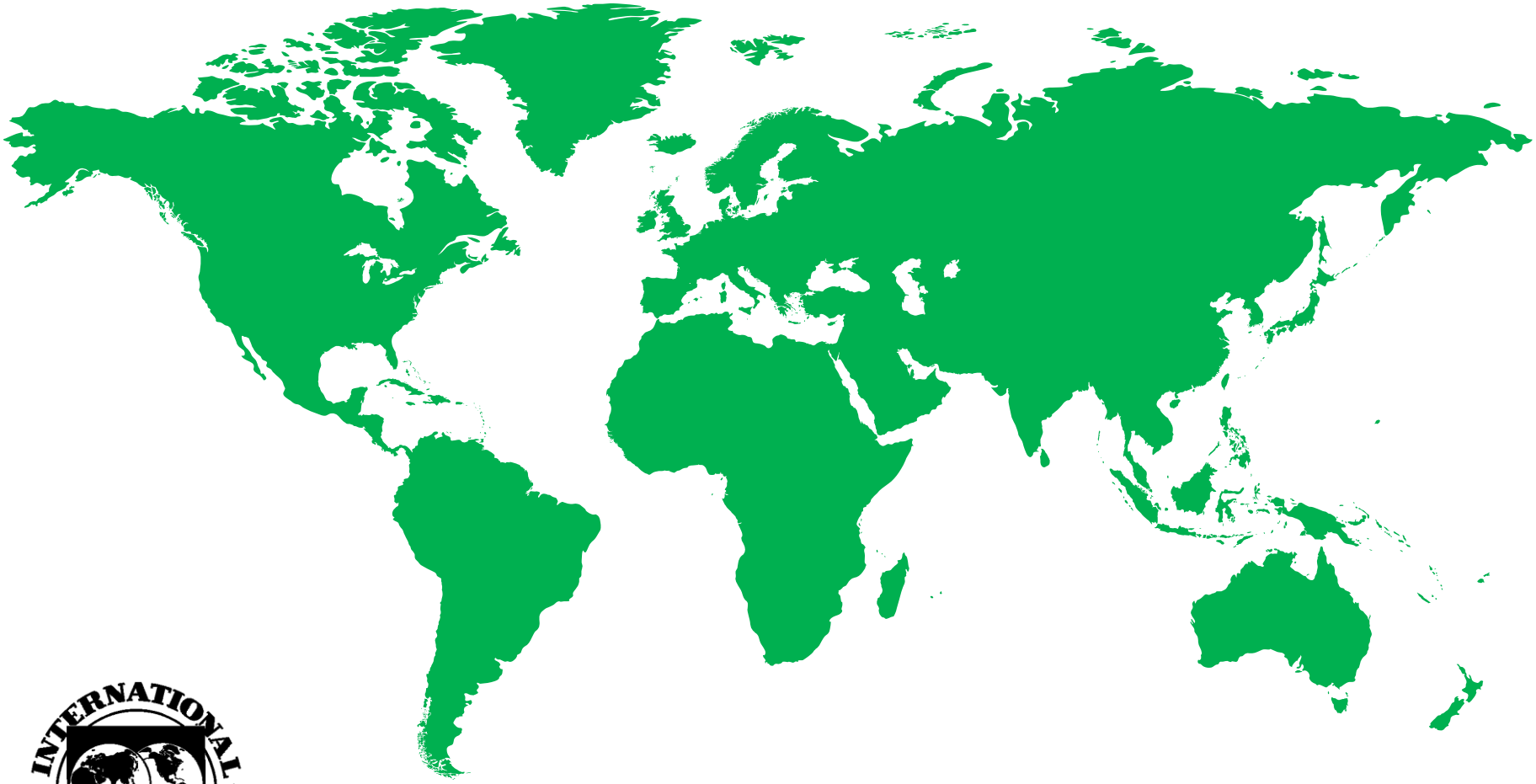
Joint Forum Report on Longevity Risk Transfer Markets



Universidad Diego Portales, Santiago, Chile, September 4, 2014

Agenda

- Motivation for Joint Forum Action
- Global longevity risk landscape
- Longevity risk transfer markets
- Policy recommendations
- U.S. DB plan drill down

The Joint Forum's report on longevity risk will help global policymakers and supervisors remain ahead of the curve as this risk may amplify the interconnectedness of financial sectors and can lead to risk management challenges, systemic risks and stress.

Thomas Schmitz-Lippert, Chairman of the Joint Forum

Motivation

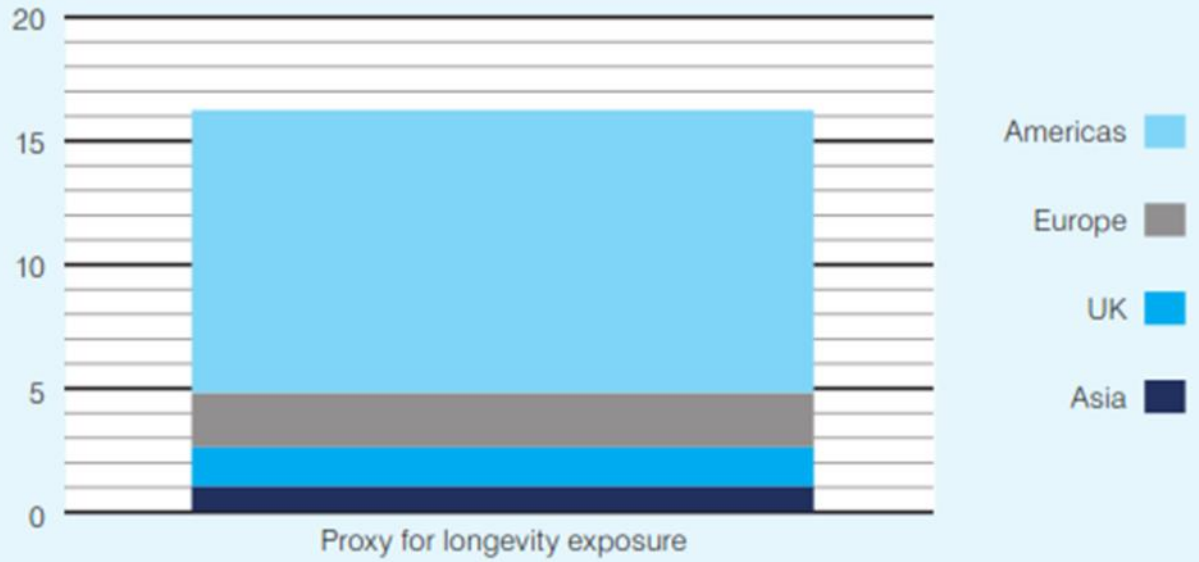
- An important lesson from the credit risk transfer (CRT) markets is that the transfer of risk may lead to undesired and unforeseen consequences
- In the case of CRT markets, a proliferation of complex products resulted in the build-up of concentrated leveraged positions, many held by investors who did not fully understand the risks of these products
- There was often a lack of transparency about what was being transferred and to whom, and markets cracked under stress.

We are now in the midst of another wave of innovation in finance. The changes now underway are most dramatic in the rapid growth in instruments for risk transfer and risk management, the increased role played by nonbank financial institutions in capital markets around the world, and the much greater integration of national financial systems. These developments provide substantial benefits to the financial system. Financial institutions are able to measure and manage risk much more effectively. Risks are spread more widely, across a more diverse group of financial intermediaries, within and across countries. ***These changes have contributed to a substantial improvement in the financial strength of the core financial intermediaries and in the overall flexibility and resilience of the financial system in the United States.***

There is growing recognition that the dispersion of credit risk by banks to a broader and more diverse group of investors, rather than warehousing such risk on their balance sheets, has helped to make the banking and overall financial system more resilient. *Over the last decade, new investors have entered the credit markets, including the credit risk transfer markets. These new participants, with differing risk management and investment objectives... help to mitigate and absorb shocks to the financial system... The improved resilience may be seen in fewer bank failures and more consistent credit provision. Consequently, the commercial banks, a core segment of the financial system, may be less vulnerable today to credit or economic shocks...*

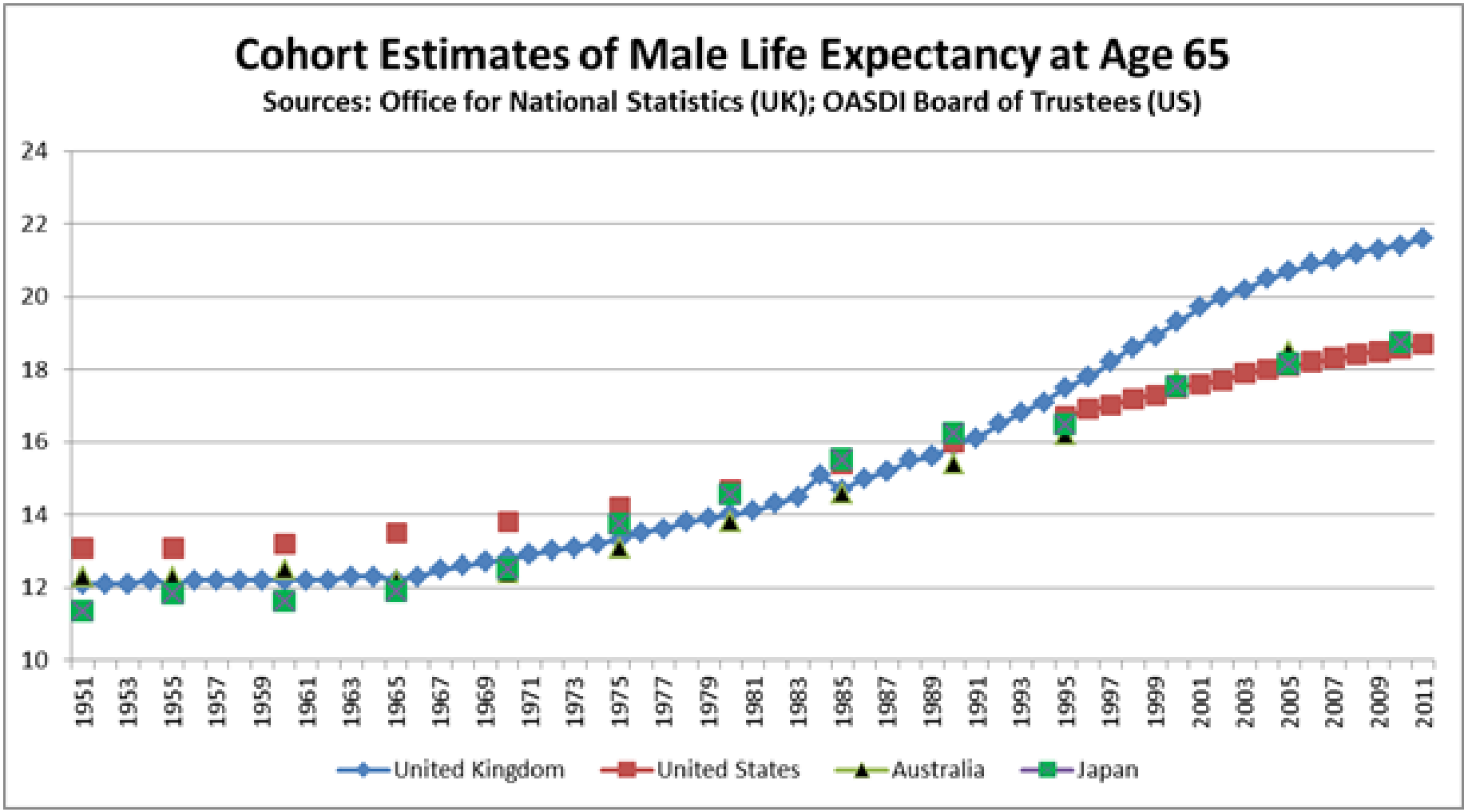
Global longevity risk exposure estimates range from $15 to $25 trillion

Figure 3.1 Funded global longevity risk exposure, as measured by total pension assets in OECD registered countries

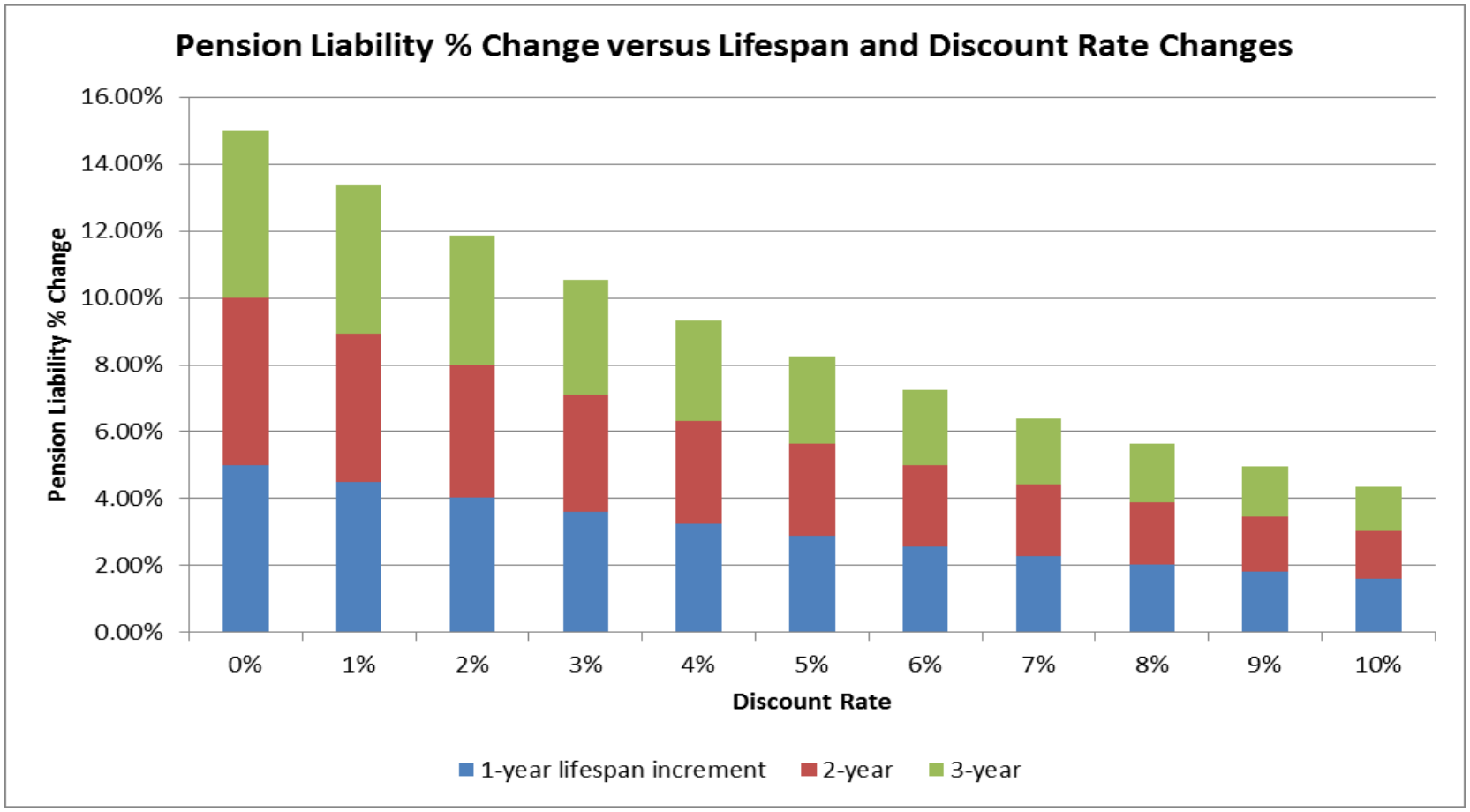


Source: OECD data

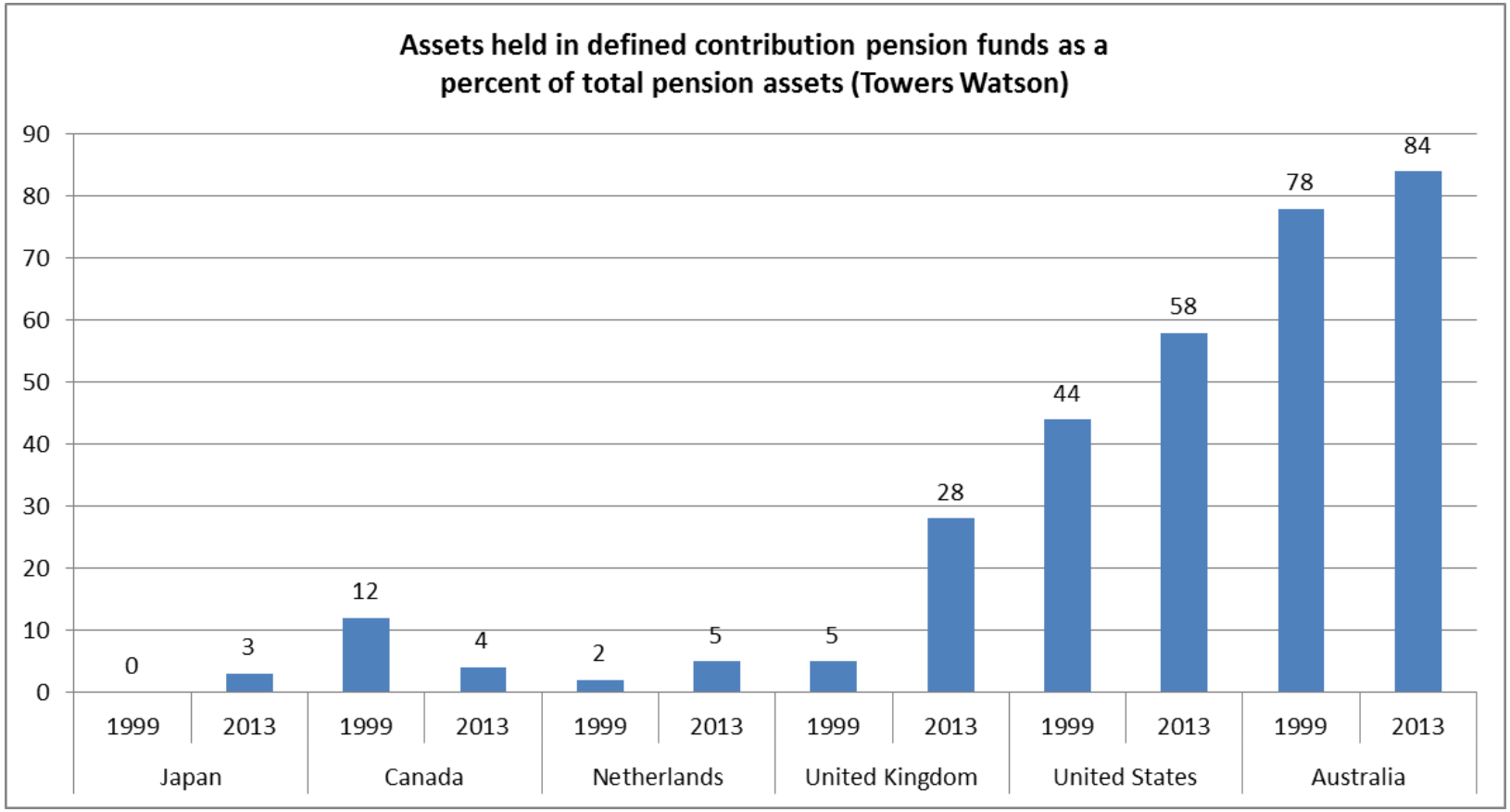
Longevity is consistently underestimated



Longevity underestimation is expensive

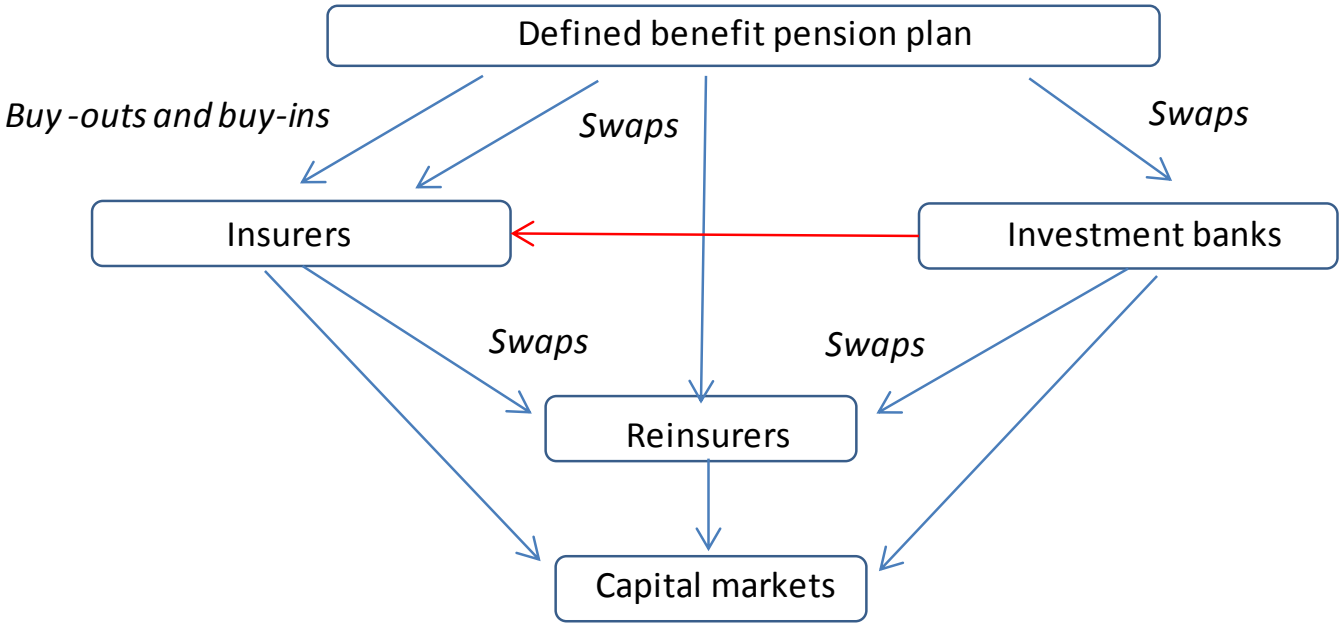


“Traditional” longevity risk mitigation – Transfer it to employees

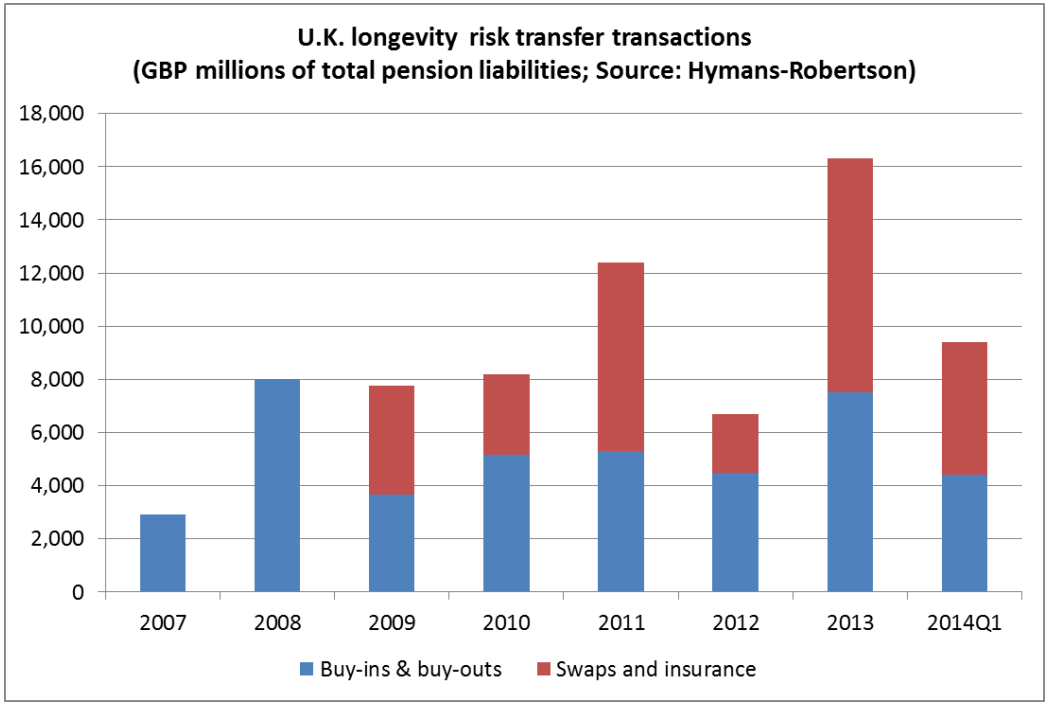


Market-based risk mitigation through buy-outs, buy-ins and longevity swaps

Structure of longevity transfers by defined-benefit pension plans, by type of counterparty



Transaction volumes are a small fraction of total longevity risk transfer potential



Royal London	RGA	Reinsurance	£1,000	May-14
Total UK	PIC / Hannover Re	Buy-In + Reinsurance	£1,600	Jun-14
BT	Prudential (US)	Swap	£16,000	Jul-14
Rothesay Life	Prudential (US)	Reinsurance	£1,000	Aug-14

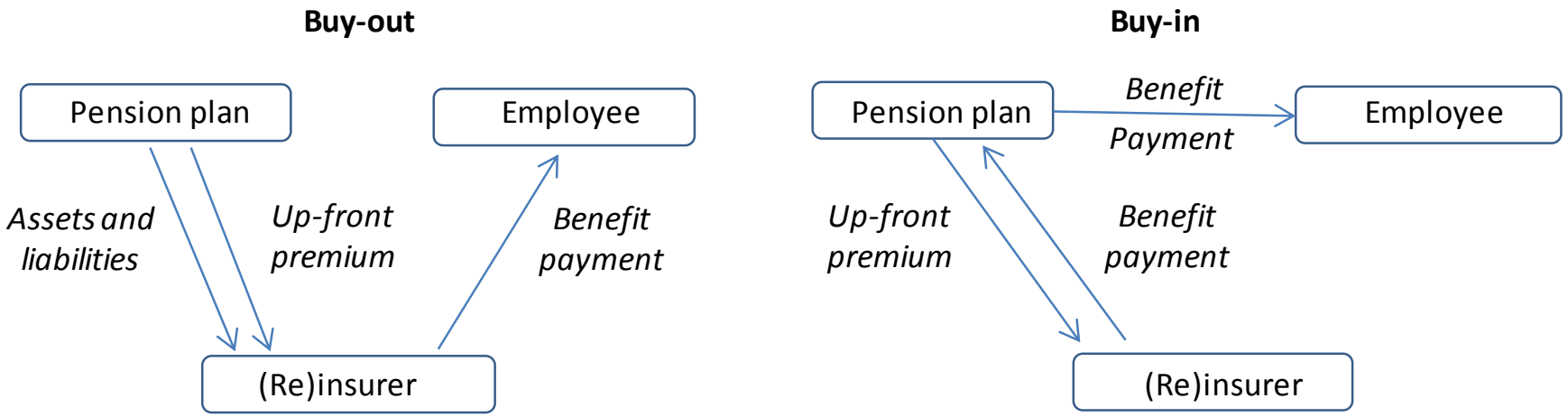
And the Market is Very Concentrated

UK Longevity Risk Transfer Transactions 2010 - 2014Q1					
		Buy-ins			Cumulative
		Buy-outs	Swaps	Total	Total
1	**Legal & General**	£7,719	£5,900	£13,619	28%
2	**Deutsche Bank**		£9,900	£9,900	49%
3	**Pension Insurance Corp**	£6,750		£6,750	63%
4	**Goldman Sachs**	£5,299	£1,300	£6,599	77%
5	**Aviva**	£2,650		£2,650	82%
6	**Prudential**	£2,617		£2,617	88%
7	**Swiss Re**		£2,200	£2,200	93%
8	**Credit Suisse**		£1,700	£1,700	96%
9	**Metlife**	£1,406		£1,406	99%
10	**The Rest**	£369	£100	£469	100%
		£26,810	**£21,100**	**£47,910**	

Non-UK Longevity Risk Transfer Transactions				
Sponsor	**Provider (s)**	**Solution**	**Size**	**Date**
Aegon	Deutsche Bank	Swap	€ 12,000	Feb-12
General Motors	Prudential (U.S.)	Buy-Out	$26,000	Jun-12
Verizon	Prudential (U.S.)	Buy-Out	$7,000	Oct-12
Aegon	Société Générale CIB / SCOR	Swap	€ 1,400	Dec-13
AXA France	Hannover Re	Swap	€ 750	Aug-14

Buy-ins and buyouts have different implications for sponsors and employees

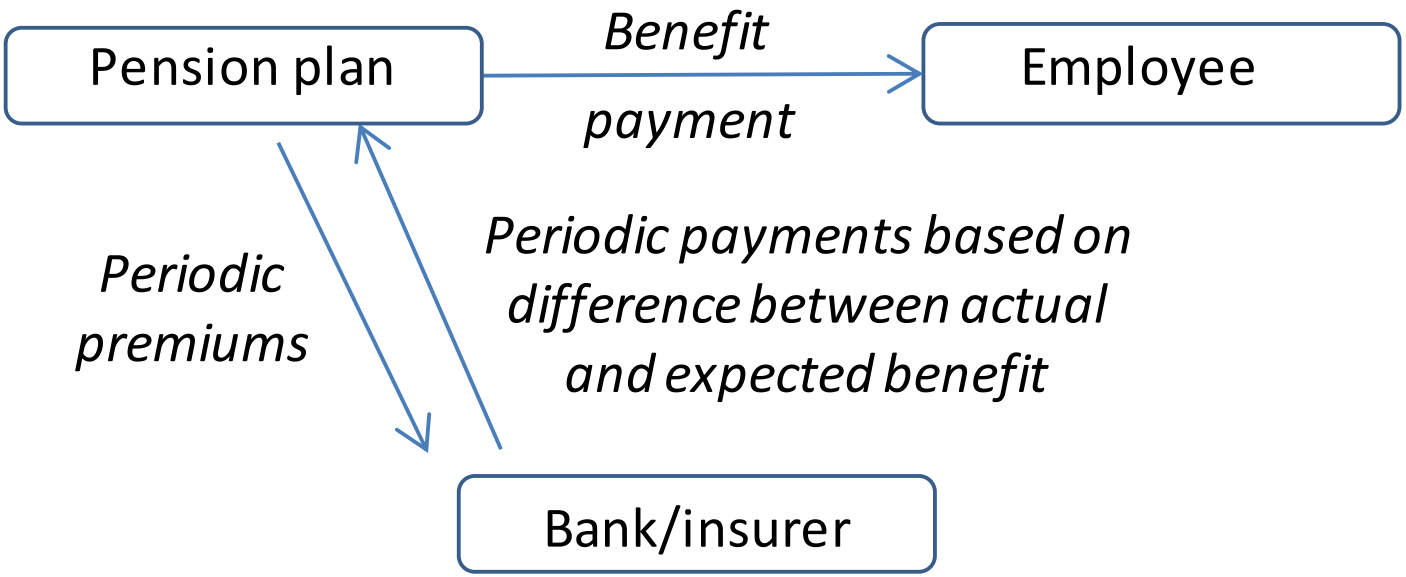
Structure of pension buy-out and buy-in transactions



- Buy-outs usually trigger settlement accounting and may require funding status topping up. Buy-ins do not

Longevity swaps / insurance don't require top-ups and settlement accounting…

Structure of longevity swap transactions



New Players (Some Unregulated) New Risks and Interconnections

- Life (re)insurers may be natural longevity risk buyers but their capacity is limited
- Reinsurers and banks are looking to transfer longevity risk to capital markets
- Often no bright line on what kind of longevity risk transfer transactions can be done with whom.
- In many jurisdictions banking regulations do not explicitly account for longevity risk.

Innovations to Ramp Up Market Leave Behind Basis and Tail Risk

- Some recent transactions are based on standard population indices to improve market liquidity and attract new investor types.
- Other features being used to broaden interest leave risk sellers (ie pension fund sponsors) with various basis and/or tail risks.
- E.g. Some transactions terminate with a close-out payment while the cohort is still alive.
- Others involve capped and floored cash flows.

Pricing transparency and liquidity may be coming to these markets

- The Life & Longevity Markets Association (LLMA) is developing standardized index-based longevity swap curves and pricing models.
- The Deutsche Bourse is planning to offer exchange-traded longevity swaps off their XPect® indices.
- Longevity swaps based on indices using standard ISDA documentation and capped investor risk

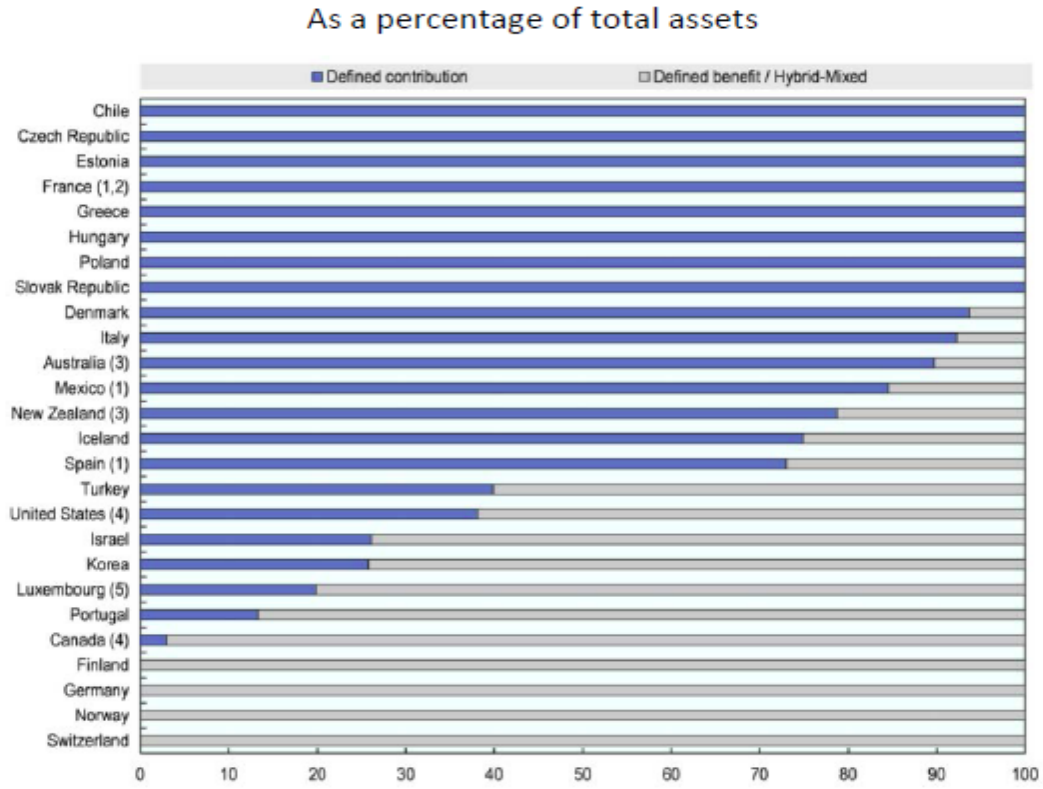
Potential "sell-side" impediments to longevity risk market growth

- Pension funds often not required to fully recognize and deal with (e.g., reserve for) longevity risk
- Pension funds often given more flexibility to choose mortality projections & discount rates than insurers.
- Hedges may not be fully rewarded by regulators and credit rating agencies.

Plus…

- Market risk attract more attention ("in your face")
- Government backstopping assumed (moral hazard)

Figure 18. Relative shares of DB and DC pension fund assets in selected OECD countries, 2012



Note: For methodological notes see page 52 onwards.

Source: OECD Global Pension Statistics.

But investor-friendly transactions create basis risk for longevity risk hedgers

- Techniques to broaden longevity markets expose risk sellers (e.g., pension funds) to new risks
- For example, the Aegon - Deutsche Bank swap:
  - Was based on mortality data from the Dutch National Office for Statistics rather than Aegon's cohort
  - Had a 20-year maturity with a close-out mechanism that determined the final payment, versus traditional open-ended maturities
  - Floored and capped floating payments to limit potentially open-ended investor under-estimation risk

Joint Forum concluded that

While longevity risk transfer markets are not large enough to present systemic concerns yet, their massive potential size and the growing interest from investment banks in mobilizing this risk make it important to ensure that these markets are safe, both on a prudential and a systemic level…

Review Longevity Risk Rules and Regulations

“Jurisdictions and standard setters should review rules and regulations pertaining to the measurement, management and disclosure of longevity risk with the objective of establishing or maintaining appropriately high qualitative and quantitative standards, including provisions and capital requirements for expected and unexpected longevity improvements, within and across sectors. “

Longevity Risk Management Standards Should be High

"Such standards should consider ensuring that institutions taking on longevity risk, including pension fund sponsors, are able to withstand extreme, as well as trend, longevity improvements. Relatively lenient treatment of pension obligations in some jurisdictions has been noted as a market distortion that needs to be better justified by policymakers and regulators."

Market Monitoring Should be Upgraded

"Jurisdictions should closely monitor the longevity risk transfer taking place between corporates, banks, (re)insurers and the financial markets. They should be aware of the amount and nature of the longevity risk that the institutions and sectors are exposed to and of the interconnectedness within the financial markets that the longevity risk transfer arrangements give rise to."

Special Focus Should Be Put on Banking Sector

- “Regulators should be especially aware that longevity swaps may expose the banking sector to longevity risk tail risk, that is, a sharp rise in longevity risk that may lead to a breakdown of the risk-transfer chain.”

Improve Cross-Sectoral Communication

"Communication and cooperation between those with supervisory responsibility for financial instruments containing longevity risk should be improved."

Longevity Risk Data Quality and Timeliness Could be Improved

"Jurisdictions should support and foster the compilation and dissemination of more granular and up-to-date longevity and mortality data that are relevant for the valuations of pension and life insurance liabilities as well as for the measurement and management of longevity risk to the extent possible. Such data would also help to reduce the basis risk created by risk transfer transactions based on standard indices."

Decide Where Longevity Risk is Best Held

"Jurisdictions should review their explicit and implicit policies with regards to where longevity risk is best held to better inform their policy towards longevity risk transfer markets. Such reviews should consider which sectors are in the best position to bear and manage the risk, and the roles of pension and insurer guarantee mechanisms. Ultimate policy could take the form of actively steering the risk or limiting inter-sector transfers."

Motivated by observations that pension funds usually manage to looser longevity reserving

- No specific longevity reserving for European, Japanese and U.S. pension funds (and insurers)
- But Solvency II will impose a charge on European insurers and maybe pension funds
- Pension funds often given more flexibility to choose mortality projections & discount rates than insurers
- Notable exceptions are the Netherlands and U.K. where pension funds must use latest life tables and account for unexpected longevity improvements

Pension funds are often given more flexibility on mortality projections & discount rates

- Again Netherlands and U.K. are notable for aligning insurer and pension fund discounting inputs – e.g., risk-free interest rate curves
- But German pension fund discount rates exceed those applied to insurers
- In the U.S. pension liability discount rates can be based on corporate bond yields. The rates applied to insurer liabilities are generally higher

Rationale for more lenient treatment of corporate pension plan longevity risk?

- Additional protection provided by the sponsor?
- Preference to spread pension risk around due to…
- Capacity constraints in the (re)insurance sector?
- Whatever the rationale, it could be more explicit
- And there should be more communication, cooperation and coordination between the bodies that oversee pension funds and insurers

Longevity assumptions of U.S. defined benefit plans

Michael Kisser[1], John Kiff[2], Erik Oppers[2] and Mauricio Soto[2]

[1]Norwegian School of Economics / [2]International Monetary Fund

What do we do…

- Investigate relation between longevity assumptions and pension liabilities for a large sample of U.S. corporate DB pension funds from 1999 to 2007
- Using detailed actuarial information from the U.S. Department of Labor…
- Investigate whether longevity assumptions depend on financial risk characteristics of plan and sponsor
- Estimate longevity assumption impacts on liabilities

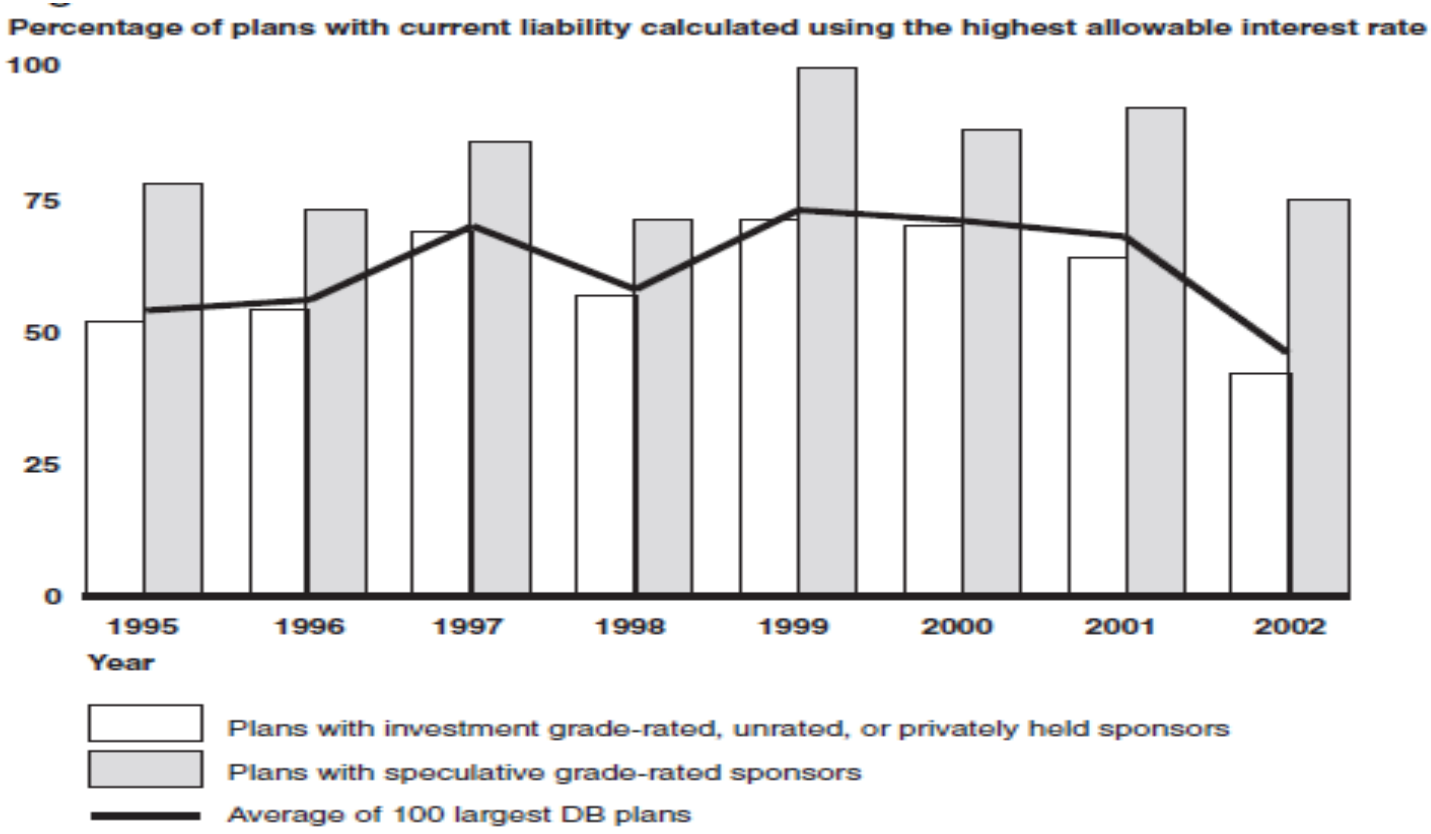
How we do it…

- Use Department of Labor Form 5500 data which must be filed by all corporate plan sponsors
- Focus on DB plans with at least 100 members
- Remove observations with erroneous, ambiguous or missing mortality table indicators still leaving 58,909 plan-year observations for 13,908 plans
- Impute each sponsor's longevity assumptions from the demographic and mortality table data

What we find…

- Positive relation between funding status and life expectancy assumptions – underfunded plans make shorter life expectancy assumptions
- As do sponsors with higher leverage, more growth opportunities and/or lower dividend yields

Low-rated sponsors tend to use higher liability discount rates



Source: GAO analysis of PBGC Form 5500 research data and COMPUSTAT data.

Why should we care?

- U.S. DB funds are already severely underfunded, and with total liabilities of about $2.0-2.5 trillion…
- One-year of longevity underestimation equals about $80-100 billion of further underfunding
- Which would require a substantial top up from the employees and/or employer or the Pension Benefit Guaranty Corporation (if the sponsor fails)
- Currently high stock market levels hide the problem but it will eventually come home to roost

Key Takeaways

- Longevity risk transfer markets not yet big enough to be a systemic risk concern, but potential size and increasing “shadow insurer” roles bear monitoring
- Regulations and policies that pertain to longevity risk should be reviewed, particularly with regard to where longevity risk should reside
- Authorities should communicate and cooperate on longevity risk policies across sectors and borders

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Joint Forum, “Longevity risk transfer markets: market structure, growth drivers and impediments, and potential risks” (http://www.bis.org/publ/joint34.pdf)

Kisser, Michael, John Kiff, Erik Oppers and Mauricio Soto, 2014, “Longevity assumptions and defined benefit pension plans,” Unpublished paper. (http://ssrn.com/abstract=2022883)

IMF GFSR and OECD call for longevity risk recognition and mitigation

- Governments are the ultimate holders of longevity risk directly via social security and health care schemes, and indirectly via backstopping private sector shortfalls
- They should (1) recognize these exposures and (2) take measures to reduce public balance sheet vulnerabilities
- Possible measures include linking retirement ages and/or payouts to expected longevity
- Market-based transfer of longevity risk could help