

## Box 16

## AGEING POPULATION AND LONGEVITY RISK

As the so-called baby boom generations – i.e. those born between the mid-1940s and the mid-1960s – approach retirement, policymakers in many developed countries have become increasingly concerned about retirement funding and retirement income security. With ongoing pension reforms reducing the generosity of funding from public sources, more emphasis is being placed on private saving. However, the inherent uncertainty about the length of human life complicates any decision regarding saving for retirement. In particular, there is a risk that individuals may outlive their resources and could be forced to reduce their living standards quite substantially when they reach a more advanced age, or even risk falling into a poverty trap. Longevity risk,<sup>1</sup> which materialises when expectations regarding lifespan are not met, has two components.<sup>2</sup> *Individual* longevity risk is the risk that a person will die either prior to or after the average lifespan of his/her cohort. It can theoretically be diversified away by pooling risks in private annuity markets, where those who live longer than the average may benefit from the contributions of those who die earlier. *Collective* longevity risk concerns the risk of underestimating the average expected longevity. This risk poses more challenges than individual longevity risk because it cannot be shared within members of the same cohort by writing a large number of life policies. This Box discusses some of the challenges raised by collective longevity risk, for which no simple hedge may be found.

Governments, pension funds and to a less extent life insurance companies used to bear collective longevity risk. Due to the partial disengagement of governments from pension

1 Longevity risk concerns the upper end of the age distribution of the population. It differs from mortality risk, which is driven by short-term extreme events such as flu epidemics.

2 See M. King (2004), “What Fates Impose: Facing up to Uncertainty”, the Eighth British Academy Annual Lecture.



provision and the gradual change from defined benefit pension plans to defined contribution schemes, not only individual but also collective longevity risk has been increasingly transferred to the household sector. At present in the euro area, the risk of outliving resources is rather limited, as the bulk of pension income continues to originate from public sources and/or occupational defined benefit schemes. Nevertheless, further reforms are likely to shift risks towards households. Hence, there is the risk that households at retirement may find it difficult to convert accumulated wealth into a guaranteed stream of income until death. Liquid and efficient annuity markets could dampen this risk and eliminate the individual longevity risk that is now increasingly borne by households. However, adverse selection problems and difficulties faced by life insurers and pension funds in hedging collective longevity risk currently weigh on the development of such markets.

An adverse selection problem arises with the provision of individual annuities, because those who live longer than the average expected life span will tend to buy more annuities on a voluntary basis than others. Consequently, this raises the price of annuities, thus reducing the incentives of those new potential annuitants with shorter life expectancy to enter the market. Hence, only a very small proportion of saving is currently invested in annuities. In order to circumvent the adverse selection problem that is associated with the *individual* provision of annuities, collective schemes could be made compulsory. As a result, policy prices should converge to their fair actuarial prices as mortality tables of the *whole* population may replace those of annuitants currently used by annuity writers. However, any compulsory scheme would involve some problems of redistribution so that as a first step, annuities could simply be set as the default option in defined contribution plans instead of the current practice of lump sum withdrawals.

Regarding problems associated with hedging exposures to *collective* longevity risk, no simple solutions exist. This risk is currently concentrated in corporate defined benefit pension funds and in life insurance companies' balance sheets. Ideally, these institutional investors may desire to hold assets whose return is proportional to the average longevity of their annuitants in order as a hedge. Such hedging instruments do not exist yet and the absence of adequate hedging has already led to significant deficits in the reserves of pension fund balance sheets, and the problem has been exacerbated by the low level of interest rates. Indeed, when interest rates are low, any unexpected improvement in lifespan results in a significantly larger increase in reserves than the rise needed when interest rates are high.<sup>3</sup>

While the design of effective hedges for longevity risk would appear to be important, there are practical challenges in that there are many more potential buyers of longevity protection than there are sellers. Indeed, the appetite of reinsurers to take further longevity risk is very limited. Owing to the legal scrutiny of financial/finite risk reinsurance contracts, reinsurers have become more reluctant to provide insurance against longevity risk than in the past.<sup>4</sup> Furthermore, M&As have reduced the number of companies operating in this sector. Attracted by increasing premium prices, many reinsurers have also shifted resources to the non-life sector.

3 A 10% improvement in longevity by leads to an increase by 5.4% of the net present value of the immediate annuity – an immediate annuity being a regular income payable throughout life, which is usually secured in exchange for a lump sum – to meet an annual payment of 10,000 euro over 25 years, based on a 3% interest rate. With interest rates equal to 5% and 10% respectively, this figure would fall to 4.2% and 2.1%. Hence, life insurance companies and pension funds are concerned about interest rate/longevity correlation risk.

4 See Fitch Ratings (2005), "Reeling in the Years: VIF securitisation", Special Report on Insurance, Europe, June.

Given the lack of longevity insurance capacity within the reinsurance sector, the capital markets could provide innovative solutions to hedging longevity risk. In November 2004, the European Investment Bank/BNP Paribas announced their intention to issue a 25-year survivor bond, also called a longevity bond, where coupon payments would be linked to the proportion of the UK male population who were aged 65 in 2003 and who are still alive at the coupon date. The longevity risk in this operation will be born by the Bermuda-based Partner Re through a reinsurance contract. However, Partner Re has apparently made it clear that it has little appetite for additional deals. Since an active and liquid market for longevity bonds requires not only buyers but also sellers, there might be a role for governments to substitute for reinsurers. By assuming *collective* longevity risk, either as an issuer of longevity bonds or of long-dated annuities, governments would support the development of liquid annuity markets.<sup>5</sup>

Regarding the consequences for financial stability, the lack of transparency about longevity assumptions used for the calculation of reserves may expose shareholders of companies with corporate defined benefit plans to risks of significant declines in distributed profits and in stock prices following revelations of unrealistic assumptions in mortality rates. In the UK, as from 23 September 2005, new actuarial valuations will apply which make more prudent assumptions regarding longevity. The implementation of the new Statutory Funding Objectives requires the elimination of any potential deficits in UK defined benefit pension funds over a predetermined period that is likely to be set to ten years. Owing to the relatively short period of reserve rebuilding, most employers with defined benefit schemes incur a significant risk of financial distress, even in some cases a risk of insolvency. The choice of the discount rate – which is crucial in the assessment of underfunding – is still being debated (see Box 17).

<sup>5</sup> The UK Debt Management Office conducted a consultation about the relevance of issuing annuity-type gilts. Most respondents – except policy advisers in the pension industry and trustees – did not support the project, pointing out concerns about the potential illiquidity of such instruments, in that annuities could be buy-and-hold instruments. Hence, no issuance of annuities will occur in the near future. See <http://www.dmo.gov.uk/gilts/public/consdoc/cons160305.pdf>.