Trends in social security incentives in Belgium

Anne-Lore Fraikin
University of Liège (Faculty of Law, Tax Institute and HEC-Liège) and UNU-MERIT/Maastricht University

Alain Jousten
University of Liège (Faculty of Law, Tax Institute, and HEC-Liège), IZA and NETSPAR

Mathieu Lefebvre
University of Strasbourg and BETA

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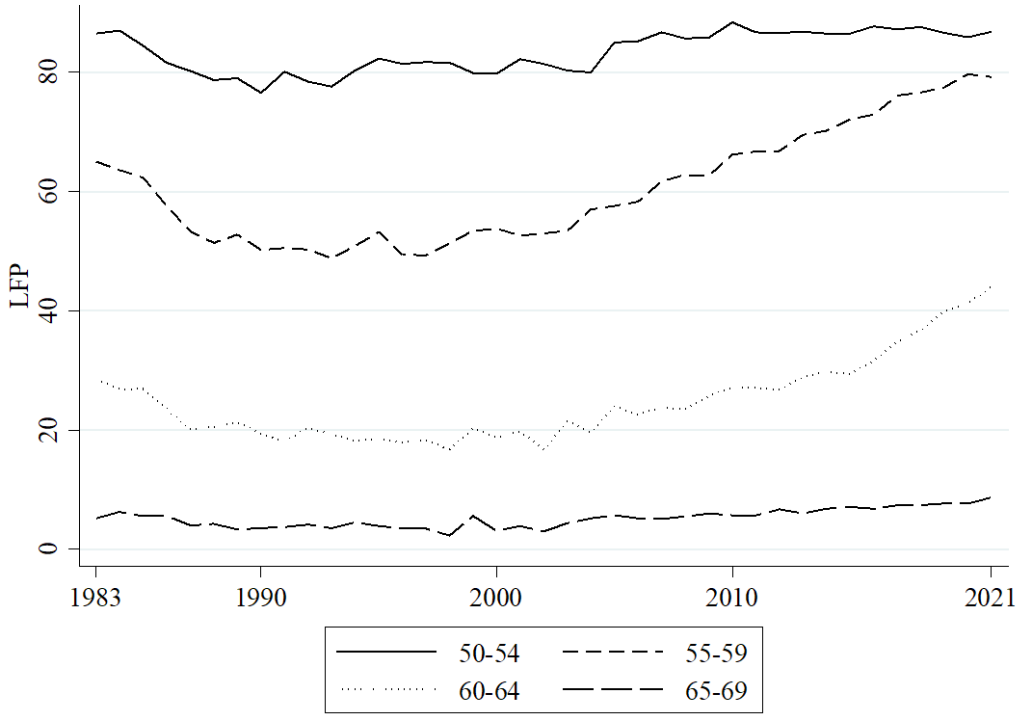
1. Introduction

Like many other European countries, Belgium has been exposed to a major transformation of its labor market environment over the last decades. At the same time, a large array of social security reforms has been implemented with the overarching goal of increasing the labor force participation through better work incentives – with a special focus on older workers. This paper aims at assessing the role of those incentive-based reforms as an explanatory factor for the observed changes in older workers' employment patterns.

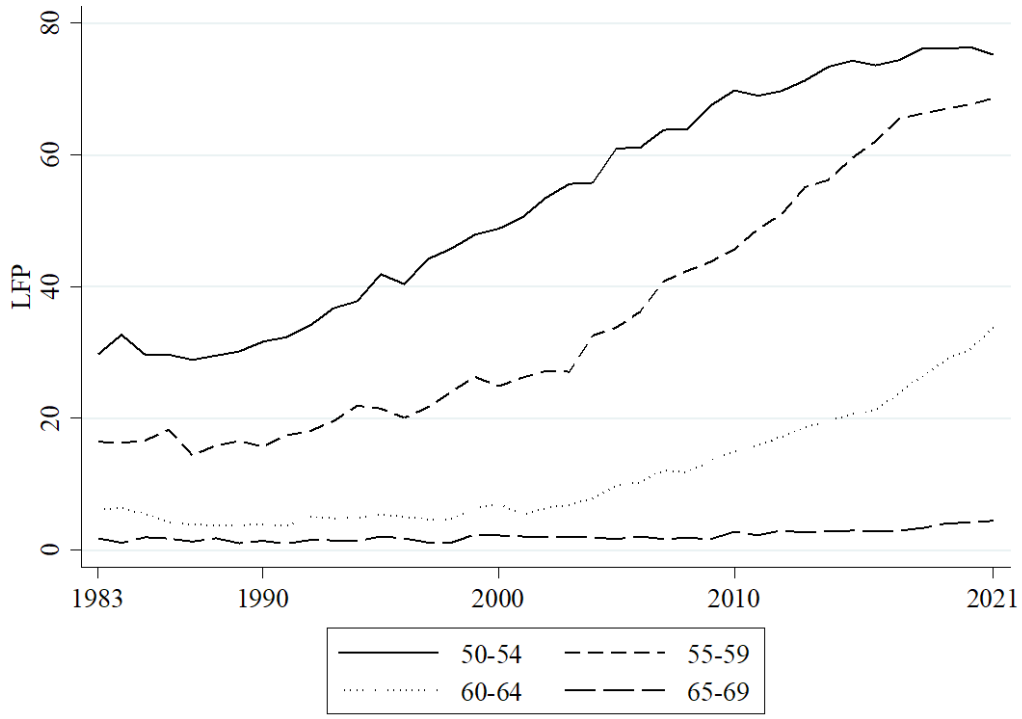
Figures 1 and 2 display the evolution of labor force participation of older workers, for men and women respectively. Since the start of the collection of Labour Force Statistics (LFS) in their current format in 1983, we observe distinct sex-specific patterns. The figure reveals a U-shaped curve of labor force participation for men in the different age cohorts – with a reduction of participation in the mid 1980's and then an upward trend. The year of the trend's tipping point depends on the specific group of age-cohorts. Changes have been the most pronounced for the age group 55-59 – with a variation of almost 30 percentage points from trough to peak. Labor force participation above the statutory eligibility age of 65 remains the exception throughout the time-period. For women we observe a long-term upward trend that is the reflection of the secular increase in female labor market participation. In Belgium, major social security reforms have also undoubtedly played a reinforcing role, particularly the gradual increase of the statutory eligibility age for women from age 60 in 1997 to 65 in 2009.

Figure 1 : Labor force participation of older men by age group



Source: Eurostat Labour market statistics (2021)

Figure 2 : Labor force participation of older women by age group



Source: Eurostat Labour market statistics (2021)

Previous studies for Belgium have already pointed at the role of social security incentives and institutional changes in explaining the labor force participation of the elderly (see i.e. Pestieau and Stijns, 1999; Dellis et al, 2004; Jousten and Lefebvre, 2013; 2019a and 2019b). However, they have generally covered much shorter time-spans and been unable to separate age effects from those of reforms.

Fraikin et al. (2020), proposed a first analysis over a more extended period. The authors used a typical-worker simulation approach akin to Pestieau and Stijns (1999) to assess the role of social security incentives on employment outcomes over the last four decades. They suggest that policy reforms in Belgium over the recent decades have focused more on implementation measures rather than on changes in key policy parameters. Relying on these typical worker simulations, they document a rather marginal effect of reforms on employment outcomes at the macro-level. However, these results cannot be seen as definitive as a typical-worker approach is unable to reflect the institutional complexity – and the associated retirement incentive heterogeneity – of a country like Belgium with its highly segmented institutional landscape. Only micro-simulation and micro-estimation analysis can capture the prevailing degree of heterogeneity.

In this chapter we provide a contribution to fill this gap. We investigate how individual social security incentives and particularly their changes over time explain the retirement decision at the micro level. For a sample of Belgian wage-earners, we systematically calculate indicators of benefit entitlement and retirement incentive measures and we relate them to the individual labor force participation. More specifically, in our empirical analysis, we focus on the population of contractual wage-earners aged 55 to 64 over the period 2004 to 2010. This sample choice is motivated by two factors: First, the wage earner pension scheme is by far the largest one in terms of enrollment and coverage. It is also the scheme with the most time-series information available in administrative datasets. Second, data availability imposes a constraint on the period of analysis. Given the ad hoc nature of the dataset, we cannot easily update it to more recent years. We believe that this limitation is not too severe given that the analysis focuses on a period of major parametric changes (see below), while at the same time allowing us to use the highly granular nature of the underlying administrative data as a source of variation. In the end, we estimate a series of econometric specifications and use the results to simulate counterfactual labor supplies under a reform scenario.

The structure is as follows. Section 2 presents the main features of the social security schemes that apply to Belgian wage-earners. It also provides an overview of the main changes that

took place during our period of analysis. Section 3 presents our dataset as well as the microsimulation approach we use to calculate financial retirement incentive measures. In Section 4, we show the results of a series of regressions using these financial incentive measures and Section 5 provides the counterfactual simulation analysis to scope the effect of social security reforms. Section 6 concludes.

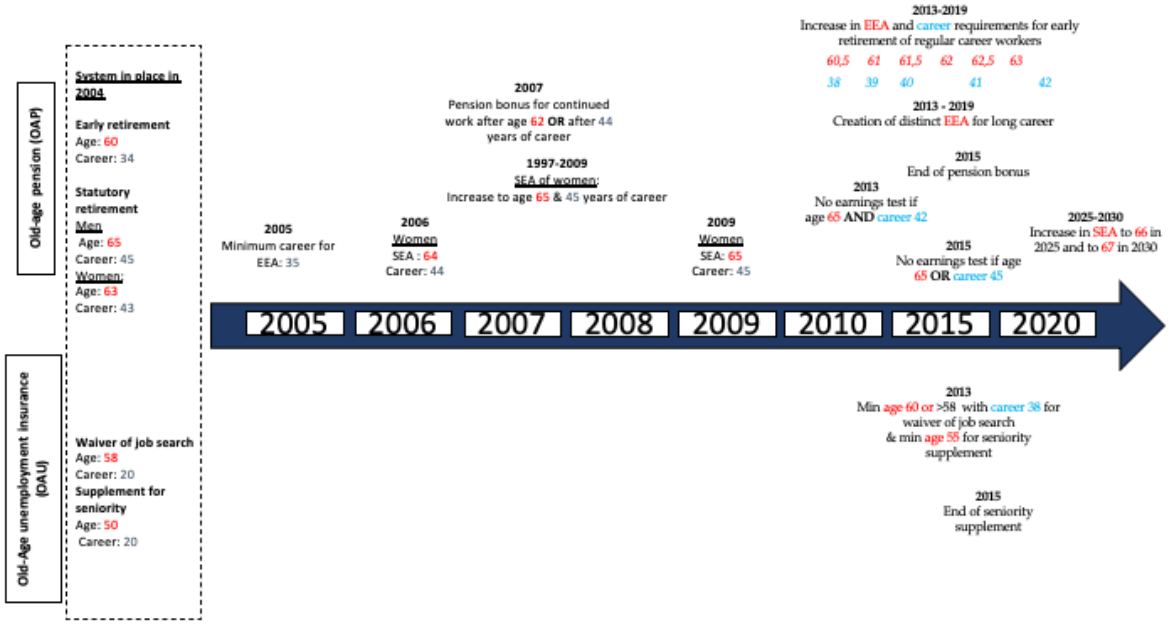
2. Pathways to retirement

Belgian wage earners essentially have four main exit routes into retirement: the old-age pension system (OAP hereafter), the unemployment insurance (UI), the conventional early retirement system (CER) and the disability insurance system (DI).[1] In the following, we summarize each pathway and survey the main reforms that have been implemented since the early 2000's, with a special focus on those implemented until the end of our observation period, namely 2010. Figure 3 and Figure 4 summarize this information.

It is important to note that the reforms presented and the rules we consider in our analysis are those applicable in the "headline" system – i.e., those applying to standard workers not benefiting from preferential regimes. As mentioned in Fraikin et al (2020), Belgium's retirement landscape is characterized by complexity, both in institutions and applicable rules. Laws and bylaws provide preferential treatment for some categories of workers (mine-workers, pilots, etc.). Also, collective bargaining agreements play an important role in the implementation and even the design of social protection schemes. Collective bargaining agreements can sometimes substantially deviate from the headline rules – e.g., by providing a lower early retirement age in some sectors. As the data does not allow us to track the precise rules applicable to a specific worker, we use the headline system as the best possible approximation of real-world incentives faced by workers.

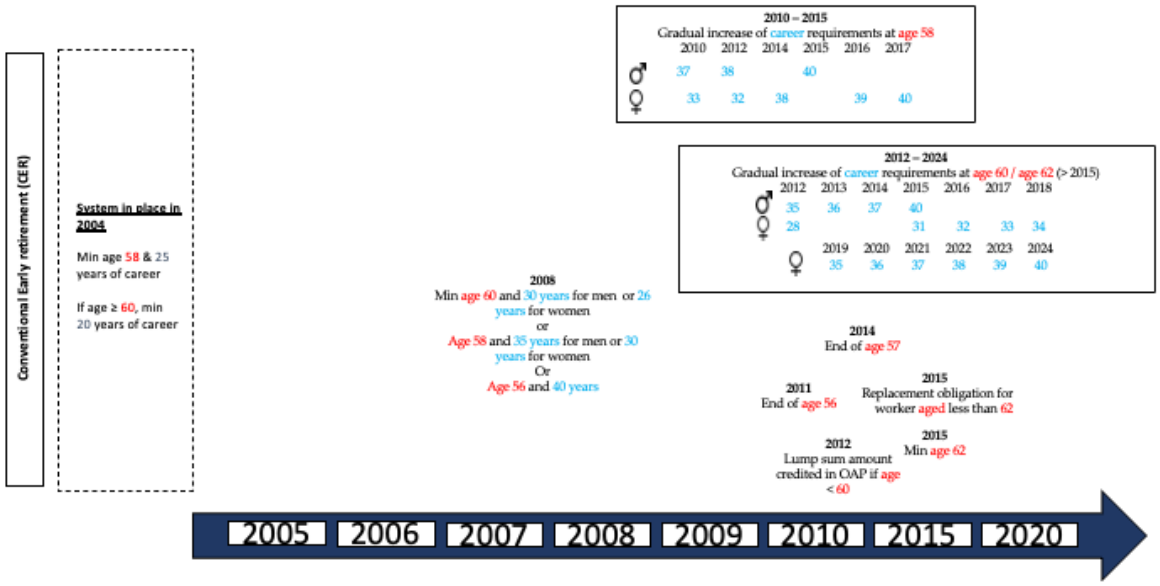
[1] We do not detail rules for the separate programs of professional disease and workplace accident insurance. Overall, their importance in terms of beneficiaries remains smaller in magnitude – though they can clearly play an important role as an exit route for some workers.

Figure 3 : Timing of reforms 2005 – 2020: Old-age pension and old-age unemployment



Note: EEA: early eligibility age; SEA: statutory eligibility age.

Figure 4 : Timing of reforms 2005 – 2020: Conventional early retirement



Note: EEA: early eligibility age; SEA: statutory eligibility age

a. Old-age pension

The Old-age pension (OAP) system is the main public social security scheme covering the elderly. It encompasses the wide majority of private sector workers as well as the contractual staff of the public sector. The system is part of the global financing mechanism of social security – and as such has no earmarked financing. Social security is funded by tax-deductible employer and employee general social security contributions, by alternative financing mechanisms as well as by budgetary transfers from the federal budget. The program runs on a pay-as-you-go basis.

The amount of the benefit depends on career earnings histories, on the marital status and on income. Full benefits nowadays require 45 years of earnings or assimilated periods for both males and females.[2] Assimilated periods correspond to periods of life spent on replacement income (e.g., unemployment benefits, disability benefits, career breaks) or other forms of paid or unpaid leave. Until 2012, these periods fully count as years worked at the full (last) wage in the computation of the pension benefit.[3] The pension corresponds to 60 percent of average lifetime earnings over the best 45 years of career. For married individuals, a higher single earner couple benefit rate of 75 percent is available but is subject to a pension or earnings test of the spouse, and survivor benefits also apply.

There are ceilings and floors, applicable both to pensionable earnings and pensions. Both pensions and ceilings are indexed to consumer prices. Pension floors are further proportionately adjusted by a ratio depending on the completeness of the career. In addition, numerous ad hoc discretionary increases of both the ceilings for pensionable earnings and the pension floors are applied –with the stated dual aim of (i) correcting for the lack of real wage indexation and (ii) increasing minimum pensions at a faster pace than average pensions. Two important discretional increases in the pension floor occurred in 2001 and 2004, with a real growth rate of 3.5% and 3.8%, respectively. De facto, the faster growth of minimum pensions progressively makes the old-age pension system tend towards a flat-rate benefit structure.

Both benefits and past earnings are indexed across time using the health index, which is essentially a slowed-down variant of the consumer price index (CPI) that is applicable as of 1996. Effectively, this indexing past earnings exposes individuals to a double systematic loss: First, they are exposed to an erosion of past earnings as the defined benefit formula is not reflecting real wage growth. Second, inflation-protection is not fully covered both for past

[2] The female full career condition was increased between 1997 and 2009 from 40 to 45 years in line with the increase in the statutory eligibility age.
[3] For details see http://www.onprvp.fgov.be/FR/profes/calculation/career/inactivity/Pages/default.aspx.

earnings and benefits in payment as the health index grows less than the true cost of living summarized by the CPI. Beyond this mechanical drift caused by indexing on a slowed-down consumer price index, additional ad hoc changes are applied. On the one hand, until 2004, ad hoc adjustments were applied to past wages to undo some of this drift. On the other hand, in 1984, 1985, 1987 and in 2015, the automatic indexing of wages and benefits was not granted for budgetary reasons hence further reinforcing purchasing power loss– de facto lowering benefits for the rest of the life as these measures were never unwound.

For men, the statutory eligibility age (SEA) to full benefits has been of 65[4] for several decades. For women, the statutory eligibility age has undergone substantial changes. Before 1997, the statutory eligibility age for women was age 60. It was then increased by one-year steps every three years starting in 1997 and finishing in 2009 – resulting in full alignment with the male statutory eligibility age.

Early retirement in the OAP system has been possible at an early eligibility age (EEA) of 60 during our period of analysis, with reforms to this parameter only occurring in the period 2013-2019. Claiming before the statutory eligibility age has always been subject to career conditions. The career condition for early claiming between the early eligibility age and the statutory eligibility age has undergone substantial changes. Whereas before 1997, a career of 20 (10) years was required for men (women), between 1997 and 2005 the career condition was increased gradually to 35 years. Between 2013 and 2019, both the headline early eligibility age and the career length requirement were progressively increased. Currently, under the headline system, workers can retire at the age of 63 if they satisfy a 42-year career requirement, or alternatively at the age of 60 with a 44-year career requirement.[5]

In Belgium, the EEA effectively also plays the role of a statutory retirement age (SRA), i.e. an age at which an individual can obtain actuarially unreduced benefits by satisfying both a minimum contribution history and the early eligibility age. This occurs because the Belgian old-age pension system does not apply actuarial adjustments in case of claiming before the SEA. Early claiming between the SEA and SRA only causes lower benefits if as a result of

[4] A legislative change in 2017 is scheduled to increase this age to age 66 in 2025 and to 67 in 2030.
[5] As of 2013, a distinction between regular and long careers was introduced into the headline system. Starting in 2013, the regular early eligibility age increased by half a year every calendar year until it reached age 63 in 2018. In line with the progressive increase in the early eligibility age, regular career conditions for retirement at the headline early eligibility age are further tightened: 38 years in 2013, 39 in 2014, 40 in 2015 and 2016, 41 in 2017 and 2018 and 42 in 2019. For long careers, early claiming remains possible at age 60. Since 2019, this is the case for careers longer than 44 years. See http://www.onprvp.fgov.be/FR/profes/benefits/retirement/age/Pages/default.aspx for details.

the early exit the career remains incomplete. As a corollary, a worker with a full career at the EEA is entitled to full benefits, with no reductions of any kind.

For careers spanning beyond the SEA, benefits can still increase in case of continued work, even with a full career: first, by replacing lower earning years by higher earning ones; and second, by means a lump-sum pension bonus – introduced in 2007 and abolished in 2015 – granted per day of continued work past age 62 or past a career length of 44 years.

Under social security law, combining old age pension receipt with work is, in principle, possible but generally subject to an earnings test. Over time, successive reforms have progressively liberalized the earnings test, with a complete elimination in 2015 for long careers or workers above the SEA (see Figure 3). [6] The earnings test is categorical – with benefits completely suspended if surpassing a pre-determined level. The structure of the earnings test itself has not undergone major reform.

b. Unemployment insurance and the old-age unemployment system

The regular UI system is available to wage-earners of all ages under the condition of having paid contributions during at least 12 months in employment or having been in assimilated status (sickness, etc.) in the last 18 months. The unemployment benefits are also a function of unemployment duration and household status. At the beginning of the unemployment spell, the benefits represent 60 percent of the last gross wage for unemployed with dependents, 55 percent for single unemployed and 40 percent for individuals that are effectively cohabiting. These benefits are not limited in time with payments ending upon re-employment or reaching the statutory eligibility age – in the latter case the person is automatically rolled over into the OAP program. Benefits are generally decreasing as a function of benefit duration with exceptions prevailing for unemployed workers who are either aged more than 55, have worked as a wage-earner for at least 25 years or can prove a disability of more than 33 percent. There are minimum and maximum unemployment benefits that also vary by household status and are decreasing in unemployment duration. Under the regular system, individuals have to be available for the job market and actively look for employment.

In 1989, a seniority supplement was introduced for those aged 50 or more and who have been employed for at least 20 years. The amount of the seniority supplement was added to the

[6] Under labor legislation continued work after the SRA requires the explicit consent of the employer. Also, income tax rules hamper simultaneous work and benefit receipt in our period of analysis – as a result of substantial discrete jumps in tax liabilities when having labor income in addition to benefit income.

regular unemployment benefit and depended on the household status and the age. The age condition was increased to 55 in 2013 and the measure was finally abandoned in 2015.

A specific feature of the Belgian UI system is the status of old-age unemployed (OAU). Under OAU rules, the unemployed is exempted from both actively looking for a job and from an availability condition for the labor market. Also, benefits remain unreduced until reaching the OAP statutory eligibility age. The OAU system was introduced in 1985 and have been gradually changed, starting from an initial eligibility age of 55, it has been lowered to 50 in the 1990s. In 2004, the government introduced more stringent conditions to benefit from the job search and availability waiver. Only workers aged 58 and above with a career of at least 20 years still benefit from a full waiver. In 2013, the conditions to benefit from the waiver of job search were made even stricter: only workers aged above 60 or workers aged above 58 with at least 38 years of career could still benefit from the waiver.

For people in our sample, any time spent on unemployment benefits is fully credited towards pensionable periods at the last real wage before unemployment.[7]

c. Conventional early retirement

Conventional early retirement (CER) is a parallel system of early retirement benefits that was created in the early 1970's. Benefits are composed of two elements. First, the early retiree is entitled to benefits from the unemployment insurance that are more generous than the ones of the simple UI system – particularly because of the absence of degressivity with respect to benefit duration and more favorable treatment of household composition. Second, these baseline UI benefits are topped up by a complementary benefit paid by the former employer—equal to half the difference between the last net wage and the UI benefit.

During our period of analysis, CER beneficiaries were fully exempted from job search and did not have to be available for the labor market (see Figure 4). [8] As for all regular and old-age unemployed, periods on CER were fully credited at the last pre-retirement wage.[9]

Eligibility conditions have undergone a steady flow of adjustments. While the eligibility age in 2004 was 58 with a minimum career of 25 years and 60 with a minimum career of 20 years,

[7] Since 2012, the wage crediting is limited to a lower flat-rate amount for unemployment spells longer than two years.
[8] This has been changed in 2015 and a new notion of "adapted availability" has been introduced in the applicable rules, essentially making numerous early retirees subject to an availability condition up until the statutory eligibility age – though it remains less stringent than for regular UI. The name of the scheme has also been adapted to unemployment scheme with company supplement – mirroring this conceptual shift.
[9] Since 2012, the last-wage crediting is limited to a lower minimum amount for individuals retiring on CER before the age of 59.

it increased to 60 with a minimum career of 30 years for men and 26 years for women in 2008 but remained accessible at age 58 with a minimum career of 35 years for men and 30 years for women and at age 56 with a minimum career of 40 years. These exceptions for long career workers were gradually removed. Since 2010, a new wave of restrictions in terms of career length and early eligibility age has occurred, leading to a general tightening of access and a harmonization between genders.

d. Disability insurance

The Disability Insurance (DI) system is the main program targeted at people withdrawing from the labor market for disability reasons – though it has become an increasingly relevant early retirement route in light of ever tighter eligibility and benefit criteria for the CER and UI systems (see Jousten et al, 2012). To be eligible for the benefit, the worker has to satisfy a series of conditions. First, there is a condition in terms of the loss of earnings capacity in the usual job. In order to be eligible, the worker has to suffer from a loss of earnings capacity of 66 percent over a period of at least twelve months – the primary period of incapacity.[10] After first benefit entitlement, continued eligibility is periodically validated using medical and administrative controls. Second, workers also have to satisfy minimum contributory requirements to qualify for benefits. The coverage under the system prior to the onset of the disability has to be assured for at least two quarters, combined with at least 120 days of actual or assimilated work (or 400 hours for part-time workers) before the covered event occurs.

During the 12 month-period primary incapacity period preceding the entry into DI, workers first benefit from continued wage-pay by their former employer and then for the remainder of the year the benefit is equal to 60 percent of reference earnings irrespectively of family composition. After the first year, upon the onset of the secondary period of incapacity and the entry into the DI system, the benefit level changes and is a function of the household status of the worker. It is equal to 65 percent of reference earnings if the insured has dependents, 55 percent of reference earnings if the insured lives alone and 40 percent of reference earnings if the insured cohabits with a partner and has no dependents. Reference earnings during this secondary period are different from those during the primary period and are based on real observed earnings in the year leading up to the onset of the insured event.

As for the UI and CER systems, sickness and DI benefits are payable up to the statutory eligibility age. Periods of benefit receipt have always fully counted toward the build-up of

[10] During these initial twelve months, workers are generally covered by sick pay from their employers and the sick pay insurance.

pension rights at the value of the last real wage – in contrast to the reformed regimes in place since 2012 for UI and CER.

3. Incentive measures calculation

Based on the institutional setup described in the previous section, we compute several individual-level financial incentive measures that summarize the generosity of the different social security retirement pathways. Below, we first present the data and then detail the formulae used to calculate financial incentives for each individual.

a. Data

The analysis relies on a representative administrative panel dataset drawn in 2004 and coming from the "Datawarehouse Labor Market and Social Protection". The data were provided by the Belgian Crossroad Bank for Social Security (CBSS)[11]. Records on individuals' labor market status are retrieved from the administrative records of various social security institutions and personal characteristics are retrieved from the national registry. The panel includes information on a quarterly basis for cohorts born between 1941 and 1949 for the period 2004 to 2010. For the purpose of this study, we use the calendar year as a period of reference, and hence merge the quarterly income data into a single yearly observation, using that status of the last day of the last quarter of each year.

We use a subsample of the original population that satisfies the double condition of working and of belonging to the wage-earner scheme in 2004, the start of the observation period.[12] Although we focus our attention on the population of wage-earners, our sample inevitably includes people who currently have mixed employment histories as wage earners, civil-servant or self-employed. Also, current pure wage-earners may have had earlier spells as civil-servants or self-employed. For the purpose of our study we selected an initial sample of individuals aged between 55 and 64 who were in active wage-earner employment in 2004 (part-time or full-time).[13] Moreover, in each of the following sample years 2005-2009, we add individuals aged 55 in the given sample year and who satisfy the double condition of having been in active wage-earner employment in 2004 and still being in this status. We follow each individual until 2010, age 65 or until retirement.[14] We obtain a sample of 89,621 observations with possible retirement ages ranging from 56 to 65 in years from 2005 to 2010, which

[11] This dataset was initially created for the EMPOV project (Employment and Poverty in a Changing Society), financed by the Belgian Science Policy Administration (BELSPO research project TA/00/45).
[12] A similar condition is applied to spouses in each year of analysis.
[13] The workers who are still actively employed but receive some forms of (retirement-related) social security benefit are included. Because of the initial dataset structure, the sample includes no persons aged 64 in 2004.
[14] Individuals who die or transfer to civil servant or self-employed status are also withdrawn from the sample.

corresponds to 26,880 distinct individuals. Table 1 presents descriptive statistics of the 26,880 individuals, as they appear in their first observation year. Based on the active employment condition at older ages that we impose, we obtain a sample with a stronger male component than for the Belgian population as a whole. In line with the wider population, women in our sample have shorter careers on than men.[15] The breakdown of the sample by region implies that older Flemish men are more frequently still at work than in other regions. The majority of the individuals are married.

Table 1: Main Characteristics of the individuals present in the sample, in their first observation year

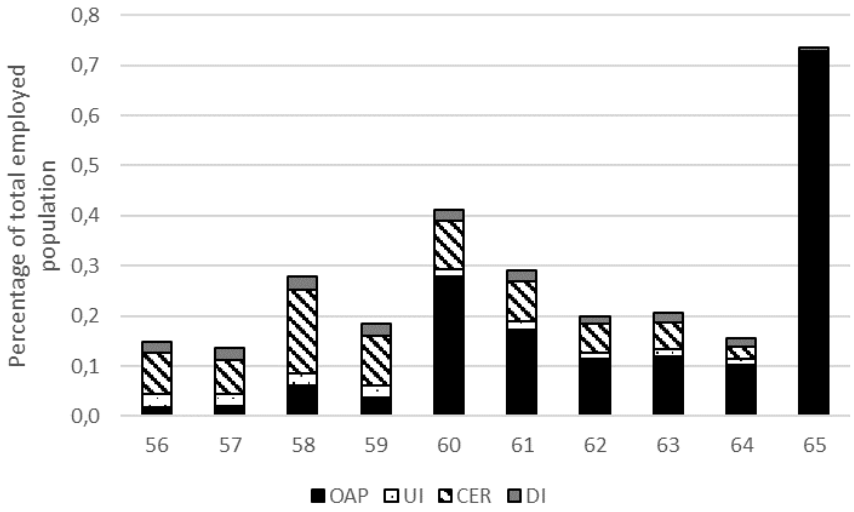
	All	Men	Women
N	26,880	16,981	9,899
Breakdown by Region			
Flanders	61.7%	63.9%	58%
Wallonia	29.6%	28.5%	31.4%
Brussels	8.7%	7.6%	10.6%
Breakdown by Marital Status			
Married	72.8%	77.1%	62.7%
Unmarried or single	28.2%	22.9%	37.3%
Average years of career	33.3	34.6	31.1

Note: Author's calculations based on BCSS data.

Figure 5 and 6 present the observed exit rates by age for years 2005-2010 at possible retirement ages 56 to 65. These exit rates correspond to the transition from paid employment to inactivity through one of the four main exit pathways (residual exits[16] are included in the OAP pathway). Some key ages are important: the ages of 58 (the early eligibility age for CER), 60 (OAP early eligibility age and CER eligibility age) and 65 (OAP statutory eligibility age) are modal labor market exit ages. For women the situation is slightly different at the upper end of the age spectrum as the statutory eligibility age increased during our sample period from 63 to 65 (reform of 1997) hence limiting the pivotal role of age 65.

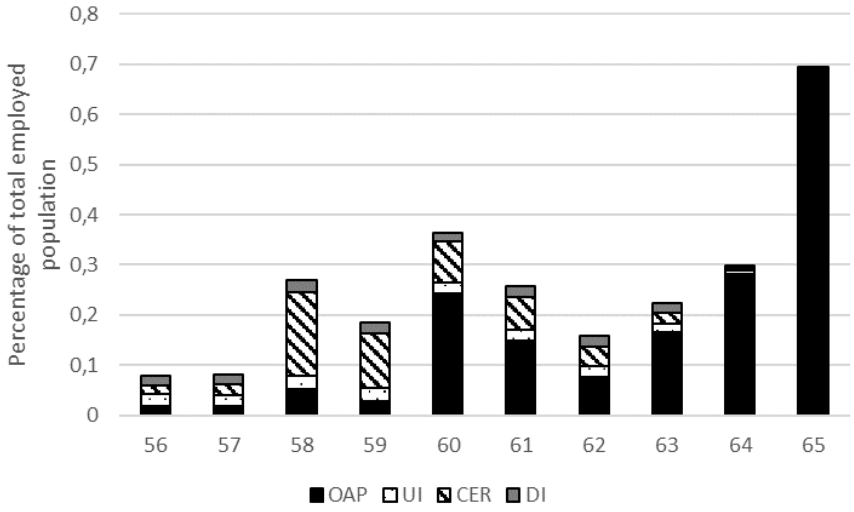
[15] Because of the activity condition at older ages that we imposed, the sample of women we have selected have relatively longer working careers than in the total population of Belgian women at older ages.
[16] These includes exits through social aid, professional diseases, work injury, etc.

Figure 5: Exit rates by age for men – all sample



Note: Full sample of person-year observations 2005-2010. Author's calculations based on BCSS data.

Figure 6: Exit rates by age for women – all sample



Note: Full sample of person-year observations 2005-2010. Author's calculations based on BCSS data.

b. Benefits calculation

For each individual in the sample and for each year of observation, we compute the after-tax stream of benefits that he could claim in case of exit through each of the four exit routes applying the rules at this possible retirement age– also using tax rules as applicable in the possible year of retirement. Expressed differently, for each individual i of age a, we calculate the after-tax benefit $B_{k,a}(R,i)$ from the exit pathway k in case of retirement at age R, where $R \in [56, 65]$. Benefits are equal to the benefit entitlement from exit pathway k for all ages $a \geq R$.

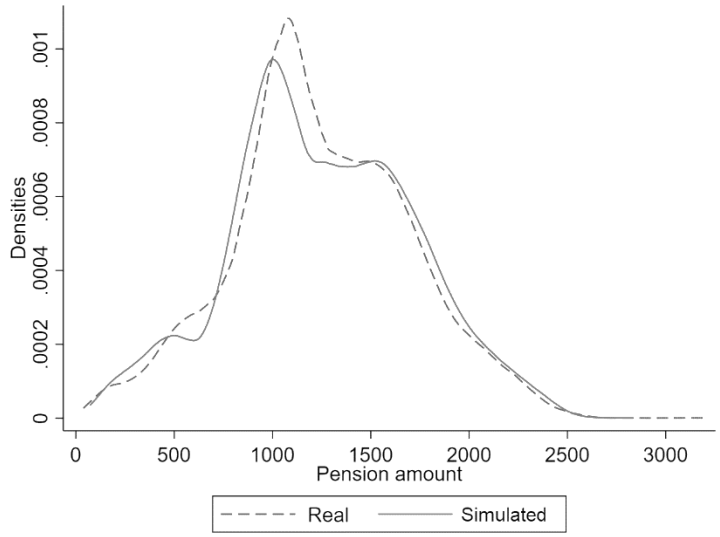
For UI and DI exits, no early entitlement ages exist. For CER exits, we do not verify the eligibility conditions as there are many exceptions to these rules that we cannot validate with our data. Hence positive benefits are applied for all $a \geq R$ in the UI, DI and CER exit pathways– with automatic rollover into OAP at the statutory eligibility age. For OAP exits, given strict eligibility conditions, zero benefits are imputed in periods t where the eligibility conditions are not yet met, applicable positive benefits are counted otherwise. Once positive benefits are claimed, we assume they remain constant in real terms in future years as long as benefits are payable.

We apply the social security rules for eligibility and benefit calculations as they were applicable for each year of first entitlement based on each individual's career history, marital status and occupation as well as the partner's occupation. Social security and taxation rules differ greatly according to the spouse's occupational status. We combine information from the national registry and individual occupational status to identify single earner and dual earners couples in order to calculate the social security benefits accordingly.

To validate our OAP benefit simulator, we compute OAP benefit entitlements using our simulation tool and we compare them with the observed real-world OAP entitlements that individuals in our sample who retired before the end of our observation period are granted as indicated in the pension administration administrative records. As shown in Figure 7, both distributions are very close. For individuals who belong to our sample and who retired between 2005 and 2010, we find an average simulated pension of 1417.7€ and an average real pension of 1388.1€ (in the first year of retirement).[17] In total, 87.6% of our simulated pensions are less than 200€ from the corresponding observed real pension amount.

[17] The remaining differences between our simulations and the real pensions are caused by missing data on personal characteristics and special career histories. For instance, we lack information on years on self-employment before 2004, those years are used in the accessibility criteria for and calculation of the guaranteed minimum pension, which leads to an underestimation of the amount of minimum pension received by some individuals.

Figure 7: Comparison of observed and simulated OAP benefits, OAP retirees in the sample 2005-2010



Note: Author's calculations based on BCSS data.

c. Incentive measures

From these annual benefit amounts by scheme, we calculate three aggregate indicators of incentives for each individual: the aggregate social security wealth (SSW), the aggregate accrual of SSW (ACC) and the implicit tax on continued activity (ITAX).

The SSW associated with a scheme is the present discounted value of all future benefit flows from a given exit pathway for an individual retiring in a given year. SSW for an individual of type i who starts to claim benefits from exit pathway k as of retirement age R is then given by:

$$SSW_k(R,i) = \sum_{a=R}^{T} B_{k,a}\sigma_{i,a}\beta^{a-R}$$

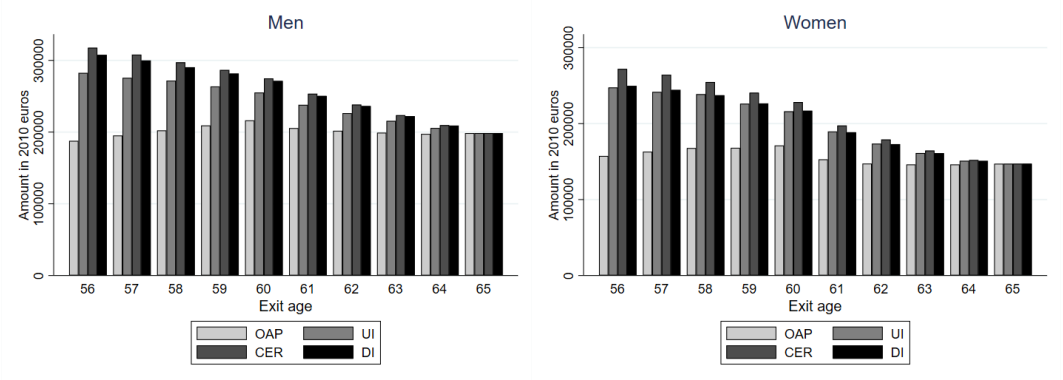
Where $B_{k,t,R}$ is the after-tax benefit from exit pathway k at age $a \geq R$ as calculated above. The formula sums these benefits until the end of life T. Discounting is done allowing both for time preference and mortality adjustments: $\sigma_{i,a}$ is the survival probability[18] at age a for individual i and β is the time discount rate that we assume to be equal to 3 percent real.

Figure 8 presents the average SSW for each exit pathway by age for every year of observation and separately for men and women. The CER pathway is the most generous scheme in terms of benefits for men and women. The DI presents the second highest thanks to relatively generous benefits ceilings (at least as compared to the UI and CER). The third most favorable exit pathway is the UI, which includes the seniority supplement from age 58 onwards, but has

[18] Obtained from the Human Mortality Database.

relatively low benefits ceilings. The benefits granted in these three exit pathways are combined with continued pension accruals until the statutory eligibility age. The least favorable exit pathway is the OAP scheme that is only available from age 60 onwards. Thus the SSW of the OAP exit pathway increases with age before 60 because we assume that individuals receive an income of zero until they become eligible for the OAP. From age 60 until the statutory eligibility age, individuals can access the OAP if they meet the minimum career requirement (34 years in 2004 and 35 years from 2005 until 2013) and the SSW decreases as age increases. This reversal in average SSW amounts comes about as delaying claiming now has an instantaneous cost in terms of benefits payable – the latter cost being effectively larger than the gain from adding one year of earnings to the OAP benefits calculation. At age 65, it is not possible to receive UI, CER or DI benefits anymore and workers are automatically transferred to the OAP system. Thus, the difference in SSW between the OAP and the other exit pathways decreases as we get closer to age 65 because there are less years spent in the UI, CER or DI schemes.

Figure 8: Average SSW by exit pathway (in 2010€)



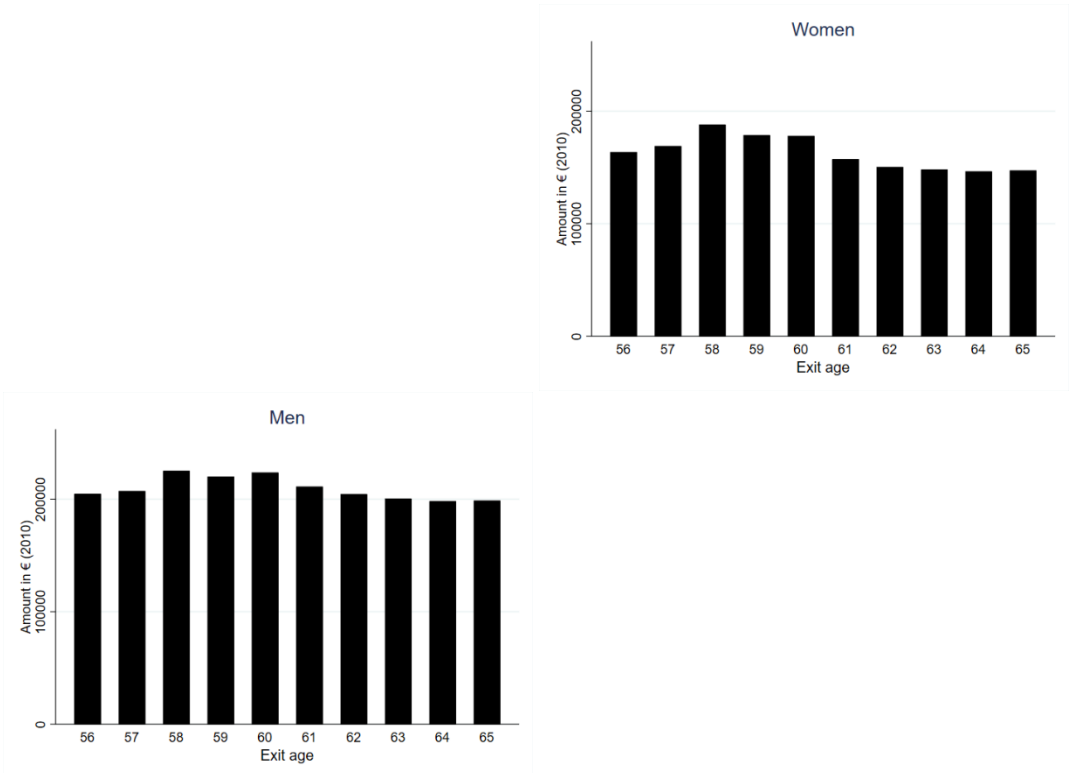
Note: Full sample of person-year observations 2005-2010. Author's calculations based on BCSS data.

We then aggregate these scheme-specific SSW measures into one aggregated SSW indicator which sums the previously scheme-specific incentive measures. We use an aggregation method that is similar to the one applied by Dellis et al (2004): For each pathway except OAP, we use the number of observed exits into each route from a certain age until the statutory eligibility age as a proportion of the total number of employed individuals at each age as weights, and we further differentiate the weights by sex and year.[19] The OAP scheme takes the residual weight.

[19] See appendix for the weights used in the aggregation method.

Figure 9 presents the aggregated SSW measure for men and women separately. The incentives are mostly driven by the SSW OAP and the SSW CER from 56 to 60 and by the SSW OAP only after 60. The aggregated SSW of men and women increase at age 58 following an increase in the CER participation rate, and then decreases until age 64 because of the growing influence of the SSW OAP. Unsurprisingly, the SSW are lower for women than for men because of lower average pension entitlements.

Figure 9: Average aggregated individual SSW, by gender (in 2010€)



Note: Full sample of person-year observations 2005-2010. Author's calculations based on BCSS data.

Based on these aggregated SSW, we then compute a secondary incentive measure that represents the variation in SSW that is obtained by retiring one year later, the benefit accrual. Postponing claiming by one year has two effects on social security wealth. On the one hand, annual benefits $B_{k,a}(R,i)$ can vary with later claiming due to additional earnings entering the benefit formula (and possible actuarial adjustments). On the other hand, benefits may (or may not) be foregone as claiming may (or may not) start one year later, depending on whether the individual was entitled to immediate benefit payouts or not. The accrual of social security wealth is given by:

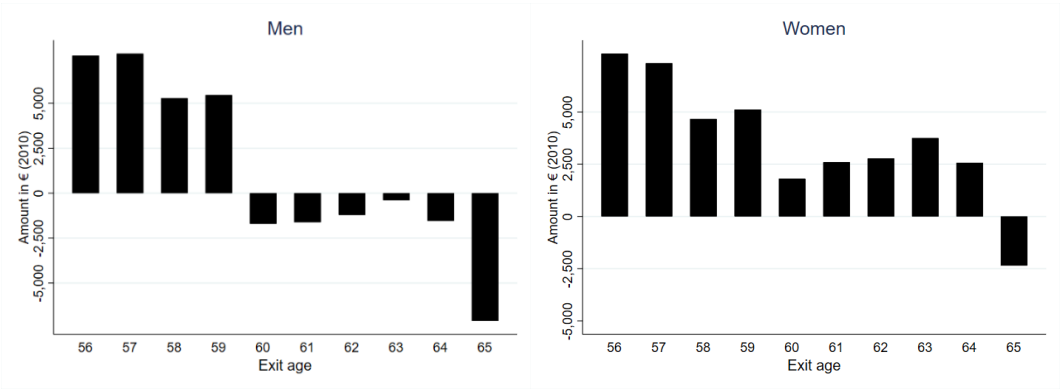
$$ACC\ \ (R,i) = SSW\ \ (R+1,i) - SSW\ \ (R,i)$$

The accrual can thus be positive, zero, or negative. If the accrual is negative, the social security system imposes an implicit tax on continued activity. The implicit tax rate is the (negative) accrual of social security wealth divided by the after tax (and after social insurance contribution) earnings during the additional year of work Y_i:

$$ITAX\ \ (R,i) = \frac{-ACC\ \ (R,i)}{Y_i}$$

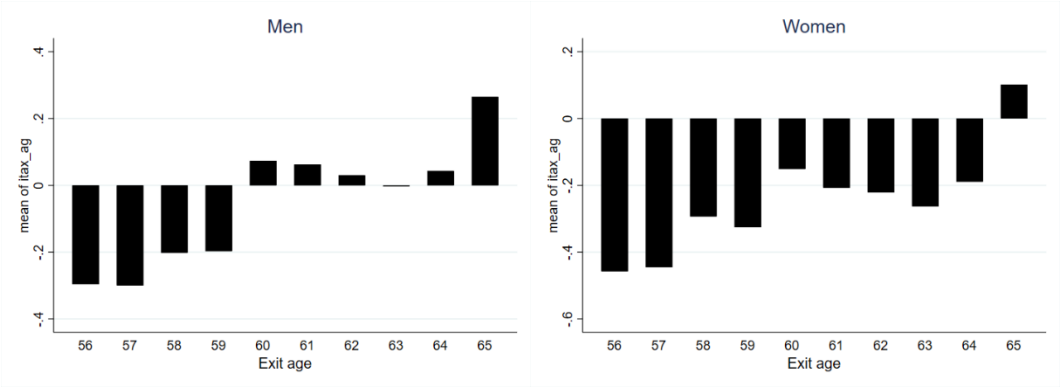
A positive value means that there is an extra implicit tax on working longer beyond income taxes and social insurance contributions originating on the benefit side of social security, a negative value represents an implicit subsidy for working longer. Figure 10 and 11 illustrate the aggregated ACC and ITAX measures for both sexes. The ITAX of men and women is negative for exits between 56 and 59. This is mainly due to the influence of the OAP that is not available at those ages. Individuals are imputed a pension of zero until the OAP becomes available at the early eligibility age of 60 if they have a career that is long enough or at the statutory eligibility age. The aggregated ITAX of men is less negative than that of women because of the larger influence of the CER program, associated with large positive ITAX. From age 60 onwards, the ITAX turns positive for men as they have largely reached the OAP early eligibility age. As for women, since they are less likely to access the early eligibility age OAP because of career conditions, the ITAX generated by the OAP remains negative for the same reasons mentioned above. At age 65, the ITAX is only composed of benefits from the OAP pathway since other pathways are not available anymore.

Figure 10: Average ACC, by gender (in 2010€)



Note: Full sample of person-year observations 2005-2010. Author's calculations based on BCSS data.

Figure 11: Average ITAX, by gender (in 2010€)



Note: Full sample of person-year observations 2005-2010. Author's calculations based on BCSS data.

4. Regression results

In this section we present the regression results we obtained from five different models: a standard linear probability model (LPM), the same model with fixed effects and random effects, a probit model with and without random effects.

The dependent variable is retirement and it is equal to one if the individual exits employment through one of the four exit pathways within the year, and zero otherwise. It corresponds to the observed exit patterns presented in Section 3.a. We use the previously derived three incentive measures as explanatory variables, and control for a large set of personal and socio-demographic variables: being a female, having a partner, having an active partner, a dummy if the individual lives in Wallonia or Brussels (living in Flanders is the reference) and the age (and its squared form). We control for the individual's earnings and that of his or her partner by including indicators of average life-time earnings[20] and the current salary (and their squared forms). We control for job related characteristics: part-time work, white collar worker (with blue-collar worker as reference) and two dummies indicating if the individual works in the primary or the tertiary industry sectors (working in the secondary sector is the reference). Finally, we add an eligibility dummy variable that indicates whether the individual has reached the statutory eligibility age of OAP, set at age 65 for men and 63, 64, 65 for women between 2003 and 2005, 2006 and 2008 and after 2009, respectively.[21] For the probit regressions, we report marginal effects estimated at the mean.

[20] The average lifetime earnings for the reference person is calculated as $\frac{lifetime\ earnings}{(age-16)}$ and the average lifetime earnings for the partner is calculated as $\frac{lifetime\ earnings}{45}$ because of a lack of data on the partner's age.

[21] While age dummies are potentially well equipped to capture age-based focal points and bounded rationality concerns as in the behavioral economics literature on the subject (Seibold, 2021), eligibility variables also have their role to play as they capture factors going beyond age and financial incentives. This includes, for example, issues of liquidity constraints.

Table 2 presents the results of our five models using the total sample of individuals aged 56 to 65 between the year 2005 to 2010. We report the results for models using the SSW and the ITAX measures of incentive in the body of the text.[22] The marginal effect of ITAX is positive and significant in every model, which means that a larger tax on continued activity leads to higher probability of retirement. In all models except for the fixed effect model, the effect of SSW is positive and significant. The fixed effect model removes the impact of invariant unobserved individual characteristics such as demand for leisure and time preferences. It is likely that the SSW measure in the other models is positively correlated with these unobserved variables and thus captures their positive effect on the retirement probability. We are thus left with a negative and significant impact of the SSW on the retirement probability in the fixed effects model – a result that is in line with previous findings for Belgium (Dellis et al, 2004). The FE results should however be read with caution as we only have a limited number of periods of observation for each person in our sample (3.33 on average) and some unobserved characteristics (health trends, e.g.) might also be age-varying.

Table 2: Retirement – Total sample

	LPM	Fixed effect	Random effect	Probit	Probit random effects
ITAX	0.079***	0.148***	0.093***	0.063***	0.705***
	(0.005)	(0.007)	(0.005)	(0.005)	(0.006)
SSW/100,000	0.162***	-0.178***	0.202***	0.172***	0.194***
	(0.004)	(0.014)	(0.006)	(0.004)	(0.005)
Female	-0.053***		-0.069***	-0.055***	-0.063***
	(0.003)		(0.005)	(0.003)	(0.004)
Age	0.559***	0.461***	0.393***	0.610***	0.633***
	(0.029)	(0.036)	(0.029)	(0.029)	(0.030)
Age squared	-0.005***	-0.003***	-0.003***	-0.005***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SEA	0.354***	0.408***	0.335***	0.381***	0.248***
	(0.010)	(0.011)	(0.010)	(0.016)	(0.009)
Partner	-0.012***	0.001	-0.015***	-0.018***	-0.021***
	(0.003)	(0.015)	(0.005)	(0.003)	(0.004)
Active partner	0.000	-0.017***	0.005	0.004	0.006*
	(0.003)	(0.005)	(0.004)	(0.003)	(0.003)
Brussels	-0.021***		-0.036***	-0.020***	-0.024***
	(0.004)		(0.007)	(0.004)	(0.005)
Wallonia	-0.012***		-0.017***	-0.011***	-0.013***
	(0.003)		(0.004)	(0.003)	(0.003)
Part-time	0.021***	-0.064***	0.004	0.022***	0.022***
	(0.003)	(0.006)	(0.004)	(0.003)	(0.003)
White collar	-0.036***	-0.082***	-0.053***	-0.035***	-0.039***
	(0.003)	(0.024)	(0.005)	(0.003)	(0.003)
Primary sector	-0.038***		-0.059***	-0.036***	-0.046***
	(0.014)		(0.023)	(0.011)	(0.016)
Tertiary sector	0.003		0.020***	0.001	0.002

[22] The regressions that include the accrual measure as explanatory variable instead of the ITAX measure present very similar results and are presented in the appendix.

	(0.002)		(0.004)	(0.002)	(0.003)
Average lifetime earnings/1000	-0.195***	-2.001***	-0.254***	-0.213***	-0.243***
	(0.010)	(0.144)	(0.014)	(0.010)	(0.012)
Squared form	0.019***	0.261***	0.028***	0.019***	0.22***
	(0.002)	(0.017)	(0.003)	(0.002)	(0.002)
Current salary/1000	-0.033***	-0.088***	-0.054***	-0.028***	-0.030***
	(0.003)	(0.006)	(0.004)	(0.003)	(0.003)
Squared form	0.004***	0.006***	0.005***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Average lifetime earnings of partner/1000	0.070***	0.059***	0.092***	0.073***	0.081***
	(0.006)	(0.022)	(0.008)	(0.005)	(0.006)
Squared form	-0.011***	-0.014	-0.015***	-0.012***	-0.014***
	(0.002)	(0.009)	(0.003)	(0.002)	(0.002)
Current salary of partner/1000	-0.028***	-0.045***	-0.038***	-0.027***	-0.030***
	(0.002)	(0.006)	(0.003)	(0.002)	(0.003)
Squared form	0.002***	0.004***	0.003***	0.002***	0.002***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Observations	86,666	86,666	86,666	86,666	86,666

Note: Full sample of person-year observations 2005-2010. Standard errors are in parentheses. For Probit regressions, the table reports marginal effects estimated at the mean. *** p<0.01, ** p<0.05, * p<0.1.

Reaching the statutory eligibility age increases the probability of retirement. This effect hints at the existence of a corner solution for numerous individuals: employment legislation and social protection legislation are such that individuals face hurdles on continued work after the statutory eligibility age. If individuals would not face such hurdles, their choices would likely be smoother with overall later retirement.

Being a woman significantly decreases the probability of retirement. Being older increases the probability to retire but at a progressively decreasing rate. Having a partner has a negative and significant impact on retirement, except in the fixed effect model. Having an active partner decreases the probability of retirement in the fixed effect model, in line with the literature on joint retirement, unlike other models where it is not significant. We observe higher instantaneous retirement probabilities in Flanders than in Brussels and Wallonia. Working part-time significantly increases the probability to retire, except in the fixed effect model where the opposite sign prevails: both results don't have to be contradictory. While the part-time variable captures a status in the other models (being a part-time worker, retirement is earlier), in the FE specification it captures the transition into part-time status (shifting into part-time status, reduces the likelihood of full exit from labor market). Being a white collar worker and working in the primary sector (as compared to the secondary sector) decrease the retirement probability in every model. Higher average lifetime earnings and higher current salary decrease the probability to retire at an accelerating rate. Finally, the average lifetime

earnings of the partner increases the probability to retire at a decelerating rate and the current salary of the partner decreases the probability to retire at an accelerating rate.

In Table 3, we report regressions separately for men and women. We only present the results for the probit model in the body of the text for the sake of simplicity and because the probit model presents the best fit in terms of its predictions of retirement rates compared to the observed retirement rates.[23] We find positive and significant effect of ITAX and SSW for both sexes but the effect of ITAX and SSW is slightly stronger for women than for men. For the rest, the results are qualitatively similar to Table 2 and we observe stronger effects of the age, reaching the statutory eligibility age (SEA) and the region on the retirement probability of men. Having a partner significantly decreases the retirement probability of men but it significantly increases the retirement probability of women. However, having an active spouse decreases the retirement probability of men, in line with the literature on joint retirement, but it is not the case for women as it increases their retirement probability. This opposite effect of men and women explain the effect of having an active spouse in table 2 that is non-significant. Being a white collar worker, working part-time and working in the primary sector (as compared to the secondary sector) significantly decreases the retirement probability of men but not of women (part-time work is only significant at the 10% level for women). Interestingly, the effect of the average lifetime earnings and of the current earnings is stronger for women than for men. However, the effect of the average earnings and the current earnings of the partner is stronger for men than for women. The positive effect of having an active spouse for men, and the negative effect for women would indicate that women follow their partner's decision, while men do not follow their wives.

Table 3: Retirement using the probit model – by sex

	Male	Female
ITAX	0.061***	0.075***
	(0.008)	(0.008)
SSW/100,000	0.158***	0.247***
	(0.005)	(0.008)
Age	0.610***	0.590***
	(0.037)	(0.049)
Age squared	-0.005***	-0.005***
	(0.000)	(0.000)
SEA	0.470***	0.269***
	(0.021)	(0.026)
Partner	-0.028***	0.020***
	(0.005)	(0.005)
Active spouse	0.010**	-0.022***
	(0.004)	(0.005)

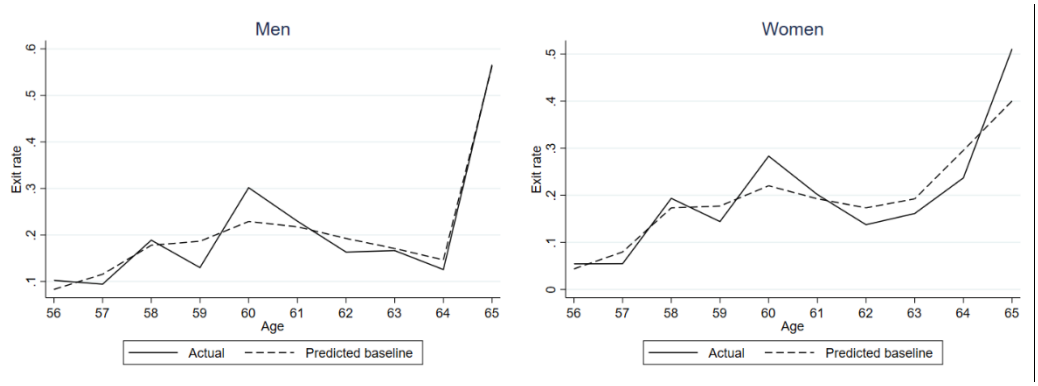
[23] All results are presented in the appendix.

Brussels	-0.028***	-0.011*
	(0.005)	(0.006)
Wallonia	-0.012***	-0.010**
	(0.003)	(0.004)
Part-time	0.028***	0.008*
	(0.004)	(0.004)
White collar	-0.051***	-0.007
	(0.004)	(0.005)
Primary sector	-0.043***	0.010
	(0.013)	(0.038)
Tertiary sector	0.008***	-0.011***
	(0.003)	(0.004)
Average salary of the reference person/1000	-0.201***	-0.309***
	(0.012)	(0.021)
Squared form	0.019***	0.020***
	(0.002)	(0.005)
Current salary of the reference person/1000	-0.021***	-0.055***
	(0.004)	(0.006)
Squared form	0.003***	0.011***
	(0.000)	(0.001)
Average salary of the partner/1000	0.090***	0.028***
	(0.010)	(0.007)
Squared form	-0.014**	-0.003
	(0.006)	(0.003)
Current salary of the partner/1000	-0.037***	-0.011***
	(0.005)	(0.003)
Squared form	0.002	0.001**
	(0.002)	(0.000)
Observations	56,377	30,289

5. Simulations

In order to illustrate the effect of incentive measures on the probability to exit the labor market, we present the results of counterfactual simulations. In this exercise, we rely on the regression results of Table 2 using the probit model. Figure 12 plots separately the actual exit rates and the predictions by the model – by sex and age. We find an increasing probability of retirement over the age, that spikes at the statutory eligibility age of the OAP. However, our predictions do not fully capture the spikes that appear at the eligibility ages of the CER (58) and the early eligibility age of the OAP (60).

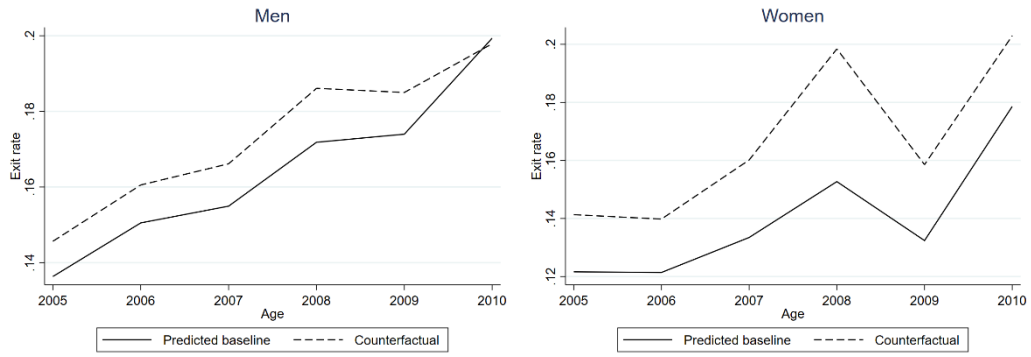
Figure 12: Retirement rate for men and women– actual and predicted baseline



In a second step, we use these predictions as a baseline for our counterfactual simulations. In this simulation, we predict the value of the incentive measures that would have prevailed if the social security schemes had remained unreformed and in their 2004 format. The reforms include the delaying of the statutory eligibility age OAP for women in 2006 and 2009, the one-year increase in the career conditions for the early eligibility age OAP in 2005 and the introduction of the pension bonus in 2007. All other covariates are kept at their actual value. The aim of such a counterfactual simulation is to eradicate all changes due to policy reforms and to examine what would have been the exit rate of older Belgian workers without the reforms that happened between 2005 and 2010.

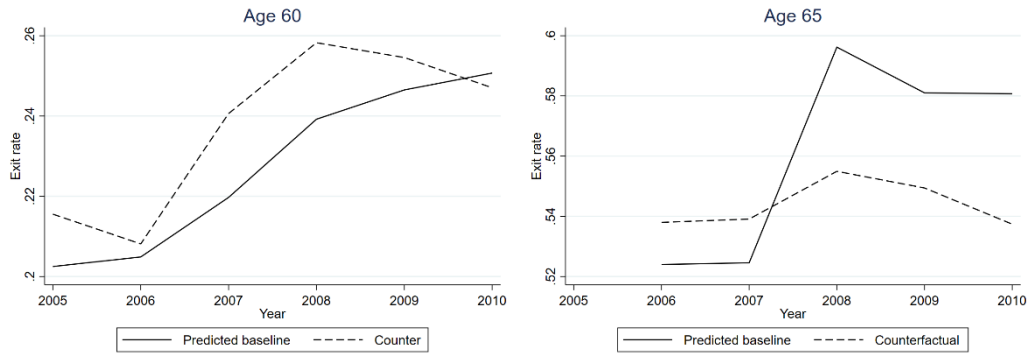
Figure 13 presents the average probability of retirement for the total population aged 56-65 for years 2005 to 2010. We observe that the counterfactual is higher than the baseline for every years of observation, which means that the reforms implemented during these years have been efficient in decreasing opportunity to exit the labor market. However, these averages can hide different situations with respect to the age. In the following figures we show the evolution of the exit rate by sex and year for certain key eligibility ages.

Figure 13: Counterfactual simulation – total population aged 56-65



Figures 14 shows simulated counterfactual exit rates for men aged 60 and 65. We see that for men aged 60, the counterfactual is higher than the baseline for every years of observation, indicating that the reform that increased the career conditions for the early eligibility of the OAP has fulfilled its role of closing the early exit through the OAP.[24] Nevertheless, we observe an increase in the retirement rate of the baseline scenario starting in 2008, while the counterfactual simulation displays a decreasing retirement rate. This is due to the introduction of the pension bonus with an effective date in 2008, granted for continued work after age 62 or 44 years of career. The bonus directly increases the SSW with its strongly positive sign, leading to higher counterfactual exit rates through an income effect. The dynamic incentive effect through a reduced ITAX that would lead to lower retirement rates remains moderate as we find that the SSW has a stronger impact on the retirement probability than the ITAX does (see table 3). For men at retirement age 65, while the counterfactual is higher during the first years of simulation, the baseline dominates in all later years due to the introduction of the pension bonus. This result contradicts the simulation of incentive measures in Fraikin et. al. (2020), in which the pension bonus was expected to create an incentive to stay on the labor market through a reduced ITAX effect.

Figure 14: Counterfactual simulation– Men aged 60 and 65 - by year



Note: The baseline is obtained from the regressions from Table 2 using the ITAX specification and the probit model. Due to the structure of the dataset, no one is aged 65 in 2005.

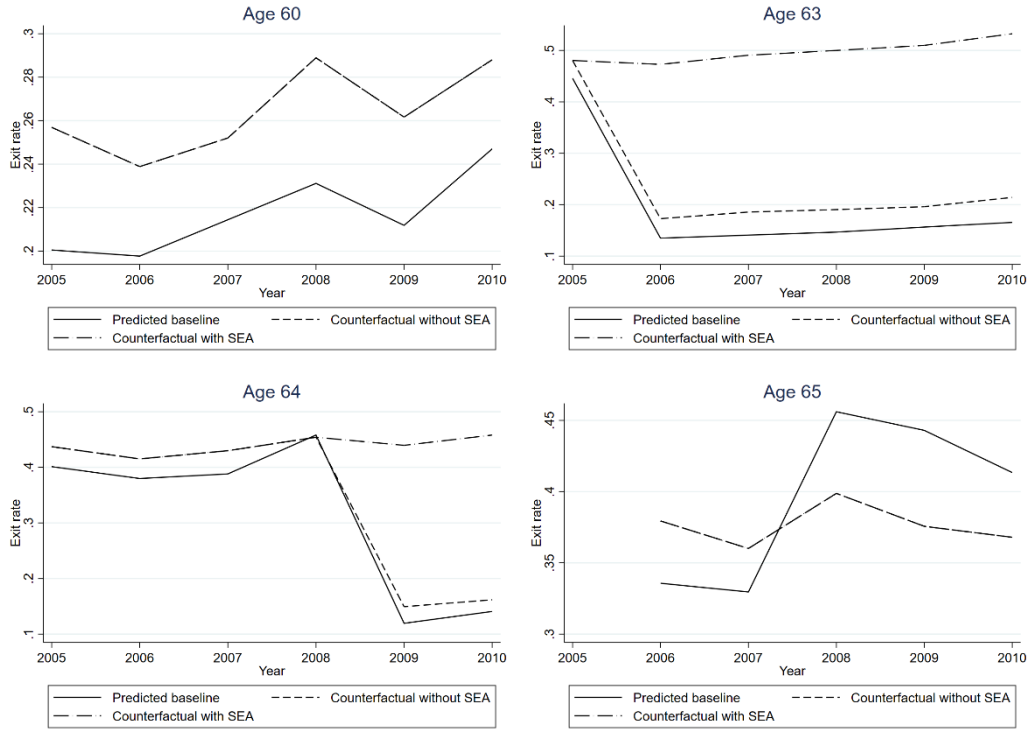
Figures 15 presents the simulations of the baseline and the counterfactual scenarios for women at ages 60, 63, 64 and 65 where we vary the ITAX and the SSW measures and distinguish the effect of the statutory eligibility age changes. Ages 63 to 65 correspond to statutory eligibility age for the successive cohorts under analysis. Looking at the simulation for women aged 60, we observe similar results as for men. The counterfactual simulation

24 In 2010, the average years of career per worker aged 60 decreases in our sample compared to previous years, leading to a decrease in the simulated ITAX and thus a decrease in the predicted retirement rate of the counterfactual simulation.

shows that the retirement rates would have been higher without the reform that increased the career conditions for the early eligibility of the OAP. Here however, the effect of the pension bonus is not as strong as it was for men because women have shorter careers on average and were thus less likely to satisfy the eligibility conditions for the pension bonus at age 60. At the age of 65, as for the men, we observe the impact of the pension bonus as a result of the increase of SSW.

At ages 63 and 64, in addition to the ITAX and the SSX variable the statutory eligibility variable (SEA) matters in the counterfactual simulation. When taking SEA explicitly into the analysis, we document the key role of eligibility variables. There are important decreases in the retirement probability of women of the baseline simulation as compared to the counterfactual including the SEA dummy at the age of 63 in 2006 and 64 in 2009. These simulations indicate that the 1997 reform that equalized the statutory eligibility age of men and women fulfilled its role of limiting the access of women to the OAP before the statutory eligibility age, mostly through a gate-keeping logic rather than through financial incentives themselves in line with Jousten and Tarantchenko (2014).

Figure 15: Counterfactual simulation without SEA change– Women - by year

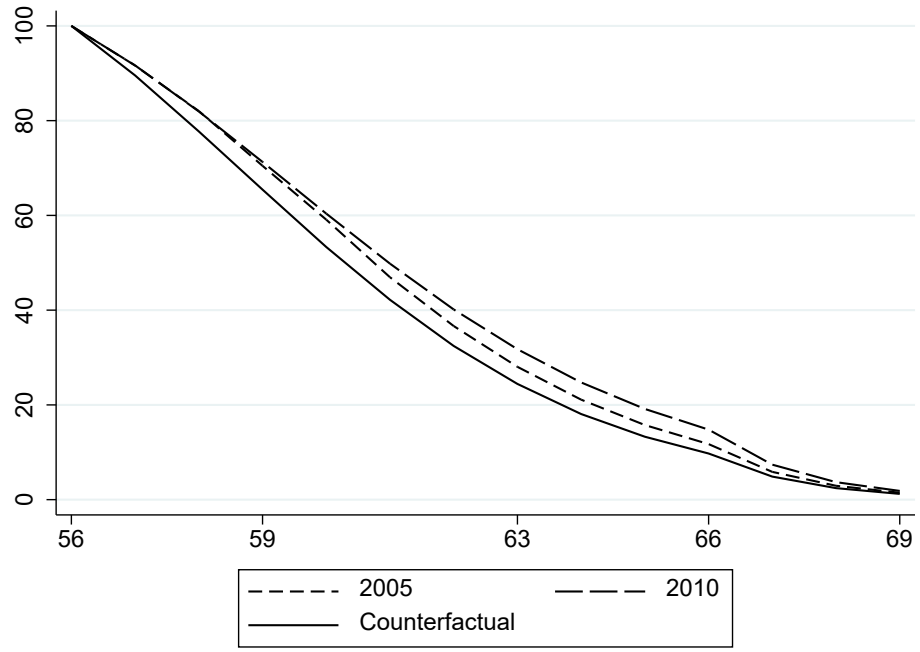


Note: The baseline is obtained from the regressions from Table 2 using the ITAX specification and the probit model. Coincidentally, no sample-member is aged 65 in 2005.

Finally, in Figure 16, we present the employment survival curves according to the predicted probability of exit and our counterfactual simulation. These curves show the proportion of

workers who remain in employment over the age if we start with a fully employed population at age 56. We compare situation in 2005 and 2010 for which we have data with the counterfactual of 2010 in which no reforms happened between 2005 and 2010. We observe that the reforms have been effective in keeping workers in employment since both the 2005 and the counterfactual display lower cumulative probability to be active.

Figure 16 : Employment survival curve



6. Conclusion

In this chapter we explore the link between social security incentives and labor supply using data from an administrative panel data set. Following a set of Belgian wage-earner workers during at most ten years, we calculate how the various reforms implemented during the period have affected the financial incentives to retire from the labor market.

We consider both the wealth effect as captured by the Social Security Wealth and the dynamic incentive effect when changing retirement behavior at the margin (social security accrual and implicit tax on continued activity). Given the Belgian landscape that offer older workers several possibilities of exiting, we aggregate the social security scheme specific measures into one single incentive indicator.

Our general regression analysis shows that the effect of SSW and ITAX are positive such as more generous measures induce higher retirement rates. When we consider men and women separately, we find a stronger effect of the dynamic incentive (ITAX) and SSW for women.

Based on these results we perform a series of simulations in which we neutralize the various reforms that took place since the beginning of our period of observation. While the overarching guiding principle behind these reforms was to increase older workers' labor force participation, they were rather different in their effects on incentive variables: the tightening of eligibility conditions unambiguously led to lower labor market retirement rates, the introduction of the pension bonus for continued work led to a positive wealth effect – hence increasing retirement hazards. Our results are ambiguous, with strongly incentivizing effects at lower ages and more mixed results at higher ages – particularly for men.

From a policy perspective, the abolition of the pension bonus in 2015 can be seen as a consistent measure if the primary aim of successive governments was the increase of the effective retirement age. Based on our results, retirement hazards at 65 should clearly decrease going forward. Also, closing early entitlement routes remains a powerful policy tool – as illustrated by the lower retirement hazards in the baseline versus the counterfactual situation.

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Appendix

Figure A1: Aggregation weights by exit pathways for men (averaged over years)

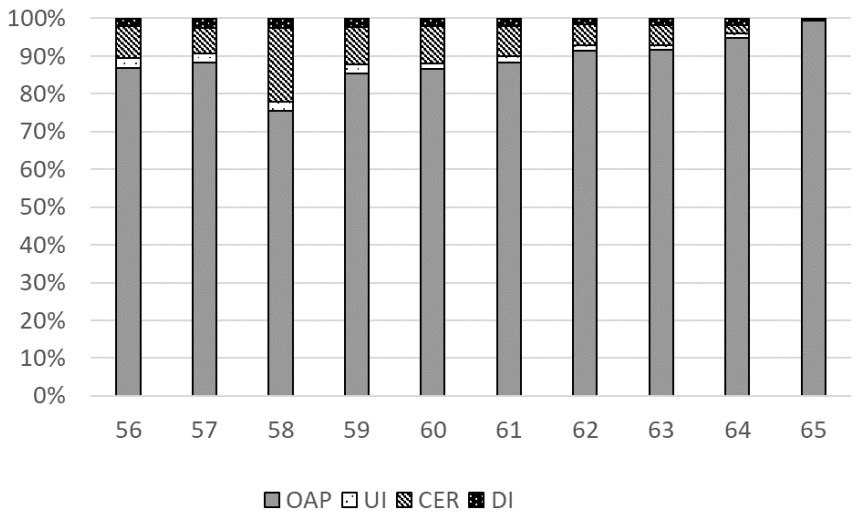

Figure A2: Aggregation weights by exit pathways for men (averaged over years)

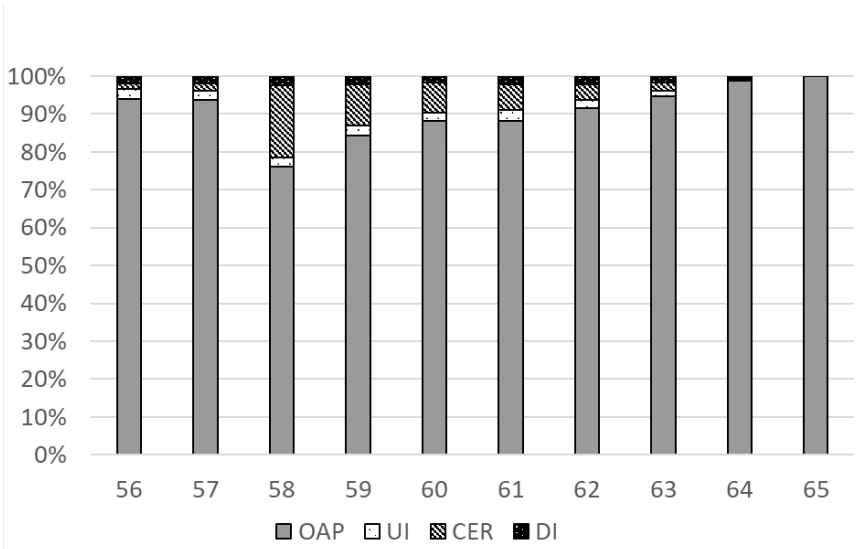

Table A1: Total sample with accrual

	LPM	Fixed effect	Random effect	Probit	Probit random effects
Accrual/ 100,000	-0.191***	-0.290***	-0.135***	-0.283***	-0.293***
	(0.017)	(0.020)	(0.017)	(0.022)	(0.023)
SSW/100,000	0.161***	-0.155***	0.207***	0.168***	0.184***
	(0.004)	(0.015)	(0.006)	(0.004)	(0.002)
Female	-0.059***		-0.079***	-0.057***	-0.065***
	(0.003)		(0.005)	(0.003)	(0.004)
Age	0.588***	0.482***	0.428***	0.622***	0.642***
	(0.029)	(0.037)	(0.029)	(0.029)	(0.030)
Age squared	-0.005***	-0.004***	-0.003***	-0.005***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SEA	0.362***	0.422***	0.347***	0.386***	0.251***
	(0.010)	(0.011)	(0.010)	(0.016)	(0.009)
Partner	-0.012***	0.000	-0.016***	-0.018***	-0.019***
	(0.003)	(0.015)	(0.005)	(0.003)	(0.004)
Active partner	0.000	-0.017***	0.005	0.004	0.005*
	(0.003)	(0.005)	(0.004)	(0.003)	(0.003)
Brussels	-0.021***		-0.036***	-0.020***	-0.023***
	(0.004)		(0.007)	(0.004)	(0.005)
Wallonia	-0.012***		-0.017***	-0.011***	-0.012***
	(0.003)		(0.004)	(0.003)	(0.003)
Part-time	0.021***	-0.064***	0.004	0.021***	0.021***
	(0.003)	(0.006)	(0.004)	(0.003)	(0.003)
White collar	-0.033***	-0.081***	-0.049***	-0.032***	-0.035***
	(0.003)	(0.024)	(0.005)	(0.003)	(0.003)
Primary sector	-0.037***		-0.056**	-0.035***	-0.043***
	(0.014)		(0.023)	(0.011)	(0.015)
Tertiary sector	0.004		0.020***	0.002	0.003
	(0.002)		(0.004)	(0.002)	(0.003)
Average salary of the reference person/1000	-0.183***	-2.170***	-0.254***	-0.198***	-0.221***
	(0.010)	(0.145)	(0.014)	(0.010)	(0.012)
Squared form	0.017***	0.293***	0.028***	0.017***	0.019***
	(0.002)	(0.017)	(0.003)	(0.002)	(0.002)
Current salary of the reference person/1000	-0.031***	-0.089***	-0.053***	-0.026***	-0.028***
	(0.003)	(0.006)	(0.004)	(0.003)	(0.003)
Squared form	0.004***	0.006***	0.005***	0.003***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Average salary of the partner/1000	0.067***	0.060***	0.089***	0.069***	0.075***
	(0.006)	(0.022)	(0.008)	(0.005)	(0.006)
Squared form	-0.010***	-0.014	-0.014***	-0.011***	-0.012***
	(0.002)	(0.009)	(0.003)	(0.002)	(0.002)
Current salary of the partner/1000	-0.027***	-0.045***	-0.038***	-0.026***	-0.103***
	(0.002)	(0.006)	(0.003)	(0.002)	(0.003)
Squared form	0.002***	0.004***	0.003***	0.002***	0.002***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Observations	86,666	86,666	86,666	86,666	86,666

Note: Full sample of person-year observations 2005-2010. Standard errors are in parentheses. For Probit regressions, the table reports marginal effects estimated at the mean. *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Men with ITAX

	LPM	Fixed effect	Random effect	Probit	Probit random effects
Accrual/ 100,000	0.075***	0.146***	0.081***	0.061***	0.067***
	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)
SSW/100,000	0.143***	-0.226***	0.179***	0.158***	0.182***
	(0.005)	(0.017)	(0.007)	(0.005)	(0.007)
Age	0.578***	0.643***	0.471***	0.610***	0.654***
	(0.036)	(0.045)	(0.036)	(0.037)	(0.039)
Age squared	-0.005***	-0.005***	-0.004***	-0.005***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SEA	0.437***	0.441***	0.413***	0.470***	0.311***
	(0.014)	(0.013)	(0.013)	(0.021)	(0.013)
Partner	-0.020***	-0.002	-0.025***	-0.028***	-0.032***
	(0.004)	(0.016)	(0.006)	(0.005)	(0.005)
Active partner	0.006	-0.020***	0.011**	0.010**	0.013***
	(0.004)	(0.007)	(0.005)	(0.004)	(0.004)
Brussels	-0.028***		-0.049***	-0.028***	-0.035***
	(0.006)		(0.009)	(0.005)	(0.007)
Wallonia	-0.013***		-0.019***	-0.012***	-0.013***
	(0.003)		(0.005)	(0.003)	(0.004)
Part-time	0.027***	-0.075***	0.007	0.028***	0.027***
	(0.004)	(0.008)	(0.005)	(0.004)	(0.004)
White collar	-0.051***	-0.099***	-0.077***	-0.051***	-0.058***
	(0.004)	(0.031)	(0.006)	(0.004)	(0.004)
Primary sector	-0.044***		-0.067***	-0.043***	-0.055***
	(0.016)		(0.025)	(0.013)	(0.018)
Tertiary sector	0.009***		0.031***	0.008***	0.011***
	(0.003)		(0.005)	(0.003)	(0.003)
Average salary of the reference person/1000	-0.176***	-1.091***	-0.231***	-0.201***	-0.235***
	(0.012)	(0.192)	(0.017)	(0.012)	(0.015)
Squared form	0.017***	0.175***	0.027***	0.019***	0.0222***
	(0.002)	(0.021)	(0.003)	(0.002)	(0.003)
Current salary of the reference person/1000	-0.025***	-0.094***	-0.051***	-0.021***	-0.024***
	(0.004)	(0.006)	(0.005)	(0.004)	(0.004)
Squared form	0.003***	0.006***	0.004***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Average salary of the partner/1000	0.087***	0.008	0.118***	0.090***	0.104***
	(0.010)	(0.046)	(0.014)	(0.010)	(0.011)
Squared form	-0.014**	0.002	-0.023***	-0.014**	-0.016***
	(0.005)	(0.027)	(0.008)	(0.006)	(0.006)
Current salary of the partner/1000	-0.038***	-0.030***	-0.050***	-0.037***	-0.043***
	(0.005)	(0.011)	(0.007)	(0.005)	(0.006)
Squared form	0.003**	0.001	0.005***	0.002	0.002
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Observations	56,377	56,377	56,377	56,377	56,377

Note: Full sample of person-year observations 2005-2010. Standard errors are in parentheses. For Probit regressions, the table reports marginal effects estimated at the mean. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Women with ITAX

	LPM	Fixed effect	Random effect	Probit	Probit random effects
Accrual/ 100,000	0.096***	0.159***	0.117***	0.075***	0.080***
	(0.008)	(0.011)	(0.009)	(0.008)	(0.008)
SSW/100,000	0.256***	-0.060**	0.294***	0.247***	0.234***
	(0.009)	(0.025)	(0.012)	(0.008)	(0.011)
Age	0.494***	0.126**	0.181***	0.590***	0.577***
	(0.052)	(0.063)	(0.052)	(0.049)	(0.051)
Age squared	-0.004***	-0.001*	-0.001***	-0.005***	-0.004***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
SEA	0.255***	0.322***	0.203***	0.269***	0.169***
	(0.016)	(0.019)	(0.016)	(0.026)	(0.014)
Partner	0.022***	0.062	0.022***	0.020***	0.021***
	(0.006)	(0.049)	(0.008)	(0.005)	(0.006)
Active partner	-0.027***	-0.014	-0.021***	-0.022***	-0.0233***
	(0.005)	(0.009)	(0.006)	(0.005)	(0.005)
Brussels	-0.012*		-0.018*	-0.011*	-0.012*
	(0.006)		(0.010)	(0.006)	(0.006)
Wallonia	-0.010**		-0.013*	-0.010**	-0.010**
	(0.004)		(0.007)	(0.004)	(0.004)
Part-time	0.007	-0.043***	-0.003	0.008*	0.009*
	(0.005)	(0.011)	(0.006)	(0.004)	(0.004)
White collar	-0.010*	-0.050	-0.012	-0.007	-0.007
	(0.005)	(0.038)	(0.008)	(0.005)	(0.005)
Primary sector	0.001		-0.010	0.010	0.008
	(0.036)		(0.056)	(0.038)	(0.038)
Tertiary sector	-0.008*		0.001	-0.011***	-0.011***
	(0.004)		(0.006)	(0.004)	(0.004)
Average salary of the reference person/1000	-0.314***	-3.416***	-0.343***	-0.309***	-0.332***
	(0.022)	(0.326)	(0.031)	(0.021)	(0.024)
Squared form	0.021***	0.464***	0.017**	0.020***	0.022***
	(0.005)	(0.053)	(0.008)	(0.005)	(0.006)
Current salary of the reference person/1000	-0.067***	-0.089***	-0.092***	-0.055***	-0.059***
	(0.007)	(0.016)	(0.009)	(0.006)	(0.006)
Squared form	0.013***	0.012***	0.016***	0.011***	0.0011***
	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)
Average salary of the partner/1000	0.033***	0.080***	0.053***	0.028***	0.029***
	(0.007)	(0.026)	(0.010)	(0.007)	(0.007)
Squared form	-0.003	-0.017*	-0.007*	-0.003	-0.003
	(0.003)	(0.009)	(0.004)	(0.003)	(0.026)
Current salary of the partner/1000	-0.015***	-0.055***	-0.028***	-0.011***	-0.012***
	(0.003)	(0.007)	(0.004)	(0.003)	(0.003)
Squared form	0.001**	0.004***	0.002***	0.001**	0.001**
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Observations	30,289	30,289	30,289	30,289	30,289

Note: Full sample of person-year observations 2005-2010. Standard errors are in parentheses. For Probit regressions, the table reports marginal effects estimated at the mean. *** p<0.01, ** p<0.05, * p<0.1.