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Mortality and Longevity Securitisation

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Agenda

I. Securitisation
II. Mortality cat bonds
III. Longevity securitisation
IV. Annuity securitisation
V. The future…

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What is securitisation?

- Securitisation is the process of pooling together and then selling a stream of cash flows to investors
- It is a form of structured finance
- Why is it used:
  - Long dated financing
  - Provides liquidity
  - Capital and cost efficient
  - Risk management / risk transfer

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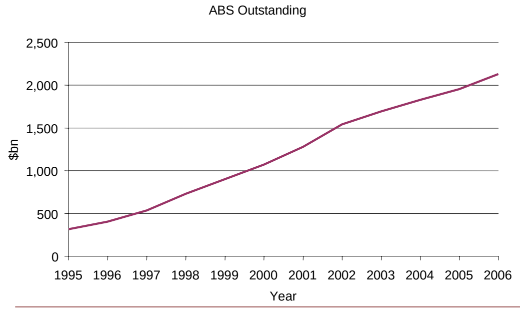
Growth of the asset backed securitisation market



Source: The Bond Market Association

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Securitisation – different asset classes

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Selected life insurance securitisations

Risk	Selected Issuers	Total Size
XXX in the US	Legal & General / Banner Life RGA Scottish Re Genworth / First Colony	$1,000m $850m $3,405m $2,000m
Embedded Value	Swiss Re Friends Provident Barclays Life Norwich Union Life & Pensions Prudential US	$615m £380m £400m £200m $1,750m
Mortality Cat Bonds	Axa (Osiris) Scottish Re (Tartan) Swiss Re (Vita I, II, III)	$250m + €150m $155m $1,152m + €240m

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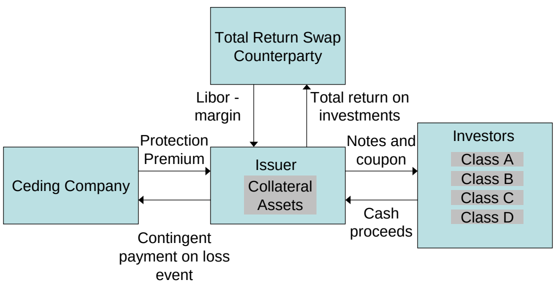
Mortality Cat Bonds

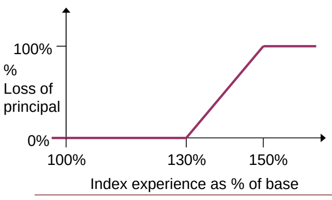
- First mortality cat bond issued in 2003
- Typical term 3 – 5 years
- Parametric index rather than indemnity trigger. Index constructed based on population mortality with country, age and gender weights to reflect profile of ceding company's mortality risk
- Latest bond issues smooth experience by taking average experience over 2 consecutive years
- Principal-at-Risk Notes and Guaranteed Notes both issued

Mortality Cat Bond – typical structure



Mortality Cat Bond – example payout

- Various attachment and exhaustion points e.g. Vita I payout triggered between 130% - 150% of base index



Example ratings:

- Vita I, 3 yr: 130% - 150% A+/A3
- Vita II, 5 yr: 120% - 125% A/Aa3
- Vita II, 5 yr: 115% - 120% A- / A2
- Vita II, 5 yr: 110% - 115% BBB/ Baa2

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Mortality vs. Longevity Securitisation

	Mortality	**Longevity**
Term	Short Term	Long term
Key Risk	Jump risk	Trend risk
Understanding of risk?	Good and improving: - Government preparedness - Vaccine research - Production capabilities	Still poor: - Great uncertainty over impact of future medical advances etc.
Models	Various: Milliman, RMS	Many available but no consensus
Monoline wrap	Several now have ability to wrap this risk	Untested. Dislike long dated nature of this risk.

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Recent developments in longevity risk transfer

Focus on creation of standardised indices:

- Credit Suisse Longevity Index
- JPMorgan LifeMetrics Index

Longevity securitisation

- In theory it is possible to develop all manner of pure longevity risk transfer instruments
- An alternative to pure longevity structures is to look at annuity books as a whole
- Annuities are leveraged asset books with parallels to the CDO market. Therefore ready made investor interest in this asset class
- The longevity risk provides some diversification from market risk

Annuity book as a CDO

- An annuity book can be regarded as a CDO with annuitants as super senior
- An annuity book is a leveraged play on assets

Annuitants 90%
Equity 10%

- Assume equity is 10% of total assets backing the annuity book
- Every 10bps additional return earned on the assets results in 100bps additional return to the life company. This is x10 leverage
- The life company can be viewed as borrowing assets from its annuitants

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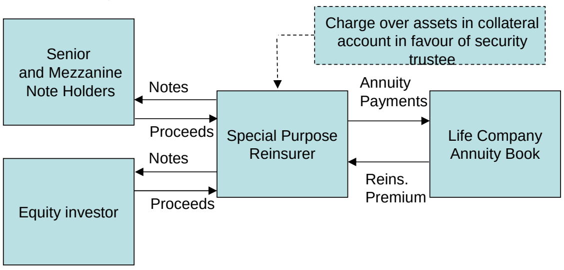
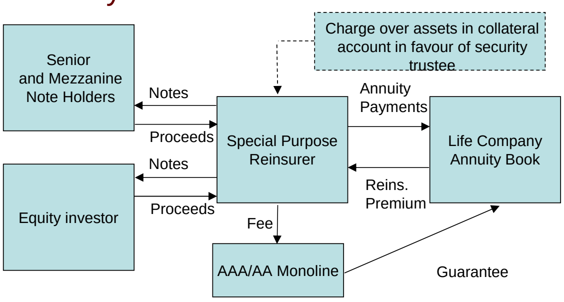
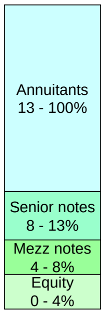
Annuity securitisation structure I



Annuity securitisation structure II



Example capital structure



- Significant capital raised to support aggressive investment policy. Capital approx. 15% of premium paid by ceding company
- 15% capital comprises: 4.5% Equity, 4.5% Mezzanine and 6% Senior notes
- Equity investor is highly levered
- x25 leverage in this example i.e. each 10 bps extra investment return on assets results in ~2.5% additional return to equity investor

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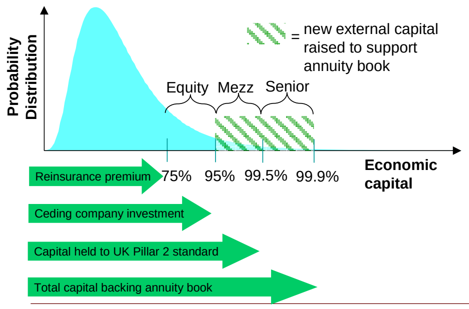
Illustrative capital backing annuity book after securitisation



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High level structure

- Reinsurance of first 25 years' cash flows from annuity book to special purpose reinsurer or protected cell company
- Life Co retains exposure to annuity payments beyond 25 years
- Reinsurer over capitalised at 115% of reinsurance premium
- Various credit enhancements e.g. 1% held back in interest account to ensure timely interest payments to note holders
- Structure offers flexibility to follow changes in Life Co's annuity book reserving

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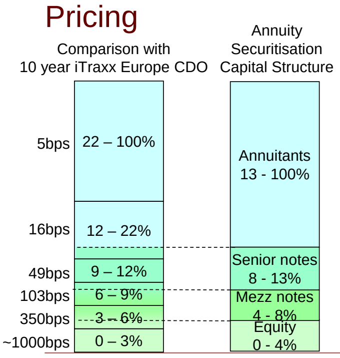
Pricing



- If annuities are purchased at a discount rate below Libor + 6 bps then structure offers potentially cheaper leverage than available elsewhere in financial markets
- This can provide adequate compensation for taking longevity risk

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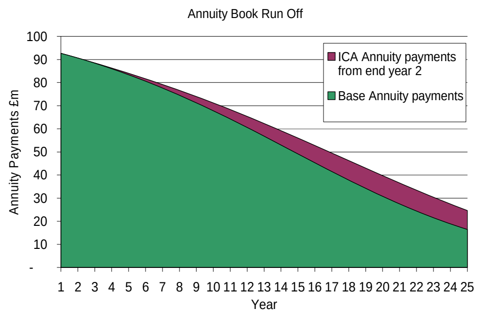
Annuity payments covered by securitisation



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Reserve run off

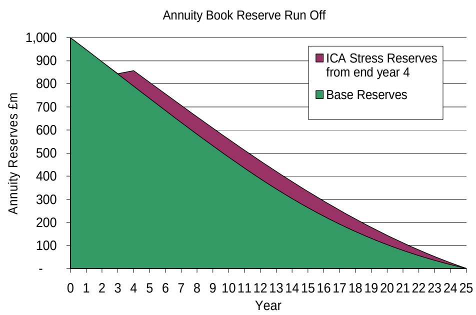

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Illustration of profit emergence on annuity book

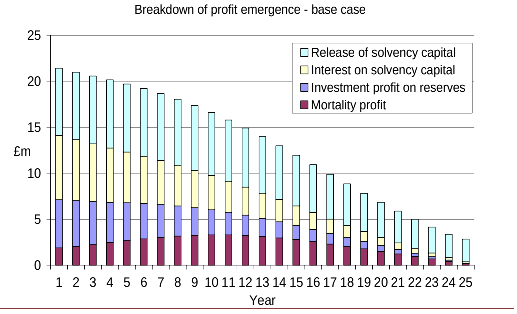
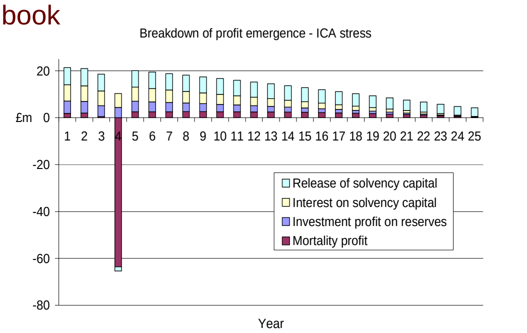
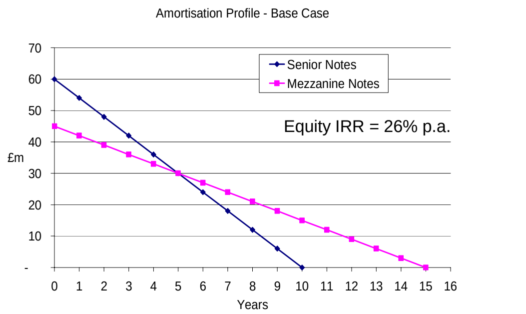


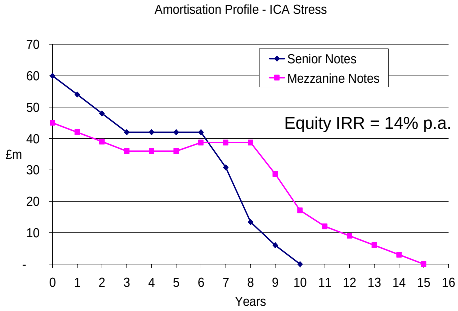
Illustration of profit emergence on annuity book



Notes amortisation profile - base case



Notes amortisation profile - ICA stress



Annuity securitisation - some issues

▪ Term	▪ 25 years or longer depending on equity investor
▪ Rating agencies	▪ Approach taken by rating agencies will be critical to success of the securitisation
▪ Regulator	▪ Full risk transfer no capital arbitrage
▪ Credit enhancement	▪ Monoline ▪ Various buffer accounts established to protect ceding company, note holders / monoline ahead of equity investor
▪ Asset management	▪ Within guidelines set at outset ▪ Within control of equity investor
▪ Disclosure	▪ Life companies may not wish to disclose sensitive information on their longevity experience ▪ However, may be okay for a ring fenced book

Annuity securitisation - the benefits

▪ Attraction to investors	▪ Potentially cheap leverage ▪ Diversification ▪ Access to a new asset class ▪ Comfortable with investment risks so better understood than pure longevity risk transfer ▪ Cheap leverage locked in for long term
▪ Benefits to cedant	▪ Risk mitigation ▪ If retain equity piece then more highly levered investment ▪ Offshore reinsurance may permit greater investment freedom ▪ Better pricing than currently available in reinsurance market

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The future…

- Extend to include deferred pensioners
- Give pension funds direct access to capital markets
- Allow corporate sponsor to participate in upside
- Provide exit route for new entrants to pension buy-out market
- Stimulate a traded market in longevity linked securities

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Questions

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