# The effect of pension reforms on old-age income inequality

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## ARTICLE INFO

## ABSTRACT

Many OECD countries are raising the normal retirement age (NRA), thereby, making early retirement more costly. Whereas such reforms incentivize individuals to work longer, labor market frictions might partly undermine intended behavioral responses. Employing administrative data of West German men, I estimate a dynamic discrete choice model of work, unemployment and retirement allowing for labor market frictions. Involuntary job losses constrain individual choice sets to differing degrees along sociodemographic characteristics. A policy-simulation suggests that the behavioral response to an increase in the NRA from 65 to 67 is moderate, with an average delay of employment exits of only 0.7 years. Widespread reform effectiveness is hampered by the heterogeneous availability of jobs. Concerning the resulting pension benefits, poverty-vulnerable groups are hit hardest: Individuals with low education and blue collar employees suffer disproportionally. Old-age income inequality increases.

## 1. Introduction

Low fertility and rising life-expectancy are exerting increasing pressure on unfunded pay-as-you-go pension schemes. As a coping strategy, many states initiated reform processes that attempt to increase the normal retirement age (NRA). Among others, Canada, Denmark, Germany, Italy, Japan, and the US, are currently upward-shifting their NRAs to 67 (OECD, 2015, Chapter 1.3). These reforms imply a financial incentive to prolong the working life and postpone retirement entry. However, financial incentives are ineffective if jobs cannot be retained because of labor market constraints.

I estimate a structural model of labor supply decisions of elderly male workers in Germany and subsequently simulate the effects of shifting the NRA in different scenarios to draw conclusions about the evolution of employment outcomes and distributional effects. The model is identified by exogenous variation from a previous pension reform. To investigate the heterogeneity of the effects of a shift of the NRA, I analyze subgroups and look at changes to old-age income inequality. In contrast to other studies, special attention is given to the role of involuntary job separations. Identifying the interplay of a NRA shift and labor market constraints as a driver of old-age income inequality is one central contribution of this study.

In theory, NRA shifts imply financial incentives to postpone retirement compared to the pre-reform situation. Therefore, a rational agent reacts to an upward shift of the NRA by increasing labor supply by some extent. However, the individual will try to balance financial incentives and countervailing leisure preferences. Thus, working life cannot be expected to increase one-to-one with the change of the NRA. Furthermore, the financial incentive to postpone retirement turns out ineffective if the labor market for the elderly is rationed.

Labor market frictions are relevant in the retirement process. Household survey data shows that involuntary job losses are the cause for a significant share of the overall number of job exits in Germany. Every year about 6% of employed men aged 60 + involuntarily lose their jobs. In particular, low educated, sick and poor individuals, as well as those with low seniority, previous unemployment experience or foreign citizenship face a high risk of involuntarily losing their job.[2] These groups are poverty-vulnerable. For example, the economic revival of Germany did not benefit low-wage workers (Dustmann et al., 2014). Wage inequality in Germany is still high and has increased dramatically since the mid-1990s (Autor, 2014; Card et al., 2013). Moreover, the chances of re-employment after a job loss after turning 60 are virtually nonexis-

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[2] Own calculations using SOEP data of waves 2001–2013. Radl (2013) gives further insights into the social stratification of labor market exits in Germany.

tent in Germany.[3] If a heterogeneous risk of job loss implies a varying ability to cope with reforms to the statutory retirement age, societal imbalances might be exacerbated through pension reforms.

Yet, Germany is not an isolated case here. Male unemployment rates of more than 7% and inactivity rates of more than 40% in, for example, Portugal, Finland, France, Spain and Greece (ages 60–64 in 2017; Eurostat, 2018) are worrisome and indicative that labor demand for elderly Europeans is generally limited.[4]

I perform an *ex ante* evaluation of the shift of the NRA to age 67 that is being phased-in in Germany from 2012 to 2031. In contrast to Fehr et al. (2012), who simulate the effects of a NRA shift in Germany in a calibration study, I estimate a structural retirement model with labor market frictions to evaluate the increase in the NRA. Structural discrete choice models are particularly common in the analysis of retirement timing (see, for example, French, 2005; Haan and Prowse, 2014; Manoli et al., 2015; Rust and Phelan, 1997; Stock and Wise, 1990). Whereas Gustman and Steinmeier (2015) estimate a rich structural model to simulate a shift of the NRA to 67 in the US using survey data, I employ high quality administrative data. Therefore, I can accurately compute accrued pension rights based on full working biographies and precise earnings information. Furthermore, the timing of employment exits and retirement benefit claims can be distinguished clearly.

The empirical discrete choice model used in this paper differentiates between three labor market states: work, unemployment, and retirement. Further, the model features an external and individual risk of involuntary job loss. Upon involuntary job loss, individual choice sets are restricted to retirement and unemployment. The probability of involuntary job loss varies along socio-demographic characteristics (Burda and Mertens, 2001; Haan and Prowse, 2014). Introducing a welfare stigma parameter accounts for the fact that Unemployment insurance (UI) benefits are valued differently than other income (Moffitt, 1983). Further, I account for time-invariant unobserved heterogeneity by introducing two types of workers (Heckman and Singer, 1984). Types differ in their level of initial working disutility. This way, I account for unobservable differences in working conditions, leisure preferences, and health status. Endogenous savings allow for consumption smoothing.

As the main data source, I use the *Biographical Data of Social Insurance Agencies in Germany (BASiD)*. This data comprises the complete employment histories and pension entitlements of a random sample of the German population and is used to estimate structural parameters of retirement timing. I only use West German men to keep the sample comparable. In addition to cross-sectional variation, the data includes variation from a cohort-specific phase-in of actuarial early retirement deductions. I use the SOEP household survey as an auxiliary data source to impute a heterogeneous probability of involuntarily job loss. This probability is used within the dynamic discrete choice framework to bound the individual choice set by differing degrees.

The shift to a NRA beyond 65 has not started before the 1990s or 2000s in most countries.[5] Therefore, *ex post* evidence on the effects of the NRA is scarce. It is, at the moment, limited to the US, where the phase-in began relatively early and, as of 2017, the NRA is 66. Using survey data, Mastrobuoni (2009) finds that a 2 month increase in the NRA increases the effective retirement age by 1 month. Highly skilled individuals react the most (Behaghel and Blau, 2012), with some program substitution into disability benefits observable (Duggan et al., 2007).

Any analysis of a NRA shift quite naturally relates to the literature estimating effects of the early retirement age (ERA) on employment outcomes (for example, Atalay and Barrett, 2015; Hanel and Riphahn, 2012; Staubli and Zweimüller, 2013; Vestad, 2013). Looking at a shift

of the ERA of women from 60 to 63 in Germany, Geyer and Welteke (2017) find positive employment effects and no active substitution into UI or disability pension. However, reforms of the ERA are arguably less relevant for groups that tend to retire late. Therefore, it is unclear how the effects of a NRA of 67 compare to effects of a shift of the ERA, especially, when it comes to the heterogeneity of the results.

Moreover, my study can be contrasted with the literature on the effects of pension benefit levels and actuarial deductions. Krueger and Pischke (1992); Manoli and Weber (2016) and Puhani and Tabbert (2016) either find no or a limited responsiveness to changes in benefit levels in the US, Austria and Germany, respectively. Hanel (2010) and Engels et al. (2017) report more substantial effects of the introduction of actuarial deductions on labor supply in Germany. Yet, shifts of eligibility ages comprise more than a mere change of social security wealth and results cannot be easily extrapolated.

Additionally, my paper is related to a strand of literature that explicitly accounts for labor market rationing (Blundell et al., 1987; Chan and Stevens, 2004; Haan and Prowse, 2014; Merkurieva, 2016). Labor market risks are essential to understand the distributional aspects of a pension reform, because individuals are unequally affected by labor market constraints. In particular, low education and low income are highly correlated with the risk of involuntary job loss. So far, the analysis of distributional aspects and pension benefit inequality has received little attention in the literature on pension reforms. Linking involuntary job losses in the context of a pension reform to old-age income inequality is a contribution to the literature.

Further, I briefly touch upon the topic whether involuntarily early exits from employment can explain part of the drop of consumption at retirement ("retirement consumption puzzle") as suggested by Haider and Stephens (2007); Smith (2006) and Blau (2008).

From the estimation it shows that labor market frictions matter. Disallowing for labor market frictions, implicitly done in many other studies, changes the estimation parameters fundamentally. Therefore, I use the parameters of a model with frictions to simulate a shift of the deduction-free NRA from 65 to 67. In the main specification, my simulation suggests that the average retirement age increases by 0.6 years in response to the reform. Pension benefits decline by 2.0%. The reform has heterogeneous effects. Less educated and poor individuals are generally those who are most endangered by involuntary job loss and therefore have less possibilities to adjust their retirement timing. The frictions-caused inability to adjust retirement behavior results in increasing pension inequality. I estimate alternative scenarios varying the context of the reform: Decreasing the risk of involuntary job loss is most effective in curbing inequality and highlights how an involuntary job loss leads to a drop in consumption during retirement. Uniformly improving health has the opposite effect, inequality is increased. Raising the ERA, in addition to raising the NRA, reduces the inequality of pension benefits, but increases pre-retirement income inequality.

This paper is structured as follows: I proceed by describing the model in Section 2 and continue by discussing the data in Section 3. The model estimation and identification are discussed in Section 4, including a short explanation of the German statutory pension scheme and the reforms to it. Parameter estimates are presented in Section 5. An *ex ante* evaluation of the effects of a shift of the NRA is presented in Section 6. Special attention is paid to the fate of vulnerable groups. I conclude in Section 7.

## 2. Model

I employ a dynamic discrete choice model to estimate behavioral parameters in the retirement process. The model rationalizes individual behavior by attributing utility gains to specific decisions while accounting for the consequences for future decision possibilities and respective utility gains. The model features savings decisions and capital decumulation. The institutional framework and labor market constraints are accounted for in detail.

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[3] Own calculations using SOEP data of waves 2001–2013.

[4] Furthermore, the unemployment rate of low educated individuals (ISCED levels 0–2) typically lies 50% to 200% above the average of other educational groups.

[5] An NRA of 67 already applies in Iceland, Norway, and, for men only, in Israel.