

**The actuary's role in the ORSA (part two)**  
Dean Swallow, Chris Smerald & Niraj Shah



12 October 2011, GIRO 2011 Liverpool

© 2010 The Actuarial Profession • www.actuaries.org.uk

## Agenda

- **Recap (part one)**
- **Defining the ORSA**
  - **Level 3 guidance**
  - **Implementation**
- **Practical challenges**
  - **Economic capital**
  - **Risk appetite**
  - **Capital allocation**
  - **Business model**

## Recap (part one)

### ORSA requirements

- Article 45
- CEIOPS Issues Paper
- Collate emerging practice / discussion

### ORSA processes

- Identify key business processes for ORSA
- Suggest required process enhancements
- Understand how ORSA fits with BAU

### Actuarial involvement

- Risk and capital assessment processes
- Strategic decision making
- Challenges and opportunities

### ORSA Report template

- Sections / sub-sections
- Suggested content
- Stress & scenario testing

2

## Article 45 – Own risk and solvency assessment

- 1. As **part of its risk-management system** every insurance undertaking and reinsurance undertaking shall **conduct its own risk and solvency assessment**.
- That assessment shall **include at least the following**:
  - (a) the **overall solvency needs** taking into account the **specific risk profile, approved risk tolerance limits** and the **business strategy** of the undertaking;
  - (b) the **compliance, on a continuous basis, with the capital requirements**, as laid down in Chapter VI, Sections 4 and 5 and with the **requirements regarding technical provisions**, as laid down in Chapter VI, Section 2;
  - (c) the **significance with which the risk profile** of the undertaking concerned **deviates from the assumptions underlying the Solvency Capital Requirement** as laid down in Article 101(3), calculated with the standard formula in accordance with Chapter VI, Section 4, Subsection 2 or with its partial or full internal model in accordance with Chapter VI, Section 4, Subsection 3.
- 2. For the purposes of paragraph 1(a), the undertaking concerned shall have in place **processes which are proportionate to the nature, scale and complexity of the risks inherent in its business** and which enable it to properly **identify and assess the risks it faces in the short and long term** and to which it is or could be exposed. The undertaking shall demonstrate the methods used in that assessment.
- 3. In the case referred to in paragraph 1(c), when an internal model is used, the assessment shall be performed together with the **recalibration** that transforms the **internal risk numbers into the Solvency Capital Requirement** risk measure and calibration.
- 4. The own-risk and solvency assessment shall be an **integral part of the business strategy** and shall be taken into account on an ongoing basis in the **strategic decisions** of the undertaking.
- 5. Insurance and reinsurance undertakings shall **perform the assessment** referred to in paragraph 1 **regularly and without any delay following any significant change in their risk profile**.
- 6. The insurance and reinsurance undertakings shall **inform the supervisory authorities of the results** of each own-risk and solvency assessment as part of the information reported under Article 35.
- 7. The own-risk and solvency assessment **shall not serve to calculate a capital requirement**. The Solvency Capital Requirement shall be adjusted only in accordance with Articles 37, 231 to 233 and 238.

3

## Template for ORSA Report

| Section | Section Heading                              |
|---------|--|
| 1       | Overview of ORSA process                     |
| 2       | Business model, strategy and planning        |
| 3       | Risk appetite & tolerance                    |
| 4       | Risk governance                              |
| 5       | Risk identification and assessment           |
| 6       | Reporting date capital and solvency position |
| 7       | Projections of capital and solvency position |
| 8       | Stress and scenario testing                  |
| 9       | Capital and liquidity planning               |
| 10      | Decision-making                              |
| 11      | Risk profile monitoring                      |
| 12      | Results of independent review                |

- Broadly in line with subsequent guidance
- Detail available on request

4

## Agenda

- **Recap (part one)**
- **Defining the ORSA**
  - **Level 3 guidance**
  - **Implementation**
- **Practical challenges**
  - **Economic capital**
  - **Risk appetite**
  - **Capital allocation**
  - **Business model**

5

## EIOPA Level 3 guidance (1)

### Draft proposals for Level 3 guidelines on ORSA

|                               |   |
|-------------------------------|---|
| <b>Proportionality</b>        | Develop tailored, efficient processes. Works both ways!   |
| <b>Role of Board</b>          | Actively provide steer, challenge and approval  |
| <b>Documentation</b>          | Policy, process, internal /external ORSA reporting  |
| <b>ORSA Policy</b>            | Describes ORSA processes & procedures<br>Links risk profile, risk tolerance and solvency needs<br>Details of SST, assumptions, data, ORSA frequency     |
| <b>Process records</b>        | Individual risk analyses, links between risk and capital<br>Overall solvency needs now and in future<br>Comparison of risk profile with SCR assumptions |
| <b>Internal communication</b> | Results and conclusions on solvency and compliance<br>Communicate to Board, Senior Mgmt, Risk Owners etc  |

6

## EIOPA Level 3 guidance (2)

### Draft proposals for Level 3 guidelines on ORSA

|  |  |
|--|--|
| <b>Recognition and valuation basis</b> | Explain differences from Solvency II basis and why<br>Quantitative assessment & qualitative risk description<br>Reflect all risks, business strategy and mgmt actions<br>Capital is not always the answer! Explain risk mgmt too |
| <b>Forward looking</b>                 | Assess capital needs over the planning horizon<br>Inform capital planning and responding to change<br>SST, RST, sensitivity analyses   |
| <b>Regulatory capital</b>              | SCR and MCR calculation, monitoring processes<br>Risk profile monitoring & worst case scenarios<br>Early warning indicators  |
| <b>Technical provisions</b>            | Actuarial Function to confirm compliance and advise on risks   |

7

## EIOPA Level 3 guidance (3)

### Draft proposals for Level 3 guidelines on ORSA

|  |   |
|--|---|
| <b>Comparison with SCR assumptions</b> | Does it fit the actual risk profile and cover all risks?<br>Qualitatively identify any material issues<br>Quantitatively analyse significant deviations |
| <b>Internal model</b>                  | ORSA used as a tool to ensuring ongoing compliance<br>Implications of model error   |
| <b>Decision making</b>                 | Consider strategic decisions through the ORSA (before!)<br>Feed into governance, capital management, business planning and product development          |
| <b>Frequency</b>                       | On a regular basis - at least annually<br>Directly following a significant risk profile event   |

8

## ORSA Implementation

### ORSA policy

- ORSA governance
- Develop policy, activities & responsibilities
- Define scope & objectives

### Business strategy and planning

- Risk appetite & economic capital
- Business model
- Business planning

### Risk and compliance assessment

- Traditional risk management activities
- Consider long-term risks & emerging risks
- Qualitative ERM

### Capital, liquidity and portfolio assessment

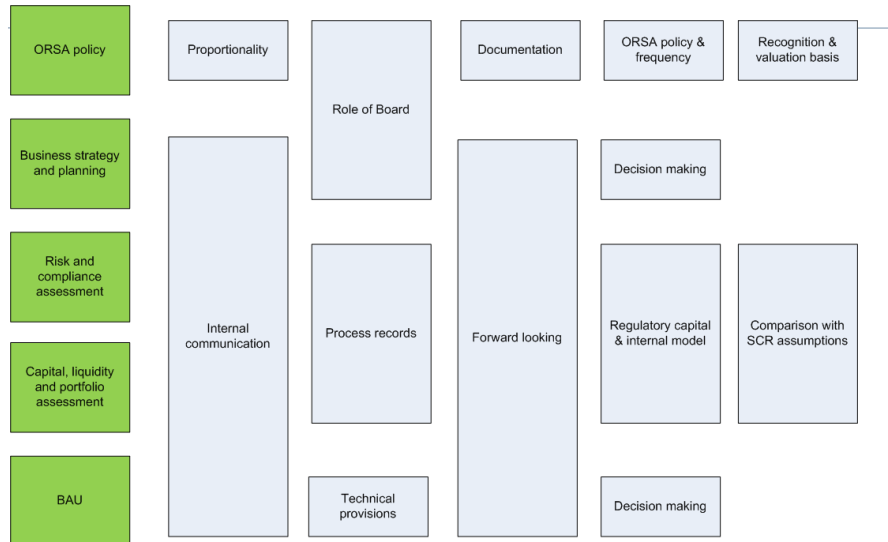
- Regulatory & economic capital calculations
- Capital allocation & projections, stress & scenarios
- Liquidity and portfolio management
- Quantitative ERM

### Business as usual

- Business planning
- Decision making (strategic & operating level)
- ORSA use test

9

## Mapping the Level 3 guidance



10

## Agenda

- **Recap (part one)**
- **Defining the ORSA**
  - Level 3 guidance
  - Implementation
- **Practical challenges**
  - Economic capital
  - Risk appetite
  - Capital allocation
  - Business model

Which parts  
of ORSA are  
troubling you?

11

## ORSA Practical Challenges

### Defining and Modelling ECONOMIC CAPITAL

© 2010 The Actuarial Profession • www.actuarial.org.uk

12

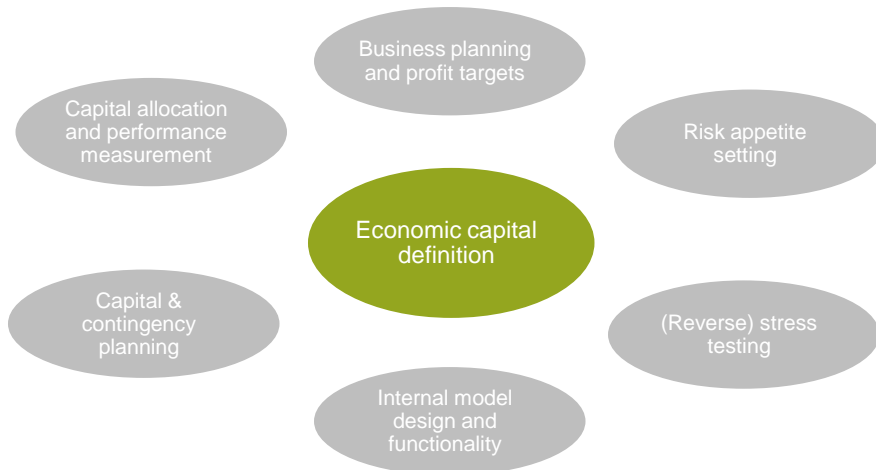
## How to define Economic Capital?

| EC definition  | Positives   | Negatives / challenges   |
|--|---|--|
| Minimum solvency ratio<br>e.g. SCR + 50%                       | Easy to calculate and explain to management                               | How to calibrate % uplift and explain to supervisor?                               |
| Target credit rating<br>e.g. 1yr VaR @ 0.1%                    | Fairly simple and aligned with key business objective                     | Do we trust the model at 1 in 1,000? Can this be validated?                        |
| Protect franchise value<br>e.g. < 5% insolvency over next year | Capital planning – links with business objective to avoid capital raising | Need to project future SCR (may need approximations)                               |
| Multi-year time horizon  | Forward-looking perspective, align with business planning horizon         | How to balance model complexity against reflecting reality (e.g. dynamic planning) |

COMPLEXITY  
↓

13

## Implications for ORSA processes



14

## Deep-Dive into ORSA Inputs **RISK APPETITE**

“Profit-Hungry Executive’s Guide”  
to  
**RISK APPETITE**



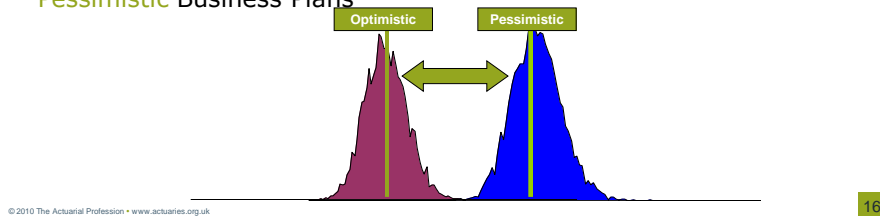
© 2010 The Actuarial Profession • www.actuaries.org.uk

15



## Step 1 – The Business Plan

- To Start with – Next Year's Business Plan
- Involvement from - Board, Exec, Senior Mgmt Underwriters; more involvement from Actuaries?
- Is the Business Plan challenged enough?
  - Is it a best estimate?
  - Could this be an "Independent Validation" role assigned to Actuaries?
  - Who else could help?
- Capital Requirements will vary significantly between Optimistic and Pessimistic Business Plans



## Step 2 – Establish Risk vs Reward

- Business Plan established
  - Let's now try to understand the Board's/Exec/Management's ("The Team's") attitude to Risk
- How do you do that?
  - Keep it simple – Just ask them
- Suppose PBT in the plan was £50m;
  - How low a profit could the Team risk making before their position would be untenable? £20m? £10m? £0m?
- The answer will vary depending upon :-
  - Track Record / Position in the UW cycle
  - Peer Pressure
  - Shareholder Requirements (minimum RoE)

## Step 3 – Define the Probabilities

- Let's say in our example, the Team state that:-
  - they would like profit of  $< \text{£}10\text{m}$  to be an UNLIKELY EVENT (Risk Appetite)
- Actuarial Internal Model based on the same business plan should come into play
  - According to the IM, what 1 in X does a profit scenario of  $< \text{£}10\text{m}$  fit into?
- Feed results back to the Team:-
  - "The Stochastic Model says that there is now a 1 in X chance of them hitting this unlikely event".
- Are they happy to accept the Plan as is, or do they wish to take Mitigating Actions? e.g. buy more reinsurance? Factor this into plan and revise plan. ITERATIVE PLANNING PROCESS

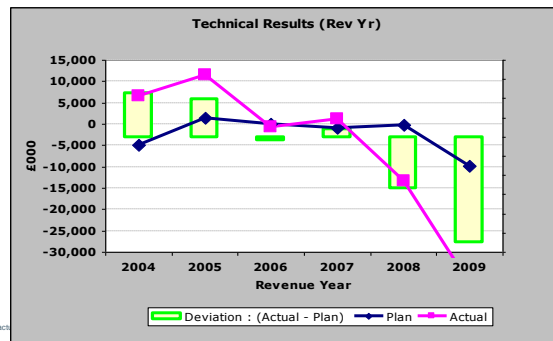


© 2010 The Actuarial Profession • www.actuaries.org.uk

18

## Step 4 – Validate/Challenge the Model

- Before the Team decide to accept the Model results and amend their Business Plan :-
  - Validate and Challenge the Model Output
- Historical Back-Test e.g. :-
  - how often in the past has that unlikely event occurred and does this tie up reasonable well with the IM predictions? Only if all looks ok should Team accept results (Embedding Model Use)



© 2010 The Actuarial Profession • www.actuaries.org.uk

19

## Step 5 – Risk Appetite and Risk Tolerances

- With the help of the previous Iterative Process:-
  - **the "Team" have finalised their Business Plan**
  - **quantified what their Risk Appetite is in terms of a 1 in X view. Use of the Internal Model?**
- Now use the Internal Model to Drill Down and see what this Risk Appetite translates to by LOB (**Risk Tolerances**)
- Sounds Easy? **Except that it's not quite there**
- The Challenge process continues; UW might not agree with the drill-down numbers by LOB i.e. they don't tie in with their experience?  
**Iterative Process – Feed Back to Model and Recalibrate OR Challenge UW?**
- *I won't go into the detail of how we got there finally. My colleague Tom will give you some more insight; Meet me at the watering hole and I might bore you with the details...*

© 2010 The Actuarial Profession • www.actuaries.org.uk

20

## Deep-Dive into ORSA Inputs **CAPITAL ALLOCATION**



© 2010 The Actuarial Profession • www.actuaries.org.uk

21

## The Key Steps Involved

1. Run the model
2. Choose an appropriate capital allocation method
  - Be pragmatic
3. Discuss the results with Senior Management, Underwriters, etc.
4. Most likely – go back to (1) or (2) on basis of “feedback” from (3)
5. Start to embed the results in internal reporting, monitoring, business planning, pricing models, etc.



Which steps do you think:

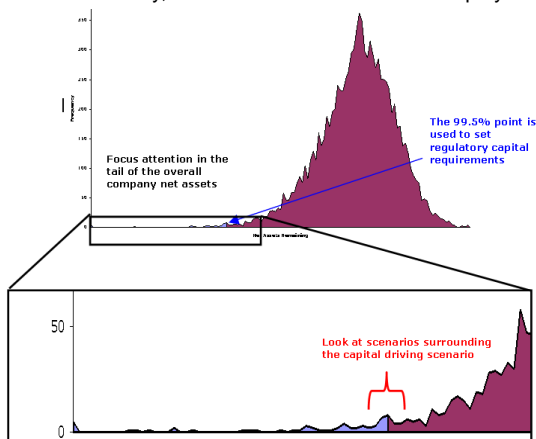
- Add the most value
- Are the most challenging
- Take the longest amount of time?

Yet where do we, as Actuaries, focus all our time and attention?

22

## Example Allocation Method

- Look at the capital driving scenarios for the company as a whole, and then ask which business segments contributed to that loss
- Technically, the method is the Aumann-Shapley method, using the RMK framework



Example – Suppose company X has capital req. of £40m

Sample Simulation

| Sim | Overall Company | Class A | Class B | Class C |
|-----|-----------------|---------|---------|---------|
| 1   | 5               | -10     | 20      | -5      |
| 2   | -5              | 0       | -15     | 10      |
| 3   | 40              | 20      | 10      | 10      |
| 4   | 45              | 10      | 25      | 10      |
| 5   | 35              | 20      | 10      | 5       |

Isolate Capital Driving Scenarios

|   |    |    |    |    |
|---|----|----|----|----|
| 5 | 40 | 20 | 10 | 10 |
|---|----|----|----|----|

Allocate Capital Proportionally

• Class A is allocated  $20/40 = \frac{1}{2}$

• Class B and C are allocated  $10/40 = \frac{1}{4}$  each

“How much can things go wrong, and what causes them to go wrong when they do”

23

## Issues to consider (1)

- **What happens with lines that are currently loss-making**
  - E.g. if Class A is expected to lose £10m, it is already “consuming” £10m of capital even before we even consider things going wrong!
- **Capital consumption over 1 year vs. planning horizon vs. whole cycle**
  - Depends on what we are going to use it for
  - Will it distort decision making?
- **Who is credited with the benefits of diversification?**
  - International / LOBs
- **Do you really trust your 1 in 200s?**
  - At an overall level?
  - By class?
  - Look at other percentiles too

24

## Issues to consider (2)

- **How stable should a capital allocation be?**
  - More importantly, how difficult will it be to explain to underwriters why their allocation is changing?
- **How should you express the capital allocation?**
  - As £ amount?
  - Per £ premium? Gross? Net?
  - By measure of exposure?
  - Combination of premiums & reserves?
  - Discuss with the business!!
- **Overall....**
  1. **BE PRAGMATIC**
  2. **CONSULT THE BUSINESS**

25

## How can your capital allocation be used throughout the ORSA?

- **In approximating future capital needs**
  - Current capital per £ premium \* Future premium = Future capital needs
  - Why build a complex model if you don't need to?
- **In risk assessments / quantification**
- **Risk ranking**
- **Risk appetite**
  - This is just capital allocation but at a “normal” return period
- **Comparison with standard formula**
- **Use of the model in decision making**

26

## *A business facing ORSA*



27

---

*I have made this ~~letter~~ {Solvency Directive} longer than usual, because I lack the time to make it short.*

*~Blaise Pascal, Lettres Provinciales (1656-1657), no. 16.*

---

## Making it Shorter: An Ontology Around Business Models

---

A **business model** describes the way in which a company makes money. It is central to **business strategy** and thus is key to interpreting the first paragraph of Article 44:

*“1. As part of its risk management system every insurance or reinsurance undertaking shall conduct its own risk and solvency assessment. **That assessment shall include at least the following:***

- (a) the overall solvency needs taking into account the specific risk profile, approved risk tolerance limits and the **business strategy of the undertaking;***

**An additional Solvency II principle:**

**“If it is not written down and verifiable it does not exist”**

## How Does an Articulated Business Model Help?

*When well described, it is a powerful tool to:*

- Aid in business strategy: analysis, validation and monitoring. **The why behind ORSA**
- Link business planning to capital, solvency and risk concerns.
- Visualise and design ORSA processes.
- Evaluate environmental factors and emerging risks.
- Communicate diverse Solvency II requirements.

30

## Business Model Elements –borrowed from: [www.businessmodelgeneration.com](http://www.businessmodelgeneration.com) (+ a mission)

- **Mission** (+ Stakeholders?)
- **Customer Segments & Markets**
- Customer Relationships
- Channels
- **Value Proposition**
- **Key Processes**
- Key Partners
- **Key Resources**:- Non Financial / Financial
- **Revenue Streams**
- **Cost Structure & Liabilities**

31



## Granular Business Model Element Examples:

### **-Customer & Market Segments** (A made up Example)

| <u><i>For whom are we creating value? Who are our most important customers?</i></u> | <u><i>How Monitored?</i></u> |
|---|------------------------------|
| -Major European +Global companies (Bkrs)  | -Market Share                |
| -Local and Regional Business with unusual or high risk insurance needs (Agency).    | -Broker Surveys              |
| -Healthcare & Professional org's (Lloyds)   | -Cust. Surveys               |
| -High Value/Risk homeowners (direct)  | -Business mix                |
| -Public Entities (umbrella layer)   | -Qtrly Mgt. Pack             |
| -Program Administrators (Internal or External)                                      | -Etc.                        |
| -Captives, Associations, RRG's, etc.  |                              |
| -Other insurers on a subscription basis   |                              |
| -Brokers  |                              |

32

## Granular Business Model Element Examples (continued)

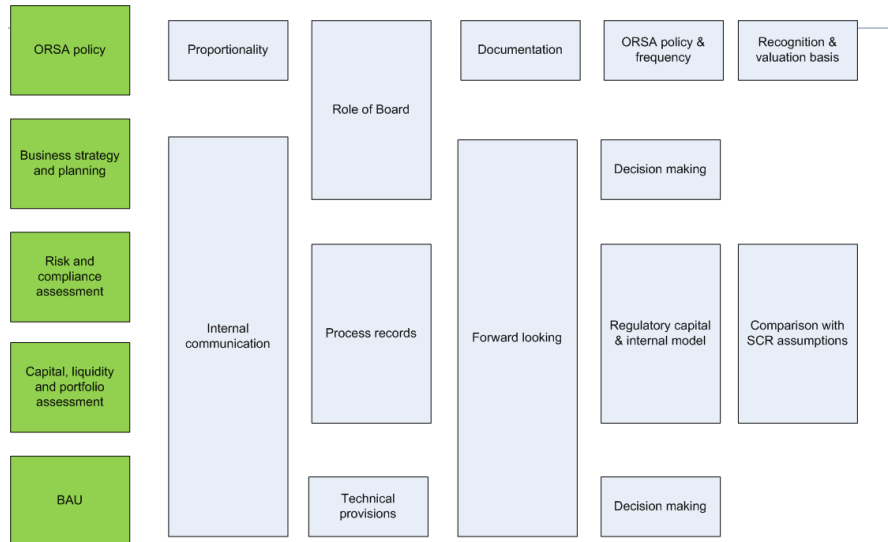
**-Value Proposition.** Types of service or product that defines us and why a customer would look to us over others. *What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? Which customer needs are we satisfying? What bundles of products and services are we offering to each Customer Segment?*

**-Key Business Processes.** *Actions a company must take to operate successfully (Operating Model). What Key Business process do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams?*

**-Etc.**

33

## Mapping the Level 3 guidance



34

## Summary ORSA Process Ontology

### ORSA Policy

Internal and  
External  
Environment

Business  
Model

Forward  
Looking  
(Analysis /Planning)

### Business Process Operating Model

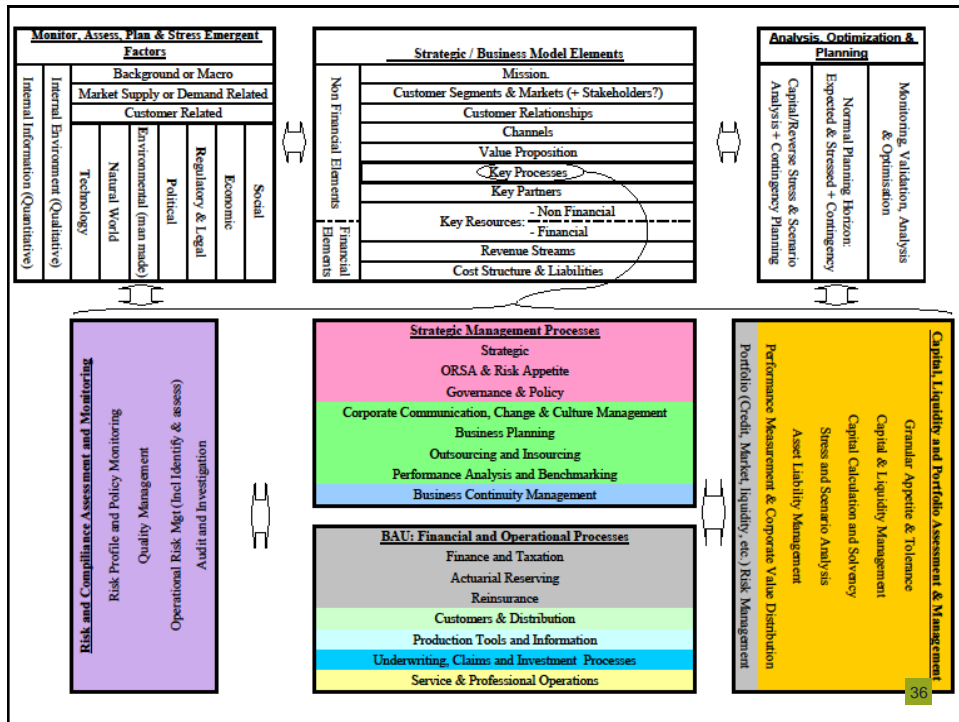
Risk and  
Compliance  
Assessment /  
Monitoring

Strategic  
Processes

BAU  
Processes

Capital,  
Liquidity and  
Portfolio  
Assessment &  
Management

35



## The Actuary's Involvement in ORSA Processes

- **Process Owner and Analyst Support**
  - Appropriateness of technical provisions and assets
  - Stress, scenario and mitigation analyses
  - Risk profile quantitative monitoring and validation
  - Relate subjective to quantitative information
- **Translator and Organiser**
  - Granular business concerns into something quantifiable
  - Convert 'outputs' to a business relevant context
  - Go the details and create something useful

---

## 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 presenter.

