Importance of climate-related risks for actuaries

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IAA CRTF members

9 October 2020
IAA Climate-related Risk Initiative

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IAA Climate-related Risk Initiative

Launched in May 2020

Purpose

• Wider awareness of the potential impacts of climate-related risks on financial risk management, reporting and disclosure;

• Increased recognition for the potential contribution of actuaries as risk experts on the part of supranational organizations, government agencies, industry and the public; and

• Development of the actuarial profession’s skill sets and capabilities to assist third parties in managing climate-related risks.

Activities to be completed by the end of 2020

• Paper on the role of actuaries in climate-related risk management.

• Introductory paper on global climate-related scenarios and considerations when applying to regional and/or local circumstances.

• Paper on the development of effective and globally-applicable links between climate-related risk scenarios and insurance and pension risks and costs, identifying gaps in data availability, assessment methodologies, and process capabilities at the industry sector level.
IAA Climate-related Risk Initiative

Recommended activities for 2021-2024 include:

- Paper on application of climate-related risk scenarios to asset portfolios.
- Advise on climate-related financial risk management, reporting and disclosure.
- Paper on transition and adaptation and on the consequences for the private and public insurance and pension sectors.
- Review of existing IAA publications regarding climate-related risks.
- Paper on the link between climate-related risk scenarios and social security.
The importance of climate-related risks for actuaries

This paper was authored by a subgroup appointed by the CRTF consisting of:

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• Dr. Tatjana Miljkovic, Assistant Professor and Actuarial Science Advisor, Miami University (USA); and
• Philip Shier, FIA, FSAI (Ireland).
Executive Summary

- Actuaries have long played vital roles in managing the uncertainties of financial risk.
- Growing global recognition of the importance of climate-related risks.
- Actuaries increasingly involved in considering how climate-related risks are applicable to their work and to the wider business interests of their employer or client.
- Paper examines categories of climate-related risks and their importance for actuaries.
- Paper concludes with implications and next steps for actuaries.
Contents of paper

• Why actuaries should care
• Climate – related risks
• Actuarial modelling
• Product management
• Risk and capital management
• Investment management
• Disclosure
• Implications for actuaries
• Next steps
Why actuaries should care?

- Climate-related risks are rising to a global level with impacts on many areas of our society.
- Business, governments and society are seeking the best means of managing and mitigating climate-related risks, both financial and non-financial, as well as exploring climate-related opportunities.
Importance of climate-related risks to actuaries – 9 October 2020

Top 5 Global Risks in Terms of Likelihood *

1. Climate action failure
2. Natural disasters
3. Biodiversity loss
4. Human-made environmental disasters
5. Extreme weather

Top 5 Global Risks in Terms of Impact*

1. Climate action failure
2. Weapons of mass destruction
3. Biodiversity loss
4. Extreme weather
5. Water crises

* Global Risks Report, World Economic Forum
Why should actuaries care?

- Actuaries have long played vital roles in managing the uncertainties of financial risk.
- An increased focus on and understanding of climate-related risks benefits all stakeholders by increasing the transparency with which these risks are addressed by all market participants.
- The importance of actuarial involvement in climate-related risks has been noted in a survey of insurance supervisors.
Why should actuaries care?

• Actuaries can play important roles:
  – Reviewing underlying models in their work;
  – Aligning insurance product design with the needs of consumers, corporates, vulnerable groups, regulators, governments, etc.;
  – Encouraging pension funds, insurers and other clients to be active investors who support the management of climate-related risks in their investments;
  – Developing investment strategies and products to help solve or address problems associated with climate-related risks;
  – Working towards improved governance and risk management of this risk;
  – Contributing to the public debate and review of relevant government programs;
  – Disclosing in their work the impact of climate-related risks
# Climate-related risks

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Risk</td>
<td>Can be event-driven (acute) or longer-term (chronic) shifts in climate patterns</td>
<td>Extreme weather events eg windstorm, sea-level rises Social conditions eg droughts, wildfires</td>
</tr>
<tr>
<td>Transition Risk</td>
<td>Transitioning to a lower-carbon economy may entail extensive policy, technology and market changes</td>
<td>Policy risk Technology risk Market risk</td>
</tr>
<tr>
<td>Legal / Reputation Risk</td>
<td>An increase in climate-related claims being brought before the courts by eg property owners</td>
<td>Failure to mitigate Failure to adapt Insufficiency of disclosure</td>
</tr>
</tbody>
</table>
Actuarial modelling

Data → Identifying and assessing relevant data
Assumptions → Interpreting trends and future evolution
Model → Adaptation to allow for climate risk over time
Output → Interpreting and communication of results
# Actuarial modelling

<table>
<thead>
<tr>
<th>Investment Assumptions</th>
<th>Mortality and Morbidity Assumptions</th>
<th>GI Claims Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact of physical and transition risks</td>
<td>Food and water security</td>
<td>Uncertain trends and potential for step-changes in eg:</td>
</tr>
<tr>
<td>Stranded assets</td>
<td>Temp change and volatility</td>
<td>● Weather - related</td>
</tr>
<tr>
<td>Reduction in investment returns, impact differs by eg segment and geography</td>
<td>Pandemics and vector-borne diseases</td>
<td>● Decarbonisation effects</td>
</tr>
<tr>
<td></td>
<td>Social impacts</td>
<td>● Liability risks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Nat cats</td>
</tr>
</tbody>
</table>
Product Management

- Balance needs of consumers with need to run a viable insurance business:
  - Premium levels
  - Policy coverage
  - Adoption of a sustainable approach to investment

- Opportunities for product innovation eg introducing incentives that manage risk exposures or incentivize initiatives that seek to directly address climate-related risks
## Risk and Capital Management

<table>
<thead>
<tr>
<th></th>
<th>Physical</th>
<th>Transition</th>
<th>Legal / Reputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>General Insurance</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Longevity</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Mortality/Morbidity</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Lapse</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Counterparty</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Operational</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Strategic</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Reputational</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
</tbody>
</table>
**Risk and Capital Management**

<table>
<thead>
<tr>
<th>ERM Key Feature</th>
<th>Potential Climate-related Risk Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance and ERM Framework</td>
<td>Ensure that climate-related risk is properly considered and assessed in its enterprise risk management framework.</td>
</tr>
<tr>
<td>Risk Management Policy</td>
<td>Sufficiently flexible to incorporate climate-related risk both as it is considered now but also as it develops in the future.</td>
</tr>
<tr>
<td>Risk Tolerance Statement</td>
<td>Should explicitly consider climate-related risks, eg with regard to the fund's or firm’s investment strategy</td>
</tr>
<tr>
<td>Risk Responsiveness and Feedback Loop</td>
<td>Analysis of previous experience, as well as forward-looking emerging risk assessments</td>
</tr>
<tr>
<td>Scenario Analysis</td>
<td>Forward-looking views of companies’ risk exposures and how this links to their future business strategy</td>
</tr>
</tbody>
</table>
Risk and Capital Management

- Expectation of inclusion in ORSA for insurance
- Use of an appropriate range of scenarios - design and usage in subsequent papers
- May need to review reinsurance coverage
- Approach of rating agencies
- Relationship with pension fund sponsor
Investment Management

- Implications for pensions schemes, insurance companies and fund managers
- ESG / socially-responsible investment
- Quantitative assessment of climate-related risks
- Understanding of impact on correlations between different investments
- Third party assessments
- Investment mandates
Disclosure

• Increasing demand by stakeholders for more extensive disclosure of companies’ own assessment of the risks they face, together with the actions they are taking to identify, manage and mitigate those risks

• Relevance to actuaries:
  – Actuaries are likely to be asked to support the development and production of the disclosure for the insurers, pension funds or other institutions they work for or advise; and
  – The disclosures of firms in which those institutions invest will be of interest to actuaries as they will help them understand the sustainability of those investments.
TCFD recommendations (2017) provide framework for companies and other organizations to develop climate-related financial disclosures through their existing financial reporting processes.

**Disclosure**

**Table 3:** The TCFD's recommended four-pillar approach to company disclosure on climate-related risks

<table>
<thead>
<tr>
<th>Governance</th>
<th>Strategy</th>
<th>Risk Management</th>
<th>Metrics and Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclose the organization’s governance around climate-related risks and opportunities</td>
<td>Disclose the actual and potential impacts of climate-related risks and opportunities on the strategy and financial planning of the business</td>
<td>Disclose how the organization identifies, assesses and manages climate-related risks</td>
<td>Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities</td>
</tr>
</tbody>
</table>
# Implications for actuaries

## Table 4: How actuarial work is exposed to climate-related change

<table>
<thead>
<tr>
<th>Climatic impacts</th>
<th>Socio-economic impacts</th>
<th>Impacts on actuarial work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>Social</td>
<td>Economic</td>
</tr>
<tr>
<td>Heatwaves</td>
<td>Air pollution</td>
<td>- GDP growth</td>
</tr>
<tr>
<td>Storms</td>
<td>Water and food supply</td>
<td>- Investor preferences</td>
</tr>
<tr>
<td>Floods</td>
<td>Diseases</td>
<td>- Infrastructure investment</td>
</tr>
<tr>
<td>Sea level rise</td>
<td></td>
<td>- Employment</td>
</tr>
<tr>
<td>Bushfires</td>
<td></td>
<td>- Housing</td>
</tr>
<tr>
<td>Droughts</td>
<td></td>
<td>- Energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Taxation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Changes to modelling &amp; assumptions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Development of products including re-design, pricing, exclusions etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Changes to risk management practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Changes to capital management practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevised/new investment management practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Changes to financial stability management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disclosure that allows for climate risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Broader application of actuarial work</td>
</tr>
</tbody>
</table>
Next steps

• For actuarial associations:
  – Research and development efforts
  – Training and continuing professional development
  – Regulatory environment – Proactive actuarial involvement
Next steps

• For individual actuaries:
  – Be informed
  – Learn about climate-related risks and the value of adaptation
  – Build deeper expertise
  – Collect and share data and techniques
  – Start a dialogue
  – Validate the sources of information used
  – Make part of integrated part of day-to-day work
  – Continuously learn
Any questions?
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