INSURANCE PROTECTION GAPS

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What is an insurance protection gap?

*Insured vs uninsured losses, 1970–2019 (USD billion, 2019 prices)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Insured losses</th>
<th>Uninsured losses</th>
<th>10-year moving average insured losses</th>
<th>10-year moving average economic losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
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<td>1975</td>
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<td>1980</td>
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<td>1985</td>
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<td>1990</td>
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<td>1995</td>
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<td>2000</td>
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<td>2005</td>
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<tr>
<td>2010</td>
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<tr>
<td>2015</td>
<td></td>
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</tbody>
</table>

Economic losses = insured + uninsured losses;
Source: Swiss Re Institute
Why is it a puzzle?

◦ In general, people are risk averse
  ◦ Gamble A: -4 or 14 with equal probability
  ◦ Gamble B: -2 or 12 with equal probability
  ◦ Gamble C: 5 for sure

◦ If losses are independent, then diversification of losses allows to replace a gamble with a sure outcome
  ◦ And people are willing to pay for it

◦ **Thus all diversifiable losses should be insured**

◦ **But they are NOT**

◦ Market imperfections, adverse selection and moral hazard
March 2011 Japan Earthquake 9.0 magnitude and tsunamis
Direct cost estimated at $225 Billion
4% of Japan’s GDP
Over 1% of national wealth
6% of Japan’s net international investment position
How much of the direct costs were covered by (re)insurance?
Outline

- Why does it matter?
  - The macroeconomic implications of protection gaps
- How large is the problem?
  - It is large
  - It is growing for emerging markets
- Why does it happen?
  - Demand factors
  - Supply factors
- Zoom special: COVID-19
The long-run costs of uninsured losses

Source: Hsiang and Jina (2014)
Optimal global risk sharing

- International risk sharing = reinsured losses/total losses
- The optimal risk sharing would mean that Japan would bear only 10% of losses (i.e. its share in the global economy), and the rest is paid by the other countries

Source: Ito and McCauley, 2019
Decomposition of the shortfall into insurance cover and reinsurance

Source: Ito and McCauley, 2019
International risk sharing and lack of fiscal space in the advanced economies

Source: Ito and McCauley, 2019
What drives the gaps?

**Demand for insurance**
- Household demand
  - Bounded rationality and behavioral biases
  - “Unaffordability” of insurance
  - Charity hazard
- Corporate demand
  - Costs of financial distress
  - Debt capacity

**Supply of insurance**
- Insurability of risk
- Insurance groups
- Reinsurance and ART (alternative risk transfer)
- Public-private partnerships
Supply side: the structure of the global insurance market

- What is the global footprint of the internationally active insurance groups?
  - Ability to share risks globally is one of the key functions of insurers are financial intermediaries
  - But it also leads to interconnectedness within a group and complexity in resolution

- What is the structure of the global insurance market?
  - Do groups expand internationally in insurance business or other businesses? What is the mix between financial and non-financial subsidiaries?
  - What are the differences in terms of structure between the emerging markets and developed markets strategies?

- We build a novel data set on the corporate structure of the top 100 global insurance groups (by asset size) and companies which identifies business and geographic characteristics of 8,000 subsidiaries
Location of HQ of the major insurance groups
Location of IG subsidiaries
Corporate structure

Royal London Mutual Insurance Society Ltd.
- Royal London Limited
  - Primera Ltd
  - Wrap IFA Services Ltd.
- RL Finance Bonds No. 3 plc
- Royal Liver Assurance Ltd
  - Capital Financial Planning Ltd
  - Capital Advisory Services
  - McCarthy Investment Services Ltd
  - Kinane Life & Investments Ltd
- RL Finance Bonds No. 2 plc
- Royal London Management Services Ltd
Corporate structure: medium complexity

Total: **102** major subsidiaries/investments
Corporate structure: high complexity

Total: 330 major subsidiaries/investments
AXA geographic presence
<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>St.Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levels</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>No. of subsidiaries</td>
<td>82</td>
<td>125</td>
<td>1</td>
<td>980</td>
</tr>
<tr>
<td>No. of subsidiaries</td>
<td>46</td>
<td>68</td>
<td>0</td>
<td>317</td>
</tr>
<tr>
<td>outside home country</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of subsidiaries</td>
<td>38</td>
<td>90</td>
<td>1</td>
<td>764</td>
</tr>
<tr>
<td>in non-insurance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>business</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Distribution of majority subsidiaries/investments across levels

° %

![Bar chart showing distribution of majority subsidiaries/investments across levels. The chart has levels labeled 1, 2, 3, 4, 5, and 6-15, with corresponding bar heights indicating the percentage of distribution.]
### Domestic or international focus?

<table>
<thead>
<tr>
<th>Region</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
</table>
| Japan               | 30    | 0.00%
| Europe (excl. UK)   | 25    | 0.00%
| United Kingdom      | 20    | 0.00%
| China*              | 15    | 0.00%
| United States       | 10    | 0.00%

The table reports the number of subsidiaries at home and abroad for selected locations of HQ.

* includes Hong Kong SAR, Chinese Taipei, Macao SAR
Location matrix for major insurance markets

Europe HQs
- Europe: 1070
- United Kingdom: 492
- Japan: 19
- China: 259
- United States: 491

United Kingdom HQs
- Europe: 528
- United Kingdom: 173
- Japan: 151
- China: 227
- United States: 2

Japan HQs
- Europe: 74
- United Kingdom: 86
- Japan: 139
- China: 280
- United States: 14

United States HQs
- Europe: 218
- United Kingdom: 21
- Japan: 12
- China: 392
- Other: 392

China HQs
- Europe: 99
- United Kingdom: 38
- Japan: 7
- China: 99
- United States: 7
- Other: 11
Location matrix for advanced and developing economies

Subsidiaries location:
- Advanced economies
- Developing Europe
- Latin America and Caribbean
- Africa and Middle East
- Asia and Pacific (incl. HK, TW)
- Offshore centers

Europe HQs

United Kingdom HQs

Japan HQs

United States HQs

China HQs
Location by business area of subsidiaries

- Total
- Insurance
- Financial
- Non-financial

- Advanced economies
- Emerging economies
- Offshore centers
Summary: International focus

- EU and Japanese companies are most international
- US companies are domestically-focused
- Chinese companies expand primarily to financial centers (HK and Macau)
Subsidiaries: business area by location

- Total
- Advanced economies
- Emerging economies
- Offshore centers

- Insurance
- Financial
- Non-financial

%
Subsidiaries business line: United Kingdom HQs

- Multiline
- P&C
- Life&health
- Insur.brok.
- Reinsurance
- Financials
- Non-financials
- Unknown

Domestic subsidiaries vs. International subsidiaries
Subsidiaries business line: United States HQs

- Multiline
- P&C
- Life&Health
- Insur.brok.
- Reinsurance
- Financials
- Non-financials
- Unknown

Legend:
- Domestic subsidiaries
- International subsidiaries
Subsidiaries business line: Japan HQs
Subsidiaries business line: China (incl. HK, TW) HQs
Summary: Business focus of groups

- Insurance groups strategies are very diverse
  - UK → intermediation
  - EU → insurance focus (P&C and Life)
  - US → non-financial subsidiaries, reinsurance
  - Japan → non-financial and PC
Does asset size drive complexity?

\[
y = 0.3942x - 6.6166 \\
R^2 = 0.0623
\]

\[
\ln(\text{count}) \text{ vs } \ln(\text{assets})
\]

\[
y = 0.3611x - 9.5437 \\
R^2 = 0.0524
\]

\[
\ln(\text{non-ins-to-ins-ratio}) \text{ vs } \ln(\text{assets})
\]

\[
y = 0.0269x + 0.0345 \\
R^2 = 0.0106
\]

\[
\text{Business complexity vs. } \ln(\text{assets})
\]

\[
y = 0.0891x - 1.8419 \\
R^2 = 0.0612
\]

\[
\text{Geographic complexity vs. } \ln(\text{assets})
\]
Comparison between banks and insurers

<table>
<thead>
<tr>
<th>Measure</th>
<th>Banks</th>
<th>Insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln(count)/ln(assets)</td>
<td>$R^2 = 0.786$</td>
<td>$R^2 = 0.062$</td>
</tr>
<tr>
<td>Nonbank-to-bank ratio/ln(assets)</td>
<td>$R^2 = 0.172$</td>
<td>-</td>
</tr>
<tr>
<td>ln(Non-ins-to-ins-ratio)/ln(assets)</td>
<td>-</td>
<td>$R^2 = 0.052$</td>
</tr>
<tr>
<td>Business complexity/ln(assets)</td>
<td>$R^2 = 0.016$</td>
<td>$R^2 = 0.011$</td>
</tr>
<tr>
<td>Geographic complexity/ln(assets)</td>
<td>$R^2 = 0.226$</td>
<td>$R^2 = 0.061$</td>
</tr>
</tbody>
</table>
Global groups and global risk sharing

- Two layers of risk transfer, insurance and reinsurance
- Trade-off between local expertise and presence with global risk diversification
- Groups combine both features
- How the reinsurance decisions depend on the structure of the group?
- How does the presence of the groups contribute to covering insurance gap?
Summary

- Insurance protection gaps have real economic costs
- Global risk sharing is limited
- We need deeper understanding of various demand and supply factors that limit risk sharing