What’s in it for me?
Capital

• Too much capital:
  – shareholders lose out

• Too little capital:
  – shareholders lose out
Business Mix

Expected Returns

Diversification

Risks

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Resilience Testing

- Deep uncertain world – increasingly so
- What does “optimality” mean?
- Resilience
Use

- How else can I use the capital model?
Another Angle

• Long-term view
Agenda

• What’s in it for me?
• Background
Background
<table>
<thead>
<tr>
<th>Colour</th>
<th>RGB Values</th>
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</thead>
<tbody>
<tr>
<td>Dark blue</td>
<td>R17G52B88</td>
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<tr>
<td>Gold</td>
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<tr>
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<tr>
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Secondary colour palette

<table>
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<tbody>
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In the beginning

- Ultimate ruin
A twist

- Returning surplus
Literature

- A popular actuarial research subject in academia
Not connecting

• Engagement by only few practitioners
Working Party

- Make theory available
- Highlight questions to researchers
Working Party Members

Practitioners
- Kapil Radia
- Jo Lo
- Andres Melo
- Yuriy Krvavych

Academia
- Ronnie Loeffen
- Corina Constantinescu
Agenda

• What’s in it for me?
• Background
• A simple model
• Spreadsheet implementation
• Case studies
• Next steps
A simple model
Spreadsheet implementation
How much capital to hold?

The question:

• $b$: Shareholders?
• $x$: equals to $b$?

Specific uncertainty:

• $a$: What happens at ruin?
• $q$: how impatient are shareholders?
What happens at ruin?

Firm Value (net of Capital initially raised / released) vs Capital Level

- Immediate Run Off
- Going Until NAV<0
- Realistic?
How impatient are our shareholders?

Firm Value (net of Capital initially raised / released)
vs Capital Level

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Business Mix

• Given:
  – Capital \((x = b)\)
  – Premium capacity \((c)\)

• Two classes
  – “Large”: Low frequency, high severity
  – “Attritional”: High frequency, low severity

• How much of each should we write?
Is there an optimal point?

Expected return by business mix

Max return at 32.3% "large", 67.7% "attritional"
How sensitive?

Sensitivity to "large" loss ratio assumptions

<table>
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<th>Percentage &quot;Attritional&quot; by premium</th>
<th>PV of return</th>
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<td>8.00%</td>
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<tr>
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<td>70%</td>
<td>11.50%</td>
</tr>
<tr>
<td>80%</td>
<td>12.00%</td>
</tr>
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</table>

Legend:
- Blue: 74%
- Red: 74.5%
- Green: 75%
- Purple: 75.5%
- Teal: 76%
- Orange: 76.5%
- Light Blue: 77%
How resilient are we?

• Unknown shocks
  – $\varepsilon$% chance
  – extra exponential in the mix
  – with high severity mean

• Specific uncertainty
  – “mean loss ratio” already has this?
Expected shocks

Firm Value (net of Capital initially raised / released)
vs Capital Level

Capital Level

- Unstressed
- Stressed (4% chance p.a.)
- Stressed (8% chance p.a.)
Surprising shocks

Firm Value (net of Capital initially raised / released) vs Capital Level

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Summary

• Slick – another angle to problems

• Uncertain parameters
  – Ruin: $a$?
  – Impatience: $q$?
  – Loss ratios
  – Uncertain shocks

• How would shareholders calibrate the model?
Next steps
Working Party Plans

Complete second leg of the bridge

Paper of questions from practitioners
Your next steps

• Download our spreadsheet
• Answer questions with it
• Contact us
Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

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