

The value of pension reforms for late working life: evidence from Sweden

Pension reforms for late working life

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Received 11 February 2023
Revised 14 March 2023
Accepted 14 March 2023

Abstract

Purpose – Driven by the aim to increase the participation of older people in the labour force and to extend people's working lives, the Swedish Parliament passed a bill in 1998 to increase the pension eligibility age from 60 to 61 years and establish a notional defined-contribution (NDC) plan. In this article, the authors investigate the impacts towards the prolongation of working lives expected from such an intervention.

Design/methodology/approach – The authors apply a multinomial probabilistic model based on Swedish registry data on the birth cohorts 1937–1938 ($n = 102,826$) and observe differences in exit behaviour between eligible and non-eligible individuals.

Findings – The authors find that the cohorts eligible to the pension reform exit the labour market at a later age compared to non-eligible cohorts at the 61-years cut-off. The authors also find that the effect persists in the long term. Furthermore, the authors find that both men and women are equally struck by the reform.

Originality/value – While there exist many descriptive reports and theoretical analyses on the costs and benefits of pension reforms, this study is the first one to empirically analyse the effect of the first European NDC pay-as-you go pension plan on the potential exclusion of old-aged workers.

Keywords Ageing, Late-working life, Pensions, Retirement, Sweden

Paper type Research paper

Introduction

With the ageing of population, the impact of pension systems on older workers' retirement has become crucial (Vogel *et al.*, 2017) with reforms increasingly financially and socially sustainable (Väänänen and Liukko, 2022). Often derived from changes in political institutions (Verbič and Spruk, 2019) or countries' investment portfolios (Hu, 2014), reforms on statutory retirement ages may constitute an effective tool to react to the demographic transition, especially in Europe. On the one hand, they increase the participation rate of older people in the labour force (Kuitto and Helmdag, 2021). On the other hand, they extend the employment phase from the life-course perspective (Henretta, 2003) to both benefit from the occupational talents present in the ageing workforce and improve contributions side while reducing expenditures for old-age security.

Individuals decide when to exit the labour market based on the requirements for the minimum pension age, as well as their professional career, work–life balance, and the social

JEL Classification — J14, H55

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The Project is funded by the Swedish Research Council for Health, Working Life and Welfare (FORTE), with the grant 2019-01245 (Diarienummer). The Project is part of the 'Exclusion and Inequality in Late Working Life' research programme.



rights and benefits they are entitled to over the course of their lives. On this subject, pension rules affect individuals' exit age from the labour market through both direct and indirect channels; namely, legislative requirements and financial incentives (Gruber and Wise, 1998). Having respected said requirements, it is possible for the individual to exit the labour market at the predisposed statutory age or at later ages (Stock and Wise, 1990). In other words, "a person continues to work if the expected value of retirement in the future is worth more than the value of retiring now" (Stock and Wise, 1990).

Often seen as pioneer of labour market policies (Bonoli, 2012), Sweden represents a valid case study to better understand the implications of changes implemented on pension entitlements. In 1960, individuals could retire at 67 and the pension was based on earnings. Several occupational schemes already allowed to retire at 65 with full benefits from the public scheme. In 1976, the normal retirement age became to all effects 65, with benefits available from the age of 60 (Sunden, 2006). Mid-1980s, reports by the government showed that the Swedish pension system was not sustainable in the long term. In parallel, life-long widows pension was abolished and replaced with a temporary adjustment pension together with an improved child pension (Scherman, 1999).

A compromise between the Social Democrats and the Conservatives was reached in 1998, with a pension reform based on the Swedish government's Bill 1993/94:250 "Reformering av det allmänna pensionssystemet" [1], with which the age limit for the access to old age pension was raised from 60 to 61 years and a notional defined-contribution (NDC) financed on a pay-as-you-go basis was introduced as a forerunner in Europe (Kangas, 2010; Nyqvist, 2015). Today, "pensionable pay is defined as earnings less the employee contribution to the pension system of 7% of gross earnings" (OECD, 2021). The reform meant that benefits were based on all earnings over an individual's career but that, by being less generous, the new pension system was able to protect those with generally lower earnings (Scherman, 1999). As well-illustrated by Sunden (2006), the aim of the reform was to create a direct link between benefits and contributions and encourage labour supply – one more year of work corresponded to higher benefits. Identifying anticipated future outcomes based on earlier observed similar events is an established approach, and a similar analysis was recently conducted by Borzutzky (2019) for Chile, investigating the successful efforts of the government to reform the pension system in 2008.

In this article, we aim to shed light on the impact of such long-awaited reform on the working life of old-aged workers; namely whether it encouraged or not a more active participation in the labour market. For the purpose of our analyses, we exploit Swedish registry information on late-work careers for the birth cohorts 1937–1938 living in Sweden before and after the reform of 1998 during the years 1996–2005 for those born in 1937 and the years 1997–2006 for the cohort of 1938. While the cohort 1937 was not affected by the reform, the cohort 1938 was.

We investigate (1) to what extent one could find differences in exit from the labour market between these cohorts at age 60 and 61; and (2) whether effects of the reform could even be found before and after the 61-years cutoff. Based on a multinomial probabilistic model applied to $n = 102,826$ individuals, which are the total population in the birth cohorts 1937–1938 living and registered in Sweden during the observed period, we conduct an analysis on the effect of an increase in the pension eligibility age on the cohorts' labour market exit during 60–65.

By doing so, this article contributes to the extant literature by providing the first empirical analysis on the effects of the 1998 Swedish pension reform on aggregate exit effects from a cohort-comparative perspective and by discussing policy implications applicable to the one-year increase in pension eligibility established recently. Particularly, we investigate the magnitude of effects for eligible compared to non-eligible cohorts from both within- and between-groups perspectives.

Below, [Section 2](#) illustrates the data employed for the Swedish case and the empirical methods used for the analysis. [Section 3](#) presents the main findings with respect to differences observed in cohorts of the Swedish population eligible and not eligible to the pension reform. [Section 4](#) discusses the key results.

Data and methods

Data material and study population

We use Swedish registry data from LISA, the longitudinal integrated database for health insurance and labour market studies in Sweden; RTB, the register of the total Swedish population; and the Swedish job and company registers, which contain information about all official work activity. The study population includes all people born in 1937 and 1938, who lived in Sweden between the ages 60 and 68 received at least one-month income statement from regular or self-employment in the years of investigation ($n = 102,826$). While individuals born in 1937 were entitled to their retirement pension once they reached the age of 60 years, individuals born 1938 were affected by the 1998 Swedish pension reform and were eligible to their retirement pension from the age of 61.

Variables

Exit from the labour market was measured as the last calendar year individuals received an income statement in the period between 2011 and 2018. We did not use proxies or estimates for our definition but relied on the official and available information related to income and retrieved from the Swedish job register. Recently, [Eyjólfsson et al. \(2021\)](#) also resorted to income from old-age to measure retirement age. According to their comparative analysis on survey and registry data, income-based measures provide good indicators for policymakers.

All personal characteristics were collected from LISA, based on the calendar year the individual turned 59 years old. These include gender (male, female), education (primary, secondary and tertiary), income (measured as the income statement from paid or self-employment in the years of investigation), country of birth (born abroad, born in Sweden). Inflation is not accounted for due to the very small variations characterising the inflation rate in Sweden in this period – between 0.89% in 2012 and 0.98% in 2016. Information on the sector (measured by whether the individual worked in agriculture, forestry, and fishing, manufacturing and extraction, energy production, water supply, construction, trade and communication, financial activities and business, education and research, care and nursing, personal and cultural services, or public administration) is retrieved from the Swedish company register.

In [Table 1](#), we illustrate descriptive statistics distinguishing between affected and non-affected cohorts. With respect to demographic characteristics, we observe that the cohorts are quite similar in the distribution of females (52.8%, on average) and domestic-born individuals (89.4%). 39.9% of the population has a primary education, 38.5% a secondary education and 22.6% a tertiary education. Further, we note that the most common sector was care and nursing (31.1%), followed by manufacturing and extraction (18.5%), and trade and communication (15.6%).

When looking at the outcomes of interest – namely, when individuals exit from the labour market – , we observe significant differences between eligible and non-eligible cohorts. In particular, individuals not affected by the 1998 pension reform exit the labour market before the age of 61 years to a larger extent. 9.45% of them exits at 60, while only 6.24% for cohort 1937. 26.38% of the cohort 1938 exit between 62 and 64. The proportion is equal to 27.04% for the cohort 1937. For those born in 1938, the proportion is equal to 40.46%, while only 37.66% of those belonging to the cohort 1937 exit after 65 [\[2\]](#). These differences are confirmed by the causal analysis reported below.

	(1)	(2)	(3)
<i>Cohort</i>	1937	1938	Total
	%	%	%
<i>Gender</i>			
Male	47.33	47.18	47.25
Female	52.67	52.82	52.75
<i>Education</i>			
Primary	39.77	38.15	38.94
Secondary	37.88	39.08	38.50
Tertiary	22.35	22.77	22.56
<i>Country of birth</i>			
Born in Sweden	89.31	89.55	89.43
Born abroad	10.69	10.45	10.57
<i>Yearly labour market income (100 SEK)</i>			
Mean	1,811	1,832	1,789
<i>Sector of reference</i>			
Unknown sector	5.19	6.60	5.91
Agriculture, forestry and fishing	0.85	0.87	0.86
Manufacturing and extraction	18.82	18.11	18.46
Energy production, water supply	0.83	0.88	0.86
Construction	4.32	4.00	4.16
Trade and communication	15.53	15.56	15.55
Financial activities and business	8.56	8.78	8.67
Education and research	5.05	5.26	5.16
Care and nursing	31.40	30.80	31.09
Personal and cultural services	4.93	4.89	4.91
Public administration	4.51	4.24	4.37
<i>Exit from the labour market</i>			
Exit at 60	9.45	6.24	7.80
Exit at 61	6.98	7.66	7.33
Exit between 62 and 64	27.04	26.38	26.70
Exit at 65	18.86	19.26	19.07
Exit after 65	37.66	40.46	39.10
<i>Observations</i>	49,994	52,832	102,826

Table 1.
Summary of
descriptive statistics

Model

We employ a multinomial probabilistic regression where Y_i is a set of different possible outcomes for a variable that is categorically distributed; namely, the individual exits at 60, 61, between 62 and 64, at 65 and after 65 [3]. Our justification for this is that retirement and pension receipt are not the only mechanisms of exit from the labour market that individuals in late working life can experience. This is why we prioritize the outcome exit from the labour market rather than the more limited outcome of retirement. Indeed, individuals may continue working with pension, exit from the labour market without pension, with disability benefits or other forms of financial support.

In our first specification, $ELIG_i$ indicates whether the individual belongs to an eligible or non-eligible cohort; namely, whether she was born in 1938 or, instead, in 1937. K_i , on the other hand, includes controls such as gender, sector of reference, income and education [4]. With respect to gender, a further analysis is conducted on the sample to identify potential

differences between male and female older workers. With respect to income this indicates personal labour market income, intended as income received from paid work or self-employment. Below we present and discuss our results.

Results

Findings from a multinomial probabilistic regression show that non-eligible cohorts are more likely to leave the labour market earlier than eligible cohorts. This can be observed from [Table 2](#), summarising the margins computed from the adjusted model inclusive of controls.

The predicted probability for individuals born in 1937, and therefore not directly affected by the reform is equal to 9.28 as regards exit at 60. This is potentially explained by a lag in the effect of a 1997 reform that abolished the more favourable eligibility rules for disability benefits targeting individuals over 60. This proportion is equal to 6.35 for eligible individuals born in 1938 who are generally less likely to exit the labour market during this timeframe. For the same group of people the predicted proportion of exit at 61 is equal to 7.73, which directly reflects an immediate effect of the 1998 pension reform. Eligible individuals are also less likely to exit the labour market between 62 and 64 with a predicted margin value of 26.43. In general, given that exiting between 62 and 64 is more costly under the NDC plan, with “annual benefits calculated by dividing the balance in the notional account by an annuity divisor” ([Sundèn, 2006](#)), we observe a larger proportion of eligible individuals exiting at 65 or after. The higher proportion, in general, of individuals exiting the labour market after 61 may be partially explained by the incentive granted to local government workers to obtain their full occupational pension were they to retire between 63 and 65 ([Hagen, 2018](#)).

The sectors most affected by the reform appear to be manufacturing and extraction, construction, care and nursing, and personal services, with individuals more likely to exit the labour market. This is also in line with the post-Covid financial context experienced in Sweden and worldwide according to which certain categories of workers experience physical and mental constraints that push them out of the working life. On this subject, current results may also vary depending on new migration patterns, health-related worries and fluctuations of prices that influence employers to retain their employees and employees to leave the labour market earlier than expected. While, in general, there is an increased likelihood of exiting the labour market and claiming pension benefits, the NDC pension system used by Sweden seems to be less vulnerable to such risks as liabilities are by definition equal to the value of assets ([Feher and de Bidegain, 2020](#)).

In general, our results suggest that the one-year increase in pension eligibility combined with the notional defined-contribution (NDC) plan is efficient in keeping old-aged workers active in the labour market until the newly established age. Being it twofold, we are not able to disentangle the separated effects of the increase in pension eligibility age and the pay-as-you-go system [5]. Rather, we are interested in the effect of the reform in its entirety.

Exit	(1) At 60 %	(2) At 61 %	(3) 62–64 %	(4) At 65 %	(5) After 65 %
<i>Cohorts</i>					
1937	9.28	6.93	27.01	18.79	37.99
1938	6.35	7.73	26.43	19.34	40.15

Table 2. Predicted proportions (margins) of the 1998 pension reform on exit from the labour market

Similarly, we are aware that other secondary and non-significant changes may have occurred in the period under investigation. In 2001, for instance, employment protection was increased from 65 to 67, while in 2003 disability insurance was officially separated from the old-age pension (Table 3). What is, however, evident is that the reform caused an economically significant effect and that the effect seems to remain significant over time (Figure 1). By focusing on the cohorts who are as local as possible to the implementation of the reform, we try to provide an estimate of the effect of the 1998 pension reform, net from the ones affecting the later cohorts.

While other explanations might be possible, our model indicates that individuals can keep working for longer when affected by pension reforms interested in increasing labour supply. This is in line with the recent analysis by Parlevliet (2017), which provides evidence on collective learning for Dutch households. In our case, the change in behaviour expected by Swedish workers affected by the pension reform is progressively absorbed and contributes to encouraging them to remain in the labour market, also in the name of active ageing (Carmel *et al.*, 2007).

Gender discrepancy

Because of the gender discrepancy that exists with respect to retirement (Ginn, 2001), we also investigate whether the reform is particularly salient for women. With pre-retirement role identities (Bordia *et al.*, 2020) being more rigid for women, it is common for male earners to remain employed longer when in a marriage (Bertogg *et al.*, 2021). However, when isolating the effects from the pension reform on eligible and non-eligible cohorts, our findings depart from the extant literature that women are impacted differently and negatively by retirement planning (Larisa *et al.*, 2020).

Women eligible to the 1998 pension reform are 2.86 percentage points less likely than non-eligible women to exit at 60 (Table 4). They are also 0.97 percentage points less likely than non-eligible women to exit, respectively between 62 and 64. Women born in 1937 are, respectively, 19.38 and 36.62 percentage points likely to exit the labour market at and after 65. This is potentially explained by the fact that the cohort of individuals born in 1938 is affected by a 2001 reform in Sweden that increases employment protection from 65 to 67.

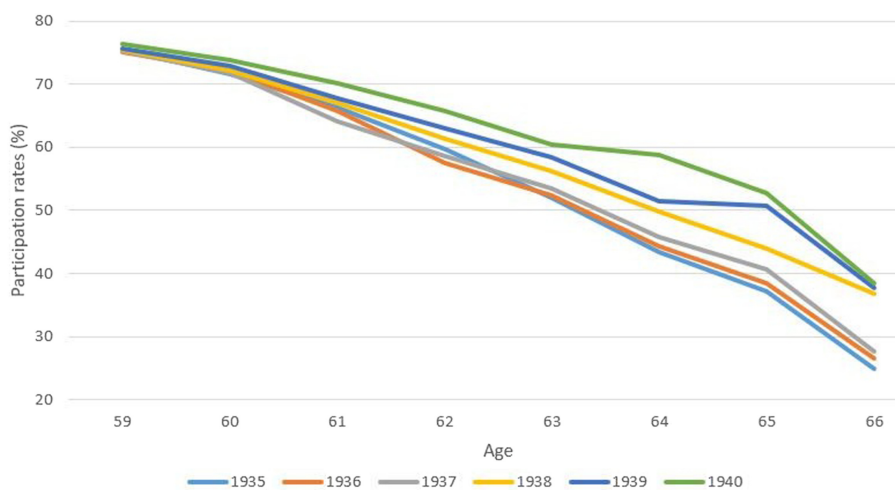
What is, however, relevant to observe is that men and women appear to be affected by the reform to a similar extent. Particularly, our findings show that the predicted probability for both non-eligible men and women to exit at 60 is around 9 percentage

Year	1997	1998	1999	2000	2001	2002	2003	2004
<i>Cohorts</i>								
1935	62Δ	63Δ	64Δ	65	66*	67*	68∇	69∇
1936	61Δ	62Δ	63Δ	64Δ	65*	66*	67*∇	68∇
1937	60Δ	61Δ	62Δ	63Δ	64Δ	65*	66*∇	67*∇
1938	59	60Δ■	61Δ■	62Δ■	63Δ■	64Δ■	65*■∇	66*■∇
1939	58	59	60Δ■	61Δ■	62■	63■	64■∇	65*■∇
1940	57	58	59	60Δ■	61Δ■	62Δ■	63Δ■∇	64Δ■∇

Note(s): ΔAffected by the 1997 reform, when more favourable rules of disability pension for 60–64 were abolished. □Affected by the 1998 reform, when the earliest public pension age was increased from 60 to 61 and subject to a NDC-based system. *Affected by the 2001 reform, when the employment protection age limit was increased from 65 to 67. ∇Affected by the 2003 reform, when the disability insurance was separated from the old-age pension

Source(s): Author's own work

Table 3. Cohorts affected by reforms in the Swedish pension system



Source(s): Author's own work

Figure 1. Participation rates in the labour market by age (years) and cohorts

Exit	(1) At 60 %	(2) At 61 %	(3) 62-64 %	(4) At 65 %	(5) After 65 %
<i>Gender*Cohort</i>					
Male*1937	9.61	6.34	23.42	18.12	42.50
Male*1938	6.60	7.48	23.26	18.57	44.08
Female*1937	9.02	7.42	30.25	19.38	33.93
Female*1938	6.16	7.92	29.28	20.02	36.62

Table 4. Predicted proportions (margins) of the 1998 pension reform on exit from the labour market, with gender interaction

points. Non-eligible men and women are also, respectively, 6.34 and 7.42 percentage points likely to exit at 61. The predicted proportions increase similarly between 62 and 64 and 65, when they are equal to 23.42 and 30.25, and 18.12 and 19.38 for men and women born in 1937. On the other hand, eligible cohorts of men and women are less likely than their non-eligible peers but equally likely within their cohort to exit the labour market at 61. The estimated margins are, respectively, 6.60 and 6.16 for men and women born in 1938. When they exit between 62 and 64, the predicted probability is equal to 23.26 for men and 29.28 for women. Overall, we find that differences between the 1937 and 1938 cohorts are similar for men and women.

Conclusions

As of 2023, there is no fixed retirement age for Swedes, who can decide at what age they wish to start receiving all or part of their national public pension, although this cannot be done before the age of 63. This limit is set to increase gradually based on life expectancy. In 2020, another pension reform was put in place in Sweden, making people eligible to receive their old-age pension once they turned 62 years old. The reform expected an increase of one year of work compared to what was originally established; namely, pension eligibility at 61.

In this article, we looked at a similar one-year-increase in pension eligibility by analysing the effect of the 1998 pension reform in Sweden, which increased eligibility age from 60 to 61 and introduced a NDC plan based on a pay-as-you-go system that linked benefits to contributions closely. This is done in a way that the financial sustainability of the NDC scheme is independent on retirement age. On the one hand, an automatic balance mechanism allows for a balanced budget in Sweden. On the other hand, postponing retirement age appears essential to make sure that the pension system is adequate to the increase in life expectancy.

For the purpose of our analysis, we used registry data ($n = 102,826$) and compared eligible and non-eligible cohorts of old-aged workers. Applying a multinomial probabilistic model, we found that eligible cohorts are less likely to exit the labour market compared to non-eligible cohorts at the 61 age cutoff. In particular, they are not only less likely to exit soon after having reached 61 years of age, but the effect remains present for other eligible cohorts long after the established cutoff of 61. We also observed that men and women are equally affected by the pension eligibility reform. Both are more likely to stay in the labour market for a longer time, compared to non-eligible individuals, and the reform did not have relevant effects towards gender equality.

Our article presents several limitations. First, while the investigated pension reform of 1998 increased the minimum age of retirement of workers, other macro- and micro-economic variables may have impacted the possibility or decisions of individuals to retire. Second, wage profiles and length of career interruptions remain quite stable across individuals, making the Swedish population an ad hoc case compared to other European regions, where other aspects of life (e.g. care systems, life expectancy, disability policies) may compromise the working life of that community's individuals.

In other words, the Swedish experience suggests that an NDC pension reform like the one of 1998 "can be sustained in a supportive political environment, but [is not] immune to electoral pressures to prevent visible cuts in pension benefit" (Weaver and Willen, 2014). Future research could commit to overcoming the limitations of our article and provide a deeper understanding and disentangling of similar pension reforms, especially due to the restrictions that such pension reforms can pose on certain individuals.

Overall, however, the 1998 pension reform in Sweden shows that increasing pension eligibility and recurring to a NDC plan, based on pay-as-you-go contributions, is effective in boosting occupational activity during old age. This is line with the findings by Palme and Laun (2018) on the economic incentives produced by the pre-reform old-age pensions of the 1980s, as well as the delay in retirement observed by Glans (2008) in the period 1999–2003 in the country. On the other hand, our analysis departs from the conclusions of Laun *et al.* (2019) for Norway. Indeed, the authors find that raising access for old-age retirement benefits is not sufficient to maintain a stable budget for the economy, while lowering old-age retirement and disability benefits boosts employment.

If the argument by Lindbeck and Persson (2003) that, sometimes, reliance on pension "makes it even more imperative to maintain a safety net to prevent poverty in old age" is valid for Sweden, we believe this should alert other countries to the same, if not larger, extent. Our conclusions are drawn based on findings relating to a reform that occurred in 1998. The implications that can, however, be of usage for policy makers dealing with the more recent yet similar pension reform in Sweden, in that they show that increasing pension eligibility age, together with an efficient contribution plan, can prevent occupational inactivity in both short and long terms.

Notes

1. For more information, please see: https://www.riksdagen.se/sv/dokument-lagar/dokument/proposition/reformering-av-det-allmanna-pensionssystemet_GH03250/html.

2. In addition to the new minimum retirement age set at 61, any difference in exit after 61 or 65 could depend on the benefit system put in place with the NDC pension reform.
3. Exit age is defined as the age that corresponds to the last registered income statement for the individual, up until the age of 68 years.
4. Observations related to 547 individuals with no information on education were dropped.
5. Differences in retirement between eligible and non-eligible cohorts may also be explained by the fact that NDC rules were applied to compute 20% and 25% of the whole pension of, respectively, the 1938 and 1939 cohort's pension.

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