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Climate Change Threatens the Stability of the Financial System

By Gregg Gelzinis and Graham Steele November 21, 2019

According to the Intergovernmental Panel on Climate Change (IPCC), humans have already caused the planet to warm by 1 degree Celsius above preindustrial levels.[1] Catastrophic floods, droughts, wildfires, and storms are becoming all-too-regular occurrences, and there is overwhelming scientific evidence that paints a clear and devastating picture of the changing climate.[2] Under current projections, the overall social, environmental, and economic impacts of climate change could rise to catastrophic levels.[3] One estimate suggests that if temperatures rise to 4 degrees Celsius above preindustrial levels over the next 80 years, global economic losses could mount to $23 trillion per year—permanent damage that would far eclipse the scale of the 2007-2008 financial crisis.[4] The speed and magnitude of actions taken to limit carbon emissions will determine how much these impacts can be mitigated over the coming decades.

This is an all-hands-on-deck moment. It is incumbent on policymakers across the issue spectrum—from energy and tax policy to infrastructure and financial services—to mitigate the impacts of climate change and facilitate a timely transition to the U.N. goal of net-zero greenhouse gas emissions by 2050 using the respective tools available under their jurisdictions.[5] This issue brief focuses on financial regulators, who have so far ignored the clear systemic risk that climate change poses to financial institutions and markets. It's time for regulators to take decisive steps to ensure that the financial system can withstand climate-related shocks. In particular, the Federal Reserve Board and the Financial Stability Oversight Council (FSOC) have the statutory mandates and tools necessary to coordinate the integration of climate-related risks into the financial supervisory and regulatory frameworks.

This brief outlines why climate change poses a threat to financial stability in the United States and details steps that regulators should take to integrate climate risk into their regulatory and supervisory frameworks.

Why climate risk threatens financial stability

Climate change is a systemic risk to the financial sector that warrants the heightened scrutiny and enhanced mitigation efforts of regulators. In the financial system, systemic risks are risks that have the potential to destabilize the normal functioning of the system and lead to serious negative consequences for the real economy. At least two[6] categories of climate-related risks rise to this threshold: 1) the physical risks associated with more frequent severe weather events and lasting environmental changes and 2) the transition risks posed by the policy and technological changes necessary to achieve a greener economy. Such changes could strand carbon-intensive assets and affect the value of other financial instruments.[7] The immense magnitude of estimated losses due to physical and transition risks, along with the potentially rapid nature of those losses, could have a severe impact on systemically important financial institutions and broader financial markets.[8]

Importantly, financial institutions not only are exposed to the physical and transition risks of climate change, but they are also actively exacerbating those risks by continuing to provide substantial financing to activities that intensify climate change. The six largest Wall Street banks in the United States committed more than $700 billion toward fossil fuel financing from 2016 to 2018.[9] The largest insurers held $528 billion in fossil fuel investments, according to a 2016 survey, and the biggest asset managers have increased their holdings of assets tied to carbon-intensive industries by 20 percent over the last three years.[10]

Physical risks

The increase in frequency and severity of damaging floods, droughts, fires, and hurricanes, as well as encroaching sea level rise, can lead to destabilizing losses for insurance companies, banks, and other financial intermediaries with direct and indirect exposure to different affected industries and assets.[11] Stress at a large, complex, and interconnected financial institution—a firm that is systemically important—or correlated stress across smaller firms all exposed to the same risks could transmit stress throughout the financial system. From 2016 through 2018, the United States experienced 45 natural disasters that each caused at least $1 billion in losses.[12] Over the same time period, the average annual economic losses from natural disasters totaled about $150 billion.[13] This represents a substantial increase in terms of both severity and frequency relative to past decades.[14] From 1980 through 2019, there were, on average, six natural disasters per year that caused more than $1 billion in damage, and the total average annual losses from natural disasters was a little less than $50 billion.[15]

Insurance companies are the financial intermediaries most directly exposed to the physical risks of climate change, at least in the near term, due to the fact that their main business line requires them to guarantee losses on physical assets and property. These firms are working to adjust their loss models and underwriting practices in

the face of a changing climate and severe weather trends, as historical datasets are proving to be less useful predictors of future underwriting losses.[16] This leaves the industry vulnerable to large-scale losses from one or a combination of natural disasters that were thought to be nearly impossible or were not contemplated at all. The example of Hurricane Andrew provides a cautionary tale.[17] In 1992, the Category 5 storm devastated South Florida, inflicting $15.5 billion of insured damage and causing at least 16 insurance companies to fail.[18] At the time, insurers relied on primitive risk assessment and pricing methods for catastrophe risk[19] that did not anticipate a storm of Andrew's magnitude and left insurers vulnerable. Shifting severe weather trends—and the lack of reliable historical data as an accurate predictor of future climate events—means that insurers today may be similarly vulnerable to an unforeseen climate change-driven event.[20]

None of the insurers that failed as a result of Hurricane Andrew were large, complex, and interconnected financial conglomerates. Since the 1990s, however, certain global insurance firms have become deeply interconnected intermediaries in the broader financial system. In 2016, the international Financial Stability Board listed nine insurance companies as global systemically important insurers.[21] Of those nine, three were U.S. companies.[22] Stress at a major insurance company due to an unexpected climate shock could be transmitted to banks and other nonbank financial companies that serve as creditors or counterparties to the failing insurance company. The FSOC, a post-financial crisis body of financial regulators chaired by the treasury secretary and tasked with identifying and mitigating threats to financial stability, refers to this avenue for systemic risk transmission as the exposure channel.[23]

Moreover, in the face of potentially staggering losses, insurers may be forced to sell off illiquid assets at fire-sale prices to generate enough cash to pay unprecedented claims or to otherwise meet the cash demands of creditors and counterparties trying to reduce their exposure to the troubled firm. This fire-sale dynamic could push down asset prices, affecting financial firms that hold similar assets and raising the cost of funding for firms that rely on those markets. The FSOC refers to this risk transmission channel as the asset liquidation channel.[24]

The core banking system is also directly exposed to the physical risks of climate change. In varying parts of the country, mortgage, commercial real estate, business, and agricultural loans—as well as derivative instruments tied to these markets—are susceptible to losses related to severe weather events and other environmental changes. For example, the increase in the brutality and frequency of hurricanes, droughts, floods, fires, and other environmental shifts could decrease the value of damaged assets and put a strain on borrowers' ability to repay lenders—leading to increased levels of default and losses on these credit portfolios.[25] If sea levels rise by 6 feet by 2100, as has been estimated, about $900 billion worth of U.S. homes would be literally—and in turn financially—underwater.[26] This includes more than half of the housing stock for almost 300 cities.[27] *The Economist*'s Intelligence Unit estimates

that the current value of direct private investor losses globally due to the physical risks of climate change is between $4.2 trillion and $13.8 trillion, depending on the warming scenario.[28] Moreover, if insurance companies choose to pull out of certain geographies and business lines, banks and other financial intermediaries could see their exposure to physical risks increase even further. Banks under financial duress from higher-than-expected losses could transmit stress through both the asset liquidation and exposure transmission channels.

Banks and other financial institutions are also indirectly exposed to these physical risks. Severe weather events and environmental changes can lead to second-order economic disruptions in local or regional economies, beyond the direct negative impact on the value of assets that the event affects. Research shows that severe natural disasters lead to outmigration, lower housing prices, and higher poverty rates in affected communities.[29] Moreover, some evidence indicates that economic output is generally stronger in cooler years compared with hotter years[30]—and recent years have been hotter, on average.[31] Worsening economic conditions in affected communities could lead to higher-than-expected losses on banks' and other financial intermediaries' credit portfolios.

Transition risks

Beyond these physical risks, the financial system could be destabilized by potentially rapid losses to carbon-intensive assets caused by the urgently needed transition to a greener economy.[32] If policymakers took the required action to decarbonize the economy, or if technological developments made that transition financially attractive, carbon-sensitive assets tied to the utilities, energy, transportation, industrial, and other sectors could lose value. Such action or innovation could increase the price of carbon drastically, stranding certain fossil fuel assets and decreasing the value of other assets exposed to the price of carbon. One estimate that takes a broad view of stranded assets—not only of those directly in the fossil fuel sector—puts the present value of potential losses at $18 trillion.[33] Columbia University history professor Adam Tooze estimates that as much as one-third of all equity and fixed income assets are tied to carbon-sensitive industries.[34]

The revaluation of these assets would place losses on the investors and financial intermediaries holding them. A price shock could ripple across the financial system as firms and investors offload assets at fire-sale prices; creditors run from firms particularly exposed to the revaluation pressures; and stressed firms fail to pay back creditors or derivatives counterparties—transmitting stress through both the asset liquidation and exposure transmission channels.[35] Losses could cascade throughout the financial system, creating instability and leading to severe knock-on effects to the real economy. Bank of England Governor Mark Carney has described this type of scenario as a "climate Minsky moment,"[36] a sudden drop in asset prices triggered by the bursting of the carbon-price bubble—precipitating broader financial instability.

It's possible that the transition could occur gradually with little disruption in financial markets; financial firms and investors could encourage this by pricing in the effects of a shift to a greener economy seamlessly over time and adjusting their risk management frameworks and models accordingly. Although they might experience some inevitable losses on certain assets that are highly sensitive to the price of carbon, they could also take advantage of new opportunities to finance green industries. But regulators shouldn't bet that this optimistic outcome will occur without their intervention.[37] It's regulators' job to guard against worst-case scenarios—so-called tail risks—so that workers, families, and taxpayers don't bear the burden of regulators' lack of imagination. In fact, the longer policymakers wait to address climate change head-on, the more likely a rapid greening of the economy, and a disorderly revaluation of carbon-sensitive assets, becomes. Taking significant steps to protect the financial system from the risks of climate change would facilitate a smooth transition, limit the chances of a climate-driven financial crisis, and prevent climate skeptics from using potential financial disruptions as an excuse to oppose the rigorous policies necessary to achieve net-zero emissions by 2050.

Financial regulators must act

Financial regulatory safeguards are supposed to limit both the chances and severity of destabilizing crises by bolstering the resilience of the financial system. It's time for policymakers to take decisive regulatory and supervisory steps to ensure that the U.S. financial system is prepared to safely handle the physical and transition risks posed by climate change. Mitigating the financial stability impact of a rapid transition may also increase the likelihood that policymakers take the necessary transition steps in the first place.

The United States is trailing the rest of the world

In 2017, eight central banks established the Network for Greening the Financial System (NGFS). This international group of central banks and financial regulators works to integrate the risks of climate change into their respective supervisory and regulatory regimes, recognizing, "Climate-related risks are a source of financial risk and it therefore falls squarely within the mandates of central banks and supervisors to ensure the financial system is resilient to these risks."[38] The number of members in the NGFS now stands at 48. The countries where these central banks and regulators are located constitute 44 percent of global gross domestic product and 45 percent of global greenhouse gas emissions, and they supervise two-thirds of the world's systemically important banks and nonbank financial companies.[39]

The Federal Reserve and other U.S. federal financial regulators are notably absent from this group and—except for a few individual agency officials—have failed to even consider conducting similar work.[40] Responding to a letter from Sen. Brian Schatz (D-HI) that asked about the Fed's regulatory and supervisory integration

of climate-related risks, Federal Reserve Chair Jerome Powell wrote that the Fed only focuses on preparing financial firms for severe weather events.[41] He noted that "addressing climate change is a responsibility that Congress has entrusted to other agencies."[42] This response is inadequate and leaves much to be desired in terms of thoroughly preparing firms for the increased frequency and severity of severe weather events; it ignores transition risks altogether. The FSOC has also sat on the sidelines, failing to identify climate change as a systemic risk or coordinate a regulatory response to address it.

Potential regulatory actions

There are several concrete steps that the Fed, the FSOC, and other federal regulators should take to mitigate climate-related risks to financial stability and protect the economy from the potentially destructive consequences of a climate shock.[43] Many of the following actions have been recommended by the NGFS, and countries are at various stages of developing these climate-focused changes to their regulatory regimes.[44]

Regulators should take a series of easy, but meaningful, steps immediately. At a bare minimum, the Federal Reserve should join the NGFS and look to contribute to international efforts on this front. Regulators should also immediately seek to address data and modeling gaps to better map the physical and transition risks of climate change.[45] To that end, the FSOC should direct the U.S. Department of the Treasury's Office of Financial Research to coordinate with member agencies on increasing interagency resources devoted to analyzing climate-related threats to the financial system. Furthermore, the Securities and Exchange Commission (SEC) should require public companies to disclose information on the risks that climate change poses to their businesses. Sen. Elizabeth Warren (D-MA) and Rep. Sean Casten (D-IL) introduced legislation that would require the SEC to take this action, but the SEC has the authority to implement it on its own.[46] Investors need reliable, comparable information to accurately price climate risk and help limit the chances of a future climate-driven disorderly revaluation in financial markets.

Once regulators take these baseline steps, they should work to deeply integrate climate change into the regulatory and supervisory framework. For example, regulators should use their financial stability authority under Section 165 of the Dodd-Frank Act to implement the climate-focused macroprudential legislation recently introduced by Sen. Schatz. The bill would direct the Fed to create climate change stress tests for the largest financial institutions in the country.[47] The Fed's current stress tests measure how firms would fare in a simulated macroeconomic downturn.[48] The climate stress tests that this legislation envisions would probe the impacts of various adverse climate scenarios, considering both physical and transition risks on financial institutions. The bill would require the Fed to work with climate scientists and environmental economists to design and model the potential economic impact of the climate scenarios. Firms would be required to incorporate a focus on climate risk into their capital planning processes, internal controls, and governance structures

to prepare for and safely manage a climate shock. If firms failed to demonstrate a credible plan to stay above minimum capital levels following the simulated climate shocks, or if they otherwise failed to meet the qualitative standards regarding capital planning, the Fed could restrict firms' capital distributions to shareholders. The Bank of England, the Dutch National Bank, the European Systemic Risk Board, the NGFS, and others have all begun to develop climate change-oriented stress tests, either on a stand-alone basis or incorporated into existing stress-test regimes. The bill would also create a climate change subcommittee at the FSOC and direct the FSOC to issue a report on the threats that climate change poses to financial stability—both provisions that the FSOC could implement under its existing authorities.

Regulators should also seek to integrate climate risk into other aspects of the supervisory and regulatory framework. Enhanced supervisory expectations for climate preparedness, climate-focused risk management standards, and higher risk-weighted bank capital requirements for assets that are sensitive to the price of carbon are all worthy of regulators' consideration.[49]

The recommendations provided in this issue brief focus primarily on banks and systemically important nonbank financial institutions. However, other state and federal financial regulators should also consider the impacts of climate change and look to use their own tools for financial institutions within their jurisdictions.

Conclusion

Climate change is a threat to the stability of the financial system and falls squarely within the jurisdiction of financial regulators. They must wake up to this emerging systemic risk and take steps to bolster the resilience of financial institutions and markets. Waiting to act will only increase the likelihood of a climate shock destabilizing the financial system and severely affecting the broader economy. Workers, families, and taxpayers should not have to bear the burden later for regulators' failure to act today.

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