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Pension Regression

by P.G. Alistair Cammidge

"It is too simple to say that work until you drop is the answer to the pensions problems we face."—General Secretary of the (British) Trades Union Confederation

First, the good news—mortality at the older ages is improving at the best trot ever!

Second, the bad news—the rate of improvement far exceeds actuarial projections!

In Japan, the babyboom 'dankai' (big cluster) generation is reaching normal retirement age at 60. In 2005, 3.3 workers supported each Japanese retiree; by 2015 that ratio is expected to have fallen to 2.4.

How can this tsunami of retirees be supported? The issue confronts policymakers in all advanced economies.

Traveling from a pattern of islands off the northeast coast of the Eurasian landmass to an archipelago off its northwest shore, we reach the British Isles—where a week is a long time in politics. With politicians playing politics, retirees-to-be are left to muddle through—under a terrible malediction. I must give favorable mention to the politicians' answer to Britain's pension problems: In 1997 one policymaker imposed a GBP (pounds) 5 billion (US$10 billion) per annum tax on company pension plans. Taxes —added to low returns, increasing longevity and inadequate advance provision - have broken the backs of defined benefit (DB) pension funds, causing many to close and some to collapse—while the Department of Tramways, Fine Arts and Pension Supervision lolled languidly. The European Court has found British pension supervision 'inadequate.' The High Court has ordered the British Government to review its decision not to compensate pensioners of failed funds. The government has said compensation would cost GBP 15 billion (US$ 29 billion).

Research by a transatlantic firm of consulting actuaries tells us that in Britain the days of two-thirds final salary pensions are gone—today's employees must expect far less.

We have regressed—we have gone far backwards!

Mortality and Interest Rate Risk in Pension Plans

In the United Kingdom—as in the United States—corporate defined benefit pension plans are becoming extinct. Defined benefit (DB) pension plans face both mortality and interest rate risks. Currently many British DB pension plans are being closed to new entrants; later closed plans have benefit accrual terminated for remaining members. In happier times, open and growing DB plans could control their mortality risk by employing dynamic mortality tables. For today's closed and contracting DB plans, the mortality risk is much greater—particularly at the higher ages. In mathematical terms, the ratio of the standard deviation to the expected number of survivors increases ever more rapidly with age.

DB pension funds may mitigate interest rate risk by investing in cashflow-matched bond portfolios. In the United Kingdom, the longest 'gilts' (British government security) mature in 2038, 2046 and 2055. (There are small volumes of 'undated' gilts redeemable at government option.) Corporate bonds tend to be shorter but offer higher redemption yields. Similarly, wage inflation risks can be reduced by investing in index-linked gilts.

Traditionally, DB pension plans handled their risk from improving mortality by employing projected (static) mortality tables or dynamic mortality tables incorporating rates of mortality improvement (for each age and sex). Today the grave problem of mortality risk can be reinsured and soon securitized.

Dark clouds above the heads of working folk have a silver lining for insurers acting as pension undertakers. Indeed, so lucrative is undertaking that new firms of pension undertakers are being formed to challenge the old family firms. In the United Kingdom, buying out corporate pension plans (using bulk purchase of payout and deferred life annuities) is the acceptable face of opportunism.

In the pension buyout market a specialist pension broker will approach highly-reputed insurers on behalf of a DB pension plan, provid-

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ing details of current and/or deferred pensioners and contingent beneficiaries. Insurers place competitive quotations of their charges to assume the risks. The low bid wins! The premium may be a one-off for a full buyout, installment premiums over a period of years or segmented—with only the risks associated with pensioners being transferred.

A new alternative is to securitize the longevity risk faced by both DB pension plans and insurers writing life annuities.

A mortality or survivor derivative is a financial instrument with a mortality-dependent payout. The first proposals were "survivor" or "longevity" bonds whose coupons are proportionate to the survivors of some cohort of lives.

The first survivorship bond was proposed in 2001. In 2005, the European Investment Bank (EIB—a tentacle of the European government), a leading French retail bank and a Bermuda reinsurer launched a GBP 540 million 25-year longevity bond, with coupons proportionate to the number of survivors of the English and Welsh male population aged 65 in 2003. Projected coupons were valued at LIBOR minus 35 basis points to give the issue price. The greater volatility of elder mortality makes little difference in pricing—but a big difference in hedging! (Payment indexation was lagged to allow for calculation and publication of statistics.)

Observe the absence of a specific capital repayment—thus the bond mimicked a portfolio of employee pensions. Purchase of such a bond would considerably mitigate a DB plan's ongoing mortality improvement risk by spreading it across the market. Combining heavyweight intellect with lightweight judgment, the market proved excessively cautious about a little-understood instrument; the bond was only partially subscribed, then withdrawn for redesign. However, the banks received much favourable publicity!

Several reasons excuse the slow take-up of the bond by the market. At 25 years, the bond provided a less effective hedge than a longer bond. Similarly, it would be a less effective hedge for other age cohorts and females. Perhaps the most serious problem was the large amount of capital required in relation to the reduction in risk exposure.

Securitizing excess mortality has been more successful. The first such bond was issued by Swiss Re in December 2003. Maturity was four years, with investors receiving a coupon of US LIBOR plus 135 basis points. The principal repayment was at risk if the weighted average of general population mortality in five specified countries exceeded 130 percent of the 2002 level in any year. In April 2005 the Swiss issued a second bond and in November 2006, the Swiss placed $ 442 million in a catastrophe mortality securitization on behalf of AXA. The issue was oversubscribed.

Other mortality and survivorship instruments have been suggested. An example is a survivorship swap in which two parties agree to exchange two payments at an agreed future time. One payment is fixed; the other is dependent upon some mortality index or population cohort. Such an arrangement does not require the expense of a bond issue—just two willing parties.

Investment banks and financial institutions are investing time and effort in solving the problems associated with longevity, for example the increased stochastic volatility of mortality at the older ages. Longevity will be the new frontier for financial derivatives!

But this is old claret in new bottles. Does it amount to any more than rearranging deckchairs on the Titanic while British pensions disappear beneath the waves? The reality check just bounced! "What is to be done?" the late V.I. Ulyanov (a.k.a. Lenin) famously asked.

Public sector pensions begin at 60—private sector employees will have to work till they drop! Workers of the World—Unite! You have a right to a pension!

Further reading:

Blake, D., A.J.G. Cairns and K. Dowd. 2006. "Living with mortality: longevity bonds and other mortality-linked securities." Presented to the Faculty of Actuaries, 16th January 2006. □