands and see if it is possible to conduct a differences-in-differences design with the Netherlands as a control group. If the common trend assumptions hold, it would be of interest because it could be observed how a country's early retirement system develops with and without the implementation of a heavy occupation early retirement system. With that a causal interpretation would be possible and policy recommendations for the Netherlands could be conducted clearly. Nevertheless, this thesis gives relevant insights on how the intentions of early retirement for workers in physically demanding jobs developed over a time period filled with pension reforms in the two countries and can function as basic research.

Building on the results of this thesis, a heavy occupation early retirement system in the Netherlands is desired by the workers above the age of 55. Since Austria has a heavy occupation early retirement system in place already, it could function as a blueprint. However, it is important to notice, that there was no statistical difference of the intention to retire early between workers in physically demanding and non-physically demanding jobs in Austria in the years 2004 and 2006. Years in which no heavy occupation early retirement system was in place. A higher probability for workers in physically demanding jobs can be observed in the year 2011, a year after the implementation of said system. In the Netherlands, for workers above the age of 55, there is a higher probability for workers in physically demanding jobs to intending to retire early compared to workers in non-physically demanding jobs. This can be observed for all analyzed years. In contrast to Austria, there is no heavy occupation early retirement system in place. Therefore, more research is needed to understand the country specific differences and to forecast how the implementation of such a system would influence the Dutch labour market.

References

European Comission. 2009. “AUSTRIA : Pension Projections 2004 - 2050.” (January 2005):1–18.

Euwals, Rob, Annemiek van Vuren, and Daniel van Vuuren. 2011. “The Decline of Early Retirement Pathways in the Netherlands: An Empirical Analysis for the Health Care Sector.” *Ssrn*.

Euwals, Rob, Daniel Van Vuuren, and Ronald Wolthoff. 2010. “Early Retirement Behaviour in the Netherlands: Evidence From a Policy Reform.” *Economist* 158(3):209–36.

Finanzministerium. 2014. “Austrian Country Fiche on Public Pensions.” 40.

Fitzpatrick, Maria D. and Michael F. Lovenheim. 2014. “Early Retirement Incentives and Student Achievement.” *American Economic Journal: Economic Policy* 6(3):120–54.

French, Eric and John Jones. 2012. “Public Pensions and Labor Supply over the Life Cycle.” *International Tax and Public Finance* 19(2):268–87.

Järvholm, Bengt, Mikael Stattin, Suzan J. W. Robroek, Urban Janlert, Bernt Karlsson, and Alex Burdorf. 2014. “Heavy Work and Disability Pension - A Long Term Follow-up of Swedish Construction Workers.” *Scandinavian Journal of Work, Environment and Health* 40(4):335–42.

Knell, Markus, Walpurga Köhler-Töglhofer, and Doris Prammer. 2006. “The Austrian Pension System – How Recent Reforms Have Changed Fiscal Sustainability and Pension Benefits.” *Monetary Policy & the Economy* Q2(06):69–93.

Komp, Kathrin. 2018. “Shifts in the Realized Retirement Age: Europe in Times of Pension Reform and Economic Crisis.” *Journal of European Social Policy* 28(2):130–42.

Maatman, René H. 2014. “The Dutch Pension System.” *Cambridge Handbook of Institutional Investment and Fiduciary Duty* 72–86.

Montizaan, Raymond, Frank Cörvers, and Andries De Grip. 2010. “The Effects of Pension Rights and Retirement Age on Training Participation: Evidence from a Natural Experiment.” *Labour Economics* 17(1):240–47.

Oude Hengel, Karen M., Birgitte M. Blatter, Goedele A. Geuskens, Lando L. J. Koppes, and Paulien M. Bongers. 2012. “Factors Associated with the Ability and Willingness to Continue Working until the Age of 65 in Construction Workers.” *International Archives of Occupational and Environmental Health* 85(7):783–90.

Siegrist, Johannes, Morten Wahrendorf, Olaf Von Dem Knesebeck, Hendrik Jürges, and Axel Börsch-Supan. 2007. “Quality of Work, Well-Being, and Intended Early Retirement of Older Employees - Baseline Results from the SHARE Study.” *European Journal of Public Health* 17(1):62–68.

Sozialversicherung, Österreichische. 2018. “Berufsliste Für Frauen Und Männer Mit „ Körperlicher Schwerarbeit “.”

Staubli, Stefan. 2011. “The Impact of Stricter Criteria for Disability Insurance on Labor Force Participation.” *Journal of Public Economics* 95(9–10):1223–35.

Staubli, Stefan and Josef Zweimüller. 2013. “Does Raising the Early Retirement Age Increase Employment of Older Workers?” *Journal of Public Economics* 108:17–32.

Vermeer, Niels, Mauro Mastrogiacomo, and Arthur van Soest. 2014. “Demanding Occupations and the Retirement Age in the Netherlands.” *Ssrn*.

Van Vuuren, Daniel. 2014. “Flexible Retirement.” *Journal of Economic Surveys* 28(3):573–93.

Online References

Austrian Federal Chamber of Labour. 'Früher in Pension.' (accessed 20.03.2019) https://www.arbeiterkammer.at/beratung/arbeitundrecht/pension/pensionsformen/Frueher_in_Pension.html

Austrian Social Insurance. 'Berufsliste Männer und Frauen mit körperlicher Schwerarbeit' (accessed 20.05.2019)

https://www.sozialversicherung.at/cdscontent/load?contentid=10008.555254&version=1543500862

European Commission. 'Austria - Old-age pensions and benefits.' (accessed 15.03.2019) https://ec.europa.eu/social/main.jsp?catId=1101&intPageId=4407&langId=en

European Commission. 'Netherlands - Retirement pension.' (accessed 15.03.2019) https://ec.europa.eu/social/main.jsp?langId=en&catId=1122&intPageId=4993&

Ministry of Social Affairs Austria. 'Abschrift: Zu- und Abschläge'. (accessed 26.03. 2019) https://www.sozialministerium.at/cms/site/podcast_abschrift.html?document=CMS1520496242598

Pensionsversicherungsanstalt. 'Zahlen und Daten'. (accessed 25.03.2019) https://www.pensionsversicherung.at/cdscontent/?contentid=10007.707619

SHARE (2015). 'Questionnaire Wave 5 - CAPI main questionnaire'. (accessed 20.03.2019) http://www.share-project.org/data-documentation/questionnaires/questionnaire-wave-5.html

De Volkskrant. 'Druk groeit op kabinet: gun zware beroepen eerder pensioen'. (accessed 18.03.2019) https://www.volkskrant.nl/nieuws-achtergrond/druk-groeit-op-kabinet-gun-zware-beroepen-eerder-pensioen~bbd1ee98/

Appendix

List of heavy occupations - Austria

Berufsliste für Frauen und Männer mit „Körperlicher Schwerarbeit"

Beruf	**Frauen und Männer mind. 2000 kcal**	**Frauen mind. 1400 kcal**
Acherbäuerin/ Ackerbauer	X	X
Ambulante Händlerin		X
Anlagenarbeiterin Umweltdienst		X
Aufzugsbauer/in (Service mit Störungsbehebung)	X	X
Aufzugsbauer/in (Umbau und Neugestaltung von Anlagen)	X	X
Aufzugsbauerin (Schmiererin bzw. Service- und Wartungsfrau		X
Automateneinrichterin, Maschineneinrichterin, Maschineneinstellerin		X
Autosattlerin (außerhalb industrieller Fertigung)		X
Bäcker/in (gemischte Tätigkeiten)	X	X
Bäckerin (allgemein) ohne Spezialisierung		X
Bäckerin: Ofenarbeiterin (mit überwiegend technischer Unterstützung)		X
Bauendreinigerin		X
Bauhilfsarbeiter/in	X	X
Bauhilfsarbeiter/in Asphaltierer/in	X	X
Bauhilfsarbeiter/in Schwarzdecker/in	X	X
Bauhof – Gemeindearbeiterin (Dienstgeber Gemeinde)		X
Bauspengler/in	X	X
Bautischler/in	X	X
Bergarbeiter/in im Tagbau	X	X
Beizerin von Edelstahlfässern (automatische Beizanlage)		X
Berufsjäger/in	X	X
Beton- und Schalungsbauer/in	X	X
Blech-, Portal- und Stahlbauschlosser/in	X	X
Bodenleger/in	X	X
Bodenmarkierer/in	X	X
Bohrarbeiter/in im Salzbergwerk	X	X
Bohrmann/frau	X	X
Bootsmann/frau (Güterschifffahrt)	X	X
Briefzustellerin mit überwiegender Gehleistung		X
Buchbinderin (Endfertigung)		X
Chemiehilfsarbeiterin		X
Dachdecker/in	X	X
Dachdecker/in mit Spezialaufgaben (Blitzschutzanlagenbauer/in, Kirchdachabdeckung)	X	X
Drahtzieherin (Baudraht)		X
Drehgestell-Monteur/in ÖBB	X	X
Eisenbieger/in und -flechter/in	X	X
Elektroinstallateurin (mit Ausnahme von Servicetätigkeiten)		X
Elektromaschinenbauerin, Elektromechanikerin (Anlagentechnikerin)		X
Elektrowicklerin		X
Erdöl- und Erdgasgewinner/in	X	X
Erntehelfer/in (Obst und Diverses manuell)	X	X
Estrichhersteller/in	X	X
Fassadenreinigerin (Reinigungsberufe, Denkmalreinigerin)		X
Fleischerin Bereich Schlachtung (darunter fällt nicht: Geflügel)		X
Fleischhauerin im Verkauf mit manueller Zerlegungstätigkeit (darunter fallen nicht: Ladnerin, Wurstverkauf)		X

Fleischverarbeiter/in (ausgenommen Zerlegung und Verarbeitung in Betrieben mit maximal 5.000 kg Fleisch/Woche bzw. ausgenommen bei geringem körperlichen Einsatz wie z.B. Zuschneiden, Salzen, Füllen,…)	X	X
Flughafenarbeiter/in (Belader/in)	X	X
Flughafenarbeiter/in (Gepäckabfertigung)	X	X
Flugzeugmechanikerin		X
Förderer/in	X	X
Former/in, Gießer/in, Kernmacher/in (Eisen- und Stahlbereich)	X	X
Forstarbeiter/in (auch mit erheblichem technischem Einsatz)	X	X
Friedhofsarbeiterin Kleingemeinden		X
Gartenarbeiter/in (gewerbliche/r Landschaftsgärtner/in)	X	X
Gehobener Dienst für Gesundheits- und Krankenpflege (Krankenpflegefachdienst)		X
Gepäckverladerin (mit überwiegend Staplerfahrt/anderer maschineller Unterstützung)		X
Gerüster/in	X	X
Gesundheitshilfsdienst (Sanitätshilfsdienste)	X	X
Getreidemüllerin		X
Glasbe- und verarbeiter/in (überwiegend Fenster im Fassadenbau)	X	X
Glasbe- und verarbeitung (Bereich Montage und Reparatur)		X
Glasformenbau		X
Gleiserhaltung	X	X
Gleisneubau	X	X
Grobmechaniker/in (Industrieanlagenbauer/in mit Montage)	X	X
Gussputzer/in (ausgenommen Leichtmetalle)	X	X
Güterwagen-Monteur/in ÖBB	X	X
Hafner/in	X	X
Hauer/in	X	X
Hausarbeiterin		X
Hebamme (Anstellung in öffentlichen Krankenanstalten)		X
Heimhilfe		X
Hilfsarbeiter/in im Holzbereich (mit überwiegend manueller Tätigkeit)	X	X
Hilfsarbeiter/in im Metallbereich	X	X
Hilfsarbeiterin in der Zuckerherstellung		X
Hilfsarbeiterin in Mühlen		X
Industrieisolierer/in	X	X
Installateur/in mit Ausnahme von Servicetätigkeiten und ausschließlicher Einstellungs- und Justierarbeit (Sanitär-, Gas-, Wasser-, Heizung-, Lüftung- und Klimainstallation)	X	X
Kabelerzeugung	X	X
Kamerafrau (mit überwiegend Außendienst)		X
Kanalarbeiter/in (überwiegend manuelle Kanalreinigungstätigkeit)	X	X
Kantinenbetreuerin/Gastgewerbe (Kochtätigkeit – ohne Verwaltungsaufgaben)		X
Karosseurin (Karosseriebautechnikerin)		X
Käsereihilfsarbeitern/in	X	X
Kellnerin		X
Kfz-Spenglerin (Karosseriebautechnikerin)		X
Klärwärter/in	X	X
Kohlearbeiter/in	X	X
Köchin		X
Kranmonteur/in (Auf- und Abbau, Servicetätigkeiten)	X	X
Küchengehilfin		X
Kunststein- und Betonwarenerzeugerin		X
Lackiererin (Spritzlackiererin, Spritzkabinen)		X
Lagerarbeiter/in (ohne überwiegende Staplertätigkeit/andere maschinelle Unterstützung)	X	X
Landarbeiter/in (Pflanzenbau einschl. gärtnerische Pflanzenproduktion, Tierhaltung)	X	X

Ledererzeuger/in und Lederarbeiter/in (überwiegend händische Bearbeitung)	X	X
Ledererzeugerin und Lederarbeiterin Finish (Schleifen, Bügeln)		X
Leichenbestatter/in	X	X
Leitungsmonteur/in (Hochspannungsleitungen) / Oberleitungsmonteur/in	X	X
Lohndienerin		X
Lüftungsspenglerin		X
Magazin-, Lagerfachleute, Expedientin		X
Maler/in und Anstreicher/in (mit Bodenverlegungsarbeiten)	X	X
Masseurin		X
Matrose/in (Transport/Fracht, d.h. nicht Personenverkehr) Binnenschifffahrt	X	X
Matrose/in (Transport/Fracht, d.h. nicht Personenverkehr) Hochseeschifffahrt	X	X
Maurer/in	X	X
Maurer/in Feuerungsmaurer/in	X	X
Maurer/in im Tunnelbau	X	X
Mechanikerin Bereich Kraftfahrzeuge		X
Mechanikerin Bereich Leichtmaschinen und Motorrad		X
Mechaniker/in Schwermaschinen und LKWs	X	X
Melkanlagenmonteur/in	X	X
Mineur/in	X	X
Möbeltischlerin		X
Montagetischlerin		X
Montagetischler/in (bis max. 10 % Fahrzeitanteil)	X	
Müllkübelentleerer/in	X	X
Öler/in und Schmierer/in	X	X
Ölpresserin		X
OP-Gehilfe/Gehilfin (ohne Umbettungsschleuse)	X	X
Paketzusteller/in	X	X
Pannenfahrerin – ausschließlich großstädtischer Bereich		X
Pannenfahrer/in – Land	X	X
Papiermacherin (Papiertechnikerin)		X
Pflasterer/in mit Randsteinsetzarbeiten	X	X
Pflegehilfe		X
Physiotherapeutin, MTF-Sparte Physiotherapie		X
Pistendienst (Gletscherskigebiet)	X	X
Platten- und Fliesenleger/in	X	X
Post-Paketverteilzentrum (maschinelle Bedienung)		X
Presserin, Stanzerin, Biegerin (ausgenommen Eisenbiegerin BAU)		X
Rauchfangkehrerin		X
Raumpflegerin und Gebäudeinnereinigerin (sofern nicht ausschließlich Büroreinigung)		X
Reifenmonteur/in (LKW)	X	X
Reifenmonteurin (PKW)		X
Restauratorin (Gebäude, Fassaden, Denkmäler)		X
Saat- und Pflanzenzüchterin		X
Sägewerkerin		X
Saison-Gartenhilfsarbeiterin in gewerblichen Betrieben		X
Sandstrahlerin		X
Sanitärgießer/in – Handgießer/in (nicht maschinelle Bearbeitung)	X	X
Schaustellerin		X
Schlepper/in (Bergbau)	X	X
Schmied/in (Eisen- und Stahlschmied/in)	X	X
Schwarzabwäscherin		X
Seilbahnbetriebsmitarbeiterin (Beschneierin, Liftwartin, Pistenfahrerin)		X
Seilerin		X
Setzen von Hochspannungsisolatoren	X	X
Speditionsbranche (Lagerarbeiterin, Umschlagtätigkeit)		X

Starkstrommonteur/in – Kraftwerksmonteur/in	X	X
Steinarbeiter/in (ohne überwiegend maschinelle Unterstützung)	X	X
Steingewinnerin (mit überwiegend maschineller Unterstützung)		X
Steinmaurer/in	X	X
Straßenbau / Straßenerhaltung (Gebietskörperschaften und ASFINAG, bis max. 12 % Fahrzeitanteil, ausgenommen 2 Monate im Winter)	X	X
Straßenwärterin		X
Streckendienst (Gebietskörperschaften und ASFINAG)		X
Stubenfrau		X
Tapezierer/in Bereich Möbel	X	X
Tapeziererin Bereich Wände		X
Tapeziererin mit Bodenverlegungsarbeiten		X
Tätigkeit an der Unterflur-Drehbank ÖBB / Bahntechnik		X
Tätigkeiten in Zentralwäschereien von öffentlichen Krankenanstalten		X
Tränkerin		X
Taucher/in im Brücken- und Kraftwerksbau (sofern nicht nach § 1 Z 3 der VO berücksichtigt)	X	X
Tiefbauer/in und Straßenbauer/in mit Spezialaufgaben (Kanalbau, Brunnenbau)	X	X
Tierzüchter/in	X	X
Trockenbaumonteur/in	X	X
Universalschweißer/in (ohne stationäre Schweißanlagen)	X	X
Verlader/in	X	X
Verschieber/in	X	X
Walzerin		X
Warenzustellerin Bereich Lebensmittel/Hauszustellung		X
Warenzusteller/in Elektrogeräte	X	X
Warenzusteller/in Maschinen	X	X
Warenzusteller/in Möbel	X	X
Werbewandaufsteller/in (Großtafeln mit baumäßigen Grundarbeiten)	X	X
Werkzeugmacherin		X
Werkzeugmaschineurin und Zerspannungstechnikerin (Fräserin, Bohrerin, Schleiferin, Dreherin)		X
Wildbach- und Lawinenverbauer/in / Lehnenarbeiter/in	X	X
Winzer/in	X	X
Zimmerer/in	X	X

Source: Austrian social insurance (2018) (https://www.sozialversicherung.at/cdscontent/load?contentid=10008.555254&version=1543500862)

STATA do File

```
*Using the files dn, ph, ep, ex, cv_r and gv_isced for each wave

* Cleaning the data

keep if country==11 | country==14

gen year=.

replace year = 2004 if hhid1 != "."

gen year=.

replace year = 2006 if hhid2 != "."

gen year=.

replace year = 2011 if hhid4 != "."

gen year=.

replace year = 2013 if hhid5 != "."

* merge and

keep mergeid hhid1 mergeidp1 coupleid1 country language year ep036_ ep027_ dn042_ dn003_ dn002_ ep329_ ep328_ ph003_ ep018_ ep005_ ep054_ isced1997_r ph004_ ep033_ ep051_ ep213_1 ep213_2 ep213_3 ep213_4 ep213_7 ep213_8 ep213_9 age_int

gen IER=.

replace IER=1 if ep036_==1

replace IER=0 if ep036_==5

gen PDEM=.

replace PDEM=1 if ep027_==1 | ep027_==2

replace PDEM=0 if ep027_==3 | ep027_==4

gen MALE=.

replace MALE=1 if dn042_==1

replace MALE=0 if dn042_==2

*Wave 1 only

gen retyear = min(ep213_1, ep213_2, ep213_3, ep213_4, ep213_7, ep213_8, ep213_9) if year == 2004

replace retyear=. if retyear <=0 & country == 2004

gen retage1 = retyear - dn003_

*For all other waves

gen mbday = ym(dn003_, dn002_) if year !=2004

format mbday %tm

gen rdate = ym(ep329_, ep328_)

format rdate %tm

gen monthsretage = rdate - mbday

gen retage = (monthsretage/12)

replace retage=. if retage <=0
```

```
*For all waves
gen EDUC=.
replace EDUC=1 if isced1997_r==1
replace EDUC=2 if isced1997_r==2
replace EDUC=3 if isced1997_r==3
replace EDUC=4 if isced1997_r==4
replace EDUC=5 if isced1997_r==5
replace EDUC=6 if isced1997_r==6
gen LTI=.
replace LTI=1 if ph004_==1
replace LTI=0 if ph004_==5
gen ASAL=.
replace ASAL=1 if ep033_==3 | ep033_==4
replace ASAL=0 if ep033_==1 | ep033_==2
gen age_int2 = age_int * age_int
gen age1=.
replace age1=age_int if age_int > 19 & age_int < 55
gen age2=.
replace age2=age_int if age_int > 19 & age_int > 55
*Regressions
* younger than 55
reg IER PDEM isced1997_r MALE if country == 11 & age1 != . & year == 2004, robust
reg IER PDEM isced1997_r MALE if country == 14 & age1 != . & year == 2004, robust
reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age1 != . & year == 2004, robust
reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age1 != . & year == 2004, robust
reg IER PDEM isced1997_r MALE if country == 11 & age1 != . & year == 2006, robust
reg IER PDEM isced1997_r MALE if country == 14 & age1 != . & year == 2006, robust
reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age1 != . & year == 2006, robust
reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age1 != . & year == 2006, robust
reg IER PDEM isced1997_r MALE if country == 11 & age1 != . & year == 2011, robust
reg IER PDEM isced1997_r MALE if country == 14 & age1 != . & year == 2011, robust
reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age1 != . & year == 2011, robust
reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age1 != . & year == 2011, robust
```

```
* older than 55

reg IER PDEM isced1997_r MALE if country == 11 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE if country == 14 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE if country == 11 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE if country == 14 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE if country == 11 & age2 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE if country == 14 & age2 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age2 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age2 != . & year == 2011, robust

*Robustness test

drop age1

drop age2

gen age1=.

replace age1=age_int if age_int > 19 & age_int < 50

gen age2=.

replace age2=age_int if age_int > 19 & age_int > 50

* younger than 50

reg IER PDEM isced1997_r MALE if country == 11 & age1 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE if country == 14 & age1 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age1 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age1 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE if country == 11 & age1 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE if country == 14 & age1 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age1 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age1 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE if country == 11 & age1 != . & year == 2011, robust
```

```
reg IER PDEM isced1997_r MALE if country == 14 & age1 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age1 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age1 != . & year == 2011, robust

* older than 50

reg IER PDEM isced1997_r MALE if country == 11 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE if country == 14 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age2 != . & year == 2004, robust

reg IER PDEM isced1997_r MALE if country == 11 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE if country == 14 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age2 != . & year == 2006, robust

reg IER PDEM isced1997_r MALE if country == 11 & age2 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE if country == 14 & age2 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 11 & age2 != . & year == 2011, robust

reg IER PDEM isced1997_r MALE LTI ASAL age_int age_int2 if country == 14 & age2 != . & year == 2011, robust

*Summary statistics

gen retage2004=.

replace retage2004= retage1 if retage1>0

univar retage2004 retage2006 retage2011 if country==11

univar retage2004 retage2006 retage2011 if country==14

univar retage2004 retage2006 retage2011 if country==11 & MALE==0

univar retage2004 retage2006 retage2011 if country==14 & MALE==1

univar retage2004 retage2006 retage2011 if country==11 & MALE==0

univar retage2004 retage2006 retage2011 if country==14 & MALE==1

summ IER if year==2004 & country==11

summ IER if year==2006 & country==11

summ IER if year==2011 & country==11

summ IER if year==2004 & country==14

summ IER if year==2006 & country==14

summ IER if year==2011 & country==14

*below age 55
```

```
summ IER if year==2004 & country==11 & PDEM ==1 & age1 !=.
summ IER if year==2006 & country==11 & PDEM ==1 & age1 !=.
summ IER if year==2011 & country==11 & PDEM ==1 & age1 !=.
summ IER if year==2004 & country==14 & PDEM ==1 & age1 !=.
summ IER if year==2006 & country==14 & PDEM ==1 & age1 !=.
summ IER if year==2011 & country==14 & PDEM ==1 & age1 !=.
summ IER if year==2004 & country==11 & PDEM ==0 & age1 !=.
summ IER if year==2006 & country==11 & PDEM ==0 & age1 !=.
summ IER if year==2011 & country==11 & PDEM ==0 & age1 !=.
summ IER if year==2004 & country==14 & PDEM ==0 & age1 !=.
summ IER if year==2006 & country==14 & PDEM ==0 & age1 !=.
summ IER if year==2011 & country==14 & PDEM ==0 & age1 !=.

*above age 55
summ IER if year==2004 & country==11 & PDEM ==1 & age2 !=.
summ IER if year==2006 & country==11 & PDEM ==1 & age2 !=.
summ IER if year==2011 & country==11 & PDEM ==1 & age2 !=.
summ IER if year==2004 & country==14 & PDEM ==1 & age2 !=.
summ IER if year==2006 & country==14 & PDEM ==1 & age2 !=.
summ IER if year==2011 & country==14 & PDEM ==1 & age2 !=.
summ IER if year==2004 & country==11 & PDEM ==0 & age2 !=.
summ IER if year==2006 & country==11 & PDEM ==0 & age2 !=.
summ IER if year==2011 & country==11 & PDEM ==0 & age2 !=.
summ IER if year==2004 & country==14 & PDEM ==0 & age2 !=.
summ IER if year==2006 & country==14 & PDEM ==0 & age2 !=.
summ IER if year==2011 & country==14 & PDEM ==0 & age2 !=.

*Number of observations men and women
sum country if country == 11 & MALE == 1 & year == 2004
sum country if country == 11 & MALE == 0 & year == 2004
sum country if country == 14 & MALE == 1 & year == 2004
sum country if country == 14 & MALE == 0 & year == 2004
sum country if country == 11 & MALE == 1 & year == 2006
sum country if country == 11 & MALE == 0 & year == 2006
sum country if country == 14 & MALE == 1 & year == 2006
sum country if country == 14 & MALE == 0 & year == 2006
```

```
sum country if country == 11 & MALE == 1 & year == 2011
sum country if country == 11 & MALE == 0 & year == 2011
sum country if country == 14 & MALE == 1 & year == 2011
sum country if country == 14 & MALE == 0 & year == 2011
```