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Reverse Stress Testing

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Agenda

Today's Session

- Introduction to Reverse Stress Testing (RST)
- Defining business model failure
- Scenario selection
- Qualitative and quantitative analysis
- Governance & uses of RST

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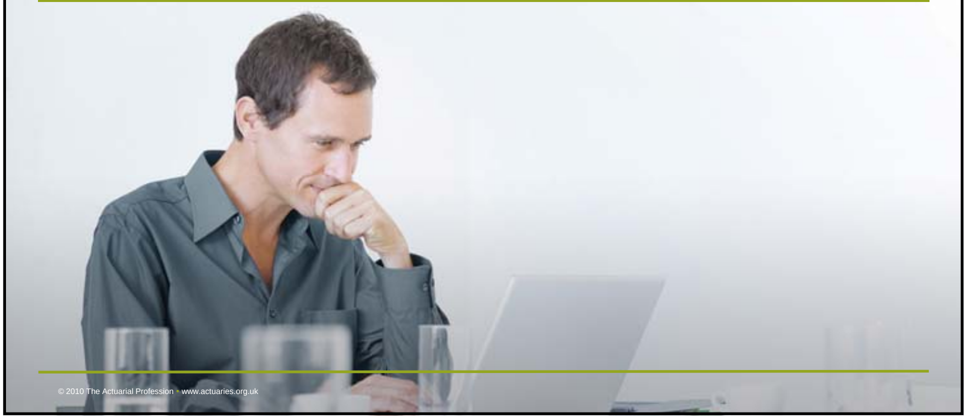
Introduction to Reverse Stress Testing (RST)



Stress Testing

What is it?

Stress testing in financial institutions is commonly used as a term to describe the approaches used to assess **behaviour of key performance indicators** under a range of **severe but plausible downside events**.

Most firms, as a part of stress testing, consider a range of **macroeconomic, portfolio specific and firm specific events** to identify potential **vulnerabilities** and inform **mitigating management actions**

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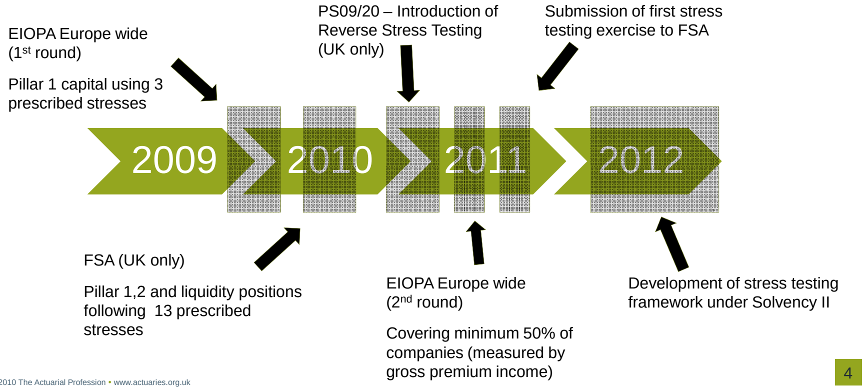
Stress Testing

What's been happening?

Over the last 2 years insurance companies across UK and Europe have seen a change in the way regulators assess their ability to withstand adverse conditions.



Stress Testing - Focus on 2011

Insurance Industry

- Firms now expected to have developed and implemented robust stress testing programme
- Specific focus on testing of high impact firms
- EIOPA system wide stresses for analysis of financial stability

Banking Sector

- Banks also expected to have developed and implemented robust stress testing programme
- Seen a series of testing that has led to an unprecedented transparency of disclosures on individual banks.
- EBA stress testing exercise completed that assessed the resilience of a large sample of banks in the EU against a consistent plausible scenario
- Comprehensive approach with gross and net stress results, considering the impact of mitigating actions

Reverse Stress Testing

Definition of Reverse Stress Testing (RST)

*From 14th December 2010, the FSA requires firms to reverse stress test their business plans in order to **identify a range of adverse scenarios** that could lead to the **business model becoming unviable**. Firms are also required to **identify the likelihood of such scenarios** happening. Where the RST reveals that the likelihood of failure is unacceptably high when compared to the firm's risk appetite, firms will be expected to adopt **effective measures to prevent or mitigate the risks**. The requirements for RST, as set out by the FSA, can be found in PS 09/20.*

Adverse Scenarios

- What are the **most likely scenarios** that could render business unviable?

Business failure

- **Failure is different for each company** based on business plans

Scenario likelihood

- Surely business failure is an extreme probability? **Does 1 in 1,000,000,000 make sense?**

Mitigation of risks

- What **management actions** do companies have in an extreme crisis?

Case Study: Prudential Group – RST Framework

Definitions of business model failure

Scenario Definition
Consider a comprehensive shortlist and document key selection

↓

Quantitative and qualitative analysis
Develop analysis around shortlist of scenarios

↓

Use of reverse stress test
- Identification of management actions
- Feed into business plan 2012-2014

- Developed by the Group Capital Management Team with input from business units, internal treasury and asset managers
- Discussed regularly at the Group Executive Risk Committee
- >12 month cycle from concept to delivery

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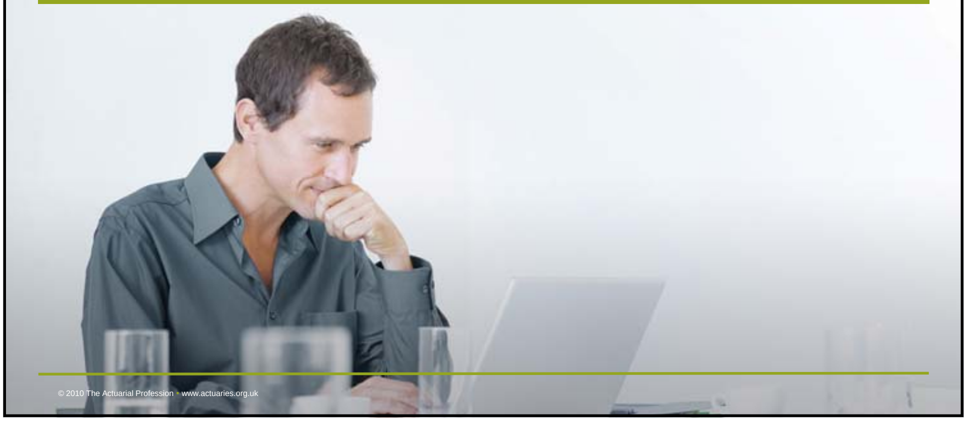
Defining Business Model Failure



Business Failure – FSA Intentions

Key Statements

Business plan failure in the context of Reverse Stress Testing* should be understood as:

•***The point at which the market loses confidence in a firm***

•***Where a firm is no longer able to carry out its business activities***

Potentially this point may be reached **well before the firm's financial resources are exhausted**

(as outlined in paragraph 20.2.4 of SYSC)*

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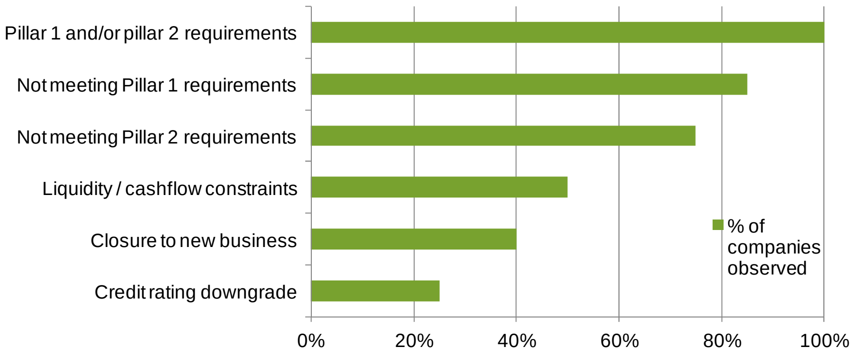
Business Failure – Examples

Examples

- Exhaustion of capital
- Insufficient liquid resources to meet requirements as they fall due
- Closure to new business
- Inability to service debt
- Market refusal to provide or renew financial support
- Severe reputational damage
- Mass lapse
- Inability to meet operational commitments
- Inability to pay dividend (over an extended period)
- Sustained losses or inability to meet financial/commercial targets

Business Failure – Market Insight

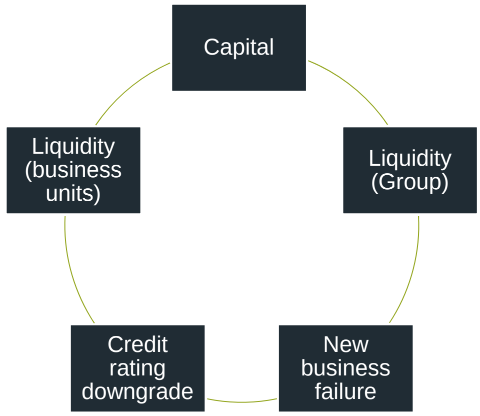
What we have seen across the market



Other areas considered:

- Cutting dividends
- Failure compared to EV/MCEV targets

Case Study: Prudential Group - Business Failure



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Scenario Selection

Scenario Selection – FSA Intentions

FSA Expectations

A firm must identify a range of adverse circumstances that would cause its business plan to become unviable and assess the likelihood that such events could crystallise
(20.2.1 of SYSC)

Scenarios should be considered using either a qualitative or quantitative approach (with potentially qualitative considerations also).
(P18 of PS09/20)

This doesn't have to be a large number! (although companies should be using some type of analysis to eliminate those scenarios not relevant to them).

Scenario Selection – Market Insight

What we have seen across the market

- Most firms initially considered a much larger number of scenarios
- Through discussions with senior management and initial quantitative analysis the number of key scenarios reduced
- Firms have focused more effort on those scenarios that they believe would impact them most

Case Study: Prudential Group - Sample scenario

Double dip recession

- A severe “double-dip” recession coupled with an expectation of prolonged weak economic performance result in a large fall in equities and increase in credit spreads.
- Default rates also increase and central banks maintain lower interest rates.
- No significant FX movements envisaged.

The scenarios are expected to have an immediate shock followed by further gradual declines.

We assumed that the crisis is very severe and the resultant shocks are individually akin to “1-in-200” year stresses per ICA / S2 methodology without allowing for any diversification benefit.

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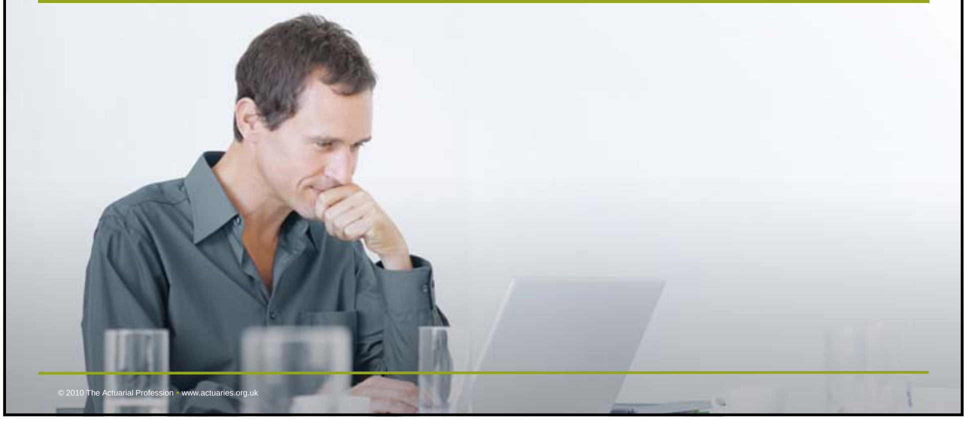
Qualitative and Quantitative Analysis



Qualitative and Quantitative Analysis

Types of Analysis

*The FSA expects that the analysis should not be a purely **quantitative analysis**, but the quantitative analysis should act as a support to the **qualitative analysis** used to identify the scenarios in which firms may consider the business model to fail.*

Quantitative analysis

Requires firms to consider the magnitude of the impact of an adverse scenario by assigning a numerical analysis to any results.

For example, the impact of an equity fall on capital could form part of the quantitative analysis

Qualitative analysis

Requires companies to consider any additional events occurring under an extreme scenario that might not be quantifiable.

For example, considerations around events that would lead to closure to new business (e.g. Loss of market confidence)

Quantitative Analysis – Market Insight

Capital based scenarios

- Market downturn
  (equity falls, yields, credit spreads)
- Large insurance event
  (mass lapse, pandemic)

Commercial target based scenarios

- Sustained investment underperformance compared to commercial targets
- Low new business volumes due to loss of confidence across markets

Liquidity based scenarios

- Default of a large number of counterparties
- Failure in reinsurance arrangements

Likelihood of scenarios

Range of methods including:

- ICA type approaches
- Interpolation/extrapolation
- Independent validation
- Ranking scenarios

Qualitative Analysis – Market Insight

Large fine from the regulator and impact on market confidence

Impact of retail distribution review

Poor customer services and / or low successful claim rate

Fraud risk and/or failure in internal controls

Terrorist attack/ sustained rioting in major UK city

Qualitative scenarios should be:
- Specific to firms
- Have buy in from senior management

UK ratings downgrade and impacts on the ability to raise further capital

Pandemic impacting both policyholders and staff

Failure of business continuity plans leading to loss of key data

Significant change in regulatory regime

Undertaking downgraded by rating agencies

Analysis – Mitigating Actions

Mitigating actions

Steps that can be taken now

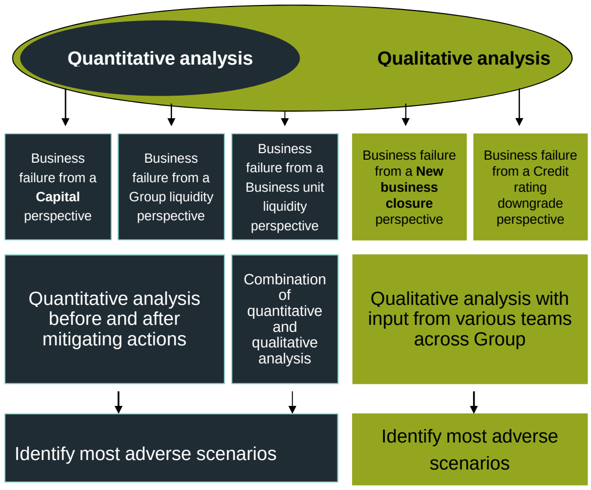
- Changes to valuation basis (release of prudence in assumptions)
- Transfer risk to reinsurers
- Purchase swaps to hedge out known risks
- Agree actions that would be taken (e.g. Option purchasing) in the event of large equity falls.
- Reviews of products sold and strategic review of expenses.
- Consider threats and opportunities of new competitors
- Consider defensive options which would counter price competition in one channel or product lines

Steps that could be taken in a crisis

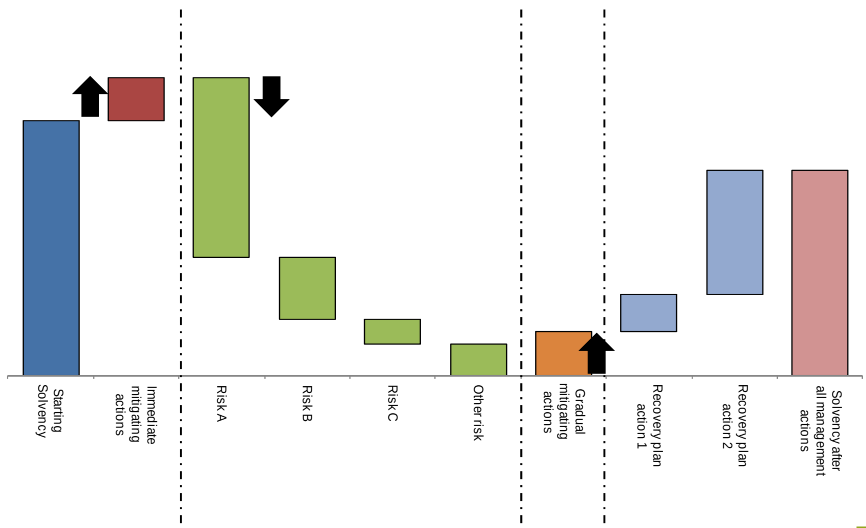
- Changes to valuation basis (smoothing of asset shares, release of prudence in assumptions)
- Sell risky assets during market event to de-risk portfolio.
- Hedging risk using market options
- Defer additional contributions to Staff Pension scheme
- Restructuring
- Cutting dividends
- External capital raising
- Disposal of business

Case Study: Prudential Group – RST Framework

- Framework considers each of the business failure definitions
- Considers all scenarios qualitatively
- Where applicable, quantitative analysis also completed



Case Study: Prudential Group – Example output



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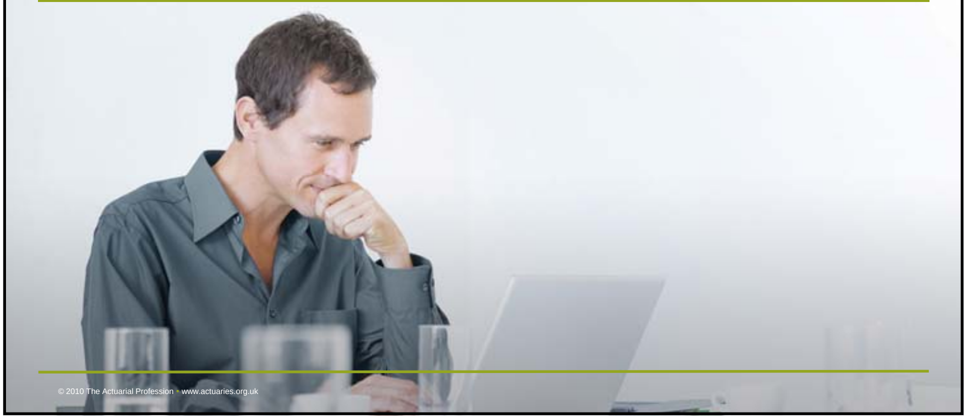
Governance and Uses of RST



Governance and uses of the RST

FSA Expectations

- Stress and scenario testing should be an important element in firms' planning and risk management processes, helping firms to identify, analyse and manage the risks inherent within their businesses.
- It also serves as an effective communication tool internally to senior management as well as externally to supervisors.
- Incorporating a robust stress and scenario testing framework into a firm's risk management structure can add substantial value by giving senior management additional information about all risks borne by a firm, in particular, in relation to its risk tolerance and strategy in a stress.
- The results of this analysis should also inform a review of risk appetite

Governance and uses of the RST

In practice…

- Has proven a helpful way to think about the current market dislocations
- Has led to a more detailed review of available management actions
- Management are more familiar with the tools and discussions
- Facilitates discussions about if and when management actions should be taken
- Provides another lens through which to view the company's balance sheet and business model

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenters.