Insurer Solvency Assessment

March 23, 2003
Financial Stability Institute,
Basel (Switzerland)
Agenda

- Introduction
  - Earlier report of Solvency WP
  - Project status of current RBC WP
  - Next steps

- Overview of draft final report

- Preferred structure for solvency assessment

- Q&A and input on our progress
Introduction

Working Party Members:

Peter Boller (Germany & Switzerland)  Glenn Meyers (USA)
Allan Brender (Canada)              Teus Mourik (Neth)
Henk van Broekhoven* (Neth)        Harry Panjer (Canada)
Tony Coleman (Australia)            Dave Sandberg (USA)
Jan Dhaene (Belgium)                Nylesh Shah (UK)
Dave Finnis (Australia)             Shaun Wang (USA)
Marc Goovaerts (Belgium)            Stuart Wason** (Canada)
R Kannan (India)                   Hans Waszink (Neth)
Toshihiro Kawano (Japan)            Bob Wolf (USA)
Sylvain Merlus (France)

* Vice-Chair

** Chair
Introduction

- IAA Insurance Regulation Committee & the International Association of Insurance Supervisors (IAIS) co-operation on solvency issues
- IAA Solvency Working Party report delivered in early 2002 - key elements:
  - Classification of insurer risks
    - Underwriting
    - Credit
    - Market
    - Operational
    - Event
    - Liquidity
  - Risk assessment process overview
IAA Solvency Working Party report delivered in early 2002 - key elements (cont’d):

- Risk assessment process overview
  - Modelling tools
  - Key components of risk
  - Time horizon
  - Risk management
  - Combining risks
  - Distributions ⇒ assessment ⇒ risk measures
  - Implications for solvency assessment
Introduction

- IAA Risk-Based Capital Solvency Structure Working Party formed spring of 2002

- Terms of reference:
  - describe principles & methods to quantify total funds needed for solvency
  - foundation for global risk-based solvency capital system for consideration by IAIS
  - identify best ways to measure the exposure to loss from risk & any risk dependencies
  - focus on practical risk measures & internal models
Introduction

- Current WP progress (March 2002 to March 2003):
  - Meetings; numerous conference calls plus 2 face-to-face meetings of entire WP + many calls involving WP assignment groups
  - Wrap up meeting of WP scheduled next week (San Francisco)

- Deliverables to date
  - Presentation at EC event in Brussels June 25 together with GC
  - Presentation to IAIS Technical Sub-Committee Nov 20
  - Draft incomplete report with case studies and appendices totalling 140+ pages (November 2002)
  - Sought input on our progress from various parties and obtained broader member association input (on-going effort in this regard)
Introduction

Steps until delivery of draft final report in May 2003:

– Consider final input from IAA Insurance Reg’n Committee and interested supervisory bodies (e.g. IAIS, EC, etc.)
– Compile work presently done (focus on streamlining of text; Chapter 6; case study expansion etc.)
– Face-to-face wrap up meeting in San Francisco at the end of March
– Draft final report due in Sydney in May 2003
Outline of draft report

Table of contents:

– Chapter 1 - Introduction - terms of reference
– Chapter 2 - Executive Summary - (under construction)
– Chapter 3 - Solvency, the Supervisory Challenge
– Chapter 4 - Preferred Structure for Solvency Assessment
– Chapter 5 - Insurer Risk Types & Measures
– Chapter 6 - Factor-Based Approach
– Chapter 7 - Internal Model Approach
– Chapter 8 - Reinsurance
– Chapter 9 - Total Company Approach
– Glossary
– Appendices (case studies, analytic methods etc.)
Preferred Structure for Solvency Assessment

- Multi-pillar approach to supervision
  - set of capital requirements is necessary for solvency assessment but not sufficient by itself
- Types of risks to be included
  - all types of insurer risk to be included
- Principles vs rules based approach
  - “Principles-based” approach focuses on “doing the right thing” but requires reliance and risk-based supervision
  - “Rules-based” approach is objective & simple but may not capture an insurer’s risks appropriately - encourages “gaming the system”
Preferred Structure for Solvency Assessment

- Integrated balance sheet approach
  - Insolvency s.b. determined on an economic basis as measured by difference between present value amount of insurer’s obligations when valued at a high confidence level (e.g., 99%) and best estimate (fair?) value of insurer’s assets
  - This amount of total capital margin (TCM) can be split between the margins held implicitly or explicitly in the assets and liabilities and the remainder amount, which is required surplus

- Appropriate risk measures
  - Need to be clearly described
  - Preference for consistent (e.g., coherent) measures such as TailVar
Appropriate Risk Measures

Normal Distribution

- Mean
- Std Deviation
- Value at Risk (95th Percentile)
- Tail VaR$_{95}$ (Average VaR in Shaded Area)
Appropriate Risk Measures

Skewed Distribution

- Mean
- Std Deviation
- Value at Risk (95th Percentile)
- Tail VaR_{95} (Average VaR in Shaded Area)
Preferred Structure for Solvency Assessment

- Appropriate time horizon
  - Need to recognize full duration of business
  - Need to ensure solvency over a suitable supervisory control horizon such as one or two years
  - **Systematic risk** arises from **uncertainty risk** (i.e., model specification error, parameter estimation error, structural risk error) and **extreme event risk** (i.e., high impact one-time shocks, events which may be completely unanticipated and not captured in model)
  - Uncertainty risk is generally considered to be non-diversifiable
  - **Non-systematic risk** (also called volatility risk or process risk) represents random fluctuations in experience and is considered to be diversifiable
Time Horizon Illustration

Value

Zero

Present 2 Years Run-off into the future

Time

Non-Systematic Risk

Systematic Risk
Preferred Structure for Solvency Assessment

- Risk dependencies
  - must recognize risk dependencies, concentration and diversification
  - Should put focus on tail dependency, ie. when “things get really bad”
  - mathematical concepts such as copulas can be used
- Risk management
  - solvency assessment should recognize the impact of risk management
Case Study Results - General Insurance

Sample calculations demonstrate the difficulties inherent in assessing impact of reinsurance using factor-based approach

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Preferred Structure for Solvency Assessment

- Internal models
  - useful for modelling all quantifiable risks and risk dependencies
- Factor-based approaches
  - WP suggests the conditions needed for simple vs complex risk measures
Preferred Structure for Solvency Assessment

Total Company Risk

Risk Type

Products

Risk Aggregation

Total Risk

Value

Market Risk

Value

Underwriting Risk

Value

Credit Risk

Value

Operating Risk

Value

CAT Risk

Value

Product 1

Value

Product 2

Value
Working Party report in May 2003

- Key principles for preferred insurer solvency assessment framework defined
- Preferred framework makes use of a combination of either internal risk models or a factor-based approach along with a process for aggregating these to form a total company capital requirement
- Appropriate risk measures are defined
- Appropriate aggregation processes are defined
- Case studies illustrate how solvency assessment can be done
- Discussion of how preferred framework would have lessened the likelihood of prior insolvencies
- Work to calibrate factor based approach to individual jurisdictions would be an additional next step
Insurer Solvency Assessment

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