

Impact of Climate Change on Credit Scoring

Two weeks ago, a [study](#) backed by 11,000 scientists confirmed that climate change is a “clear and unequivocal” emergency. Based on 40 years of data, it reiterated much of what has already been said for a long time, including by groups such as the [IPCC](#). In response, around 200 nations have signed on to The [Paris Agreement](#), signed in 2016. In summary, the nations agreed to take steps to keep global temperature rise by 2100 well below 2 degrees Celsius above pre-industrial levels, and to pursue greater efforts to limit the temperature increase to 1.5 degrees Celsius. They also agreed to take steps to deal with the predicted impacts of climate change.

From the viewpoint of financial institutions, the financial risk from climate change will mostly come from three major sources:

- **Physical risk:** the risk from physical effects of increased frequency and severity of weather events such as hurricanes, floods, droughts, heat waves and a rise in sea levels.
- **Transition Risk:** As economies move away from fossil fuels to greener options, there will be disruptions to the fossil fuel industry and supply chains as markets, policies and consumer preferences shift.
- **Reputational Risk:** As consumer sentiments continue to change, firms that fund fossil fuel projects or do not take steps to reduce their own carbon footprints will see an increase in negative sentiments to their reputation.

At the moment there are initiatives driven by both regulators as well as industry groups to encourage disclosure, propose regulatory expectations, as well as establishing consistent frameworks for managing this emerging risk. The [Task Force on Climate-Related Financial Disclosures](#), the [PRA](#) and [Network for Greening the Financial System](#) are particularly active in this sphere. In addition, almost all businesses are taking some steps to reduce their carbon footprints – including reducing their use of things such as plastics, retro fitting offices to be more energy efficient and funding initiatives that promote such practices.

So what does all this mean to credit scoring?

While this is an emerging discipline, and most organisations at present are looking at it from a very high level – including issues like governance, frameworks and disclosure, there will certainly be a downstream impact on credit scoring and lending. Some regulators such as the EBA are already encouraging lenders to consider climate change factors in lending, but a more pervasive global approach will probably happen in the mid to long term as recommendations from groups such as the NGFS and TCFD are more widely accepted and implemented.

Physical risk

There are maps available displaying severity of impacts from physical risks such as hurricanes across geographies. This can be translated into possible negative impacts on assets such as principal residences, investment properties, commercial buildings and production facilities. If current trajectories are correct, these properties will be facing additional risks from physical damage due to events such as floods,

hurricanes and droughts. In lending terms, it [means increased risk of defaults](#) (rising Probability of Defaults), lowered property values (increased Loss Given Default), loss of income (decreased debt service ratios), and downstream negative effects on credit bureau histories.

The mortgage market, in particular, is susceptible to this risk – and there are already [banks](#) and [investors](#) taking this into account for lending. Lenders may want to re-evaluate property values and use forward looking scenario analysis to predict price drops in affected areas.

Transition Risk

Transition risks will be highly dependent on public policies, consumer preferences as well as regulations concerning the fossil fuel industry. It will also be mitigated to some extent by similar policies such as tax breaks and investments in alternative energy sources. In general, we should expect decreasing investments in the fossil fuel industries – some estimates put this at [over \\$1.3 Trillion](#). This would mean presumably some job losses and decreases in the values of assets for those involved directly and indirectly with the industry. The assets include for example oil fields as well as suppliers who provide services and chemicals, to related infrastructure such as rail tracks built to transport oil. For lenders, this would mean negative impacts for retail (lower income, lower property values), SME and corporate loans (lower profitability, lower asset values).

As an example of such risks, there are already lenders who have publicly announced that they will [no longer finance coal projects](#), will not [hold bonds from issuers with large climate footprint](#) and [stop funding any fossil fuel energy projects](#).

Note that in some sectors and regions the effects will be positive – for example, those involved in clean energy businesses and agriculture in areas where higher temperatures may produce higher yields.

What Comes Next ?

There is no doubt lenders are reacting to this risk. Most banks are at the stage of designing frameworks, figuring out their exposures to climate change risk and finding ways to comply with some of the disclosure requirements suggested by regulators. Some of these are driven by [recommendations](#) from the TCFD, country regulators in places like the [UK](#) and [Canada](#), as well as the NGFS. None that I know of is integrating analytics into lending at the retail level as yet.

It is anticipated that once frameworks are in place, and more regulatory guidance is available, the next phase will be design of analytical methodologies to incorporate these risks in banks. Those of us in the credit scoring field need to prepare for this, and recognize some challenges. These include things such as:

- Limited historical data: credit risk models are built using plenty of historical data on defaults. The scenarios being anticipated for climate change have little or no historical data. As such, either forward looking scenario analysis or methodologies dealing with low sample sizes will need to be deployed.
- Long prediction horizons: most credit risk models are built to predict over fairly short horizons. The impact of climate change may take decades. Predictions from any model will be very sensitive to small changes inputs and assumptions.

- Causality: while credit models can draw correlation and assign causality from demographic and bureau data to specific defaults, it is much harder to do that with climate change. Defaults in one location may not be caused by local factors (other than location). I would imagine, climate change factors would be included in future credit models in the same way that we consider macro economic variables today.

There are of course a myriad of issues that will impact how banks can react to this. The effects of both transition and physical risks are regional – in countries that have policies against ‘redlining’, banks may face limitations in terms of allowable lending strategy. In addition, re-training, subsidies and other government actions may dampen the impacts of climate change risk.



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