

An Age-old Story

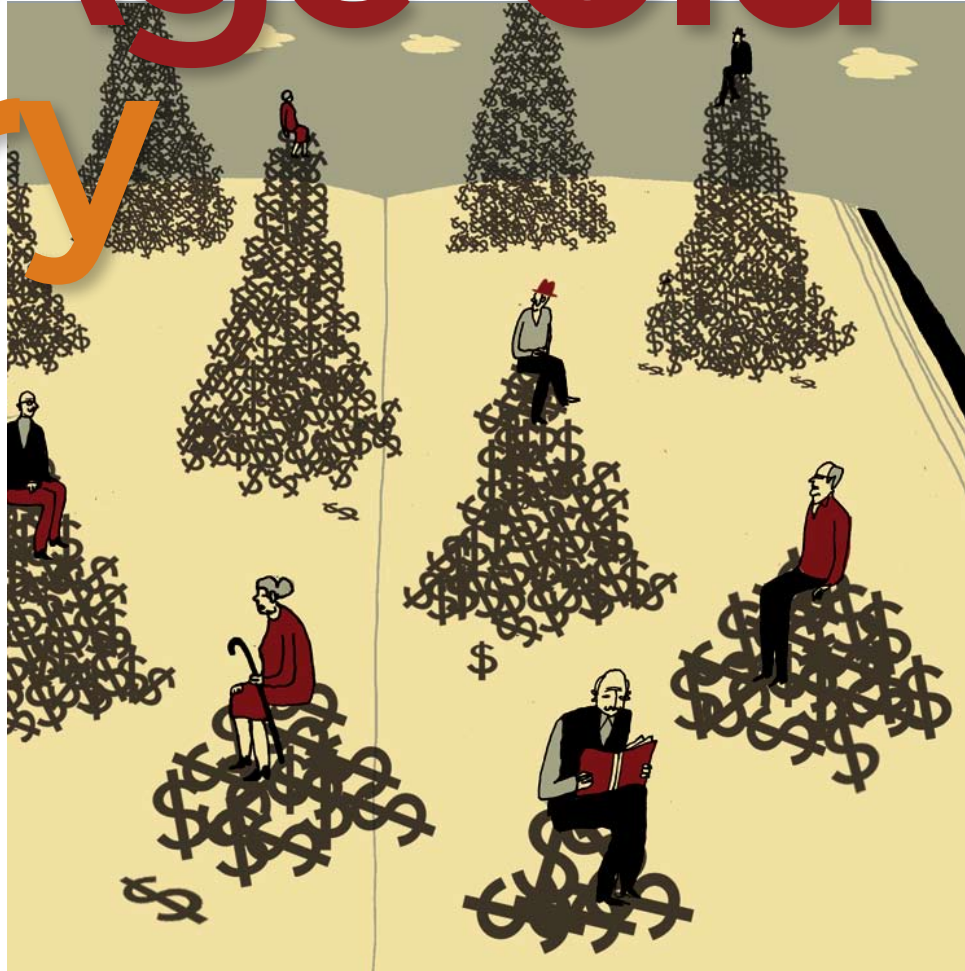
Since the market meltdown of 2008, pension plans have a renewed focus on managing investment risk. However, few plans can afford to lose sight of another significant risk: longevity risk, the risk of plan members living longer than anticipated under the plan's funding assumptions.

Despite being overshadowed by investment risk, the importance of managing longevity risk is growing, both in Canada and around the world. In fact, a U.K.-based survey by Aberdeen Asset Management found that longevity risk ranks second (after investment risk) among the most important risks that pension plans face. To ensure the long-term financial health of the plan, sponsors must understand the impact of longevity risk and find ways to mitigate it.

Why It's an Issue

In short, people are living longer. Life expectancy is increasing with improvements in living conditions and better treatments for chronic life-threatening illnesses. More importantly for pension plans, most of the increase in life expectancy at birth in Canada over the last 30 years has come from improvements in mortality at ages 65 and older. As indicated in Figure 1, life expectancy at age 65 has increased from 14 to 18 years for males and from 18 to 21 years for females, and it's projected to continue increasing—meaning that it will continue to cost plan sponsors more to fund lifetime pension benefits.

Recognizing mortality improvements in pension plan valuations can result in significant added costs. For example, when the mortality basis used for solvency valuations was strengthened in 2005, many plans



Longevity risk is a growing concern for pension plan sponsors, but there are new strategies to help them manage it.

BY JASENKA BRCIC AND CHRIS BRISEBOIS

in Canada experienced a one-time increase in solvency liability values of 5% to 10%.

For plan sponsors, the challenge is to account for the increases in average life expectancy in the mortality tables used to value the liabilities of their plans. Mortality tables are often based on population statistics rather than on specific plan member experience. To the extent that plan member mortality differs from the general population, mortality may be overstated or understated.

Certain groups may have worse mortality than the general population—for example, construction trades—while others, such as university groups, may have better mortality.

It's important for plan sponsors to get an accurate picture of the mortality characteristics of their plans in order to control costs. If the mortality improvements over time are significant, accounting for these improvements in advance is critical. At the same time, setting aside too much for assumed

mortality by being too conservative in the mortality assumptions, or by using a mortality table that doesn't accurately reflect a plan's mortality characteristics, may create unintended surpluses.

Quantifying Longevity Risk

There are two types of longevity risk that apply to all pension plans:

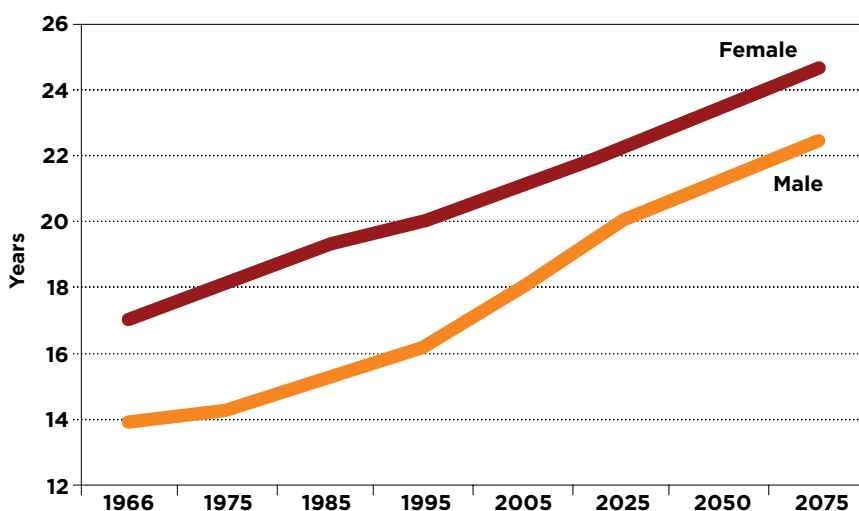
- **systematic risk**, in which the mortality assumption used is incorrect as a whole; and
- **specific risk**, the risk that certain individuals will live longer than expected. This is the volatility of the mortality assumption.

Specific longevity risk is a bigger risk for small plans because they don't have the economies of scale that allow them to spread that risk over larger groups. For example, if a plan has only two retirees and both of those retirees live to age 90, the cost (loss) to the plan will be higher than expected. However, if a plan has 2,000 retirees, it's unlikely that all 2,000 retirees will live to age 90. The realized lifetime will be more evenly spread across the life expectancy of the group, with some retirees living longer than expected and others dying sooner than expected.

Plan sponsors already get a comparison of how well the mortality assumption is aligned with the plan membership through valuation reports. As part of a valuation, actuaries provide a gain and loss analysis that reconciles the actual mortality experience of the plan with the expected experience from the last actuarial valuation. If the plan consistently experiences losses because pensioner mortality is lower than expected, it could be subject to significant longevity risk. To assess whether or not the mortality tables properly account for the plan-specific mortality, large plans often undertake a mortality study. The results of the study can then be used to adjust the mortality assumptions, if necessary.

More recently, mortality measurement services, such as Club Vita in the U.K., have been introduced. These services more finely tune the mortality characteristics by comparing plan-specific data across a number of different pension plans. Because of the large amount of data collected, they can look at where members live, their income levels and other factors to help plan

Figure 1: Life Expectancy at Age 65



Source: Canada Pension Plan Mortality Study, July 2009

sponsors better understand the mortality characteristics of their membership.

The key variable is longer life expectancy. To account for increasing longevity, the mortality tables used by plan actuaries typically include an allowance for mortality improvement. This allowance is usually based on historically observed mortality improvements and can be prescribed in some cases.

While plan sponsors may be comfortable with these mortality assumptions over the short to medium term, some are less comfortable with assumed mortality improvements over the long term. But tools are available to help eliminate or at least mitigate this risk.

Traditional Risk Management Tools

Plan sponsors are most familiar with annuity purchases as a longevity risk management tool. Annuities can be purchased for an entire pension plan or for a certain subset of the plan, such as the pensions already in payment. When a plan sponsor purchases annuities for its plan members, it not only removes the investment risk for those liabilities but also eliminates the longevity risk, both systematic and specific, associated with those members.

However, transferring these risks comes at a cost. In today's market, purchasing a single-premium immediate annuity for a retiree

who is 60 years old will cost the plan 115% or more of the liabilities held for that retiree (based on a non-indexed pension plan that is valued using a 6% discount rate and the UP94 mortality table projected to 2020). Given the funded status of most defined benefit plans these days, that extra 15% is hard to find.

Another way to reduce a pension plan's systematic longevity risk is to select a mortality table that is appropriate for the plan's demographics. As noted earlier, large pension plans can undertake mortality studies to produce a plan-specific mortality table. Small plans can use standard tables and adjust them for known past mortality experience. By strengthening the mortality table, a plan can pre-fund the longevity risk. However, note that this risk is not eliminated.

Plan design can also reduce the specific longevity risk. One option is to reduce the number of beneficiaries that a plan is covering or subsidizing. For example, many Canadian plans subsidize joint and survivor pensions, which increases the longevity risk. Plan sponsors can remove the subsidy, but they can't remove the requirement that a member must provide his or her spouse or partner with a survivor pension. However, the plan can reduce the longevity risk associated with the spouse, requiring that the member pay for the added cost of the joint and

Longevity Risk for DC Plans

Longevity risk also applies to defined contribution (DC) pension plans. As DC plan members live longer, there is an increased likelihood that members will outlive their retirement assets. And as more members move from the accumulation phase to the de-accumulation phase, this risk will become even more important to address. While new products, such as guaranteed minimum withdrawal benefits, are now available to help DC plan members manage this risk, other innovative products will likely come to market over the coming years.

survivor benefit through a reduced pension. The plan can also choose an appropriate mortality assumption to use when calculating the actuarially equivalent joint and survivor pension.

In addition, plan sponsors can rely on long-term investment gains to fund any shortfalls resulting from members living longer than expected. However, most sponsors view this as an ineffective way to manage longevity risk because of the embedded risks. Relying on investment gains is usually viewed as an option of last resort.

Emerging Strategies

Since plan sponsors may be reluctant to make annuity purchases today, given low interest rates, new tools are being developed to allow them to insure longevity risk separately from investment risk, which eases the dependence on the level of interest rate risk that is a significant part of annuity pricing. While they offer some promise, they also raise additional considerations such as complexity, costs, credit risk and lack of product choice, all of which should be carefully evaluated. Many of these tools are not yet broadly available in Canada, but they have been introduced to manage longevity risk in other jurisdictions.

Longevity insurance provides compensation if the mortality for a plan is better than expected. Deferred annuities purchased at retirement that start payment at a later date (for example, at age 85) are one example of longevity insurance.

Longevity bonds have coupons that are based on the longevity of a defined group (such as the general population or, for larger plans, the actual plan experience).

Longevity swaps provide a hedge against plan members living longer than expected. With this type of swap, a bank or insurer agrees to take on a series of payments that relate only to changes in longevity. This strategy has gained momentum in the U.K. over the past few years, with six longevity deals completed in 2009 covering liabilities of approximately £4.1 billion.

Risk-sharing allows plan sponsors to share the financial impact of changes in mortality. In some jurisdictions, plan sponsors have reached an agreement with their members around this.

While investment risk has been the focus of many pension plans over the last couple of years, it's clear that a comprehensive risk management program must include longevity risk. Plan sponsors must monitor this risk diligently and ensure that they manage it effectively. And as new tools are introduced into the Canadian marketplace, plan sponsors may have even better ways to manage longevity risk in the future. **BC**

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