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Current Issues In Life Assurance May 2010
Andrew Hitchcox



Stress and Scenario Testing
PS09/20 (effective Dec 2010)

Much recent emphasis by FSA on Stress and Scenario Testing

08/24

Financial Services Authority
Stress and scenario testing

86 pages

09/20

Financial Services Authority
Stress and Scenario Testing
Feedback on CP08/24 and final rules

100 pages

New rules in FSA Handbook

Come into force Dec 2010
→ implement this summer
- at the same time as ICAs, QIS5, SII PAP!

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Requirements of PS09/20

Strong reminder of existing requirements GENPRU 1.2.42

- Broad programme of stress and scenario testing
- Overseen by senior management
- Documented, records retained for 3 years
- Subject to review during ARROW visits.

Introduces new requirement SYSC20

- Reverse stress testing
- Signed off by the Board.

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Topics highlighted in this presentation

Design and selection of (ordinary) stress tests

- Involvement of senior management.

Design ideas for reverse stress tests

- Involvement of the Board.

Specific examples from Kiln's experience

- Specialist GI company.

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Design and selection of (ordinary) stress tests - evidence of alternatives considered

Involvement of senior management

- Need to demonstrate evidence of selection process
- Sufficiently severe:
 - look at known worst events
 - by definition, you have survived these
 - double them to see what you get: unknown
- Market risks
 - last 25 years experience, but "doubled"
 - SII standard formula shocks: must discuss relevance
 - FSA's Financial Risks Outlook published annually.

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Design and selection of (ordinary) stress tests - evidence of alternatives considered

Sharp currency fluctuations

- Is your capital in the same currency as your ICA?

Insurance product related stress events

- Life: mortality, lapse rates
- GI: fires, thefts, accidents, nat cat events

Operational risk stress events

Scenario = combination of stress events

- circumstances occurring over a protracted period of time;
- sudden and severe events, such as market shocks and
- some combination of (a) and (b), which may include a sudden and severe market event followed by an economic recession.

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Design ideas for reverse stress tests - evidence of alternatives considered

Range of criteria

- Involvement of Board.

Think of 3 levels

- Ordinary stresses ("1 in 25", bad economic cycle)
- Business plan not viable (this is the hardest one)
- Cusp of insolvency (policyholders get paid in full, but only just).

Think like a BCP exercise

- Lose 25% of capital, have rights issue (expect to recover)
- Lose say over 50% of capital (orderly winding up)
- Going insolvent – are your arrangements in order?
 - e.g. banks' requirements for "living wills"

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Design ideas for reverse stress tests - evidence of alternatives considered

Business not viable (defining this is hardest)

- Chief issue is evidencing behaviour of external counterparties
 - customers, brokers
 - creditors, reinsurers
 - rating agencies, regulators, capital providers.

Ripple effects, second order effects

- Not all of them, just one or two on top of original shock
- "1/1,000 = many combinations of 1/10+1/100, 1/20+1/50"
- "If you can't survive just one piece of bad luck ...".

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Design infrastructure requirements for reverse stress tests

Co-ordination across Groups

- Consistency across Group –vs- applicability at solo level

Model breakdown effects

- capital fungibility in Groups
- risk mitigations, hedging strategies don't perform.

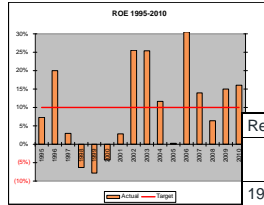
Able to do quickly during a financial crisis

- (1) where are we now?
- (2) able to be updated quickly as conditions vary
- (3) able to do further ones: what if it got X% worse?

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Specific examples from Kiln's experience - design of ordinary stress tests (Level 1)



Recent actual experience:

	State of market pricing cycle	Scale of shock event
1998/99	Poor	< "1/25"
2001	Weak to average	> "1/100"
2005	Medium strong	~ "1/50"

We expect to get shocks of 10%-15% of capital (i.e. zero profits) one year in three

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Specific examples from Kiln's experience - severe stress tests (Level 2)

Natural catastrophe events (Realistic Disaster Scenarios)

Syndicate XXX Premium £500m / Capital £420m

Event	Loss (£m)	% of CA
Cat of Mexico Windstorm \$112.5bn	148	35%
Tampa Bay Windstorm \$125bn	138	32%
Two events 1 NE Wind	135	32%
Two events 2 Carolina	130	31%
Miami Windstorm \$125bn	112	26%
Vancouver quake	102	24%
LA Earthquake \$78bn	97	23%
New Madrid Earthquake-Stress \$107bn	95	22%

Approve projected profits for 2009 £80m

→ wipe out 1 year's profits and up to 20% of capital

Rights issue needed to keep trading

- Contingency funding plans agreed with capital providers

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Specific examples from Kiln's experience - reverse stress tests (Level 3A) – lose ICA capital

Compare with tail runs from capital model

Output from the capital model based upon the average of the points around the ICA level of 99.5%:

Source	General losses	US cat losses	EU cat losses	Reserving deviation	BI credit loss	Operational loss
Average in tail	135	150	11	55	15	15
Sim 579	223	9	0	-19	9	24
Sim 7,685	5	205	13	30	20	6
Sim 15,869	81	197	1	72	13	11
Sim 21,545	47	44	1	191	4	53
Sim 24,047	-9	463	1	-12	8	1

- On a probability weighted basis, main reasons for insolvency:
 - Not: major nat cat event plus reinsurer failure
 - But: major nat cat event during period of weak market prices
- Duty to cut back peak exposures at bottom of pricing cycle

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Specific examples from Kiln's experience - reverse stress tests (Level 3B) – insolvency events

Ripple effects

- Natural catastrophe events (RDS): probability <1/100
- Knock on to reinsurer failures
 - One or two failures: probability <5%
 - Many failures: probability <1%
 - Directors can conclude:
 - Sufficiently severe scenarios
 - Likelihood of insolvency well less than "1/1,000"
 - Consistent with promise to policyholders of single A rating

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One final comment on reverse stress tests (the dreaded S-word)

Internal Model validation standards

- CEIOPS-DOC-48/09 paragraphs 8.90 – 8.104
 - 8.90. undertakings shall have processes in place as part of the ORSA to identify possible events or future changes in economic conditions that could have unfavourable effects on its overall financial standing.
 - 8.93. Stress and scenario testing is one of the quantitative validation tools
 - 8.100. Undertakings shall also conduct reverse stress tests
 - document its reverse stress testing
 - demonstrate that it has been signed off by its Board.

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