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Decreasing fertility vs increasing longevity: Raising the retirement age in the context of ageing processes ☆

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ABSTRACT

Given the decreasing fertility and increasing longevity, in many countries the policy debate emphasizes the role of either raising the minimum eligible retirement age (MERA) or raising fertility to avoid adverse changes in the population structure. In this paper we evaluate the welfare and macroeconomic effects of increasing the retirement age for various demographic scenarios under three major pension systems (defined benefit, notionally defined contribution and funded defined contribution). We compare populations with decreasing fertility, increasing longevity and one subject to both of these changes, and show that the welfare effects of raising MERA stem mainly from longevity. We show that – for increasing longevity – raising the retirement age is universally welfare enhancing for all living and future cohorts, regardless of the pension system and fertility. Finally, we show scope for further welfare gains if productivity is relatively high at old ages.

1. Introduction

With the ageing processes of populations, the ratio between the number of retirees and those of the working cohorts increases. The deterioration of the old-age dependency ratio hazards the stability of pension systems. This problem is potentially the most acute in the pay-as-you-go defined benefit (DB) systems, which are fairly common among the advanced economies. Alternative schemes – such as the notionally defined contribution (NDC) and the funded defined contribution (FDC) – rely more directly on the actuarial fairness, which potentially limits the scope of adverse fiscal effects. On the other hand, under the DC systems increases in longevity lead to substantially reduced benefits, in which too may call for policy intervention.

Indeed, the process of ageing was present in the economic research as early as in the 1950s, see Modigliani and Ando (1957) but it is the emergence of the overlapping generations literature in the late 1980s that gave momentum to the research in the field. Late 1990s are a period when the first signs of the demographic transition became visible in the advanced economies, which resulted in an additional boost to the fast expanding field. Even simple numerical simulation studies are able to show the considerable fiscal burden emerging purely from negative demographic trends.

In the debate over the past three decades various policy options have been proposed, including for example reductions in pension benefits, increases in taxation, facilitation of immigration as well as fertility and productivity policies, see Aglietta et al. (2007), and van Sonsbeek (2010). Among the most hotly debated policy options is the raising of the minimum eligible age for retirement. Most numerical simulations show a considerable reduction in the fiscal burden as well as an increase in the received pension benefits.

However, as pointed out already by Kotlikoff and Summers (1981), numerical simulations are far from sufficient to analyse policy issues such as raising the retirement age. First, since they do not have any behavioural mechanisms, they are unable to capture the policy response in terms of labour supply and savings. Indeed, such exercises implicitly assume that a considerable policy change leads to no behavioural change, which is highly unlikely. Second, saving behaviour tends to be age-specific. Miles (1999) reviews the extensive evidence on the impact of ageing on savings and capital accumulation, concluding that the general equilibrium effects are likely to be large and need not be overlooked.[1] Third, even if fiscal and macroeconomic consequences of raising the minimum eligible retirement age were

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[1] See also Jimeno et al. (2008) for a more recent survey of different approaches used to analyse the effects of ageing on the sustainability of social security systems.

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universally positive, this increase happens at the expense of leisure, which has important intrinsic value to the agents. Research that takes no account of welfare may thus heavily mislead policy guidance.

The seminal contribution of Auerbach and Kotlikoff (1987) provides a broad and versatile framework for general equilibrium modelling with overlapping generations (OLG). The heterogeneity between cohorts helps to analyse the impact of the demographic change on the economy as well as to reliably model the effects of various pension system reforms, see Boersch-Supan and Ludwig (2013), and De Nardi et al. (1999). Indeed, comparisons of the two scenarios – the simulated status quo and an implemented or potential reform scenario – enable an assessment of both the welfare and macroeconomic effects of the pension system reforms, see e.g. Fehr (2009), and Lindbeck and Persson (2003). Since all these models necessarily rely on the concept of utility, welfare is directly conceptualized and can be easily compared between alternative scenarios, as in Breyer (1989), and Feldstein (1995).

Numerous studies apply the OLG models to analyse the overall efficiency of postponing the labour market exit. Two main approaches can be distinguished among these studies. The first strand of literature directly assesses the macroeconomic and welfare effects of the change in exogenous retirement age through comparison to the baseline scenario of no pension system reform, see Boersch-Supan and Ludwig (2010), and Vogel et al. (2012). Numerous papers also challenge the effectiveness of increasing the retirement age by estimating the effects of other reform proposals, e.g. Auerbach et al. (1989), Fehr (2000), and Hviding and Marette (1998). Indeed, Hviding and Marette (1998) compared the timing of various reforms' backlashes and conclude that an increase in the retirement age could potentially serve as the most effective of the instant relief measures to balance the public finances.

In the second group of papers, the retirement age is determined endogenously in the model. They aim to observe if the demographic change or a policy change may endogenously induce a change in behaviour leading to the sufficient postponement of the labour market exit. If the agents (households) are able to freely choose the moment of exit (in order to maximize their lifetime utility), the de iure retirement age may be evaluated and thus amended to reflect the voters' preference, see e.g. Galasso (2008), Gruber and Wise (2007), and Heijdra and Romp (2009). Thus the effects of raising the retirement age can be indirectly measured: if the optimum retirement age appears to be higher than the minimum eligibility age, postponing the labour market exit is welfare enhancing. For example, evidence provided by Galasso (2008) suggests that in the ageing societies – such as in France, Italy, the UK, and the USA – the median voter would in fact raise the minimum eligible retirement age.

A welfare assessment of postponing the labour market exit is inherently ambiguous. Reducing leisure has a direct welfare deteriorating effect. On the other hand, increasing the retirement age potentially allows for raising the old-age consumption, see Galasso (2008). In addition, alleviating the fiscal burden may lead to higher general consumption, as shown by Boersch-Supan (2013). However, the effect of prolonging the working life and reducing leisure may be suppressed by withdrawal of labour supply or within-household substitution, see Boersch-Supan and Ludwig (2013). Last but not least, as shown by Boersch-Supan (2013), lower taxation of younger generations may translate into higher productive capacity. The impact of pension reform may differ substantially between generations as well as depend on the existing regulations and behavioural responses to the policy change, as argued by Fehr (2000).

While the effects of an increase in the retirement age were mostly analysed under the DB pension system design, see Auerbach et al. (1989), Boersch-Supan and Ludwig (2013), Fenge and Pestieau (2005), Hviding and Marette (1998), Vogel et al. (2012) as well as Fehr (2000) underlined that there may be substantial differences in efficiency gains or losses from the pension reform depending on the linkage between contributions and benefits. For example, Auerbach et al. (1989) allow the adjustment to occur via lower contribution rates, which immediately negatively impacts older generations (little welfare gain from lower contributions, large welfare loss from longer working period). The effects of reforming the DC schemes remain substantially less explored, see Beetsma and Bucciol (2011).

Summarizing, the literature has usually analysed the effects of increasing the minimum eligible retirement age under a single pension system – predominantly the defined benefit one. In addition, earlier work has abstained from comparing various demographic scenarios under one policy reform regime. Thus, the term of ageing usually encompasses two different processes: increasing longevity and decreasing fertility. While the latter lowers the number of working-age individuals, the former increases the pension expenditure (under a DB system) or lowers the pension benefits substantially (under DC systems). The effects of raising the minimum eligible retirement age are thus likely to differ whether ageing is driven by deteriorating fertility or by improving life expectancy.

We aim to contribute to the literature in three major ways. First, we *compare the welfare and macroeconomic effects of raising the minimum eligibility age under three of the most popular pension schemes*: DB, NDC and FDC. The analysis of the DC systems is scarce in the literature, which is often motivated by the premises that the demographic changes are neutral in the DC systems. However, neutrality applies only to the fiscal side – indeed with longer life, the same stock of savings yields substantially lower pension benefits, necessitating an adjustment in labour supply, consumption and savings for agents experiencing decreases in mortality risk. We attempt to fill this gap by using a model carefully calibrated to the case of Poland – a country that introduced a change from a DB system to a combination of NDC and FDC systems. Moreover, Poland is experiencing one of the fastest ageing processes in Europe.

Second, we separate the *role of decreasing fertility and increasing longevity in analysing the effects of raising the retirement age*. To this end we develop three demographic scenarios. In the first scenario we closely follow the demographic projection for Poland (as provided by the European Commission). This scenario comprises both decreasing fertility and increasing longevity relative to the initial steady state. In addition, we analyse a case where stable fertility is accompanied by a gradual increase in longevity and an opposite case i.e. unchanged longevity accompanied by a decreasing fertility. In the fertility scenario individuals are mostly subject to indirect general equilibrium effects as smaller young population along the transition affects the macro environment. In the longevity scenario, demography directly affects individual decisions: consumers need to adjust lifetime paths of labour, leisure and consumption in response to increased longevity. Clearly, the adjustment in individual decisions may also imply general equilibrium effects.

Third, we *provide a precise analysis of the labour market effects*. Although various studies assume exogenous labour supply,[2] labour supply adjustments will occur following the pension system reforms.[3] In fact, the analysis of the labour supply response is far from trivial and hinges significantly upon the choice of the utility function. Typically, the literature differentiates between intensive (hours) and extensive (years) margins. Starting from Auerbach and Kotlikoff (1987), the CES utility function is often assumed. In the OLG framework however, this otherwise useful form has some adverse consequences. Namely, the adjustment after the increasing retirement age is influenced by the wealth effect, which makes it impossible to precisely distinguish

[2] For example Fougere and Merette (1999), Galasso (2008), Heijdra and Romp (2009), Hviding and Marette (1998).

[3] See: Bassi (2008), Boersch-Supan and Ludwig (2013), Boersch-Supan et al. (2006), Ludwig (2005), Ludwig et al. (2007).

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