

# Risk Management and Climate Risk

## Actuarial Practice - Risk Management and Climate Risk<sup>1</sup>

Professor Benjamin Avanzi



09 August 2021

- 1 The world needs to wake up to long-term risks
  - 2 Risk management
  - 3 The expert corner
  - 4 Australian Prudential Regulation Authority (APRA)
  - 5 Enterprise Risk Management
  - 6 Climate Risk
- 
- A hand-drawn red arrow starts from the right side of item 4, points left, then goes down, then left again to point at item 2. Another red arrow points left from the right side of item 4. A red circle is drawn around item 6. The text 'CERA' is written in red to the right of item 5.

CERA

- 1 The world needs to wake up to long-term risks
- 2 Risk management
- 3 The expert corner
- 4 Australian Prudential Regulation Authority (APRA)
- 5 Enterprise Risk Management
- 6 Climate Risk

# The world needs to wake up to long-term risks

The world needs to wake up to long-term risks

- 16th edition of the World Economic Forum's Global Risks Report
- "In 2020, the risk of a global pandemic became reality, something this report has been highlighting since 2006. We know how difficult it is for governments, business, and other stakeholders to address such long-term risks, but the lesson here is for all of us to recognise that ignoring them doesn't make them less likely to happen."
- "other long-term risks, such as climate change and environmental concerns, do not have an immediate response to diminish risk"

Those broad issues all have impacts on risk, insurable risk, and insurance.

## Some take-aways:

- “Risks categorised across five areas – economic, environmental, geopolitical, societal, and technological”
- Likelihood vs Impact
- “Climate action failure is the most impactful and second most likely long-term identified risk.”
- Top risk by likelihood is “Extreme weather”
- Top risk by impact is “Infections diseases”



For Infectious diseases, refer, for instance, to this non-mandatory reading:

- Impact of Covid-19 on insurance by Marsh )

Climate risk is discussed below.

- 1 The world needs to wake up to long-term risks
- 2 Risk management**
- 3 The expert corner
- 4 Australian Prudential Regulation Authority (APRA)
- 5 Enterprise Risk Management
- 6 Climate Risk

# Risk management

Such a broad term!

- Wikipedia:

“**Risk management** is the identification, evaluation, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events or to maximize the realization of opportunities.”

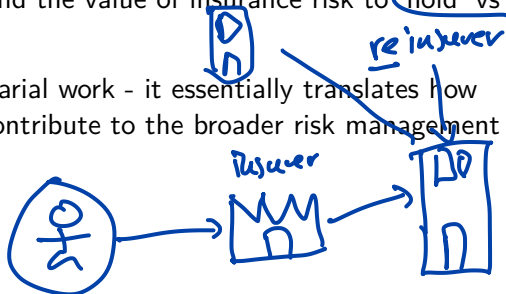
- Note that this definition considers the downsides, but also the upsides of risk.
- This definition could be seen as a little too broad for the actuarial focus.



- "Insurance Risk Management" according to PwC:  
 "Insurance Risk Management is the assessment and quantification of the likelihood and financial impact of events that may occur in the customer's world that require settlement by the insurer; and the ability to spread the risk of these events occurring across other insurance underwriter's in the market. Risk Management work typically involves the application of mathematical and statistical modelling to determine appropriate premium cover and the value of insurance risk to 'hold' vs distribute."

This is better tailored to the actuarial work - it essentially translates how the actuarial skill set is used to contribute to the broader risk management concept.

reinsurance:



- 1 The world needs to wake up to long-term risks
- 2 Risk management
- 3 The expert corner**
- 4 Australian Prudential Regulation Authority (APRA)
- 5 Enterprise Risk Management
- 6 Climate Risk

- 3 The expert corner
  - Interview: Gloria Yu
  - Gloria Yu: take-aways

## Interview: Gloria Yu

Interview with Gloria Yu

Gloria Yu FIAA FSAS MAICD:

- Back then Director at Deloitte Actuaries and Consultants (in 2017 when I interviewed her)
- Now Senior Manager at the Australian Prudential Regulation Authority

- 3 The expert corner
  - Interview: Gloria Yu
  - Gloria Yu: take-aways

## Gloria Yu: take-aways

### *1:48 (Actuaries and Risk Management)*

- “risk management is a very broad area [ ... ] actuaries [ ... ] are all about managing uncertainty and so that’s essentially what risk management is about [ ... ] we can actually bring to bear the actuarial skill set to areas which are potentially not seen as traditional actuarial space.”
- “risk management [ ... ] actually straddles across a number of different practice areas”
- “an actuary will need to comment on the **suitability and adequacy of the risk management framework** and there are prudential standards that govern these types of work, essentially saying that the **statutory actuary or appointed actuary will need to comment on the risk management framework on an annual basis** and to submit that to APRA as a regulator as well.”

## 1:48 (*Actuaries and Risk Management*)

- the other side is capitalisation - the amount of money to support the risks taken on by the insurer
- “So [ . . . ] actuaries [ . . . ] get involved in [ . . . ] drafting up risk appetite statements, looking at [ . . . ] the risk management strategy [ . . . ] reviewing some of the risk management framework that a company has as well”
- “essentially incorporating a lot of the elements that we as actuaries learnt in our traditional fields but really expanding it to a wider area”
- “CROs nowadays some of them are actually actuaries as well so that’s a great space for us to be in”

## 4:53 (*typical employers*)

- “Risk management essentially is important for every single company”
- “There are also other organisations **even in non-financial services** sector which actuaries are starting to get involved in, whether it's around the operational risk or whether it's about credit risk or strategic risk.”
- “but [ . . . ] actuaries would tend to have a natural fit to more of the financial services sector”



## 5:45 (*Why is it interesting?*)

- “risk management is really interesting. So to me, it’s interesting also because you listen to the news and it’s pretty much all over the news, every single day.”
- “cyber risk [ . . . ] is a growing area within the risk management practice”
- “a combination of the what’s happening in the real world but also utilising some of the actuarial skill sets that I’ve been equipped with and combining the two and that creates a really viable and useful value add to any insurer and to ultimately to the end customer as well”
- APRA: risk culture (so that everyone is doing the right thing, even if no-one is watching), risk management framework (responsibilities of the board)

## 9:48 Advice:

- keep being curious
- think about what is actually happening
- continuous professional development
- challenge yourself
- continuous improvement
- be aware of geopolitical, economic, financial, any other issues – what can an actuary do about it?
- so much more than just numbers : “it’s the people side, the communication side that really needs to be at the forefront of your development and that’s what’s going to make you stand out from the crowd and be successful as an actuary”
- don’t focus only on the downside: think about the upside (opportunities)

- 1 The world needs to wake up to long-term risks
- 2 Risk management
- 3 The expert corner
- 4 Australian Prudential Regulation Authority (APRA)**
- 5 Enterprise Risk Management
- 6 Climate Risk

# Australian Prudential Regulation Authority (APRA)

- Australian Prudential Regulation Authority (APRA)'s role is to protect the interests of policyholders (*beneficiaries* of the institutions under APRA's supervision in the broad sense). APRA supervises **trillions** of AUD.
- Australian Securities and Investments Commission (**ASIC**) is the institution that is concerned with shareholders' interests (and market conduct in general).
- APRA's mission:
  - *To establish and enforce prudential standards and practices designed to ensure that, under all reasonable circumstances, financial promises made by institutions that APRA supervises are met within a stable, efficient and competitive financial system.*
  - There are no guarantees. APRA aims only to control the chance of failure to an acceptable small number.
- APRA employs many actuaries

- 1 The world needs to wake up to long-term risks
- 2 Risk management
- 3 The expert corner
- 4 Australian Prudential Regulation Authority (APRA)
- 5 Enterprise Risk Management**
- 6 Climate Risk

# Enterprise Risk Management

Committee of Sponsoring Organisations of the Treadway Commission ("COSO") defines:

**Enterprise risk management** is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite. to provide reasonable assurance regarding the achievement of entity objectives.

CERA  
AAAA  
impact

actual likelihood  
+ impact

- 1 The world needs to wake up to long-term risks
- 2 Risk management
- 3 The expert corner
- 4 Australian Prudential Regulation Authority (APRA)
- 5 Enterprise Risk Management
- 6 Climate Risk**

## 6 Climate Risk

- Climate change?
- AD: "Ringing the bells of climate change"
- Actuaries Institute Climate Change Public Policy Statement
- The role of actuaries in climate risk
- Extra readings (non mandatory)



# Climate change?

Simple (but compelling) evidence of climate change:

- by NASA
- in Australia; see also
- Australian Actuaries Climate Index



## 6 Climate Risk

- Climate change?
- AD: "Ringing the bells of climate change"
- Actuaries Institute Climate Change Public Policy Statement
- The role of actuaries in climate risk
- Extra readings (non mandatory)

## AD: "Ringing the bells of climate change"

Ringing the bells of climate change

How can climate change affect insurers and their financial stability?

→ in three broad channels:

- **Physical risks** value of assets impacted by climate and weather related events. More events of bigger scale → impact on capitalisation
- **Liability risks** whose fault?
- **Transition risks** assets revalued, changes in policies (e.g. move out of coal), changes in socio-economic-political environment, ...

Also discusses recommendations for insurers.

## 6 Climate Risk

- Climate change?
- AD: "Ringing the bells of climate change"
- **Actuaries Institute** Climate Change Public Policy Statement
- The role of actuaries in climate risk
- Extra readings (non mandatory)

# Actuaries Institute Climate Change Public Policy Statement

## Actuaries Institute "Climate Change: Public Policy Statement"

- The AI's position is that climate change is a thing, and that it is "man-made"
- Climate change has major consequences, and actuaries have skills that can help address those:
  - identify and understand risks ✓
  - develop policy and strategy to respond to those risks ✓
  - develop and implement frameworks to manage those risks ✓

Climate change will likely have a major impact on at least four key areas:

- **Extreme weather events:** frequency and severity
- **Population and health:** pandemics, heat
- **Scarcity of resources:** water, food, ecosystems
- **Economic value of assets:** shift away from fossil fuels

## Policy positions:

- ① supports the 2015 Paris Agreement ✓
- ② supports public policy to improve resilience and reduce vulnerability ✓
- ③ inform public debate, support actuarial contributions to effective responses ✓

## 6 Climate Risk

- Climate change?
- AD: “Ringing the bells of climate change”
- Actuaries Institute Climate Change Public Policy Statement
- **The role of actuaries in climate risk**
- Extra readings (non mandatory)



## The role of actuaries in climate risk

The role of actuaries in climate risk ✓

Interesting quote:

“Sea level rise is an increasing focus for Singapore as **1/3rd of Singapore residents live in buildings with ground levels five metres or less above sea level**. Professor Horton showed the projected sea level rise under different climate scenarios. Sea level rise has two main causes – expansion of oceans as they warm, plus melting of glaciers and ice sheets. **Melting of the Greenland ice sheet alone could raise sea level by around six metres. The Antarctica ice sheet has enough water to raise sea levels by 65 metres.**”

Otherwise, read the article to get an idea of people's answer to the question.

## 6 Climate Risk

- Climate change?
- AD: "Ringing the bells of climate change"
- Actuaries Institute Climate Change Public Policy Statement
- The role of actuaries in climate risk
- Extra readings (non mandatory)

## Extra readings (non mandatory)

### Actuaries and climate change:

- Actuaries Institute Climate Risk Working Group
- Climate Change at the 20/20 All-Actuaries Virtual Summit

### Climate change analysis:

- Polar Vortex: a counterintuitive threat of climate change?
- Coastal erosion and insurance