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Stress Testing and Scenario Analysis – Risk Assessment and Quantification and use in the determination of Capital

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Agenda

- When you would use Stress and Scenario Tests
- 3 Types of Model
- Risk Categories to be Stress Tested
- Aggregation
- Observations
- Key Design and Implementation Steps
- Correlation and Aggregation
- Risk measures and risk appetite
- Documentation of Individual Stress tests



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When you would use Stress and Scenario Tests

- Focus is on a particular business question
 - Don't require a full blown analysis of the company
 - Produce results quickly
 - Transparency – ease of communication of results
- ICA Calculation with no DFA Modelling
 - Don't believe in or don't have a DFA Model
 - Other Constraints – Business Model / Group Issues
- Fill in gaps not covered through the use of DFA Models
- Input to the design of DFA models
 - Causes / Effects
 - Correlations between risks
- Test DFA output and calibration of DFA models

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3 Types of Model

- Individual Scenario Modelling (Ground-Up)
 - Specific Events e.g.
 - Pharmaceutical Industry Loss
 - Specific named reinsurers become insolvent
 - Gross & Net Losses at a prescribed ruin probability
 - Distribution, Simulation or Point estimate
 - Individual in isolation or with 'Ripple' effects over time
 - 12-months → 5 years
- Risk Category Modelling (Top-down)
 - Distribution or Simulation
 - 12-month time horizon
- DFA Model

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Risk Categories to be Stress Tested

- Insurance risk – Underwriting / Reserving
- Market risk
- Credit risk
- Liquidity risk
- Operational risk

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Risk Categories to be Stress Tested

▪ Credit Risk

- RI Receivables / Recoveries modelled via simulation
 - Probability of Default by Rating / Loss Given Default
 - Correlation of Default between reinsurers
- Value in considering default of specific reinsurers
 - Reflect unique features of certain reinsurers / Transparency
- Debtor items less easy to model - Broker balances

▪ Liquidity Risk

- Cash available when needed. If cash shortfall then consider asset sales or capital raising
- Judgement of costs incurred (e.g. selling)

Risk Categories to be Stress Tested

▪ Operational Risk

- Ground-Up approach – Individual event types
- Working through a scenario e.g. Fraud;
 - Causes, Risk drivers and Behavioural patterns
 - Controls and Risk mitigation practices in place

Aggregation

Capital by Risk Category

€000's		Diversification	
LOB / Risk Type	Risk Category	Gross	Net
Credit Risk	Credit	38,129	34,876
Investments	Credit	10,326	7,576
Investments	Market	36,143	29,512
Casualty	Insurance	30,979	17,469
Marine	Insurance	9,532	3,745
Other	Insurance	5,560	2,055
Property	Insurance	19,064	8,986
Property Cat	Insurance	15,887	7,046
Operational Risk	Operational	12,363	12,363
Liquidity Risk	Liquidity	2,621	1,600
Diversified Capital		180,605	125,228
Insurance / Catastrophe		81,023	39,301
Capital - 100% Dependence between risks			180,605
Capital - Independence between risks			79,971

Observations

- Focus
 - Understanding of business drivers
 - Risk Quantification should reflect Risk Assessment
- > 12-month (3 – 5 years) View
 - Reflect future risk e.g. 'Soft' market (insurance risk)
 - Demonstration of continued Solvency
- Capital Considerations & Decisions
 - How much capital do you hold now – 12-month / 3 - 5 year view
 - Transparency and ease in rolling forward to future years
- Risks
 - Data / Parameter risk – 99.5%ile
 - Model risk – e.g. Management actions

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Key Design and Implementation Steps

- Establish a base level (Business Plan)
- Identify Risk
- Select Key risks for analysis
- Consider causes / effects of risks
 - Ripple effects
 - Correlations & aggregation
- Risk measure / appetite
- Identify plausible adverse scenarios
- Calculated corresponding capital requirement
- Aggregate results across risks
- Documentation

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Correlation and Aggregation

- Correlations
 - Within individual risk categories
 - Between risk categories
- Approaches:
 - Scenarios
 - Correlation matrices
 - Drivers - causes
 - Past experience
 - Judgemental
 - Aggregate distributions
 - DFA

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Risk Measures & Risk Appetite

- ICA has a specified risk measure / tolerance level
- Modelling for other business purposes may require other risk measures / appetites
- Choosing realistic adverse scenarios

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Documentation of Individual Stress Tests

- Entity being modelled
- As at date
- Risk reference
- Stress / scenario test owner
- Scope
- Causes
- Effects
- Related risks
- Methodology / Assumptions
- Financial Impact (capital requirement / risk measure)
- Conclusions

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