

Workshop E07
Sizing-up the Non-Life Risk Modules
in the current Solvency II proposals

Andy Hancock
 David Paul

GIRO 2007
 Cardiff Suite

15:45 – 16:45, Thursday 7 October 2007

0 |

EU Member States



1 |

Solvency II Quiz Question – delegates to CEIOPS

Austria	Belgium	Bulgaria	Cyprus	Czech Republic
Denmark	Estonia	Finland	France	Germany
Greece	Hungary	Iceland	Ireland	Italy
Latvia	Liechtenstein	Lithuania	Luxembourg	Malta
Netherlands	Norway	Poland	Portugal	Romania
Slovakia	Slovenia	Spain	Sweden	United Kingdom

|

**Ambition (Spring 2007)
versus reality (October 2007)**

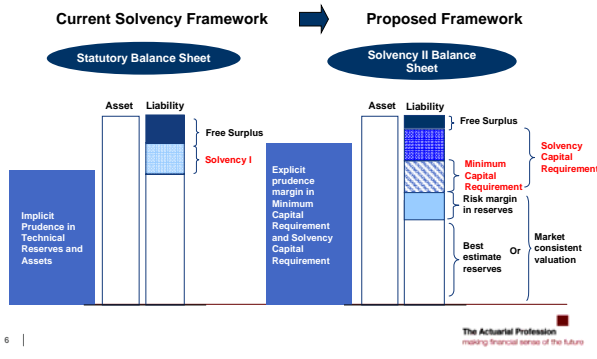
- **Ambition – to seek out patterns**
 - General trends
 - Higher / lower
 - Concentrate on non-life underwriting and catastrophe components
 - **Reality**
 - Three-step analysis
 - Creating a Solvency II balance sheet >>>> available capital
 - SCR (Solvency Capital Requirement) by 'standard formula'
 - Comparison with ICAS >>>> how relevant is 'standard formula' SCR ?
 - Diversity at each of three steps
 - Pluses counter minuses
 - Multi-dimensional
- GIRO 2007 Objective**
- E&Y QIS3 Survey – experiences gained and shared
 - Give insights: why this diversity?
 - Discuss: some pointers for FSA / CEIOPS (QIS4)?

Experience gained through peer to peer comparisons

- **Ernst & Young General Insurance Solvency II Forum**
 - 15 participant firms / groups and growing
 - Practitioner forum
 - Discussion
 - Debate
 - Comparison
 - Actuaries & Risk Officers
- **Solvency II General Insurance QIS3 Survey**
 - Converting to a 'Solvency II' restated balance sheet
 - For general insurers, degree of complexity tends to be understated
 - < life insurers are more advanced with 'market consistent' valuation >
 - Computing the non-life underwriting and catastrophe components of 'standard formula' SCR

Converting to a 'Solvency II' restated balance sheet

The Solvency II restated balance sheet



Solvency II balance sheet: What was surveyed?

- 'pre-claims' <-> unearned premium provision
- Restatement of claims outstanding ('post-claims' liability)
- Overall movement in available capital, comprised of:
 - 'pre-claims' change
 - Removal of DAC
 - 'post-claims' change
 - Introduction of risk margin
 - Valuation of assets changes

Solvency II balance sheet: What was learned? 'pre-claims liabilities'

- **Theory**
 - Intended to be a 'market consistent' valuation of unexpired period of risk
 - Should be abandoning the "n/12 x Pr" convention of UPR (existing GAAP)
 - Should incorporate assessment of current loss ratios on in-force business
 - Correct allowance for time value of money
- **Practice**
 - QIS3 Technical Specification was unclear and allowed 'opt out' from a 'market consistent' approach
 - Only a few in Survey had attempted full 'market consistency' inclusive of loss ratios etc.
 - Some had not introduced discounting and / or doubted the reliability of time-based run-off projection
- **Diversity**
 - Reductions: 0% // 5 to 10 % // >20%

Solvency II balance sheet:
What was learned? 'post-claims liabilities'

- **Theory**
 - Best estimate
 - Discounting
- **Practice**
 - Current booked estimates may be deemed to be 'best estimate'
 - Is QIS3 computation being done robustly – in a way that will satisfy IFRS Phase 2 requirement for best estimate and risk margin?
 - Again doubts over the reliability of time-based run-off projection
- **Diversity**
 - Reductions: 5% to 25%

9 |

Solvency II balance sheet:
What was learned? 'available capital'

- **Expectation (theory?)**
 - New 'pre-claims' liability versus UPB less DAC – generally expect to increase 'available capital'
 - Discounting – increase 'available capital'
 - Explicit risk margin – reduce 'available capital'
- **Practice**
 - In Survey – available capital increased in most cases
 - Large insurance liability reductions didn't correspond to large risk margin additions
 - No instances of investments revaluations, however
 - further distortions by changing values of subsidiaries in balance sheet
- **Diversity**
 - Increase in available capital: 5% to 20%
 - Decrease in available capital: 0% to -10%

10 |

Solvency II balance sheet:
What was learned? Qualitative issues

- **Risk margin:**
 - Most of Survey participants had used QIS3 'helper tabs' for Cost-of-Capital Risk Margin calculation:
 - Done mechanically,
 - Not validated in a conceptual way
 - Not validated against internal economic capital framework (either insurers didn't have such a framework, or simply didn't think the cross-comparison was relevant)
- **Actuarial, Risk or Finance?**
 - In Survey, mostly balance sheet was restated by actuaries without Finance team involvement
 - Some instances of QIS3 completed by Finance, without actuaries being involved
 - QIS3 completed by Group, without BU involvement

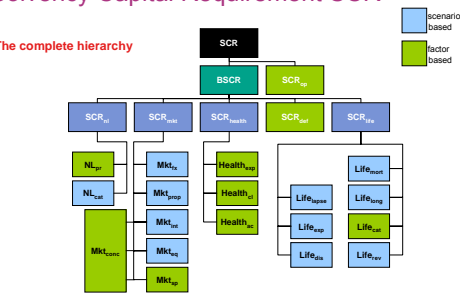
11 |

Computing the 'standard formula' SCR Non-life underwriting and catastrophe risk modules

12 |

'Standard Formula' Solvency Capital Requirement SCR

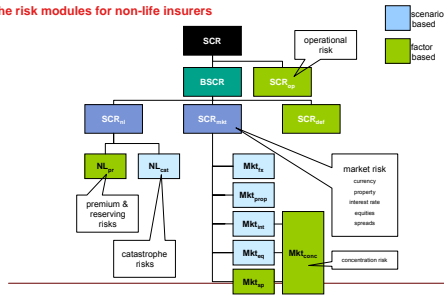
The complete hierarchy



13 |

'Standard Formula' Solvency Capital Requirement SCR

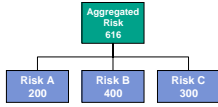
The risk modules for non-life insurers



14 |

Demonstration of Correlation - combinations

Correlation	Risk A	Risk B	Risk C
Risk A	100%		
Risk B	0%	100%	
Risk C	75%	0%	100%



Risks A and C are highly correlated
Risk B is independent of A and C

Aggregated risk = $\sqrt{(200^2 + 400^2 + 300^2 + (2 * 0.75 * 200 * 300))} = 616$

No correlation between A and C = $\sqrt{(200^2 + 400^2 + 300^2)} = 539$

Fully correlated = $200 + 400 + 300 = 900$

Non-life underwriting risk

- separate calculations for premium risk and reserving risk
 - but now combined in a single 'non-life underwriting' risk module
 - this part of SCR has become less intuitive - difficult to comprehend and relate to 'real world'
- structurally built up on 15 categories of non-life LOB's (lines of business)
- 'market' volatility factors and correlation matrices for premium and reserving risks are prescribed by CEIOPS
 - CEIOPS is seeking to set the factors and correlations to calibrate the Standard Formula at the 99.5% VaR risk measure over 1 year time period
- insurers may calculate their 'entity-specific' volatility factors for premium risk
 - using up to 15 years of historical loss ratios
 - credibility weighting is then applied to blend entity specific factor with market (CEIOPS prescribed) factor
 - no such entity-specific factors permitted for reserving risk

Volatility Factors QIS3 vs QIS2

Non-life premium risk volatility											
QIS2	5.0%	12.5%	7.5%	15.0%	10.0%	25.0%	10.0%	15.0%	10.0%	15.0%	15.0%
QIS3	5.0%	10.0%	10.0%	12.5%	10.0%	10.0%	12.5%	5.0%	7.5%	12.5%	15.0%
Non-life reserve risk volatility											
QIS2	15.0%	15.0%	7.5%	15.0%	10.0%	20.0%	10.0%	10.0%	20.0%	20.0%	20.0%
QIS3	15.0%	12.5%	7.5%	15.0%	10.0%	15.0%	10.0%	10.0%	10.0%	15.0%	15.0%

Correlations QIS3 vs QIS2

QIS2	1	2	3	4	5	6	7	8	9	10	11
1: Accident and health	100%										
2: Motor, third party liability	25%	100%									
3: Motor, other classes	0%	100%	100%								
4: Marine, aviation and transport	0%	0%	50%	100%							
5: Fire and other damage of property	0%	0%	50%	25%	100%						
6: Third party liability	25%	0%	0%	0%	0%	100%					
7: Credit and suretyship	0%	0%	0%	0%	0%	50%	100%				
8: Legal expenses	50%	25%	0%	0%	0%	50%	100%	100%			
9: Assistance	0%	0%	50%	50%	50%	0%	0%	0%	100%		
10: Miscellaneous non-life insurance	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	
11: Reinsurance	0%	0%	50%	50%	50%	50%	0%	0%	0%	0%	100%

QIS3	1	2	3	4	5	6	7	8	9	10	11
1: Accident and health	100%										
2: Motor, third party liability	25%	100%									
3: Motor, other classes	25%	50%	100%								
4: Marine, aviation and transport	25%	50%	25%	100%							
5: Fire and other damage of property	25%	25%	25%	25%	100%						
6: Third party liability	25%	50%	25%	25%	25%	100%					
7: Credit and suretyship	25%	25%	25%	25%	25%	50%	100%				
8: Legal expenses	50%	50%	50%	25%	25%	50%	50%	100%			
9: Assistance	25%	25%	50%	50%	50%	25%	25%	25%	100%		
10: Miscellaneous non-life insurance	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	
11: Reinsurance	25%	25%	25%	25%	50%	25%	25%	25%	50%	25%	100%

18

'Standard formula' SCR: What was surveyed?

Premium & Reserve Risk Capital

- Survey was large enough to make comparisons for 5 or 6 lines of business where there were multiple data points (but other lines of business were absent from Survey or only one / two data point)
- Expressed relative to net written premiums and to technical provisions

Catastrophe Risk Capital

- Survey expressed catastrophe risk component relative to other major risk components in the upper level aggregation

19

'Standard formula' SCR: Premium & Reserve Risk What was learned?

• Hard to discern pattern

- Combination of premium and reserve risk modules means that different volume measures for premium risk and reserve risk combine – explains considerable variation in premium & reserve risk capital component for two companies in same LOB

• 'Entity specific' factors for premium risk

- Survey revealed spectrum: not attempted / data problems / results didn't seem sensible / attempted and used
- Most Survey participants did support that 'entity specific' factors should be allowed and made effective
- On balance Survey participants also were 'pro' developing process of 'entity specific' factors for reserve risk

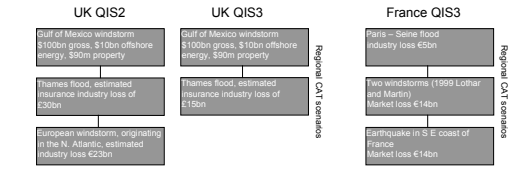
• CEIOPS 'market' parameters

- Parameters are arbitrary and Survey suggests that there is a lack of buy-in by UK actuaries and their firms

20

Non-life catastrophe risk

- Regional CAT scenarios specified by local regulators, as was the case during QIS2
- QIS3 has also seen the addition of European 'Transregional' CAT scenarios prescribed by CEIOPS
 - European windstorm corresponding to a 1 in 200 year event
 - Man-made scenario – two aircraft, level crossing, single largest property, terrorist attack at event
- QIS3 Technical Specification says that consideration of the transregional European windstorm can be 'obsolete' if local regulator has specified equivalent windstorm (dependent upon location of risks)



21 |

'Standard formula' SCR: Catastrophe Risk What was learned?

- Regional & Trans-regional scenarios**
 - Survey reveals lack of engagement by insurers / actuaries with the latest scenario suggestions
 - Practical difficulties:
 - Major investment in time / money to change existing cat scenario 'tests'
 - Not motivated to do that for 'non-mandatory' QIS3 (or indeed QIS4!)
 - Why change from 'bespoke' to 'standard'?
 - QIS3 cat scenario framework fails to contend with complexities of business of most of Survey participants
- Diversification / Reinsurance**
 - Impractical to work 'arbitrary' scenarios through 'real' treaty arrangements
 - In Survey the Cat Risk capital was mostly "diversified away" except for participants with very large cat risk capital, relative to attritional risk capital

22 |

Observations & Questions

23 |

Observations & Questions (1 of 2)

- **General insurers have work to do on their 'SII balance sheets'**
 - Balance sheet needs focus – not just focus on internal models and standard formula SCR
 - Life insurers and life actuaries have been addressing issue of 'market consistent' valuation for longer period
 - But 'market consistent' valuation for GI raises different issues than in life
 - Introducing discounting is a large cultural change – not discounting has been a variable and unreliable proxy for prudence / risk margin
- **Risk Margin - Cost of Capital Method**
 - Mechanically done in QIS3 (by the majority)
 - 'helper tab' may be counter-productive in the longer term
 - Not understood and related to internal capital frameworks (bodes ill for Use Test)
 - Needs joint development through co-working of actuarial and finance functions

24 |

Observations & Questions (2 of 2)

- **Does 'standard formula' SCR matter for UK actuaries and insurers?**
 - '2 year clause' in the Directive
 - Role of the UK FSA
 - Will we transition directly from ICAS to approved internal model SCR?
- **Are there unreasonable expectations of 'standard formula' SCR**
 - Should it only be a back-stop?
 - More – or less – of 'entity-specific' parameterisation?
 - Can Cat Risk difficulties be solved in a credible way?

25 |

Questions & Discussion

for more information on the G.I. Solvency II Forum and
to participate Surveys please contact:

Andy Hancock ahancock@ey.uk.com
David Paul dpaul@ey.uk.com

26 |

Solvency II Quiz Question – delegates to CEIOPS

Austria	Belgium	Bulgaria	Cyprus	Czech Republic
Denmark	Estonia	Finland	France	Germany
Greece	Hungary	Iceland	Ireland	Italy
Latvia	Liechtenstein	Lithuania	Luxembourg	Malta
Netherlands	Norway	Poland	Portugal	Romania
Slovakia	Slovenia	Spain	Sweden	United Kingdom

The Actuarial Profession
making financial sense of the future

Solvency II Quiz Question – delegates to CEIOPS

Austria	Belgium	Bulgaria	Cyprus	Czech Republic
Denmark	Estonia	Finland	France	Germany
Greece	Hungary	Iceland	Ireland	Italy
Latvia	Liechtenstein	Lithuania	Luxembourg	Malta
Netherlands	Norway	Poland	Portugal	Romania
Slovakia	Slovenia	Spain	Sweden	United Kingdom

The Actuarial Profession
making financial sense of the future
