Insurance Risk in a Changing Climate

Dr. Ulrich Ebel
Marine Insurance

- roots go back to Babylonian times
- oldest known reinsurance treaty is from 1347, covering a ship and its goods against loss
- solidarity in the form of risk spreading is the basic principle of insurance and reinsurance
- cargo and hull are normally insured, as well as parts of the infrastructure
- marine insurance is normally an all risk cover
- consequential losses can arise in business interruption for industry production
Natural catastrophe losses are rising

Natural catastrophe losses 1980-2009, in USD billion

- Economic Loss (grand total)
- Insured Loss (grand total)
- 10 year average

Note: Loss amounts indexed to 2009
Source: Swiss Re, sigma No 2/2010
Rising natural catastrophe losses: Climate change is not the key driver yet

- Climate change results in rising intensity of storms, forest fires, droughts, flooding and heat waves in many regions
- Accumulation of assets in exposed areas:
  - Example Ocean Drive in Miami, Florida:

![1926 Image](image1)

![2000 Image](image2)
Transport sector will also experience higher losses
Swiss Re Studies on Climate Change Effects

The effects of climate change: Storm damage in Europe on the rise

Climate change is affecting winter storms in Europe. Based on the findings of a scientific study, Swiss Re forecasts a significant rise in damage from storm events in the long term, creating additional risk for society and insurers to manage.

Focus report

The effects of climate change: An increase in coastal flood damage in Northern Europe

Climate change is affecting storm surges in Europe. Based on the findings of scientific research, Swiss Re forecasts a significant increase in coastal damage in the long term. By the end of this century, once-in-a-millennium storm surge events could well be striking Northern Europe every 30 years. Governments and insurers will have additional risk to manage as a result.

Focus report
Storm losses on the rise

Increase in annual expected loss for the period 2071–2100 compared to a 1961–1990 reference period:

- Climate model 1: 68%
- Climate model 2: 48%
- Climate model 3: 16%

Swiss Re loss model
Change in annual expected loss from storm surge

A2 scenario with:
- 0 cm sea level rise
- 37 cm sea level rise (IPCC scenario)
- 50 cm sea level rise (hypothetical)
Economics of climate adaptation – a framework for decision-makers

Please find the full study at www.swissre.com/rethinking/climate
Economics of climate adaptation (ECA)
The working group

Partner consortium:

- **The Global Environment Facility (GEF)** is a trust fund partnership among 178 countries, international institutions, non-governmental organizations (NGOs), and the private sector.

- **Climate Works** is a newly formed global philanthropic network organized to win the battle against climate change.

- **The United Nations Environment Programme (UNEP)** is an international inter-governmental organization established by the General Assembly of the United Nations.

- **Standard Chartered** operates in many of the world’s fastest growing markets, and derives over 90 per cent of its profits from the emerging trade corridors of Asia, Africa, and the Middle East.

- **Swiss Re** is a leading global reinsurer, was a lead contributor to the research, risk assessment and quantification.

- **McKinsey & Company** drove the analytical execution and contributed to the fact base.

- **The Rockefeller Foundation** is a global philanthropic corporation.

- **The European Commission** is the executive branch of the EU responsible for proposing legislation, implementing decisions, upholding the Union’s treaties.
The economic value at risk for each scenario is comprised of two components – economic growth and climate change.

India, Maharashtra case study

Expected loss from exposure to climate
High climate change scenario, 2008 USD millions

- Expected loss is driven by current risk, agricultural growth, and climate change.
- Agriculture income growth would contribute to an additional 23% of 2030 upper bound loss.
- Climate change (occurring in combination with income growth) will account for 35% of 2030 upper bound loss.

<table>
<thead>
<tr>
<th>Year</th>
<th>2008, Today's expected loss</th>
<th>Incremental increase from economic growth; no climate change</th>
<th>Incremental increase from climate change</th>
<th>2030, total expected loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>238</td>
<td>132</td>
<td>200</td>
<td>570</td>
</tr>
</tbody>
</table>
Global overview: Expected loss averted by adaptation measures

Percent of expected loss (high climate change scenario), 2030\(^1\)

100% = total expected loss

<table>
<thead>
<tr>
<th>Country</th>
<th>Remaining loss</th>
<th>Non-cost-effective measures, CB&gt;1</th>
<th>Cost-effective measures, CB&lt;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mali</td>
<td>14</td>
<td>6</td>
<td>65</td>
</tr>
<tr>
<td>Guyana</td>
<td>18</td>
<td>47</td>
<td>48</td>
</tr>
<tr>
<td>UK</td>
<td>29</td>
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<td>48</td>
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<tr>
<td>Samoa</td>
<td>47</td>
<td>48</td>
<td>47</td>
</tr>
<tr>
<td>China(^2)</td>
<td>34</td>
<td>44</td>
<td>20</td>
</tr>
<tr>
<td>India</td>
<td>13</td>
<td>44</td>
<td>20</td>
</tr>
<tr>
<td>Tanzania</td>
<td>13</td>
<td>44</td>
<td>20</td>
</tr>
<tr>
<td>Florida</td>
<td>40</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

1 Based upon select regions analyzed within the countries (e.g., Mopti, Mali; Georgetown, Guyana Hull, UK; North and Northeast China; Maharashtra, India; Central regions of Tanzania; Southeast Florida, U.S.)
2 Based upon moderate scenario data and analysis

www.swissre.com/rethinking/climate
Summary

- Swiss Re monitors catastrophes worldwide
- Several studies on climate change effects forecast an increase of losses
- The marine sector and its insurance will also be affected
- Adaptation is essential
- To get adaptation measures accepted, the economic consequences need to be calculated
- Although the time scale of changes is long, we need to start now
Thank you
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