

Evolution of the Canadian Longevity Market

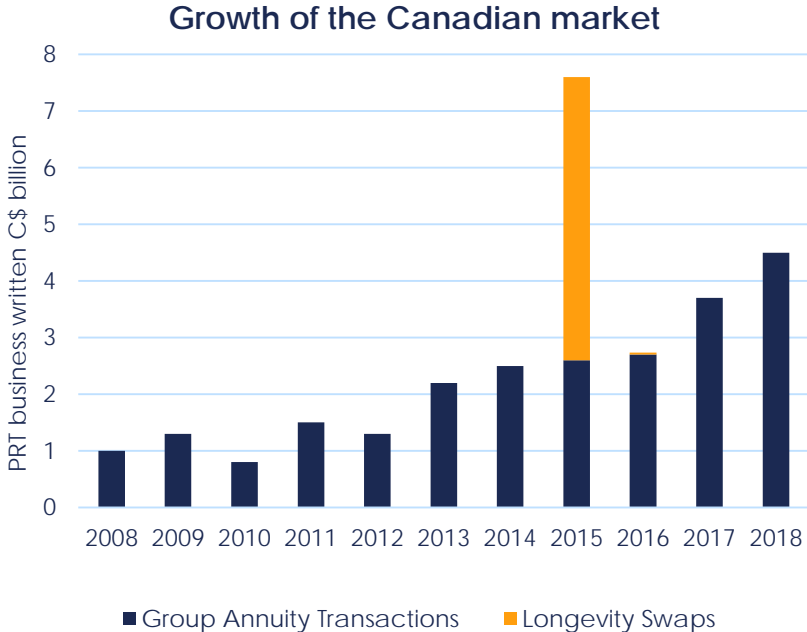
Longevity 15
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Robert A. Diefenbacher, FSA, MAAA
Senior Vice President, Pacific Life Re

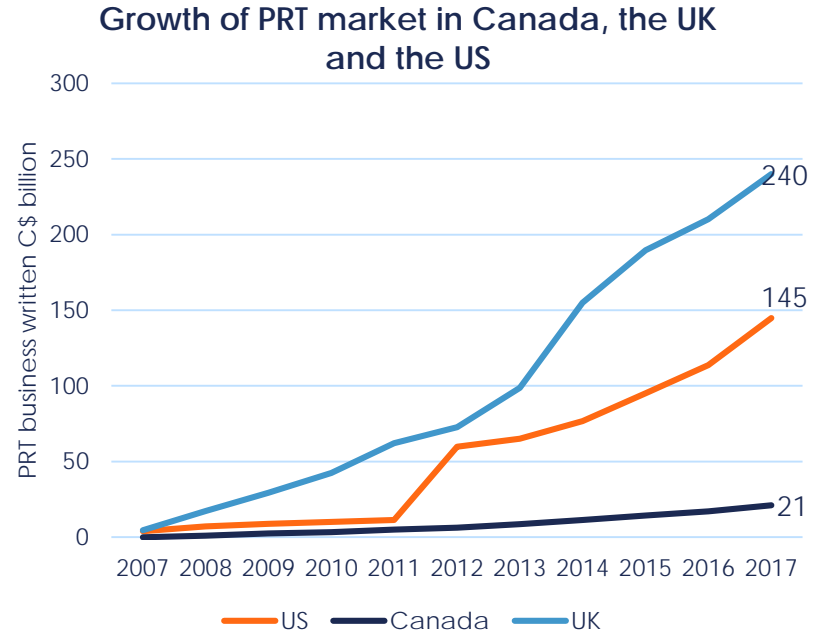


PACIFIC LIFE RE

Canada PRT Market Growing, but lags US & UK



Source: Eckler Pension Risk Transfer Report, March 2019



Sources: LIMRA Secure Retirement Institute (US); Eckler PRT Report (Canada); LCP De-Risking Report (UK)

UK Market: Defined Benefit Pensions

- The UK pensions risk transfer market is driven by the C\$3trn of defined benefit pension liabilities.
- A number of factors have made running defined benefit pension plans increasingly unattractive, driving the growth of pension risk transfer in the UK market:

Rising contributions over the last 10 years, UK FTSE100 companies have paid over C\$240bn into their defined benefit pension plans to meet funding shortfalls.

Increasing longevity has pushed up the cost and unpredictability of providing a guaranteed benefit for life.

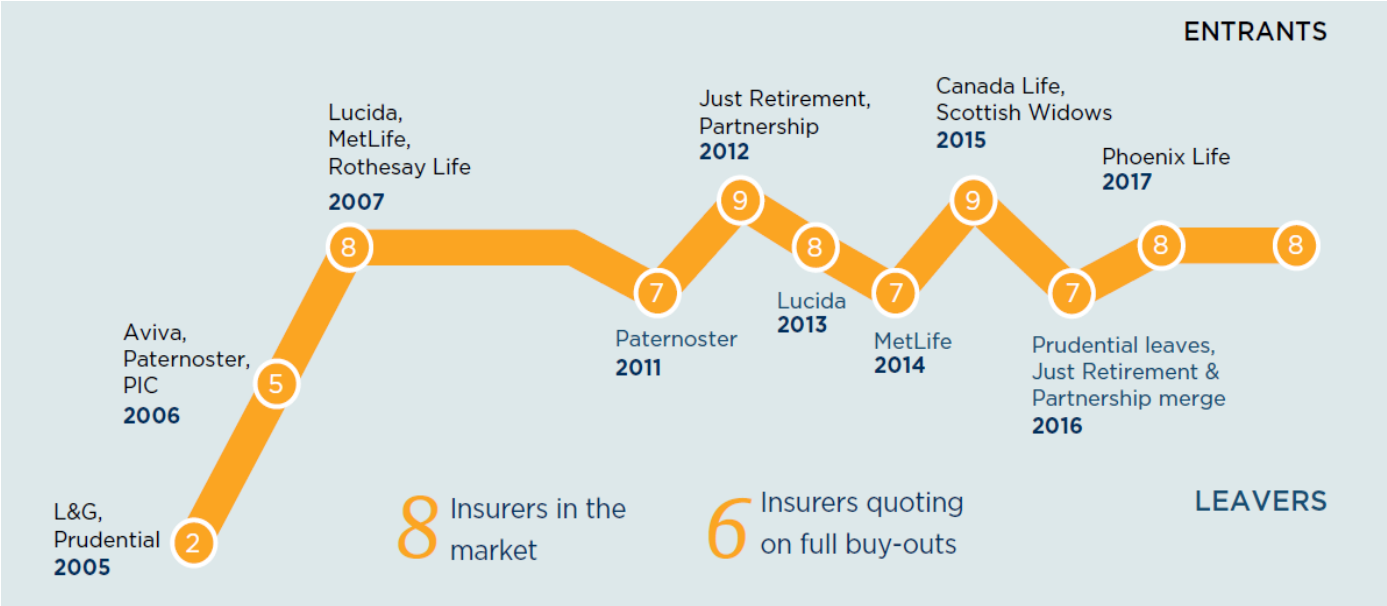
Inflation-linked increases in retirement have further increased costs and uncertainty.

Accounting changes have increased the impact of running defined benefit pension plans on company balance sheets.

Development of the pension risk transfer market has provided opportunities to affordably manage and/or remove the risks associated with defined benefit pensions.

Complex administration and governance has increased costs and distracted management focus.

UK Market: PRT Entrants and Leavers

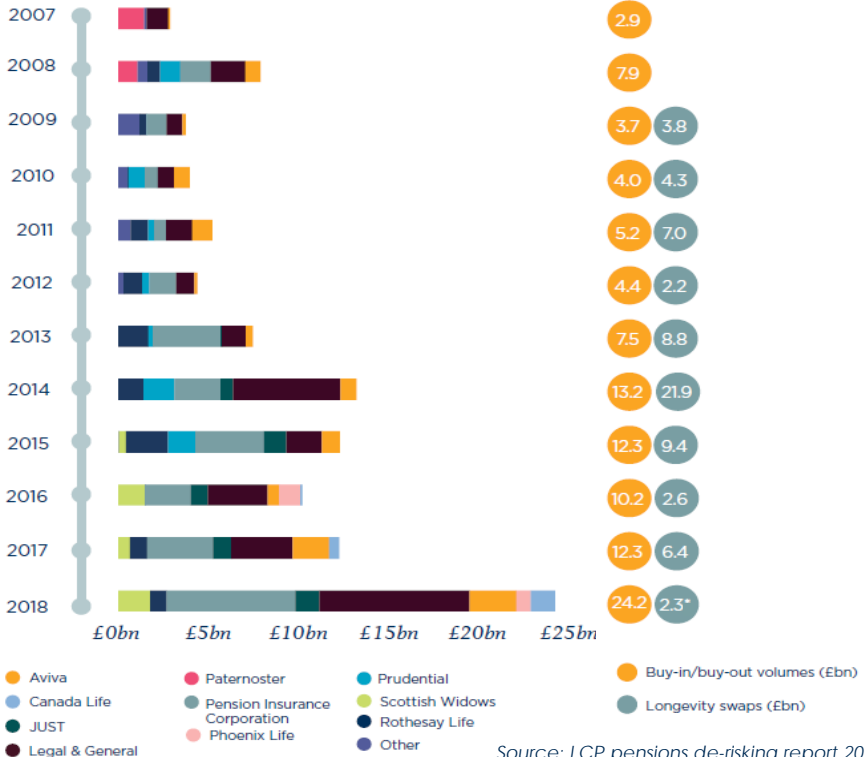


Source: LCP pensions de-risking report 2019

8 Insurers competing for a £30 Billion per annum market

UK Market: Market Evolution

- Pension plan risk transfer activity has been at record levels so far in 2019 in the UK, and is expected to hit more than **£30bn of transferred risk by year-end**.
- Over the last decade, the insurance market has evolved to cater for various participants, including:
 - Solutions for **smaller pension plans**;
 - Increased appetite to take on the risk of members who are **younger and have yet to retire**; and
 - Greater use of **reinsurance** to improve pricing and provide capacity.

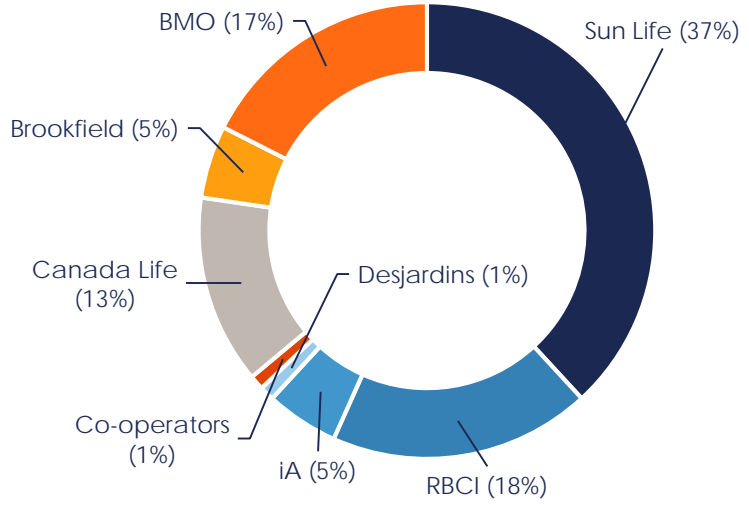


Canadian Longevity Market

Active Canadian PRT Insurers:

- Sun Life 
- RBCI 
- BMO 
- Canada Life 
- Brookfield 
- Desjardins 
- Industrial Alliance 
- Co-operators 

Group Annuity Market Share by Insurer 2018



Source: Eckler Pension Risk Transfer Report, March 2019

8 Insurers competing for C\$5 Billion per annum market

Differences Between Canadian and UK Markets

Some (though certainly not all) key areas of difference between the Canadian and UK markets include:

- Availability of Data
- Required Capital
- Splitting of Transactions
- Lack of Standard Processes and Terms

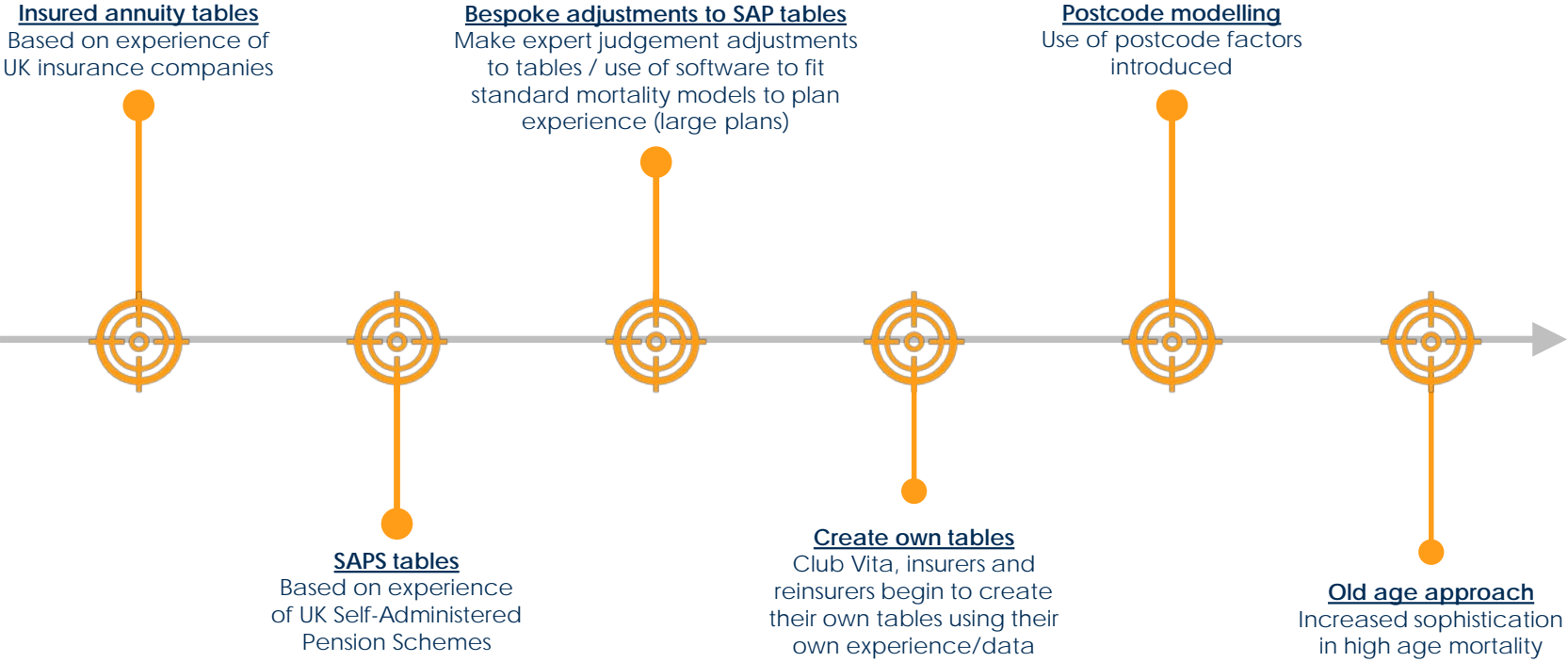
UK Data

- The UK market is mature with **widely available sources of data** to help determine longevity (and spouse demographic) assumptions.
- Third party **pension plan experience data can be purchased** e.g. Club Vita.
- **Granular population death data** can be obtained from the UK Government's Office of National Statistics.
- As a robust longevity market has existed for more than a decade, **re/insurers used their own experience data**.

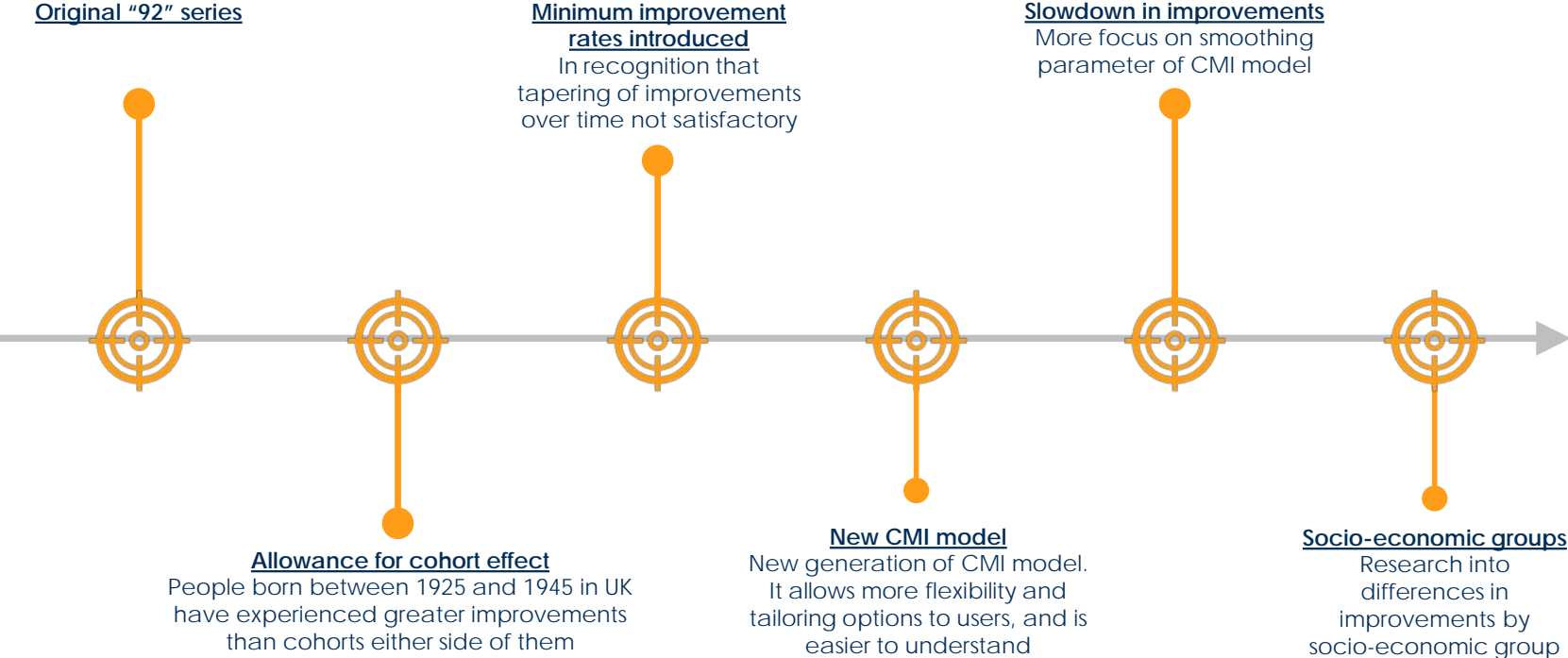
Continuous Mortality Investigation

- The Continuous Mortality Investigation (CMI) exists in the UK as part of the Actuarial Profession.
- They conduct research into the mortality and morbidity experience of insured lives in the UK market.
- This research is published and they **produce tools including mortality tables**.
- Their Self-administered Pension Schemes (SAPS) mortality investigation collects and **analyses mortality experience from the majority of larger UK pension plans**.

UK Evolution of Base Mortality Assumption



UK Evolution of Improvement Assumptions

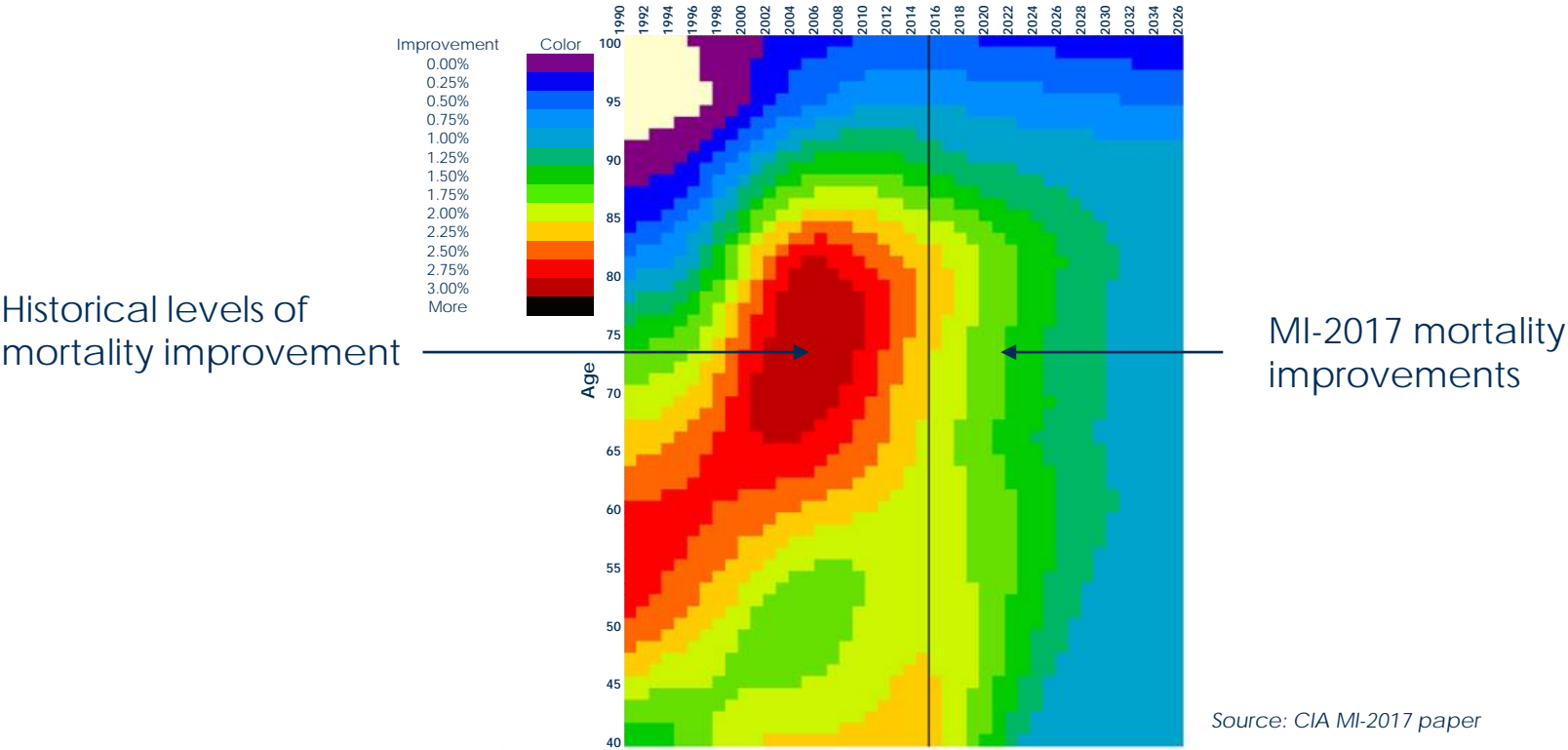


Canada Recent Publicly Available Data Sources

	Canadian Pensioners Mortality Study (February 2014)	Task Force Report on Mortality Improvement (September 2017)
By Who	CIA Pension Experience Subcommittee	Canadian Institute of Actuaries (CIA) Task Force on Mortality Improvement
Details	<ul style="list-style-type: none"> • CPP/QPP Study (Canadian Pension Plan and Québec Pension Plan) • RPP Study (Canadian Registered Pension Plans) 	<ul style="list-style-type: none"> • Historical rates of mortality improvement up to 2011 in the general Canadian population data recorded in the Human Mortality Database (HMD) • Additional data for the Canadian Old Age Security (OAS) program plan up to 2015
Model Output	<ul style="list-style-type: none"> • CPM2014 Base Table • CPM-B Improvement Scale 	<ul style="list-style-type: none"> • MI-2017 Improvement Scale
Data Output	RPP study data covering 101,078 deaths from 1999-2008	None

Third Party data sources (e.g. Club Vita) are becoming available

Comparison of Historical MI with MI-2017



Required Capital on Longevity

UK

- Solvency II:
 - Stresses on base mortality and mortality improvements use Best Estimate assumptions; and
 - Most players in the market (both insurers and reinsurers) using internal models.
- Some reinsurers active in the market are not subject to Solvency II.

Canada

- LICAT:
 - Stresses on base mortality use Best Estimate assumptions;
 - Stress on mortality improvement is a prescribed multiple of 75% of Best Estimate assumption;
 - Resulting in a more conservative base assumption leading to higher capital; and
 - Operational risk component also adds capital.
- Offshore reinsurers must collateralize reserves and LICAT.

Transaction Splitting

- Canadian PRT market will tend to chop up larger opportunities into tranches to spread among multiple insurers.
- Reasons given for splitting include:
 - Asset availability;
 - Credit risk exposure;
 - Less dependency on single provider;
 - Increase participation in RFP; and
 - Competitiveness.

Recent Example:

- C\$900 Million Plan.
- Transaction split into 4 tranches, with each tranche going to a different insurer.
- Largest tranche believed to be C\$420 million.

Established UK Longevity Terms

- There are a broad range of structures used within the UK market e.g. intermediated, pass-throughs and captive arrangements.
- While there is no market standardized longevity contract, a number of concepts are well established and contracts are now more streamlined:

Counterparty Risk

Experience collateral provisions in place to manage counterparty risk

Data Errors

Provision to adjust the contract to allow for gender and date of birth errors

Transaction Models

Use of models to simplify administration and ensure consistent modelling

Termination Events

Agreed events and process for contract termination e.g. payment default

For more information, please contact:

Bob Diefenbacher

Senior Vice President

Pacific Life Re | North America

T: +1-617-391-0950

E: bob.diefenbacher@pacificlifere.com

W: www.pacificlifere.com

Andy McAleese

Head of Longevity, Europe

Pacific Life Re | Europe

T: +44 (0)20 7709 1812

E: andy.mcaleese@pacificlifere.com

W: www.pacificlifere.com