Labour Economics 19 (2012) 718–728

Contents lists available at SciVerse ScienceDirect

Labour Economics

journal homepage: www.elsevier.com/locate/labeco

The timing of retirement — New evidence from Swiss female workers ☆

Barbara Hanel [a,*], Regina T. Riphahn [b,**]

[a] University of Melbourne, Australia
[b] University of Erlangen-Nuremberg, Germany

ARTICLE INFO

Article history:
Received 27 May 2011
Received in revised form 4 May 2012
Accepted 14 May 2012
Available online 22 May 2012

JEL classification:
J26
H55
J14

Keywords:
Retirement insurance
Incentives
Social security
Labor force exit
Natural experiment

ABSTRACT

We investigate the responsiveness of individual retirement decisions to changes in financial incentives. A reform increased women's normal retirement age (NRA) in two steps from age 62 to age 63 first and then to age 64. At the same time retirement at the previous NRA became possible at a benefit discount. Since the reform affected specific birth cohorts we can identify causal effects. We find strong and robust behavioral effects of changes in financial retirement incentives. A permanent reduction of retirement benefits by 3.4% induces a decline in the age-specific annual retirement probability by over 50%. The response to changes in financial retirement benefits varies with educational background: those with low education respond most strongly to an increase in the price of leisure.

1. Introduction

Since an understanding of the magnitude of workers' responsiveness to institutional reforms is crucial for policy design, it is important to provide reliable empirical estimates. A large literature attempts to quantify the effect of retirement incentives, and the problems involved in identifying their causal effects are widely discussed (see, e.g., Lumsdaine and Mitchell, 1999; Coile and Gruber, 2007; Chan and Stevens, 2004). Much of the literature identifies behavioral responses to financial incentives based on the cross-sectional comparison of individuals with different benefit claims and focuses on the appropriate representation of dynamic incentives (for cross-national comparative studies see, e.g., Gruber and Wise, 2004; Duval, 2004). This approach mostly neglects the possibility of unobserved heterogeneity in tastes for retirement which might affect both incentives and responses. In their study of retirement expectations Chan and Stevens (2004) find that such heterogeneity strongly affects the estimates of responses to retirement incentives.

Some studies rely on natural experiments to obtain estimates of the effect of financial incentives that are not biased by unobserved heterogeneity: Krueger and Pischke (1992) show that workers affected by reduced retirement benefits in the U.S. in 1977 did not respond as strongly as would have been expected based on prior findings. Mastrobuoni (2009) investigates whether the 1983 reform of the U.S. normal retirement age affected retirement behavior. He finds that every 2-months-increase in the NRA (normal retirement age) at actuarially fair benefit reductions for early retirement increases the mean age of benefit claiming by one month.

Similar to these studies we take advantage of a reform in the retirement system to identify the effect of financial incentives on retirement behavior. The 1991 reform of the Swiss mandatory retirement insurance introduced two separate institutional modifications. On the one hand the normal retirement age for females was raised in two steps from 62 to 64. On the other hand the possibility of early retirement was introduced at the expense of a benefit discount. As these measures reflect policy options available in about every social security system, it is both interesting and important to study their effects. Also, since the retirement reform is tied to the year of birth as a fixed individual characteristic, the experiment is not subject to endogenous sorting into treatment.

☆ We gratefully acknowledge helpful comments received from the editor and anonymous referees, at the ESPE (European Society for Population Economics) meeting in Seville and from seminar participants at the University of Hannover research seminar.

* Correspondence to: Barbara Hanel, Melbourne Institute of Applied Economic and Social Research, Alan Gilbert Building, University of Melbourne, VIC 3010, Australia. Tel.: +61 3 9035 4565; fax: +61 3 8344 2111.

** Correspondence to: Regina T. Riphahn, Department of Economics, University of Erlangen-Nuremberg, Lange Gasse 20, 90403 Nuremberg, Germany. Tel.: +49 911 5302 826; fax: +49 911 5302 178.

E-mail addresses: bhanel@unimelb.edu.au (B. Hanel), riphahn@wiso.uni-erlangen.de (R.T. Riphahn).

0927-5371/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
doi:10.1016/j.labeco.2012.05.013

This study contributes to the literature in various ways: first, it identifies the labor supply response to retirement incentives by comparing the behavior of birth cohorts which differ only with respect to the financial incentives of a policy regime. In contrast to studies which rely on the cross-sectional identification of incentive effects, we can take advantage of an exogenous institutional reform. We know its precise timing and can therefore avoid measurement error. In addition, we avoid the problem that individuals may not be informed about their retirement incentives (Asch et al., 2005): the reform we look at here was subject to intense public debate due to a national public referendum (Bütler, 2002).

Second, we evaluate the heterogeneity of the behavioral response to the policy reform, i.e. labor force exit, across various levels of individual human capital. Song and Manchester (2007) find that there are large differences in the response to changes in the social security earnings test along the income distribution. Similarly, Mastrobuoni (2009) finds stronger responses to retirement incentives among men with less formal education.

Third, we investigate whether the behavioral response to the institutional change happens instantaneously or whether the adjustment process takes time. If retirement age is strongly affected by social norms the response to policy reforms might be dampened and protracted. Social norms play a key role in the debate on excess retirement at age 62 and 65 in the U.S. (cf. Lumsdaine et al., 1996; Coile and Gruber, 2007; Duflo and Saez, 2003), where they are discussed as a potential explanation.

Finally, while many studies in this literature focus on males we take advantage of a retirement reform specifically for female workers. For historical reasons, benefit eligibility rules for retiring females are often more lenient than those for retiring males. Therefore, adjustments specifically for the female labor force are a relevant policy issue in many countries. In addition, both health and financial restrictions may cause different responses to given policy changes for men and women.

We find clear behavioral adjustments in response to changes in retirement incentives. Labor supply elasticities differ across population groups with heterogeneous educational backgrounds. The estimation results are robust to controls for endogenous panel attrition. The evidence suggests that the adjustment of retirement behavior to changed institutional circumstances intensifies over time.

2. Institutional background and hypotheses

The Swiss retirement system consists of a public social security pillar (AHV), financed mainly by payroll taxes on a pay-as-you-go basis, and of heterogeneous, typically employer-based fully funded private pension systems as a second pillar (for a detailed description see, e.g. Bütler, 2002; Dorn and Sousa-Poza, 2003, for a cross-national comparison see Krieger and Traub, 2011). Both, the first and the second pillar are obligatory. Before the reform, the public AHV pillar sets a normal retirement age as an eligibility criterion for benefit receipt, but not a mandatory retirement age. For men the normal retirement age has always been 65, while women used to be able to retire at age 62. In 1991, a reform law (the "10th revision") was enacted, which was confirmed by a referendum in 1995. This reform prompted two types of changes that we summarize in Table 1 and we use as a natural experiment: first, the normal retirement age for women was ratcheted up in two steps from 62 to 63 years in 2001, and to 64 years in 2005. Second, it became possible to choose early retirement. The option to draw retirement benefits in one year (and later in 2 years) prior to the normal retirement age was connected with a permanent benefit discount of 3.4% for females if they retired 1 year early and of 6.8% for retiring 2 years prior to the normal retirement age. Table 1 reports the timing of the reform steps as well as the benefit reductions tied to early retirement.[1]

Table 1
Normal retirement age and early retirement options after the 1991 reform.

(a) Timing of changes

Retirement regime as of	Normal retirement age	Early retirement age (% benefit reduction)	
Before 2000	62	–	–
2001–2004	63	62 (3.4)	–
Starting 2005	64	63 (3.4)	62 (6.8)

(b) Summary of reform steps

Reform steps	
1	Starting 2001 retirement for 62 year olds at 3.4% benefit discount
2	Starting 2005 retirement for 62 year olds at 6.8% benefit discount
3	Starting 2005 retirement for 63 year olds at 3.4% benefit discount

Based on these reform steps we expect behavioral adjustments in the timing of retirement. In the framework of a standard intertemporal consumption model (compare e.g. Mitchell and Fields, 1984) individuals' maximization problem at time t is given by:

$$max_{c_s,R}\int_{s=t}^{R} e^{-\delta(s-t)}u\,(c_s,l_w)\,\pi_t(s)ds+\int_{s=R}^{T} e^{-\delta(s-t)}u\,(c_s,l_r)\,\pi_t(s)ds$$

$$\text{s.t.}\int_{s=t}^{T} e^{-r(s-t)}c_s\pi_t(s)ds=\int_{s=t}^{R} e^{-r(s-t)}y_s\pi_t(s)ds+\int_{s=R}^{T} e^{-r(s-t)}b_s(R)_s\pi_t(s)ds+A_t,$$

where R is the date of retirement. Utility u depends on the level of consumption, c_s, and the amount of leisure if the individual is working (l_w) or not (l_r). The survival probability until period s is denoted as $\pi(s)$, δ is the individual discount factor, and r is the interest rate. A_t is the net present value of assets held in period t. The labor market income received prior to retirement is denoted as y_s and $b_s(R)$ indicates the retirement benefits received from the date of retirement until death in period T. The stream of benefits depends on the date of retirement R. If benefits are a differentiable function with respect to R, the first order condition yields:

$$e^{-\delta(R-t)}[u(c_R,l_w)-u(c_R,l_r)]\pi(R)=\lambda e^{-r(R-t)}\left[(y_R-b_R(R))\pi(R)+\int_R^T e^{-r(s-R)}\frac{\partial b_R(R)}{\partial R}\pi(s)ds\right]$$

The integral on the right hand side indicates the effect of retirement date R on pension accrual.[2] The Swiss reform changed the individual budget constraint: starting 2001, $b_s(62\leq R<63)$ declined by 3.4%, while $b_s(R\geq 63)$ remained unchanged. These changes in the budget constraint imply changes in the optimal labor supply due to income and substitution effects: first, the downward shift in the budget constraint at age 62 should decrease the demand for leisure if leisure is a normal good (income effect). In addition and at the same time, the benefit adjustment upon retirement at age 62 after the reform implies that leisure becomes more expensive. Thus, also a

[1] Since 1991, individuals can delay benefit receipt for up to 5 years after the normal retirement age. This possibility was not affected by the reform discussed here. Postponing retirement increases benefits by about 5% per year for the first 5 years (BSV, 2006). Both, before and after the reform, less than 1% of female retirees use the delayed benefit option (Dorn and Sousa-Poza, 2003; BSV, 2000; BSV, 2006). A possible explanation for this limited utilization is that mandatory contributions continue to be collected (currently, 5.15% of gross earnings) during the period of benefit delay; however, these contributions usually generate no or very low additional benefit entitlements. The additional contributions paid during the period of delay thus offset the nominal increase in benefits due to the actuarial adjustment at least partly.

[2] The model implies that retirement behavior is driven by pension wealth as well as by pension accruals. We cannot distinguish between the two effects because the Swiss reform changed both at the same time. However, previous literature finds pension accruals to be the central determinant of retirement behavior (e.g. Samwick, 1998; Gruber and Wise, 2004).