

Life-expectancy links

The quiet revolution in pension policy



Continuous growth in life expectancy, often at a more rapid rate than forecast, creates financial challenges for retirement-income systems. Most countries have responded with pension reforms to contain rising pension costs. Around two-thirds of reforms will **automatically** link future pensions to changes in life expectancy.

This quiet revolution in pension policy means that the financial costs of longer lives will be shared between generations subject to a rule, rather than spreading the burden through potentially divisive political battles.

Traditionally, pension entitlements were “defined” by some sort of formula. In theory, at least, this meant that the annual value of the pension was the same whatever happened to life expectancy. These “defined-benefit” schemes dominated both public and private pension provision in OECD countries in the second half of the 20th century. Over the last decade, however, this defined-benefit paradigm has been diluted and pension systems around the world have become much more diverse.

Most significant has been the expansion of defined-contribution pension schemes, where the pension depends on contributions and interest earned on them. In some countries, these have replaced all or part of the public defined-benefit pension scheme. In others, a requirement to contribute to the defined-contribution plan was added on top of existing state pensions. Finally, in countries with widespread, voluntary occupational pensions, employers have tended to shift these from defined-benefit to defined-contribution (or a mix of the two).

In defined-contribution schemes, individual retirees bear the burden of changes in life expectancy as lower pensions. When people retire in a defined-contribution plan, the accumulated contributions and investment returns must be converted from a lump sum into a regular pension payment, known as an annuity. The calculation of the annuity will be based on projected life expectancy of retirees at the time of retirement. So, pensions will be lower as people live longer.

In defined-benefit schemes, in contrast, the cost of paying pensions for longer as life expectancy increases falls, in the first instance, on the pension provider: the government, for example. Ultimately, however, the cost must be financed by younger taxpayers and contributors. In practice, many recent pension reforms have cut future benefits, so some of the cost of increasing life expectancy is borne by future pensioners themselves in the form of lower pensions.

What did countries do?

Nearly half of OECD countries – 13 out of 30 – now have an automatic link between pensions and life expectancy in their retirement-income systems (Table 1). A decade ago, only one country – Denmark – had such a link. The spread of this policy has a strong claim as the major innovation in pension policy in recent years. The link to life expectancy has been achieved in four different ways.

Table 1. Four changes to pensions

	Defined contribution	Notional accounts	Benefit levels	Qualifying conditions
Australia	•			
Denmark	•			•
Finland			•	
France				•
Germany			•	
Hungary	•			
Italy		•		
Mexico	•			
Norway	•			
Poland	•	•		
Portugal			•	
Slovakia	•			
Sweden	•	•		

Note: Covers the 13 countries OECD countries with a link to life expectancy in the pension system.

Source: Whitehouse (2007).

First, Hungary, Poland, Mexico, the Slovak Republic and Sweden introduced **defined-contribution** plans as a substitute for all or part of their public pensions in the late 1990s.

Australia and Norway added mandatory contributions to private pensions on top of existing public provision. Denmark has long had defined-contribution plans covering nearly all workers.

Secondly, Italy, Poland and Sweden have substituted **notional accounts** for traditional, defined-benefit public schemes. Notional accounts, like most public, defined-benefit schemes, are financed on pay-as-you-basis, where today's contributions pay for today's retirement benefits. Defined-contribution schemes, in contrast, are "funded", with real money in individual accounts, and are usually privately rather than publicly provided. But notional accounts are designed to mimic some of the features of defined-contribution plans: in particular, pension entitlements are calculated in a similar way to annuities.

Thirdly, some countries have kept defined-benefit public schemes while introducing a link between life expectancy and pensions. Finland, Germany and Portugal will adjust **benefit levels** with life expectancy.

Finally, two countries will link **qualifying conditions** for pensions to life expectancy: the pension age in Denmark and the number of years of contributions needed for a full pension in France.

Life-expectancy risk

Forecasts of mortality and life expectancy are usually based on past experience: the approach adopted here. Looking forward, improvements are projected to be the same as those observed in the G7 leading industrial countries since the late 1940s

Others have argued that there is a biological limit to human life to which we are now close. Some stress that medicine and hygiene have largely conquered bacterial infections. Heart disease is much less deadly than it used to be. But chronic, degenerative conditions, such as Alzheimer's disease, have not yielded so easily to medical progress.

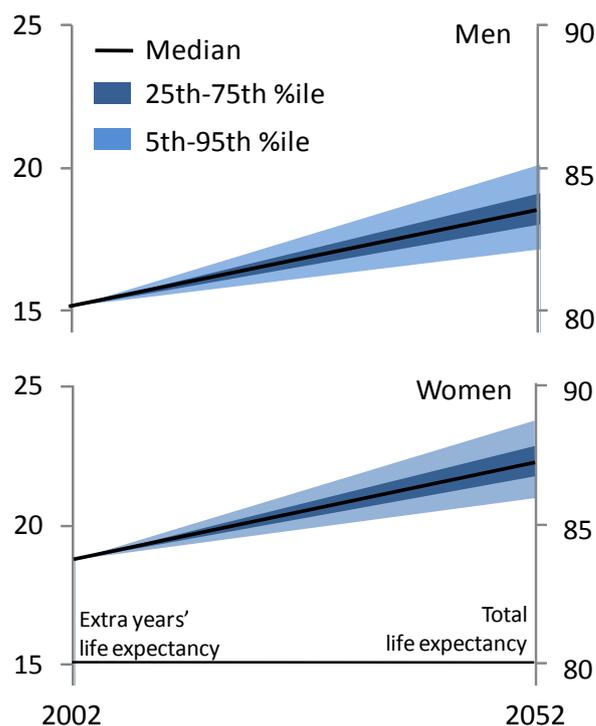
The debate over how long people will live is a heated one. But the focus of the paper is the degree of uncertainty in future life expectancy and how the resulting financial risk is shared between different stakeholders. Figure 1 shows how life expectancy is projected to develop

over the next 50 years under different scenarios.

The central forecast (shown by the black line) is for additional life expectancy for men at age 65 (the typical standard pension age) to increase from 15.1 to 18.5 years (upper panel). For women, the projected growth is from 18.7 to 22.2 years (lower panel).

The shaded areas show the degree of uncertainty in the life-expectancy projections, again based on past experience. The darker area shows the "inter-quartile" range. In the worst 25% of cases, additional life expectancy for men only reaches 18.0 years, while in the best 25%, it is expected to be 19.1 years or more. The lighter area covers 90% of cases. In the best 5%, life expectancy for men is projected to be 20.1 years or more, compared with 17.1 years or less in the worst case. The degree of uncertainty for women is similar to that for men.

Figure 1. Life-expectancy forecasts



Note: %ile = percentile of the life-expectancy distribution.
Source: Whitehouse (2007).

How is life-expectancy risk shared?

The value of future retirement benefits have been calculated, using the OECD pension models, under different scenarios for future life

expectancy. The results are compared with two benchmarks. Under the first, annual pensions are constant and so longer life expectancy means higher lifetime benefits. In contrast, lifetime benefits in the second benchmark are the same whatever happens to life expectancy, meaning that annual pensions are reduced when people are projected to live longer. These benchmarks underpin a measure of the degree of life-expectancy risk borne by individual retirees, ranging from zero in the first case above to 100% in the latter.

The results show huge diversity between countries in the way life-expectancy risk is shared (Figure 2). Due to the small mandatory contribution in Norway – 2% of earnings – only 10% of the financial cost of longer lives is borne by retirees. In Australia, this proportion is about 30%: the means-tested public pension limits the impact of longer lives on pension entitlements. The earnings-related pension in Hungary, which is not linked to life expectancy, will continue to provide most old-age income.

At the other end of the spectrum, close to 100% of life-expectancy risk is borne by individual retirees in Finland and Portugal. In Poland, this is more than 100%: individual retirees are projected to have higher lifetime benefits if the shorter is life expectancy because of the way the notional-accounts pensions are calculated.

The differences between countries in the sharing of life-expectancy risk mainly result from the structure of the pension package.

How should the risk be shared?

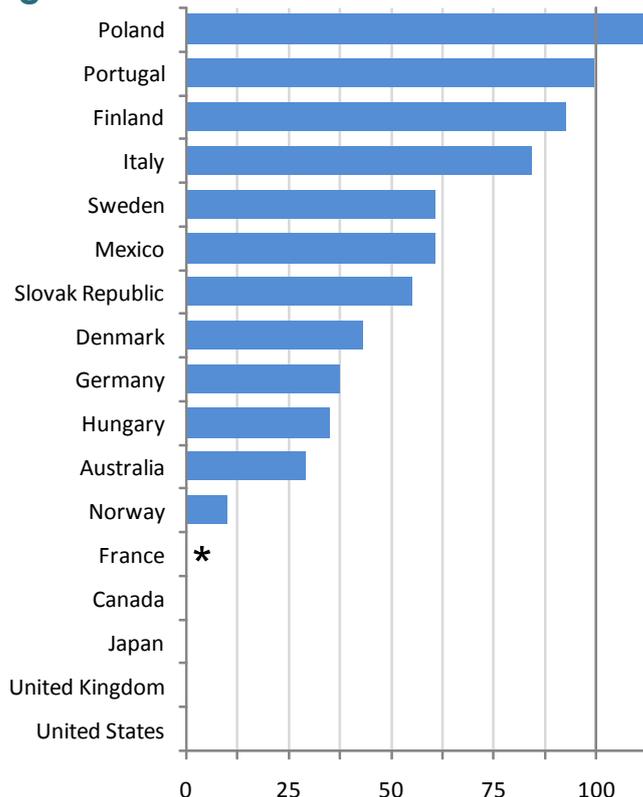
It is hard to see why people approaching retirement should not bear at least some of the cost of their generation living longer than previous generations. After all, living longer is desirable. A longer life *and* a larger lifetime pension payout due to increased life expectancy confer a double advantage.

The optimum life-expectancy risk that individual retirees should bear is not zero. But is it 100%? The issue is complex because each individual has periods as both a contributor and a beneficiary. There is a trade-off: greater certainty over retirement benefits versus greater certainty over the amount of contributions or taxes paid when working.

Moreover, life-expectancy risk is but one of many in pension systems. With defined-contribution pensions, retirement incomes are also subject to investment risk. Other aims of the retirement-income system may conflict. For example, reducing already small pensions to reflect increases in life expectancy might risk a resurgence of old-age poverty.

Together, these factors suggest that individual retirees should bear some but not all life-expectancy risk.

Figure 2. Who bears the risk?



Note: shows 13 countries that link pensions to life expectancy and four countries with no link. It is not possible to calculate the risk allocation for France. Source: Whitehouse (2007).

Why did these reforms happen?

From a position of hindsight, it is easy to rationalise these changes to pension systems as a considered rule for sharing life-expectancy risk between contributors and retirees. A more cynical interpretation would be that this risk sharing is a fortunate, accidental result of pension reforms.

In the transition economies of Central and Eastern Europe, there was clearly a desire to break with the past. By privatising part of the pension system, Hungary, Poland and the

Slovak Republic moved from monolithic, public to mixed, public-private provision of old-age incomes. The sharing of life-expectancy risk in defined-contribution plans was a by-product of this change.

A second reason for introducing automatic links between pensions and life expectancy has been to make cuts in pension benefits politically palatable. Such links provide an understandable and logical rationale for lower pensions in the future.

The third motive is again rooted in political economy: a radically new pension system was needed to achieve other goals. In Italy, one aim was to adjust benefits depending on retirement age. The goals of Sweden's reforms included extending the years of contribution needed for a full pension and the period over which earnings are measured to calculate benefits.

Links between pensions and life expectancy were often a side effect of reforms undertaken for other reasons. But this should not detract from the fact that this involves a fundamental change in the sharing of risk between generations. This risk-pooling based on rules, not *ad hoc* changes, could make all generations better off.

Which countries next?

Of the 30 OECD countries, 17 do not currently have a link to life expectancy in mandatory pension systems. Which of them might be advised to follow the lead of the 13 countries that share the financial burden of increasing life expectancy automatically?

The case for transferring life-expectancy risk to individual retirees is strongest in countries with the largest compulsory pensions. Where the mandate to provide for retirement is relatively small, the risks borne by taxpayers and contributors are also commensurately smaller; so are the gains from sharing the risk between generations. This applies, among others, to Canada, Japan, the United Kingdom and the United States. In these countries, voluntary, private provision for old-age is widespread, under which life-expectancy risk is often borne by individual retirees.

Of the 10 countries with the largest mandatory pensions, four already link pensions to life

expectancy: Denmark, Finland, Hungary and Sweden. Of the four, Hungary might consider going further because the degree of life-expectancy risk borne by individuals overall is still relatively small. A life-expectancy link in the public pension scheme – either through benefit levels or qualifying conditions – might improve the intergenerational sharing of risks.

Another four of the 10 countries with the largest mandatory pensions have purely public systems with no life expectancy adjustments. These are Austria, Greece, Luxembourg and Spain.

Austria has introduced a series of changes in its pension system, but the effects on future benefits are much smaller than the reforms in, for example, France, Germany and Italy. A sustainability adjustment, modelled on the German approach, has been proposed but has not got very far.

The other three countries on this list – Greece, Luxembourg and Spain – have not seen any major changes to pension systems in the last 15 years. A reform package including a link to life expectancy would deliver a fairer allocation of risks across generations. But, perhaps more significant for policymakers, it might provide a rationale for cuts in benefits that voters find both credible and reasonable.



Follow-up

Whitehouse, E.R. (2007), "Life-expectancy risk and pensions: who bears the burden?" Social, Employment and Migration Working Paper no. 60, OECD, Paris.

OECD (2007), *Pensions at a Glance: Public Policies across OECD Countries*, Paris.

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