



Joint Banca d'Italia - Bank of England research conference: The macro-financial impacts of climate change and the net-zero transition

19-20 October 2021 – Milan, Italy (hybrid)

Conference summary¹

Background:

On 19 and 20 October 2021, the Banca d'Italia and the Bank of England jointly held a research conference on the macro-financial impacts of climate change and the net-zero transition. Held ahead of the 26th [UN Climate Change Conference of the Parties \(COP26\)](#), the joint conference aimed to stimulate the discussion between policymakers at central banks and leading academics on the most pertinent economic and financial issues related to climate change and the transition to a net-zero emissions economy. The conference was structured into four sessions: the first three sessions focused on the research frontier in understanding the economic and financial impacts of climate change and the transition to a net-zero emissions economy. The fourth session was a panel discussion consisting of academics and policymakers.

Session summaries:

The **first day** of the conference provided a comprehensive background of how the climate is evolving, how its effects propagate through the economy and the potential macro-financial implications of the transition to net zero.

Andrew Bailey, Governor of the Bank of England, opened the conference by highlighting the progress central banks and supervisors have made over the last few years in responding to climate change, but also stressing that many unanswered questions remained. In particular, he noted that there was a need to: i) further integrate climate and macro modelling; ii) go beyond the aggregate impacts of climate risk to understand distributional implications; and iii) assess how the transition to net-zero might impact the demand and supply sides of the economy. He closed with a call to action for policymakers and academia to collaborate in understanding the risks, in developing analytical capabilities, and in formulating solutions to the challenges posed by climate risks. He expressed his wish for this research conference to help lay the groundwork for ambitious commitment underpinned by decisive and credible action at COP26.

Sarah Breeden (Bank of England) launched the Network for Greening the Financial System's (NGFS) new report "[Scenarios in Action: A progress report on global supervisory and central bank climate scenario exercises](#)" and presented its key messages. The report sets out how NGFS members, to date, have been using climate scenarios to identify and assess climate risks in their economies and financial systems. Sarah underscored that the results from various climate scenario exercises will complement each other and will gradually rise to a multi-faceted and global picture of the risk from climate change. She also highlighted that the NGFS plans to expand its scenarios, particularly in terms of sectoral granularity and physical risk.

Session 1 was on 'Climate change and the economy', and was chaired by **Sarah Breeden** (Bank of England) and **Glenn Rudebusch** (Federal Reserve Bank of San Francisco). It focused on the economic risks associated with climate change. The direct economic risks from climate change are multifaceted, **Geoffrey Heal** (Columbia) explained, including not only the effects on physical capital,

¹ Prepared by the Organising Committee: Thomas Viegas, Theresa Löber and Edo Schets (Bank of England); Filippo Natoli, Ivan Faiella and Enrico Bernardini (Banca d'Italia).

but also the spread of new diseases, social discontent due to impoverishment of certain geographies and related psychological effects, and the loss of biodiversity - for example of pollinating species serving agriculture.

Historical data could be used to show evidence of the potential impacts of climate change on economic activity. **Solomon Hsiang** (UC Berkeley) and **Tatyana Deryugina** (University of Illinois, Urbana Champaign) explained that extremely hot days reduce households' income and firms' output, even in urban areas and in non-agricultural sectors. Temperatures negatively affect labor supply and productivity, particularly in jobs that require spending time outdoors. Based on current projections, in the long run, temperatures will continue to weigh on workers, even in the United States, despite a gradual adaptation of the economy to the evolving climate. Natural disasters such as hurricanes or floods, which have catalysed huge amounts of public resources in the past, will become more frequent and intense due to climate change seriously impairing the local communities' ability to thrive. Mitigating these potential climatic trends ultimately requires a decarbonization of the real economy. Substituting fossil fuels with renewables for power generation, transportation and heating requires huge investments and technological breakthroughs.

A key risk related to the transition to net-zero emissions concerns domestic energy security: wind and solar sources are intermittent and not uniformly distributed within countries, so mechanisms to balance these non-dispatchable sources (e.g. scaling up energy storage) will be needed and evaluating how much this will cost is, at present, challenging. The net-zero transition can also have distributional consequences, as policies to reduce emissions may cause a collapse in trade of fossil fuels among countries. In this scenario, as **Pablo Salas Bravo** (University of Cambridge) explained, fossil fuel importers have incentives to decarbonize faster than exporters, while the most severe implications are suffered by less competitive producers bearing the highest costs of fuel extraction.

Session 2 on 'Climate change, asset prices and the financial sector' was chaired by **Sabine Mauderer** (Deutsche Bundesbank). It discussed how the financial sector was not immune from the implications of an evolving climate, and explored how intermediaries see the risks related to climate change and how these are priced into asset prices. **Zacharias Sautner** (Frankfurt School of Finance and Management) presented survey evidence suggesting that large intermediaries have pessimistic expectations about the evolution of temperatures and, while they have serious reputational concerns, active climate risk management is still limited.

According to **Stefano Giglio** (Yale School of Management), home prices in some coastal areas of the United States embed a premium to compensate for the risk of inundation due to sea level rises; other types of risk, such as the risk of stranded assets, are also found to be priced in certain securities. However, information on climate-related risks and opportunities of financial investments is still incomplete and sometimes incoherent, notably regarding ESG scores provided by market operators.

The **second day** of the conference, introduced by **Filippo Natoli** (Banca d'Italia), explored the interaction between climate change and the economy from a policy perspective.

Session 3 on 'Climate policies' was chaired by **Ivan Faiella** (Banca d'Italia). It discussed challenges and potential effects of net-zero policies. **Elmar Kriegler** (University of Potsdam) highlighted that, to avoid abrupt shifts in investment flows and prices of goods and services, emission reduction measures should mainly target fossil fuels companies and the manufacturing industry; public policies are also needed to support the development of bioenergy and carbon capture and storage technologies.



As **Carolyn Fischer** (University of Ottawa) showed, carbon pricing and the coverage of carbon-reducing measures at global level are at present too low, while subsidies for fossil fuel sectors are still in place. Concerns to extend carbon pricing are related to carbon leakage, the interaction with other tax policies and to distributional concerns, among others, but well-designed tax rebates can amplify incentives to switch to clean energy. Technological progress is essential to addressing climate change but, as **Lint Barrage** (University of Santa Barbara) noted, incentives for such innovation are grossly insufficient: across advanced economies, 'green' innovation has actually declined over the past decade. Low fossil fuel prices made market incentives poor, so public subsidies are needed to support green innovation.

Regarding monetary policy, **Monika Piazzesi** (Stanford University) argued that the "market neutrality" principle, which has historically been pursued by central banks within their asset purchase programs, does not always coincide with carbon neutrality. An analysis of the pool of corporate bonds bought by the European Central Bank during its Corporate Bond Purchase Program reveals that purchases were disproportionately high in "dirty" sectors and low in "greener" ones.

Session 4 was a panel session 'From Venice to Glasgow: High-level panel on net-zero policies and finance' chaired by **Ignazio Visco**, Governor of Banca d'Italia, in which policymakers at central banks and international financial institutions discussed with academics how research findings can support policy actions. Panelists were **Gita Gopinath** (International Monetary Fund), **Michael Greenstone** (University of Chicago), **Klaas Knot** (President of the De Nederlandsche Bank and Vice Chair of the Financial Stability Board), **Nicholas Stern** (London School of Economics and Political Science).

The key takeaways from the discussion included:

- First, evaluating the social cost of carbon in an effective way is ultimately critical to guide climate policies.
- Second, setting an appropriate price on carbon is not enough if market failures and lack of investment are not addressed through fiscal measures. For central banks, there is a need to understand how such a set of policies might affect the relative price of goods and services and inflation, which has implications for the economic outlook and thereby monetary policy.
- Third, increasing private finance for the transition is crucial, and globally harmonised disclosure and taxonomies will play key roles.
- Fourth, technology transfers across countries are important to ensure emerging and developing countries are not left behind.
- Fifth, as climate change and biodiversity loss can have important feedback loops, analysis on the implications of nature-related financial risks should be undertaken to complement the understanding of climate-related financial risks.

Closing the conference, **Ignazio Visco**, Governor of Banca d'Italia, underlined that, as the economic and financial risks posed by climate change are substantial, there is a need for more information to develop analytical tools to integrate climate scenarios into macro-economic analysis and financial modelling. He stressed that a unitary view across institutions and economies on what needs to be done to combat climate change is emerging, and that the decarbonization process should be pushed forward in a coordinated, transparent and decisive way.