Sharpening up an Insurer’s Balance Sheet

How the Actuary can help

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Sharpening up the balance sheet

1. The optimisation problem
2. Case study 1 – Who calls the shots?
3. Case study 2 – The secret of a long life (is knowing when it’s time to go)
4. Case study 3 – Mixing it up...
5. Conclusion - Getting more useful?
But first...

- ICA regime
  - Lots of good work done
  - Lots of approaches taken
  - Many companies have modelled/considered standalone risks and aggregated them
  - FSA requirement to ‘pass the Use test’ and ‘embed in the business’
- How to leverage what has been done so far

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So...

- We need to demonstrate to the FSA that the model is ‘in use’
- Make the model pay for itself!
- Actuarial involvement in strategic decisions

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The optimisation problem
Step 1 – Probability of ruin
The optimisation problem
Step 2 – Equalise

The optimisation problem
Step 3 – Compare performance
The optimisation problem
Step 3 – Compare performance

The optimisation problem
Step 4 – Determine best strategy
The optimisation problem

Step 4 – Determine best strategy

Constraints:
- Regulatory capital or other target?
- Defining / allocating target RoE?

Objective function
- What is definition of “best”?
- Best for whom?

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Who calls the shots?

- Exercise for all
- Three groups (Shareholders, senior management, underwriters)
- Question: What reinsurance retention to hold?
- Fairly simple deterministic example needed
- Shows that all will rationally choose differing level of RI

Who calls the shots?

- Company ABC
- 3 line – all £100m premium income
- Motor, Property, Energy
- Exposed to the usual perils
- What reinsurance program to purchase

Who calls the shots?

- Available cover
- Motor –
  - 4m xs 1m
  - 5m xs 5m
  - Unlimited xs 10m
- Property XL
  - 5m xs 5m
  - 10m xs 10m
- Energy
  - 10m xs 10m
  - 20m xs 20m
Who calls the shots?

- Cat
  - 5m x 5m
  - 15m x 10m
  - 25m x 25m

Likely program?
Who calls the shots?

Range of Return on Capital

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<thead>
<tr>
<th>Scenario</th>
<th>Mean</th>
<th>Percentile 1</th>
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<th>Percentile 3</th>
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Who calls the shots?

Impact of Reinsurance program on hurdle exceedence probability

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Who calls the shots?

Impact of Reinsurance program on hurdle exceedence probability

Scenario
Motor Company ABC

Probability (RoC exceeds hurdle)

60% 65% 70% 75% 80%

Motor Company ABC

Scenario

Impact of Reinsurance program on hurdle exceedence probability - line of business

Probability (RoC exceeds hurdle)
Who calls the shots?

Impact of Reinsurance program on hurdle exceedence probability - line of business versus company

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Knowing when it's time to go...

- Problem: When should you exit a run-off line of business?
- Issue: It's a dead-weight on capital resources. Suppresses RoE compared to peers without run-off exposure.
- But shedding it incurs significant capital cost...
- While waiting for certainty runs risk of deterioration
- Some forms of finality are better than others, but not all will be available
- Can the actuary use their DFA model to enhance this decision?
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Mixing it up

- Optimisation Techniques
- Ranking Scenarios
- Case Study – Asset Mix

Case Study 3 – Optimisation -Reward
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Getting more useful?

- Key test for current generation of DFA models is whether they actually help with business decisions.
- ICA regime has provided useful impetus to companies to invest time building models...
- … but has focus been too much on regulatory needs, not on building models that help run the business.
- For models to be taken seriously by investors and regulators, companies need to crack the problem of getting them to pass the “in-use” test.
- To get there, the models need to be at the heart of key business decisions – eg those outlined today.