Reserve Risk: Are my bootstraps too tight?

Jessica Leong, FCAS, FIAA, MAAA
Lead Casualty Specialty Actuary
Reserve Risk: Are my bootstraps too tight?

It’s next year already
How time travelling would work

Space-time is like a flat surface, and when it is curved it may be possible to create a ‘wormhole’ that connects one part of space-time to another allowing us to go forward or back in time.

Source: New Scientist

Guy Carpenter
Company A
Distribution of Homeowners Unpaid as of 12/2000

Reserve $m
Company A

Distribution of Homeowners Unpaid as of 12/2000

Reserve $m

$38

$15

$53
<p>| | |</p>
<table>
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2. Why?
3. What can I do about it?
Company A
Distribution of Homeowners Unpaid as of 12/2000

Reserve $m
Company A
Distribution of Homeowners Unpaid
as of 12/2000

Hindsight Percentile
$45 million, at the 91st percentile

Reserve $m
<table>
<thead>
<tr>
<th>51 Companies</th>
<th>Hindsight Percentile</th>
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<tbody>
<tr>
<td>Company A</td>
<td>91%</td>
</tr>
<tr>
<td>Company B</td>
<td>51%</td>
</tr>
<tr>
<td>Company C</td>
<td>6%</td>
</tr>
<tr>
<td>Company AA</td>
<td>85%</td>
</tr>
<tr>
<td>Company AB</td>
<td>37%</td>
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</table>
Ideal Histogram of the Hindsight Percentile

Number of Companies

Hindsight Unpaid Percentile

0-20th  20-40th  40-60th  60-80th  80-100th
Homeowners as of 12/2000
Histogram of the Hindsight Percentile

Number of Companies

Hindsight Unpaid Percentile

0-20th  20-40th  40-60th  60-80th  80-100th
Homeowners as of 12/1996
Histogram of the Hindsight Percentile

Number of Companies

Hindsight Unpaid Percentile

0-20th  20-40th  40-60th  60-80th  80-100th

0  5  10  15  20  25  30  35
Homeowners: Percentiles 1989-2002

Number of Companies

Hindsight Unpaid Percentile Buckets

0 - 10th
10 - 20th
20 - 30th
30 - 40th
40 - 50th
50 - 60th
60 - 70th
70 - 80th
80 - 90th
90 - 100th
1. Are my bootstraps too tight?
2. Why?
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Why are our distributions too narrow?

Reserve risk split into two:

- systemic risk
- independent risk
Why are our distributions too narrow?

Reserve risk split into two:

- systemic risk
- independent risk

Models only cover independent risk, not systemic risk
Measuring Independent Risk
Measuring Independent Risk
Measuring Independent Risk
...but not Systemic Risk!
1. Are my bootstraps too tight?

2. Why?

3. What can I do about it?
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What can I do about it?

- Inflation risk
- Tort reform risk
- Legislative risk
Inflation Risk?
Tort Reform Risk?
Legislative Risk?
What can we do about it?

Systemic Risk Distribution - Homeowners
Reserve Risk – without Systemic Risk

Systemic risk
Reserve Risk – without Systemic Risk

Independent risk

Systemic risk
Reserve Risk – without Systemic Risk

Independent risk

Systemic risk

1.13
Reserve Risk – without Systemic Risk

Independent risk

1.13

Systemic risk

$32 million
Reserve Risk – without Systemic Risk

Independent risk

1.13

$32 million

x

Systemic risk

$36 million

$36 million
Reserve Risk – without Systemic Risk

Independent risk

Systemic risk

0.92
Reserve Risk – without Systemic Risk

Independent risk

Systemic risk

0.92

$44 million
Reserve Risk – without Systemic Risk

Independent risk

0.92

x

$44 million

$40 million
Reserve Risk – with Systemic Risk
Reserve Risk – with and without Systemic Risk

Reserve $m
Homeowners percentiles after systemic risk

Number of Companies

Hindsight Unpaid Percentile Buckets

0 - 10th
10 - 20th
20 - 30th
30 - 40th
40 - 50th
50 - 60th
60 - 70th
70 - 80th
80 - 90th
90 - 100th

Number of Companies
Indicated Capital without Systemic Risk
Indicated Capital with Systemic Risk

$38

$23

$61

50% increase in capital

Reserve $m
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