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Digest

Monetary policy and physical risks - some recent insights

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The current surge in energy prices has put into sharper focus the potential risks to price stability arising from the transition to carbon zero. The way in which climate-related physical risks may affect price stability has received less attention, not least because impacts are viewed as being more distant, in the latter half of this century. Yet some recent preliminary research suggests policymakers should also factor physical risks into their policy framework. In particular, the research highlights the need for careful thought surrounding the size and nature of the shock, and what the implications may be for available policy space.

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**The views expressed here are those of the writer and not necessarily those of the European Central Bank.*

The impact from acute physical risks on output in advanced economies

Hee Soo Kim et al. (2021), in their working paper "Severe Weather and the Macroeconomy," provide some evidence that this impact may be increasing. They study how climate extremes affect the US economy over the course of six decades. While the impact is indeed muted in the first half of their sample, more prominent extremes in recent decades have had a more marked impact, lowering the growth rate of industrial production for up to 20 months.

William Ginn (2021), in "Climate Disasters and the Macroeconomy: Does State-Dependence Matter? Evidence for the US," also considers the impact of disasters on the US economy, but investigates whether the impact changes depending on the state of the business cycle when the event takes place. He finds that the impact is greater during expansionary phases, in part through raising economic uncertainty, which tends to dampen output.

Climate-related disasters: demand or supply shocks?

Previous research has highlighted that these events can have some elements that look like negative supply shocks – reducing output, but increasing inflation – and some that appear more like negative demand shocks – pushing down both output and prices at the same time. ***Negative supply shocks pose a dilemma for central banks****, since reacting to the inflationary impact can worsen the negative impact on demand, whereas negative demand shocks can be more easily combated through more accommodative policy.*

Matteo Ciccarelli and Fulvia Marotta (2021), in "Demand or supply? An empirical exploration of the effects of climate change on the macroeconomy," study the impact of physical and transition risks on a panel of 24 OECD countries. They find that physical risks have a meaningful and durable impact on output and inflation, and this typically manifests similar to a negative demand shock – depressing both activity and prices.

Donata Faccia et al. (2021), in "Feeling the heat: extreme temperatures and price stability," study the impact of extreme temperature events on prices for a range of advanced and emerging economies. They find that only summer heatwaves have a durable impact on prices. In the short run, these events tend to drive up food prices, particularly in EMEs, but in the medium term there is a negative impact on other prices as well, potentially reflecting a longer-lasting negative demand shock. For advanced economies, particularly hot events can result in lower consumer prices over the medium term.

Does climate change reduce central banks' policy space?

The ability of central banks to combat negative demand shocks depends on the ***available policy space****, which has been constrained recently by low equilibrium interest rates. Some recent research has focused on whether climate change may influence equilibrium rates over the longer term, and therefore affect the available policy space.*

Alexander M. Dietrich et al. (2021), in "The Expectations Channel of Climate Change: Implications for Monetary Policy," study the impact of expectations that climate change will increase the incidence of rare disasters in the future, using a New Keynesian model. They find that the disaster expectations channel can depress the natural interest rate by around 65 basis points, and can have a recessionary impact, particularly if the natural rate is already low. **Alessandro Cantelmo** (2020), in "Rare disasters, the natural interest rate and monetary policy," similarly finds that an ex ante increase in disaster frequency, as predicted by climate scenarios, depresses equilibrium interest rates.

Finally, **Ghassane Benmir et al.** (2020), in "Green Asset Pricing," look at the impact of climate change through the lens of asset pricing. They find that the environmental externality of carbon emissions can lower equilibrium rates by increasing risk aversion. Their model suggests that a pro-cyclical carbon tax could reduce risk aversion and help limit the impact on monetary policy space.

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