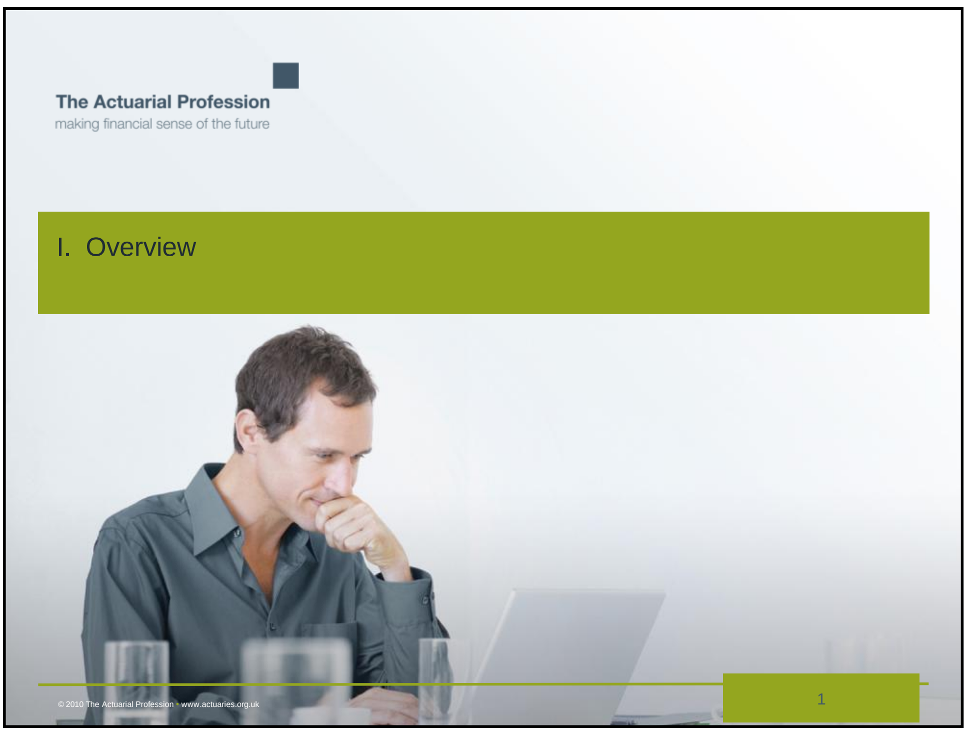
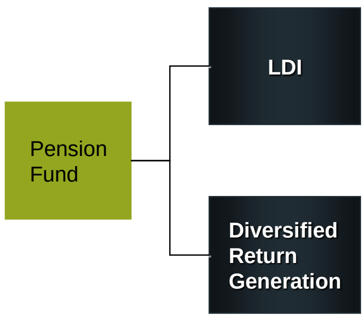

The Actuarial Profession
making financial sense of the future
Latest Developments in Pension Risk Transfer Solutions
Steven Dicker
Pensions Conference 2011
© 2010 The Actuarial Profession • www.actuaries.org.uk

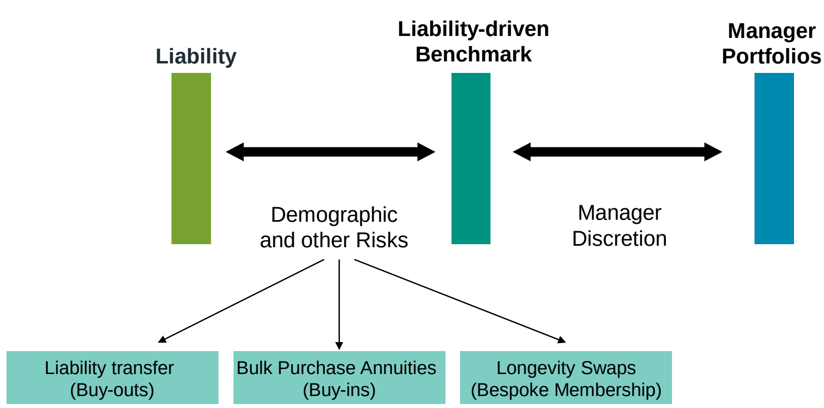

The Actuarial Profession
making financial sense of the future
I. Overview
1
© 2010 The Actuarial Profession • www.actuaries.org.uk

Evolution of Pension Fund Investment
The last 5 years

- Breakdown in the traditional approach of
  - strategic asset allocation
  - with regular rebalancing
- Increasing use of a combination of LDI and return generating assets

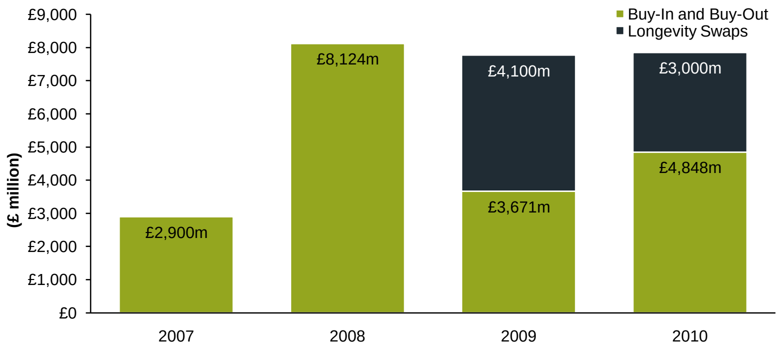


Solutions Have Emerged to Address the Longevity Risks Ignored by LDI Mandates



The insurance de-risking market

Buy-In, Buy-Out and Longevity Swap Transactions



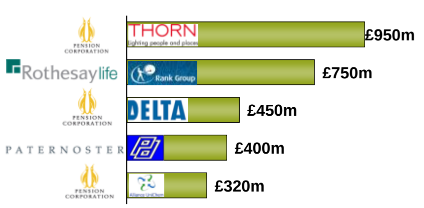
- Over the last four years, 11 providers have transacted 21 deals of premium exceeding £250m
- The entry of new players to the Bulk Annuity Market has stimulated larger and more bespoke transactions

Source: Press Releases

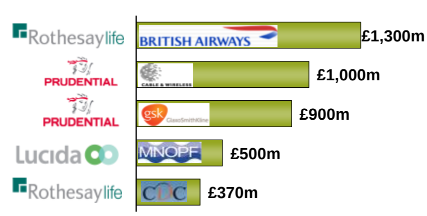
4

Evolution of the UK Bulk Annuity and Longevity Market Recent Pension Scheme Transactions

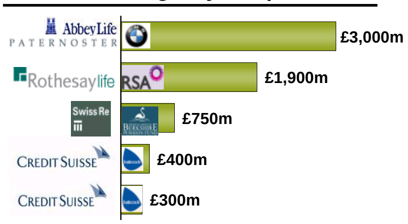
Buy-Out



Buy-Ins



Longevity Swap

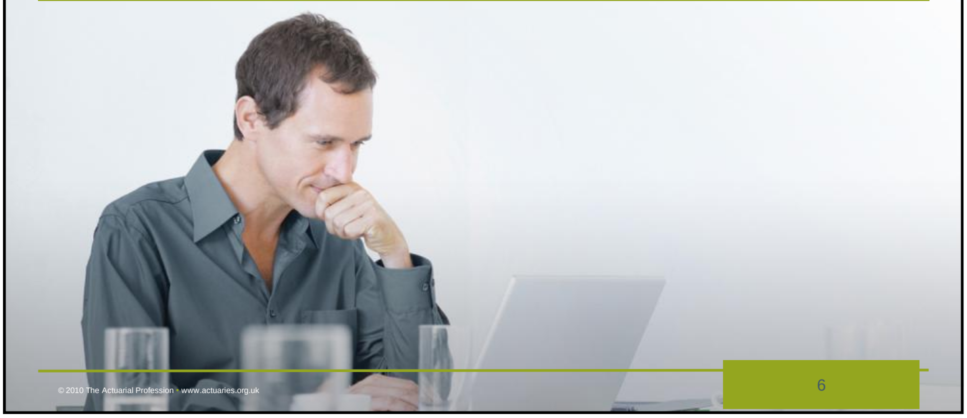


Source: Press Releases

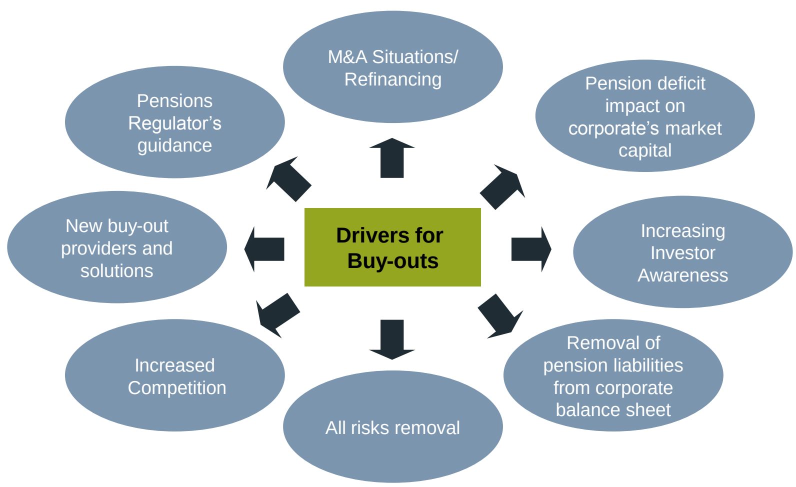
5

The Actuarial Profession
making financial sense of the future

II. Buy-Out



Exit is Increasingly the Aim for Many Corporates



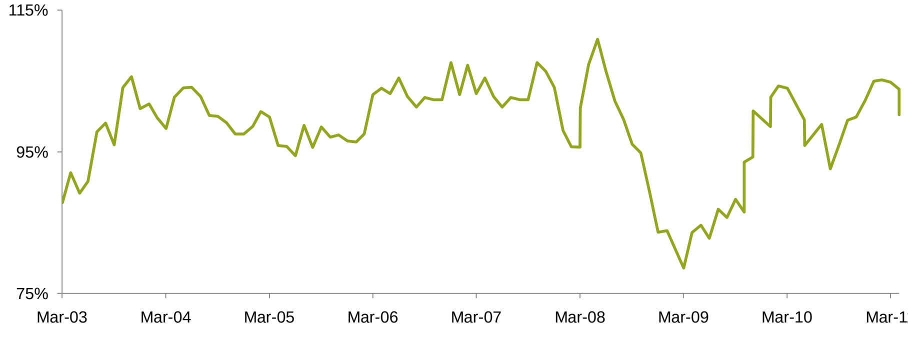
Issues to Address in a Settling Liabilities

- Residual liabilities (i.e. unknown liabilities)
  - Missing beneficiaries
  - Errors in benefits
  - GMP reconciliation
  - GMP equalisation
- Discretionary benefits
- AVCs
- ETVs previous to Buy-Out
- Trustee indemnities
- Corporate affordability
- Deferred premium

8

Execution is Complex When Solvency is Volatile

Example scheme - Buy-out solvency in last 8 years



- Company board is unlikely to approve a transaction without knowing the cost in terms of any additional contributions
- Trustee board may not want to derisk to match the premium unless company is committed to paying the shortfall

Source: PPF 7800 Website Data

9

Target Based Execution

Enables the transaction to be executed at the point when the Corporate's budget for the buy-out shortfall is met through market movements

Target Setting

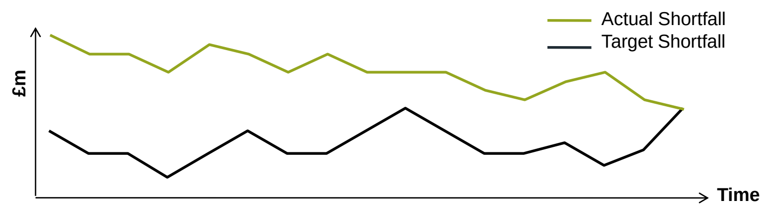
- The Corporate would set its Target Shortfall amount for the transaction
- The transaction is only enforced at the point of execution

Monitoring Phase

- The insurer then monitors the shortfall level against the Corporate's target on a regular basis
- The Scheme's Assets remain within the Scheme until the point of execution
- When the Target Shortfall level is met, the transaction will be executed

Execution

- At the point of execution, the Scheme Assets are paid to the insurer

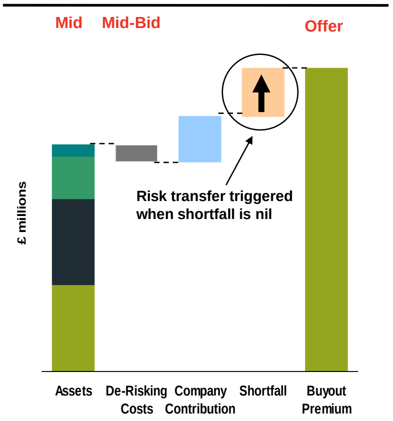


10

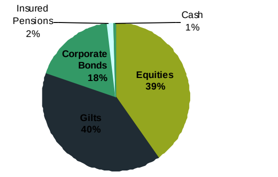
Solving the Execution Conundrum

Opportunistic execution is critical if the entire transaction is contingent on an affordable contribution from the company

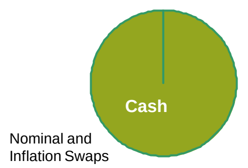
Overview of Execution Trigger



Pre-Transition Asset Mix

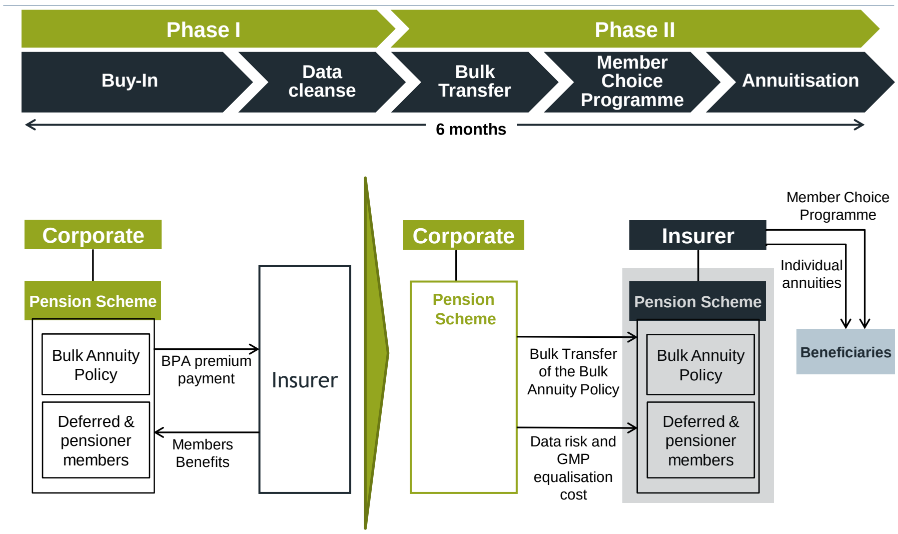


Post-Transition/Premium



11

Buy-In Followed by Buy-Out



12

Buy-In Followed by Buy-Out

Phase I

- The Insurer commits to a Data Risk Premium and the cost of equalising Guaranteed Minimum Pension benefits (“GMPs”)
  - Requires detailed process due-diligence
- Payment of Bulk Annuity Premium by the Pension Fund to the Insurer
  - The Insurer becomes liable for meeting pre-defined benefit obligations to the insured members under a Bulk Annuity Policy (“BPA”)
- A data cleanse is carried out to remove pre-transaction deaths and correct for any benefit errors

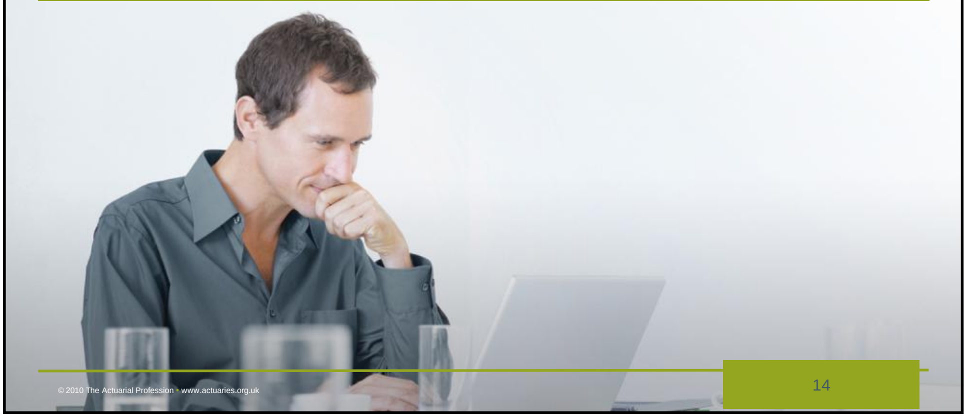
Phase II

- Following data cleanse, an adjustment is made to the Premium
- Data Risk Premium and GMP equalisation cost paid by the Pension Fund
- Settlement of the liabilities via assignment/bulk transfer

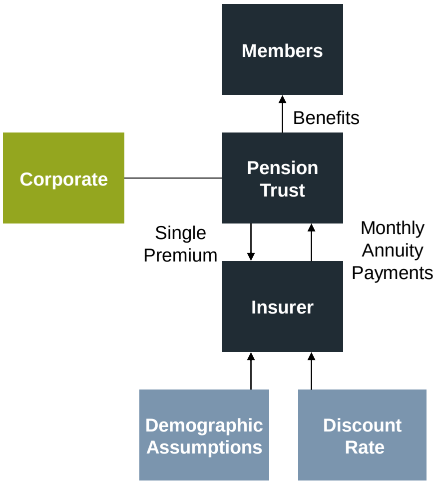
13

The Actuarial Profession
making financial sense of the future

III. Buy-In



Basic Bulk Annuity Structure (a Buy-in)



Features

- Trustee pays a single premium to invest in a bulk annuity
- Insurer pays the trustee the monthly annuity amounts
- Trustee retains the liability and admin to pay the benefits
- Annuity may or may not replicate the benefits exactly
- 2 key pricing inputs:
  - Demographic Assumptions
  - Discount rate

The Security Profile of a Vanilla Buy-in

- **The Industry has previously relied on FSA oversight**
  - Capital requirements provide considerable security
- **Recent and emerging focus on some key aspects of security**
  - Reserving at the annuity provider
  - Extent of exposure to risky assets (eg credit)
  - Viability of business model
  - Commitment from holding company/investors
  - Diversification of holding company
- **As a result, a variety of security approaches have emerged**
  - Charges/Pledges on insurance assets
  - Regular premium / funded longevity swaps
  - Full collateralisation of annuity value

16

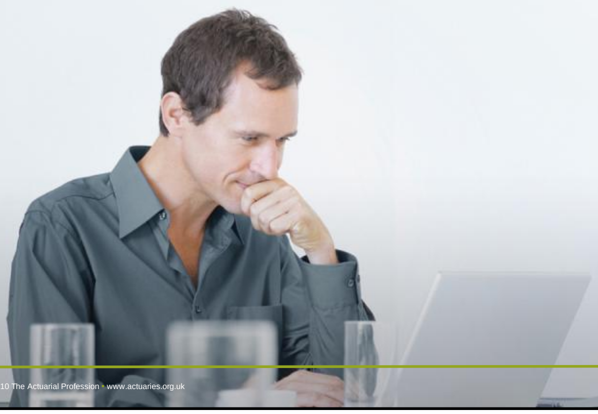
Enhanced Security
Protection against Default Risk

- Issues to consider
- ✓ How transparent is the annuity valuation methodology?
- ✓ What are the longevity assumptions to calculate the value?
- ✓ Who retains the ownership of the collateral assets?
- ✓ How the assets are recovered on the insurer default?
- ✓ What constraints are there over the assets used as collateral?
- ✓ What protection do the Trustees have when credit assets are used as collateral?
- ✓ How correlated are the collateral assets with the insurer default?
- ✓ How frequently is the level of collateral adjusted?
- ✓ How collateral moves for rises on premiums

17

The Actuarial Profession
making financial sense of the future

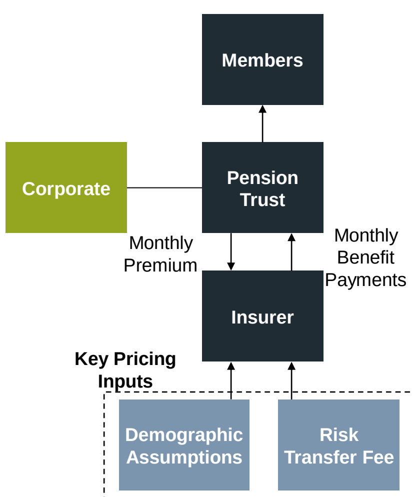
IV. Longevity Swaps



18

Longevity Swap Pricing and Impact on Funding

Longevity Swap



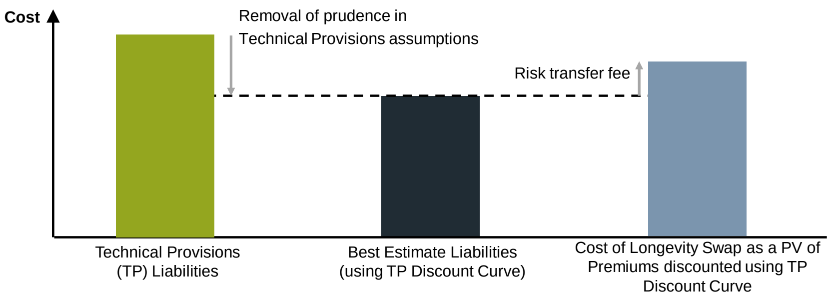
Longevity swap pricing is a combination of:

- Best estimate assumptions comprising
  - Base table for mortality
  - Longevity improvement trends
  - Proportion eligible for spouses pensions
  - Age difference between members and spouses
- Risk Transfer fee reflecting the level of longevity risk in the contract
- The impact on funding can vary, in some cases if the funding assumptions are prudent the longevity cost be lower than Technical Provisions (see next page)

19

Longevity Swap Pricing and Impact on Funding

Example of Impact on Funding of Longevity Swap Pricing



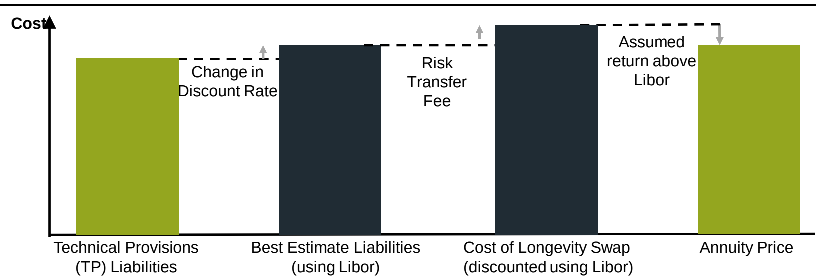
- The impact of longevity swap pricing on funding is difficult to measure considering asset and longevity risk separately

Longevity swap pricing is often compared against a scheme's Technical Provisions (TP) which typically include a prudence margin on demographic assumptions. However, the true cost should be measured against best estimate, implying a "Drag" that must be funded (i.e. the risk transfer fee)

20

Longevity Swap Pricing – Risk-Free Perspective

Example of Longevity Swap Pricing on a Risk-Free Basis and Annuity Pricing



- On a risk-free basis (Libor basis), the Best Estimate liabilities are bigger than the Technical Provisions in this case due to the change in the discount rate
- On this basis, annuity prices are typically lower than the Libor based PV of the longevity swap premium because insurers will typically make an allowance for a return above Libor in pricing the annuity

Many processes request both longevity swap and annuity pricing. In a risk-free analysis, the annuity has been more attractive due to its affordability and risk mitigation.

21

The Longevity Swap – Issues and Mitigants

While a longevity swap could remove a number of key risks from a pension scheme, a number of residual issues should be addressed and potential mitigants considered…

Protected Risks

- Longevity risk
- Proportion married risk
- "Second order" longevity / inflation risk
- Age difference risk
- Counterparty risk mitigated through effective collateralisation

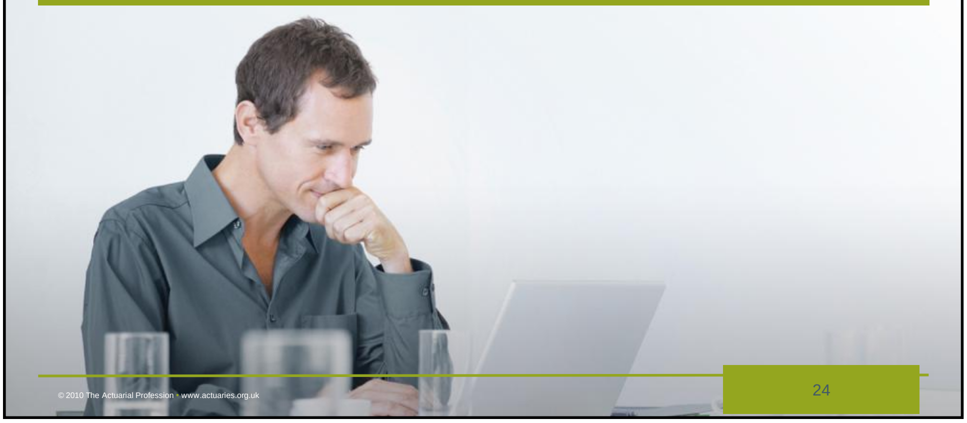
	Residual Issues	Potential Mitigants
1	Cost of funding the longevity swap "drag"	Additional contributions into scheme Optimise fixed income portfolio to monetise illiquidity
2	Inflation caps and floors Interest rate mismatch Inflation mismatch	LPI hedging Rates and inflation hedging or alignment of longevity swap premium line and cash flows from LDI portfolio
3	Longevity swap should not limit flexibility to continue to manage pension scheme risk (i.e. conversion to bulk annuity)	Ensure terms facilitate conversion to bulk annuity at pre-agreed annuity premium target

Longevity Solutions Compared

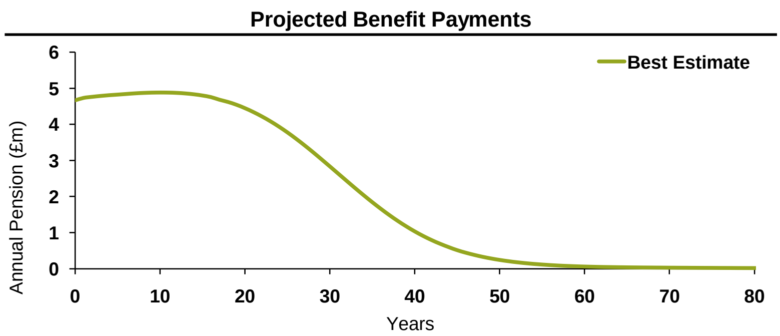
Liability transfer (Buy-outs)	Bulk Purchase Annuities (Buy-ins)	Longevity Swaps (Bespoke Membership)
Risks Mitigated Longevity Investment risks Pension increase (eg LPI) and interest rates Operational, legal and data	Risks Mitigated Longevity Investment risks Pension increase (eg LPI) and interest rates	Risks Mitigated Longevity
Advantages Complete risk removal	Advantages Vast majority of risks can be removed at competitive levels	Advantages Allows the scheme to retain assets Relevant if annuities are not affordable
Disadvantages Benefits need to be codified without any trustee discretions	Disadvantages Liability remains with trustee and on corporate b/s	Disadvantages Insurer pricing doesn't include investment return Need to fund risk transfer

The Actuarial Profession
making financial sense of the future

V. Swaps versus Buy-In



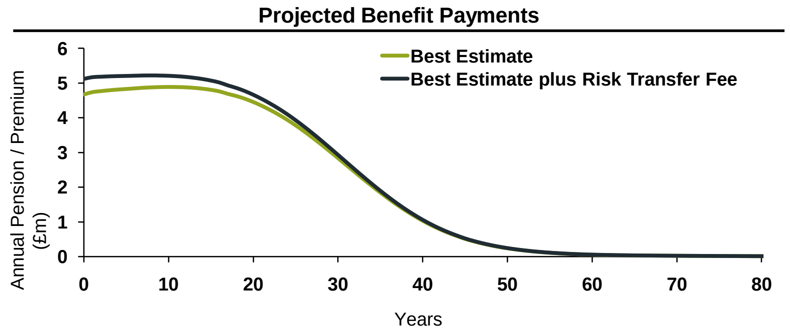
A Gilt-matching Investment Approach



- A gilt portfolio can be constructed to match the best estimate benefit payments
- The value of the matching portfolio is equal to the present value of the benefit payments discounted using a gilt curve
- If the present value of the benefits is 100, then a gilt portfolio value of 100 is needed

Pricing for illustrative purposes, as of 20-May-2011
This analysis is provided for your information only based on certain set of assumptions and does not guarantee any future performance
Source: Goldman Sachs

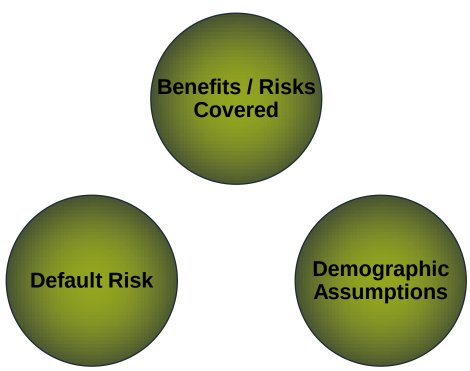
Gilt-matching Investment plus a Longevity Swap



- Longevity risk can be hedged using a longevity swap
- Trustees will now need more money to cover the risk transfer fee
- For a liability duration of 15 years and a longevity risk transfer fee of 40bp, the present value of the swap premium will be ~106, i.e. a gilt portfolio of 106 is needed

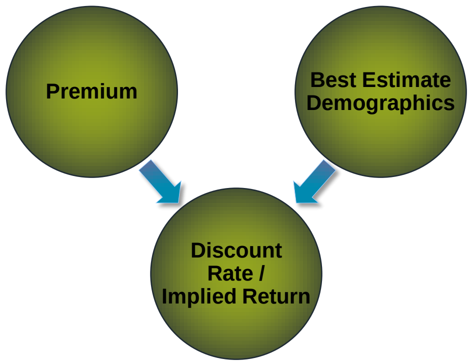
Pricing for illustrative purposes, as of 20-May-2011
This analysis is provided for your information only based on certain set of assumptions and does not guarantee any future performance
Source: Goldman Sachs

Swaps v Annuities - Making a Valid Comparison



These 3 areas need to be consistent in order to compare the value of an annuity and the gilts plus longevity swap structure.

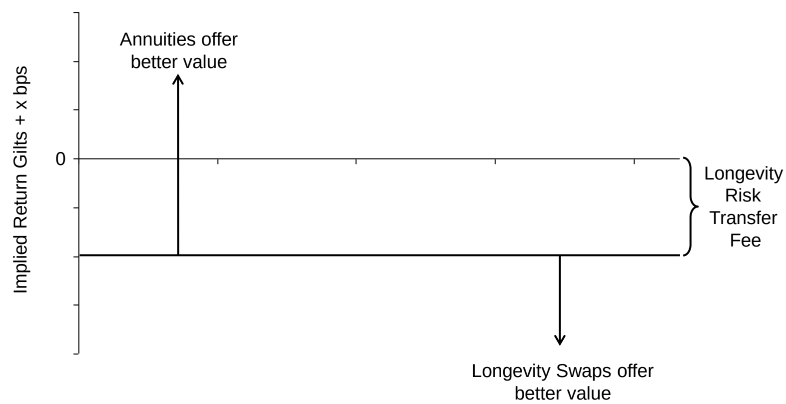
Implied Return on Annuity



The discount rate / implied return is a function of premium and the best estimate demographics.

28

Comparing the Implied Return / Costs



Comparison is best made using best estimate assumptions but changing the demographic assumptions is unlikely to change the relative positioning .

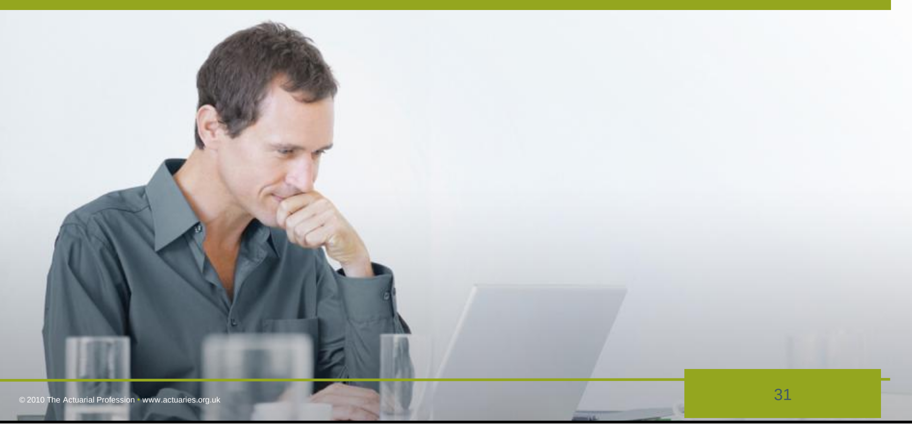
29

Additional Considerations

- Can we generate a better return than gilts without taking more risk than collateralised annuity?
- Are there any second-order longevity risks?
- Need to adjust for the hedging costs for pension increases caps and floors (i.e. Limited Pension Indexation (LPI))
  - LPI exposures would be hedged by an annuity but are not usually hedged by a longevity swap

The Actuarial Profession
making financial sense of the future

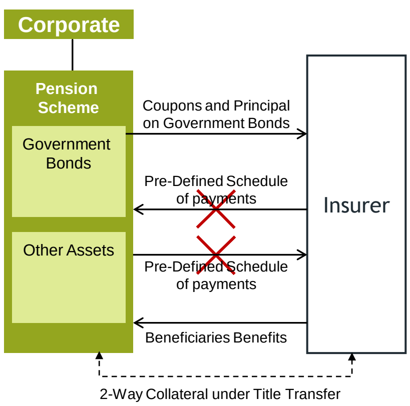
V. Synthetic Buy-In



Synthetic Buy-In

Risks Covered

Interest rates › Inflation › Longevity › Asset Volatility › Reinvestment › Pensions' Volatility

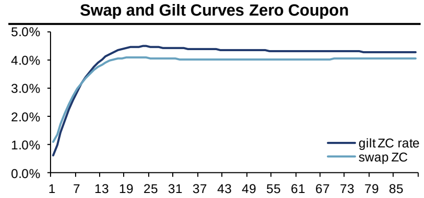


- For the more sophisticated investors, synthetic buy-ins totally remove the asset and longevity risks in a fully collateralised transaction executed as an asset swap and a longevity swap
- In return for the benefit payments, the Scheme pays the coupons and redemption amounts due on the government bonds held to back the contract
- The transaction is structured as an insurance contract, under which the Trustees retain ownership of the assets, comprising government bonds
  - The Trustees retain the default risk on the government bonds but have flexibility over the use of the government bonds and are able to post them as collateral to other counterparties for derivatives

Synthetic Buy-In Transaction Economics

Insurers Pricing Liabilities using a Libor discount rate

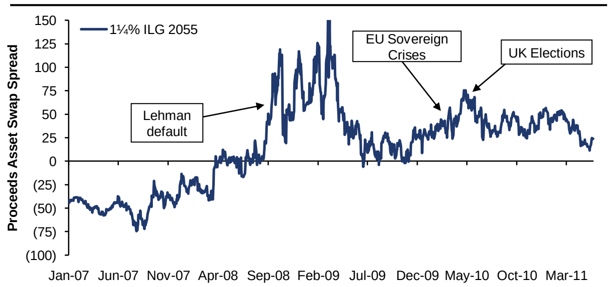
Swap and Gilt Curves Zero Coupon



Comments

- Pension Funds typically discount using Gilt yields
- Some insurers price liabilities using libor, i.e. swap-based values and then adjusts to reflect
  - Investment opportunities available to the insurer at the time of the transaction
  - Reinvestment risk
  - Hedges and transaction costs
  - Longevity risk

Gilt Asset Swap (bps)



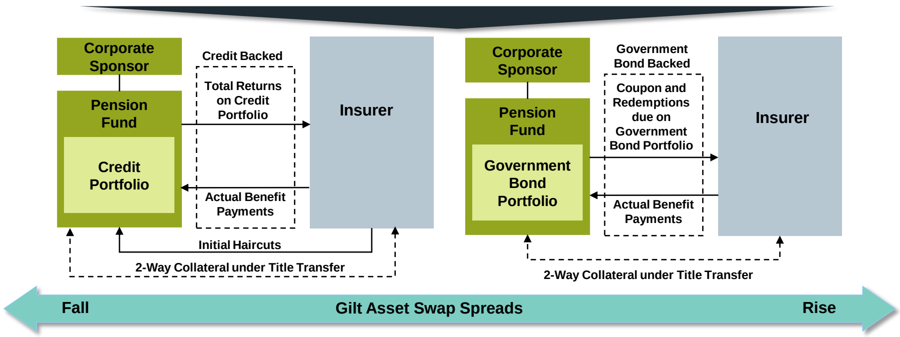
Source: Goldman Sachs' Plot Tool

Commentary

- The chart shows the yield available from a long-dated index-linked gilt relative to swap rates (i.e. the swap spread)
- Until 2008, the swap spread on gilts had been running at around 50bps under swaps
- During 2010 and 2011, market conditions have remained volatile, following the formation of a coalition government , the recent budget and the ongoing global concerns regarding sovereign credit

Increasing the Probability of Executing at a Target Price

To maximise the probability of the transaction: dual track two kinds of structures with different pricing behaviours



	Regular Buy-In	Synthetic Buy-In
Portfolio of Assets	■ Bonds	■ Government Bonds
Default Risk on Assets	■ Insurer	■ Trustees
Control over Assets	■ Insurer	■ Trustees
Collateralisation	■ Daily 2-Way ■ Haircuts	■ Daily 2-Way

34