



Avoiding the storm: climate change and the financial system

Climate change poses significant risks to the economy and to the financial system, Sarah Breeden asserts, and calls for action today

My message is simple. Climate change poses significant risks to the economy and to the financial system, and while these risks may seem abstract and far away, they are in fact very real, fast approaching, and in need of action today. In short, there are storm clouds on the horizon and the financial system needs to act now to plot a new course to safer waters. To do that we will need three things. Firstly, a destination. Secondly, an able crew. And finally, a nautical chart – or map - to get us there.

We have the destination. More than 190 countries have signed the [2015 Paris agreement](#) and set a goal to limit average global temperature rises to well below 2 degrees above pre-industrial levels. We even have a broad course to follow – that of a smooth and orderly transition.

We have also assembled a crew. Managing the transition to a low carbon economy is a global challenge that requires a global response. And so a coalition of the willing among central banks and supervisors have come together to form the [Network for Greening the Financial System](#) (NGFS).

In addition, and closer to home, we are working domestically with industry through the [Climate Financial Risk Forum](#) (CFRF) to build intellectual capacity and establish best practice in how to manage the financial risks from climate change.

What we are missing is the map. Getting us to our destination requires an understanding of what risks lurk in these deep waters and what future winds may buffet us, so we can make better decisions today. We need more data, greater disclosure, better analytical toolkits, advanced scenario analysis and new risk management techniques to help identify the hidden dangers on our journey. Of course there are opportunities potentially in front of us, too. Financing that orderly transition to a low carbon economy holds the promise of favourable tailwinds and smooth sailing.

But how do we begin to draw this map? Climate change is an unprecedented challenge and, I am sorry to say, there are no existing charts for us to follow.

We therefore need to start with the very basics - understanding how, and on what scale, climate change creates risks for the financial system.

How the financial risks from climate change affect the financial system

The financial risks from climate change manifest through two channels – physical risks and transition risks.

We can already hear distant thunder, but we must not wait for the storm to hit. We need to work together internationally and domestically, private sector and public sector, to achieve a smooth and orderly transition

Physical risks arise from damage to property, land and infrastructure from catastrophic weather-related events and broader climate trends such as heatwaves, hurricanes, droughts, floods and rising sea levels.

These are not just risks for the future. Inflation-adjusted insurance losses from these events have increased fivefold in [recent decades](#). And these physical risks affect banks and other financial institutions too. For example, according to [analysis by ClimateWise](#), the average annual loss on UK residential mortgages from flood risk is expected to more than double by 2050 in a 4 degree world. And smaller lenders with geographic concentrations would be more at risk. The risk to the safety and soundness of the firms we supervise is clear.

Transition risks arise from changes in climate policy, technology and market sentiment as we adjust to a lower-carbon economy. The need to transition is widespread, affecting not only energy companies but also transportation, infrastructure, agriculture, real estate to name just a few. The implied change in energy costs from the transition will have a significant effect on many businesses. And so banks that have provided loans to those companies and investors that own their securities may find themselves with unexpected losses.

The timing and form of transition is inherently uncertain. But here, too, [risks are already materialising](#). Tightening energy efficiency standards are affecting property markets. And credit risks associated with the low-carbon transition are already emerging in the automotive and energy sectors.

The distinctive nature of the risk

It is therefore clear to us at the Bank that climate change creates financial risks that are core to our mandates of safety and soundness and financial stability. But we have also been clear that the financial risks that climate change creates are distinctive and require a different approach if they are to be managed effectively.

First the risks are far-reaching in breadth and scope. They will affect all agents in the economy, in all sectors and across all geographies. Their impact will likely be correlated, and non-linear. They will therefore occur on a much greater scale than other risks.

Second, the risks are eminently foreseeable. I cannot tell you now exactly what will happen and when. But I can say with a high degree of certainty that some combination of physical and transition risk will materialise at some point in the future. Uncertainty about what will happen cannot lead to inaction and inertia. Rather we must develop different ways of managing the risk.

Third - and for me this is key - the size of those future risks will be determined by the actions we take today. The carbon released today is creating the physical and transition risks of tomorrow. Climate change therefore represents the tragedy of the horizon: by the time it is clear that climate change is creating risks that we want to reduce, it may already be too late to act.

That need to act most obviously includes government through climate policy. But since the financial risks that climate change creates are to be managed in all future states of the world, it is incumbent upon financial firms, and central banks and supervisors, to act too.

Sizing the risk

How well placed are we to measure these far-reaching, foreseeable financial risks that require action today? To return to our metaphor of the storm – do we know if we are facing a near gale or a hurricane?

Studies show that average global incomes could be significantly reduced, perhaps by as much as one-quarter by the end of the century, if limited or no action is taken to reduce carbon emissions. Global averages of course mask

significant differences across regions and sectors. And most estimates are in my view conservative – particularly since the models are partial, heavily dependent on assumptions, and do not capture well the non-linearities that are a key feature of the most recent climate analysis.

The good news is that these risks can in principle be avoided. Let me be clear, the scale of transition is significant. But it need not create substantial costs across the global economy as a whole.

There will of course be winners and losers. Studies have focused on the impact from the transition on the financial system through ‘stranded assets’ that turn out to be worth less than expected, probably zero in the case of unburnable carbon. The estimated losses are large – \$1 trillion-\$4 trillion when considering fossil fuels alone, or up to \$20 trillion when looking at a broader range of sectors.

Even at the bottom ends of these ranges, losses represent a material share of global financial assets. A climate Minsky moment, where asset prices adjust quickly with negative feedback loops to growth, seems possible. That underlines why the financial system needs an early and orderly transition. And why we need to change course now.

The Bank of England’s response

Now we have established that the financial risks from climate change are significant and relevant to our objectives, what is the Bank of England doing about it?

We are of course considering the implications of climate change for our own operations, taking account of the financial risks from climate change whilst ensuring the purpose of our core operations as a central bank is preserved.

In our work with the financial system more broadly we are taking a two-pronged approach, tackling the issue top-down and bottom-up.

Bottom-up: supervisory expectations, CFRF, disclosure

The action, or lack of action, of individual institutions will be critical in determining whether climate-related risks are well managed.

To that end, today, and following several months of consultation, we became the first regulator in the world to publish supervisory expectations that set out how the banks and insurance companies we regulate need to develop an enhanced approach to [managing the financial risks](#) from climate change.

Our expectations cover governance, risk management, scenario analysis, and disclosure. They are designed to ensure firms take a strategic approach, led by the Board, and with clear accountability. The approach should be holistic, forward-looking, embedded in business-as-usual risk management but grounded in the long-term financial interests of the firm.

We have deliberately not been prescriptive in our expectations, recognising that our understanding of this risk is immature but that it needs action now. Over the next year or so, as tools and expertise develop, we will however embed more granular requirements into our policy, to bring industry in line with our evolving expectations.

To support this development of best practice, we have established the UK Climate Financial Risk Forum (CFRF), co-chaired by the Prudential Regulation Authority and the Financial Conduct Authority. The forum brings together a wide range of industry participants (banks, insurers, the LSE and asset managers) as well as regulators. We have

established four workstreams – disclosure, risk management, scenario analysis and innovation – each of which will help us put greater detail on our map.

The Bank supports the disclosure of climate risks by firms in line with standards set out by the [Task Force on Climate-related Financial Disclosures](#) (TCFD).

Disclosure by firms is critical if the financial system is to be able to weigh risks and direct investment accordingly. It is essential that that disclosure is forward-looking, speaking to future risks and opportunities and not just current emissions. Speaking personally, I cannot see that we will be able to disinvest our way to a low carbon economy. And we need to get to a position where we have a better basis for consistent comparisons across different firms.

Top-down - scenario analysis, BES, stress testing

Let me be clear this is just the start of our voyage. To be able to judge whether we are sufficiently well prepared for the future storms - to see whether a change in course or greater financial resilience is required - we need to look forwards not backwards, and we need to consider the position of the system as a whole.

Measuring these future risks from climate change to the economy and to the financial system is a complex task. A myriad of possible climate pathways – with different physical and transition effects – need to be translated into economic outcomes and financial risks looking ahead over many decades.

To simplify that challenge, we need to focus not on what will happen but what might happen. To do that we can use scenario analysis – data driven narratives that help anchor our assessments of risk. We might think of that as investigating a small number of different courses that we could follow, in order to determine which delivers the safest passage.

Using scenario analysis to paint a picture of the risks of continuing along the current climate trajectory creates a clear strategic imperative to act. Considering a scenario where our climate goals are met highlights the changes that will be needed to support a transition to a low carbon economy.

Both expose the customers, sectors and geographies that are vulnerable to physical and transition risks and therefore highlight the areas where action is required.

Analysis of a disorderly transition - with sudden, unanticipated and discontinuous effects, perhaps prompted by the greater occurrence of extreme weather events – will demonstrate greater risk. That should incentivise financial firms to seek to pull forward the transition so that they are ahead of and in control of it - directing their capital to those that are resilient and avoiding those that are not.

By taking different decisions today, participants in the financial system are able to minimise their future financial risks. But while necessary, that may not be sufficient to deliver a financial system that is resilient to the financial risks from climate change.

Instead, we need also to consider this risk at the level of the system. In particular, do the actions of individual institutions in aggregate deliver the smooth climate pathway that their individual plans assume? And if they do not, what further action is required? In this way we can begin to stress the resiliency of financial system to the risks from climate change.

To that end, the Financial Policy Committee and the Prudential Regulation Committee here at the Bank of England will consider including climate related factors in a future Biennial Exploratory Scenario. The PRA will also ask UK insurers, as part of its market-wide insurance stress tests this year, to consider how their businesses would be

affected in different physical and transition risk scenarios. And the NGFS plans to set out voluntary guidelines for how central banks can use scenario analysis to assess system-wide financial risks from climate change.

Scenario analysis thus bridges the gap between our top-down and bottom-up understanding of risk. That supports different actions by financial firms, central banks and supervisors today, and ensures that everyone is steering a safer course to avoid that otherwise impending storm.

Opportunities

My natural focus as a central banker is on the risks. But let me spend a brief moment on the opportunities.

The investment needs to [finance this transition](#) are significant – an estimated \$90 trillion (almost five times US GDP) by 2030. This presents substantial opportunities for the financial sector to develop new products and services to mainstream green finance.

To support that goal, we might well need to develop new standards and classifications to identify which economic activities contribute to the transition to a low-carbon economy. With buoys pointing the way, we will be better able to identify the investment and lending decisions that will support a smooth and orderly transition.

Conclusion

Where does this leave us? I set out at the beginning our need for a map to get us to our destination. And I have set out how we at the Bank of England have begun to draw that map and where further cartography is in train.

What I did not mention is that the economy and the financial system appear to me to be like super-tankers rather than high-speed catamarans in the America's Cup. To change course, therefore, we need early action, a sustained

effort and a recognition that it is better to be roughly right now not precisely right when it is too late. We can already hear distant thunder, but we must not wait for the storm to hit. We need to work together internationally and domestically, private sector and public sector, to achieve a smooth and orderly transition.

The window for that orderly transition is finite and closing. And our work to seize that opportunity could not be more important. Indeed it is not an overstatement to say that the future of our planet depends on it.

All hands on deck. ■

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