Needs-Driven Reinsurance

Greg Solomon & Nalen Naidoo
Disclaimer

1. Presenters have mainly Life & Health backgrounds

2. Content based on literature as well as anecdotal evidence from practical experiences

3. The views expressed herein are those of the presenters and not necessarily those of their employers

4. There is no paper backing this presentation (and that’s the good news)

5. We will make generalisations, even though in general you should never generalise
What this presentation is not

- Almost everyone in this room has either worked at a reinsurer, used reinsurance at an insurance company, or at least studied that one chapter on reinsurance in the actuarial exams.

- We are not here to teach you reinsurance. In fact, we’re only going to mention a couple of examples of reinsurance.

- Our goal is to consider some alternative perspectives on reinsurance, particularly matters of buying motivations for buying reinsurance, as well as the quantification of value.
Ask the audience

• Do you work, or have you ever worked, in a reinsurer, with a reinsurer, in the reinsurance purchasing areas, or in the reinsurance management areas of your company?

  • Yes
  • No
  • Not sure
Agenda

1. The reinsurance market and players
2. Value proposition
3. Buying decisions – theory, real and ideal
4. Catastrophe cover
5. Capital management
Reinsurance market in a couple of minutes

• “Reinsurers insure the insurance companies”
• The players and their roles
  • External: specialist reinsurers, Lloyd’s, even ‘internal reinsurers’ can be external
  • Internal: intra-group reinsurers, captives (PCCs etc.), SPV Re’s
• Reinsurance Brokers
• Reinsurers sell their value proposition, and insurers are looking for value-add – where do they overlap? We are looking at needs-driven reinsurance
Ask the audience

• What was the total gross written reinsurance premium globally in 2013?
  
  • USD 50bn
  
  • USD 100bn
  
  • USD 250bn
  
  • USD 1 trillion
Ask the audience

• Looking separately at non-life and life, what is the proportion of the market that is made up by the top 10 players?
  • 78% / 98%
  • 65% / 95%
  • 57% / 75%
  • 90% / 75%
Ask the audience

• For the two answers you just gave, did you …

• Take a random guess at the number?

• Know roughly the order of magnitude anyway?

• Avoid the biggest & smallest answers, and arbitrarily choose one of the two middle options?
Reinsurance in numbers

Top 50 Global Reinsurance Groups
Ranked by unaffiliated gross premium written in 2013 (USD m)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Total</th>
<th>Non-life</th>
<th>Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Munich Re</td>
<td>38,333</td>
<td>23,423</td>
<td>14,909</td>
</tr>
<tr>
<td>2</td>
<td>Swiss Re</td>
<td>32,934</td>
<td>20,670</td>
<td>12,264</td>
</tr>
<tr>
<td>3</td>
<td>Hannover Re</td>
<td>19,225</td>
<td>10,764</td>
<td>8,461</td>
</tr>
<tr>
<td>4</td>
<td>Lloyd's</td>
<td>15,614</td>
<td>15,594</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>SCOR</td>
<td>14,116</td>
<td>6,675</td>
<td>7,442</td>
</tr>
<tr>
<td>6</td>
<td>Berkshire Hathaway</td>
<td>12,776</td>
<td>7,339</td>
<td>5,437</td>
</tr>
<tr>
<td>7</td>
<td>RGA</td>
<td>8,573</td>
<td>-</td>
<td>8,573</td>
</tr>
<tr>
<td>8</td>
<td>China Re</td>
<td>7,936</td>
<td>4,947</td>
<td>2,989</td>
</tr>
<tr>
<td>9</td>
<td>Korean Re</td>
<td>5,623</td>
<td>4,995</td>
<td>628</td>
</tr>
<tr>
<td>10</td>
<td>PartnerRe</td>
<td>5,562</td>
<td>4,590</td>
<td>972</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Great West Lifeco</td>
<td>4,206</td>
<td>-</td>
<td>4,206</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Assicurazioni Generali SpA</td>
<td>2,178</td>
<td>990</td>
<td>1,188</td>
</tr>
</tbody>
</table>

Σ (1-50) 223,267 153,515 69,752

Proportions made up by the top 10 in each category:

- Total: 72%
- Non-life: 68%
- Life: 95%

AM Best
Special Report on reinsurance
Sep 2014
Value proposition

- **Risk transfer**
  - avoiding insolvency
  - reducing profit volatility

- **Capital management**
  - reducing new business strain
  - holding less risk capital
  - reducing the cost of capital

- **Technical support**
  - help with product development (especially new markets or new risks)
  - access to expertise, research, underwriting manuals, automated underwriting systems, claims support, opinions

- **Independence**
  - providing ‘3rd party’ or ‘arms length’ opinions

- **Habit**
  - because it was purchased in the past
  - fear of “what if we change and something goes wrong?”
Your thoughts?

- Rank the following reasons for purchasing reinsurance until now:
  1 = most relevant / important, 5 = least relevant / important

- Risk transfer
- Capital management
- Technical support
- Independence
- Habit
Value proposition

INDEPENDENCE

RISK TRANSFER

CAPITAL MANAGEMENT

HABIT

TECHNICAL SUPPORT
Needs-driven reinsurance

• We can in theory separate reinsurance into two types:
  • Needs-driven reinsurance (where a specific risk transfer and financial impact is required)
  • Reinsurance as payment for services (including product development assistance, underwriting manuals, etc.)
• But there is a shift happening slowly
  • In a world focusing on risk management and achievement of specific KPIs, there is a growth in the former
  • Rand-cost of profits ceded is being compared with the value of the services received
  • As insurers build up their own expertise there is the potential for a reduced demand of the latter
• Greater transparency is being demanded for both types
Buying decisions - theory

- How are reinsurance buying decisions made?
  - Price & value
  - Impact on various KPIs
  - Counterparty strength
  - Long-term market trends
  - Turnaround times
  - Quality of proposals
  - Skills of the sales teams
  - Relationships
Buying decisions – “Real World”

- How are buying decisions made in the Real World™?
  - Price
    - base risk cost – in theory it’s the same for everyone
    - cost of capital – affected by diversification and future assumptions
    - margins – different companies have different targets
    - expenses – treaty-specific services and general fixed costs
  - Past practice
    - retention limits
    - type of reinsurance contract
  - Underwriting, claims and product development support
  - Exclusions and waivers applied
  - Reinsurer strength
  - Quick fixes when something blows up (or will blow up)!
Buying decisions – price vs value

• Decisions are seldom based simply on the lowest price
• But if an insurer is to pay more than the lowest price, they need to be clear that they are getting value for that
• Factors which contribute to the additional value include:
  • services – treaty-specific & general
  • expertise & experience
  • financial solvency
  • brand value
• Unless the Rand-value of the above ‘value add-ons’ is considered, then this is more a 🧠 than a 📈
Buying decisions – “Real World”

• Behavioural economics

  1. Anchoring
     • Last year’s terms and conditions
     • What are others in the market doing?

  2. Prospect Theory
     • Often risk assessed as probability of breaching risk appetite
     • Retention limit reviews – err on the side of caution due to the choice of words!

  3. Mental Accounting
     • Reinsurance treaties can be long-term – do we sufficiently aggregate decisions through time before making further decisions?

  4. Group thinking
     • To what extent is technical expertise tailored?
     • Sometimes committees make the decisions
Buying decisions – “Real World”

5. Plural Rationality

- We are irrational, but we display irrational exuberance
- Plural rationality could explain our behaviour...
- (Also called the Cultural Theory of Risk)
- Four risk belief systems
- People act and drive the risk environment
- Plural rationality theory leads to Rational adaptation

<table>
<thead>
<tr>
<th>Risk environment</th>
<th>Boom</th>
<th>Bust</th>
<th>Uncertain</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Attitude</td>
<td>Maximiser</td>
<td>Conservator</td>
<td>Pragmatist</td>
<td>Manager</td>
</tr>
<tr>
<td>Risk Management Strategy</td>
<td>Risk trading</td>
<td>Loss Controlling</td>
<td>Diversification</td>
<td>Risk Steering</td>
</tr>
</tbody>
</table>
Buying decisions – “Real World”

- But the application to reinsurance?

<table>
<thead>
<tr>
<th>Risk environment:</th>
<th>Boom</th>
<th>Bust</th>
<th>Uncertain / Moderate</th>
<th>Real world example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity:</td>
<td>Less</td>
<td>More</td>
<td>Unclear</td>
<td>Standard non-life cycles</td>
</tr>
</tbody>
</table>

AM Best
Special Report on reinsurance
Sep 2014

<table>
<thead>
<tr>
<th>Risk v Services:</th>
<th>Risk</th>
<th>Risk / Services</th>
<th>Unclear</th>
<th>Current L&amp;H shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>L&amp;H treaty type:</td>
<td>Surplus / Low QS / Profit share / High retentions</td>
<td>Higher QS / XoL / Lower retentions</td>
<td>Shorter treaties / cancellation clauses</td>
<td>Solvency II / SAM risk appetites</td>
</tr>
</tbody>
</table>
Buying decisions – Ideal World

• How could reinsurance decisions be made in an ideal world, focusing on needs-driven covers?
  • Risk-adjusted price
  • Risk targets and risk appetites
  • Group, Business, or Product level (and all the behavioural economics associated)
  • Retention limits – stochastic mortality and other variables
  • Valuing technical expertise in a transparent manner
Buying decisions – Ideal World Key practical considerations 1

- Risk appetite optimisation
  - Likely multiple metrics need to be optimised
  - Order of priority needs to be established
  - Sequential process, involving testing
  - Granularity key
  - Driven by SAM and Solvency II

- Retention limits
  - Set at Group level?
  - Or set at business-unit level?
  - Processes can be complex (stochastic mortality) ... or simpler (stress-testing)
Buying decisions – Ideal World
Key practical considerations 2

• Technical expertise
  • Valuation difficult – perhaps the difference between two courses of action?
  • Need to fit into the risk framework – but depends on the balance between risk transfer and services

• An ideal purchasing environment?
  • Transparent pricing with separate prices for risk transfer and for services
  • Consumer market has demanded transparency – why is the secondary market different?
Buying decisions – Ideal World
Key practical considerations 3

• Efficient frontiers
  • Nothing comes for free – more protection costs more money; reduced downside usually also comes with reduced upside
  • Defining very clearly the criteria for measuring ‘optimal’ is tough
  
  \[
  \text{We need to be sure we have enough regulatory capital to support our growth.}
  \]

  \[
  \begin{array}{|c|c|c|c|c|}
  \hline
  \text{Metric} & \text{Strategy 1} & \text{Strategy 2} & \text{Strategy 3} & \text{Strategy 4} \\
  \hline
  \text{Average ROE} & 16.90\% & 14.50\% & 18.00\% & 16.00\% \\
  & -127.00m & -122.00m & -130.00m & -125.50m \\
  \hline
  \text{Average UWR} & 82.00m & 75.00m & 74.80m & 80.30m \\
  & 50.00m & 48.00m & 45.90m & 47.50m \\
  \hline
  \text{1 in 5 UWR} & -210.50m & -214.30m & -220.10m & -212.80m \\
  & 173\% & 162\% & 145\% & 165\% \\
  \hline
  \text{SCR} & 133\% & 124\% & 110\% & 135\% \\
  \hline
  \end{array}
  \]

  \[
  \text{Strategy 2 does not perform in terms of ROE}
  \]
  \[
  \text{Strategy 3 delivers excellent results but does not reach the SCR target}
  \]
  \[
  \text{Strategy 4 is satisfactory but Strategy 1 outperforms it}
  \]
  
  • But it is easier to optimise across two dimensions; more dimensions increases the problem (exponentially)…
A simple example for optimised reinsurance

• The company worried about insolvency protection against a 1:200 year mortality deviation of $R_x$
  • modelling shows that whether they do $z\%$ quota share or $R_w$ individual excess-of-loss, they will receive similar 1:200 cover

• Perhaps another KPI is to smooth profits by $s\%$ (say, the CFO wants reduced sensitivity under ‘usual’ deviations
  • if $R_w$ is relatively high, then there will be limited smoothing from the XOL, so the preference swings towards the QS

• But it’s possible that an additional KPI is the new business EV, and under best-estimate projections a QS actually cedes a greater Rand amount of profits
  • which swings us back towards preferring an XOL solution, but how do we decide how strong this preference is relative to the other two mentioned above

• The CEO, Chief Actuary & CFO may have different preferences
Catastrophe cover – what?

- Examples of things that can go wrong, including the Japan earthquake, pandemics, the disappearance of MH370, the downing of MH17, explosions at construction plants, war, jumbo risks, etc.
- A ‘cat cover’ is a policy that pays all claims (death and/or disability) when there are at least [3] claims up to a maximum Rand-amount, subject to certain exclusions (like terrorism, bio-hazards, nuclear, etc.)
- Coming back to buying motivations, a company might buy cat cover for a couple of reasons:
  - as pure protection against things going wrong (risk)
  - to reduce what they’re holding against things going wrong (capital)
Catastrophe cover – how?

- Agreements with reinsurers and Lloyd’s Syndicates usually facilitated through brokers
- These are rare events, so it’s either a small profit or a large loss
- The cat risks for a one-country insurer are different to those of a multi-national insurer, which in turn differ for a global insurer
- For L&H (re)insurers, pandemics represent a major threat, but are usually excluded (even the inclusion of ‘infectious diseases’ is very limited); Some reinsurers won’t sell much pandemic cover because they know it’s their ‘peak risk’ and so it’s better not to accept premiums for something they can’t pay out on
- The amount of capital the reinsurer holds is important, and that will be affected by how correlated cat events are with other risk they are holding
- Reinsurers in turn may (should?) protect themselves against the risks they are taking in, including retros & securitisations
The impact of big cat events isn’t limited to the (re)insurers who are directly affected by the event.
Capital management in 3 graphs

• What is capital, and why should it be managed
• Even when it’s economically neutral?
• The world of arbitrage
Ask the audience

• Have you or your company ever used reinsurance as part of the capital management toolbox?
  • Yes
  • No
  • Don’t know
Capital ideas

- Free Assets
- Solvency Margin
- Reserves (conservative)
- Assets (also!)
Capital ideas

- What is capital, and why should it be managed
- The different bases for measuring capital
- Convergence of bases?
- Capital sits behind new business volumes, solvency ratios, ability to withstand events, the ROC on business written, M&A (buyers & sellers)
Capital management in 3 graphs

From KPMG’s paper on Solvency II
Capital management in 3 graphs

- It's more complicated than the previous slide
- Each country, each framework is different
  - eg. South African companies write business outside SA too, some companies are subsidiaries of European companies, non-US companies may be US-listed
- Capital structures can target very specific parts of the capital structure
  - reserves vs solvency capital, Tier 1 vs Tier 2
- Stress tests - holding capital against 1:200 events
- A deal can still be worth it, even if cost of capital is the same
Capital management in 3 graphs
Capital management in 3 graphs

• Conservative regulatory accounts create strain at the beginning
• It can be solved through arbitrage
  • VIF financing: credit for future profits now
  • South-East Asia: no policy can be an asset
  • Greater China: lapses are assumed to be all or nothing
  • (ah - but both SEA+GC are VIF deals too)
• Definition of risk transfer is usually the trigger
Wrap-up

• Reinsurance is bought for many reasons, with changing weights over time:
  • Risk transfer
  • Capital management
  • Technical support
  • Independence
  • Habit
• The purchasing decision is influenced by behavioural economics (and irrationality!)
• The real world and ideal world buying environments are different, but they are converging (SAM, Solvency II)
• Shift happens – a ‘payments for services’ model is shifting to needs-driven reinsurance (based on risk transfer)
Contact details

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Thank you!