Risk Modelling and Management: Lessons from Life

- Assumptions
- Big Issues
- Consequences

Lessons from Life: Assumptions

- Management Actions
  - PPFM (Principles and Practices of Financial Mgt)
  - “The ORSA should … provide an impact assessment of them”
- Market Data
  - “Data used for the internal model shall be accurate, complete and appropriate”
  - Extrapolation challenges
Interest-rate swaption calibration issues

- Issues relating to Libor Market Model calibration
  - Fit to market data could be improved
  - Calibration parameters are hard to interpret
  - "Best fit" often implies unrealistic correlations between short and long ends of the yield curve
- New version of LMM in iESG v6.2 was developed to address all of these issues
  - More parameters giving greater flexibility in fitting market data
  - More intuitive calibration parameters
  - Stable and plausible correlations based on "real-world" estimates

Example calibration:
GBP at end-December 2008

Example calibration:
EUR at end-December 2008
Stochastic Volatility Jump Diffusion (SVJD)

- IESG v6.2 contains a new equity model: Stochastic Volatility Jump Diffusion (SVJD)
- This is a flexible model for equity returns incorporating realistic features as observed in historical market returns:
  - Stochastic Volatility
  - Jumps
- These features naturally give rise to term structure and fat tails/skew in realised and implied volatility
- Calibrations developed for MC and RW use
- Alternative to local volatility for MC use
  - More "realistic" dynamics than local volatility
  - Fast calibration and no trial-and-error required

Example calibration: FTSE100 at end-June 2009

- Local Volatility
  - Option maturity = 1 year
  - Option maturity = 10 years
- SVJD
  - Option maturity = 1 year
  - Option maturity = 10 years

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- Longevity
  - Current experience (at older ages)
  - Longevity improvement allowance
Predicting the present

Individual Females - Comparisons

Large impact on
tables at older ages

Equivalence of tables
over credible
experience age range
(to 85)

Large impact on
liabilities of different
tables at older ages

Source: own calcs based on CMI tables

Predicting the future

Improvements for Male age 75 in 2009

Source: own calcs based on CMI projections

Lessons from Life: Big Issues (at least, some of them!)

- Annuities
  - Can illiquidity be counted?
  - What is the risk-free rate?

- Own funds
  - Eligibility criteria (e.g. what tier will VIF be?)
  - Transition arrangements?

- Unavoidable market risk
  - Treatment of UK style with profits business

- Uncertainty of requirements
  - SGR calibration
  - Has emphasis moved from management to capital?
  - IMAP – data, documentation, use test
Lessons from Life: Consequences

- ICAS
  - Impact on risk awareness and management
  - Common currency for risk discussions

- Policyholder outcomes
  - With profits surpluses (e.g. equity risk premium)
  - Product attractiveness and availability

- Shareholder value
  - Capital and returns
  - Volatility of returns

- Governance
  - Actuarial Function and the Risk Management System

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