

Securitization of Life Insurance Risks

Actuaries' Clubs of Boston and Hartford/Springfield Joint Meeting

Jack L. Gibson

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Agenda

Why
Securitization?

Securitization
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Future Outlook

Reinsurance has traditionally been preferred for managing reserve and capital strain

- Insurers have historically relied on offshore reinsurance to manage reserve and capital strain on selected insurance products; for example:
 - Term insurance subject to Guideline XXX
 - Universal life insurance subject to Guideline AXXX
- Generally requires LOC or other collateral
- Two main risks exist with regard to reinsurance LOCs:
 - Lack of reinsurance LOC capacity, particularly in future years
 - Uncertainty regarding LOC costs

With the reinsurance market reaching capacity, securitization is gaining momentum

- Insurance companies are no strangers to the capital markets; property/casualty firms have used cat bonds for years to mitigate natural and catastrophic risks
- Securitization provides almost unlimited capacity
 - However, capital markets have a learning curve in order to become familiar with underwriting risk
 - Transactions to date have been private placements with significant life industry participation
- For now, high transaction costs make securitization most viable for large blocks of business
 - Fixed nature of many costs leads to greater economies as deal size increases

When is securitization most viable?

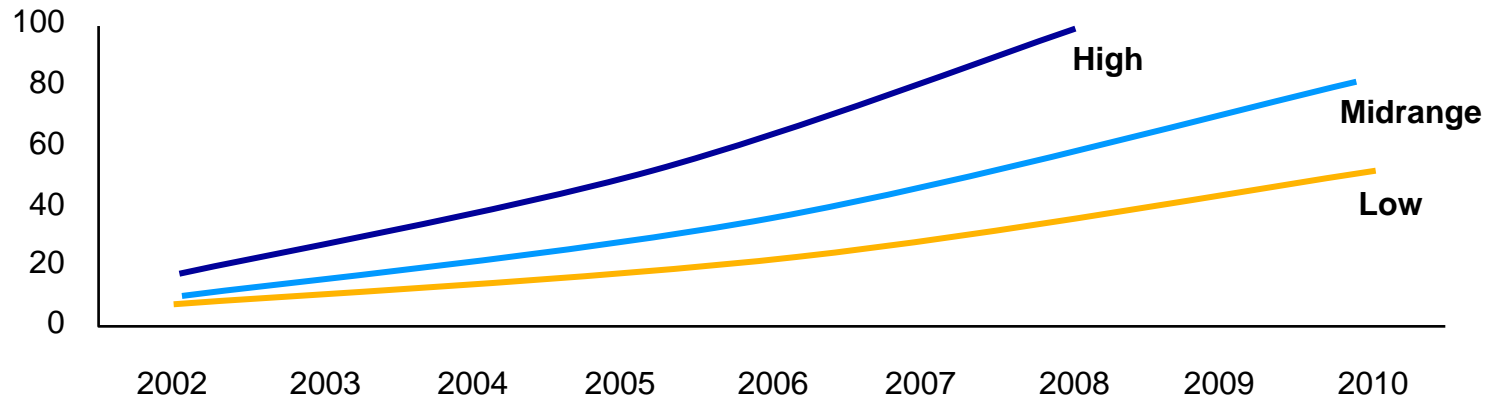
- Securitization is best suited to well-defined blocks of business with a significant level of redundant statutory reserves and/or capital
- Some examples include:
 - Closed blocks formed by recently demutualized companies
 - Term business with XXX reserve strain
 - UL business with AXXX reserve strain

Bonds are issued with principal and interest payments based on the future profits that emerge from a specific segment of a life insurer's business

The life insurance industry's need for relief from XXX reserve strain is growing rapidly

- Moody's estimates that industry LOC demand for XXX reserve credit could increase to roughly \$45 billion by 2007

**Forecasted Reinsurance LOC Market Demand
XXX Reserves Only (\$B)**



Source: Moody's Investors Service.

While securitization is rarely the financing mode of first resort, there are clear benefits

- Raising capital to meet XXX requirements frees up assets to be invested in other, higher return areas
- Securitizations can also be used to transfer unwanted or non-core risks for a particular line of business
- Additionally, companies can raise debt secured against the release of future, excess profit margins
- As these deals become more routine, the cost of securitization as a form of financing will drop

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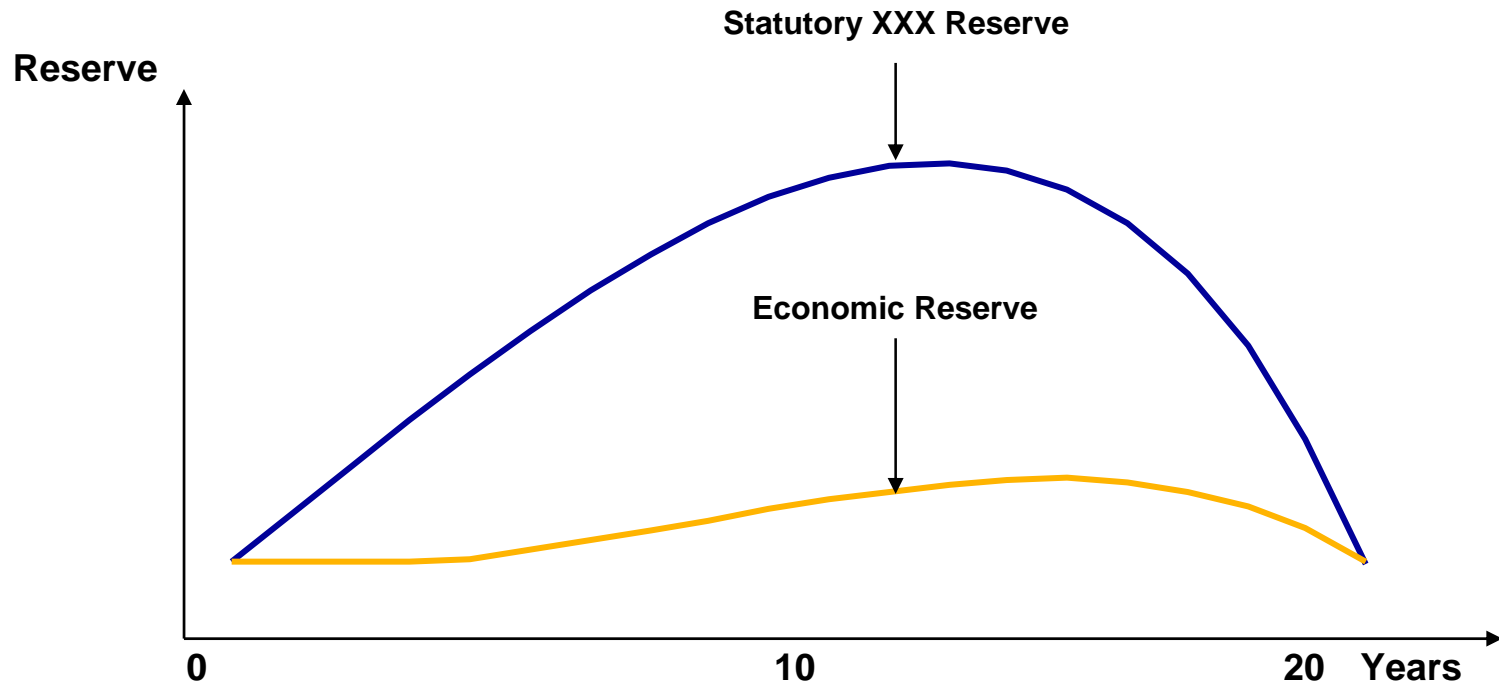
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Specific securitization examples — Term insurance redundant reserves

Regulation XXX Results in Significant Long-term Reserve Strain for Companies in the Term Market



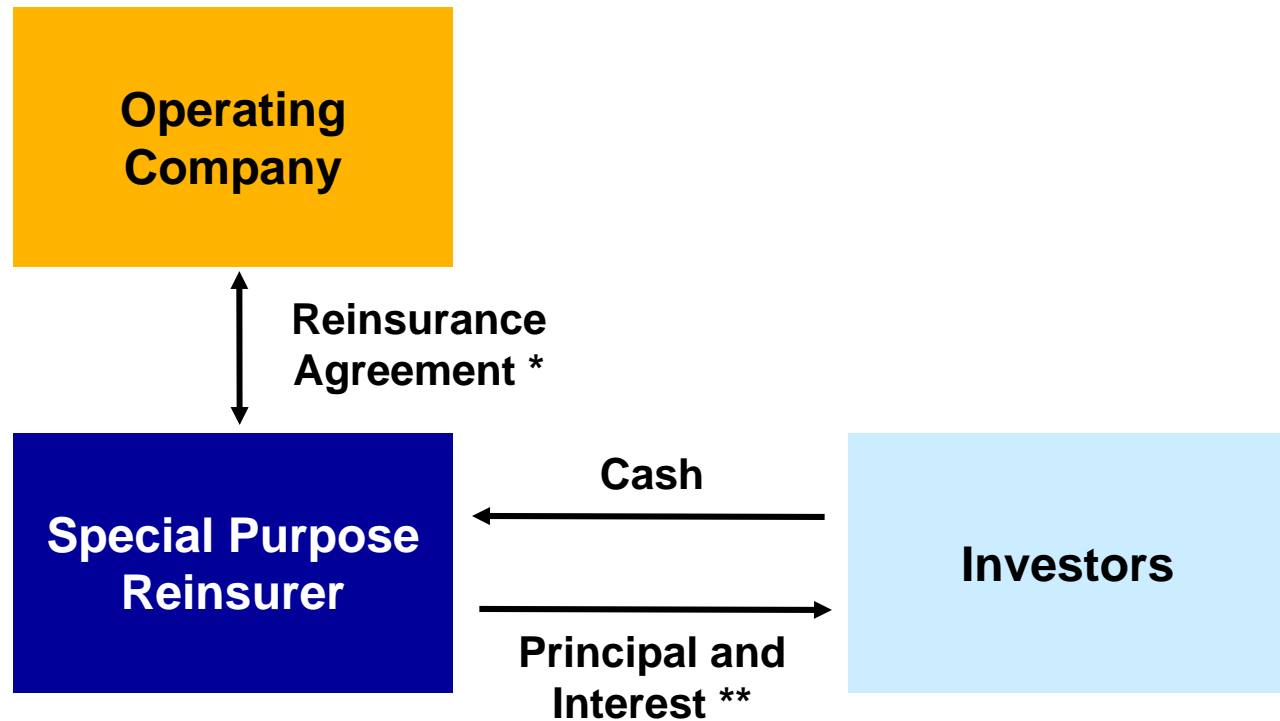
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Specific securitization examples — Term insurance redundant reserves

- Securitization is an alternative that avoids the need for LOCs
- Debt can be issued in tranches that correspond to required funding for XXX reserves
- Cost to insurer is the difference between interest rate on assets purchased with debt proceeds and debt interest rate
- This structure has advantages when compared to a LOC structure:
 - Future capacity of capital markets is less of an issue
 - Net impact of future changes in market credit spreads is small because both sides of the balance sheet are affected

Continued...

Specific securitization examples — Term insurance redundant reserves



*Reinsurance reserve credits are supported by assets placed in trust from the cash that is raised from the investors.

**Principal and interest payments made on securities issued by the special purpose reinsurer.

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Specific securitization examples — Term insurance redundant reserves

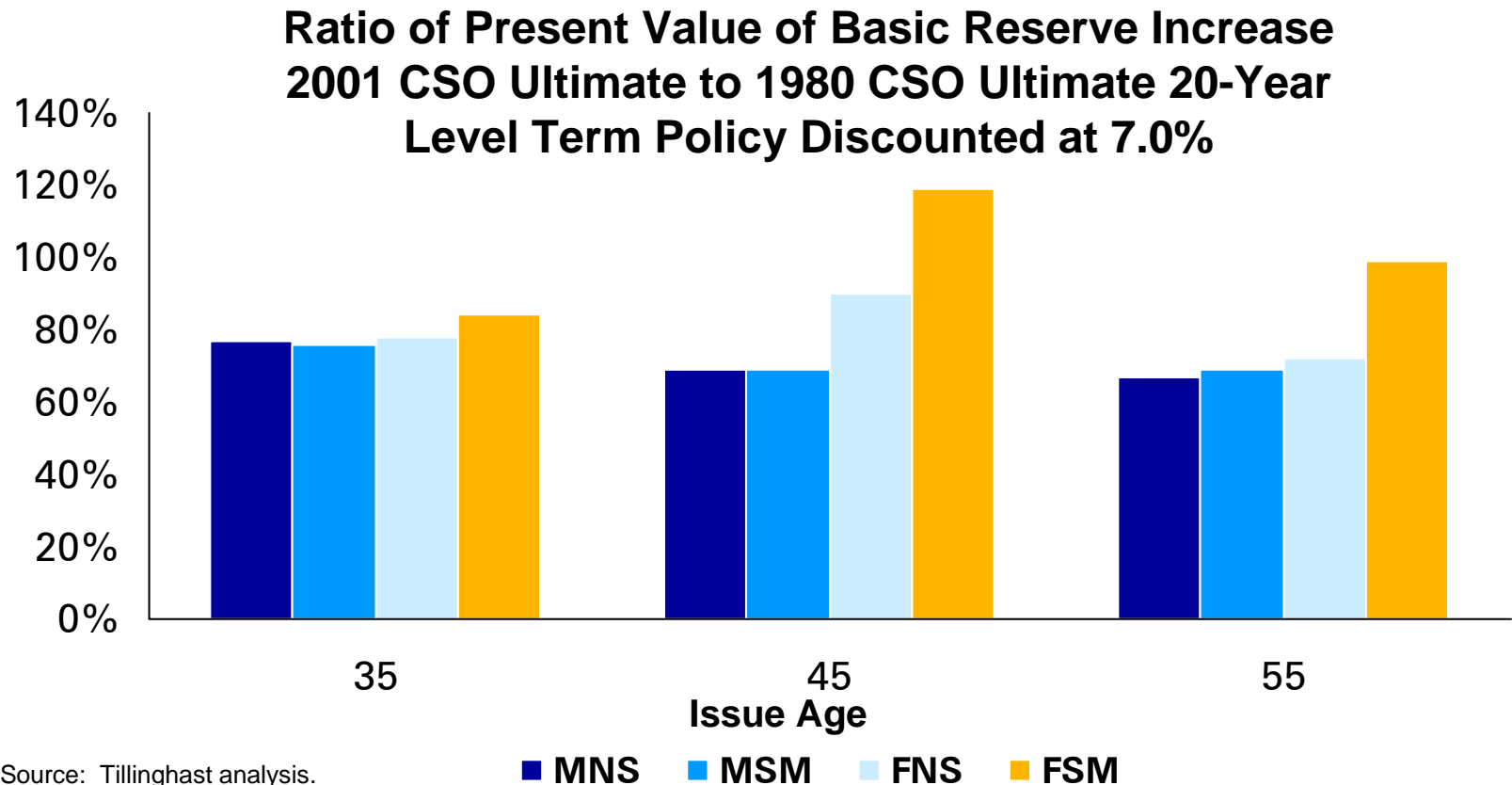
- Key risk to investors is that assets held in trust are needed to pay benefits
 - Primary risk factor is mortality
- Modeling requirements:
 - Accurate model of securitized term business
 - Ability to stress test mortality assumption in various ways
 - Varying mortality slope
 - One-time catastrophic events
 - Stochastic mortality?
- Goal is to demonstrate that securitization structure can withstand substantial adverse deviations in mortality experience

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Specific securitization examples — Term insurance redundant reserves

- Impact of 2001 CSO on basic reserves for term insurance may help alleviate term reserve redundancy to some extent

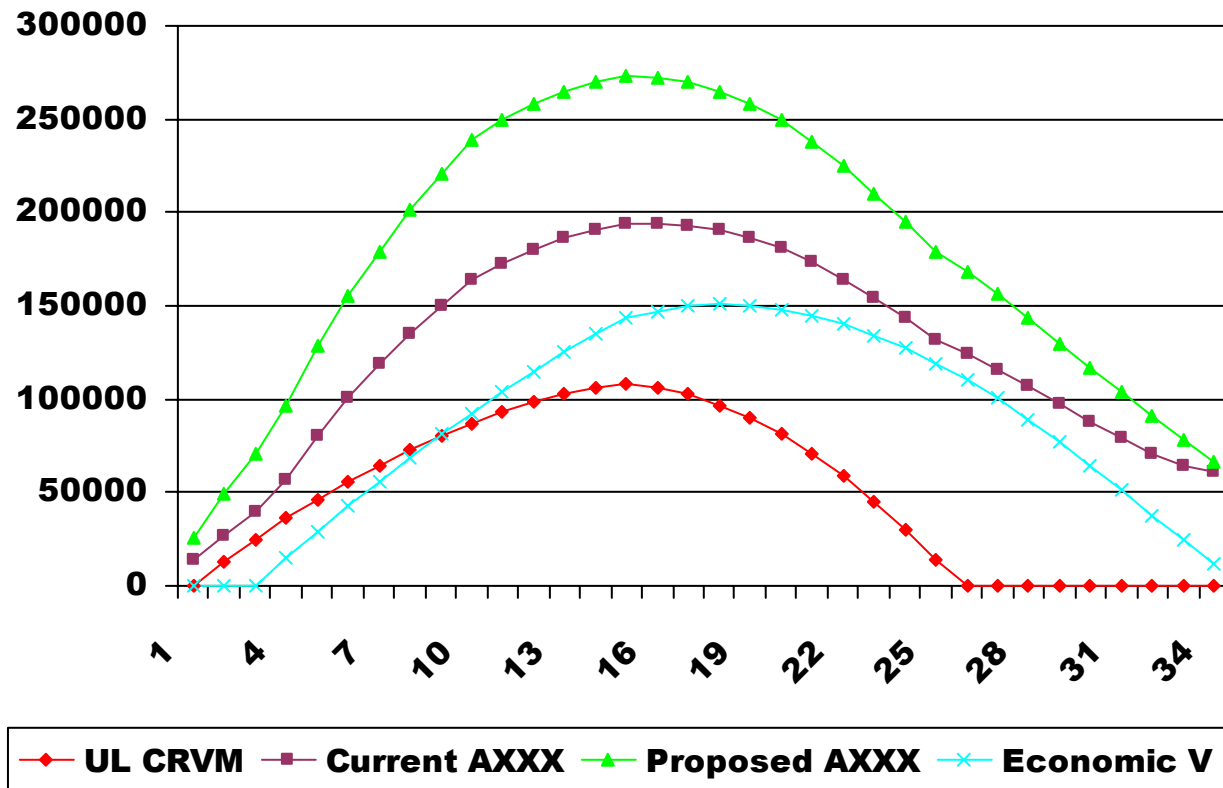
ILLUSTRATIVE



Source: Tillinghast analysis.

Specific securitization examples — Universal life redundant reserves

A Similar Structure Could be Employed for UL Business Subject to AXXX Reserving Requirements



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Specific securitization examples — Universal life redundant reserves

- Securitization structure for AXXX reserves is comparable to XXX securitization, but there is more uncertainty to analyze:
 - Mortality risk
 - Investment risk
 - Persistency risk
 - Funding levels (levels of premium payments)
 - Setting of the credited interest rate and other non-guaranteed elements

The quality of the company's pricing and product design work is important, to the extent it impacts the volatility and degree of uncertainty related to the risks listed above

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Specific securitization examples — Universal life redundant reserves

- There are additional modeling challenges for AXXX deals compared to XXX deals:
 - Asset modeling is more important
 - Stochastic analysis may be needed (e.g., interest rate risk)
- AXXX reserves are not as well defined as XXX reserves
 - Could depend on product features and fund performance
- AXXX reserves for a block of business could run off more slowly than XXX reserves and over a very long time period
- The deal structure may also play a role in reducing volatility from the investors' perspective (e.g., specific covenant relating to crediting rate strategy)

Specific securitization examples — LILACs

- Life insurance life annuity combinations (“LILAC”) have been developed to take advantage of mortality arbitrage opportunities
 - A charity sets up a trust and sells fixed income securities in that trust to institutional investors
 - Monies raised are used to purchase immediate annuities on the lives of the charity’s donors
 - Income from the annuities is then used to purchase life insurance on the same donors
- UBS has successfully put together several plans

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Specific securitization examples — LILACs

- Key risks include:
 - Timing of deaths
 - Especially given the limited number of lives in the pools
 - Stochastic mortality analysis is key to understanding timing risk
 - Deaths within the incontestability period
 - Premium guarantees
- State insurable interest laws result in limiting the donors to certain states
 - Texas and Virginia were the initial states used in the program

Specific securitization examples — Other securities focused on mortality risk

- Earlier this year Merrill Lynch sold \$70 million in bonds backed by life settlements sold by Legacy Benefits
- Legacy Benefits purchased life insurance policies from people with impaired life expectancies
 - Transaction is referred to as a life settlement
 - Typically involves insureds over age 65 with high face amount policies
- As with LILACs, the key risk with this offering is the timing of deaths
- Swiss Re issued a mortality catastrophe in December 2003, with principal payment linked to adverse mortality risk scenarios

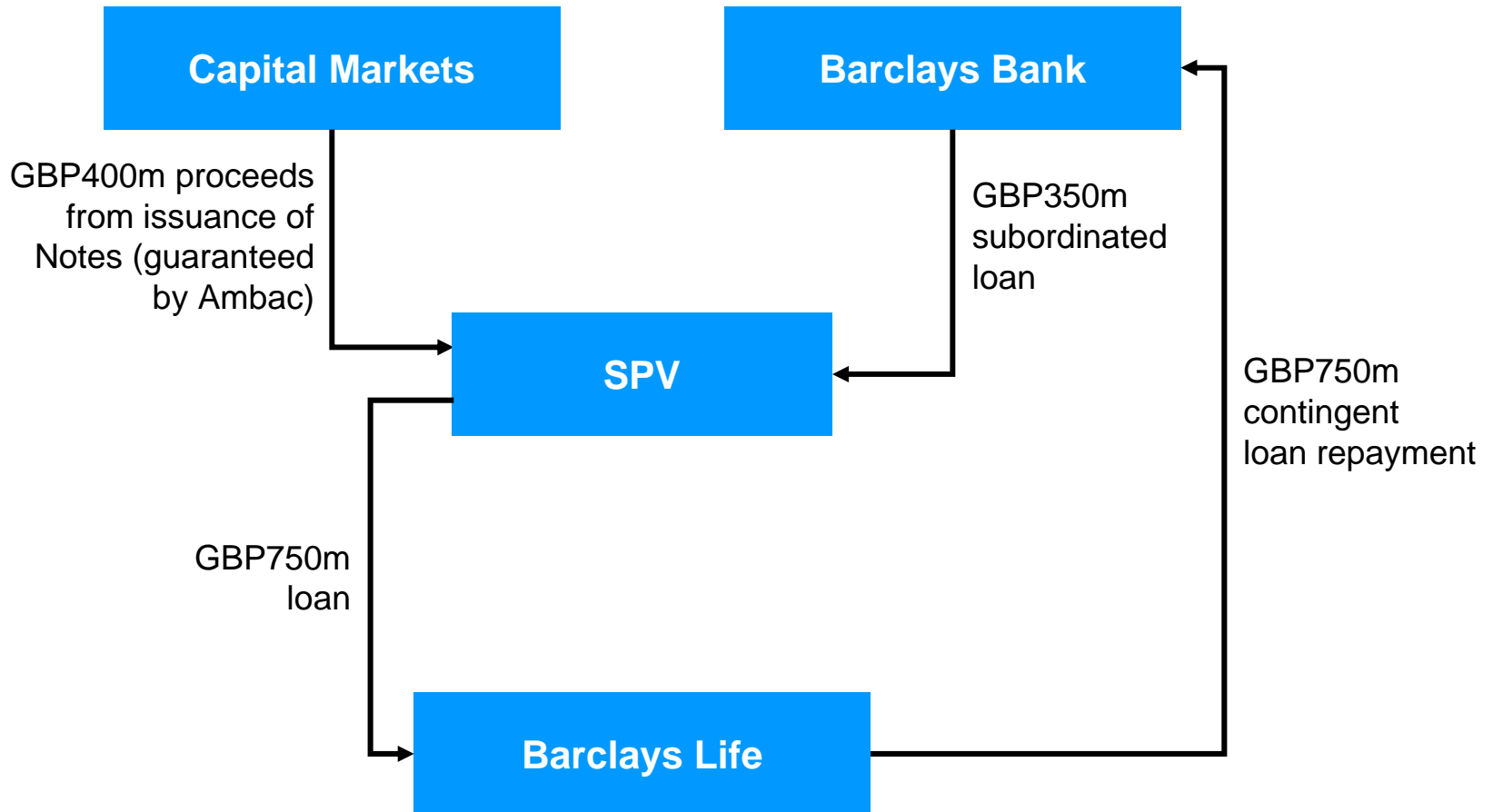
Specific securitization examples — Embedded value (U.K.)

- In late 2003 Barclays securitized the embedded value of its life business
- Objective was to refinance contingent loan from Barclays Bank to Barclays Life
- GBP400m raised from capital markets at LIBOR plus 0.4%
- Principal and interest under notes guaranteed by AMBAC
- Notes listed on Irish Stock Exchange
- Notes of GBP400m secured by base case PV surplus of GBP915m (on limited recourse basis)
- Securitized business is mostly “unit-linked” pension and life business, but a variety of other products are included as well

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Specific securitization examples — Embedded value (U.K.)

Simplified Illustration of Transaction — Initial Cashflows



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The actuary's role involves designing a sound financial model of the securitized business

- Primary modeling requirement is a good model of the securitized business, capable of projecting cash flows over a period at least equal to the term of the debt
- Securitization is non-recourse debt
 - Debt payments are contingent on sufficient cash flows emerging from the securitized business
 - Over-collateralization provides a “buffer” against adverse developments in experience
- The debt issuer uses the model to demonstrate the amount of collateral available to service the debt
 - Typically run under a baseline assumption set and a wide range of “stress” tests; e.g., Can the debt be serviced even under adverse scenarios?

The financial model and its underlying assumptions must satisfy stakeholders

- The model and assumptions will undergo significant third-party scrutiny
 - Rating agencies
 - Bond insurers
 - Potential investors
- Models and baseline assumptions must be well-documented and supportable
 - Critical assumptions supported by credible experience study data
 - Sufficient “granularity” in model
 - Good model validations (static and dynamic)
 - Third-party signoff

When stress testing the model, it is critically important to cover a wide range of scenarios

- What is the basis for the stress tests selected?
- Do they represent sufficiently adverse scenarios in light of historical experience and future expectations?
- Stochastic vs. deterministic stress tests?
- Are there other plausible scenarios that should be tested?

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Life insurers should carefully consider the pros and cons of securitizing

- Currently, high upfront costs, so need a large transaction to be cost effective (\$300 million and higher)
- Creates leverage
 - Financial versus operational?
 - Closed block structures seen as financial leverage by some rating agencies
 - XXX securitization structures may be viewed as operational leverage if monies raised by securitization are used to support XXX, or other redundant reserves
- Key factors to be considered:
 - Rating agency viewpoint
 - Wrapped or unwrapped debt?
 - Capital markets learning curve

We expect lower-cost transactions, more groundbreaking deals and new product lines

- The XXX securitization last year was viewed as groundbreaking
- Other deals in process will break additional new ground if successful (e.g., relating to AXXX)
- Long-term care products may be a good candidate
 - Long tail of liabilities
 - Significant intermediate build-up of policy reserves and associated capital requirements
 - Similar LOC issues to term/XXX
- “Hybrid” deals may involve multiple product lines