The Actuarial Profession
making financial sense of the future
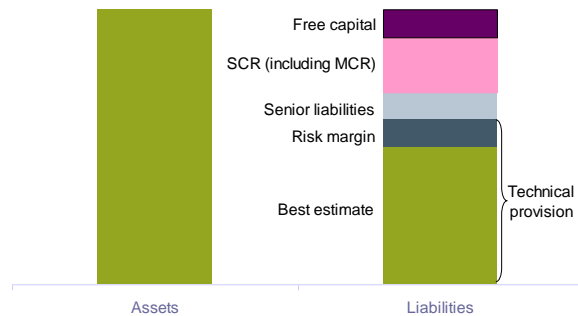
A closer look at Solvency II
Peter Telford and Feifei Zhang

Management of Annuity Business

Workshop session A3: Life

Solvency II balance sheet

- Market consistent
- Excludes liabilities that are subordinated to policyholders
- Includes free capital

Free capital
SCR (including MCR)
Senior liabilities
Risk margin
Best estimate
Technical provision

Assets
Liabilities

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Agenda

Methods and models
- Practical problems
- Internal model
- Risk margin

Calibration and assumptions
- Technical provision
- SCR standard formula

Investment and hedging strategies

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Practical problems

- Complexity of parameters
- Calculation run-time for liabilities
  - Real-time reporting and what-if evaluations
- Aggregation
- Scope of Internal Model
  - By risk and business line
  - By process
- Calculation of Risk Margin
  - Projecting SCR components

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Practical problems – some approaches

- Minimum acceptable complexity of inputs
- Scenario generation for liabilities
  - Full stochastic runs
  - Targeted runs
  - Replicating assets
  - Replicating formulas (a.k.a. curve fitting)
- Aggregation
  - Consistent methods
  - Coherent scenarios

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Scope of the Internal Model

- By risk and business line
  - Materiality
  - Credibility and predictability
  - Cherry picking?
- By process
  - Everything?
  - Whatever is not standard?

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Calculation of Risk Margin

- Cost of non-hedgeable SCR components at 6% p.a.
- What is non-hedgeable?
- Projecting the SCR
  - Nested scenarios
  - Factors per risk
  - Continuation of Internal Model
- Projecting the Risk Margin
  - Sensitivity
  - Planning

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Technical provision – best estimate

- Average of probability-weighted future cash-flows
- Proportionality assessment
- Grouping and assumption
- Risk-free discount curve
  - "Basic" risk-free curve
    - OIS, AAA government, swap
  - Extrapolation
  - Illiquidity premium

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Technical provision – illiquidity premium

- 9 principles
- Duration based
- Asset vs. liability illiquidity premium
- In force vs. future new business
- Calculation agent
- Impact on Risk Margin, SCR (credit stresses and correlations) and Internal Model

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SCR standard formula

- Market risk
  - Interest rate
    - Spot vs. forward
  - Credit spread
    - Spread widening vs. VaR loss
- Longevity risk
  - Baseline mortality and future improvements
- Counterparty risk
  - Recovery
  - Collateral

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Investment and hedging strategies

- Interest rate
  - Duration immunization vs. best estimate cash-flow matching
  - Rate basis trading
- Credit spread
  - Corporate vs. structured products
  - Bond vs. CDS basis
- Longevity
  - Trend vs. volatility risk
  - Basis risk
  - Counterparty risk

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