



Agenda

Summary of longevity swap transactions

Transaction structures

Treaty terms

- Benefit definition
- Financial dependants
- Data errors
- Collateral
- Mortality basis reviews and dispute resolution
- Preparing for reinsurance

Longevity transactions

Date	Size (£bn)	Pension Scheme	Insurer / Bank	Type	Reinsurers
2009	1.0	Babcock International Group	Credit Suisse	ISDA	Pacific Life Re, RGA + un-named
	1.9	RSA Insurance Group	Rothsay Life	Insurance	Pacific Life Re + un-named
	1.0	Royal County of Berkshire	Swiss Re	Insurance	
2010	3.0	BMW	Abbey Life	Insurance	Hannover Re, Pacific Life Re, Partner Re
	1.3	British Airways	Rothsay Life	Insurance	Pacific Life Re, Prudential Retirement + un-named
2011	1.7	ITV	Credit Suisse	ISDA	Pacific Life Re + un-named
	3.0	Rolls Royce	Deutsche Bank	ISDA	Pacific Life Re, Prudential Retirement, Scor + un-named
	1.3	British Airways	Rothsay Life	Insurance	Pacific Life Re + un-named
	1.0	Pilkington	Legal & General	Insurance	Hannover Re
2012	0.8	Uniq	Rothsay Life	Insurance	Prudential Retirement
	1.4	Akzo Nobel	Swiss Re	Insurance	

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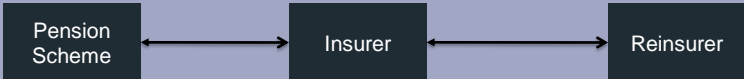
2

Transaction structures

Derivative Structure



Insurance Structure



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Reinsurance contract features

Stand alone basis

- Limited reference to insurance contract
- Key requirements explicitly referenced
- Insurer/bank manages basis risk

Simplifies transaction process

- Transparent negotiations
- Focus on important requirements

Clear obligations

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4

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5

1. Benefit Definition

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Benefit definition

Benefits and beneficiaries documented at inception

- Member listing file
- Benefit description and / or benefits model
- Eligibility criteria for dependant benefits
- May be simplified

Benefits fixed for duration

- Simplifies operation
- Ensures benefits match those priced for
- Data error process

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2. Financial Dependents

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Dependant benefits

Married and spouse age difference risk

- Uncertain benefit
- Additional data useful
 - Experience data
 - Member communication pre-transaction

Choice of reinsured benefit

- Financial dependant introduces subjectivity
- Scheme or insurer can retain this risk; or
- Clear documentation of financial dependence criteria

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9

3. Data Errors

Data error process

Annual process

- Record of discovered errors
- Amend for errors affecting mortality basis application
- Recalculate fixed cashflows
- Process accounts adjustment
- Other errors corrected by agreement

Reduces administrative overheads

- Only updating errors affecting fixed cash flows
- Maintains certainty over pricing
- Minimises review and adjustment work

Variations

Update for all data errors

- All errors must be adjusted, regardless of significance
- Pricing uncertainty for both parties
- Include re-pricing process (fee and / or basis)
 - Subject to thresholds
- Additional operational overhead tracking and adjusting

4. Collateral

Calculation of exposure

Definition of exposure

- Present value of fixed cashflows *minus* present value of best estimate of future floating cashflows
- Initial exposure from insurer to reinsurer for fees
 - Credit enhancement for fees

Calculation of floating cashflows

- Defined formula based on emerging experience
- Simple to calculate and objective
- Can be replicated for all contracts in transaction chain
- Supplemented by mortality review

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14

Forms of collateral transfer

Custody accounts

- Party posting collateral deposits into custody account
- 3rd party custody bank
- Time consuming initial negotiation
- Liquidity issues in pension transactions

Title transfer

- Party posting collateral (Transferor) directly transfers assets to the other party (Transferee)
- Transferor retains economic interest in assets, transferee holds title
- Provides liquidity for collateral transfers through transaction chain

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Eligible collateral

Basic Collateral Package

- GBP cash
- UK Gilts

Advanced Collateral Package

- Investment grade corporate bonds
- Other European government bonds + US treasuries

Considerations

- Denomination / currency
- Ratings requirements
- Issuer and industry concentration

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Multiple transactions

Collateral framework agreement

- Exposures for each reinsurance agreement aggregated and netted
 - Eliminates collateral “redundancy”
 - Reduces overall collateral required
- Simplifies operations
- Simplifies execution for follow-on transactions

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5. Mortality Basis Review and Dispute Resolution

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Dispute Resolution / Mortality basis review

Parties have limited ability to call for mortality review

- Disputing party believes best estimate differs materially from formula result
- Typically every 2-3 years since last review
- Process is still largely untested

Parties negotiate to agree updated assumptions

- Specified timeframe for these discussions

If agreed basis changes, best estimate cashflows recalculated and formula re-set

- Collateral transfer may be required based on the result

If disagree go to expert determination

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19

Dispute Resolution / Expert determination

Independent actuary

Parties submit basis proposals and reasoning

Expert chooses party's basis closest in present value terms to his own view

Binary decision ensures both parties submit reasonable bases

Neither party exposed to a third basis chosen by expert

6. Preparing for Reinsurance

Preparing for reinsurance

Clear goals and target levels

- Formulate internal view on best estimate basis
- Set expectations on reinsurance fee levels (market intelligence, etc.)
- Set overall price target
- Obtain senior management views on price target

Data

- Mortality experience data, policy file, data cleansing / reconciliation, [target best estimate basis]

Access to key individuals

- Actuaries and administrators responsible for underwriting, reserving and data admin
- Knowledge of business history, origination, etc

Due diligence

- Meetings with key individuals
- On-site data integrity review
- Product marketing history / demographics
- Rapid turn-around of questions arising during underwriting process