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GIRO Convention

23-26 September 2008
Hilton Sorrento Palace

Actuarial Aspects of Internal Models under Solvency II

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Actuarial Aspects of Internal Models under Solvency II


Internal Models Working Group
Preparation for February 2009 Sessional Paper

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Agenda

- Introduction
 - Role of this working group and role of this session
 - The EU directive
 - Sources of Internal Model Advice
- Actuarial Issues-Overview
- Four Issues for Discussion
 - Time Horizon
 - Co-dependency/Correlation
 - Data
 - Extreme Events
- Next Steps

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Purpose

- This working group is charged with writing an Institute sessional paper on “Actuarial Aspects Of Internal Models For Solvency II” to be presented at an Institute meeting in Feb 2009.
- The paper deals with life and GI, and has members representing both areas of practice.
- In this workshop we discuss some of our thinking and are looking for you thoughts. We will focus on GI.
- We want this to be very interactive—So speak up and feel free to interrupt!!

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EU Directive

- Role of Internal Models
 - Pillar 1 – Capital
 - Pillar 2 – ORSA (Own Risk Solvency Assessment)
- Specifications in the Directive
 - Use, statistical quality, calibration, validation, documentation, data, subject to regulator approval...
- Supervisory Roles
 - CEIOPS, National supervisors

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Sources of Internal Model Advice

- Actuaries
 - IAA, Group Consultatif, national actuarial organisations...
 - Insurance Supervisors
 - IAIS, CEIOPS, FSA (Solvency II paper to be issued shortly), other national supervisors...
 - Industry
 - CFO and CRO Forums...
 - Others
 - Consultants, companies, individuals, working parties, ...
- (See Appendix E for sample web links)

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Focus of this Working Party

- Implications for actuaries preparing internal models for application to companies supervised in the UK
 - UK business
 - Other business
- What is needed? What is available? What research is underway? What are the barriers to best possible practices?

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Modelling Areas with Actuarial Aspects

- Balance Sheet -- Initial and forecast
- Assessment of each risk and interrelationships among risks
- Model Structure
- "Use test"
- Testing and meeting specifications of the directive
- Other
- See Appendix A for the "Long List"

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"SWOB" Analysis

Strengths: <ul style="list-style-type: none"> ▪ Models 'R' US <ul style="list-style-type: none"> ▪ As actuaries ▪ As part of UK Supervision 	Weaknesses: <ul style="list-style-type: none"> ▪ See Appendix B for a long list, but 'nothing is perfect', so how good is 'good enough'?
Open Issues: <ul style="list-style-type: none"> ▪ Required quality ▪ IM or SCR for Technical Provisions ▪ (Appendix C) ▪ ??? 	Business Issues: <ul style="list-style-type: none"> One year time horizon? Does 'auto pilot' work? Models for IM or 'just' ORSA (Appendix D) ???

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One Year Time Horizon

- Risk after end of Year One included in risk margin. Slow-to-emerge risk (eg longevity, asbestos) may need little or no capital.
- Is this sufficient using Standard Formula capital and 6% cost?
- Are run off costs properly allowed for?
- Is the lack of insurance cycle a flaw (eg SCR becomes volatile)?

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Codependency/Correlation

- Industry studies suggest benefit of between 25-50% benefit for diversification relative to mono-line firms.
- Flipside, accumulation of risks also significant addition to capital.
- How do you get comfort around the correlation approach and results?
- How should the regulator validate the approach and results?

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Data for internal models

- Has to be “complete, accurate and appropriate” - is this achievable? How would you measure it?
- Can be external or internal – where should it come from?
- How much scope for judgement?

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Extreme Events

- Poorly represented in observed data, but
- Critical for estimation of tail of the risk distribution for capital and risk margins
- Possible sources: data, models, judgement, (other?)
- How is best source determined and validated
- Suggestion: Organised collection of expert opinions?

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Next Steps

- This working party continues to develop its paper
- Your comments continue to be welcomed

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Appendix A - The Issues

- **Balance Sheet** — assets, technical provisions and capital;
- **Risks** — UW, cats, reserving, future business, risks not in SCR, pricing cycles, market risk, credit risk, group risk, guarantees and options;
- **Structure of model** —time horizon, stochastic/deterministic, stress & scenario testing, granularity, correlations, diversification & fungibility, management actions, parameter uncertainty, probability distributions, data quality, cash flow, use of assumptions, identifying limitations, applying the required experience, identifying exposures;
- **Use** — use test, link to ORSA, IFRS and other reporting, ALM, reinsurance, pricing, ERM, capital allocation, P&L attribution;
- **Testing** — back testing, statistical quality, validation standards, calibration standard, documentation, external review;
- **Other**—control cycle, risk metrics, shortcomings, partial models, group models, valuation, alternative calibration, skills and experience, definition of exposure, application to run-off companies.

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Appendix B- Needs Improvement – Weakest Links

- Proper analysis of one-year time horizon
- Correlations, especially tail correlations
 - Inflation, pricing, reserve development, market fluctuations, the economy
- Treatment of extreme events
 - Probability weighted best estimate;
 - Risk distributions
 - Latent exposures
- Specifications within Directive –
 - Data, Calibration, Validation, Use, Statistical quality, Documentation, and Standards for regulatory approval
- Reserve uncertainty – beyond bootstrapping
- Quality of reserving
- Run times or approximations (especially life and GI if increasing granularity)
- Risk distributions for new business (wider than renewals? But how much?)
- Group diversification – Analysis of fungibility
- Use test– Given complexity that might be required, will be really be 'used'

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Appendix C – Open Issues

- Approval “bar”--How ‘good’ is ‘good enough’ for IM approval
- Risk margins — Are risk margins based on SCR or IM?
- Role of judgment in the model—selection of parameters, adjustments to the final results, other?
- Treatment of pricing cycle—future business, risk distribution of reserve development, expected reserve development
- Other?

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Appendix D – Business Issues

- One year time horizon is quite different from ‘to ultimate’ analysis – does that effect business strategy or just the model?
- Can Internal model really operate on ‘auto pilot’?
- Models for IM or ‘just’ ORSA?

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Appendix E – Sample Links

- Recent IAIS draft guidance (2008) can be found at the IAA website:
http://www.actuaries.org/CTTEES_SOLV/Agendas/Quebec_EN.pdf
- IAA Solvency Guidance (2004)
http://www.actuaries.org/LIBRARY/Papers/Global_Framework_Insurer_Solvency_Assessment-members.pdf
- CRO Forum Benchmarking Study of Internal Models (2005)
<http://www.croforum.org/publications.ecp>
