Swiss Re

Applications of Structured Finance Techniques to Insurance Companies' Balance Sheet

20th October 2006

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Swiss Re

OUTLINE

- Overview of the ILS sector
- Market Trends
- Structuring Basics
  - ✓Insurance Linked Securities for Peak Perils
  - ✓Securitisation of Embedded Value
  - ✓Excess Mortality Securitisation

Swiss Re

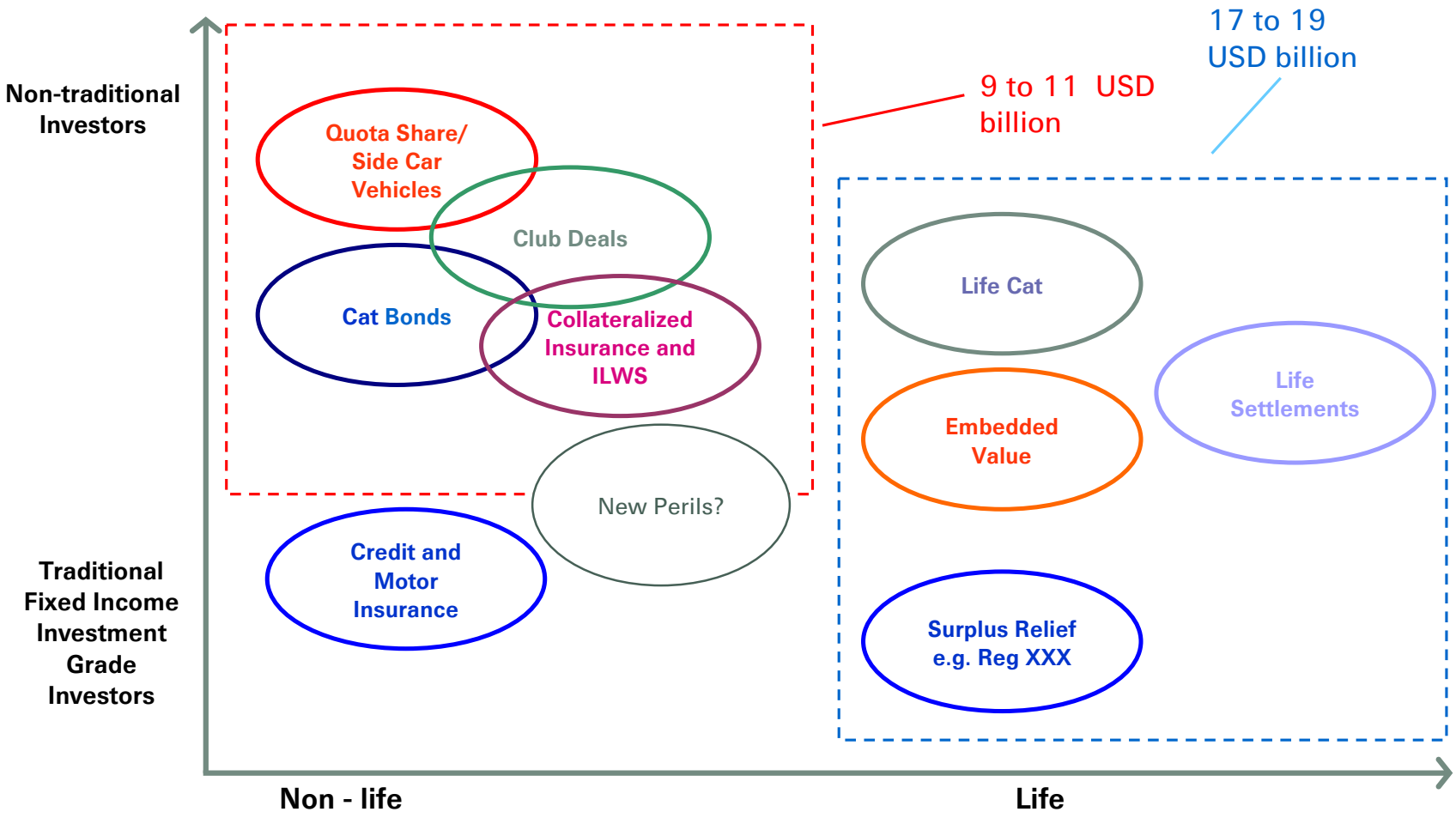
ILS Overview

- Insurance-linked securities ("ILS") offer an attractive risk return profile as a diversifying component within a broader fixed income portfolio
- By bridging the insurance and capital markets, ILS are creating a range of attractive investment opportunities previously unavailable to those outside the insurance industry
- Since 1996, over $22 billion in worldwide insurance and reinsurance capacity has been created through the issuance of ILS, with much of the issuance linked to both natural catastrophe perils as well as life risks
- New asset classes and new perils have been launched in recent months including Crystal Credit (trade credit), Australis (Australia earthquake and tropical cyclone risk), and Axa (motor)
- A broad universe of investors have committed capital and resources to the sector

ILS Market: Key Trends
Market Segmentation and Size

The Capital Markets are currently active in the insurance space by using a number of instruments:

- *Securities*
- *Derivatives*
- *ILWs*
- *Side Cars*



As of August 25, 2006
Source: Swiss Re Capital Markets

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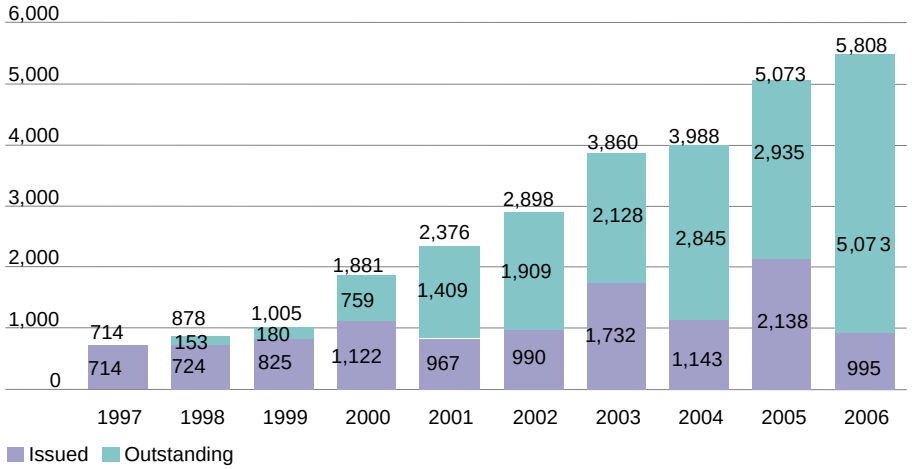
ILS: Market Capacity

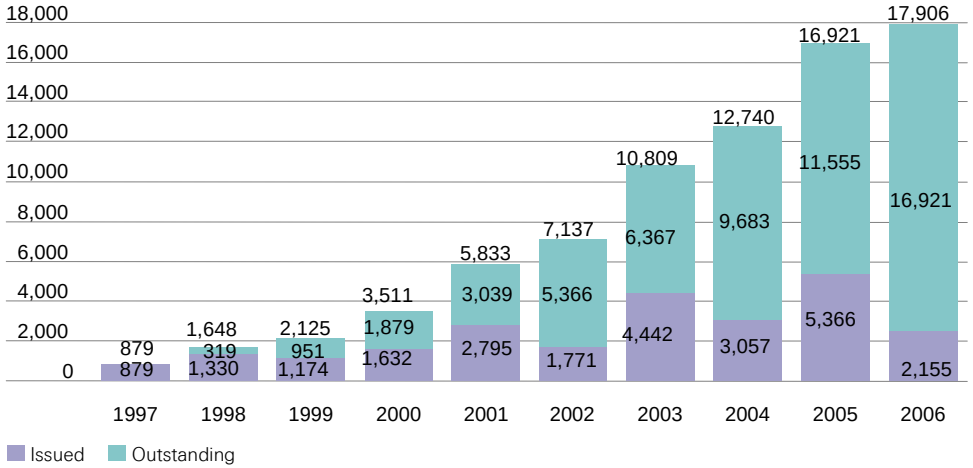
- New issuance in 2005 surpassed the previous high in 2003. Bonds outstanding increased reflecting the issuance of multi-year deals in previous years.

- One noticeable ILS trend in recent years is the increased activity in life transactions (XXX and EV)

Total non-life bonds outstanding, by year*



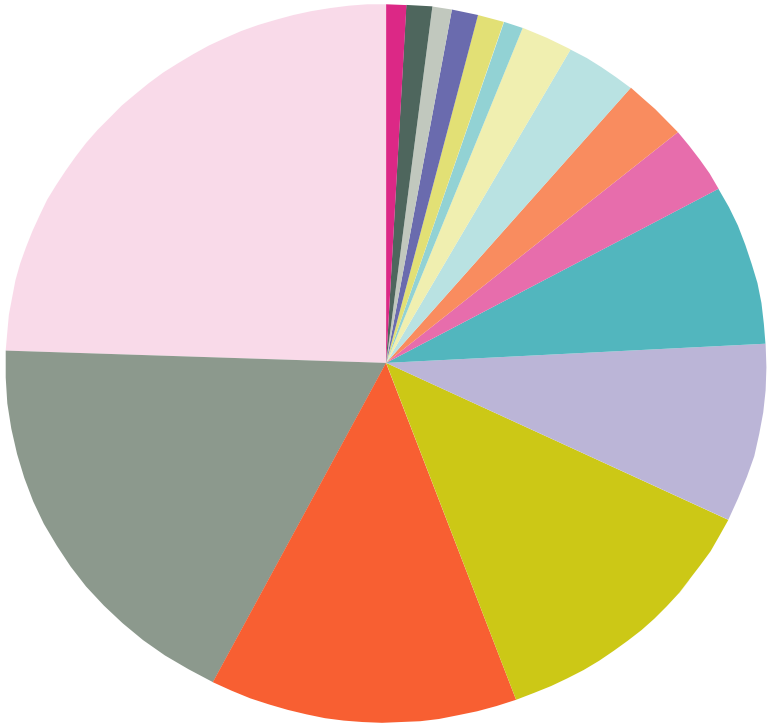
Total ILS outstanding, by year*



** As of May 5, 2006*

Source: Swiss Re Capital Markets

Risks Securitized Since 1997



- XXX 24% ($7,090mm)
- Embedded Value 18% ($5,448mm)
- Multiperil 13% ($3,895mm)
- US Wind 12% ($3,418mm)
- Other – Life 8% ($2,487mm)
- CA EQ 7% ($2,099mm)
- JA EQ 3% ($969mm)
- Euro Wind 3% ($960mm)
- Extreme Mortality 3% ($917mm)
- Pacific NW EQ 2% ($600mm)
- Industrial Accident 1% ($405mm)
- Credit Reinsurance 1% ($305mm)
- JA Typhoon 0% ($280mm)
- Auto 1% ($234mm)
- New Madrid 1% ($226mm)
- Mexico EQ 1% ($160mm)
- Taiwan EQ 0% ($100mm)

As of August 25, 2006
Source: Swiss Re Capital Markets

Market Trends – ILS Market Capacity

- New issuance in 2006 YTD had already exceeded that of the previous high in 2005. Bonds outstanding increased reflecting the issuance of multi-year deals in previous years.

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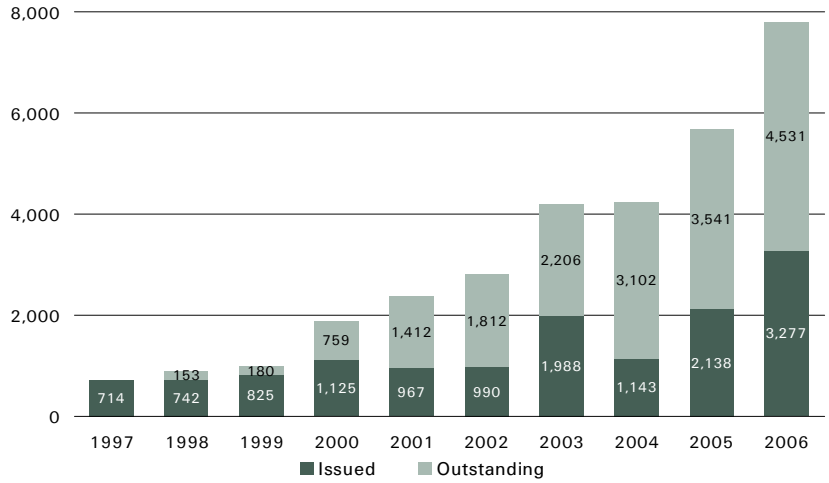
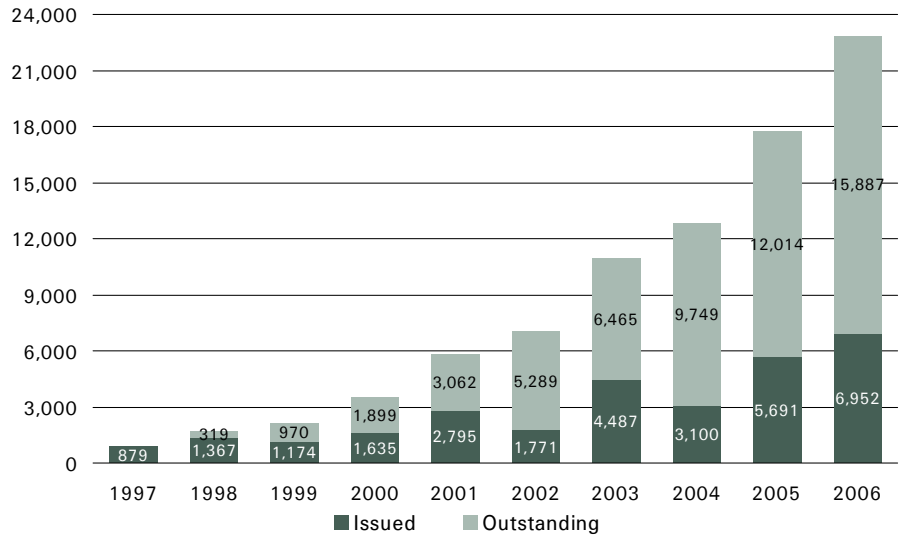


Total ILS outstanding, by year*



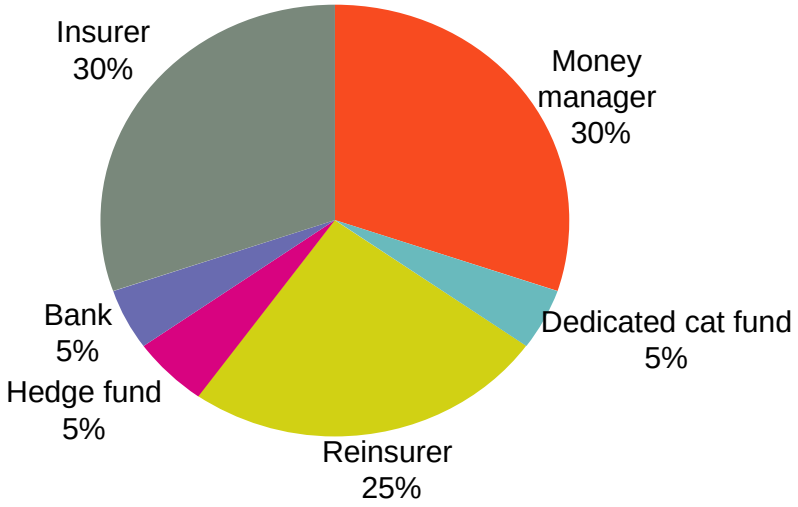
As of August 25, 2006
Source: Swiss Re Capital Markets

Investor Segmentation

Capital market investors now dominate the ILS investor base, including large institutional money managers and many funds dedicated to the sector.

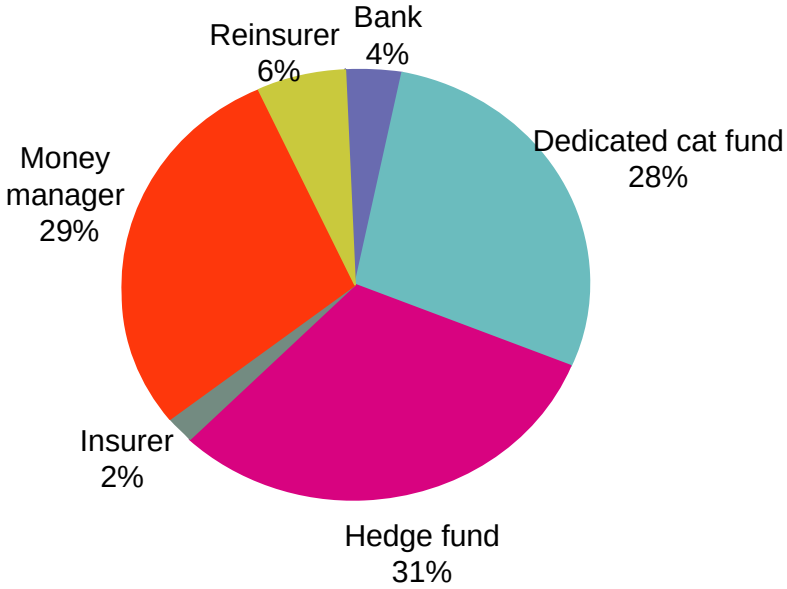
- Dedicated cat funds, money managers and hedge funds have increased their participation in the sector in recent years

1999



Market size ≈ USD 1.1 bn

2006



Market size ≈ USD 7.5 bn

Source: Swiss Re Capital Markets

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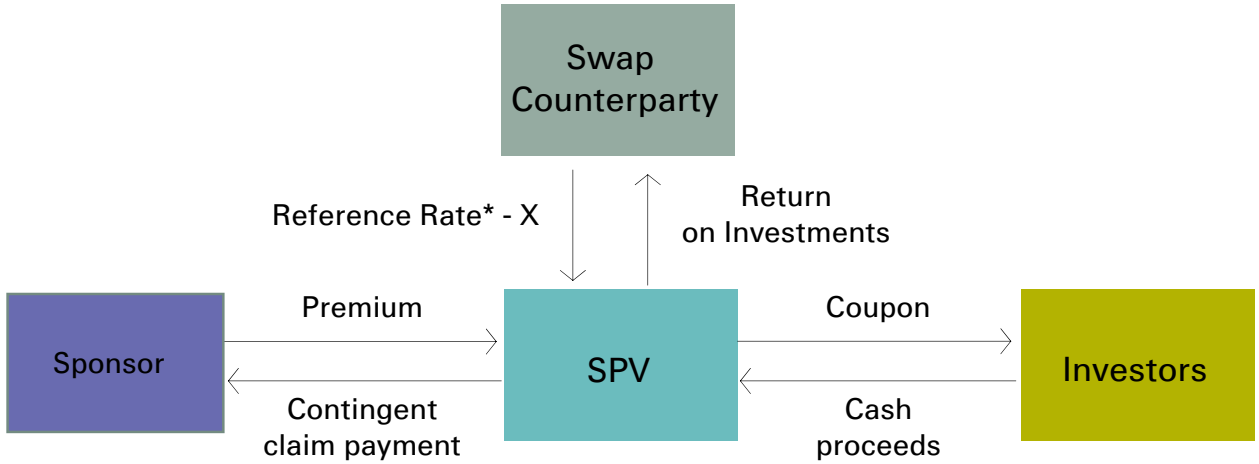
Key Features of catastrophe bonds

- Fully-collateralised protection with minimal counterparty credit risk
- Additional and diversified capacity to manage its peak exposures
- Multi-year coverage and fixed pricing
- Systematic claims recovery
- Enhanced risk management
- *Solvency 2* potential benefits:
  - Actual risk transfer mechanism without recourse to protection buyers (but need to asses impact of any basis risk)
  - Reduced concentration of credit exposure to the reinsurance industry
  - Transparency of terms and conditions of cover (form of risk transfer)

Typical Structure

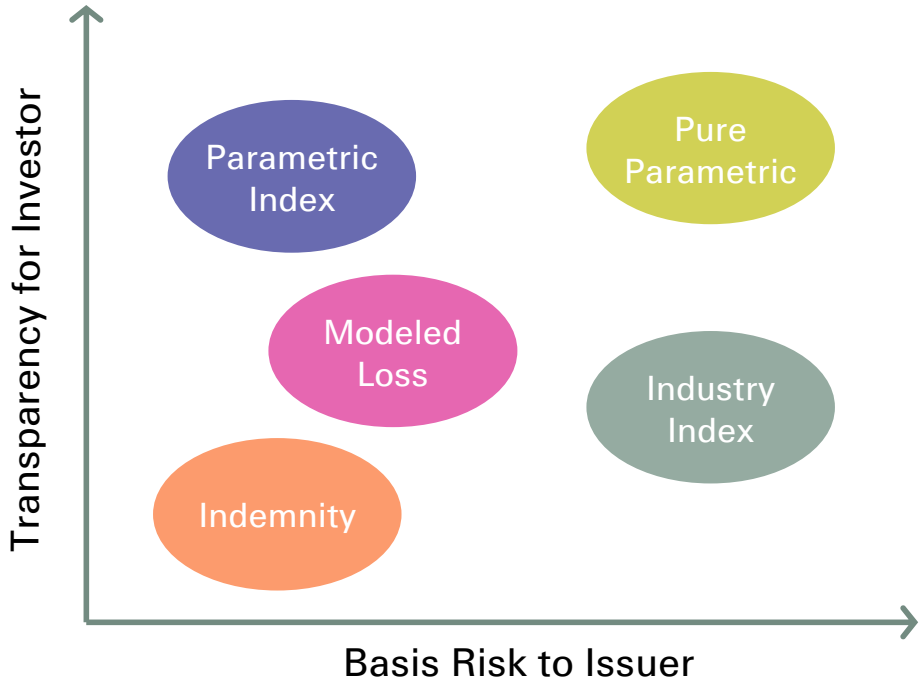


- The sponsor purchases cover from a Special Purpose Vehicle (SPV)
- SPV hedges the exposure by issuing Insurance Linked Securities (ILS) to investors
- ILS proceeds are invested in high quality securities and held in a collateral trust; investment returns are swapped to a Reference Rate-based rate by the Swap Counterparty (return depends on collateral type and rating)
- SPV pays periodic coupon payments to investors (usually quarterly in arrears)
- If no trigger event occurs, full principal returned to investors at maturity
- If a trigger event occurs, any remaining principal, is returned to investors at maturity

*Reference rate is LIBOR for USD transactions and EURIBOR for EUR transactions.

Structuring Elements: Trigger Types

Cat bonds have used a variety of triggers to manage the tradeoff between transparency and basis risk



- An **indemnity** transaction is based on the actual losses of the sponsor
- An **industry index** transaction is based on an industry-wide index of losses (e.g., Property Claim Services or "PCS" in the United States)
- A **pure parametric** trigger is based on the actual reported physical event (i.e., magnitude of earthquake or wind speed of hurricane)
- A **parametric index** is a more refined version of the pure parametric trigger using more complicated formulas and more detailed measuring locations
- In a **modeled loss** transaction, losses are determined by inputting actual physical parameters into an escrow model which then calculates the loss

Parametric Index Trigger

A parametric index utilizes a finely-tuned index calculation to measure losses, as compared to "pure parametric" deals that use a series of boxes to measure losses

- In a parametric index trigger transaction, the modelling firm works with the insurer to establish the type of physical trigger, index calculation and weighting of reporting stations that best minimises basis risk
  - First, the modelling firm runs its model with exposure data provided by the sponsor to establish the portfolio loss exposure
  - After the loss exposure is calculated, the modelling firm creates an index equation comprised of reporting stations, which measures the wind-speed at each location
  - The weighting of each reporting station in the index equation is calibrated such that the loss produced by the index calculation matches actual simulated and historical losses
- Parametric index cat bonds are favoured by investors because of the added transparency of physical loss triggers, and added transparency typically translates to tighter pricing and a reduced cost to the sponsor

Indemnity Trigger

- Although perceived to be somewhat less transparent than physical triggers, investors have achieved a high degree of comfort with indemnity trigger cat bonds
  - USAA has issued an indemnity-based cat bond every year since its original Residential Reinsurance Ltd. issuance in 1997
  - The pricing difference between physical trigger and indemnity is minimal in the current market environment, provided that good portfolio information is available from the transaction sponsor
- Indemnity cat bonds provide many benefits to sponsors including most likely reinsurance accounting (risk transfer) and minimum basis risk, as compared to physical triggers
- Indemnity trigger cat bonds require some structural safeguards to keep investors' risk constant and significant additional disclosure regarding risk mitigation and loss handling practices

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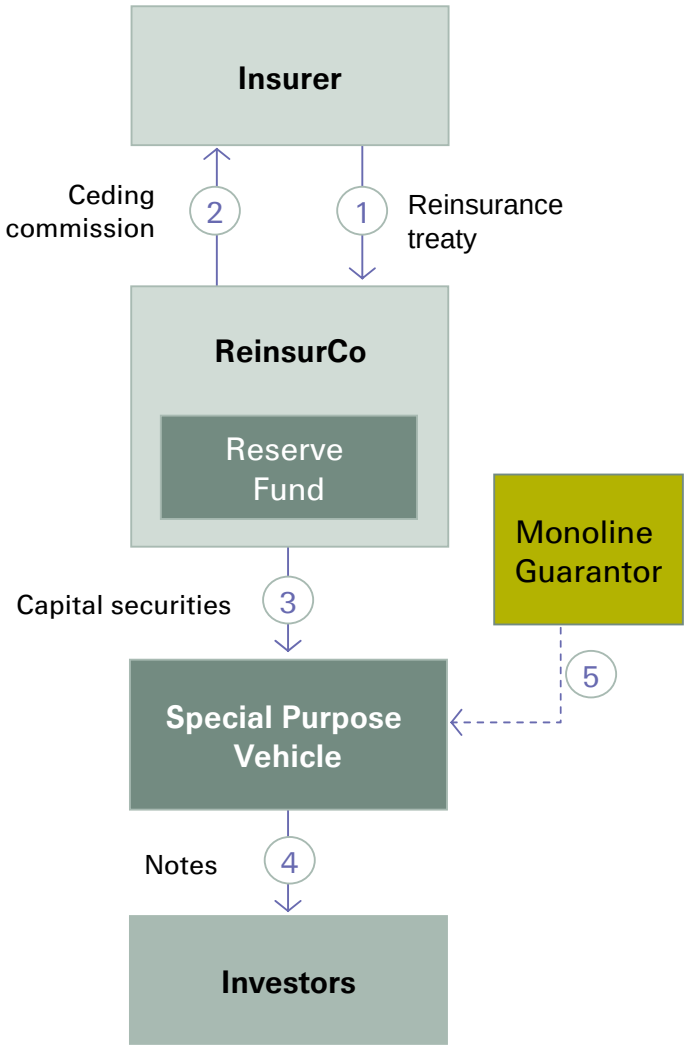
Through securitization insurance companies can monetize intangible assets and raise capital in financial markets

Embedded value (EV) securitization is an alternative tool for insurance companies to raise funds in capital markets

- **Improves capital adequacy**
  - Capital adequacy ratios could potentially be improved in cases where cash received in a transaction is above levels allowed by rating agencies
  - Rating Agencies generally view this transaction positively due to the increased capital efficiency and the transfer of risk to capital markets
- **Innovative capital raising tool**
  - Proceeds are well in excess of levels available through guarantee-based or other financial structures
  - EV securitization is priced at competitive rates to other financing tools, such as hybrid capital
- **Risk transfer to investors**
  - Limits the company's exposure to adverse developments in the underlying book of business
  - Investors participate economically in the overall performance of the blocks of business which are affected by insurance and financing risk including mortality experience, lapse levels, asset performance and changes in the interest rate environment
- **Converts an intangible asset into cash**
  - Intangible assets in the form of future profits are transferred to capital markets in exchange for cash.
  - Cover traditionally obtained with a synthetic guarantee is either cash collateralised or pre-funded, *thus eliminating the reinsurer's or the guarantor counterparty risk*

A special purpose vehicle can issue multiple tranches of notes, backed by defined blocks of life insurance policies

EMBEDDED VALUE SECURITIZATION



1. An insurance carrier (insurer) establishes a wholly owned subsidiary (ReinsurCo) and enters into a reinsurance treaty
2. At closing the insurer receives a ceding commission from ReinsurCo in connection with the reinsurance of the block of business
3. ReinsurCo issues capital securities to a third-party special purpose vehicle (SPV) to fund the ceding commission payment, transaction costs and a reserve fund. The reserve fund may be available to cover losses under the reinsurance treaty
4. The SPV funds the purchase of the capital securities by issuing notes to investors. These notes usually have multiple tranches and are secured by the ReinsurCo's securities and cash releases from the reserve fund. Features of the notes generally mirror those of the capital securities
5. Monoline guarantor may be included for credit enhancement under a wrapped structure

Capital relief, risk transfer and cost of funding

Different structures can provide different level of risk transfer, capital benefits and cost

Capital Relief, Risk Transfer and Cost of Funding

Monoline Wrapped Securitization

- Advance rate normally equivalent to A3/A- stresses
- Lower risk transfer
- Lower cost of funds
- Lesser capital credit from rating agencies due to less risk transfer
- Monoline requires a certain level of control

Partial Wrap Embedded Value Securitization

- Wrapped structure normally up to A3/A- advance rate
- BBB and BB tranches unwrapped
- Lower cost than unwrapped transactions
- High risk transfer partly to monoline

Unwrapped Embedded Value Securitization

- Higher risk transfer directly to investors can be achieved
- Capital relief from rating agencies and regulators
- May include below investment grade tranches

- **Increasing risk transfer results in greater capital relief and advance rate**
- **Cost of funding reflects the higher amount of risk transferred**
- **An unwrapped or partially wrapped Embedded Value transaction represents a new securitization alternative for insurers**

Certain books of business are better suited for securitization than others

In general, no risk should be included in the securitization that investors cannot quantify.

Lapse risks are probably among the most difficult of risks for investors to understand

- **Blocks of business**
  - Persistency and investment return are material risks investors take when investing in a book of business.
  - Seasoned books with no active sales force managing clients tend to have lower lapse rates and actuaries can draw on historical experience
  - New business is benefited by contractual protection (surrender charge, agent claw back) and mitigates some of the lapsation risks
- **Size of the block of business**
  - Insurance transactions of substantial size relative to book of business may need to be approved by various state regulators.
- **Demographic diversification**
  - Age diversification tends to increase stability. Gender is not a primary concern.
- **Product type**
  - A mix of insurance products including traditional and interest sensitive life are well received by investors

Key Comparisons: Queensgate and ALPS II

	Queensgate ($245m)	**ALPS II ($370m)**
Portfolio	Admin Re, acquired through stock acquisition. Traditional and ISL portfolios only.	Admin Re, acquired primarily through coinsurance (includes stock acquisition). New products – annuities and COLI portfolios included.
Risks ceded	Mortality, lapses, asset quality, reinvestment and Swiss Re credit	Mortality, lapses, asset quality, reinvestment and Swiss Re credit
SPV domicile	Bermuda	Ireland
Capital Structure	3 tranches; 71% of total note issuance rated single A or higher. Fixed rate notes	4 tranches; 84% of total note issuance rated single A or higher. Floating rate (senior 2 tranches) and fixed rate notes
Alignment of interests	Swiss Re covenants to hold a vertical 10% Quota Share of the Subject Business.	Swiss Re's purchases of 6m of the junior 2 tranches and ownership of the residual (not restricted from future divestiture).
Bond insurance	None	Senior 2 tranches wrapped to AAA/Aaa by XL Capital
Cost (at time of pricing)	6.96%, equivalent to S + 296bps	6.84%, equivalent to S + 197bps

Queensgate: Summary of Notes

Multiple tranches cater to different risk appetites of potential investors.

	MULTIPLE TRANCHES		
	Series A Notes	Series B Notes	Series C Notes
Securities offered	$175 million	$45 million	$25 million
Stated maturity	20 years	20 years	20 years
Exp. maturity date	2011	2014	2016
Exp. maturity	6 years	9 years	11 years
Exp. average life	3.0 years	7.6 years	10.2 years
Rating*	A+ / A1	BBB / Baa1	BB / Ba1
Payment frequency	Semi-annually	Semi-annually	Semi-annually

** Standard & Poor's, Moody's*

Source: Queensgate Special Purpose Limited Offering Circular, dated Jan 12, 2005

ALPS II: Summary of Notes

- Similar tranching methodology to Queensgate, but senior tranche split into two separate tranches
- In spite of higher interest rates, longer duration and less favorable credit spreads, the weighted average cost of the notes was reduced from 6.96% in Queensgate to 6.66%[1] in ALPS

Notes	Issue USDm	Final Maturity	Rating[2]	Average Life	Expected Maturity	Benchmark / Spreads
Series A	220	2025	AAA / Aaa	2.3 yrs	5.0 yrs	6m Libor + 30bps
Series B	90	2025	AAA / Aaa	6.6 yrs	9.0 yrs	6m Libor + 38bps
Series C	30	2025	BBB / Baa1	9.2 yrs	10.0 yrs	Swaps + 220bps
Series D	30	2025	BB / Ba1	10.4 yrs	11.5 yrs	Swaps + 675bps
Overall	**370**			**4.6 yrs**		

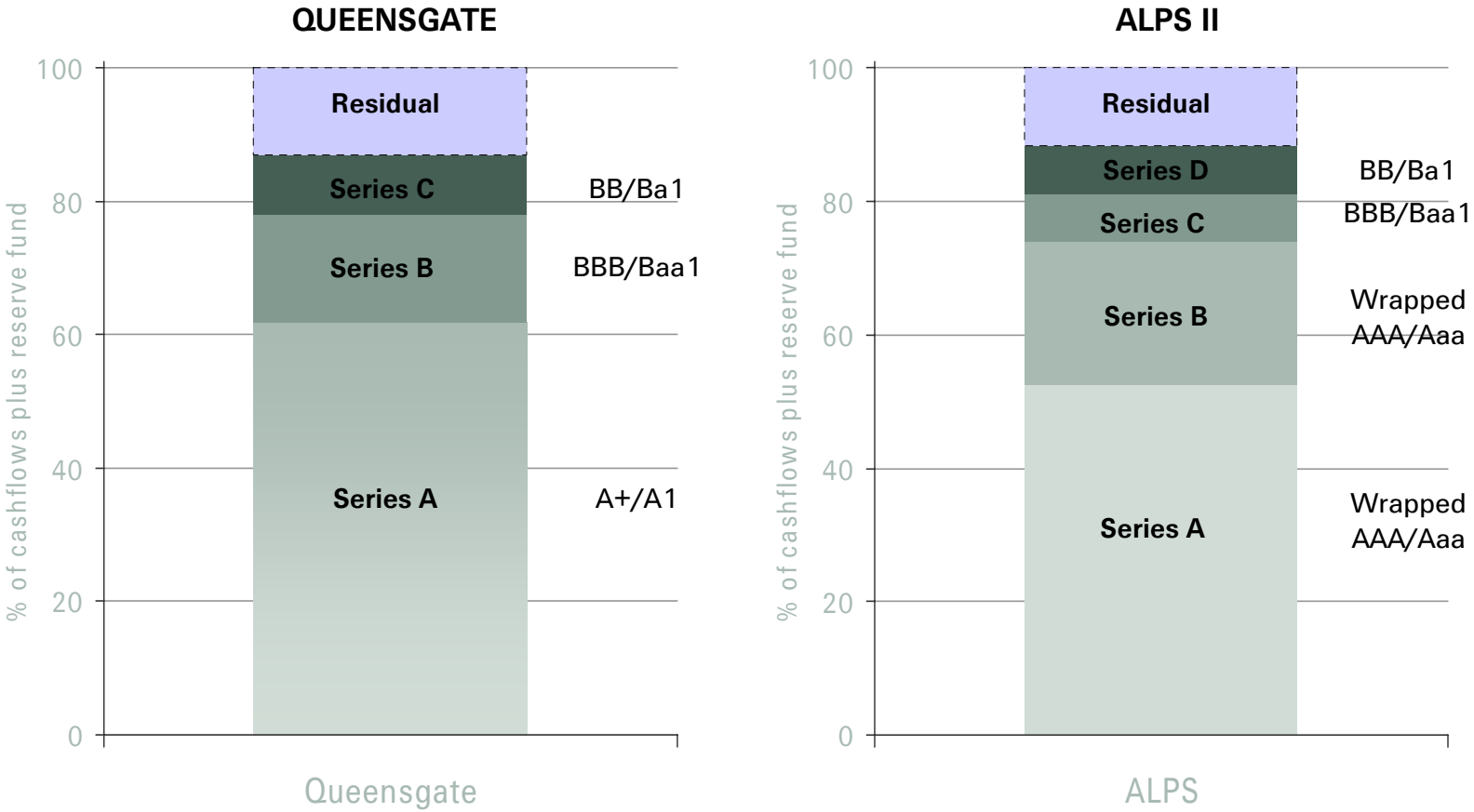
XL Capital is guaranteeing timely interest payment and principal repayment at maturity for Series A / B

1 Including guarantee fees and swap cost but excluding transaction costs, the WACC is 6.84%
2 Standard&Poor's / Moody's

Credit Protection Levels: Queensgate and ALPS II

Lower overall credit enhancement levels demonstrate increasing extent of risk transfer across all tranches of notes for the ALPS transaction.

- Based on a consistent valuation methodology to Queensgate, the advance rate for ALPS is slightly higher



Credit enhancement levels calculated based on PV of post-tax cashflows at 7.5% plus reserve fund.

Solvency 2 and Life insurance Securitisation

- Under Solvency 2 regime it will be increasingly important to achieve significant risk transfer to maximize capital benefits:
  - Traditional securitisation programs transferred risk to single-A level
  - Swiss Re's Queensgate and Alps transactions achieved risk transfer to BB level
  - Scottish Re's Ballantyne Re transaction achieved risk transfer to BBB level
- Securitisation transactions pay a ceding commission to the life insurers or fully collateralise the reinsurance treaty, thus eliminating a long term counterparty risk to the reinsurance industry
- Being fully paid up, the cover cannot be terminated at the initiative of the investors, and any termination trigger is very well documented in a transparent way in the transaction documentation

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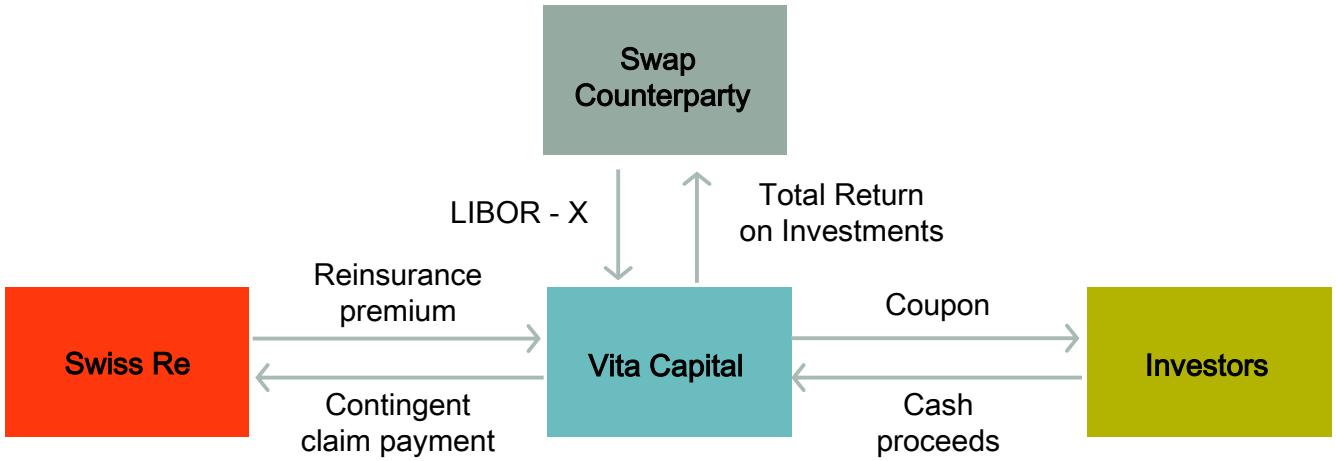
Vita Capital Structure

The Vita Capital transaction allowed Swiss Re to manage its exposure to extreme mortality risk, without assuming significant credit risk in retrocession

Distinctive Features:

- *Competitive cost*
- *No counterparty risk*
- *Structure can be adapted to portfolios*
- *Multi-year cover*

Voted "Most Innovative Asset Backed Deal of the Year" by Structure Finance International



- Swiss Re enters into a reinsurance agreement with a SPV ("Vita Capital")
  - Risk covered is that each year up to 2006 a pre-determined mortality index in a basket of countries is 130% or more than the same index calculated in 2002
- The SPV issues Insurance Linked Securities (rated A3/A+ by Moody's and S&P respectively) up to the amount of the reinsurance cover.
- The proceeds of the issuance are placed in with a AA counterparty in a total rate of return swap structure invested in AAA and AA collateral.
- If the insured event occurs, the collateral is sold and the claim paid, otherwise the collateral is liquidated at the term of the trade to repay investors
- Benefit: risk transfer and possibly capital release under Solvency 2

Vita Capital II

Similar transaction structure than Vita Capital I

Different tranches to target different risk appetite of investor base

	Vita Capital II Ltd. Notes			
	Class A	**Class B**	**Class C**	**Class D**
Trigger Level: % of 2003 Index Value	125%	120%	115%	110%
Exhaustion Level: % of 2003 Index Value	145%	125%	120%	115%
Overall Annualized Expected Loss[(a)]	0.0003%	0.0073%	0.0411%	0.1458%
Overall Annualized Attachment Probability[(a)]	0.0015%	0.0165%	0.0755%	0.2344%
Overall Annualized Exhaustion Probability[(a)]	<0.0001%	0.0015%	0.0165%	0.0755%
Rating[(b)]	A+/Aa2	A-/Aa3	BBB+/A2	BBB-/Baa2

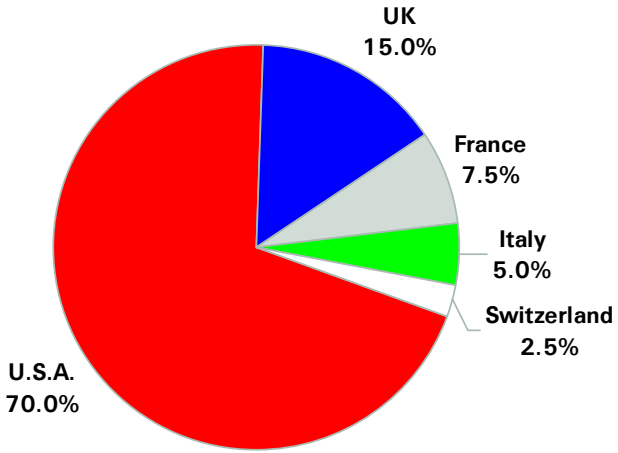
[(a)] Equals the 5-year cumulative values as estimated by Milliman divided by 5
[(b)] Standard and Poor's, Moody's

Vita Capital Index Weights

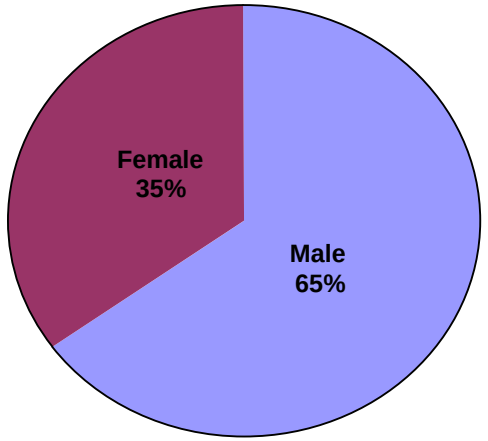
The population mortality data has been subject to different weights to reduce the basis risk for Swiss Re:

- *Geographical weights*
- *Gender weights*
- *Age weights*

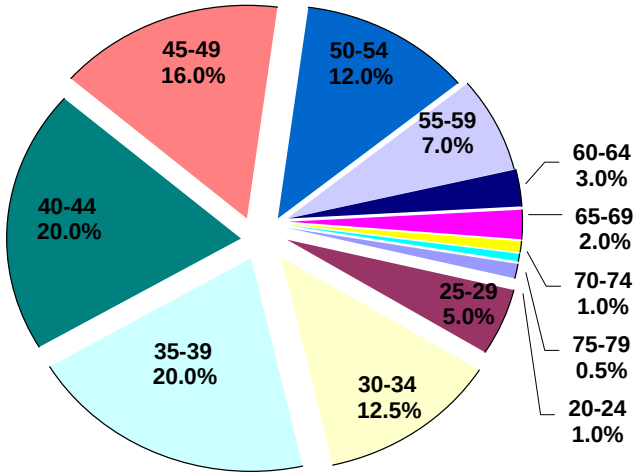
Geographical Weights



Index Weighting by Sex

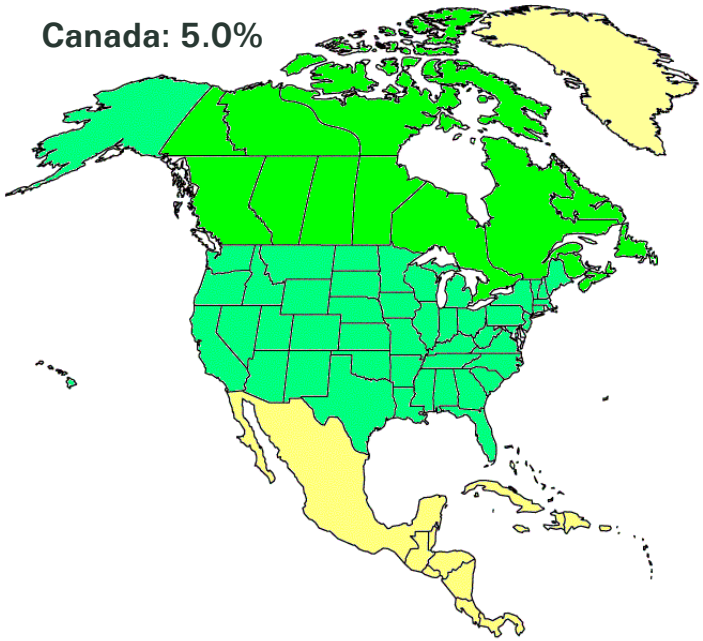


Index Weighting by Age

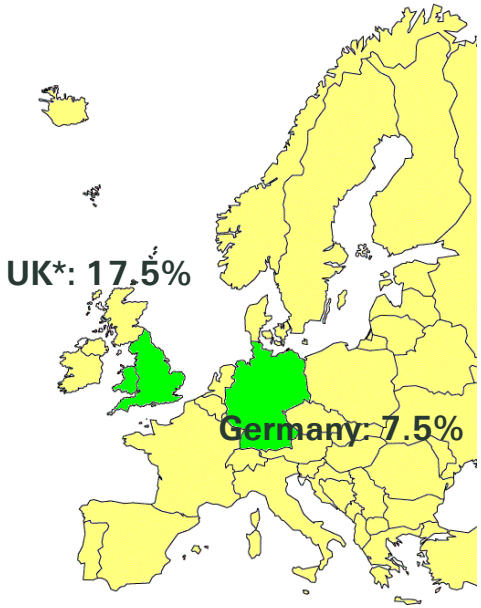


Vita Capital II Geographical Weights

North America: 67.5%



Europe: 25.0%



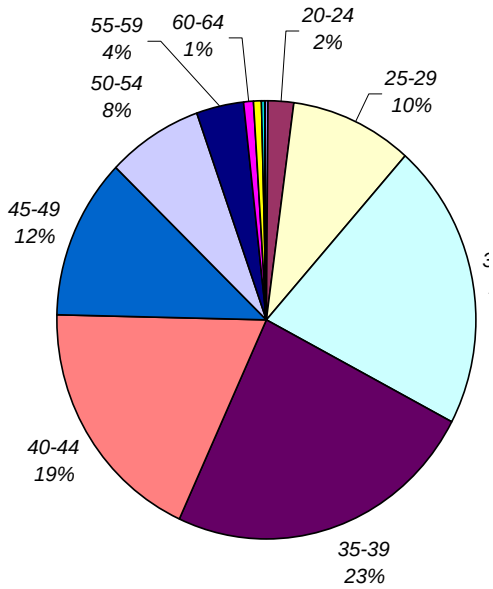
*UK includes England and Wales only

Asia: 7.5%

Vita Capital II Age Weights

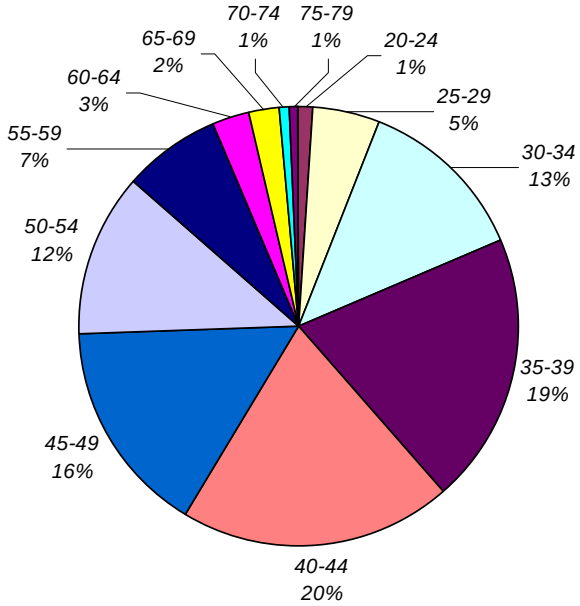
- The following age weights are selected to reflect Swiss Re's reinsured profile of mortality risks by age groupings
- For all countries, the gender weights are *65% male 35% female*

Age Weights: UK



Note: Age groups 65-79 make up for under 1% of total

Age Weights: US, Canada, Germany & Japan



Note: Age groups 80-84 make up for under 1% of total

Vita Capital II Trigger Definition

Vita Capital I observed data over a calendar year period

Vita Capital II Observed data over a 2 year period

- The ***Combined Mortality Index Value*** for a given 2-year period is defined as the average of 2 annual index values over the period concerned.
- Based on age and gender weighted death rates for five pre-defined countries constructed from publicly available sources, which are fixed at inception.
- Both the ***Trigger Level*** and ***Exhaustion Level*** for observed mortality in the risk period will be measured against 2002/2003 Index Value.
- For any Class, a Trigger Event is deemed to have occurred when the ***Combined Mortality Index Value*** exceeds the respective ***Trigger Level***.
- If a Trigger Event has occurred, the percentage of the principal lost increases linearly between the ***Trigger Level*** and ***Exhaustion Level***, calculated as:

$$100\% \times \frac{\text{Combined Mortality Index Value} - \text{Trigger Level}}{\text{Exhaustion Level} - \text{Trigger Level}}$$ subject to a maximum of 100%

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