Actuaries vs Econs

Julia Dreblow outlines the wide-ranging implications of getting our climate sums wrong

With all the fine words written and targets set to address climate change, one might reasonably expect greenhouse gas emissions to be coming down by now. They are not. In fact, meeting the internationally agreed targets set in Paris in 2015 is looking increasingly challenging - and we risk becoming immune to headlines like 'July 2023 sees multiple global temperature records broken' (Copernicus). To me though, the BBC's report that global average temperatures were 1.47C degrees above preindustrial averages in June (BerkelyEarth) was the most shocking.

As predicted decades ago, the result of global temperature rises has been significantly increased fires, floods and storms - and it is hard to imagine anyone not being concerned. Our failure to respond effectively is all the more bewildering now that we have a phenomenal range of competitively-priced, clean, future proof alternative energy options that can cope in most situations. So why are we doing such a lousy job of changing our ways?

Governments and policy-makers must of course shoulder a large part of the blame as they set the boundaries within which businesses operate - and are tasked with keeping us safe. Fossil fuel companies must also share significant responsibility as their lobbying abilities rival those employed by big tobacco.

In contravention

In the UK, both are displaying behaviours that contravene the recommendations of the UK Climate Change Committee, who are tasked with guiding and reporting annually to Parliament. The granting of fossil fuel exploration licences and the decision to undercut the EU's carbon price are recent, worrying developments. They will make the shift away from fossil fuels harder, increase costs and emissions - and are reputationally damaging.

Other key players include those who hold the purse strings - banks and investors - as well as enablers like insurers. Each has examples of leadership, but change is painfully slow. Working on the assumption that most people are sensible and right minded this disconnect is pretty baffling.

Two important reports published this summer may shed some light on what has gone wrong and what we can do about it.

They are - *'The Emperor's New Climate Scenarios'* an Institute and Faculty of Actuaries/University of Exeter collaboration and *'Loading the Dice',* which is the work of Carbon Tracker and UCL professor Steve Keen. Both bring together wider research and use analysis from EEIST – which was in part funded by the UK Government. The papers explore serious flaws in climate scenario modelling, that is used to inform policy and investment decision-making.

The IFoA report focuses on financial services' climate change scenario modelling – in other words the information used to anticipate the likely economic impact of climate change, at different levels of global warming, which is used to assess how much this matters to investors. The Carbon Tracker report zeroes in on pensions.

Underestimating the risks

In brief, their view is that current economic models significantly underestimate climate risk. Both are particularly concerned about modelling for 'hot house' scenarios – where global temperatures rise by 3C+ degrees, as they universally fail to consider the most serious negative impacts of climate change. They specifically point a finger at the failure to consider 'tipping points' and 'second order impacts', (knock-on effects), that exist in the real world and would have devastating effects.

The result of these failures is to massively underestimate likely economic costs and investor impacts. Although carefully worded, to reflect the complexities of modelling, the authors point to the wide range of forecasts employed, some of which ('implausibly') imply climate change could benefit GDP globally while others point to a 60% (or more) drop in GDP. Most, however, are in the region of a drop of around a few percentage points, despite this being so feared by scientists – hence decision-makers' complacency.

Financial impact

Going further, Carbon Tracker's survey of 738 leading climate economics papers -alarmingly showed a median GDP reduction of 10% at warming of +5C degrees - a level that the scientific community considers to be "beyond catastrophic, including existential threats". The report also names and shames investment consultants advising pension schemes and members that the impacts will be minimal - when the scientific evidence is the polar opposite.

There is much technical analysis in these reports, but some of it is relatively easy to visualise. A notable passage in the IFoA report says current climate scenario modelling is akin to "looking backward from the deck of the Titanic on the evening of 14 April 1912 and predicting a smooth passage to New York because no icebergs have yet been hit". A further analogy references assessing risks to the ship without considering that the vessel could sink.

Cherry-picking statistics from reports is always a risk – but one is particularly important. The reason we are so focused on containing temperature rises below +1.5C is because that is the level international (IPCC) scientists believe heat-related morbidity and food scarcity start to enter danger zones, and specifically, when 99% of coral reefs are likely to fail.

A further example is sea level rises. IPCC scientists report that a 2–3 metre sea level rise, by the end of the century, already looks likely (assuming +1.5C), although oceans could rise by 12 to 22 metres over time if we fail. The authors' views, unsurprisingly, indicate that it is "overwhelmingly economically positive to limit global warming to 1.5C degrees".

The IFoA report also criticises IPCC communications that talk about a "2/3 chance of success of holding global temperatures below +1.5C" without making it clear that that equates to a 1/3 chance of failure. The authors add that "given the risks associated with exceeding +1.5C degrees of warming, these are not wise odds".

The related Carbon Tracker media release title reads: "Millions of pensions at risk because investment consultants overlook threat of climate tipping points", pointing the finger at "economic research that ignores the critical scientific evidence about the financial risk embedded within a warming climate". The report also quotes actuary Mike Clark's alarming view that we are accelerating towards a 'Minsky moment', where turning back becomes impossible.

The IFoA report also discusses 'carbon budgets' – which are often used by policy-makers to plot a gradual pathway towards net zero – rather like quotas. Again, quoting scientists, the report says that "there is a possibility that the remaining carbon budget for limiting warming to +1.5C is already zero". In other words, any level of future greenhouse gas emissions may take us over +1.5C, adding that this uncertainty "is not referenced in climate models".

So, while the IFoA report makes it clear that modelling the impact of climate change is "complex, nuanced and characterised by deep uncertainty" and that "it is essential that model users understand this", a title on the same page says "Time is too short to wait for models that are perfect" - a point underscored by their view that "history is replete with incidents in which we have placed too much faith in models".

So what next?

The IFoA wants to see better education and modelling – with a greater focus on understanding. Their recommendations, somewhat alarmingly, also say: "Financial institutions should be encouraged to develop plausible qualitative and quantitative scenarios alongside regulatory ones. A simple quantitative approach could be to use a reverse stress-testing approach based on a ruin scenario of 100% loss of GDP at a certain temperature limit. This should be supported by robust internal debate around assumptions, development of appropriate investment beliefs around climate-related risks, and opportunities to foster ownership of assumptions and mitigate risk of group think..."

Given that actuaries are tasked with managing risk, not scaring people, this leaves me wondering how a retail client or scheme member might feel if they knew the financial services community was being encouraged to contemplate "a ruin scenario of 100% GDP loss". Might they expect investment professionals to respond? Might they want to make different choices? Might they flip?

So, on the assumption that actuaries know more about risk than most, where do we go from here? Encouraging all investment professionals to read these reports would be a start, but more broadly paying greater attention to real-world issues, clients' opinions and scientists are also crucial. You do not need to be an actuary to work out that our changing climate does not bode well for economies or investors, but we do need to stop blindly trusting 'data'. Indeed, we are reminded of real-world events daily.

Two particularly eye-catching stories have popped up on my phone while writing this. One was about the plight of penguin chicks in the Antarctic - which breaks my heart. The other was about the severe drought in Panama impacting the shipping industry because water levels are too low (the area is normally very wet). No amount of cynicism about ESG or sustainable investment will shield investors from 'second order impacts' such as the latter - if and when trade is seriously impacted.

Numbers don't add up

So, keeping it simple – the message is something like; scientists have charted likely climate impacts at different levels of temperature rise; economists have translated that research into likely financial impacts but have missed some key elements; policy-makers, investors and others are therefore using flawed models to make poor decisions – and actuaries are now sounding the alarm because the numbers do not add up and the costs look set to be immense.

And for investment intermediaries – this is starting to look like a masterclass in why past performance will not be a guide to the future. The need for decent, qualitative data and understanding individual fund and asset manager strategies has probably never been greater. Likewise, the benefits of knowing where funds do and do not invest, and how knowledgeable managers are about climate change and related areas looks increasingly crucial – to avoid the dreaded 'herd mentality'. Standardised climate reporting is crucial. Standardised thinking and asset selection are not.

The SDR will help with much of this, both disclosure and labels will help. But in the meantime, there are plenty of funds that exclude coal, oil and gas majors. Fund EcoMarket lists 186 such OEICs. Clients who favour engagement can cast the net much wider.

These reports are an important wake-up call. Tipping points won't bend to meet economic models - and we have a duty to ensure clients and scheme members are not exposed.

Sources

• https://actuaries.org.uk/news-and-media-releases/news-articles/2023/july/04-july-23-emperor-s-new-climate-scenarios-a-warning-for-financial-services/
• https://carbontracker.org/reports/loading-the-dice-against-pensions/
• https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-UK-emissions-2023-Report-to-Parliament.pdf
• https://climate.copernicus.eu/july-2023-sees-multiple-global-temperature-records-broken#:~:text=The%20month%20started%20with%20the,hottest%2029%20days%20on%20record

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