The Actuarial Profession
making financial sense of the future

Life conference and exhibition 2010
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Insurance Stress Testing

7-9 November 2010

Agenda

Today's session will cover:

- **Stuart:**
  - The FSA's approach to stress testing
  - The role of reverse stress testing
  - Intensive and intrusive supervision; the core prudential programme
  - Features of good practice in stress testing
  - Lessons from stress testing undertaken to date
  - Next Steps
- **Colin:**
  - What's new and what's not ?
  - Internal stress testing programme
  - FSA (and other external) stress test requirements
  - Reverse stress testing
- **Q&A**

What is stress testing?

- Stress testing

  Shifting the values of parameters that affect the financial position of a firm and determining the effect on the firm's business.

- Scenario analysis

  A wider range of parameters being varied at the same time. Scenario analyses often examine the impact of catastrophic events on a firm's financial position.

- Reverse stress testing

  Identifying explicitly and assessing the scenarios most likely to render a firm's business model unviable

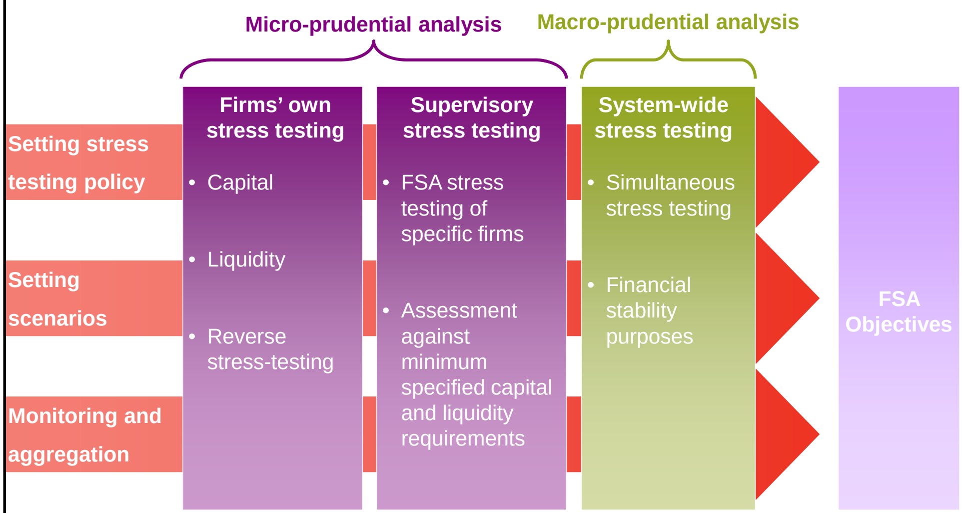
- (un)viability

  The point where crystalising risks cause a loss of confidence in the firm sufficient that the market loses confidence in the firm.

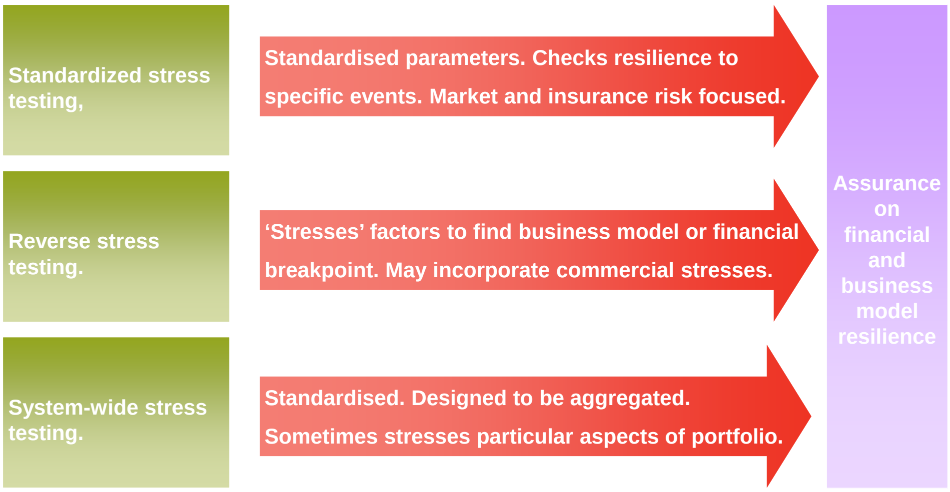
Stress testing – where are we going?

- Stress and scenario testing has been a longstanding part of the insurance regime.
- But prominence of stress testing has risen.
- Recent developments include:
  - PS09/20 – ''reverse stress testing''.
  - International agencies / European Supervisory Authorities.
  - FSA: intensive and intrusive supervision.
  - Increased public / market awareness of stress testing.

We have an integrated approach to stress testing.



The different types of supervisory stress test



Where does stress testing fit in the prudential framework for insurers?

Pillar 1	Standard capital requirements.	Stress testing runs throughout regime.
Pillar 2	Determination of capital required to survive 1in 200 stress event. Potentially derived through stress and scenario analysis.	
Capital planning	3-5 year capital plan considering how the firm would maintain compliance with capital required after adverse but plausible scenario.	
Systems and controls	Stress testing for purposes of effective governance and control. General stress testing requirement (GENPRU 1.2.42R).	

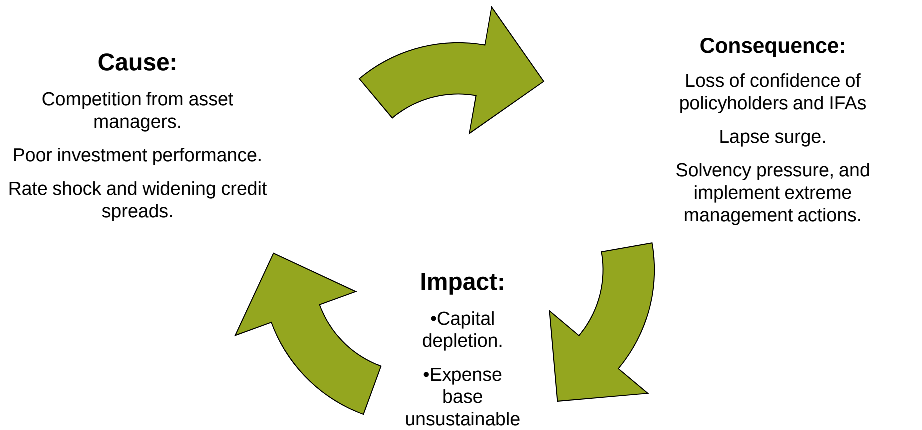
Reverse stress testing – what is business model failure?

- Imperative that approach to reverse stress testing is to define business model failure and then test scenarios which might cause a business model failure.
- Business model failure defined as ‘’point where crystalising risks cause a loss of confidence in the firm sufficient that the market loses confidence in the firm.
- Business model failure not just exhaustion of capital and / or liquidity.
- Examples of business model failure could include:
  - sustained losses or inability to meet financial / commercial targets or expectations,
  - inability to pay dividend,
  - inability to service debt,
  - closure to new business
  - mass lapse (which could itself be a cause of other forms of business model failure)
  - market refusal to provide or renew financial support,
  - severe reputational damage (affecting new business or market confidence).
  - inability to meet operational commitments.

Reverse stress testing - scenarios

- Scenarios need to examine full range of relevant variables – wider than key financial indicators and including idiosyncratic factors. Range of variables for life insurer could include some or all of the following:
  - Market risks
  - Closure of funding markets
  - Reinsurer or counterparty failure
  - Credit rating downgrade
  - Concentration risk (e.g. to broker, counterparty)
  - Insurance risk (pandemic / catastrophe)
  - Commercial risks (e.g. new market entrants, competition from different sectors)
  - Reputational risks (with both retail and wholesale clients / counterparties)
  - Regulatory risks (e.g. ring-fencing of capital / liquidity, regulatory censure)
  - Group risks (e.g. intra-group transactions, securities lending etc)
  - Operational risks (e.g. outsourcer error, data loss, pricing error).
- Good scenarios require thinking carefully about the range of qualitative and quantitative factors which could materially impact a firm. And striking a sensible balance between sophistication/complexity and tractability for senior management.
- We expect that scenarios for life groups to prospects for UK market in coming years reflecting potential impact of Sol II, RDR, Nest and other likely changes in the market.

Reverse stress testing – scenarios: possible example – with profits firm.



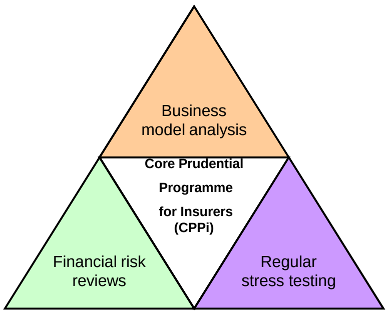
The original business model would be fundamentally unviable. Effective contingency planning stimulated by reverse stress test should allow orderly run-off to be achieved.

Benefits of stress testing

- Stress testing provides benefits for both regulators and firms.
- We believe the primary benefit of reverse stress testing is as an internal risk management tool for firms.
- Firms
  - Better understand the vulnerabilities of their current business model and strategic intentions; and reflect in planning and strategy.
  - Obtain greater assurance that business is within risk appetite.
  - Support decision making: financial and operational.
  - Better contingency planning.
  - Sign of effective governance and gives assurance on impact of major decisions.
- Regulators:
  - Gain assurance on financial resilience of a firm, group or sector.
  - Understand vulnerabilities of a firm's business model and determine potential need for action.
  - Explore and understand risk linkages and connections (scenarios).
  - Validate (but not set) expectations of capital and liquidity requirements.
  - Use to support contingency planning.

Core Prudential Programme Insurance - CPP

- Part of our how we are delivering more intensive and intrusive approach to supervision in respect of the largest life groups.
- Comprises of business model analysis, financial risk reviews and periodic stress testing.
- Designed to give ongoing assurance.
- Where possible, we will deliver our programme of work on Solvency 2 through CPP



CPP and stress testing – joined up process.

Significant linkages between CPP, and stress testing – a joined up process.

	Purpose	How	Link to stress testing
Business model analysis	Understand profit drivers and business model resilience.	Analysis of 7 elements of business model, including value proposition and profit and funding model.	Consideration of 'perfect storm' scenarios which would cause business model to break. Comparison with reverse stress testing outcomes.
Financial Risk Reviews	Gain assurance on key financial risks.	Detailed reviews covering assets, liabilities, ALM, risk transfer, risk appetite, capital management.	Order and priority of FRRs informed by stress testing results. Supervisory stress testing parameters and scenarios informed by FRR results.
Supervisory stress testing	Understand vulnerabilities of firms and gain assurance on their financial resilience.	Supervisory stress tests using either standardised or firm specific scenarios	Parameters and scenarios informed by firms stress testing, BMA and FRR results.

Examples of effective stress testing.

- Effective stress testing is likely to be accompanied by:
  - •Assumptions clearly articulated and impacts discussed.
  - •Use of scenarios incorporating "Real world" events. Not just financial risks.
  - •Meaningful senior management discussion of results. •.
  - •Impact of management actions clearly demonstrated (gross / net) and ''do-ability'' discussed.
  - •Clear outputs which are used to inform and support decision making and which change behaviours such as:
  - •Results integrated into the business plan/capital plan
  - • Results in /triggers/monitoring being put in place
  - • Action taken to address (eg) concentration risks

Core Prudential Programme for insurers stress testing – results.

• In (2009) we asked the groups covered by CPP to undertake stress tests at group and material solo level. Firms looked at the impact of stress, net of management actions, on regulatory capital and liquidity .

•The results were generally reassuring in terms of the position of the sector and gave valuable insights into the relative strength of different companies. A number of general issues emerged which we have followed up with affected firms. These included:

- •The fungibility of “surplus” capital in different entities across the group and the availability to group.
- •The monitoring and control their liquidity at group (as opposed to individual fund or company level).

•We have carrying out a similar exercise this Summer. We are currently following up a number of issues with individual firms including:

- •Reasons for non-linearity in capital requirements and capital resources.
- •Impact of lapse events on solvency.
- •Impact of exchange rate volatility
- •Capital tiering.

• We will be providing feedback to the firms involved individually the by the end of November.

Stress testing – next steps.

- Further supervisory stress testing is planned for 2011 covering both high impact and selected medium high impact life insurers. Supervisors are currently considering the methodology, scenario and parameters for future stress testing.
- A provisional proposal for H1 2011 stress testing is to focus on supervisory analysis of reverse stress testing submissions and cross-comparison / benchmarking.
- We are conscious that high impact groups have been subject to stress testing by European / international bodies. We are aware of the resource commitments required of firms for stress testing, and will look to minimise the scope for duplication between these exercises.
- As a result of previous exercises we have learnt lessons about our practical approach.
- Provide firms sufficient pre-warning to allow them sufficient time to run stress tests and take through internal governance.
  - Clearly communicate the objectives and outcomes for stress testing exercises.
  - Explain the calibration and reasons for the choice of scenarios.
  - Provide clearer and more timely feedback on conclusions.

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Actuarial Approach to Stress Testing

- Resilience Reserves
- Financial Condition Reporting
- Worst Case Scenario Stress Tests
- ICA
- Integration of Scenarios into business planning

… so what's new ?

- Regular stress testing programme defined by the FSA
  - Supplementary to internal stress testing
  - Easier comparisons by regulator between companies
- Reverse Stress Testing
  - PS09/20
  - Implementation by end 2010

FSA Stress Tests

- FSA focus on large firms
- Additional EU Stress requests via FSA
- Timing & Resource
- Process – best endeavors?
- Governance
- External Review
- FSA Appetite vs Firm Appetite
- Next steps

Other Regulatory Requirements

- QIS 5
- Solvency 2 developments
- Business Model Analysis
- Financial Risk Reviews

Reverse Stress Testing

- Started process in 2009 with business unit assessment of key stress scenarios
- January 2010 – group wide stress scenarios agreed by Enterprise Risk Management Committee
- Group wide stresses performed by each business unit
- Results presented internally August to October
- Recently shared with FSA

Definition of the Reverse Stress

Internal definition at start of exercise

- The aim of the Group-wide Extreme Scenario analysis is to consider a risk event or combination of risk events that would challenge the "viability" of the Group as a whole and to test the overall resilience of the Group's financial plan, irrespective of the probability of those events.

FSA definition

- A firm's business model is described as being unviable at the point when crystallising risks cause the market to lose confidence in the firm…..A consequence of this would be that counterparties and other stakeholders would be unwilling to transact with or provide capital to the firm and, where relevant, existing counterparties may seek to terminate their contracts. Such a point could be reached well before a firm's regulatory capital exhausted.

Definition of the Reverse Stress

The business is unviable if;

- It has insufficient capital to cover its pillar 1 or pillar 2 capital requirements
- It has insufficient liquid resources to meet its liabilities as they fall due

What are the funding requirements of the business ?

Inability to pay dividends does not render the business unviable

Closure to new business does not render the business unviable

Questions to ask…

- Is the scenario one that would have a materially larger impact on Standard Life than its peers?
- Are we comfortable taking the management actions that have been assumed in the particular circumstances?
- Is the risk sufficiently remote that they are comfortable in being exposed to it?
- Is the exposure consistent with the strategy of the business and qualitative risk appetites?
- Does the business or strategic plan need changed in any way in light of the extreme scenario results?

Stresses Considered

- Extreme Combined Market Event (Equity, Property, Credit, Fixed Interest yields moving adversely together)
- Focused Market Events
  - Single factor
  - Combinations of factors that business is most exposed to
  - Focus on scenarios where we may be different to others
- Credit & Reinsurance Counterparty Defaults

Stresses Considered

- Longevity Stress
- Regulatory Changes (Solvency 2 impact)
- Operational Event (Outsourcing counterparty insolvency)

Benefits of Exercise

- Reassurance about ability to withstand certain events
- Enhanced dialogue on risk appetite
- Better understanding of risks
- More work on management actions and response strategy

Questions ?