

# Population ageing and pay-as-you-go pensions

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## Documents reviewed

- *Joint report by the Commission and the Council on adequate and sustainable pensions.* (Brussels: Council of the European Union, 2003, 6527/2/03 REV 2)
- *The 2003 aging vulnerability index: An assessment of the capacity of twelve developed countries to meet the aging challenge.* By R. Jackson and N. Howe (Washington, D.C.: Center for Strategic and International Studies and Watson Wyatt Worldwide, 2003)
- *Germany and the challenge of global aging.* By R. Jackson (Washington, D.C.: Center for Strategic and International Studies and Nationwide Global, 2003)
- *Achieving financial sustainability for the social security systems. Report by the commission. Rürup Commission* (Berlin: Federal Ministry of Health and Social Security, 2003). English summary of Rürup-Kommission, Die Nachhaltigkeit in der Finanzierung der Sozialen Sicherungssysteme.
- *Assessing the political sustainability of parametric social security reforms: The case of Italy.* By M. D'Amato and V. Galasso (London: Centre for Economic Policy Research, Discussion Paper No. 3439, 2002)
- *Population ageing and public finance targets.* By H. Oksanen (Brussels: European Commission, Directorate-General for Economic and Financial Affairs, Economic Papers No. 196, 2003)
- *Ageing and pensions in the euro area: Survey and projection results.* By P.C. Rother, M. Catenaro and G. Schwab (Brussels: ENEPRI Conference on Ageing and Welfare Systems, January 2003)

Europeans are living longer and having fewer children. The population aged 65 years and older is expected to increase by 40 million over the next 50 years while the working-age population (those aged 15 to 64 years) falls by 100 million, sending the support ratio –the number of persons of working age per elderly person– from its current level of 4:1 to 2:1 by the year 2050<sup>1</sup> (see Table 1 at the end of this essay). With fewer workers available to support each pensioner, a crisis is looming for pay-as-you-go (PAYG) public pensions. The crisis is one of distribution, however, not of output. No one is predicting a fall in gross domestic product (GDP), much less in GDP per capita. The European Commission expects productivity gains and increased female participation to more than offset the effects of a reduced working-age population, allowing GDP to increase by 1.4% per annum even in slow-growing Italy and Germany (see the first column of Table 1).

## Private and Public Pensions

All pension systems –PAYG or pre-funded, public or private, compulsory or voluntary– transfer output of today's workers to today's retirees (Barr, 2000). Indeed, that is their purpose. Contributors to a public PAYG system receive promises from government that future earmarked taxes (compulsory contributions) will provide them with goods and services in their old age. When there is not enough tax revenue to meet pension promises, a distributional crisis can result. Contributors to a pre-funded pension system also obtain a claim on future output, but in a different way: they accumulate financial assets (bonds and equity), which are later

sold to younger workers. If the supply of financial assets on the market is high, due to large numbers of retirees who want to sell, and the demand for them is low, their price can fall, lowering the market value of the pension fund. Unless financial risk is borne by contributors (defined contribution), a crisis can erupt, despite pre-funding, when revenue from sales of bonds and equity is less than required to meet pension promises.

Governments become involved in the old age pension business for two distinct reasons. First, they would like to eliminate poverty among the elderly by assuring all residents a minimum income once they attain a specified age, regardless of their

work history. Some argue that the responsibility of government stops here. Dr. Michael Cullen, New Zealand's Deputy Prime Minister and Minister of Finance, articulated such a view when he said "the ability to retire in a degree of personal comfort, without worry and with dignity, is the least that citizens can expect in a modern, developed economy.... [I]t is also most they can expect. They cannot expect the state to maintain in retirement the incomes people became accustomed to during their working lives" (Speech of 13 June 2003, quoted in O'Connell, 2004). New Zealand's public pension is wage-indexed, non-contributory, financed from general revenue, and given to everyone aged 65 and older who satisfies a modest residency requirement. It is not employment-tested, means-tested or retirement-tested, but it is taxable as income, so a larger portion is 'clawed back' from those who continue to work or have other income. (See St. John and Willmore, 2001 and O'Connell, 2004.) In the European Union, all governments offer means-tested assistance and minimum pensions to lift elderly citizens out of poverty, but only Ireland limits its *contributory* pension to a modest benefit based solely on years of contributions, not income.

The second reason governments become involved in the pension business is to insure that citizens, in retirement, are able to maintain the standard of living to which they have been accustomed during their working lives. In pursuit of this goal, 14 members of the European Union (Ireland being the exception) require all workers to contribute to earnings-related pension schemes. Sometimes this is in addition to a contributory or non-contributory basic pension. For the most part, these income-related schemes are public and operate on a pay-as-you-go (PAYG) basis. Each of the seven studies reviewed here analyses, or claims to analyse, this type of system, so it is helpful to set out the basics using simple algebra.

## The Analytics of Pay-as-You-Go Pensions

In a balanced PAYG system, expenditure in each period equals revenue such that

$$pR = swL \quad (1)$$

where  $p$  = the average pension and  $R$  = the number of pensioners. Expenditure on pensions,  $pR$ , is financed by a proportional contribution  $s$  (percentage rate 100s) on covered wages. Typically there is a wage ceiling above which no contribution is collected, and a maximum pension is associated with it. If  $L$  workers participate in the scheme, and their average covered wage is  $w$ , then  $swL$  is the revenue collected.

Equation (1) can be re-written to show that the rate of contribution ( $s$ ) must equal  $p/w$ , the replacement ratio, divided by  $L/R$ , the support ratio:

$$s = (p/w)/(L/R) \quad (2)$$

With a constant replacement ratio and a constant support ratio, the proportional contribution is also constant. Pensioners share increases in worker productivity, for wages typically track productivity and the replacement ratio refers to current wages, not past wages. In other words, pensions are indexed to wages. If the support ratio is 4 workers per retiree, and an average pension is equal to 60% of the average wage, then workers must contribute 15% of their wages ( $60/4$ ) to the PAYG scheme.<sup>2</sup> Often the contribution rate ( $s$ ) is known as a payroll tax. In a contributory, earnings-related PAYG pension scheme, it is better to think of it as a contribution rather than as a tax, for reasons that will soon become clear.

When  $L/R$  changes, the PAYG system breaks down; expenditure is no longer equal to revenue. Suppose that population ageing causes the support ratio to fall by half. To balance revenue with expenditure, either contributions ( $s$ ) must double to 30% or the

replacement ratio ( $p/w$ ) must be cut by half, to 30%. Either change—or some combination— will restore *financial* solvency to the system. But what is the ethically preferred course of action?

In the case of a flat, basic pension, financed from general revenue, the answer is clear: maintain the gross value of the pension as a percentage of the average gross wage. Provided pensions are universal and taxable as income, as in New Zealand, the demographic shock affects pensioners as well as workers, the latter more than the former to the extent that the tax system is progressive and workers have higher incomes than pensioners. If basic pensions are means-tested and not taxable as income, they will have to be indexed to average wages net of taxes rather than the gross wages, so that recipients of basic pensions retain the same standard of living relative to that of an average worker.

In the case of an earnings- (contribution-) related pension, if we view contributions as saving rather than taxes the answer is equally clear, but precisely opposite: restore financial solvency by cutting benefits rather than mandating higher contributions from current workers. Contributions to PAYG pension schemes are sometimes referred to

as taxes; if so, they are taxes unlike any other, for they are returned with interest in old age. Contributions resemble the purchase of bonds, for the promised pensions are implicit debt of government, just as bonds are explicit debt. There are two important differences, however, between implicit pension debt and explicit public debt. First, pension contributions are mandated whereas purchase of government bonds is voluntary. Second, pension rights cannot be transferred or sold, whereas bonds are freely traded.

Early participants in a PAYG pension system receive a gift, for they obtain full pensions even though they contribute only briefly at the end of their working careers. Later participants receive windfall gains as well with each increase in the contribution rate. In a mature system, with a constant contribution rate, the Samuelson-Aaron rule (Samuelson, 1958; Aaron, 1966) states that the real return on contributions for the average participant in a balanced PAYG scheme will equal the sum of the rate of growth of the labour force plus the rate of growth of real wages (productivity). This rule assumes a constant contribution rate ( $s$ ), but does *not* require a constant support ratio ( $L/R$ ) provided the replacement rate ( $p/w$ ) is allowed to vary.

To illustrate the Samuelson-Aaron logic, consider a simple model in which citizens spend one period of time working and a second period retired. (We ignore time spent in childhood.) For realism, think of each period as being 30 years in length. Let the number of workers at time  $t$  be  $L_t$  and their average wage be  $w_t$ . The number of workers grows according to  $L_{t+1} = (1+n)L_t$  and the average wage grows according to  $w_{t+1} = (1+g)w_t$ . The total pension benefit that this generation will receive when it retires,  $P_{t+1}$ , is equal to the total contribution to be paid by the next generation:  $P_{t+1} = S_{t+1} = sw_{t+1}L_{t+1}$ . The ratio of pensions received by retirees to the contributions these retirees paid while working is  $P_{t+1}/S_t = S_{t+1}/S_t = sw_{t+1}L_{t+1}/sw_tL_t = (1+g)(1+n)$ , which implies a return of approximately  $n+g$ . The Samuelson-Aaron rule assumes that the contribution rate,  $s$ , is constant. If the rate doubles, say from 10% to 20% of covered wages, then  $P_{t+1}/S_t = 2(1+g)(1+n)$  and current retirees (who contributed at the lower rate) receive as pension twice the amount they contributed plus an additional return of approximately  $2(n+g)$ . A return in excess of 100% seems large, but recall that each period is about 30 years long, and a 100% return over 30 years is equivalent to an annual return of only 2.3%.

The share of wages in GDP changes only slowly, so the rate of growth of GDP –not GDP per capita, but GDP– is a useful proxy for the return on contributions in a mature PAYG pension scheme. So long as GDP is rising, contributors to a PAYG system can receive positive return with no increase in contribution rates, regardless of what happens to the ratio of workers to retirees. GDP projections of the European Commission for the next 50 years suggest that real returns would range from 1.4% in Germany and Italy to 4% in Luxembourg. (See Table 1 once again.) This is the outcome if the contribution rate is held constant and all adjustment is done by lowering the replacement ratio ( $p/w$ ), in part by increasing the age at which full pension benefits become payable, and making full actuarial adjustment for earlier pensions. Individual participants have the option of higher income in retirement by postponing retirement, saving privately, or contributing to a private pension plan.

Whether this outcome is perceived as fair depends on whether mandated contributions are regarded as taxes or as forced saving. Framing is important. Each of the studies reviewed here advocates a freeze on payroll taxation (contributions). Nonetheless, each frames the issue as one of taxes and transfers rather than return on retirement saving. It is for this reason the arguments are less than compelling, even though the policy advice is sound.

## Europe's Pension Crisis

The **Joint report by the Commission and the Council on adequate and sustainable pensions** draws on earlier work of the Economic Policy Committee (2001). It is the longest (175 pages), the most complete, and by far the most balanced of the seven studies under review. Especially useful are the concise country summaries in the annex (pp. 106-175). The Report expresses concern that “public spending on pensions is likely to rise by between 3 and 5 percentage points of GDP in most EU Member States between

2000 and 2050” (p. 6). The report looks with favour on containment of this spending, noting that the relatively small increases projected for Italy and Sweden “can largely be attributed to the switch to new contribution-defined pension schemes with close actuarial links between contributions and entitlements and a benefit formula which takes account of life expectancy at the age of retirement” (p. 62).

The Report frames the problem as fiscal, as a matter of taxes and transfers, thus misses an opportunity to explain that notional defined-contribution systems run on a PAYG basis, yet are able to mimic pre-funded systems with individual, notional accounts and a notional rate of interest. It praises Sweden and Italy for having “changed their public pension systems to notional defined-contribution systems, with the aim of stabilising contribution rates across generations and incorporating better incentives to work, thus contributing also to meet the objective of higher employment rates” (p. 7). This is praise of tax-smoothing rather than intergenerational equity. Support for constant contribution rates across generations would be strengthened if it were pointed out also that in the wake of a demographic shock this produces a much more equal return on contributions compared to stabilization of the replacement ratio.

Because the Report focuses on taxes and transfers rather than return on contributions, it counts as “pension expenditure” most replacement incomes provided by government to persons aged 55 years and over. This amounts to “the sum of seven different categories of benefits: disability pension, early-retirement benefit due to reduced capacity to work, old-age pension, anticipated old-age pension, partial pension, survivors’ pension and early retirement benefit for labour market reasons” (p. 108). Many of these benefits are non-contributory and, indeed, are given to individuals younger than minimum retirement age, so it is difficult to see how they might be related

to reform of the PAYG pension system. The generosity of what, in effect, are early retirement benefits disguised as unemployment or disability pensions are the reason that workers in many countries are able to exit the labour force at a young age.

**The 2003 aging vulnerability index** presents an alternative, more alarmist view of the future. Jackson and Howe employ projections for the years 2000 to 2040 to construct an ‘Ageing Vulnerability Index’ for 12 countries, eight of which are members of the EU.<sup>3</sup> They start from the premise that the “rising old-age dependency ratio will translate into a sharply rising cost rate for pay-as-you-go retirement programs — and a heavy burden on the budget, on the economy, and on working-age adults” (p. iii). But their projected costs include much more than PAYG public pensions. In fact, they include nearly all public expenditure on those aged 60 years or more, including expenditure on civil service pensions and health benefits. With such a broad definition, they are able to calculate that the cost of “pay-as-you-go retirement programs” in the eight European countries they study will increase on average from 14% of GDP in the year 2000 to 26% in the year 2040. **The Joint report by the Commission and the Council**, even though it uses a broad definition of pension expenditure, projects a much smaller rise in expenditure, from 10% to 13% of GDP, for these same eight countries over the same period of time.

Jackson and Howe calculate the Ageing Vulnerability Index from country scores on eleven indicators. Six of the eleven indicators consist of public expenditure on the elderly in various guises (percentage of GDP in 2040, growth to 2040, percentage of income of the young in 2040, percentage of income of the elderly in 2040, percentage of total government expenditure in 2040, and percentage of elderly that would be pushed into poverty by a ten percent cut in this expenditure). Two indicators relate to fiscal policy and two to the relative affluence of the elderly. A final indicator refers to living

arrangements (percentage of elderly who live with their adult children), on grounds that close ties between the elderly and their children make it easier to reduce public spending on the elderly. Curiously, neither old age dependency ratios nor PAYG contributory pensions are components of this index. Contributory pensions are included in total public expenditure on the elderly, but this expenditure is swamped by other types of government expenditure. Also missing are numbers for projected GDP and GDP per capita. Positive income growth seems to underlie the projections, but it would help to know its magnitude and variation across time and countries.

On the basis of this Index, the authors rank the twelve countries from least to most vulnerable. Three countries score as low vulnerability, six as medium and three as high. The only European country in the study to register ‘low vulnerability’ is the United Kingdom, which ranks between two Anglo-Saxon countries, Australia and the United States. Four European countries (Sweden, Germany, Netherlands and Belgium) register medium vulnerability while three (France, Italy, and Spain) register high vulnerability.

**The 2003 aging vulnerability index** attempts to measure sustainability of current policies, but it is very difficult to project expenditure other than pension promises into the future. This is especially true for expenditure on health benefits, which are a large and growing portion of expenditure on the elderly in the forecast period, reaching a third or more of total expenditure in most countries by 2040 (Ageing Vulnerability Index, 2003, Table 2, p. 34.). It is difficult to know with any confidence how much government might spend on health care forty years in the future, much less how it might allocate this expenditure between the elderly and the non-elderly population. Technological change, such as the possibility of transplanting organs of genetically modified pigs into humans, may make increased expenditure on elderly

patients feasible, but this does not mean that all desired surgery will be financed by government. What evidence there is to date suggests that population ageing in itself currently has little effect on health care expenditure because expenditures tend to be concentrated at the end of life, regardless of the age of death of an individual (Economic Policy Committee, 2001, pp. 38-39). Indeed, for reasons that are not entirely clear (perhaps because of age discrimination), hospitalisation costs tend to peak at 80 years of age, such that expenditure per capita on the oldest old is less than expenditure on the younger old (Seshamani and Gray, 2004).

Jackson and Howe (p. 2) claim that the Ageing Vulnerability Index “clearly shows that global aging is pushing much of the developed world toward fiscal and economic meltdown. There is still time to avert crisis. But time is running short, and the problem is worse than is generally supposed.” This may be true, but their Index is unlikely to convince careful readers.

**Germany and the challenge of global aging** provides a detailed look at Germany, making use of projections that underlie **The 2003 Aging Vulnerability Index**. The author, R. Jackson, views contributions to PAYG pensions as taxes rather than saving, asserting (p. 8) that “payroll taxes, the main means of financing pensions and health-care benefits, already total 41 percent of workers’ wages in Germany”. Somewhat later (pp. 10-11) we learn that this is not entirely true. “The payroll tax—19.1 percent in 2002, split evenly between employers and employees—covers just under three-quarters of total costs [of public pensions]. .... If benefits were financed entirely by payroll taxes, the contribution rate would have to rise to 27 percent.” This is still far from 41%. To get that figure, it is necessary to add in a 14% contribution that funds, for all ages, “the entire range of medical expenses, from dentistry to prescription drugs”. Moreover, retirees who want health care benefits have to contribute, albeit at a lower, 7% rate, while the self-employed and those with high

earnings have the option of opting out and purchasing private insurance instead. It is fair to conclude, then, that the 41% figure is unnecessarily alarmist.

On a positive note, **Germany and the challenge of global aging** does a superb job describing how government incentives are responsible for the fall in average age of retirement from 65 to 60 years in the past three decades. “Germany, like many European countries, has tried to create jobs for younger workers by bribing older workers to retire. The experiment has been a failure. Germany now has one of Europe’s earliest retirement ages and one of its lowest rates of job growth” (p. 22).

Jackson’s recommendations are somewhat vague, expressed as “larger reductions in pay-as-you-go benefits and providing for a more certain and secure funded alternatives” (p. 26), but he clearly favours replacing at least part of PAYG pensions with private pensions. Financial rates of return may not be attractive in an ageing, slow-growing Germany of the future, but “workers can continue to earn higher returns by investing in faster growing economies around the world” (p. 25). There are various obstacles to this investment strategy, “including the lack of transparency and security in the capital markets of many developing countries. Much progress will have to be made before retirees in Berlin will be able to entrust their golden years to investments in Beijing” (p. 25). Indeed.

The “Commission for Sustainability in Financing the German Social Insurance Systems”, known popularly as the Rürup Commission after its chairman Bert Rürup, was set up by the German government in November of 2002 and published its report, **Achieving financial sustainability for the social security systems**, in August of 2003. In the commission’s view, payroll taxes must be kept below 22% “to ensure that the rising costs of social security in an ageing society are spread more evenly across all generations” (p. 3). This requires a decrease

in the generosity of pensions, beyond that implemented in major reforms of 1992 and 2001, to be accomplished primarily by increasing the normal retirement age and by modifying the pension benefit indexation formula.<sup>4</sup>

The commission recommends a gradual increase in the statutory retirement age from 65 to 67 years, to be introduced in monthly steps over 24 years, beginning in 2011. Life expectancy at age 65 is projected to increase by three years (to 18.4 years for men and 22.6 years for women), so this measure would offset only two-thirds of the increased pension costs anticipated from longer life expectancy. The commission also proposes that the minimum retirement age be increased from 62 to 64 years, in tandem with the statutory retirement age. Workers will still have every incentive to take early retirement, for the commission was not able to propose an increase in the actuarial adjustment for early pensions, currently set at a low 0.3% per month (3.6% per year). With an actuarially fair adjustment, the age at which participants choose to retire would have no effect on costs to the system, but neutrality requires a rate roughly twice as high as that currently in effect.

The second major reform proposed by the commission is the introduction of a “sustainability factor” that links pension benefits to the system dependency ratio. The sustainability factor is automatic: “it raises pensions whenever the employment level rises and lowers them whenever the number of benefit recipients is growing faster than the number of contribution payers” (p. 8). The sustainability factor is based not just on demography—changes in life expectancy, birth rates and immigration—but also on labour market developments. The commission wisely allows for the possibility that increased labour force participation might offset the inevitable increased numbers of elderly and reduction in the working-age population.

In the German pension system, benefits are

strictly work-related, with little redistribution within cohorts. The Rürup Commission rejects calls for more intra-cohort redistribution, such as a larger minimum pension or reduction of benefits for higher-income earners and, with its proposed sustainability factor, would bring the German system close to the notional defined benefit systems of Sweden and Italy. Yet the commission makes no mention of moving to a defined contribution system, preferring to frame its proposals within the existing defined benefit paradigm, thus focusing on taxes and transfers rather than the rate of return on contributions. For this reviewer, with no knowledge of German politics, this seems unfortunate, as it might have been possible to address the fact that payroll taxes finance only three-quarters of the cost of pensions, providing pensioners with an excessively high return on contributions.

The commission also rejects calls to bring civil servants into the contributory scheme, for two reasons: “firstly, the right of civil servants to a non-contributory pension is enshrined in the German Constitution and, secondly, civil servants’ pensions are already financed within the pay-as-you-go system (i.e. out of general taxation)” (p. 10). Actually, civil service pensions, because they are not based on contributions, are best described as deferred wages. Civil servants accept a lower current wage in exchange for the promise of a pension in their old age. If this pension were contributory, they would insist on a higher wage and government would have to either increase taxes or borrow (issue debt) to pay it. The real cost of civil servants is thus much higher than recorded under the current system of cash accounting. A good reform would be to move to a system of accrual accounting, setting up at least a notional fund to pay these deferred wages, but the commission did not touch this subject. The commission was right, however, to treat civil service pensions separately, something authors of *The 2003 Aging Vulnerability Index* failed to do.

In Italy, the Dini reforms of 1995 seek to reverse the upward trend in pension spending by moving to a notional defined-contribution system and by reducing the incentives for early retirement. The reformed system appears to be *economically* sustainable, but D'Amato and Galasso, in **Assessing the political sustainability of parametric social security reforms**, insist that it is not *politically* sustainable because “despite the defined-contribution formula – the generosity of the system may still be easily changed by modifying the conversion coefficients. These coefficients transform – at retirement – the capitalized contribution into a pension annuity. The Dini reform – and thus its supporting majority – has set these coefficients according to actuarial principles as a function of the expected residual life at retirement. Current regulations allow these conversion coefficients to be reexamined every 10 years to take into account changes in longevity gains. These regulations – we argue – can not however prevent future majority from modifying these coefficients towards more generous pensions, as the population ages. Under budget balancing, this increase in the generosity of the system amounts to choosing a higher tax rate” (pp. 28-29). If young workers rebel against tax increases imposed by an elderly majority, the system may well break down.

D'Amato and Galasso assume, in effect, that PAYG pension systems remain tax and transfer mechanisms, despite attempts to frame them in terms of notional rates of return. In their model, the size of the system depends on majority voting, hence on preferences of the median voter. Retirement age is exogenous. In 1992 the age of the median voter in Italy was 44 years, the median retirement age was 57 and life expectancy was 78 years. A 44 year-old voter would have expected to contribute to the system for 13 years and receive pension benefits for 21 years, and would set the optimal tax rate accordingly, from a purely private, selfish point of view. In 2050, the median age of voters is expected to be 57

years, with a life expectancy of 83 years. If the retirement age is 65 years, the median voter would pay contributions for only 8 years, and receive benefits for 18 years. “In this case, our simulations suggest that the social security tax rate would reach 46.8%” (p. 13). And, if the retirement age is 57, would the model not predict a payroll tax rate of 100%? After all, a majority of voters would be retired, and could vote to transfer all income to themselves!

This “intergenerational voting game” raises interesting issues but is not a good predictor of the outcome of a notional defined-contribution system, for two reasons. First, if the pessimistic forecast of D'Amato and Galasso were feasible, it would be in everyone's interest to assure political sustainability of the system by making a rule that changes in the conversion coefficients are to apply only to new pensions, not to existing pensions, so that retirees would have no interest in increasing the generosity of the system. Second, voting behaviour is seldom so selfish and calculating. After all, young workers who pay payroll taxes are the children and grandchildren of pensioners.

H. Oksanen proposes in **Population ageing and public finance targets** that PAYG pension benefits be financed with “a gradually increasing tax rate so that intergenerational fairness is fulfilled, at least approximately” (p. 4). Since “the increase in public expenditure is mostly caused by declined fertility and increasing longevity and ... successive age cohorts differ from each other in these respects, it can be argued that these factors should be taken into account in setting the tax rate for each generation” (p. 11). The revenue from higher payroll taxes would be saved to fund future pension expenditure or, what amounts to the same thing, used to pay public debt.

It is difficult to see how low fertility might result in *increased* public expenditure; the opposite is more likely. Perhaps what Oksanen has in mind is that there will be fewer workers to support the next generation



of retirees. Pre-funding is certainly an option in this case, as Oksanen suggests, but so is a reduction in benefits, with an unchanged contribution rate. Increased longevity does impact directly on pension expenditure, but the solution does not necessarily lie in pre-funding this expense. An intergenerationally fair alternative is to increase the age at which full benefits are paid, decreasing benefits, in an actuarially fair way, for early retirement. This has the added advantage of encouraging greater participation by the elderly in the labour force.

Analysts of mature PAYG pension systems sometimes note the low rate of return they offer on contributions—expected to average around 1.5% a year in real, inflation-adjusted terms over the next 50 years in the EU—and ask “Why not let participants divert a portion of their contributions to private accounts, so they can earn a higher return?” The short answer is that it is simply not possible, for all revenue is used for payment of current benefits, which is the very essence of a pay-as-you-go system. If participants reduce their contributions, government, to honour its pension promises, will have to make up the shortfall by levying taxes or borrowing. This situation exists because an early generation received pension benefits despite contributing little or nothing to the system. The difference between the market rate of interest and the rate of return on contributions to a PAYG system represents a tax, the cost of servicing this implicit pension debt.

Sophisticated analysts recognize the existence of implicit pension debt, but argue that it might be desirable to burden the current generation in order to pay off, at least partially, this inherited debt. Rother, Catenaro and Schwab present such an argument in their paper **Ageing and pensions in the euro area**. Using demographic and economic assumptions similar to those of Economic Policy Committee (2001), they calibrate a model for four euro area countries (Germany, France, Italy and Spain) using PROST

software of the World Bank, and present aggregate results for the four countries combined. “Hypothetical contribution rates”, defined as total pension payments divided by wages of contributors, were used for the base year. This adjustment is important for Germany, where a significant portion of contributory pension benefits are financed from general taxation. The system is thus balanced in the base year, by assumption.

Rother, Catenaro and Schwab’s baseline simulations reveal that, with unchanged contribution rates and increasing expenditure, the PAYG systems incur large deficits, amounting to 5 or 6 percent of GDP by the year 2050. They examine two alternative reforms, one partial and one comprehensive, each designed to reduce the present value of these deficits to zero over the projection horizon. The “partial reform” consists of a combination of changes in three parameters: i) gradual increase in retirement age, reaching one year in 2010; ii) “a rise in the contribution rates by 10%, e.g., from 30% to 33%”; and iii) “a reduction in average replacement rates sufficient to balance the system” (p. 19). The “comprehensive reform” is radical and abrupt: “Contribution rates to the pay-as-you-go system are reduced immediately and permanently by 6 percentage points. That amount is invested in a funded pillar which carries a net return of 4% after taxes and administrative costs. Replacement rates for new old age pensioners are reduced to achieve balance of the system, namely a zero present value of deficits. Existing pensioners remain unaffected ..., i.e. their pension levels and indexation mechanisms remain as in the partial reform case” (p. 21)

The authors prefer the comprehensive to the partial reform, but they are honest in reporting the cost of the transition. Participants in the comprehensive reform retiring before 2040 will receive pensions that are as much as 23% lower than they would be with the partial reform. Even after 2040, pensions are only slightly larger than

in the case of partial reform. Large benefits from partial funding do not show up until the next 50 year period, 2050-2100. Nonetheless, as the authors conclude, the decision as to who will bear this cost “is a political question. In addition to leaving it on new pensioners as in the reform scenario, it could be imposed on current pensioners through lower indexation, on future generations through raising public debt, or on any combination of these groups” (p. 24). Of course, imposing the cost on future generations by raising public debt is equivalent to eschewing partial funding in the first instance, except that the implicit debt becomes explicit.

In conclusion, it is the opinion of this reviewer that these studies are much too gloomy because they focus on PAYG pension systems as systems of taxes and transfers rather than as systems of forced saving for old age. If contributors to pensions are treated as purchasers of government debt, most fiscal problems and problems of intergenerational equity disappear. If workers want to retire with more income than is provided by the Samuelson-Aaron return on their PAYG contributions, they have a number of options. They can save voluntarily, they can lobby for government to mandate contributions to pre-funded pensions (additional to current obligations), or they can retire at an older age. It is important for government to provide proper incentives, to avoid facilitating early retirement via disability pensions or penalizing those who choose to postpone retirement and save for

old age. With these policy changes, Europeans can relax and enjoy their longer, healthier lives and increasing per capita incomes.

## References

- Aaron, H. (1966) The social insurance paradox. *Canadian Journal of Economics and Political Science* 32 (3), August, pp. 371-374.
- Barr, N. (2000) *Reforming pensions: Myths, truths, and policy choices*. IMF Working Paper WP/00/139, August.
- Economic Policy Committee (2001) *Budgetary challenges posed by ageing populations*. Brussels: European Commission, ERC/ECFIN/655/01.
- O’Connell, A. (2004) *Citizens’s pension: Lessons from New Zealand*. London: Pensions Policy Institute, March. Posted at <http://www.pensionspolicyinstitute.org.uk/>.
- Samuelson, P. (1958) An exact consumption-loan model of interest with or without the social contrivance of money. *Journal of Political Economy*, 66 (6), December, pp. 467-482.
- Seshamani, M. and Gray, A. (2004) A longitudinal study of the effects of age and time to death on hospital costs. *Journal of Health Economics*, 23, pp. 217-235.
- St. John, S. and Willmore, L. (2001) Two Legs are Better than Three: New Zealand as a Model for Old Age Pensions, *World Development*, 29(8), August, pp. 1291-1305.

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Table 1. European GDP and population, projections, 2000-2050 (% per annum and ratios).

	<u>Real GDP</u>	<u>Population</u>			<u>Old-Age Support Ratio</u>	
		<u>Total</u>	<u>15-64</u>	<u>65+</u>	<u>2000</u>	<u>2050</u>
<b>B-Belgium</b>	1.7	-0.02	-0.25	0.93	3.8	2.2
<b>DK-Denmark</b>	1.5	0.04	-0.11	0.81	4.5	2.8
<b>D-Germany</b>	1.4	-0.17	-0.47	0.93	4.2	2.0
<b>EL-Greece</b>	2.0	-0.06	-0.40	1.09	3.8	1.9
<b>E-Spain</b>	1.8	-0.23	-0.67	1.13	4.0	1.7
<b>F-France</b>	1.7	0.10	-0.14	1.14	4.2	2.2
<b>IRL-Ireland</b>	2.6	0.47	0.23	2.04	5.9	2.5
<b>I-Italy</b>	1.4	-0.36	-0.79	0.90	3.7	1.6
<b>L-Luxembourg</b>	4.0	...	...	...	4.8	2.6
<b>NL-Netherlands</b>	1.8	0.21	-0.04	1.35	5.0	2.4
<b>A-Austria</b>	1.6	-0.13	-0.49	1.15	4.3	1.9
<b>P-Portugal</b>	1.9	0.17	-0.15	1.33	4.3	2.2
<b>FIN-Finland</b>	1.6	-0.08	-0.38	0.98	4.5	2.3
<b>S-Sweden</b>	1.8	0.07	-0.07	0.86	3.7	2.4
<b>UK</b>	1.7	0.08	-0.11	1.01	4.2	2.4
<b>EU-15</b>	<b>1.6</b>	<b>-0.07</b>	<b>-0.36</b>	<b>1.04</b>	<b>4.2</b>	<b>2.0</b>

Source: Economic Policy Committee (2001), table 3.4, p. 21 and Annex 7, pp. 109-110.

Note: Old age support ratio is number of persons aged 15 to 64 for each person aged 65+.

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\* The views and opinions expressed are personal and should not be attributed to the United Nations. Susan St. John, Doug Walker and Chris Willmore provided helpful comments on an early draft, but are not responsible for shortcomings that remain

<sup>1</sup> All statistics refer to the European Union of 15 members, thus exclude the ten states that joined the EU in May of 2004.

<sup>2</sup> Pensioners collect 60% of the *gross* wage; this amounts to 70.6% (60/.85) of the wage net of pension contributions.

<sup>3</sup> The eight European countries included in the study are the United Kingdom, Sweden, Germany, the Netherlands, Belgium, France Italy and Spain. The other four countries are Australia, United States, Canada and Japan.

<sup>4</sup> The commission also discussed reform of health care and long term care insurance, but its key proposals refer to the pension system.