

BASEL COMMITTEE CONSULTATION: The Role of Climate Scenario Analysis (CSA) in Strengthening the Management and Supervision of Climate-Related Financial Risks

Introduction

Carbon Tracker Initiative is a think-tank and research organisation based in London. Our vision is of a decarbonised global economy and our mission is to accelerate the energy transition through the mobilisation of financial markets. Our primary audience is therefore a full range of financial institutions – from banks to assets owners – although our research carries implications for policymakers and regulatory authorities as well.

In July 2023, Carbon Tracker published, in collaboration with Professor Steve Keen of University College London, a seminal report called **Loading The DICE against Pension Funds**. This report ([link here](#)) highlighted the risks to the financial system –specifically to pension funds – through the overreliance on economic research that ignores fundamental and up-to-date climate scientific evidence. The report pinpoints the role of climate scenario analysis and the damage function as providing the basis for much of the non-expert advice that goes to pension funds about climate risks. Given the core importance of pension funds within the overall financial eco-system, **the issues identified in Loading the DICE constitute a potentially severe macro-economic risk which could result in a “Minsky moment”**.

Since its publication, Loading the DICE has generated major traction among pension funds and a spectrum of stakeholders, including financial regulators and parliamentarians. Working with other civil society experts in Europe, we are expanding our research agenda, with a focus on how climate scenario analysis (CSA) can be improved and the **“damage function”** be fixed. Against this background, we welcome the opportunity to contribute to this discussion paper from the Basel Committee on CSA, in the light of the major influence that CSA has on how financial institutions approach climate-related financial risks.

Carbon Tracker Views

Our view, taking into account the questions posed by the discussion paper, is that the work of the Basel Committee should be based on the following key principles:

- advice to financial institutions should be based on **up-to-date climate science**;
- that advice should be **forward-looking**
- **the precautionary principle** (as per the then-Governor of the Bank of England in his much-cited Tragedy of the Horizon speech in 2015);

- it should consider the **macro impacts of climate risk** on the overall financial system as well as on the individual exposures of financial institutions;
- features that should be included or accentuated in existing CSA so that it is up-to-date and properly forward-looking – including acknowledging and incorporating the growing risks of triggering **climate tipping points** before 2100;
- **time horizons should be flexible**, given the uncertain speed and nature of the energy transition, and that everything should be done – including by central banks – to avoid a disorderly transition.

All this is very much consistent with the Committee’s mandate: “to strengthen the regulation, supervision and practices of banks worldwide with the purpose of enhancing financial stability.”

Based on our research to date and the views we are gathering in response to it, we recommend that the Committee should strengthen its work on CSA so that it focuses on the flaws of the damage function, the potential implications for financial markets and financial stability and considers ways in which the flaws identified can be fixed.

Damage Function – Identified Flaws

1. While it is widely regarded that climate represents a systemic risk, the assumption within the damage function that GDP is fungible is inconsistent with this, and therefore allows the belief that climate risk can be diversified away by using Modern Portfolio Theory.
2. The existing damage function incorrectly assumes that, because 80% of global GDP is produced “in a controlled environment” (indoors), it will be unaffected by climate change, ignoring flooding, hurricanes, and fires;
3. The current damage function ignores the existence of Tipping Points. This has the effect of over-estimating the time before significant physical damage occurs. This has a significant effect on the value of assets by over-estimating the terminal value of cashflows/dividends in discounted modelling used by financial institutions.
4. It assumes that –
 - a. climate differences between locations are valid analogs for climate changes over time.
 - b. historical data from a stable climate at lower temperatures can predict future damage at higher temperatures in a destabilised climate.
 - c. Ergodicity - the average of a process over space is the same as its average over time – applies to climate. This requires a stable environment over time, which is clearly not the case with climate change.

All of these assumptions, while reasonable in economics, are not reasonable in climate science. All have the effect of under-estimating the physical damage of

small increment changes in temperature over time; and by default the value of assets (via the CAPM formula) by significantly under-estimating the appropriate discount rate applied to future dividends/cashflows in discounted modelling used by financial institution.

Fixing the Model

Clearly much more work and analysis needs to be undertaken by the range of experts so that the tensions enshrined in the current system can be resolved, where pension funds and other finance managers are caught on the hook of maximising short-term returns - at the expense of ignoring transition and physical risks, and therefore miscalculating the potential value destruction to the assets they hold.

Work on solutions should cover, in a list that is non-exhaustive:-

1. Real-World Data and Modern Climate Mathematics: Using up-to-date data and mathematical interpretations.
2. Revised Assumptions: Implementing current and realistic assumptions as informed by the latest scientific research.
3. Inclusion of Tipping Points: Incorporating climate tipping points in the model.
4. A Revolution in Damage Functions: Developing innovative approaches to predict physical damage from higher temperatures – not a linear damage function that fails to consider the prospect of accelerating damages as the planet warms.
5. Inter-disciplinary Collaboration: Leveraging the combined expertise of science, economics, and mathematics and ensuing economic research on the financial consequences of climate change does not occur in isolation from climate science.

In Conclusion

The points above highlight that the approach to climate modelling should be a collaboration across climate science, economics and mathematics. The Committee appears to recognise this and be implementing in climate scenarios. However, the current damage equation remains firmly built on the principles of economics alone, and this now appears inconsistent with the Committee's intended approach

We hope this contribution is helpful. We appreciate that CSA and its associated topics – including its methodologies - are a hugely complex and challenging subject. As a mission-driven organisation with the issue of climate-related financial risk central to what we do, we stand ready to contribute further to Basel Committee considerations. We anticipate publishing more research on this agenda in the autumn.

