Steering through uncharted waters: monetary policy in the face of climate change

Opening Address at the Green Swan Conference 2024

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Check against delivery.

1 Introduction

Ladies and gentlemen,

Thank you very much for your kind introduction, and thanks to you and all your colleagues at the BIS (Bank for International Settlements) for hosting this event.

Dear colleagues, ladies and gentlemen,

I am delighted to have the opportunity to deliver the opening address at this important conference.

Climate change is not only a risk of tomorrow. Climate change is already reshaping our economies, our financial systems, and our societies today. Even our lives are at risk. The devastating floods in Spain are a recent example.[1]

According to the Copernicus Climate Change Service, this year will be the warmest year on record. It will also be the first year in which global temperatures will be more than 1.5 degrees Celsius above pre-industrial levels.[2] Global CO_2 emissions still remain stubbornly high.[3] So far, mitigation measures have been insufficient. Current global political trends suggest that this situation may persist.

This week, global clean energy stock indices plummeted after the US (United States) elections, while the global oil and gas stocks were on the rise. As global warming continues unmitigated, we can expect more climate-related risks to materialise. We are headed towards uncharted waters.

This situation is associated with major uncertainties and entails multiple challenges for central banks and supervisors. Both climate change and the green transition will have macroeconomic impacts. These, in turn, will have implications for our work. Therefore, it is crucial to further deepen our understanding of these effects and evaluate what they mean for monetary policy.

2 Physical impacts of climate change

First, consider physical risks resulting from climate change. Without substantial climate change mitigation these risks will increase. This scenario has now become likelier. We are already seeing the acute physical impacts that stem from extreme weather events such as hurricanes, droughts and floods. Just a month ago, Hurricane Milton left a path of destruction across Florida. The damage is likely to exceed $50 billion.[4]

Over the last twenty years, annual property damage from natural disasters has more than doubled in real terms. Last year alone, the global financial damage from extreme weather events amounted to $280 billion, according to Swiss Re.[5] When we account for the second-round effects, the total impact on the global economy is much larger.

A recent report by the Network for Greening the Financial System (NGFS (Network for Greening the Financial System)) – the global coalition of central banks and supervisors – explores these complex macroeconomic effects. It illustrates how climate-related disasters can affect the economy by influencing supply, demand, and financial flows.[6] Extreme weather events cause significant damage to infrastructure and production sites. Besides the physical threats, people can lose their home or their job, with consequences for their wealth and their income.

Extreme weather events can also affect prices. For instance, droughts or floods can lead to drops in agricultural production and increases in food prices. Such effects are particularly pronounced in developing economies that rely heavily on agriculture. The devastating floods that hit Pakistan in 2022, for example, affected 33 million people and drove up food prices.[7] Overall, the direction of price effects depends on the balance between supply-side effects and the reduction in demand.

The economic impact of extreme weather events can also be aggravated through financial channels. For instance, banks might tighten their credit conditions or be less willing or able to lend money in response to a worsened economic outlook.

Physical risks also arise from long-term shifts in climate patterns, such as rising temperatures. In this context, let me highlight another recent set of publications by the NGFS (Network for Greening the Financial System).[8] Earlier this week, we published an update of our long-term climate scenarios. In particular, this update employs a new damage function that better captures the economic effects of rising global temperatures.

It shows that global estimated GDP (gross domestic product) losses from rising temperatures by 2050 could be up to four times higher than previously expected.[9] Estimates of climate damage could even increase further in future scenario updates. Looking ahead, the NGFS (Network for Greening the Financial System) is working to better integrate sea level rises and other complexities of climate change, such as climate tipping points, into the scenarios.

Our planet is on the verge of crossing multiple tipping points, which will move us even further into uncharted waters. Earlier this year, the NGFS (Network for Greening the Financial System) published a case study that zoomed in on the Amazon rainforest.[10] Over 30 million people depend directly or indirectly on the Amazon for their livelihood.[11] Droughts and deforestation have pushed this globally important ecosystem closer to collapse. If these trends continue, tipping points in the Amazon could already be exceeded in the short to medium term.

Such a tipping event could further destabilise the climate system and put pressure on other ecosystems across the globe. These compounding effects across ecosystems would lead to more economic damage worldwide.[12] The world is running out of time. But the way ahead is more uncertain than ever.

3 Impacts of the green transition

Central banks must also pay attention to the macroeconomic effects that can result from the green transition. Another recent report by the NGFS (Network for Greening the Financial System) looks at these impacts.[13] It delves into three main drivers of the green transition: mitigation policies, such as carbon pricing, green subsidies, and regulation, innovation in green technologies, and changing consumer and business preferences.

The green transition will induce substantial structural changes within economies. These shifts will have profound consequences for households, businesses and financial markets. In the financial sector, new patterns of capital flows might emerge – away from carbon-intensive businesses, and towards low-carbon ones. Such changes in investment flows could lead to asset revaluations and stranded assets.

In the real economy, carbon pricing and regulation increase the cost of using carbon-intensive inputs. These policies create incentives to adopt technologies that are climate-friendly, but more expensive. Rising costs have an adverse effect on economic activity.

However, at the same time, green investment demand, innovation and the redistribution of carbon revenues can reduce the negative supply-side effect. Especially in the short run, upward pressures on prices are possible. But in the medium to long term, as economies decarbonise and innovation lowers the cost of reducing carbon emissions, these inflationary pressures should ease.

Overall, the size and nature of the economic impacts will vary across countries and depend on the policy mix adopted. For example, the carbon intensity and the income level of each country will also affect how their economies respond. Regarding the policy mix, we are already seeing that, to spur the green transition, some countries are using subsidies while others are relying more on carbon pricing.

Moreover, the NGFS (Network for Greening the Financial System) scenarios show that delaying policy action and a lack of international coordination increase the cost of mitigating climate change.[14] Central banks must understand the complex macroeconomic effects of the green transition to tailor monetary policy responses.

4 Implications for central banks and monetary policy

The implications of climate change for central banks and monetary policy are profound and multifaceted. Monetary policy must adapt to these challenges and be prepared to manage the trade-offs associated with climate-related shocks.

Central banks have tended to look through short-lived supply-side effects caused by extreme weather events and climate policy, where inflation expectations remain well anchored. However, both physical and transition risks will intensify and the inflationary effects could get more pronounced. Then, looking through might become less of an option.

This could have important implications. Central banks may increasingly face situations in which they have to react to inflationary pressures in weak economic environments. Regarding the green transition, tightening financial conditions would imply higher financing costs for green investment. In the afternoon, we will have the chance to discuss how monetary policy affects the green transition in more detail.

Climate change also increases the uncertainties in which central banks operate. Going forward, central banks might have to expect increased climate-related volatility in inflation and output. According to the World Bank, carbon emissions are far from being priced at sufficiently high levels.[15] To meet the goals of the Paris Agreement, both coverage and price levels will need to rise rapidly.

But how this unfolds remains subject to uncertainty. More abrupt policy changes cannot be excluded, which could make the transition more disruptive and costly.

There is also uncertainty around the pace and effects of technological innovations. Take electric cars, for example. The shift from combustion engines to electric motors has caused disruptions in global automotive markets, with new players emerging.

So, where do we go from here? Central banks need to extend their horizon beyond the usual projection period and consider new sources of uncertainty. And we must communicate our strategies and rationales transparently to the public and financial markets. Effective communication can help to anchor inflation expectations, reduce uncertainty, and build confidence in our ability to navigate climate-related challenges.

Moreover, to understand the macroeconomic impacts of climate change and the transition, central banks and scientists must continue to develop and refine their analytical toolkits. As more data come in, we should use them to improve our understanding of climate risks. To support central banks on this journey, the NGFS (Network for Greening the Financial System) recently published a “Climate macroeconomic modelling handbook”.[16] The handbook provides central banks with valuable guidance on incorporating climate-related risks into their economic models.

5 Conclusion

Let me conclude.

Climate change and the green transition are reshaping the macroeconomic environment in which central banks operate. They add to the host of challenges that we need to consider in our work. Navigating uncharted waters requires proper equipment. We have already made some progress in understanding climate risks.

But the journey has just started. We must be aware of the limits of the analytical tools we have today for this purpose. A better understanding of climate risks will require more research, joining forces with academia and industry.

Moreover, uncharted waters are best navigated together. So, I cannot overstate the importance of international collaboration between all relevant stakeholders. This is why events like this one are so valuable.

Thank you for your attention, enjoy the conference.

Footnotes:

1. World Meteorological Organization (2024): Devastating rainfall hits Spain in yet another flood-related disaster *[https://wmo.int/media/news/devastating-rainfall-hits-spain-yet-another-flood-related-disaster]*, 31 October 2024.
2. Copernicus Climate Change Service (2024): 2024 virtually certain to be the warmest year and first year above 1.5°C *[https://climate.copernicus.eu/copernicus-2024-virtually-certain-be-warmest-year-and-first-year-above-15degc#:~:text=According%20to%20Samantha%20Burgess%2C%20Deputy,according%20to%20the%20ERA5%20dataset.]* , 7 November 2024.
3. United Nations Environment Programme (2024): Emissions Gap Report 2024 *[https://www.unep.org/resources/emissions-gap-report-2024]*, 24 October 2024.
4. Associated Press (2024): Helene and Milton are both likely to be $50 billion disasters, joining ranks of most costly storms *[https://apnews.com/article/helene-milton-hurricanes-climate-development-damage-costly-82c1d5df81c76fa08e035bf7c6db3a37]* , 16 October 2024.
5. Swiss Re Institute (2024): Natural catastrophes in 2023 *[https://www.swissre.com/institute/research/sigma-research/sigma-2024-01.html]*, 26 March 2024.
6. Network for Greening the Financial System (2024): Acute physical impacts from climate change and monetary policy *[https://www.ngfs.net/en/acute-physical-impacts-climate-change-and-monetary-policy]*, 29 August 2024.
7. World Bank (2022): Pakistan: Flood Damages and Economic Losses Over USD 30 billion and Reconstruction Needs Over USD 16 billion *[https://www.worldbank.org/en/news/press-release/2022/10/28/pakistan-flood-damages-and-economic-losses-over-usd-30-billion-and-reconstruction-needs-over-usd-16-billion-new-assessme]* , 28 October 2022.ftn_r
8. Network for Greening the Financial System (2024): NGFS climate scenarios for central banks and supervisors *[https://www.ngfs.net/en/ngfs-climate-scenarios-phase-v-2024]*, 5 November 2024.
9. Network for Greening the Financial System (2024): NGFS climate scenarios for central banks and supervisors *[https://www.ngfs.net/en/ngfs-climate-scenarios-phase-v-2024]*, 5 November 2024.
10. Network for Greening the Financial System (2024): Nature-related financial risks: a conceptual framework to guide action by central banks and supervisors *[https://www.ngfs.net/sites/default/files/medias/documents/ngfs-conceptual-framework-nature-risks.pdf]*, 2 July 2024.
11. World Bank (2021): The Economic Case for Nature *[https://openknowledge.worldbank.org/server/api/core/bitstreams/9f0d9a3a-83ca-5c96-bd59-9b16f4e936d8/content]*, 30 June 2021.
12. Organisation for Economic Co-operation and Development (2022): Climate Tipping Points *[https://www.oecd-ilibrary.org/environment/climate-tipping-points_b2687465-en]*, 2 December 2022.
13. Network for Greening the Financial System (2024): The green transition and the macroeconomy: a monetary policy perspective*[https://www.ngfs.net/en/green-transition-and-macroeconomy-monetary-policy-perspective]*, 21 October 2024.
14. Network for Greening the Financial System (2024): NGFS climate scenarios for central banks and supervisors *[https://www.ngfs.net/en/ngfs-climate-scenarios-phase-v-2024]*, 5 November 2024.

15. World Bank (2024): State and Trends of Carbon Pricing *[https://openknowledge.worldbank.org/server/api/core/bitstreams/253e6cdd-9631-4db2-8cc5-1d013956de15/content]*, 21 May 2024.
16. Network for Greening the Financial System (2024): Climate macroeconomic modelling handbook *[https://www.ngfs.net/en/climate-macroeconomic-modelling-handbook]*, 24 October 2024.