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Demographic Uncertainty in Europe

Implications on macro economic trends and pension reforms

An investigation with the INGENUE2 model

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NON-TECHNICAL SUMMARY

The worldwide overlapping generation model INGENUE2 has been designed to investigate the economic consequences of ageing. A benchmark scenario has been built as a basis of various simulations aiming at exploring alternative assumptions regarding structural changes. Particular attention has been devoted to Western Europe where ageing will make it difficult to preserve retirement benefits in public pensions resting on constant replacement ratios. However all investigations before the present study were performed under deterministic assumptions regarding fertility and mortality rates that shape the evolution of the age group structure and the size of population in the ten regions of the world identified in the model.

Nonetheless substantial uncertainty impacts population forecasts. In Western Europe alone, they have been revised upward significantly both by the UN and by Eurostat since the mid-1990's. Studies dedicated to providing insight on the interplay between demography and economy in the long run cannot ignore uncertainty in demographic projections. Uncertainty is best dealt with in using stochastic population paths drawn from confidence intervals in fertility and mortality rates established by demographers. In the first part of the paper we estimate the range of likely variation in total population of Western Europe until 2050 with 80% probability.

In the second part, we run simulations with INGENUE2 to figure out the impact of demographic uncertainty on the world economy. We present the results for Western Europe. The main finding is that uncertainty in the growth rate is due to variations in the size of the working age population: errors in forecasting fertility rates from the early decade of the century show up in the potential labour force from 2025 onwards. In 2050 the growth rate is within a confidence interval between 0.3 and 1.1% at 90% probability. Such a range in growth rates has significant bearing for saving and wealth accumulation. It should not be ignored in shaping pension policies.

The third part of the paper addresses the consequences on pension reform of making allowance for demographic uncertainty. It is well-known that benefit-preserving of public pension in an environment of low growth would be very costly in rising contribution rates until the mid-century. In the worst occurrence of the lowest likely growth it might become unbearable. It is wise to prepare to such occurrence in the next two decades in providing incentive to save more and institutions to diversify financial wealth worldwide. We study the economic consequences of one such policy defined as a compulsory funded system designed to substitute to pension contribution increases.