Adapting to Extreme Events

Luxembourg, 27 May 2015
- Adapting to Extreme Events
- Why is adaptation important?
- What role does insurance play?

Jean-Jacques Henchoz, Regional President EMEA, Swiss Re

Insurance Europe Conference
Luxembourg, 27 May 2015
Increasing frequency of extreme events

- 2014: a record year in terms of number of extreme events.
- Convective and winter storms generated most losses.
Adaptation is crucial in reducing economic losses and the human cost of disasters.
Mitigation measures, e.g. early warning systems, are part of this adaptation.
Protection gap widening as economic losses keep rising

<table>
<thead>
<tr>
<th>Year</th>
<th>Insured losses</th>
<th>Uninsured losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>75</td>
<td></td>
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<tr>
<td>1975</td>
<td>35</td>
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<tr>
<td>1980</td>
<td>200</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>
<td>450</td>
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<tr>
<td>2010</td>
<td>500</td>
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</tbody>
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- Economic losses from the recent Nepal earthquake are estimated to be up to USD 10bn.
- Nepal's largest reinsurer so far estimates its own insured losses to be USD 160m.
Property natural catastrophe exposure and concentration increasing in cities around the globe

*Increase in largest industry loss scenarios per region*

- Risk transfer through insurance is part of adaptation.
- Growth in exposed economic values, especially in urban areas, increases the need for insurance.
Insurers need to play a leading role in public discussions on climate change

**Risk intelligence – assess the risk**
- Experts in quantifying climate change risk
- Integrate climate change risk into underwriting and risk management

**Business solutions – seize opportunities**
- Promote risk transfer as a way of becoming more resilient
- Develop appropriate solutions for adapting to and mitigating climate change

**Risk dialogue – Advocacy**
- Raise awareness, actively disseminate knowledge
- Advocate a long-term, market-based policy framework

**Footprint – lead by example**
- Swiss Re is greenhouse neutral
- Swiss Re has reduced its emissions per employee by 57%

- The insurance industry can incentivise measures to tackle climate change and reduce the frequency and severity of extreme events.
Governments and private institutions joining forces will have the biggest impact

*Existing natural catastrophe schemes introduced by governments*

- **Public Assets**
  - **Mexico:** FONDEN fund for natural disasters
  - **Caribbean:** Caribbean Catastrophe Risk Insurance Facility (CCRIF)

- **Private Assets**
  - **Public Insurance Programs**
    - **New Zealand:** Earthquake Commission (EQC)
  - **Reinsurance Programs**
    - **UK:** Flood Re national flood pool
    - **Japan:** Japan Earthquake Reinsurance

- **Turkey:** Turkish Catastrophe Insurance Pool

- Managing the risk in a forward looking way will be more cost effective in the long-run.
- Cost of climate change could increase to around 20% GDP by 2030 in some regions.
- Adapting to climate change is an economic necessity.
Insurance Europe
7th International Insurance Conference

The Globalization of the Insurance Industry
Adapting to Extreme Events
Developments in Modeling
Catastrophe Modeling—Ripe for Change

- **Traditional models no longer effectively and efficiently informing insurers about catastrophe risk**
  - Model assumptions are “secret” so insurers cannot see what’s really driving their loss estimates
  - Users waste a lot of time and money trying to “infer” the model assumptions with “contrived” analyses of model output (process starts all over again with next model update)

- **Duopoly of modeling companies stifling innovation and leading to inefficient processes and higher costs to insurers and consumers**
  - Insurers are now expected to “own the risk” but model vendors have not designed for this
  - Disruptive and costly changes to models driven by modeling companies changing assumptions and not new science or facts

- **Over-reliance on a few numbers from the model output (100, 200, and/or 250 year exceedance probabilities)**
  - Gives a false of security
  - Leads to surprise losses and potential insurer insolvencies
  - Limits global insurance coverage
  - Increases systemic risk
The Solution: RiskInsight® Open Loss Modeling Platform

- Starts with same components as traditional models
- Model components fully transparent
- Model assumptions accessible and customizable
- Two ways to create your own proprietary view of risk
  - Customize Reference Models
  - Build new models
- Efficiently understand the risk, control model assumptions, and manage your loss potential
Why New Risk Metrics?

- PMLs (point estimates–VaRs–from EP curves, e.g. 100, 200, 250 year) are not intuitive, are volatile and misunderstood, give a false sense of security, and are not operational

- TVaR is better but doesn’t provide clarity to underwriters and senior executives and includes very extreme and sometimes “wacky” events

- Characteristic Events (CEs) where probabilities are based on the hazard (rather than the loss)
  - Intuitive and meaningful to underwriters and senior executives
  - Consistent from year to year
  - Operational
  - Identify exposure concentrations and “hot spots”
  - Manage “informal” risk tolerance (i.e. where you can have an outsized loss relative to competitors)
What You Get Without RiskInsight® and CEs

Your PML is

$750,456,891.23

(From this model version!)
What You Get with RiskInsight® and CEs: Multiple Risk Metrics for Monitoring Formal and Informal Risk Tolerances

- Your losses from the 100 year events
- Your 100 year PML
- Your market shares of the 100 year events

Loss From 100 Year Events

Locations of 100 Year Events

Your 200 year PML

RiskInsight® 3G, Karen Clark & Co.
Focusing Solely on the PML (VaR) Can Mean Missing the Obvious—the $150 Billion Florida Protection Gap
In Conclusion: Recent Innovations in Catastrophe Modeling Lead to Enhanced Insurer Relevance in Global Markets

- **Advanced open loss modeling platforms**
  - Full transparency
  - Better understanding of your large loss potential
  - Control over model assumptions
  - Higher confidence in risk management decisions
  - More efficient processes
  - Lower modeling costs

- **Additional risk metrics**—more intuitive and actionable information for decision making

- Enhanced understanding and control lead to higher confidence in risk management decisions and ability to write more business in order to **NARROW** the protection gap
Public Private Partnerships
Economics of Climate Adaptation
Dr. David N. Bresch, Global Head Sustainability, Swiss Re
david_bresch@swissre.com
Reducing the disaster gap is an urgent priority

- What is the potential natural catastrophe and climate-related loss over the coming decade?

- How much of that loss can we avert? How?

- What investment will be required? Do the benefits outweigh the costs?

- What arrangements are needed for rare but severe events?
Climate-resilient development needs to **assess** and **address** total climate risk

**Objectives**

- **Facts and methods** for decision makers to design and execute a climate adaptation strategy
- **Information** to insurers and potential funders to unlock risk prevention funding and deepen global risk transfer markets

**Methodology – Economics of Climate Adaptation (ECA)**

1. Rigorous risk management approach to **assess** the sum of:
   - today’s climate risk;
   - the economic development paths that might put greater population and value at risk; and
   - the additional risks presented by climate change.

2. Propose and prioritize a basket of adaptation measures to **address** total climate risk on an economic basis.
The working group studied more than 20 regions with diverse climate hazards

**Florida:** Hurricane risk to public and private assets

**US Gulf Coast:** Hurricane risk to the energy system

**New York:** Cyclones and storm surge risk to a metropolis

**Hull, UK:** Flood and storm risk to urban property

**China:** Drought risk to agriculture

**Caribbean:** Hurricane risk to small islands

**Guyana:** Flash flood risk to a developing urban area

**Mali:** Risk of climate zone shift to agriculture

**Tanzania:** Drought risk to agriculture

**Samoa:** Risk of sea level rise to a small island state

Total climate risk – city of Hull, UK, case study

Annual expected loss from wind, coastal and surface flooding
High climate change scenario
USD millions

Potential impact from climate change
+23
+17
96
x1.7
-65%

Potential impact from economic growth
56

Today's expected loss

Total expected loss in 2030


Dr. David N. Bresch | Insurance Europe | 27 May 2015
Adaptation cost curve – city of Hull, UK, case study

Public Private Partnerships in risk transfer – US Gulf, risk to the energy system

Source: Swiss Re, ECA Group, Building a Resilient Energy Gulf Coast
www.swissre.com/rethinking/Building_a_resilient_Energy_Gulf_Coast.html
The custodians of economies need to prioritize adaptation measures to make societies more resilient to the impacts of climate change.

The Economics of Climate Adaptation (ECA) methodology provides decision makers with the facts to systematically identify cost effective investments.

The ECA allows decision-makers to integrate adaptation with economic development and sustainable growth.

The insurance industry's experience in risk management and modelling and in developing insurance solutions makes it an important partner in future adaptation plans.

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