Case Study
Reinsurance Scenarios

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Why do we need reinsurance?

Think about microeconomic and macroeconomic functions of reinsurance!
We need reinsurance, because of …

… severe natural catastrophes, like floods:
Reinsurer as risk carrier

Reasons for reinsurance demand by primary insurers

– Risk of random fluctuation
  Example: Actual loss may differ from the expected loss

– Risk of error
  Example: Misjudging probability and severity of losses

– Risk of change
  Example: Probability and severity change in the course of time
Reinsurers support for funding risk

Expanding the scope of primary insurers

- Underwriting capacity
  - insurer can take on higher commitments with reinsurance

- Substitute equity
  - easier for insurers to complying with solvency regulation

- Balance-sheet continuity
  - reinsurance covers can stabilize annual accounts of insurers
Reinsurers services

Aim is to provide “added value” for the primary insurer

- Product development
  Example: Insurer has no past experience on his own

- Training
  Example: Development of East European insurance markets

- Claims management
  Example: Infrequent and very large claims
Global equalization of risk

Beneficial economic effects of insurance / reinsurance

- Greater scope for economic activity
  Example: Taking risks from innovators (e.g. pharmaceuticals)

- Better cost allocation
  Example: An insurance premium can directly be allocated

- Global spread of risks (concerning regions and time)
  Example: Hurricane Katrina hitting the coast, August 29, 2005
Reinsurance is a worldwide business

Distribution of premium written (2005)

- **IAIS** Global Reinsurance Market **Report** 2006:
  - Total premiums around US$ 150 billion

- Largest and therefore strongest **reinsurers** are located in:
  - Europe and the USA
Increasing role of reinsurance products

Reinsurance premiums written (worldwide)

- **Increase** in the EU is mainly due to:
  - Germany and UK

- **New** market players are especially from:
  - Japan / Bermuda
Reinsurance price cycle

Fluctuations of the reinsurance price cycle:

- **Soft** markets:
  - Lower prices and better conditions for primary insurers

- **Hard** markets:
  - Higher prices and worse conditions for primary insurers
High Solvability Requirements in sound (re-) insurance markets, including

- Sufficient equity capital
- Sufficient reserves for outstanding losses
- Clear rules concerning regulatory capital requirements
Reinsurance supervision – Introduction I

Regulatory reporting and disclosure
(here: Germany as an example)

• **Corporate Sector Supervision Transparency Act (KonTraG)**
  ➔ Requires risk management system which identifies potential risks

• **Information on a reinsurers risk management, can be found at:**
  ➔ Auditors report
    (BaFin has to be informed before his appointment and before audit takes place)
  ➔ Internal accounting
    (Term refers to information an insurer has to submit to the supervisory authority only)
Supervisory authority typically includes

• Conduct on-site and off-site inspections

• Entitlement to finally recall board members in severe cases

• Founding of reinsurance companies needs permission by supervisor
Economic analysis includes various aspects

• Check, whether sufficient equity capital and reserves are given

• Examination, whether members of the board are credible

• Analysis of different economic indicators, including
  → Combined ratio
  → Rating judgments
  → CDS spreads
Economic analysis and judgments

**Combined ratio**

- **Combined ratio**: important **profitability indicator**
  - Sum of: Loss Ratio + Expense Ratio

- **Loss Ratio**
  - Claims incurred as a percentage of net premium earned

- **Expense Ratio**
  - Acquisition and administration expenses as a percentage of the net premiums written
Economic analysis and judgments

Insurer Financial Strength Ratings

• Current **opinion** of the financial security, which is based on:
  → Characteristics of an insurance organization
  → Ability to pay under its insurance policy and contracts

• Rating is **not** a guaranty of an insurer’s financial strength

• For supervisors it can be **one** indicator among others
### Economic analysis and judgments

**Example (A.M. Best): Rating-judgments as risk signals**

<table>
<thead>
<tr>
<th>Secure</th>
<th>Financial Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>A++, A+</td>
<td>Superior</td>
</tr>
<tr>
<td>A, A-</td>
<td>Excellent</td>
</tr>
<tr>
<td>B++, B+</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Vulnerable</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B, B-</td>
<td>Fair</td>
</tr>
<tr>
<td>C++, C+</td>
<td>Marginal</td>
</tr>
<tr>
<td>C, C-</td>
<td>Weak</td>
</tr>
<tr>
<td>D</td>
<td>Poor</td>
</tr>
<tr>
<td>E</td>
<td>Under Regulatory Supervision</td>
</tr>
<tr>
<td>F</td>
<td>In Liquidation</td>
</tr>
</tbody>
</table>
Economic analysis and judgments

Credit default swaps spreads

- **Swap**
  - Contract: paying a defined amount at defined occurrence

- **Credit default swaps (CDS)**
  - Upfront defined occurrence is the credit default

- **Credit default swap spread**
  - **Spread**: span between EURIBOR European Interbank Offered Rate and the payments necessary in the case of a credit default
Basic principles of “traditional reinsurance”

• **Form** of reinsurance: tells us about basic nature of the contractual relationship
  → **Example**: acceptance of risk by reinsurer is mandatory (obligatory) *or* optional (facultative)

• **Type** of reinsurance: tells us the method by which risks are covered by the reinsurer
  → **Example**: whether participation of the reinsurer is proportional *or* non-proportional
Both parties are bound

- **Primary insurer**: obliged to cede a share of the assumed risks

- **Reinsurer**: obliged to accept the ceded risks

- Assets and drawbacks:

  What would you think?

  → Advantage: simpler administration
  → Disadvantages: (for the reinsurer) blind participation
Forms II. – Facultative reinsurance

Decisions on a case by case basis

– Cover for an **individual risk**

– **Primary insurer**: Decides whether a risk is ceded or not

– **Reinsurer**: Evaluates all available information on the risk
  → Decides whether the offered risk should be accepted
  → Names the preferred level of participation
Proportional participation

Example:
Cession 70%,
Retention 30%

- Sum insured and premium are **split proportionally**
  - between primary insurer (cedent) and reinsurer (cessionaire)

- Primary insurer
  - **passes** on a share (proportion) of risks to the reinsurer
  - **pays** reinsurer the same proportion of original premium
Types II. – Non-proportional reinsurance

Non-proportional participation

Example:

Excess of loss re - € 4m xs € 1m

- Reinsurer bears part of original loss that ...
  - ... exceeds direct insurers deductible
  - ... is below the ceiling
Proportional treaties I. – Quota share

Proportional reinsurance in its original form

• Example:

Effect of a 30% quota share reinsurance of a portfolio containing three risks

• Formula:

\[
\text{Reinsurer’s quota share participation} = \frac{\text{Sum insured} - \text{Retention}}{\text{Sum insured}}
\]
Non-proportional I. – Excess of loss (XL)

XL cover: often divided into layers

• Premium is specifically calculated

• Apart from technical considerations, XL reinsurance costs are also affected by market forces

• XL/E (XL per event)
  → Limit the loss per event
  → Especially business with significant accumulation potential
Reinsurance Scenarios so far …

Summary and preview

• Take home message:
  ➔ Various aspects and indicators are relevant for supervisors

• Next steps today:
  ➔ You have to solve a case study on your own!
Reinsurance Scenarios …

… the participants are solving their case!

-Break-
Some solutions

• First of all: thank you very much for your participation

• Secondly, there are different ways to solve a problem

• I will now present a solution for each case

  → Brief characterization of the situation
  → Presentation of the problem and a potential solution
Insurance company “A”

Characterization

- **Strong increase** in sold insurance coverage, especially … → builders’ risk, which each **could** result in very **large losses**

- Premium income of and reinsurance premium paid by “A”:
Problem and possible solution

- **Situation**: No other reinsurance protection than quota-share

- **Potential Challenge**: There is no limit of liability for insurer “A”
  → since quota-share offers no cap
  (takes “only” a certain percentage away)

- **Potential Resolution**: In addition to the existing reinsurance
  → excess of loss or stop loss protection
  (could limit the overall risk for “A”)
Insurance company “B”

Characterization

- Insurer “B” implemented cost reduction measures, including a 85% staff decrease in its reinsurance department;

- “B” now relies heavily on an external reinsurance broker “BBX” → selection of new reinsurance companies;

- All available economic indicators (CDS spread, rating, and combined ratio) signal that the new reinsurers are very weak;
Insurance company “B”

Problem and possible solution

• **Situation:** Weak reinsurer and some dependence on “BBX”

• Potential **Challenges:**
  a) Weak reinsurers might be unable to cover large losses
  b) Conflict of interest at “BBX”? (solely paid by reinsurers)

• Potential **Resolution:**
  a) Exchange at least some of the four weak reinsurers
  b) Hire a new broker, which is *not* solely paid by reinsurer
Insurance company “C”

Characterization

-Preferred field of business of “C” → protection for large construction projects (e.g. airports, oil)

- All reinsurance coverage is bought at reinsurer “RRC”

-Reinsurer “RRC” has almost the same business focus as “C”

-Reinsurer “RRC” is relatively weak: concerning combined ratio and rating

Financial Strength Rating

<table>
<thead>
<tr>
<th>Year</th>
<th>AM Best</th>
<th>S&amp;P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>D</td>
<td>CC</td>
</tr>
<tr>
<td>2000</td>
<td>C-</td>
<td>CC</td>
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<tr>
<td>2001</td>
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<td>2002</td>
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<tr>
<td>2003</td>
<td>C</td>
<td>CCC</td>
</tr>
<tr>
<td>2004</td>
<td>C+</td>
<td>CC</td>
</tr>
<tr>
<td>2005</td>
<td>C</td>
<td>CC</td>
</tr>
</tbody>
</table>
Insurance company “C”

Problem and possible solution

• **Situation**: Only *one* reinsurer “RRC”, which is relatively weak

• Potential **Challenges**:
  Double accumulation / not enough diversification:
  → Only one reinsurer (and on top of it a weak one)
  → Insurer and reinsurer business: Same region + products

• Potential **Resolution**:
  “Don’t put all eggs into one basket”. 
Insurance company “D”

Characterization

- A guiding element of the corporate culture of “D” is trust.
- After an economic downturn “D” recovered due to the activity of Mr. Juan Miller and his team.
- First year: Mr. Miller was not successful and came “in the line of fire”, he then changed the situation by

→ buying reinsurance coverage at significantly lower rates.
Insurance company “D”

Problem and possible solution

• **Situation:** Insurer “D” relays on the external manager Miller

• Potential **Challenges:**
  Juan Miller and his team could have had an incentive to present fraudulent reinsurance coverage, since
  → they “came into the line of fire” at the beginning
  → corporate culture of trust at “D” may have made fraud easier

• Potential **Resolution:**
  Double check all contracts and ask how cheaper reinsurance coverage is available in a hardening reinsurance market
Reinsurance Scenarios