

Banks begin to model climate risk in loan portfolios

Environmental stress tests and scenario analysis reveal hidden risks

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NEED TO KNOW

- A Financial Stability Board task force chaired by Michael Bloomberg has called on banks to model and disclose their climate risk exposures, while the EU is considering making such disclosures mandatory.
- Banks support greater climate disclosures but are wary of regulatory mandates. “We caution against premature regulations,” says one bank risk manager.
- A number of banks are using scenario analysis and stress tests to assess the impact of climate change on their loan portfolios, and some are adjusting lending strategies accordingly.
- Nine banks are currently piloting a drought stress-testing tool developed by RMS, a catastrophe risk-modelling firm.
- In March, a working group of 16 banks is expected to publish a set of scenarios that can be used to model climate risk in loan portfolios.

Used by large banks since the early 1990s, stress testing has grown to encompass all manner of risks. One of the latest additions to the practice is the risk posed by climate change and environmental regulation.

The use of stress testing, as well as scenario analysis, to forecast the impact of climate change on loan portfolios is only a few years old, and in these early days banks are taking different approaches. But some are already adjusting lending strategies based on their assessments of the risk.

Two recent initiatives are likely to accelerate efforts to gauge climate risk. In June, the Financial Stability Board's Task Force on Climate-related Financial Disclosures, chaired by former mayor of New York City Michael Bloomberg, issued [recommendations](#) on climate risk management and disclosure for financial institutions.

"When the TCFD recommendations were issued, we immediately said we want to follow those recommendations," says Antoni Ballabriga, global head of the corporate responsibility unit at BBVA. "A lot of investors are asking us more and more about climate change and climate-related assets."

The TCFD framework, which is voluntary, recommends the use of scenario analysis to assess climate risk exposures and calls on banks to disclose the results in annual filings, along with the metrics and processes used to conduct the analysis.

And in November, the European Parliament's economic and monetary affairs committee issued a [proposal](#) that would amend the European Union's Capital Requirements Regulation to make climate risk management and disclosures mandatory.

Banks are less enthused about the mandatory aspect of this proposal, pointing out that they have only just begun looking at ways to assess climate risk.

"There are still many unknowns and challenges associated with modelling and stress-testing climate change risk," says Rahel Wendelspiess, director of environmental and social risk at UBS. "We caution against premature regulations before these are addressed. Once it's required that we do it, it's implied we already know how, but we're still on a steep learning curve."

Taking action

The learning process includes a good deal of experimentation.

Responsibility for climate risk management typically rests with banks' environmental and social risk management functions, rather than the credit or market risk groups.

“Any of the natural disasters fall within our remit,” says Courtney Lowrance, global head of environmental and social risk management at Citi. “Environmental risks fall into a general bucket of risks. We look at it as an operational risk for the company we’re financing. Environmental issues can also carry legal risks. There could [also] be regulatory risks if regulations crack down on the use of natural resources.”

A handful of banks – including JP Morgan, PNC and UBS – have begun conducting [environmental stress tests](#) of their loan portfolios. PNC, for example, looks at how certain environmental risks, such as carbon emission regulations and a lower demand for oil, would affect a specific customer portfolio, including the probability of default and loss.

However, this field of quantitative climate risk analysis is still in its infancy.

UBS attempted to measure its exposure to climate risks using its standard stress-testing infrastructure, based on macroeconomic scenarios, in 2014. It soon became apparent this approach was suboptimal, and the firm quickly switched to a bottom-up model focused on specific industries, such as oil and gas.

“We realised the existing infrastructure is not capable of capturing such risk because it is a macro-based model,” says Wendelspiess.



We’re limiting our risk appetite in certain carbon-related industries, such as the coal sector

Rahel Wendelspiess, UBS

UBS also [joined forces](#) with eight other banks and Risk Management Solutions (RMS), a catastrophe risk-modelling firm, to develop a drought stress-testing tool for loan portfolios.

“The drought project was another step in developing a bottom-up analysis,” says Wendelspiess. “This had not been done before.”

Environmental risk managers at Citi are following a similar path.

“Historically, [environmental] risk management focused on project- or asset-level analysis. That approach has evolved to a corporate [borrower] level,” says

Lowrance. “A power company may have 10 power plants in different countries. We will look at the company’s ability to manage environmental issues, recognising conditions vary from place to place.”

Citi is able to take a specific customer’s portfolio of assets and map it to climate risks, such as drought and flooding, says Lowrance: “We can model the potential impact on a company’s financials depending on how much of their asset base is located in sensitive areas.”

Some banks are confident enough in their climate risk assessments to adjust their lending strategies accordingly. For instance, JP Morgan stopped financing coal-fired power plants in certain countries in March 2016 after analysing the impact of climate change regulations on its global power portfolio.

That same month, Industrial and Commercial Bank of China published a [report](#) on environmental factors and credit risk, which estimated that 68% of thermal power companies with a credit rating of AA or higher could be downgraded in a low-stress scenario of increased environmental regulations. That figure increases to 81% in a high-stress scenario.



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The research team conducting the stress test made a number of recommendations, including advice that access to funding for companies that violate environmental protection laws and regulations should be strictly controlled.

At UBS, the environmental and social risk team has established controls and processes to identify and mitigate climate risks at both the individual client and portfolio levels. “We define standards in environmental and social risk,” says Wendelspiess. “That means we’re limiting our risk appetite in certain carbon-related industries, such as the coal sector. By limiting our engagement, that’s one way of protecting our assets.”

Still, risk managers say more robust tools are needed to effectively assess and disclose climate risks. To this end, a [group](#) of 16 banks has been working with the UN Environment Programme Finance Initiative (UNEP-FI) to “develop scenarios

which can be used as inputs into a model into which banks can then plug in their own credit information”, says Wendelspiess of UBS, which is part of the project. “The result would be the impact on banks’ credit exposures.”

The UNEP-FI group intends to publish its methodology shortly after the project ends in March. “The working group has committed to disclose at least some of the information and report on the process,” says Wendelspiess.

Drought stress-testing tool

RMS’s drought stress-testing tool includes five scenarios of varying duration, intensity and geographical extent for each of the four modelled countries: Brazil, China, Mexico and the United States. The tool maps the drought hazard in each scenario to an implied change in revenues for companies directly affected by water shortages or indirectly impacted due to, for example, interruptions in hydroelectric power generation or reduced supply of raw materials that require water. The results can be used to adjust a bank’s internal debt ratings upward or downward.

“The tool allows us to run a debt-rating model against a single company or on thousands of companies,” says Lowrance at Citi, which has already integrated the models into its system so the stress tests can be accessed by a user anywhere within the bank.



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Courtney Lowrance, Citi

However, Lowrance says the stress tests are not yet robust enough to inform the bank’s credit decisions. “Unfortunately, the data that goes into determining the vulnerability factors and how certain industries and companies react to drought is still quite limited,” she says. “That causes the confidence interval to be too low to be used for credit decisions.”

The RMS model uses proxy information when complete financial or location data is not available. “If we have a bank that knows it’s underwriting a loan for a

petrochemical company in the US, but it doesn't have detailed location information, we use what we know about the US petrochemical industry to help inform where they are likely to reside," says Stephen Moss, the firm's director of capital markets.

The RMS model shows climate risk analysis can be performed using a standardised framework linking environmental hazards to credit ratings, and ultimately default rates, says Laurence Carter, senior consulting analyst for capital and adjacent markets at RMS. "The tool demonstrates a new framework financial institutions could adapt and apply within their own internal systems," he says. "The methodology is highly versatile and could be equally applied to many other types of environmental risk."

Climate disclosures: a hit and a miss

Initiatives on common approaches to climate risk have produced mixed results to date. In France, for instance, disclosure requirements known as Article 173, adopted in 2015, have thrust banks to the forefront of climate risk management and reporting.

A [report](#) published by ShareAction in December 2017 ranked BNP Paribas first among the largest 15 European banks for climate-related disclosure, while two other French banks – Crédit Agricole and Societe Generale – ranked fourth and fifth respectively.

"The requirement in France for assessment and disclosure of climate-related risks has accelerated action with the French banks," says Lauren Compere, managing director at Boston Common Asset Management, which specialises in sustainable investing. "I would not have considered them as leaders, starting out."

Other efforts have fallen flat. The [Portfolio Carbon Initiative](#), a group of banks and asset managers working under the auspices of UNEP-FI, has been developing guidance for financial institutions on how to manage carbon-related asset risks since 2014. But it has only recently written a draft proposal, which it plans to release in February.

Compere, who was on one of the PCI technical working groups, says the project was dogged by disagreements among the participants. "There were

many people at the table looking at the methodology,” she says. “There was a breakdown because they didn’t agree on the methodology; lack of coordination and communication is one of the main reasons why broad adoption of this concept has not happened.”

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