Article from

Reinsurance News

November 2015
Issue 83

Financial Tools to Manage Longevity Risk

By Matthew Daitch

Writing about longevity risk is increasingly popular, whether an Adviser brief about an individual's longevity risk or industry papers regarding risk exposure inherent in defined benefit pension plans or payout annuity blocks. This article will seek a balanced discussion about longevity risk—why it is of interest to U.S. life insurers but not necessarily a priority and what might happen that could change that perspective. We then will present an attractive option for managing longevity risk, the longevity swap, and provide real world scenarios illustrating how a longevity swap can help a firm manage their bottom line more effectively.

LOW PRIORITY

Unlike in Europe where longevity exposure is actively managed, longevity risk has generally been downplayed by U.S. Life Insurers for three main reasons:

- No statutory requirements,
- Low exposure, and
- Longevity's role as a mortality hedge.

No statutory capital requirements. Currently the NAIC RBC formula does not have a C-2 component for mispricing longevity risk. Once a mortality basis has been chosen for the annuity statutory reserve assumption, it is rarely if ever revisited. However, there is no guarantee that this treatment will continue. In Europe, Solvency II has explicit methods for calculating capital for longevity risk. The U.K.'s Financial Services Authority publishes new mortality improvement assumptions that must be used for valuation, which can create a material level of volatility on a company's balance sheet. The NAIC's progress on a principles-based approach to valuation may be the first step towards adequately accounting for longevity risk.

Low exposure. For most life insurers, longevity risk is less a material risk than the mortality, morbidity, equity or credit risk on their balance sheets. There are many reasons for this, but two main drivers. First, immediate annuity sales, while growing, remain a very small percentage of annuity sales and second, very few deferred annuities get annuitized. Additionally, defined contribution pension assets almost are never annuitized and for defined benefit plans, lump sums often are the option of choice if offered as a distribution option. It is highly unlikely that mandatory annuitization of pension asset legislation could pass in the U.S. in the foreseeable future. As a result, most CRO's focus on managing the more material risks on a company's books.

Longevity may act as a mortality hedge. Even if a carrier's exposure to longevity risk could be determined material, in many cases life insurers may opt to increase their exposure to longevity risk with the thought that it can serve as a hedge against their mortality blocks. After all, an insurer cannot pay death benefits and annuity income to the same person simultaneously. In Europe, Solvency II enables an insurer to take diversification credits when its in force contain offsetting risks. While one cannot take explicit credits in the U.S., companies still may view hedging as favorable for their own internal risk management purposes. However, unless an insurer holds both the longevity and mortality risk on the same life, the hedge will not be perfect. Mortality risk is centered in middle age while longevity risk is focused on older age. Mortality improvement during the last few decades has been different between the 30-50 and 65+ age groups.

WHY MANAGE LONGEVITY RISK

Given the reasons why a U.S. life insurer may not currently manage its longevity risk exposure, why might it be prudent to do so?

Lack of longevity expertise. The life insurance industry is expert in mortality risk. That knowledge foundation does not extend as strongly to longevity risk. Experts historically have understated life expectancy. In many countries (i.e., the U.S., Canada, U.K., Netherlands, etc.), recent annual mortality improvement at older ages is well above levels experienced historically. As a larger percentage of the population reaches older ages, more government and private research dollars will be directed towards addressing longevity, making it difficult to predict what future improvement will be. Best practices promote keeping the risks one understands and minimizing exposure to all others.

Longevity risk is long-dated. A single life annuity issued today to a 65-year-old likely will pay out benefits on average for 20-25 years. For a joint annuity with a younger spouse, the annuity will stay on an insurer's books much longer. Demographers' views on longevity trends—such as changes to ultimate Omega age, impact of future medical breakthroughs, global convergence, etc.—vary widely with some experts projecting that life expectancy may reach 100 during our lifetimes. While payout annuities will not cause an insurer's earnings to be volatile on a year-to-year basis, better than expected mortality will lead to a slow bleed of earnings as excess claims ratios last over an extended period of time.

OPTIONS FOR MANAGING LONGEVITY RISK

If a carrier chooses to manage their longevity risk, there are three main alternatives:

Buy-Out/Assumption Reinsurance. Existing pension plan as-

sets or an insured annuity block are transferred to a (re)insurance company. All asset and longevity risk is transferred, including the administration.

Buy-In/Coinsurance. Pension plans use the assets backing their defined benefit plan to buy a group annuity from an insurance company. The annuity is recorded as an asset on the pension plan's books. All asset and longevity risk is transferred, but administration is not.

Longevity Swap/Longevity Reinsurance. Carrier pays fixed premium equal to the expected annuity income payments plus a risk fee to a (re)insurer in exchange for receiving actual annuity income payments paid by the carrier. As a result, the carrier's payments are fixed and known. Longevity risk is transferred, but the carrier keeps asset risk and administration.

THE BENEFITS OF A LONGEVITY SWAP

Both a Buy-Out and Buy-In require an upfront premium, and thus the immediate recognition of a loss since the premium is likely to be higher than their current reserve. Alternatively, a longevity swap allows one to manage the longevity risk much more efficiently, with no upfront premium and potentially no immediate impact on a firms' balance sheet. A longevity swap can protect the income statement from unexpected costs arising from:

- Mortality improvements at a higher rate than priced,
- Errors in the base table,
- Basis error if characteristics of annuity block differs from basis used to create the firm's mortality table, and
- Volatility associated with a heterogeneous block.

If a future statutory regime requires assumptions to be updated to reflect recent mortality improvement experience, a carrier's balance sheet will be greatly exposed. Even if the current regime remains, the income statement will experience a slow bleed if actual experience deviates from expected. One way to illustrate the impact of assumption deviation is to compare the relative impact on the present value of cash flows under different but reasonable mortality events relative to a common pricing approach.

Let's assume Company A priced its annuities in 2012 by generationally improving the Annuity 2000 Basic Table to 2012 using 100 percent of Male Scale G and 50 percent of Female Scale G (the basis used to convert Table 1983A to the Annuity 2000 table), and then assume the same improvement rates from 2012 and on. Figure 1 shows the ratio of the present value as of Jan. 1, 2012 of cash flows under alternative scenarios relative to the pricing scenario.

Results can be highly volatile. Using our example, Company A's present value of cash flows range from meeting expected (A2000 Table w/Scale G) to negative (any cell over 100 percent). Scenarios vary widely, with significant potential losses in the male population if results mirror the A2000+US recent average mortality improvement, for example. When these losses are multiplied by potentially tens of thousands of contracts for even average attained-age life expectancy, annual financial losses can become material quickly.

If Company A had purchased a longevity swap, the company would be immune to these volatile scenarios. The company would lock in future claims equal to the premium stream paid to the reinsurer. The insurer no longer needs to worry about the negative financial consequences associated with better than expected mortality improvement. ■

Matthew Daitch, FSA, MAAA, CFA, is vice president, Longevity Solutions-Americas, SCOR Global Life Americas. He can be contacted at mdaitch@scor.com.

FIGURE 1 – CASH FLOW OUTCOMES CHANGE WITH TABLE BASIS

	MALE			FEMALE		
	65	75	85	65	75	85
A2000 Table w/ Scale G	100.0%	100.0%	100.0%	103.7%	104.7%	105.6%
IAM2012 w/ Scale G2	104.1%	104.7%	98.8%	103.3%	105.7%	106.1%
A2000 Table with improvement rates = U.S. average 1999-2007 {A2000+U.S. avg}	105.3%	106.2%	106.7%	103.5%	104.3%	105.5%
A2000+U.K. Avg (98 - 06)	107.5%	107.4%	104.6%	104.8%	104.6%	102.7%
A2000+Canada Avg (99 - 07)	104.5%	104.7%	102.9%	103.0%	103.9%	102.8%