Welfare and Generational Equity in Sustainable Unfunded Pension Systems

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Introduction

Actual and projected population aging threatens the financial viability of Pay-As-You-Go (PAYGO) pension programs in many countries. These programs promise a level of benefits that cannot be sustained given current tax rates, so deep structural reforms are expected and in some countries have already occurred. A new kind of pension program, called Notional Defined Contribution or Non-financial Defined Contribution (NDC), is intended to address fiscal stability. Sweden has developed and implemented an NDC system and some other countries have followed suit. Germany also has recently adopted pension reforms that reflect some of the NDC principles.

NDC plans are intended to mimic the structure and incentives of Defined Contribution plans in that individuals contribute to their own accounts which yield a specified rate of return and are converted into annuities yielding a specified rate of return at an age chosen by the individual but above some stated minimum age. The specified rate of return earned by the accounts and paid by the annuity is in principle linked to the growth rate of total wages, which is the sustainable rate of return in a steady state PAYGO system. The terms of the annuity reflect current mortality conditions, so effectively benefits are indexed to life expectancy. These provisions should make NDC systems fiscally sustainable. Because these NDC systems are PAYGO and do not hold significant assets, they are easier to implement than funded systems since the painful transitional costs, which can total one, two or three years worth of GDP, do not have to be borne.

Many actual NDC programs, including Sweden’s, set the rate of return equal to the growth rate of the wage rate rather than the growth rate of total wages, so that it does not reflect the growth rate of the labor force which in many countries is expected to be negative. Demographic change and decline will lead such programs into fiscal problems, so they include additional mechanisms to achieve fiscal sustainability.

The costs of different reform plans will have different consequences for generations during the transition to the new system, resulting from the interaction of the reform plan with the particular initial demographic conditions of each country such as the baby boom and bust in the United States. In this paper, our goal is not to analyze generational risk sharing during this specific transitional period for any particular country. Rather we analyze the generational uncertainty and risk sharing in a more
general context of economic and demographic uncertainty, with the goal of finding more general properties of the pension systems that do not result from some particular demographic circumstances.

Any pension plan must operate in an environment of demographic and economic uncertainty. Fiscally sustainable plans must make adjustments in light of this changing environment. Different plans will make different adjustments, leading to differences in the way that risks are shared among generations. These differences will influence the level of uncertainty faced by a typical generation, and also affect the extent to which welfare varies across generations. This paper modifies a stochastic forecasting model (Lee and Tuljapurkar, 1998, and Lee et al., 2003) to investigate both these consequences of plan structure. An earlier paper (Auerbach and Lee, 2009) used the same setup to investigate the fiscal stability and sustainability of different PAYGO pension plans, and we will build on those results. Here we restrict our attention to plans that are fiscally sustainable.

We consider a number of actual and hypothetical PAYGO pension structures, including: (1) versions of the US Social Security system in which taxes, benefits, or taxes and benefits are adjusted annually to maintain fiscal balance with zero debt or assets in every period; (2) the actual Swedish NDC system, together with several modifications of it developed in our earlier paper; and (3) the actual reformed German system, which also is adjusted to maintain fiscal balance in each period. For each sustainable system, we consider first some descriptive measures of uncertainty in outcomes for generations. We then estimate expected utility measures based on simplifying assumptions, and incorporate these expected utility calculations in an overall measure of social welfare.

Conclusions

The NDC systems aim to pay a rate of return to contributors that is warranted by the macroeconomic/demographic environment. However, Sweden, in setting up its system, chose to make that rate of return equal the rate of wage growth, rather than the growth rate of the total wage bill, which is the rate payable in steady state. Because they also included a brake mechanism in their system design, if labor force growth should drop below 0 then the brake would eventually automatically reduce the rate of return
below the growth rate of wages. Our analysis shows that this program design insulates participating generations from variations in the economic/demographic environment. An asymmetric brake, which reduces the rate of return in some circumstances but never raises it, apparently plays a key role. This arrangement permits the system to accumulate undistributed assets and therefore makes it yield a lower mean net present value and internal rate of return compared to hypothetical versions of the Swedish system that increase benefit accumulation when fund surpluses develop. But, by accumulating more assets, it avoids having to apply the brake and thereby leaves the rate of return more stable along a trajectory. This makes the Swedish system look relatively better when risk aversion is explicitly included in the calculation of expected utility, but the net benefit appears smaller once the welfare of initial transition generations is taken into account, for these are the generations that bear the brunt of the Swedish system’s buffer stock accumulation.

Among other plans, the apparent advantage over other variants of the US system of a version in which benefits are adjusted annually to maintain cash-flow balance disappears when transition generations are taken into account, and one finds that the system in which benefits and taxes bear equal shares of the adjustment performs up to the standards of NDC systems based on the Swedish plan, all systems that distribute annual shocks among both workers and retirees. The German system resembles this US system of tax and benefit adjustment in many respects but its performance suggests that it places a higher relative burden of risk bearing on workers and spreads risk somewhat less efficiently. Among the NDC plans based on the Swedish system, there is relatively little difference apparent until transition generations are taken into account, at which point the systems based on wage rate growth look somewhat better than the inherently more stable systems that depend on the growth of total wages. This suggests that shifting more of fiscal adjustment to the brake mechanisms may also improve risk spreading.

Our results suggest, then, that spreading risk widely among generations improves welfare, and that the policy of reducing risk through asset accumulation, as the actual Swedish system does, offers a less attractive approach unless one places very high weight on horizontal equity, i.e., on maintaining a very smooth pattern of net benefits from one cohort to the next.
References


