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Coping with the Life Expectancy Gap: Amending the Retirement Age to Restore Actuarial Neutrality Across Generations

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Understanding the relationship between period and cohort life expectancy measures, quantifying the size of the gradient and how it evolves over time are critical issues for demographic analysis and its impact in pension design and reforms. In recent decades most OECD countries have responded to continuous growth in life expectancy with pension reforms in which a common denominator is to create an automatic link of future pensions to changes in life expectancy. In almost all cases and countries, period and not cohort life expectancy measures have been used to link longevity and pension benefits, which results in i) underestimating remaining lifetime at retirement, ii) incorrectly signalling solvency and delaying pension reforms, iii) in sizable implicit subsidy rates between current and future generations, and in iv) an unfair actuarial link between contributions and benefits, which distorts labor supply and saving decisions. In this paper we provide detailed estimates of the life expectancy gap (Ayuso, Bravo and Holzmann, 2019; Bravo et al., 2020) at adult ages for 42 homogeneous national populations (countries or areas), disaggregated by sex, from 1960 to 2050. The life expectancy gap estimates are then used to quantify the size of the underfunded pension liabilities attributed to the adoption of an inappropriate remaining lifetime measure in pension policy. We then adopt an intergenerational actuarial fairness and neutrality principle to pension design and pension reform and provide detailed estimates of the retirement age adjustments required to restore the pension system's solvency, neutrality and actuarial fairness. Linking the statutory retirement age to life expectancy is one of the most obvious automatic mechanisms to tighten the link between longevity improvements and

pension benefits. The adjustment in the retirement age implies an equivalent increase in the contribution period if the labor market entry age is maintained. Depending on the policy design, the retirement age amendments may be different and increase the value of accumulated pension entitlements. In DC schemes this works in favour of increasing the supply of labour. It also performs a similar function in DB schemes depending on if the accrual rate remains unchanged and the policy objective is to maintain a constant replacement rate. In addition, in DC pension schemes the direct use of life expectancy projections in the computation of the benefit creates an "automatic" ceteris paribus adjustment of benefits to increasing life expectancy, and similar mechanisms have in some country cases been integrated into national DB public pension schemes. In this paper the feasibility and policy implications of the different alternative designs are examined and discussed. Raising the effective retirement age cannot be achieved unless early retirement incentives are reduced and health, education and labour market (both supply and demand) policies are implemented to keep workers fit, qualified and motivated to prolong their working lives. We discuss the adequacy implications of these pension reforms and their redistributive consequences given differential mortality by socioeconomic group. The proposed study builds on our previous work on mortality for projecting life expectancy. To forecast mortality rates and life expectancies we propose a new approach based on a Bayesian Model Ensemble (BME) of six well known single population Generalised Age-Period-Cohort (GAPC) stochastic mortality models, all of which probabilistically contribute towards projecting future period and cohort life expectancy measures and the life expectancy gap. Ensemble learning methods train several baseline models and use rules to combine them together to make predictions, constituting an innovative statistical approach to inference in the presence of multiple competing models. This approach offers an additional advantage in the sense that it reduces the inherent uncertainty in the choice of the appropriate projection model (model risk) and it accounts for more sources of risk. The historical mortality and population data are obtained from the Human Mortality Database (2020).

References used as starting point:

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