

**Hearing on  
“Addressing Climate as a Systemic Risk:  
The Need to Build Resilience within Our Banking and Financial System”  
Before the U.S. House of Representatives Committee on Financial Services  
Subcommittee on Consumer Protection and Financial Institutions**

**Wednesday, June 30, 2021**

**Prepared Statement**

**Hilary J. Allen  
Associate Professor  
American University Washington College of Law**

Chairman Perlmutter, Ranking Member Luetkemeyer, and Members of the Committee:

Thank you for inviting me to testify at today’s hearing. My name is Hilary Allen, and I am an Associate Professor at the American University Washington College of Law. I teach courses in corporate law and financial regulation, and my research focuses on financial stability regulation. I have authored numerous law review articles and a book about financial stability, which have (among other things) defined the concept, explored its precautionary and interdisciplinary nature, and considered the financial regulatory architecture needed to promote financial stability.

Prior to entering academia, I spent seven years working in the financial services groups of prominent law firms in London, Sydney and New York. In 2010, I worked with the Financial Crisis Inquiry Commission, which was appointed by Congress to study the causes of the financial crisis of 2007-2008.

I am not testifying on behalf of the Washington College of Law or any other institution; the views expressed here are entirely my own.

**Table of Contents**

<b>1. Executive Summary .....</b>	<b>2</b>
<b>2. Financial stability as a regulatory goal .....</b>	<b>3</b>
<b>3. A precautionary approach to financial stability regulation.....</b>	<b>3</b>
<b>4. Climate-related threats to financial stability.....</b>	<b>6</b>
<b>5. Regulatory responses .....</b>	<b>9</b>
<b>6. FSOC coordination .....</b>	<b>13</b>
<b>7. Interdisciplinary expertise and the Office of Financial Research .....</b>	<b>16</b>
<b>8. Summary of action plan .....</b>	<b>18</b>

## 1. Executive Summary

Tackling climate-related threats to financial stability will require a coordinated and interdisciplinary approach from our financial regulatory agencies. In this statement, I propose a number of reforms to this end (these reforms are summarized on pages 18-20), but before diving into their technical details, it's important to recognize the stakes of the problem at hand. The economic and social impacts of financial crises can be irreversible and catastrophic, particularly for the most vulnerable members of society (who are also more likely to be suffering from the more direct environmental consequences of climate change). Because emergency measures taken once a financial crisis comes to a head will struggle to fully contain that crisis, financial regulators should take steps *in advance* to make the financial system more robust to the climate-related uncertainty that we face.

In this statement, I stress the importance of a precautionary approach to climate as a systemic risk. Policymakers and regulators following a precautionary approach should be creative in their thinking about threats to financial stability, and favor bold, simple responses that err on the side of preventing the irreversible and catastrophic harms I just mentioned. While uncertainty remains about many of the precise threats that climate change will generate for the financial system, we are already aware of broad contours of these threats. Physical and transition risks can create market, credit, liquidity, and operational risks for financial institutions, and these can interact to create systemic risks that threaten the stability of the entire financial system.

I will draw particular attention to the operational risks posed by extreme weather events and other environmental changes, as the potential systemic interactions of operational risks have not received the attention they deserve. I propose a new form of “macro-operational regulation” that can respond to the systemic dimensions of operational risks. I also consider risk-based capital requirements, and how to use them appropriately given the uncertainty surrounding climate-related threats to financial stability. For some acute transition risks, heightened risk-weightings are already appropriate, but simpler buffers of equity funding are a better response to the general uncertainty surrounding climate-related threats to financial stability. In terms of supervision more generally, I argue for a robust precautionary principles-based approach to supervising financial institutions, which will require banking regulators to repudiate recent efforts to hamstring their own supervisory discretion.

This statement also stresses that a robust financial regulatory architecture is needed to support these reforms. It focuses on the Financial Stability Oversight Council (the “FSOC”) and the Office of Financial Research (the “OFR”), highlighting that both of these regulatory bodies need more staffing and would benefit from greater independence. I single out the OFR as a regulatory body that could serve as a hub for the interdisciplinary expertise needed to confront climate as a systemic risk (particularly climate science, environmental economics, data science, computer science, and complexity science). With this interdisciplinary expertise, the OFR could develop new technologically-informed approaches to data collection and analysis, improving our understanding of building physical and transitional risks. The OFR could also innovate new regulatory approaches, like a real-time reporting system for operational outages, and consistent physical identifiers for financial assets and collateral.

## 2. Financial stability as a regulatory goal

Today’s hearing is about climate-related systemic risks that could impact the stability of our financial system. I want to start this statement by elaborating on what “financial stability” means, so that our end goal is clear. We can’t say that our financial system is stable just because we’re not currently experiencing a financial crisis; our financial system is only stable if it is robust to future shocks. Of course, that does not mean that all risks should be eliminated from the financial system. The focus of financial stability regulation should be on systemic risks that could compromise the ability of financial institutions and markets to perform the risk management, capital intermediation and payments processing functions necessary for broader economic growth. Financial stability regulation should not lose sight of the fact that the endgame is sustainable economic growth – protecting the financial institutions and markets that make up that system is a means to that end.<sup>1</sup>

Promoting financial stability should be a mandated goal for all financial regulatory agencies. A financial stability goal is already implicit in the mandates for many financial regulatory agencies – for example, the Federal Reserve takes the view that its “financial stability mandate is seen in the penumbra of the Federal Reserve Act, and that is legally sufficient”<sup>2</sup> – but most agencies lack an explicit statutory direction to promote financial stability (the exceptions that do have clear statutory mandates focusing on systemic risks and financial stability are the Financial Stability Oversight Council, the Office of Financial Research, and the Federal Insurance Office which I will discuss shortly). Legislating financial stability mandates for each of the federal financial regulatory agencies would make it abundantly clear that they are authorized to take the precautionary steps needed to protect financial stability generally, and more specifically, to address climate as a systemic risk. While my testimony today is focused on systemic risk and financial stability, climate change will also impact other financial regulatory mandates relating to market efficiency, investor protection, consumer protection, and competition.<sup>3</sup>

## 3. A precautionary approach to financial stability regulation

The financial system is only one part of the broader, highly-interconnected, adaptive and complex system that is our economy. That system has social, ecological and technological components, and the financial system cannot be completely insulated from the other components

---

<sup>1</sup> For further discussion of financial stability as a regulatory goal, see Hilary J. Allen, *Putting the “Financial Stability” In Financial Stability Oversight Council*, 76 OHIO ST. L. J. 1087, 1098 *et seq.* (2015).

<sup>2</sup> Thomas C. Baxter, Jr., Exec. Vice President & Gen. Counsel, Fed. Reserve Bank of N.Y., Remarks at the Future of Banking Regulation and Supervision in the EU Conference, Financial Stability: The Role of the Federal Reserve System (Nov. 15, 2013) (transcript available at <http://www.newyorkfed.org/newsevents/speeches/2013/bax131120.html>). For a discussion of the SEC’s implicit financial stability mandate, see Hilary J. Allen, *The SEC as Financial Stability Regulator*, 43 J. CORP. L. 715, 728-9 (2018).

<sup>3</sup> For an overview of the different goals of financial regulation, see JOHN ARMOUR ET AL., *PRINCIPLES OF FINANCIAL REGULATION*, 62-68 (1<sup>st</sup> ed. 2016). For a discussion of how the SEC’s climate-related reforms can serve other regulatory goals of protecting investors, promoting competition and facilitating capital formation (which relates to the market efficiency goal), see Comment letter from Jill E. Fisch et al. responding to the SEC’s request for public input on climate disclosure (Jun. 11, 2021), <https://www.sec.gov/comments/climate-disclosure/cl112-8911728-244385.pdf>.

– including ecological disruptions from climate change.<sup>4</sup> The interactions of components within complex adaptive systems are very difficult to predict,<sup>5</sup> and so many of the threats that the financial system faces from climate change are not, strictly speaking, risks (risks occur with a known probability and therefore lend themselves well to measurement). Instead, the major concern is *uncertainty* about how changes in our climate, and a transition to a carbon-neutral economy, will impact the financial system.<sup>6</sup> When faced with uncertainty, one possible response is to wait and see what will happen. However, when uncertain outcomes are potentially irreversible and catastrophic, “wait and see” is not good policy. In the face of these kinds of irreversible and catastrophic outcomes, government should err on the side of preventing them. This is known as the “precautionary principle”.<sup>7</sup>

Financial crises are both irreversible and catastrophic. The consequences of the 2008 financial crisis demonstrate that even once the financial system starts to recover from a financial crisis, economic recovery is often elusive for many members of society – and many of the crisis’ social harms can never be undone. A decade after the 2008 crisis, measures of broader economic growth like GDP remained persistently lower than their pre-crisis trend suggested they should be, with one study estimating the impact of the crisis as a “lifetime present-value income loss of about \$70,000 for every American”.<sup>8</sup> The GAO has estimated the total cost of the crisis to the American people as \$13 trillion.<sup>9</sup> This cost was not evenly distributed, though: while almost everyone’s net worth decreased as a result of the crisis, those with investments in the stock market saw them rebound relatively quickly with the S&P 500 returning to its pre-crisis high by March of 2013. However, only about 50% of American families own any stocks.<sup>10</sup> For most middle class families, their net worth in 2017 remained lower than it had been in 2007.<sup>11</sup> These disparities were even more pronounced for middle class African American and Hispanic families.<sup>12</sup> The brunt of the irreversible economic damage caused by the 2008 crisis was therefore borne by more vulnerable members of society, and there’s no reason to believe that things will be any different with future crises.

All of this economic damage was incurred despite herculean and imaginative crisis response efforts from the Federal Reserve and other governmental bodies: emergency responses

---

<sup>4</sup> For a discussion of SETS, see J.B. Ruhl, *Governing Cascade Failures in Complex Social-Ecological-Technological Systems: Framing Context, Strategies and Challenges*, 22 VAND. J. ENT. & TECH. L 407 (2020).

<sup>5</sup> CHARLES PERROW, *NORMAL ACCIDENTS: LIVING WITH HIGH-RISK TECHNOLOGIES*, 5 (1999).

<sup>6</sup> “There is a fundamental distinction between the reward for taking a known risk and that for assuming a risk whose value itself is not known”; “true uncertainty [is]... “not susceptible to measurement.” FRANK H. KNIGHT, *RISK, UNCERTAINTY AND PROFIT* 21 (1921).

<sup>7</sup> For a discussion of different formulations of the precautionary principle, see Hilary J. Allen, *A New Philosophy for Financial Stability Regulation*, 45 LOY. U. CHI. L.J. 173, 195 *et seq.* (2013).

<sup>8</sup> Regis Barnichon et al., *The Financial Crisis at 10: Will We Ever Recover?*, (Fed. Res. Bank S.F. Econ. Letters Working Paper, 2018), <https://www.frbsf.org/economic-research/publications/economic-letter/2018/august/financial-crisis-at-10-years-will-we-ever-recover/>.

<sup>9</sup> U.S. GOV’T ACCOUNTABILITY OFF., GAO-13-180, *FINANCIAL CRISIS LOSSES AND POTENTIAL IMPACTS OF THE DODD-FRANK ACT* (2013).

<sup>10</sup> Lowell Ricketts, *When the Stock Market Rises, Who Benefits?*, FED. RES. BANK ST LOUIS ON THE ECON. BLOG (Feb. 27, 2018), <https://www.stlouisfed.org/on-the-economy/2018/february/when-stock-market-rises-who-benefits>.

<sup>11</sup> Nelson D. Schwartz, *The Recovery Threw the Middle Class Dream Under a Benz*, N.Y. TIMES, Sept. 12, 2018, <https://www.nytimes.com/2018/09/12/business/middle-class-financial-crisis.html>.

<sup>12</sup> *Id.*

can't always contain the economic impact of financial crises once they occur. And it's also important to note that this is not a purely economic issue. Referring to the heightened unemployment rates following the 2008 crisis, Janet Yellen observed that “[t]hese are not just statistics. . . . The toll is simply terrible on the mental and physical health of workers, on their marriages, on their children.”<sup>13</sup> Growing unemployment can also result in increases in crime and substance abuse.<sup>14</sup> The stress associated with the experience of financial crises can also impact the health of those impacted economically – medical studies conducted following the 2008 financial crisis demonstrated increased rates in heart attacks and suicides, and people were less likely to seek preventative medical care in general because of concerns associated with the costs.<sup>15</sup> Even among people who were able to keep their jobs and some sense of financial security during the recession that followed the 2008 crisis, many experienced a pervading sense of uncertainty and precariousness that may have caused delays in life events like marriage, home purchases and retirement.

We shouldn't assume that the 2008 crisis was a “once-in-a-generation” event. Many people believe that we narrowly missed another financial crisis in March/April 2020,<sup>16</sup> and unless action is taken, financial crises may become much more frequent events as technology allows for more and quicker transactions,<sup>17</sup> and as climate-related events supply more shocks to the financial system. The most vulnerable members of society are most likely to bear the brunt of the economic fallout from financial crises, and with more frequent crises, they will have less time to recover from them. At the same time, the most vulnerable members of society are also likely to be suffering most from the more direct environmental consequences of climate change.<sup>18</sup>

Given the stakes involved, the avoidance (or at least mitigation) of financial crises is a matter of paramount social concern. Regulatory intervention would be justified even if there were only small chance of climate-related issues causing catastrophic financial crises, but as I will discuss shortly, we can already anticipate some very significant problems that climate-related

---

<sup>13</sup> Janet L. Yellen, Vice Chairwoman, Board Governors of the Fed. Res. Sys., Remarks at “A Trans-Atlantic Agenda for Shared Prosperity”: A Conference Sponsored by the AFL- CIO, Friedrich Ebert Stiftung, and the IMK Macroeconomic Policy Institute, *A Painfully Slow Recovery for America's Workers: Causes, Implications, and the Federal Reserve's Response* 10 (Feb. 11, 2013).

<sup>14</sup> Ronald A. Wilson, *The View from South Tucson: How the Economic Crisis Affects Defendants in My Courtroom*, 48 JUDGES' J. 14 (2009).

<sup>15</sup> Mona Fiuzat et al., *United States stock market performance and acute myocardial infarction rates in 2008–2009 (from the Duke Databank for Cardiovascular Disease)*, 106 AM. J. CARDIOLOGY 1545 (2010); Aaron Reeves et al., *Increase in state suicide rates in the USA during economic recession*, 380 LANCET 1813 (2012); Annamaria Lusardi et al., *The Economic Crisis and Medical Care Use: Comparative Evidence from Five High-Income Countries*, 96 SOC. SCI. Q. 202 (2015).

<sup>16</sup> For discussion of the near miss at the start of the Covid-19 pandemic, see Paul Tucker, *Time to look again at the financial system's dangerous faultlines*, FIN. TIMES (Jan. 20, 2021), <https://www.ft.com/content/0d848d03-7d66-4a76-a4f2-8f09980747fa>.

<sup>17</sup> “Faster trades means more trading”. Saule T. Omarova, *Technology v Technocracy: Fintech as a Regulatory Challenge*, 6. J. FIN. REG. 75, 89 (2020).

<sup>18</sup> “Communities of color and low-income or low-wealth, indigenous, rural, and rustbelt communities are more likely to be impacted by floods, storms, drought, food and water insecurity, increased diseases, faltering infrastructure, increased violence, and most other climate harms. These same communities often have the fewest economic resources with which to respond”. PUBLIC CITIZEN & AMERICANS FOR FINANCIAL REFORM, CLIMATE ROADMAP FOR U.S. FINANCIAL REGULATION, iv (2021), <https://www.citizen.org/wp-content/uploads/Climate-Financial-Reg-Report.pdf>.

issues are likely to cause for the financial system.<sup>19</sup> A precautionary approach counsels us not to wait until we understand the precise risks involved before taking action – by then, it might be too late to do anything about them.

While policy in the United States is very precautionary in some areas (for example, counter-terrorism policy), the United States’ approach to financial regulation has not typically been precautionary.<sup>20</sup> Instead, the preference has often been to wait for a crisis to develop and then provide emergency support and legislate a response after the fact. As I have just explored, that is not a responsible or sustainable approach when it comes to financial stability in general, and climate-related financial stability issues in particular.

#### **4. Climate-related threats to financial stability**

Although we do not yet have a precise understanding of many of the climate-related risks that financial stability faces, we already know a lot about the general types of threats that could disrupt the financial system. These threats have generally been divided into “physical risks” and “transition risks” (although many of them are not really risks in the strictest sense, because we don’t know their probability of occurring). When one or more of these threats become reality, then they can generate market, credit, liquidity, and operational risks for financial institutions and other participants in the financial markets. The interactions of these risks could potentially create problems for the stability of the entire financial system.

The Financial Stability Board, an influential international body that monitors threats to financial stability, has defined physical risk as “the possibility that the economic costs and financial losses from the increasing severity and frequency of extreme climate-change related weather events might erode the value of financial assets, and/or increase liabilities.”<sup>21</sup> Physical risks are most obviously of concern to the insurance industry, but they could also affect property that serves as collateral for loans, if such property is threatened by rising seas, fires, hurricanes, or any other manner of extreme weather or lasting environmental change.<sup>22</sup> If collateral proves to be vulnerable, the financial institutions that extended the secured loans could find themselves exposed to significant losses in the event of borrower default – and borrower default could also be made more likely by climate-related uncertainties (including an inability to renew insurance policies on the collateral property as insurers exit challenging insurance markets).<sup>23</sup>

The Financial Stability Board characterizes transition risks as those relating “to the process of adjustment towards a low-carbon economy, including shifts in policies designed to mitigate and

---

<sup>19</sup> “[I]t is worth considering that the probability of financial risks from climate change materializing is high, if not a certainty. Graham S. Steele, *Confronting the ‘Climate Lehman Moment’: The Case for Macroprudential Climate Regulation*, 30 CORNELL J. L. & PUB. POL’Y 109, 120 (2020).

<sup>20</sup> For a discussion of variations in US precautionary attitudes, see Jonathan B. Wiener, *Whose Precaution After All? A Comment on the Comparison and Evolution of Risk Regulatory Systems*, 13 DUKE J. COMP & INT’L L. 207, 210 (2003).

<sup>21</sup> FIN. STAB. BD., STOCKTAKE OF FINANCIAL AUTHORITIES’ EXPERIENCE IN INCLUDING PHYSICAL AND TRANSITION CLIMATE RISKS AS PART OF THEIR FINANCIAL STABILITY MONITORING, 2 (2020).

<sup>22</sup> *Id.* at 7.

<sup>23</sup> Steele, *supra* Note 19, at 119.

adapt to climate change, which would affect the value of financial assets and liabilities.”<sup>24</sup> Investments in and loans to fossil fuel-related businesses are obvious candidates for assets that would be vulnerable to policy shifts regarding carbon-producing activities, as are commodity swaps.<sup>25</sup> However, we may ultimately be surprised by seemingly unrelated assets suffering from transition risks – the spillover effects of a global phenomenon like climate change response are likely to produce unexpected correlations amongst asset classes. Transition risks could arise from domestic policy shifts with regard to certain kinds of assets, or policy changes made abroad, and these changes will not necessarily be gradual: swift political action could come hard on the heels of the occurrence of a major natural disaster. Assets could also be compromised following the invention of a new and superior green technology that quickly renders existing industries obsolete, or by retail investors’ increasing focus on environmental issues and rejection of carbon-intensive industries.<sup>26</sup> To be clear, these transition risks are not a reason to avoid adjustments towards a low-carbon economy – these kinds of adjustments will be necessary to avoid what are likely to be much larger economic dislocations from physical risks, and so it is the job of financial stability regulation to try to mitigate the impact of these adjustments on our financial system.

If a large bank were exposed to enough market risk (in other words, if its investments were to lose enough value) because of a physical or transition risk, it could fail and then its contractual counterparties would be exposed to credit risks as it defaulted. If those credit risks were big enough, some of the bank’s contractual counterparties could fail themselves, potentially dragging down some of *their* counterparties, like dominos.<sup>27</sup> Because contractual relationships between financial institutions can serve as transmission belts that spread problems throughout the financial system, financial stability regulation typically focuses on the largest financial institutions with more relationships that are likely to generate more credit risk for the system overall if they fail.<sup>28</sup> However, the simultaneous failure of many smaller financial institutions could also create systemic risk.<sup>29</sup>

Financial institutions (large and small) are unlikely to simply accept the inevitability of failure, though. In an attempt to save themselves, financial institutions that had invested in assets suffering from a physical or transitional risk would seek to sell them off *en masse*, which would put further downward pressure on the price of such assets (creating more market risk), potentially

---

<sup>24</sup> FIN. STAB. BD., *supra* Note 21 at 2. “Carbon emissions have to decline by 45% from 2010 levels over the next decade in order to reach net zero by 2050. This requires a massive reallocation of capital. If some companies and industries fail to adjust to this new world, they will fail to exist.” Bank of England, *Open Letter on Climate-Related Financial Risks* (Apr. 17, 2019) (available at <https://www.bankofengland.co.uk/news/2019/april/open-letter-on-climate-related-financial-risks>).

<sup>25</sup> Steele, *supra* Note 19, at 126.

<sup>26</sup> On the subject of changing investor preferences, see Michal Barzuza et al, *Shareholder Value(s): Index Fund ESG Activism and the New Millennial Corporate Governance*, 93 S. CAL. L. REV. 1243 (2020).

<sup>27</sup> Regarding the transmission of risks by institutions, see Steven L. Schwarcz, *Systemic Risk*, GEO. L. J. 193, 201 (2008).

<sup>28</sup> Regulatory capital requirements, for example, are higher for the largest banks because of the heightened risk they pose to financial stability. See Financial Stability Board, *2020 List of Global Systemically Important Banks (G-SIBs)* (Nov. 11, 2020), <https://www.fsb.org/wp-content/uploads/P111120.pdf>.

<sup>29</sup> “[T]he weakest link in the financial stability chain might be *small*, rather than large, financial intermediaries.” Eric S. Rosengren, President & CEO of the Federal Reserve Bank of Boston, *Defining Financial Stability, and Some Policy Implications of Applying the Definition*, Keynote Remarks at the Stanford Finance Forum, Graduate School of Business, Stanford University, 9 (Jun. 3, 2011).

requiring still more institutions to divest their holdings in a vicious cycle sometimes referred to as a “fire sale externality”.<sup>30</sup> If assets compromised by physical or transition risks were to become difficult to sell because of uncertainty about their value, holders of those assets would also experience liquidity risk, and they could then be forced to sell off other types of assets at a discount in order to satisfy their obligations when they come due, potentially jeopardizing their own solvency and transmitting the panic to other asset markets, instigating more fire sales.

Liquidity pressures could also arise because of reputational concerns, and then transform into solvency pressures. For example, if a government were to adopt a policy that penalizes the fossil fuel industry, the customers of a bank that is perceived as being close to the fossil fuel industry might assume that the bank is in trouble, even if the bank’s portfolio is well-diversified. If the bank’s customers rush *en masse* to withdraw their deposits on the basis of that mistaken assumption, then the bank will be forced to start liquidating its assets in order to meet those withdrawal requests, and if the time pressures involved mean that the bank has to sell those assets at a discount, then it may very well become insolvent. Of course, there could also be liquidity issues if the bank does indeed have significant exposures to fossil fuel related assets. For example, if a bank has made many long-term loans to the oil and gas industry and funded those loans by rolling over short-term funding (like overnight sale and repurchase agreements), that funding could easily dry up as result of concerns about the bank’s exposure to the fossil fuel industry. This would force the bank to sell these or other assets at a discount in order to raise the cash necessary to satisfy its obligations when they come due: once again, we’re faced with the prospect of bank insolvencies and fire sales (particularly if many banks have exposure to the same kinds of fossil fuel related assets, and are selling at the same time).

These dynamics of domino institutional failures and fire sales dragging down markets are systemic risks that can compromise the entire financial system. As financial institutions and markets become compromised in these ways, their ability to provide the capital intermediation services on which the broader economy depends – most notably, the provision of credit – is also compromised.<sup>31</sup> The financial system also provides important “plumbing” services, such as the processing of payments, that are essential to economic growth. The physical infrastructure involved in providing these types of services is vulnerable to physical risks,<sup>32</sup> and this is another potential (but often overlooked) source of systemic risk. Operational problems are usually considered to be idiosyncratic problems for the institution experiencing them, with few spillover effects. However, failure of one kind of financial infrastructure may sometimes result in its users migrating to an alternative infrastructure, which could buckle under the increased load, forcing more users to overload any remaining alternatives in yet another vicious cycle.<sup>33</sup> There are a variety of stress tests and other approaches that could be pursued to get a sense of when and how

---

<sup>30</sup> For a discussion of fire sale dynamics, see Anil K. Kashyap et al., *The Macroprudential Toolkit*, 59 IMF ECON. REV. 145 (2011).

<sup>31</sup> Ben Bernanke, *The Real Effects of Disrupted Credit: Evidence from the Global Financial Crisis*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY, 3 (Sept. 13, 2018).

<sup>32</sup> Christina Parajon Skinner, *Central Banks and Climate Change*, 75 VAND. L. REV. (forthcoming), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3703142](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3703142).

<sup>33</sup> For a discussion of cascading operational failures in the payments system, see Hilary J. Allen, *Payments Failure*, 62 B.C. L. REV. 453, 469 et seq. (2021).

usage might shift to alternative infrastructure following the manifestation of a physical risk;<sup>34</sup> examining the business continuity plans of financial institutions involved in payments processing and other “plumbing” functions would be a critically important part of any such exercise.

## 5. Regulatory responses

### Disclosure

I want to start my discussion of possible regulatory responses to these threats by making it clear that climate-related systemic risks are not something that the markets can be expected to manage on their own. First, financial stability is a classic “public good”, in the sense that everyone benefits from it, but the public can’t be forced to pay for it.<sup>35</sup> Therefore, in the absence of regulation, market participants have limited incentives to promote the stability of the financial system – even if those market participants knew enough about the risks at hand to quantify and price them (which they often do not), they would not automatically be “priced in” to assets. Second, financial crises are a systemic problem, and avoiding them typically requires coordinated action by many market participants. Market participants couldn’t compel other market participants to coordinate their actions for the greater good, even if they wanted to. Because market participants can’t manage systemic risks on their own, regulations mandating climate-related disclosures to those market participants are necessary, but not a complete solution to climate-related systemic risks.<sup>36</sup>

### Regulatory Capital Requirements

Regulatory capital requirements should also be part of the response to these systemic risks. Regulatory capital requirements are complicated, but their main goal is to create a cushion of funding that allows banks to better absorb losses on their investments.<sup>37</sup> If the cushion is too small and the bank experiences losses on its investments, there is a greater chance that the bank’s repayment obligations will end up exceeding the value of its investments. If the losses are big enough and the cushion small enough, the bank may even become insolvent. Because banks have strong incentives (particularly under the tax code) to fund their investments with more borrowed money, minimum regulatory capital requirements have been implemented to protect bank solvency

---

<sup>34</sup> “Netflix uses something called “chaos monkey” to shut down parts of its system randomly in order to learn more about the connections therein, as well as the ability of those connections to transmit cascade failures. Although the consequences of payments failure are much greater than an unavailable movie, some variation on this theme—perhaps a simulation of shutting down parts of the system—could assist in understanding the pathways through a constantly evolving ecosystem. Breakthroughs are also being made in the field of novelty detection, where artificial intelligence is being utilized to “find unexpected outcomes in a system.” Recently, this type of technology has been used to detect changes in retail payments flows that could serve as early warning signals of credit-related problems with payments providers. Presumably, it also could be used to identify unusual payments flows that signal operational problems.” *Id.* at 506-7.

<sup>35</sup> For an introduction to the concept of public goods, and regulation as a response to the public goods problem, see Matthew D. Adler, *Regulatory Theory* in Dennis Patterson (ed.), *A COMPANION TO PHILOSOPHY OF LAW AND LEGAL THEORY* 598-9 (2d ed. 2010).

<sup>36</sup> For further elaboration on this point, see Madison Condon, *Market Myopia’s Climate Bubble*, UTAH L. REV. (forthcoming), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3782675](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3782675).

<sup>37</sup> For further explanation of regulatory capital requirements, see Hilary J. Allen, *Cocos Can Drive Markets Cuckoo*, 16 Lewis & Clark L. Rev. 125, 129 *et seq.* (2012).

by requiring banks to fund their investments with a cushion of funding that doesn't need to be repaid to anyone. These minimum regulatory capital requirements (i.e. the size of the required cushion) are typically expressed as percentages, and the percentages required are reasonably consistent throughout the world because they are based on international standards promulgated by the Basel Committee on Banking Supervision.

The numerator of any percentage calculation is the cushion of funding – the “capital” itself. Capital can take many forms, ranging from the simplest and most loss-absorbent “Common Equity Tier 1” (which includes common equity and retained earnings) to more complicated debt-equity hybrid forms of funding. The denominator of the percentage calculation will depend on whether you're calculating a risk-based capital ratio (in which case, a complex process of risk-weighting is applied to the bank's assets to come up with the denominator) or a leverage ratio (the denominator here is simpler – it is the total assets of the bank). When designing capital requirements, regulators can therefore choose between more simple and more complicated approaches.

The risk-weighting approach is more complicated, but it can be useful for making banks more robust to quantifiable risks; risk-weightings can also be used to discourage banks from making certain types of investments that are considered risky. This approach could be used to address known transition risks, such as those affecting investments in fossil fuel-related businesses.<sup>38</sup> When dealing with most climate-related threats, though, regulators should backstop any complicated approach to risk-weighting with simpler approaches that are more robust to uncertain events.<sup>39</sup> We can think of these backstops as making the financial system more robust to climate-related threats generally, rather than trying to anticipate a particular type of shock to the system. A buffer of extra equity computed as part of a leverage ratio would be one way to respond to that uncertainty (this is not contemplated in Basel Committee's existing capital regime, and this kind of change would benefit from international agreement). At the very least, adding a buffer of extra equity to the risk-based capital requirements would provide a cushion to absorb miscalculations of risk-weightings.<sup>40</sup> This latter approach could be started immediately, relying on the Basel Committee's existing capital regime. Regulators already have the authority to implement a countercyclical buffer that requires banks to fund up to an additional 2.5% of their risk-weighted assets with Common Equity Tier 1 capital. As an alternative or a supplement to the countercyclical buffer, regulators already have the authority to require the largest banks to fund their investments with higher percentages of Common Equity Tier 1 capital – the current percentages could be increased to provide more cushion to absorb climate-related uncertainties.

### Stress Tests

When we have a good understanding of particular physical and transition risks, that understanding can inform the development of hypothetical climate scenarios that can be used to

---

<sup>38</sup> For detailed proposals in this vein, see Gregg Gelzinis, *Addressing Climate-Related Financial Risk Through Bank Capital Requirement*, CENTER FOR AMERICAN PROGRESS (May 11, 2021).

<sup>39</sup> For further discussion the benefits of simpler approaches to capital regulation, see Andrew G. Haldane & Vasileios Madouros, Speech at the Federal Reserve Bank of Kansas City's 366th economic policy symposium, “The changing policy landscape” titled The Dog and the Frisbee (Aug. 31, 2012).

<sup>40</sup> For further discussion of the benefits of increased equity funding for banks, see Anat Admati et al., *Healthy Banking System Is the Goal, Not Profitable Banks*, FIN. TIMES, Nov. 9, 2010, <https://www.ft.com/content/63fa6b9e-eb8e-11df-bbb5-00144feab49a>.

stress test whether a financial institution has sufficient capital to withstand that kind of shock to the system.<sup>41</sup> Right now, these types of stress tests would be best suited to assessing known transition risks, such as those affecting investments in fossil fuel-related businesses (as discussed in the context of risk-weightings above). Stress tests can also be used to help better understand how resilient financial institutions are likely to be in the face of climate change more generally. Instead of being engineered to test for a particular outcome, these kind of stress tests would be designed simply to find out “what would happen if . . .”, and are particularly well-suited to uncertain environments.<sup>42</sup> Regulators should therefore consider running hypothetical scenarios of possible physical risks, transition risk, and combinations of the two, to get a sense of what the outcomes for individual financial institutions, and the financial system as a whole, are likely to be in the long-term. These kinds of stress tests can start immediately, and regulators can learn from their output. While it will sometimes be appropriate to adjust regulation in light of this output, given the uncertainty involved in addressing climate as a systemic risk, financial regulators need to be somewhat humble about the predictive value of these kinds of open-ended stress tests.

### Supervision

Regulators will also need to be nimble. Because of the evolving nature of climate-related threats, the hard work of making the financial system more robust will often need to be done through tweaks made as part of the ongoing supervision of financial institutions (for example, limitations may need to be placed on financial institutions’ portfolios of carbon-related assets, or divestiture orders may become appropriate).<sup>43</sup> In the face of this evolving and uncertain situation, a use of principles-based regulation may be necessary. In a principles-based regulatory regime, high level objectives are adopted through formal rule-making procedures, and then informal guidance supplies much of the detail on how to satisfy these objectives – in a fluid situation, this affords greater flexibility to both the regulators and the regulated entities in determining how to comply with the high-level objectives.<sup>44</sup> To be clear, regulators should not adopt the light-touch principles-based regulation we have sometimes seen in the past, which can devolve into too much deference to the financial industry and therefore work as a type of deregulation.<sup>45</sup> In particular, regulators should not be too deferential to banks’ hedging strategies and internal risk models, because those strategies and risk models will not be able to respond to true uncertainty and may very well leave banks’ vulnerable to unanticipated threats. Instead, we need precautionary principles-based regulation that is committed to the high-level objective of protecting financial

---

<sup>41</sup> Gregg Gelzinis & Graham Steele, *Climate Change Threatens the Stability of the Financial System* (Nov. 21, 2019) (available at [https://cdn.americanprogress.org/content/uploads/2019/11/20072438/Climate-Change-Financial-Stability-brief.pdf?\\_ga=2.190241067.187054642.1601052962-604474383.1601052962](https://cdn.americanprogress.org/content/uploads/2019/11/20072438/Climate-Change-Financial-Stability-brief.pdf?_ga=2.190241067.187054642.1601052962-604474383.1601052962)); Bank of England, *The 2021 Biennial Exploratory Scenario on the Financial Risks from Climate Change* (Dec. 18, 2019) (available at <https://www.bankofengland.co.uk/-/media/boe/files/paper/2019/the-2021-biennial-exploratory-scenario-on-the-financial-risks-from-climate-change.pdf?la=en&hash=73D06B913C73472D0DF21F18DB71C2F454148C80>).

<sup>42</sup> For further discussion of the benefits of open-ended stress tests, see Robert F. Weber, *A Theory for Deliberation-Oriented Stress Testing Regulation*, 98 MINN. L. REV. 2236 (2014).

<sup>43</sup> Steele, *supra* Note 19, at 150.

<sup>44</sup> For a discussion of a principles-based approaches to financial regulation, see Julia Black et al., *Making a Success of Principles-Based Regulation*, 1 L. & FIN. MKT. REV. 191 (2007).

<sup>45</sup> As an example, see the critique of the UK FSA’s principles-based approach as being somewhat light-touch and deregulatory in FINANCIAL SERVICES AUTHORITY, *THE TURNER REVIEW: A REGULATORY RESPONSE TO THE GLOBAL BANKING CRISIS*, 86 *et seq.* (Mar. 2009), [http://www.actuaries.org/CTTEES\\_TFRISKCRISIS/Documents/turner\\_review.pdf](http://www.actuaries.org/CTTEES_TFRISKCRISIS/Documents/turner_review.pdf).

stability from climate-related risks, but flexible in its application. The Interagency Statement Clarifying the Role of Supervisory Guidance adopted by banking regulatory agencies in 2018 will complicate flexible approaches to regulation, though.<sup>46</sup> This Interagency Statement (often referred to as the “guidance on guidance”) made clear the agencies’ position that they would no longer enforce their informal guidance against regulated banks.<sup>47</sup> The Federal Reserve adopted a rule in March of 2021 that effectively codified this guidance on guidance, but it and the other financial regulatory agencies should move in the other direction and disaffirm this approach. Climate-related supervision requires the flexibility that can come from informal guidance.

Climate-related supervision can also be improved if bank regulators start requiring banks to disclose any known climate-related exposures in the call reports they submit to regulators. This practice should begin immediately, and would benefit from input from the experience of banking agencies around the world that have already integrated climate-related threats into their supervisory process. An international network of central banks and financial regulators known as the Network for Greening the Financial System (“NGFS”) is focused on “integrat[ing] the monitoring of climate-related financial risks into day-to-day supervisory work, financial stability monitoring and board risk management”:<sup>48</sup> banking regulatory agencies should join the NGFS immediately to enable them to take advantage of its collective expertise in this area (the Federal Reserve has already joined the NGFS).<sup>49</sup>

### Operational Risk Regulation

Finally, the threats posed by climate change require us to revise our current approach to regulating operational risk. The Basel Committee had developed Principles for the Sound Management of Operational Risk that require banks to monitor, identify and mitigate operational risks, but these Principles mostly treat operational risk as something that a bank should manage on its own, as a matter of internal governance and risk management. Principle 4, for example, provides that “[t]he board of directors should approve and periodically review a risk appetite and tolerance statement for operational risk that articulates the nature, types, and levels of operational risk *that the bank is willing to assume*” [emphasis added].<sup>50</sup> But what about the risks that a financial institution might create for others? If the costs of operational failure fall on others, institutions may be encouraged to underinvest in the robustness of their own infrastructure.

Even if a bank were willing to invest heavily to limit the consequences of any operational problems, that bank might not have the capacity to assess and address the systemic consequences

---

<sup>46</sup> Available at <https://www.fdic.gov/news/press-releases/2018/pr18059a.pdf>.

<sup>47</sup> For further background on the “guidance on guidance”, see Sidley, Federal Reserve Finalizes Rule on Role of Supervisory Guidance and Issues Consolidated Regulatory FAQs, SIDLEY (Apr. 2, 2021) <https://www.sidley.com/en/insights/newsupdates/2021/04/federal-reserve-finalizes-rule-on-role-of-supervisory-guidance-and-issues-consolidated-reg-faqs>.

<sup>48</sup> Bank of England, *Open Letter on Climate-Related Financial Risks* (Apr. 17, 2019), <https://www.bankofengland.co.uk/news/2019/april/open-letter-on-climate-related-financial-risks>.

<sup>49</sup> Bd. Gov. Fed. Res. Sys., *Federal Reserve Board announces it has formally joined the Network of Central Banks and Supervisors for Greening the Financial System, or NGFS, as a member* (Dec. 15, 2020), <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20201215a.htm>.

<sup>50</sup> BASEL COMMITTEE ON BANKING SUPERVISION, PRINCIPLES FOR THE SOUND MANAGEMENT OF OPERATIONAL RISK, 5 (Jun. 2011), <https://www.bis.org/publ/bcbs195.pdf>.

of the operational risks it is taking. It probably wouldn't know how its competitors would be affected by its operations, and even if it did, no bank can compel its competitors to resolve collective problems. Financial regulators, on the other hand, have broader oversight and access to confidential information (particularly business continuity plans) through their supervisory functions. These regulators should take a more systemic approach to the management of operational risks – I have described this approach as “macro-operational regulation” (reflecting its parallels with macroprudential regulation, which seeks to avoid the systemic consequences of actions taken by individual institutions to address their own credit and liquidity risks).<sup>51</sup>

We already have some regulatory tools that could be considered macro-operational. For example, financial infrastructure can be designated as a “systemically important financial market utility” by the Financial Stability Oversight Council,<sup>52</sup> and then it will need to comply with the Federal Reserve’s Regulation HH (which includes some relatively prescriptive requirements relating to the management of operational risks).<sup>53</sup> More macro-operational regulation is needed, though. As physical threats to financial institutions’ operating systems become more pressing, a real-time reporting system for operational issues will become crucial. Regulators should also consider developing types of circuit breakers that can be deployed when operational issues occur, preventing the execution of any business continuity plan that could overload shared financial infrastructure. These regulatory measures should be backed by a whole-of-government approach to improving the critical infrastructure (particularly telecommunications infrastructure) on which the financial industry relies to provide its services – a lot can be learned from cyberpreparedness exercises, for example. Finally, because none of these strategies are foolproof, it would be wise to adopt policies that prevent a transition to a completely cashless society (for example, the definition of “legal tender” could be amended to *require* businesses to accept cash as payment for goods and services).<sup>54</sup> The Federal Reserve has responded to past natural disasters by distributing physical cash to affected communities;<sup>55</sup> if we transition to a cashless society, that will no longer be an option, raising the stakes of operational problems.

## 6. FSOC coordination

These are just some of the kinds of financial stability regulations that could make our financial system more robust to climate-related threats. However, financial stability regulation is often very challenging to implement in the United States. We have a very fragmented financial

---

<sup>51</sup> Allen, *supra* Note 33, at 456.

<sup>52</sup> This designation power is found in Dodd-Frank Section 804.

<sup>53</sup> Regulation HH requires a “designated financial market utility” to enact “a robust operational risk-management framework” that, relevantly, “[h]as systems that have adequate, scalable capacity to handle increasing stress volumes and achieve the designated financial market utility’s service-level objectives” and “[h]as comprehensive physical, information, and cyber security policies, procedures, and controls that address potential and evolving vulnerabilities and threats.” It also sets out parameters for business continuity planning in the event of an operational failure, establishing the goal of same-day resumption of settlement services even in a worst-case scenario. Section 234.4(b) of Regulation HH also expressly authorizes emergency changes to be made to a FMU’s rules, procedures, and operations if its ability to provide services in a safe and sound manner is compromised. *See* Allen, *supra* Note 33, at 483.

<sup>54</sup> This definition is found in 31 USC § 5103.

<sup>55</sup> Federal Reserve Bank of San Francisco, *Emergency Funds: Why Americans Choose Cash for Disaster Preparation*, SF FED BLOG (Mar. 31, 2017), <https://www.frbsf.org/our-district/about/sf-fed-blog/emergency-funds-why-americans-choose-cash-for-disaster-preparation/>.

regulatory architecture with many different regulatory agencies, and the communication problems and regulatory gaps that arise from this fragmentation pose challenges for all financial stability regulation – not just regulation responding to climate as a systemic risk.<sup>56</sup> This fragmentation may be part of the reason why the United States has fallen behind the United Kingdom and the European Union in developing regulatory approaches that respond to climate-related threats: to regain this ground and confront the realities of climate change, all of the federal financial regulatory agencies will need to coordinate on developing precautionary responses to climate threats.

The most readily available solution to these coordination problems is to involve the FSOC, which was created in 2010 “to respond to emerging threats to the stability of the United States financial system”.<sup>57</sup> This FSOC is a council of the officials who lead the federal financial regulatory agencies. Each of the Chairman of the Federal Reserve, the Comptroller of the Currency, the Chairperson of the FDIC, the Director of the CFPB, the Chairman of the SEC, the Chairman of the CFTC, the Director of the FHFA and the Chairman of the NCUA is a voting member of the FSOC, as is “an independent member appointed by the President, by and with the advice and consent of the Senate, having insurance expertise.” The FSOC also has five non-voting members: the Director of the Office of Financial Research, the Director of the Federal Insurance Office, and representative state banking, insurance and securities commissioners. Finally, the Treasury Secretary is a voting member, and also acts as the Chair of the FSOC.<sup>58</sup> The FSOC should start responding to climate as a systemic risk by coordinating a road map of all the climate-related regulatory approaches that are being pursued by each of these agencies, together with a timing and implementation plan for each approach.

Since the FSOC was created, many reform proposals have sought to make increased use of the FSOC (including the Addressing Climate Financial Risk Act of 2021, which proposes to create a Climate Risk Advisory Committee within the FSOC). However, the FSOC has limited legislative authority, and was set up with very limited resources (the FSOC was designed to leverage the resources of the agencies headed by its members).<sup>59</sup> The FSOC needs to be strengthened before it can really be effective in responding to climate-related threats to financial stability. Because of the Treasury Secretary’s agenda-setting position as chair of the FSOC, the efficacy of the FSOC is dependent on how committed the Treasury Secretary is.<sup>60</sup> Ideally, the legislation that created the FSOC would be amended to give the FSOC a politically independent chair, but if that kind of legislative reform is not possible, the FSOC should at least have a more substantial staff. No legislative change would be needed before hiring more personnel for the FSOC, and these resources are needed to support any Climate Risk Advisory Committee formed within the FSOC.

The FSOC is also critical to extending financial stability regulation beyond banks to other important financial institutions and markets.<sup>61</sup> Dodd-Frank responded to the systemic risks posed

---

<sup>56</sup> For a discussion of the coordination challenges resulting from this fragmented regulatory structure, *see* Allen, *supra* Note 1, at 1128 *et seq.*

<sup>57</sup> Dodd-Frank Section 112.

<sup>58</sup> Dodd-Frank Section 111.

<sup>59</sup> Allen, *supra* Note 1, at 1120.

<sup>60</sup> *Id.* at 1126-7.

<sup>61</sup> “The complexity of modern finance means that regulators must address not only lending, but also capital-markets financing mechanisms, many of which are currently outside any meaningful regulatory oversight. In securities,

by non-bank financial institutions by giving the FSOC power to designate those institutions as systemically important and subject them to heightened regulation by the Federal Reserve.<sup>62</sup> In 2019, however, the FSOC adopted guidance that largely neutered its own designation power<sup>63</sup> – that guidance should be replaced and the designation power revived. The FSOC should also consider whether additional financial market utilities need to be designated as systemically important pursuant to Section 804 of Dodd-Frank. In addition, legislative amendments should be made to Section 120 of Dodd-Frank, to authorize the FSOC to promulgate regulations that govern systemically risky activities, not just make recommendations (this and other reforms were included in the Systemic Risk Mitigation Act proposed in 2020).<sup>64</sup>

A “whole system” approach to climate change and systemic risk would also be boosted by implementing my recommendation to give all of the FSOC’s member agencies financial stability mandates – a climate committee on the FSOC would then be able to leverage the work of individual agencies in order to promote stability. In the absence of this kind of mandate, some member agencies may simply not consider climate-related systemic risks to be part of their job description. The Addressing Climate Financial Risk Act of 2021 proposes that “Each member agency should develop and make available a strategy to identify and mitigate climate financial risks *within the jurisdiction of the member agency.*” (emphasis added), but if an agency does not consider financial stability issues to be “within their jurisdiction”, then there will be gaps in the regulation of climate-related systemic risks. To further encourage member agencies to diligently monitor and respond to these risks, the signed statement and testimony requirements in Sections 112(b) and 112(a)(2)(N) of Dodd-Frank could be revised to require each member agency to certify and testify that their individual agency is taking steps to promote financial stability by identifying and responding to emerging climate-related threats.

It would also help to legislate a precautionary definition of “financial stability”, so that the scope of the financial stability mandate is delineated (for the FSOC itself, as well as the individual agencies). Right now, there is no definition of “financial stability” in Dodd-Frank. Something like the following would be helpful:

The term “financial stability” shall mean a state of affairs wherein (i) financial institutions and markets are able to facilitate capital intermediation, risk management, and payments in a way that enables sustainable and inclusive economic growth; and (ii) financial institutions and markets are able to withstand economic and other shocks so that there will be no significant disruption to the performance of the functions set forth in (i).

---

capital has flowed away from SEC registered offerings to exempt offerings and from public markets to private ones. Private equity, hedge funds and other private funds have enjoyed meteoric growth. At the same time, the shadow banking system—a constellation of less regulated capital markets, products, and intermediaries ranging from asset-backed securities to repo to money market mutual funds—has come to dwarf the traditional depository banking system. For climate financial regulation to be effective, policymakers must extend rules to private offerings of securities while simultaneously reversing decades of capital migration to less regulated, darker corners of the financial universe.” PUBLIC CITIZEN & AMERICANS FOR FINANCIAL REFORM, *supra* Note 18, at iv.

<sup>62</sup> This designation power is found in Section 113 of Dodd-Frank.

<sup>63</sup> <https://home.treasury.gov/system/files/261/Authority-to-Require-Supervision-and-Regulation-of-Certain-Nonbank-Financial-Companies.pdf>

<sup>64</sup> Systemic Risk Mitigation Act of 2020, H.R. 6501, 116th Cong. § 5 (2020).

The final challenge that needs to be addressed with regard to the FSOC relates to insurance. Even if all of the other federal financial regulatory agencies have a mandate to coordinate on financial stability issues, insurance will continue to pose a problem because it is primarily regulated at the state level. Financial stability mandates aren't a very good fit for state-level regulators (because financial stability is a borderless public good that will accrue largely to persons residing outside of their state),<sup>65</sup> but leaving insurance out of the discussion about climate as a systemic risk is foolhardy. The Federal Insurance Office ("FIO") should therefore be made a voting member of FSOC, and given more authority "to shape insurance regulation when it has credibly determined that doing so is necessary to help monitor, manage, or prevent systemic risk in insurance."<sup>66</sup>

## 7. Interdisciplinary expertise and the Office of Financial Research

The types of precautionary regulation that I have called for in this statement ask a lot of regulators. Regulatory agencies will need to be nimble, humble about what they don't know, understand environmental as well as financial issues, and staunchly promote the public interest in the face of financial industry pressure. None of this will be possible without the necessary expertise. In addition to the economic, legal, and financial expertise that is already well represented in financial regulatory agencies, there will be an increasing need for climate scientists, environmental economists, data scientists, computer scientists, and complexity scientists.

The benefits of these types of new expertise will be maximized if the expertise is concentrated in a hub, rather than scattered through the different regulatory agencies. Establishing a hub will serve a coordinating function for climate-risk policy, preventing fractured policy from emerging from the different regulatory agencies. A hub will also respond to anticipated hiring difficulties in several ways (with new types of climate-based regulations coming into play, banks and other financial institutions will also be seeking to hire personnel with climate-related expertise, offering salaries that make it harder for the government to attract these personnel). First, consolidating interdisciplinary personnel in a hub prevents agencies from poaching from one another those experts who *are* willing to work for the government. Second, the prospect of working with like-minded experts (rather than being one of a few at an agency where their expertise isn't understood or seen as core to the agency's mission) would be attractive to prospective hires. The synergies that could emerge from having a large innovative and interdisciplinary workforce considering creative responses to climate-related systemic risks (and other emerging systemic risks, like those arising from fintech) would be of benefit to everyone.

The obvious location for this interdisciplinary expertise hub is the OFR.<sup>67</sup> The OFR was created by Dodd-Frank to address the gaps in data availability and analysis that hampered governmental authorities in their response to the events of 2008.<sup>68</sup> It is already authorized to engage in "performing applied research and essential long-term research" by Section 153(a)(3) of Dodd-Frank, and the OFR's Research and Analysis Center is already authorized by Section

---

<sup>65</sup> Daniel Schwarcz & Steven L. Schwarcz, *Regulating Systemic Risk in Insurance*, 81 U. CHI. L. REV 1569, 1628 (2014).

<sup>66</sup> *Id.* at 1635.

<sup>67</sup> For a fulsome discussion of my proposals to reform the OFR, see Hilary J. Allen, *Resurrecting the OFR*, J. CORP. L. (forthcoming), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3727585](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3727585).

<sup>68</sup> Senator Jack Reed, Floor Statement on the National Institute of Finance Act (Feb. 4, 2010).

154(c)(1)(C) of Dodd-Frank to “maintain expertise in such areas as may be necessary to support specific requests for advice and assistance from financial regulators.” The OFR’s staffing and other resources were cut substantially during the Trump Administration,<sup>69</sup> but that offers an opportunity to rebuild the OFR in a new, interdisciplinary way. Because personnel is policy, the next director of the OFR should be committed to using innovative interdisciplinary approaches to address emerging financial stability challenges like climate change.

With this interdisciplinary expertise, the OFR could lead the way in developing climate-related stress test scenarios, as well as new capital risk-weightings that reflect acute climate-related risks.<sup>70</sup> There is also a lack of readily available data about the physical location of assets, and this data is necessary for assessing physical risks:<sup>71</sup> the OFR previously took a leading role in developing standardized legal entity identifiers (known as LEIs), and it could draw on that experience to spearhead a project to standardize reporting of asset locations around the world. The OFR could also work on new types of technology-informed regulatory strategies (often referred to as “suptech”), including a real-time reporting system for operational outages.

In addition to these types of activities, a rebuilt, interdisciplinary OFR could also provide direct assistance to other financial regulatory agencies. While OFR employees would not have primary responsibility for supervising any financial institutions, they could accompany the primary regulators during some examinations, as well as help review call reports and other relevant disclosures made to regulators. Interagency collaboration could also take the form of task forces or joint research projects, where employees of other financial regulatory agencies raise the research questions, and then partner with the technical experts employed by the OFR to develop and interrogate solutions. These kinds of interagency collaboration can be established through Memoranda of Understanding. If the financial regulatory agencies fail to instigate these ventures themselves, then the FSOC’s Deputies Committee can play a coordinating role. The possibility of secondments from other agencies to the OFR should also be explored, with the dual aim of bringing different kinds of regulatory experience (including regulatory problems to be solved) to the OFR, and training secondees on financial stability issues and new interdisciplinary approaches to them in a way that they can take back to their home agency.

These are new proposals for an expanded OFR role; the OFR’s core function of data collection and analysis will also be vital to monitoring climate-related systemic risks. President Biden’s Executive Order on Climate-Related Financial Risk called for “the sharing of climate-related financial risk data and information among FSOC member agencies and other executive departments and agencies (agencies) as appropriate”, and the OFR is the natural candidate to collect and analyze that data. Unfortunately, this is easier said than done – there are currently a lot of roadblocks to data sharing. As former OFR economist Greg Feldberg puts it “[l]egacy data-collection technologies, old-school thinking, and bureaucratic turf fights continue to hinder the authorities’ ability to monitor systemic risks.”<sup>72</sup> Standardization of data reporting formats across

---

<sup>69</sup> “A round of layoffs was conducted in August of 2018, and many more personnel were encouraged to leave. As a result, the agency shrank from over 200 staff in 2016, to 96 as reported in the OFR’s 2019 Annual Report.” Allen, *supra* Note 67, at 11-12.

<sup>70</sup> Gelzinis & Steele, *supra* Note 41.

<sup>71</sup> FIN. STAB. BD., *supra* Note 21 at 13.

<sup>72</sup> Greg Feldberg, *Fixing Financial Data to Assess Systemic Risk*, BROOKINGS 5 (Dec. 2020),

different regulatory agencies as well as across different industries in the private sector will be needed to monitor climate-related threats, as will innovation in new data collection and analysis technologies.<sup>73</sup> Even with these changes, turf wars may remain an issue – the OFR has had difficulties in obtaining data from other regulatory agencies in the past,<sup>74</sup> and that may continue. It would therefore be helpful for any reform legislation adopted to include a clear statutory direction to other financial regulators that they must share data with the OFR.<sup>75</sup> Even in the absence of such a legislative amendment, though, Dodd-Frank already provides indirect authorization for the OFR to collect data from other agencies: Section 153(a)(1) directs the OFR to collect data on behalf of the FSOC, and Section 112(a)(1)(A) directs the FSOC to collect data from other agencies. The FSOC and the OFR working together could therefore compel the production of data from regulatory agencies (the OFR already has the power under Section 153(f) of Dodd-Frank to subpoena data from private sector firms).

As currently structured, the OFR is very dependent on a supportive FSOC and Treasury Secretary. More independence for the OFR is desirable, however: “[i]dentifying financial stability risks and data gaps means saying things that are unpopular. That mission requires more independence, not less.”<sup>76</sup> A number of steps could be taken to give the OFR more independence, including removing the OFR from the Treasury Department (which would include transferring authority for determining the OFR’s funding from the Treasury Department to the OFR itself), and making the Director of the OFR a voting member of the FSOC (they are currently a non-voting member). These steps would require legislative changes; if those are not feasible, it is crucial that the Treasury Secretary and the FSOC support the OFR in its efforts to address climate as a systemic risk.

## 8. Summary of action plan

This statement has covered a wide range of proposals designed to make the financial system more robust to physical and transition risks. Some of these proposals are specific responses to those physical and transition risks, others are intended to improve our financial regulatory architecture in general so that it is better equipped to execute financial stability regulation. These proposals can also be divided into “things that can be done right now”, and longer-term goals. For ease of reference, I will use these categories to summarize this statement’s proposals here.

### Things that can be done right now (without legislative changes)

- Banking regulators

---

<sup>73</sup> *Id.* at 10.

<sup>74</sup> Ryan Tracy, *Washington’s \$500 Million Financial-Storm Forecaster is Foundering*, WALL ST. JOURNAL (Feb. 19, 2018).

<sup>75</sup> For more on this kind of reform proposal, see Gregg Gelzinis, *Strengthening the Regulation and Oversight of Shadow Banks* (Jul. 18, 2019), <https://www.americanprogress.org/issues/economy/reports/2019/07/18/471564/strengthening-regulation-oversight-shadow-banks/>. A provision to this effect was included in Section 5 of the proposed Systemic Risk Mitigation Act, which proposes to amend Section 153(b) of Dodd-Frank to “require any member agency to produce such data and other information as the Director may determine necessary to carry out the duties of the Office.” Systemic Risk Mitigation Act of 2020, H.R. 6501, 116th Cong. § 5 (2020).

<sup>76</sup> Greg Feldberg, *Don’t Dismantle the Post-Crisis Early Warning System*, BROOKINGS (Nov. 21, 2018), <https://www.brookings.edu/research/dont-dismantle-the-post-crisis-early-warning-system/>.

- Deploy the countercyclical capital buffer to provide a capital cushion for climate-related threats
- Disaffirm the “guidance on guidance”
- Require climate-related risk disclosures in the call reports they receive from regulated banks
- Join the Network for Greening the Financial System
- The FSOC
  - Hire more staff
  - Apply the FSOC designation power to any non-bank financial institutions that are systemically important and significantly threatened by physical and transition risks
  - Apply the FSOC designation power for financial market utilities to designate any providers of critical infrastructure to the financial industry that have not yet been designated
  - Coordinate a road map of all the climate-related regulatory approaches that are being (and should be) pursued by each FSOC member agency, together with a timing and implementation plan for each approach.
- The OFR
  - Hire more staff, particularly climate scientists, environmental economists, data scientists, computer scientists, and complexity scientists (offering competitive salaries where possible)
  - Projects should include developing a real-time reporting system for operational outages; developing consistent physical identifiers for financial assets and collateral; working on climate scenarios for stress tests and climate-related risk-weightings for capital requirements
- Investments in infrastructure critical to the provision of financial services (particularly telecommunications infrastructure)

### Longer-term goals

- The next person hired as director of the OFR should be committed to using innovative interdisciplinary approaches to emerging financial stability challenges like climate change
- Pass an omnibus financial reform bill that includes the following:
  - A definition of “financial stability”
  - Financial stability mandates for each FSOC member agency
  - The appointment of an independent chair for the FSOC
  - Amendments to Sections 112(b) and 112(a)(2)(N) of Dodd-Frank requiring each FSOC member agency to certify and testify that their individual agency is taking steps to promote financial stability by identifying and responding to emerging climate-related threats
  - Amendments to Section 120 of Dodd-Frank allowing the FSOC to make rules, not just recommendations, regarding systemically risky activities
  - Directors of the Office of Financial Research and Federal Insurance Office become voting members of FSOC
  - The OFR becomes an independent agency with authority to establish its own funding rule

- A clear statutory direction to other financial regulators requiring them to share data with the OFR
- Pass legislation requiring businesses to accept cash payments
- Coordinate with other members of the Basel Committee on Banking Supervision on:
  - Adding an equity buffer to the leverage ratio to provide a cushion against climate-related uncertainty
  - Adopting a more “macro” approach to the supervision of operational risks