How the insurance industry can lead on climate change

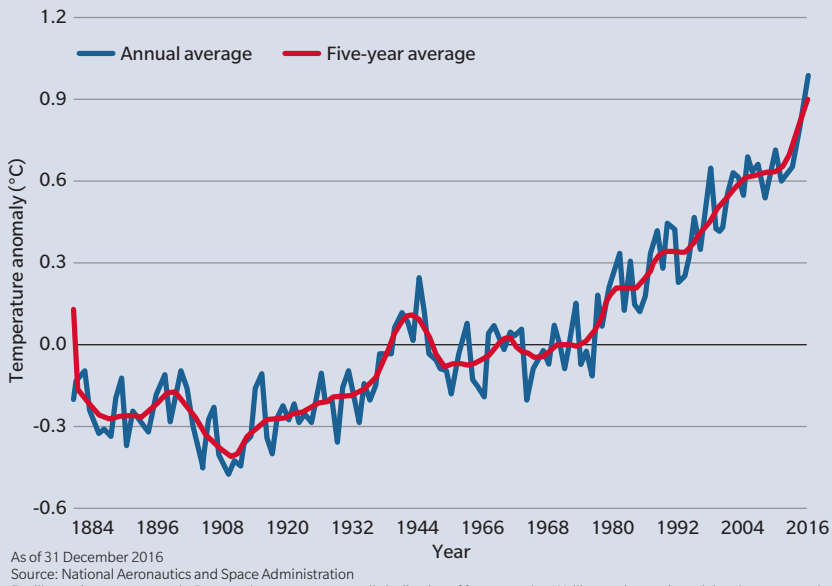
Global temperatures have been rising for decades and now appear to be accelerating – with no sign of mean reversion (Figure 1). A hotter world has innumerable potential consequences for humankind and the economy. Climate researchers have warned of catastrophic scenarios, including rising sea levels that inundate coastal cities, large-scale crop failures that can cause famine, waves of climate refugees migrating to temperate regions, unsustainable pressure on aging infrastructure and power grids, and the mass extinction of many plants and animals, which would further alter our ecosystem.[1] In our opinion, investors who continue to underestimate or ignore climate risks may do so at their own financial peril – and that of their clients.

Exacerbating the economic and physical risk of climate change is the shift of urban population centers to low-lying coastal regions. According to the National Oceanic and Atmospheric Administration (NOAA), US coastal areas have become much more crowded than the rest of the country. In 2010, the US Census Bureau reported that from 1960 to 2008, the US coastal population grew by 40 million people, an 83% increase. The number of housing units along the US coast rose by 100% during that same period, from 16 million to over 33 million.[2] The global picture is the same. One study found that population density for low-elevation coastal zones is five times higher than the global density average – and is expected to quadruple by 2030.[3]

More population density means more economically valuable, physical capital stock is at risk of flooding from potential weather events or sea-level rise. Urbanization has exacerbated flooding concerns by hampering coastal cities' ability to withstand natural disasters. Heavy rainfall and storm surges from hurricanes create drainage challenges in heavily developed areas, as asphalt and concrete aren't porous enough to absorb water. And it is not just infrastructure or personal property that is at risk. For example, according to NOAA, each year US coastal communities "produce more than US$7.9 trillion in goods and services, employ 54.6 million people, and pay US$3.2 trillion in wages."[4] Again, the threat of disruption to economic activity is enormous and is by no means unique to the US. The OECD estimates coastal flooding in large port cities including Shanghai and Mumbai could put up to US$35 trillion in property and infrastructure at risk by 2070.[5]

Wellington and Woods Hole Research Center (WHRC), one of the world's leading independent climate research organizations, recently announced a collaborative initiative to integrate climate science and asset management. This new alliance will focus on creating quantitative models to help analyze and better understand how and where climate change may impact global capital markets. With insurers on the front lines of this critical issue, we hope these new research efforts will help our insurance clients better manage, assess, and price climate risks.

Figure 1: Climate change is a trend with no sign of mean reversion



As of 31 December 2016
Source: National Aeronautics and Space Administration
For illustrative purposes only. Past results are not necessarily indicative of future results. Wellington has reviewed the above research and believes the findings are still valid even without the inclusion of more current data.

How the insurance industry is coping

Property & Casualty (P&C) insurers have a vested economic interest in managing and hedging climate risk. As a result, we believe P&C companies should be critical change agents in driving climate mitigation and adaptation through climate-risk repricing. But improvements are needed.

Insurers have historically provided valuable societal benefits. By pooling

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and managing risk, insurance enables companies and individuals to innovate and test new business models. We believe that by supporting entrepreneurship and promoting trade, the insurance industry is a key economic driver. Insurance also prices – and reprices – risks over time, helping to ensure the efficient allocation of capital.

Today the industry still attempts to manage climate risks by focusing on one of four major approaches, each of which we believe is limited in its ability to address the systemic, long-term threat of climate change.

- **Risk transfer** through the use of weather derivatives or catastrophe bonds may be a short-term solution that tends to ignore longer-term, systemic risks. Pricing relies exclusively on historical data, which will likely prove inaccurate in the face of accelerating climate change and overly narrow given advances in climate science.
- **Risk avoidance** may mitigate risks for the insurer, but sends insufficient pricing signals to the marketplace, potentially perpetuating the mispricing of climate risk. Additionally, avoidance nearly always implies eventual dependence on a state or government agency that may be ill-equipped to underwrite risk.
- **Raising premiums** has two potential drawbacks. First, it may limit near-term underwriting opportunities. Second, premiums are still mostly based on backward-looking models that do not reflect future weather and climate risks. Both of these issues imply that current premiums may be too low.
- **Private-infrastructure** investing can help underwrite the creation of necessary climate-resilient assets, but this approach can be difficult to scale and can present liquidity, reinvestment, and inflation-hedging risks.

Correlation risk between insurance assets and liabilities also poses a significant dilemma. Insurance companies must ensure that their assets (in this case, their investments) do not lose value concurrent with increases in their liabilities (claims they have underwritten). Unless an insurer's liabilities on physical property perfectly price in climate change, those obligations can become more onerous over time. At the same time, if an insurer's investment portfolio is heavily exposed to assets bearing climate risk, they face classic asset-liability mismatch.

In our view, the insurance industry should provide leadership on climate-risk repricing. No amount of insurance makes a bad risk a good risk, so in the face of accelerating climate change, we think insurers must consider more expansive, multi-decadal approaches to climate-risk management. We believe that a public equity investment strategy that offers exposure to companies engaged in climate mitigation and adaptation can complement existing hedging strategies and sends capital markets pricing signals to incentivize adaptation and mitigation infrastructure.

Decoupling investment risk from the rising climate-related liability risks that insurers are facing may be a more sustainable long-term approach. A carbon tax or carbon price – a rising probability in our view – may further add inflationary pressures on liabilities and makes a liquid equity-based approach potentially additive to a broad investment portfolio.

Those costs are not currently captured in most insurers' asset bases, which are still dominated by fixed income investments. In the US, for example, insurers still allocate over 60% of their portfolios to bonds, and in Europe the figure is north of 80%.[6] Some portfolio allocators are beginning to recommend equity investment-based approaches to their insurance clients as well, advocating a combination of asset reallocation (including divestment and environmental, social, and corporate governance [ESG] awareness), hedges using low-carbon indexes or derivative overlays, and engagement on policy and physical-risk disclosures.

While climate change poses significant risks for insurers, we believe it also represents substantial investment opportunity. Through practical portfolio management and a long-term view of the challenges ahead, we expect the industry to lead the charge on climate-risk repricing and reap the potential benefits to their business that can accrue over time.

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1 Based on research conducted by the Organization for Economic Cooperation and Development (OECD) and Woods Hole Research Center.
2 Census.gov.
3 Neumann, B., et al. "Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding: A Global Assessment," PLOS, March 2015.
4 Total Economy of Coastal Areas, NOAA, 2017.
5 "Climate change could triple population at risk from coastal flooding by 2070," OECD, April 2007. This data has not been updated by OECD in recent years; however, we believe the estimate presented is still accurate.
6 "A firm foundation: How insurance supports the economy," Insurance Information Institute, 2017 (data supplied by NAIC and sourced from S&P Global Market Intelligence).

Disclosure