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Matias Eklöf and Daniel Hallberg

Department of Economics
Uppsala University
P.O. Box 513
SE-751 20 Uppsala
Sweden
Fax: +46 18 471 14 78

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MATIAS EKLÖF AND DANIEL HALLBERG

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Private alternatives and early retirement programs*

Matias Eklöf[†] and Daniel Hallberg[‡]

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Abstract

This paper describes early retirement option programs in collective agreements in Sweden during the 1990s. We highlight the differences between actual pension benefits and those stipulated in the standard agreements. We find that the individuals frequently face far better options than those given by standard agreements. The mix and the timing of pensions is usually done in a non-trivial way. Thus, if we just relied on the standard agreement text, one important implication of these findings is that the effects of economic incentives on retirement very well might be over-estimated.

Keywords: Retirement, early retirement programs, occupational pension

JEL Classification: J14, J21

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[†]Department of Economics, Uppsala University, P.O. Box 513, SE-751 20 Uppsala, Sweden. Phone: +46 18 471 00 00, fax: +46 18 471 14 78. Email: Matias.Eklöf@nek.uu.se.

[‡]Department of Economics, Uppsala University, P.O. Box 513, SE-751 20 Uppsala, Sweden. Phone: +46 18 471 00 00, fax: +46 18 471 14 78. Email: Daniel.Hallberg@nek.uu.se.

1 Introduction

In the empirical retirement literature, there exists a wide variety of models trying to explain the retirement behavior. Regardless of which model is in use, information on economic incentives is required. The basic element is the stream of future pension benefits, from which the relevant economic measures are usually derived. This stream is derived from the pension plans faced by the individual and is generally a function of the earnings history, retirement age, and individual characteristics. However, as there generally exists several parallel pension plans, for which the individual is eligible, it is not uncommon that the individual can choose among a large set of various combinations of the pension benefits. That is, the individual can combine the pension benefits from different sources more or less freely. In Sweden, practically everyone is eligible for the national old age pension and the occupational pension systems. For example, in some cases it may be optimal to claim pension benefits solely from the occupational pension system until normal retirement age and then start claiming benefits from the national old age pension system as well. Such mixtures of pension benefits should be included in the stream of benefits. Analysts commonly use simplifying assumptions to restrict the number of available alternatives for the individual. For example, the individuals are assumed to claim benefits from all available sources from day 1 of retirement.

Further, and perhaps more important, it is quite common that firms and other types of employers offer older employees generous pension plans (so called "golden handshakes") in order to reduce the number of employees and/or restructure the firm. There may be strong incentives for firms to "buy out" the older employees as these are associated with high pension premiums rates. In fact, as we will see below, individuals seem to receive occupational pension benefits that are far above the benefits stipulated in the collective agreements. Hence, in order to estimate a model where such economic incentives are included, the analyst needs information about the options available to the individual.

In this paper, we describe peoples' actual pensions by looking at register micro-data and compare this to prevailing rules. One finding is that among early retired with occupational pension agreements a substantial fraction had replacement ratios far above the levels stipulated in the standard agreements. The standard rules in the occupational pension agreement were hence set aside.

Further we show that many individuals who exit early first make use of their occupational pension until the age of 65, without making any national old

age pension withdrawal. At their 65th birthday they reduce the occupational pension and start the (normal) withdrawal of national old age pension, often without actuarial reduction. The rules allow for early withdrawal with occupational pension before age 65 at a reasonable replacement ratio, but allow also for employers and workers to make separate arrangements via the occupational pension system, so-called "buy-outs". These agreements result in an even higher replacement ratio, enough for the employee to live on without withdrawing national old age pension.

As we understand it, the common assumptions in the literature when modeling retirement behavior has been that national old age pension and occupational pension is withdrawn at the same time, and that individual agreements with the employer are negligible. Both assumptions can be criticized when looking at real data. In order to accurately model behavior we need the relevant alternatives faced by the individuals. We therefore need to know more about these special agreements and the timing of benefit claims.

The next section, Section 2, we give a concise summary of the rules and legislation for occupational pension system. In particular, we discuss the institutional background for early retirement pension through the occupational pension system. In section 3 we present data and give exit frequencies by type of exit. We also study the timing of occupational pension and national old age pension withdrawal. Then we compare the actual replacement ratio with what the rules prescribe. We conclude the paper in Section 4.

2 Swedish pension system

The Swedish pension system has undergone a major reform during 2003. However, in this study we are interested in the retirement behavior and the options available in the 1990s. During this period, the Swedish pension system included two main parts; the national old age pension system (OAP) and the occupational pension system (*Tjänstepension*, TJP). The occupational system function as a complementary pension plan to the national old age pension system. It has also undergone several changes during later years but perhaps not as deep as the national old age pension system.

These pension systems are discussed in some detail in a number of papers (see e.g. Palme and Svensson, 1997, 2002a). Below, we will give a brief presentation of the general structure of the two main systems.

2.1 National old age pension system

During the 1990s the OAP system applied to all citizens as a defined benefit system. It consisted of the basic part (*folkpension*) and the supplementary part (ATP). In short, the national old age pension system was an aggregate of several smaller systems aiming at providing social security to all citizens.

Regarding the old age pension system (OAP), the individual earns "pension points" during the working life that entitles her to a pension benefit after retirement in the ATP (the basic part is unrelated to previous earnings). The mandatory retirement age in the national old age pension system is 65. The rules permit an individual to withdraw the pension early from age 61 (age 60 before 1998) or delay it until age 70. If the individual decides to retire before (after) the mandatory retirement age, the monthly pension benefits are reduced (increased) with a actuarial adjustment. Although the individuals have the option to early (and late) withdrawals, in practice very few utilizes this option. Another important feature of the OAP system is that it only covers pensionable incomes up to 7.5 basic amounts (BA).¹ For an individual with pensionable incomes above 7.5BA and full earnings history, the national pension benefits amounts to 14211 SEK (in 1999 prices).²

2.2 Occupational pension systems

Sweden is a country with a high degree of union membership. The occupational pension plans are divided into four main collective agreements relating to employees in four main sectors; SAF-LO and SAF-PTK agreements for the blue and white collar workers in the private sector, respectively, the PA-KL and PA91 agreements for the local governments and central government employees, respectively.³

One outcome of the collective agreements – negotiated between the employers' associations and the federations of trade unions in each of the four main sectors – was originally to guarantee a complementary pension for the income

¹The BA is usually determined to follow price movements. In 1999, 1 BA=36400 SEK \approx 360€.

²This person would have (in 1999 prices) 11830 SEK per month coming from the ATP system and, if married, another 2381 SEK as basic part pension (folkpension). The ATP pension income is calculated as $0.6 \frac{N}{30} (A - 1)$ where N is the maximum of the number of earnings years and 30, and A is the average earnings of the 15 best years below 7.5BA. The basic part pension is 96% of the BA for unmarried and 78.5% of the BA for married.

³The collective agreement for blue collar workers was named STP before 1996, and that for local government employees was named PFA-98 after 1998.

losses above the top compensation level in the national old age pension system of 7.5BA. Nowadays most of these agreements have expanded to give not only complementary pension for incomes below the 7.5BA threshold.⁴ The agreements also – with some variation – give income complements in other parts of the social security system such as the national survivor’s pension, childrens’ pension, the part-time pension, as well as give early retirement option plans. The outsider in this respect is the SAF-LO agreement, which does not allow for early withdrawal of occupational pension before the age of 65.

A major share of those employed in local governments, covered by the PA-KL agreement, are women in low-income jobs: about 80% of local employees are women. The SAF-LO agreement also represent below-mid income earners. About two thirds of the white collar workers, SAF-PTK, are men. This agreement typically covers groups with the highest incomes, and among these workers the average income is higher than among workers in any of the other agreements.

Although some important differences exist across sectors they are fairly similar in structure as to how benefits are defined. The usual case is to define benefits as a function of the previous earnings within a certain occupational sector, the years of service within that sector, and retirement age.

The pension is, if used simultaneously, designed to complement the national pension. However, notably, the SAF-PTK, the PA-91, and the PA-KL agreements also allow for early retirement using the occupational pensions only. The early withdrawal generally includes an actuarial adjustment of the benefit level.⁵ The employer has to formally agree to early retirement through the occupational pension. The early retirement age is for most groups 60-64.⁶

The replacement rates within the TJP systems, after the mandatory retirement age of 65, are generally low for incomes below 7.5BA and higher for incomes above this threshold. However, if the individual retires *before* the mandatory re-

⁴All occupational schemes also have a contribution defined benefit as well. In our study will not go into any detail about these since they are relatively small in comparison to the ordinary pension.

⁵The actuarial adjustment is 0.4% in PA-91 for each month of early withdrawal after age 60 and before the month of the 65th birthday. The adjustment in the SAF-PTK and PA-KL agreements are determined in a more complex way since it is higher for some years and lower for others. The monthly adjustment ranges from 0.3% to 0.5% in PA-KL and lies approximately at 0.5% in SAF-PTK.

⁶The early retirement option should not be confused with the lower mandatory retirement age that some some minor occupational groups – typically in the state sector, but also in the local government sector – has. These groups receive occupational pension until they reach age 65, the mandatory retirement age in the national old age pension system.

retirement age, the SAF-PTK and PA91 agreements include a clause of higher replacement rates in that income segment until the individual reaches the mandatory retirement age. The PA-KL agreement is set up a little differently, since this pension is coordinated with other pensions, as well as with the social security system. The PA-KL agreement stipulates a relatively high replacement ratio for early retirement before age 65, but if the individual simultaneously receives national old age pension, then the occupational pension is reduced. As mentioned, the agreement for blue collar workers (SAF-LO) does not allow for early withdrawal of occupational pension before the age of 65.

Figure 1 gives a broad picture of the different replacement rates (without actuarial adjustments) in the four collective agreements for the years until age 65 for a worker who decides to retire early before age 65. Figure 2 gives the corresponding levels after age 65. (We have plotted PA-KL as if it would give the same replacement ratios independently if the retirement age is before or after age 65. Since it is coordinated with other pension income this graph rather shows the net benefit level, including national old age pension.) SAF-LO does not provide an early retirement option which is why the rate for this sector is zero. For an average-salary worker in the SAF-PTK system with an wage of 7.4BA the compensation ratio is 10% of the qualifying wage after age 65. In these ages the pension hence function as a complement to the national old age pension. If this person would retire early at, say, age 61 the compensation rate is 65% (excluding actuarial adjustments) in ages 61-64.

2.2.1 Golden handshake agreements within the occupational pension system

The occupational pension plans also give employer and employee an option to can make special pension arrangements that go beyond the rules in the standard agreements. In order to reduce the number of employees and/or restructure a firm or organization, firms and other types of employers can offer older workers generous pension plans.

A usual rule in this case seems to be a compensation rate of about 80%, as well as offsetting of any possible loss in ATP points after age 65 which the employed might suffer because of the special pension arrangements (see Wadensjö and Sjögren, 2000). There may be strong incentives for firms to "buy-out" the older employees as these are associated with high pension premiums rates. Old workers are normally protected by employment security rules with prohibit

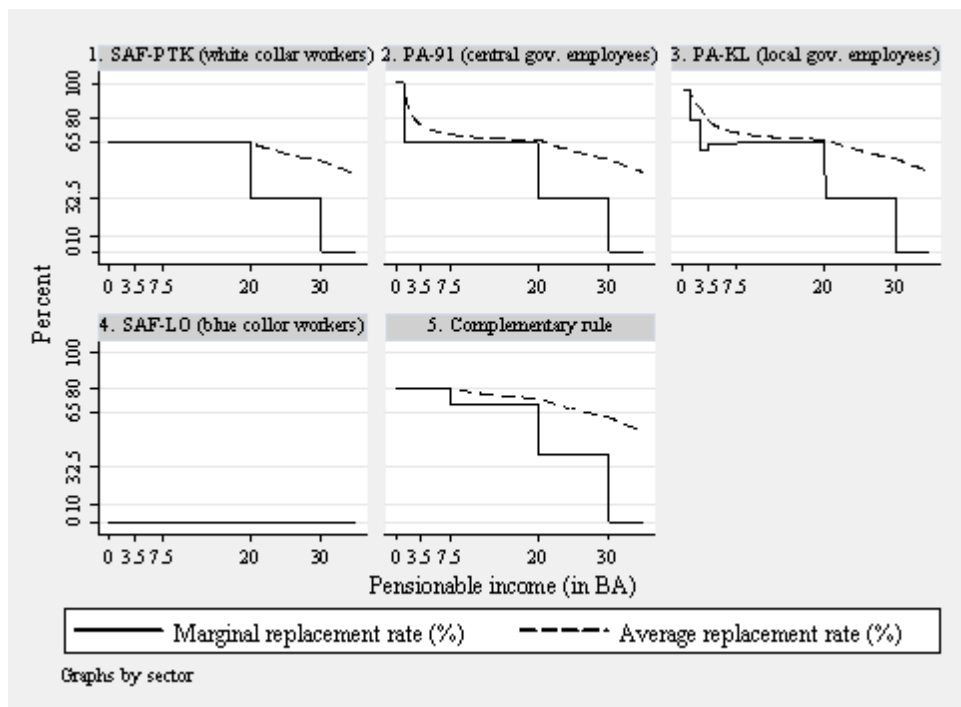


Figure 1: Benefits received before age 65 (replacement rates): 1. SAF-PTK, 2. PA-91, 3. PA-KL, 4. SAF-LO, 5. Maximum according to the complementary rule in the income-tax legislation

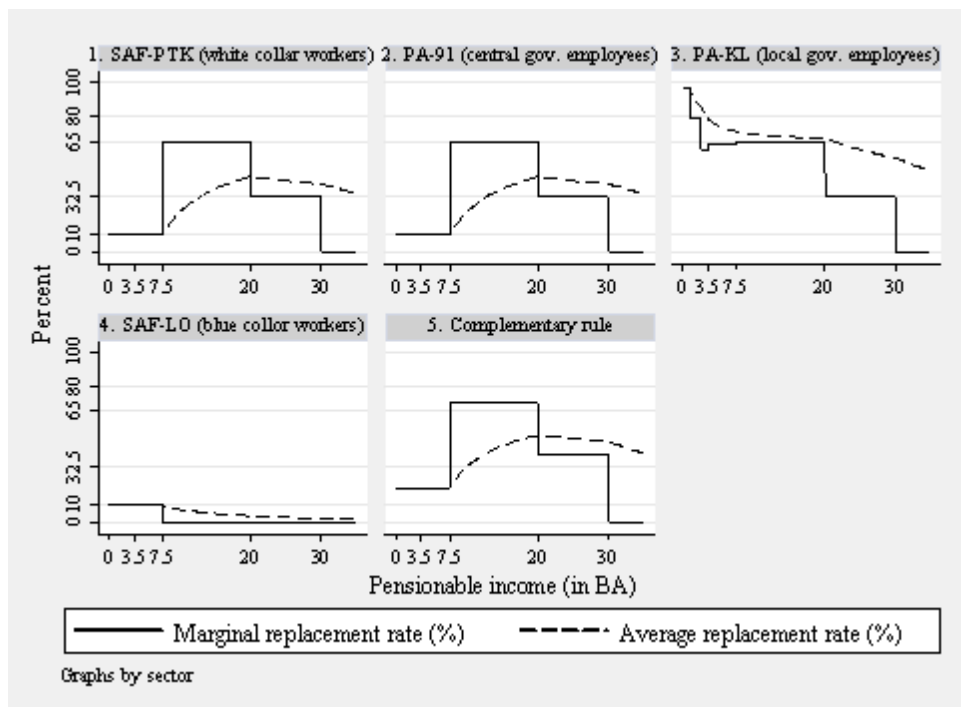


Figure 2: Benefits received after age 65 (replacement rates): 1. SAF-PTK, 2. PA-91, 3. PA-KL, 4. SAF-LO, 5. Maximum according to the complementary rule in the income-tax legislation

employers to get rid of older workers before employing younger personnel (last-in, first-out). The special agreements give an employer a chance to get around such rules. It may also be better for working moral since it looks better for the company to give someone a special early retirement pension than to fire someone (Wadensjö and Sjögen, 2000).

The complementing rule in the income-tax legislation stipulates how much of pension payments that is possible to count as tax-deductible against the company-tax. The rule can be seen as a norm for how these special pension arrangements are set up. There are however no real (legal) limit as to how high the pensions can be. The rule imply that occupational pension payments are deductible to 80% of the part of the qualifying wage up to 7.5 BA, 70% of the part of the qualifying wage between 7.5 BA and 20BA, and 40% of the part of the qualifying wage between 20BA and 30BA. The replacement rates stipulated by this rule is shown in Figure 1 and Figure 2 (as 5. Complementary rule). Since most workers, also white collar workers, earn below 7.5BA, the effective rate which is company-tax deductible is 80%.

3 Empirical findings

3.1 Data

We use a subset of the Longitudinal INdividual DAta set (LINDA), which is a register-based longitudinal data set drawn from income registers and population censuses (for a detailed description of LINDA, see Edin et al (2001), and <http://www.nek.uu.se>). It consists of a large panel of individuals, about 300,000 individuals annually, or about 3% of the population, representative of the overall population from 1960 to 2000.⁷ After dropping a minor share of individuals with inconsistent income records, we observe 33,704 men and 41,383 women that are 50+ during 1992-2000. We categorize individuals by occupational sector by using the source of occupational pension, i.e., from which occupational sector that the pension is paid out. To avoid unnecessary complications, we drop individuals ex post with multiple claims from more than one occupational pension source.

We use different subsets of the data in different parts of this paper. In the next subsection we study typical exit pattern from the labor market. To

⁷The data base also contains information on all family members of a sampled individual, as long as they remain in the household.

this end we use the panel unconditionally of type of exit path (Sample A). In Section 3.3 we examine the timing of pension withdrawal from the national OAP and the TJP systems, i.e., at which ages individuals decide to start pension claims. The data set is therefore restricted to individuals 50+ for whom we observe the first claim of occupational pension and/or of national old age pension within the observation period (Sample B). Using a third subset of data we discuss replacement ratios in the occupational pension systems. Here we include individuals aged 50 or more, for whom we observe the first claim of occupational pension (regardless of national old age pension) within the observation period *and* at least one preceding year of work income as main source of income (Sample C).⁸ For samples B and C we require that individuals are observed during the whole period.

There are 8,615 men and 9,199 women for whom we observe the first claim of occupational pension within the observation period. The year of the first occupational pension claim is defined as the year in which occupational pension is paid out if none was received in the preceding year. This means that the first claim can be observed in the second year of the panel, i.e., in 1993. Of these, about one half (4,859 men and 4,995 women) have work (or active business income) as their main source of income in the year preceding the first year with occupational pension claim.

Since individuals may change any time during the year there is a high possibility, with the annual structure of data that LINDA has, that the transition year (the year when an individual changes from work to pension income) becomes difficult to use. To avoid potential part-time and part-of-the-year problems we will not use the transition year in our study. The procedure is instead to measure individuals in three-year panels, centered around the transition year.

This implies that the first year of occupational pension claim must be observed no later than two years before the panel ends, i.e., in 1999. This restriction reduces the sample to 4,226 men and 4,481 women. The shortest (longest) time we might observe an individual before his or hers first occupational pension claim is thus 1 year (7 years). Some of these had occupational claims from multiple sectors which resulted in a final sample consisting of 3,068 men and 3,664 women.

⁸We also include those with active business income as main income.

3.2 Typical exits

In Sweden, the mandatory retirement age is 65. However, as reported in Hallberg (2003), only about one third of those whose income from work is their main income source at age 60 work steadily until the age of 65, and then start collecting pension benefits. The early withdrawal from the labor market is thus substantial. It is useful to examine the empirical magnitude of different exit routes which we will do below.

Table 1 for men and Table 2 for women give details about exit routes by retirement age, using Sample A. The tables give the proportion of exits with a particular main income source (representing more than 50% of total income). For each age group the main source of income is examined conditional on that the main income source two periods earlier was either from work or active business. The list of income types includes all the major unearned income types, transfers and benefits, including occupational pension (TJP). (The category "Mixed sources" means that we are unable to classify into a specific source because the individual did not have one income which was more than 50% of total income.)

The exit routes vary by age and to some extent by gender. In ages 55-59 early retirement from the labor market is financed through unemployment insurance (UI), sickness insurance (SI), occupational pensions (TJP), and disability pension insurance (DI). When a worker turns 60 or 61, the importance of TJP as exit route increases dramatically, for men the exit rate increases from about 15% to 33%, while exit rates to other sources, in particular SI and UI, diminishes. This is natural considering the rules. As we shall see below, many do not have the possibility to claim TJP before 60, and those that do claim TJP before 61 are relatively few in numbers because of the lower overall exit rate in those age groups (see the bottom line in the tables). There are minor occupational groups, particularly in the state sector, who have a lower mandatory retirement age, e.g., military, pilots, firemen, and ballet dancers, some as early as 55. The exits to TJP before age 60 should mainly come from these groups.

One should also note that the exit rates presented in the tables include all workers from all sectors of the economy, including blue collar workers, who, according to their occupational pension scheme, cannot claim TJP early before the age of 65. According to Palme & Svensson (2002), this group is overrepresented among those that exit via SI or UI. Thus, among those that have the option to exit early in TJP, state employees, white collar workers in the private

Table 1: First main income source after an exit from work, by age, men

Men, per cent	56	57	58	59	60	61	62	63	64	65	66	Total
Age												
No income	2.5	1.7	1.2	1.1	0.7	0.8	0.8	0.5	0.1	0.0	0.0	0.7
Mixed sources	16.2	18.5	17.5	22.0	20.6	21.4	25.5	22.6	38.7	10.5	12.0	21.0
Passive business	0.5	0.6	0.6	0.4	0.1	0.4	0.2	0.5	0.2	0.0	0.0	0.3
Capital income	6.0	5.2	5.8	3.5	2.4	2.2	2.4	2.8	0.4	0.0	0.2	2.3
Disability pension insurance (DI)	9.2	10.3	12.9	12.0	12.8	14.1	14.3	12.4	0.1	0.0	0.0	8.0
Partial pension	0.0	0.0	0.0	0.1	0.6	1.8	2.2	1.6	0.1	0.0	0.0	0.6
Old age pension (OAP)	0.0	0.0	0.0	0.6	4.8	4.9	4.7	8.5	48.7	88.4	86.2	28.5
Occupational pension (TJP)	13.5	12.2	15.4	20.5	33.1	33.6	29.5	29.4	7.3	0.8	1.0	17.2
Private pension insurance	3.4	2.2	1.5	2.1	2.7	1.6	1.3	1.0	0.2	0.2	0.1	1.3
Sickness insurance (SI)	20.6	18.2	15.5	14.5	8.2	5.4	4.7	4.7	1.1	0.0	0.1	6.9
Unemployment insurance (UI)	25.9	29.8	29.2	22.2	13.9	13.6	14.2	16.0	3.1	0.0	0.0	12.8
Transfer payments and benefits	2.2	1.3	0.4	1.0	0.2	0.3	0.2	0.0	0.2	0.1	0.3	0.5
Sum	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total exits	1033	785	850	993	1427	1440	1205	1247	1876	2240	915	14011
Total in age class	11324	7000	6605	6057	5517	4845	4002	3449	2867	2381	999	55046
Total exit rate, per cent	9.1	11.2	12.9	16.4	25.9	29.7	30.1	36.2	65.4	94.1	91.6	25.5

Note. 3-year panels 1992-1999 conditional on having work or active business income as main income source (more than 50% of the income from work or active business) in the first year of the panel. In table, the main income source (other than work or active business) are measured in the third year of the panel (i.e., the possible transition year, the second year, is not included in table). Age is measured in second year. Sample A.

Table 2: First main income source after an exit from work, by age, women
Women, per cent

	56	57	58	59	60	61	62	63	64	65	66	Total
Age												
No income	2.2	1.3	0.5	0.6	1.1	0.7	0.4	0.6	0.1	0.2	0.0	0.6
Mixed sources	22.2	25.7	24.8	26.4	21.5	22.9	28.6	16.9	35.5	6.7	8.3	21.8
Passive business	0.3	0.3	0.5	0.4	0.6	0.2	0.2	0.1	0.1	0.2	0.3	0.3
Capital income	5.8	5.9	4.5	4.0	2.9	2.8	3.6	4.1	0.6	0.7	1.6	2.9
Disability pension insurance (DI)	8.7	12.0	11.3	12.4	13.3	14.0	14.1	9.4	0.0	0.0	0.0	7.9
Partial pension	0.0	0.0	0.0	0.1	0.2	0.5	0.4	0.4	0.0	0.0	0.0	0.2
Old age pension (OAP)	0.0	0.0	0.0	0.3	1.6	2.2	3.0	4.1	43.9	92.1	89.3	25.1
Occupational pension (TJP)	3.9	6.0	12.6	19.2	32.2	35.8	33.2	50.1	15.1	0.0	0.1	20.8
Private pension insurance	1.1	0.8	1.0	1.4	1.4	0.9	0.5	0.5	0.1	0.0	0.0	0.6
Sickness insurance (SI)	29.7	22.9	21.0	16.8	10.6	6.7	5.6	3.6	0.9	0.0	0.0	8.4
Unemployment insurance (UI)	25.2	24.6	23.2	18.0	14.1	12.6	9.9	9.9	3.7	0.0	0.0	10.9
Transfer payments and benefits	0.9	0.4	0.6	0.5	0.5	0.7	0.5	0.3	0.0	0.2	0.4	0.4
Sum	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number of exits	961	715	781	1007	1323	1342	1379	1690	1989	1913	757	13857
Total in age class	10548	6791	6260	5932	5374	4726	3977	3540	2787	2007	822	52764
Total exit rate, per cent	9.1	10.5	12.5	17.0	24.6	28.4	34.7	47.7	71.4	95.3	92.1	26.3

Note. See Table 1.

sector, and local government employees, we should expect an even higher exit probability to TJP than that shown in our tables.

These results hence show that a substantial fraction of those that exited in ages 56-60 did so via the use of occupational pension. In ages 60-64 the occupational pension was actually the most important exit route. Hallberg (2003) reports that about 98% of those aged 60-64 with TJP as their main income source also had TJP as main income source in the following year. The transition into TJP as main income source thus seems to be terminal before age 65 (i.e., it is less likely that individuals that has begun their TJP claim stops or reduces this claim before age 65). The sizable inflow into TJP as dominant income source therefore also reflects a considerable increase in the stock of occupational pensioners.⁹

3.3 Timing of pension withdrawal

The mix and the timing of income from different sources are often rather simplified in the literature, but can be quite unorthodox in real life. Here we look at the timing of pension withdrawal with the occupational and national old age pension systems. Table 3 and Figure 3 (using Sample B) show the age distribution of the first occupational pension claim by sector. Over the sample as a whole the table clearly indicates that the vast majority of individuals make their first pension withdrawal at age 65. However, a nonnegotiable amount, about 39%, make their first withdrawal prior to their 65th birthday.

The influence of sector affiliation is however evident. Blue collar workers do not have the possibility to claim occupational pension early. Only 2.8% withdraw occupational pension before age 65. It is most likely that this group exit from the labor market through other channels. As indicated in Palme & Svensson (2002) blue collar workers are overrepresented in exits via sickness (SI) and unemployment (UI) insurances. Employees in the three other major sectors use however early withdrawal of occupational pension to a large extent. According to our results, 51% of the central government employees and 47% of the white collar workers in the private sector have started their withdrawal of occupational pension at age 61 or earlier. Employees in the local government

⁹In comparison, individuals with SI as first main income source after retiring from the labor force are less likely to stay uninterruptedly with this income source until age 65. Some individuals return to work or becomes eligible for DI. Hallberg (2003) and Palme and Svensson (2002a) show that the first route to DI usually is via a spell of SI. The exit probability to DI in our tables will thus capture shorter, intermediate, spells of sickness insurance but not longer ones. These will instead contribute to the SI exit.

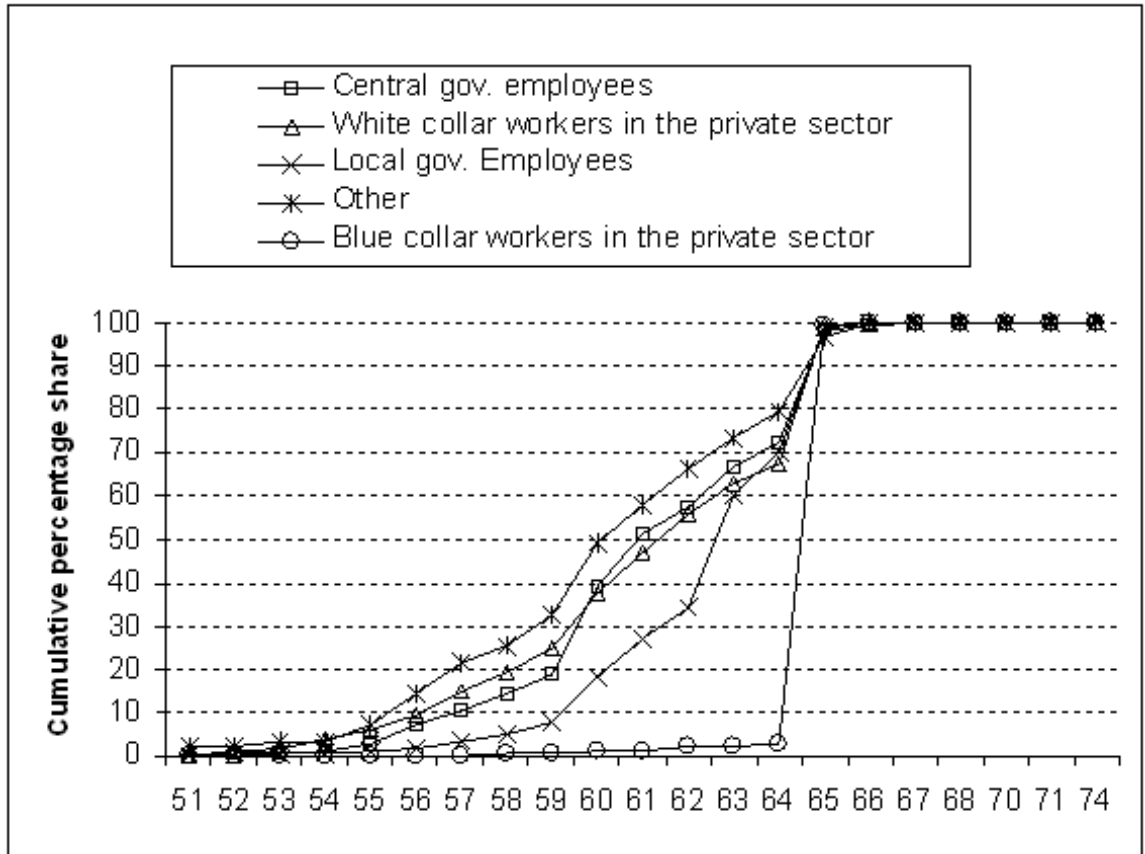


Figure 3: Age of occupational pension claim

go with this type of pension later, many at age 63: the cumulative share that have initiated their occupational pension withdrawal increases from 34% at age 62 to about 60% at age 63. The group of individuals in category "other" is very small, however also here we see a clear tendency of early occupational pension claim.

Looking at the age distribution for the claiming year of national old age pensions a dramatically different picture evolves. Figure 4 show that the spike at 65 is more pronounced and individuals are less prone to make old age pension withdrawals prior to their 65th birthday. There is not much difference between sectors.

Evidently, early claim of national old age pension is economically very unfa-

Table 3: Age of first occupational pension claim, by sector employment, 1992-2000

	Central gov. employees (PA-91)	White collar workers in the private sector (SAF-PTK)	Local gov. employees (PA-KL)	Blue collar workers in the private sector (SAF-LO)	Other	Total
51	2	2	3	0	2	9
52	0	9	5	0	0	14
53	7	13	6	0	1	27
54	2	28	5	0	0	35
55	22	26	18	0	4	70
56	50	50	18	0	7	125
57	34	68	33	2	7	144
58	45	58	53	1	4	161
59	54	78	75	1	7	215
60	229	165	313	6	16	729
61	137	123	259	4	9	532
62	74	122	199	6	8	409
63	102	95	760	5	7	969
64	63	57	286	4	6	416
65	298	425	833	984	17	2557
66	15	6	26	6	3	56
67	1	0	0	0	0	1
68	1	1	0	0	0	2
70	0	1	0	0	0	1
71	1	0	0	0	0	1
74	1	0	0	0	0	1
Total	1138	1327	2892	1019	98	6474

Note. Sample B

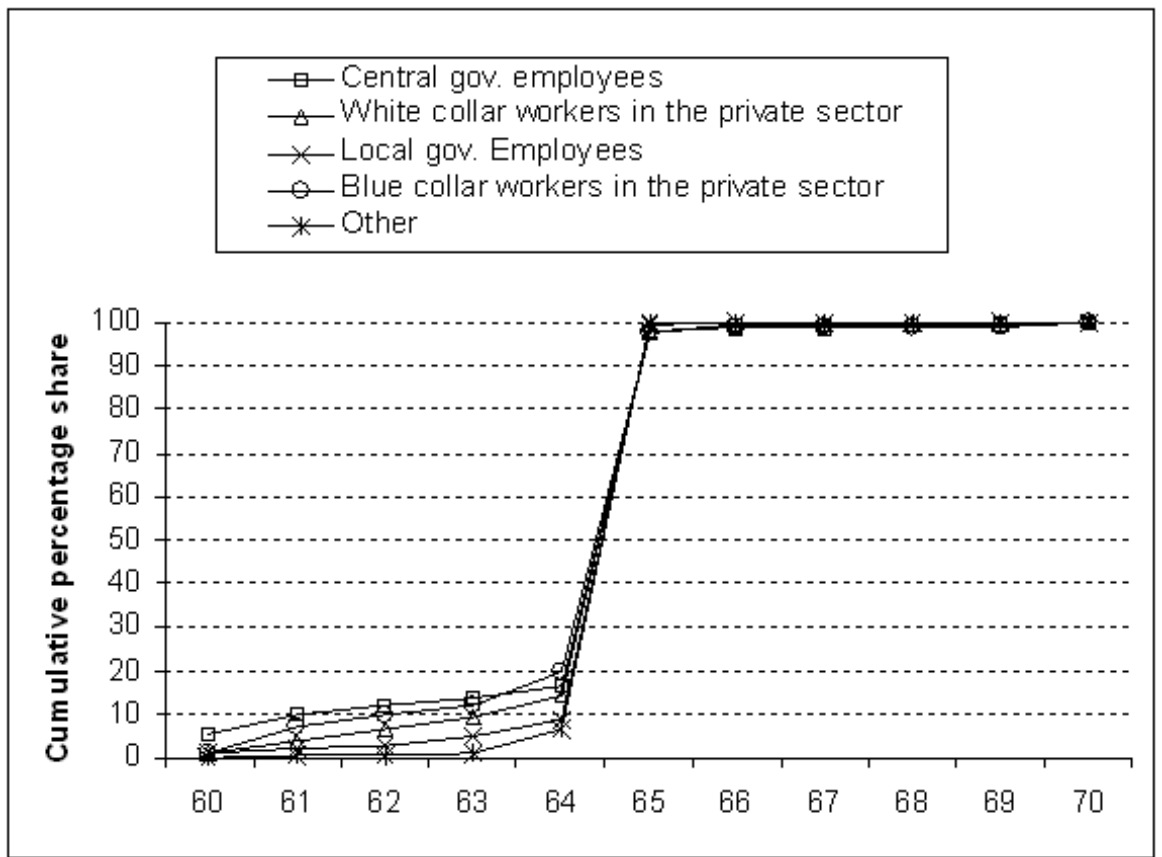


Figure 4: Age of national old age pension claim

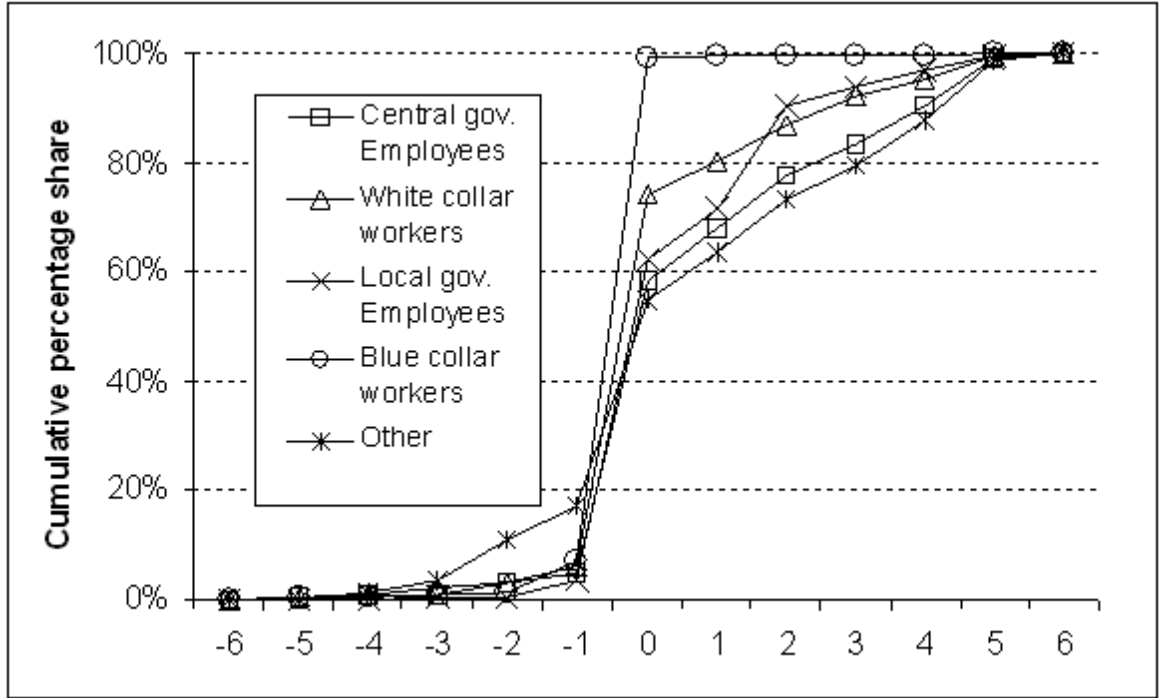


Figure 5: Age difference between national old age pension claim and occupational pension claim

avorable due to the actuarial adjustment on early claims (and, possibly, also due to a potential loss in pension points in the ATP system). However among those that did, one should expect that it is common to combine these payments with early occupational pension claims. Since the age distribution is different for the two types of pension, we are interested in the source of this discrepancy. Table 4 and Figure 5 give the number of years between the initial occupational pension withdrawal and the old age pension withdrawal. A positive number indicates that the individual made a withdrawal from the occupational pension before she began her withdrawal from the old age pension. A negative number indicate the reversed order of withdrawals (old age pension first, then occupational pension).

The spike at 0 (about 72% in the population as a whole) indicates that the normal case is to start withdrawal of occupational and old age pension simultaneously. Nevertheless, in accordance with what has said above, about 22% make a withdrawal from the occupational pension at least 1 year before

Table 4: Number of years between national old age pension claim and occupational pension claim (negative numbers indicates the reversed order)

Diff=AGE _{OA,P} -AGE _{T,JP}	Central gov. employees (PA-91)	White collar workers in the private sector (SAF-PTK)	Local gov. employees (PA-KL)	Blue collar workers in the private sector (SAF-LO)	Other	Total
-6	1	0	0	0	0	1
-5	4	6	3	8	0	21
-4	1	6	2	3	1	13
-3	2	10	6	12	2	32
-2	20	12	5	21	6	64
-1	14	35	87	179	5	320
0	464	748	1767	2934	31	5944
1	85	68	271	8	7	439
2	82	76	570	6	8	742
3	52	56	107	3	5	223
4	59	37	90	1	7	194
5	76	45	77	6	9	213
6	8	6	11	1	1	27
Total	868	1105	2996	3182	82	8233

they start their old age pension withdrawal.¹⁰ Again blue collar worker affect the aggregate measure, since they are restrained from early withdrawal of occupational pension. We therefore give the age difference between the initial withdrawal in OAP and TJP by occupational sector. We see that a fair share of workers in other sectors withdraw TJP before OAP: 42% of employees in central government, 38% of local government employees and 26% employees in the white-collar private sector do. It thus seems to be very common to have a few years where only occupational pension is withdrawn in those sectors where withdrawal prior to age 65 is allowed. In local government sector there is a peak at +2 years, which is in compliance with the finding that many employees in the local government leave the labor force at age 63 with occupational pension only.

To summarize, this section has shown that many individuals who exit early first make use of their occupational pension until the age of 65, without making any national old age pension withdrawal. At their 65th birthday the occupational pension is reduced while the (normal) withdrawal of national old age pension is started. As we understand it, the common assumption in the literature when modeling retirement behavior is that national old age pension and occupational pension is withdrawn at the same time. This can thus be criticized when looking at real data. Because we see so much variation in pension withdrawal from the occupational pension system we gather that the underlying decision when to retire is more focused on the timing of the occupational pension than it is on that of the national old age pension, much more than previous retirement literature suggests. To understand retirement in Sweden we should keep this mind.

Clearly, the rules in the occupational pension schemes support this behavior. First, they allow for early withdrawal with occupational pension at replacement ratios substantially higher than the 10% which normally is paid out when both the national old age pension and the occupational pension is used simultaneously. Some of these early withdrawal rules are set up for occupational groups with an early mandatory retirement age. Second, employers and workers can make special arrangements (with even higher replacement ratios) during the years until mandatory retirement (so called "buy-outs"). As we will see below, the major part of early retirement pension agreements made through the occupational pension system resulted in very high replacement ratios, and hence

¹⁰Delaying occupational pension after withdrawal of the national old age pension is very rare. About 5% make their claim in reversed order, with a peak just one year before.

have the necessary ingredients for a typical "buy-out".

3.4 Replacement ratios

Using the third data subset (Sample C) from LINDA we now study the replacement ratio, i.e., the occupational pension benefits as a quota of earlier wage earnings. One issue we pursue is how well the formal rules describe actual data of pension pay-outs.

The formal rules in the occupational pension system determines the benefit level as a share of earlier wage, the "qualifying wage". The different occupational sectors use, however, somewhat different procedures how to determine the benefit level. Nevertheless, all of them include the qualifying wage and the number of years of service within the current occupational sector as the main features. The qualifying wage is an average taken over the last year's sector-specific wage earnings before pensioning (the exact definition is depending on the sector affiliation), weighted by the number of service years.

In our data we cannot observe neither the number of years in service within a specific sector nor the qualifying wage perfectly. We have chosen to assign the maximum number of service years (which is 30 years for all sectors) to everyone in the sample, and compute the qualifying wage as the mean of the taxable income in the last five years prior to the year of first occupational pension withdrawal. The intention behind the procedure is that we do not want to be at risk of overstating the replacement ratios in any way.^{11, 12} We have, furthermore, chosen to measure the replacement ratio in the first year after we first observed an occupational pension claim.¹³

¹¹We use fewer than five years for qualifying wage determination depending on how many years of observation we have before the first year of occupational pension claim.

¹²By assigning 30 service years we will, for some individuals, overstate the qualifying wage. Also by using taxable income instead of the sector specific labor earnings, which we do not observe perfectly, we may overstate the qualifying wage since taxable income include *any* earned income (plus that from business, net of general deduction and any pension insurance premiums and periodically allowances paid).

The qualifying wage is measured up to a year before the start of the occupational pension claim. Our measure of the replacement ratio hence misses the real wage increase during the last year of work. As a sensitivity check we therefore adjusted our measures accordingly ex post, using the average real wage change for white collar workers. We found however no or very little change in the results.

The average qualifying income in our sample (Sample C) were 7.44BA (271,000 SKR \approx 29,000 EURO) for men and 4.50BA (164,000 SKR \approx 18,000 EURO) for women (in 1999 SKR).

¹³That is, for someone who did not claim occupational pension at age 60 but did so at age of 61, we measure the the first full-year equivalent with occupational pension withdrawal in the year when he turned 62. The replacement ratio is then this amount divided by the qualifying

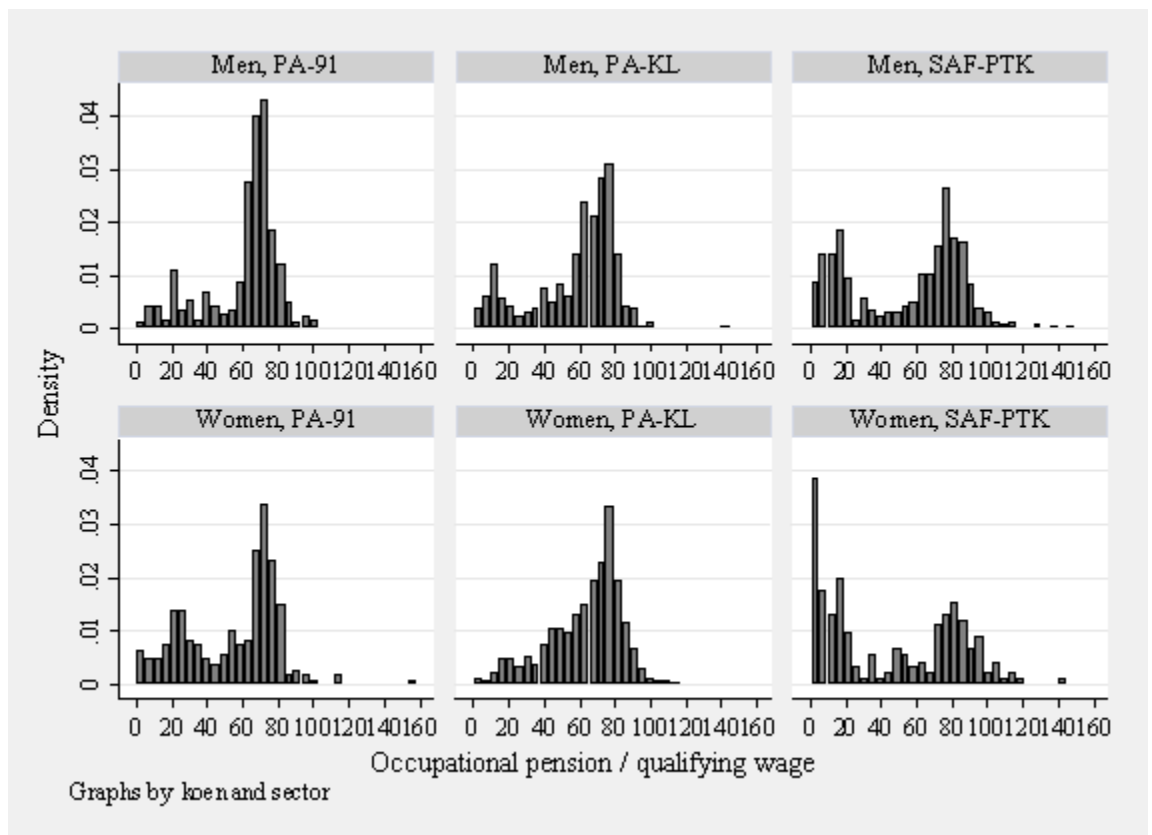


Figure 6: Replacement ratios by sector and gender

The replacement ratio is given in Figure 6 for the three sectors which allow early withdrawal (SAF-PTK, PA-91, and PA-KL). The majority of observed data points are situated around a replacement ratio of 75-80%, depending on gender and sector. There is also a clustering in the lower end, which we return to below. The group of observations at the high end is quite interesting considering that this ratio clearly is higher than the highest replacement ratio stipulated in the "standard" agreement text for early retirement with occupational pension (65%). The peak is more likely to reflect the maximum deduction rate set by company-tax legislation (i.e., 80% for most).¹⁴ Since we do not perfectly observe the qualifying wage of reasons described above there is bound to be some elements of measurement error which contribute to the variation around the peak. As mentioned, we are careful not to overstate the compensation rate. Since some may have less than 30 years of service or have earnings from outside their main sector, it is more likely that we underestimate than overestimate the rate.

Of those employed in the white collar sector, central government, and in local governments that claimed their occupational pension before the age of 65, about half (53%) had a replacement ratio above the highest replacement ratio stipulated in the "standard" agreement (i.e., above 65%). In fact, in the regions where we would expect to find most observations if we just trusted to the agreement text, which is at or just below a replacement ratio of 65%, we find practically no observations!

A bit unexpectedly we find a non-negligible part of the observations situated at a rather low replacement level, just below 25% of the qualifying wage. A closer inspection of this group of observations shows, however, that these to a larger extent than others have either substantial work incomes, a withdrawal of national old age pension or disability insurance. It is natural that individuals with alternative income sources obtain a smaller part of their income from the occupational pension, in particular if the other income source is another type of pension. One interpretation is that these are individuals who favored an early exit but did not get a favorable "buy-out" offer from the employer, and therefore chose to exit with alternative income sources. Obviously, these got a very low replacement ratio from the occupational pension system. However, if we include other type of benefits as well the overall replacement ratio may well

wage, which we measure before age 61.

¹⁴One can note that what we observe is the average and not the marginal replacement ratio.

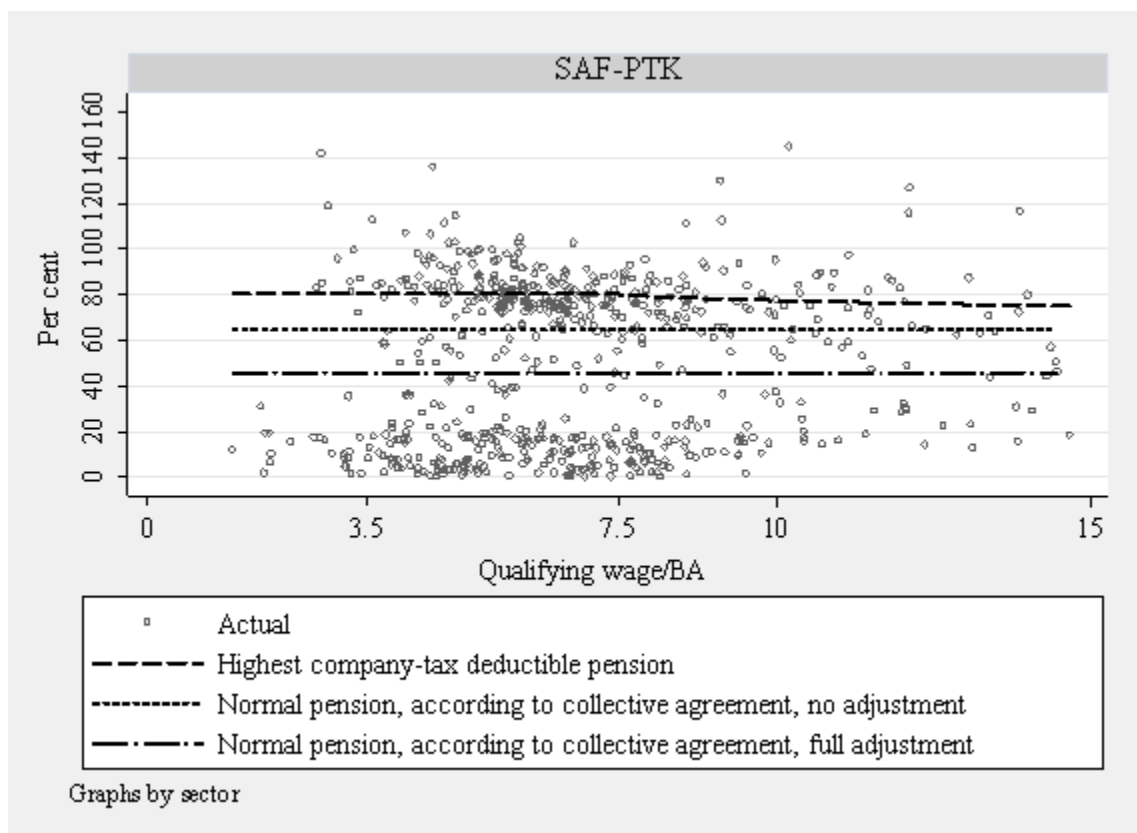


Figure 7: Observed replacement ratios for white collar workers in the private sector (first occupational pension claim at age 60-63)

be at a reasonable level.¹⁵

The next couple of figures allow for a direct comparison of data with prevailing rules. Here we have plotted the replacement ratio against the qualifying wage (as in Figure 1), and indicated the upper and lower bounds of the "standard" occupational pension.¹⁶ We have also marked out the highest tax-deductible

¹⁵If we remove from our sample those individuals who have either national old age pension or disability insurance withdrawal in the same year that we measure the occupational pension withdrawal, we get the distributions depicted in Figure 10 in the Appendix. One can notice that most of the accumulation in the lower end of the distribution is gone, while the centering around 80% is more accentuated.

¹⁶The upper limit is calculated without actuarial adjustment and the lower with full actuarial adjustments due to early withdrawal. The actuarial adjustment is made with the assumption that individuals retire at earliest possible retirement age according to their particular collective agreement.

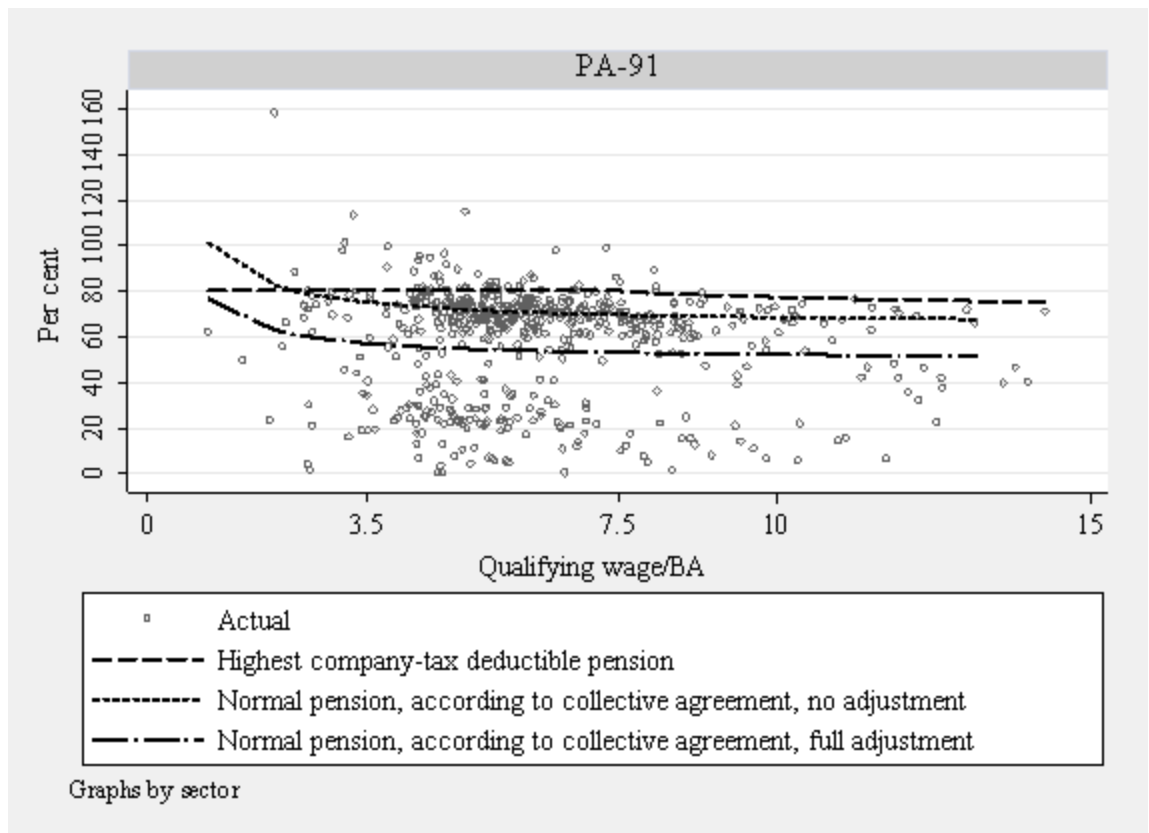


Figure 8: Observed replacement ratios for employees in the central government (first occupational pension claim at age 60-63)

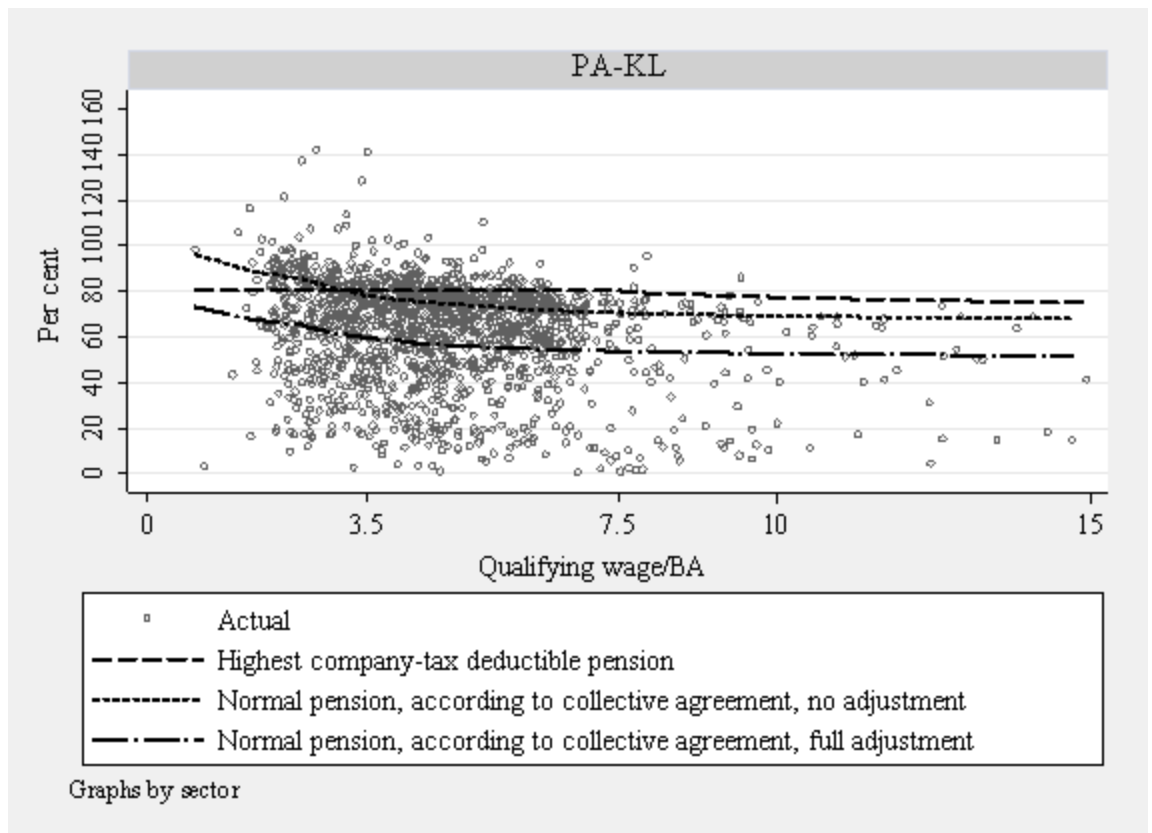


Figure 9: Observed replacement ratios for employees in the local government (first occupational pension claim at age 60-63)

pension (as a ratio of qualifying income), i.e., the complementary rule in the income-tax legislation. Interestingly the agreements for white collar workers (Figure 7) are clearly best described by the complementary rule, and not at all by standard agreement rules. Between the two bands that mark out the highest and lowest possible replacement rate according to the standard agreement, very few observations appear. If going by the text we would hence clearly underestimate the true value of this benefit. For central government employees (Figure 8) there is instead an accumulation of observations on the upper bound of the "standard" occupational pension (no actuarial adjustment). Their agreements made also these quite well off but perhaps not as well as the white collar workers. Also for many in this group we would be at risk of underestimating their true benefit. Replacement rates for the local government employees have a much higher spread (also if we were to exclude those with a simultaneous withdrawal of either old age pension or disability insurance, or work incomes). For this group it is hence harder to say whether the benefits actually follow the standard agreement text or not. It might be that we make a worse job of predicting the qualifying wage for this group compared to the other two groups.

4 Summary and conclusions

Exits via occupational pension are substantial in Sweden, particularly in ages 60-64. In those ages occupational pension is the most common exit route. This study highlights some notable differences between actual pension benefits in the occupational pension system and those stipulated by the standard agreements. We find that the individuals get far better options than those given by the standard agreement.

Many individuals who exit early in Sweden first make use of their occupational pension until the age of 65, without making any national old age pension withdrawal. At their 65th birthday the occupational pension is reduced while the normal withdrawal of national old age pension is started. As we understand it, the common assumption in the literature when modeling retirement behavior is that national old age pension and occupational pension is withdrawn at the same time. This can thus be criticized when looking at real data. Another finding is that many get a higher benefit than what the standard agreement text stipulates. Our results suggests, depending on gender and sector, that the majority of early retirement programs in the occupational pension system render

a replacement ratio of 75-80%. One important implication of these findings is – if we just relied on the standard agreement text – that the effects of economic incentives on retirement very well might be over-estimated.

Some of these early withdrawals are made by particular occupational groups that have a lower mandatory retirement age. However, employers and workers can – within the occupation pension system – make special arrangements and themselves specify a retirement age and negotiate about, e.g., the replacement ratio during the years until mandatory retirement age (so called "buy-outs").

Not many decide to withdraw their national old age pension early. Because we see so much variation in pension withdrawal from the occupational pension system one conclusion must be that the underlying decision when to retire is more focused on the timing of the occupational pension than it is on that of the national old age pension. To understand retirement in Sweden one should keep this mind.

We hence point at the importance of private alternatives for retirement in Sweden. However, our results might be equally important for other countries which also have several parallel pension benefit plans for the individual to choose from.

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5 Appendix

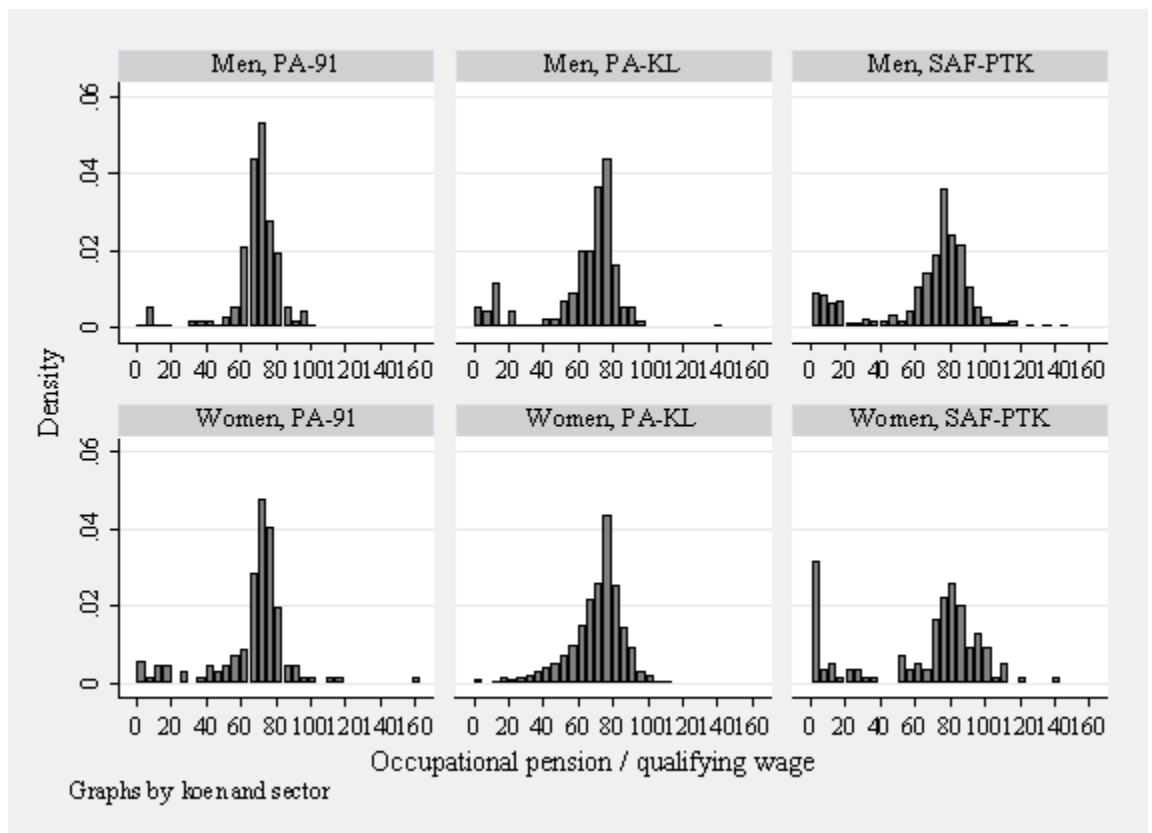


Figure 10: Replacement ratios by sector and gender , given no withdrawal of neither national old age pension or disability pension

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