

Viewpoint: Investor climate scenarios need to be probability-aware

Riccardo Rebonato argues that climate scenarios need to come with probabilities if they are to be useful for investors



Riccardo Rebonato,
scientific director of EDHEC-
Risk Climate Impact Institute

The question of what impact climate change will have on investors' portfolios is becoming increasingly difficult to avoid and the need for scenario analysis is becoming more and more acutely felt. Climate scenarios, however, are more complex than the traditional macrofinancial scenarios with which financial

practitioners are well familiar.

Their complexity stems from the fact that they must combine information about the economy and financial markets, with which investors are well familiar, and information about the climate system, with which very few investors have more than a passing familiarity.

In addition, even seasoned investors cannot draw from their expert knowledge (accumulated in times when climate change was a totally secondary factor) to gauge whether a given climate scenario constitutes clear and present danger, or is a remote tail event.

Since 'intuition' can provide little guidance when climate outcomes are in play, useful scenarios must come equipped with probabilities.

Unfortunately, the excellent climate scenarios created under the auspices of the Intergovernmental Panel on Climate Change (IPCC) – which were intended with the needs of policy-makers and prudential regulators in mind, not of investors – have by design eschewed any probabilistic information.

Following their publication, academics have debated at length whether some of the proposed scenarios were so far-fetched as to be virtually impossible, or whether they added useful 'tail information'.

Unfortunately, these spirited debates have been lost on the investment community, which has been left in the uncomfortable position of having to guess which scenarios should be taken seriously.

Not infrequently, the unwarranted assumptions have often been made either that they

should be regarded as all equiprobable, or that looking at the two extreme ones would somehow usefully book-end the plausible financial results. Neither assumption has proven useful.

“Not many investors realise that the only narrative chosen by the NGFS is little suited to dealing with non-steady-as-she-goes scenarios”

Matters have not been helped by the fact that an influential industry body, the Network for the Greening of the Financial Sector (NGFS), has taken one of the IPCC-endorsed 'narratives' as the only reference point around which variations in climate policy have been applied.

Not many investors realise, however, that the only narrative chosen by the NGFS* is called Middle of the Road, and, as such, little suited to dealing with non-steady-as-she-goes scenarios. And as for those who do realise this, they have often assumed that, given its name, the Middle of the Road narrative should be considered as the most likely one. In reality, no such claim is made by the IPCC.

Where does this leave investors?

‘Probability-aware’

We think that they are left in dire need of probability-aware scenarios, without which it is difficult to see how reasonable investment decisions can be made.

Probabilistic information can be estimated from a variety of sources, ranging from economists' surveys to technological and fiscal constraints on which abatement paths are doable. Of course, these probabilities will never attain the other-worldly precision claimed by measures of market risk such as VaR, but should flag to investors the economic outcomes they should worry about, the ones that are unlikely but still plausible, and the ones that belong to the meteorite-hitting-the-Earth category.

The most natural way to provide this information is via probability distributions – which, by the way, embed often-lost-in-translation

information about the huge degree of uncertainty associated with all these estimates. We recognise, however, that a probability-distribution-based message is not necessarily couched in the language investors most readily respond to. It is therefore important to translate this rich but 'unfriendly' probabilistic information into probability-aware scenarios with which investors should feel more comfortable.

The attending loss of information is hopefully more than compensated for by the familiarity of the scenario framework.

Reverse stress-testing

Finally, in situations where probabilities are difficult to gauge, investors often resort to reverse stress testing – and, indeed, regulators have encouraged them to do so after the 2008 crisis. The unstated assumption behind reverse-stress testing is that, once the market move required to generate a certain unacceptable loss is obtained, an experienced practitioner can estimate how plausible that move is, and judge whether the portfolio is at risk.

Unfortunately, when climate change plays a role, it is exactly this kind of 'intuitive' expert knowledge that is again missing. In the presence of climate damages, the goal of reverse stress testing can therefore be rephrased as finding the most likely way in which an unacceptable loss could be incurred.

Probabilities, escorted out of the scenario house through the main door, therefore reappear via the back door. This is why a probability-centred approach is also particularly well-suited to dealing with reverse stress testing.

Riccardo Rebonato is scientific director of EDHEC-Risk Climate Impact Institute

*Last month the NGFS published a technical document acknowledging the need for users of its scenarios to aim to "tailor their analyses to suit their requirements and determine what additional risk assessment tools and scenario calibration may be required".