Assessing the impact of climate risks on the financial system

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In the wake of 2015 Climate Paris Agreements to limit global temperature below 2°C above pre-industrial levels, many governmental and private stakeholders have advocated for the introduction of policies

to mitigate climate change. This would affect directly only the fossil-fuel and utility sector, but it would also expose indirectly many other economic sectors, in particular the energy-intensive sectors. The financial system can be affected due to its exposure to firms in the form of equity shares, bonds holdings and loans. However, the impact of climate policies on the financial system has remained unclear so far.

A stress-test to assess climate risks of investments portfolios

An international team of researchers lead by Stefano Battiston, Professor at the Department of Finance of the University of Zurich, has developed a novel network-based climate stress-test methodology to assess climate risks of investments portfolios, conditional to policy scenarios. "Our method allows to extend familiar financial statistics of risk for individual institutions, such as the Value at Risk, to account for the risks deriving from climate change and climate policies both through direct and indirect exposures across the network of financial contracts," says Battiston.

The analysis was based on microlevel data on equity holdings of all EU and US listed companies held by individual financial investors, on balance-sheet data for the top 50 listed European banks, and on financial exposures at the sectoral level.

Small exposure of top EU banks, but large combined effect on pension funds

The researchers found that exposures of all financial investors' types to the fossil sector on their equity portfolios are limited (i.e. 4%-13%). In particular, the direct exposure of the top EU banks to the fossil-fuel and utility sectors is small (i.e. a Value at Risk on average of 1% of banks'

capital and a maximal loss of about 7% of capital across banks), even when taking into account amplifications through the network of interbank obligations. "The direct effect of climate policies on the fossil-fuels and utilities sectors is unlikely to cause banks' defaults nor systemic domino-effects in the financial system. Therefore, EU banks should not fear the introduction of climate policies", adds Battiston.

In contrast, combined exposures of financial investors' equity portfolio to the climate-policy relevant sectors is large (i.e. 45%-47% across types). Moreover, exposures of financial investors to each other also matter because they amplify risk. In particular pension funds hold indirect exposures through their holdings in investment funds.

Prompt and stable climate policies do not imply systemic risk

In the context of the policy discussion around the guidelines from the G20's Financial Stability Board Task Force on Climate-related Financial Disclosure, the results suggest that the disclosure of climate-relevant financial information is necessary to improve risk estimations and create the right incentives for investors. However, because combined exposures are large, better disclosure may not be sufficient to mitigate risk. What matters is the timing and credibility of the implementation of climate policies. Stefano Battiston concludes: "An early and stable policy framework would allow for a smoother adjustment of asset prices and for the emergence of net winners and losers in the transition to a low-carbon economy."

More information: Stefano Battiston et al. A climate stress-test of the financial system, *Nature Climate Change* (2017). DOI: 10.1038/nclimate3255

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