

Incorporating Climate Change into Traditional Supervision

*Kevin Stirob**

Abstract

This note argues that traditional risk management and supervisory programs should incorporate climate-related risk drivers to the extent that they contribute to material risks for supervised banks. The challenge for bank risk managers and supervisors is that climate-related risk drivers are growing and have distinctive attributes such as wide-spread and secular impacts, deep uncertainty, and the belief that the future is unlikely to look like the past, which suggest a need for additional focus from banks and their supervisors to achieve traditional prudential objectives. The note concludes with observations about how supervisory and regulatory activities can effectively incorporate climate-related risk drivers.

Keywords: financial institutions, risk management, supervision and regulation, climate-related risk drivers.

1. INTRODUCTION

The question of how central banks and supervisory authorities should address the economic and financial impact of climate change has received increasing attention since the well-known “Tragedy of the Horizons” speech by then-Governor of the Bank of England Mark Carney (Carney, 2015). Subsequent work by a wide range of central banks and supervisory authorities and by international groups such as the Basel Committee on Banking Supervision, the Financial Stability Board, and the Network for Greening the Financial System has brought this into the mainstream with respect to monetary policy, financial stability, and prudential supervision and regulation through a combination of policy actions, speeches and moral suasion, and rigorous empirical research. Despite these efforts, some debate remains about whether it is appropriate for central banks and supervisory authorities to consider the financial impact of climate-related risk drivers as part of their traditional responsibilities.

This note discusses conceptual issues related to the specific link between climate-related factors and traditional supervisory programs that are designed to promote the safety and soundness of individual financial institutions. The note also presents observations about how banks and prudential supervisors can effectively incorporate climate-related risk drivers into their existing enterprise risk management frameworks and supervisory programs.

* Senior Fellow, Resources for the Future.

2. TRADITIONAL SUPERVISION

Bank supervisors generally expect banks to manage all material risks regardless of the source, i.e., whether they come from a business cycle, a geopolitical event, a cyber threat, or a climate-related risk driver linked to physical or transition risk. That statutory responsibility reflects the observation that banks (broadly defined to include financial institutions that accept customer deposits, provide credit, and offer related financial services) are critically important for the real economy and that resilient banks can best support those activities. Absent supervisory and regulatory intervention, there are good reasons to believe that market forces alone won't lead to optimal financial outcomes from society's perspective.

The standard rationale for the need for prudential supervision and regulation is that market failures such as information asymmetries, externalities, and the resulting institutional responses such as deposit insurance and lender of last resort responsibilities encourage banks to take excess risks from society's perspective (Mishkin, 2001; Stiroh, 2016). As a result, governments developed regulations such as minimum capital standards or liquidity requirements and supervision such as broad risk management expectations and on-site examinations to curb this excess risk-taking. Financial institutions have a responsibility to all stakeholders to pursue opportunities and manage risks in a manner consistent with their corporate strategy and risk appetite. This requires that banks appropriately manage all material risks through traditional risk management approaches such as risk-based monitoring and pricing, business resilience planning, client engagement, and development of robust business strategies and effective governance and controls. The role of supervision and regulation to ensure those processes are effective and consistent with broader societal goals such as the stable provision of financial services.

The challenge is that climate-related risk drivers are deteriorating and have distinctive attributes. For example, Swiss Re (2026) estimates that insured losses from natural catastrophes are growing around 5-7% per year, and climate-related risk drivers are important determinants for some perils such as severe convective storms and wildfires. In addition, climate-related risk drivers have several distinctive attributes that suggest a need for additional focus from banks and their supervisors and regulators.

First, the impact of climate change is likely to be wide-reaching and secular, rather than narrow and cyclical. This suggests that the business models of some banks could be impacted in both the short-run and the long-run and that shocks can compound and materialize over time in new ways. Second, while the direction of travel is clear, the economic and financial impact remains highly uncertain in terms of both the timing and the allocation of impact across regions and sectors. This suggests the need for banks to develop and maintain robust strategies and risk management tools for financial risks and operational resilience and for supervisors to

consider the necessary attributes of an effective risk management and control framework as part of their oversight framework. Third, the future is unlikely to look like the past, so banks and supervisors need new models, data, and expertise such as those required for forward-looking scenario analysis to appropriately account for the impact of climate-related risk drivers. In the United States, for example, the Federal Reserve's pilot climate scenario analysis (CSA) exercise identified data gaps that hindered effective analysis, e.g., characteristics of physical assets such as location, age, and energy efficiency, insurance such as type of coverage, deductible, and replacement value, and borrower attributes related to emissions and transition risk management (Federal Reserve Board, 2024).

This rationale is entirely motivated by traditional, prudential objectives for supervision to ensure that banks manage all material risks to continue to provide critical financial services to the real economy. While it has sometime been portrayed differently, this rationale does not rely on a need for supervisors to broaden their mandate to include additional societal objectives such as those related to facilitating a transition to a low carbon economy.

The Basel Committee on Banking Supervision (BCBS) took this approach through its Taskforce on Climate-related Financial Risks (TCFR). BCBS (2021) focused on the ways that climate change can act as a "risk driver" that impacts traditional prudential risks. This is analogous to the way business cycle dynamics can impact credit risk as borrower income fluctuates or a geopolitical event can impact market risk as perceptions of risk evolve. From a climate risk driver perspective, a severe weather event has the potential to impact a wide range of bank risks. For example, a hurricane might raise a bank's credit risk if default rates among borrowers rise. It may increase a bank's operational risk if its branch network or supply chain are disrupted by the storm. The effects of a storm could also ripple through the local economy or through insurance markets, bringing additional indirect impacts as local economic conditions deteriorate or house prices fall. For example, as the price and availability of insurance change in response to rising physical risks, financial losses get reallocated among borrowers, insurers, and creditors in ways that are difficult to predict and hard to price.

3. RECENT DEVELOPMENTS

When thinking about this framing, it is instructive to consider the evolution of financial policy in the United States, where a fundamental tension has emerged (Stiroh, 2025). On the one hand, the risks are growing and there's a compelling case for risk management described above. At the same time, the U.S. financial sector is pulling back.

All three of the U.S. federal banking regulators (the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC))

exited the Network for Greening the Financial System (NGFS) in early 2025. The publicly stated rationales generally reported that the NGFS had broadened its scope of activities, covering a wider range of issues that went beyond their supervisory mandates. Similarly, in October 2025, the federal banking agencies formally withdrew the risk management guidance that was issued in 2023 (FDIC et al., 2025). The explanation for the shift centered on the idea that risk-specific guidance was not necessary and could be distracting large financial institutions from the management of material financial risks. The Securities Exchange Commission (SEC) ended its defense of the rule requiring disclosure of climate-related risks and greenhouse gas emissions in March 2025 (SEC, 2025). Finally, the Financial Stability Oversight Council (FSOC) rescinded the charters of two climate-related committees that had been started just a few years prior — the Climate-Related Financial Risk Committee and the Climate-Related Financial Risk Advisory Committee in September 2025 (U.S. Department of Treasury, 2025).

In the private sector, the picture is somewhat different with more heterogeneity in responses. For the U.S. insurance sector, for example, climate-related risk drivers continue to be a factor in the determination of the pricing and availability of insurance for mortgage on residential real estate in high-risk areas. A large body of academic work has been developed that links the physical risks of climate change to a wide range of insurance outcomes such as insurance premiums and renewal rates and to related financial outcomes such as house prices or mortgage delinquencies. Sastry and Sen (2025) provide an overview of the link between climate-related shocks, household finance, and the macro-finance literature.

As a related point in the world of insurers, several recent papers have highlighted the question “uninsurable” risks related to climate-driven shocks (Glendon et al., 2025; Jones, 2025, and Mitchell, 2025). These papers raise the possibility that the shifting distribution of shocks can impact supply and demand forces in the market for insurance in a way that causes markets not to clear, i.e., some real estate properties become “uninsurable.” These papers and the broader literature often conclude that traditional insurance tools such as diversifying and broadening the pool won’t be enough to bring the market back to equilibrium. Rather, investment in resilience and adaptation are required as a scalable solution to reduce the underlying risk.

Results for the banking sector are more mixed. In terms of academic research, De Bandt et al. (2025) review over 230 papers and conclude that: “Despite notable progress in terms of the quantity and quality of studies published in recent years, the cumulative impact of physical and transition risks on banks’ exposures remains difficult to quantify for several reasons.” Conceptually, there are reasonable explanations that suggest that this literature understates the potential future impact for the banking sector. The work is largely backward-looking and, as discussed above, the distribution of shocks is likely to change as climate continues to deteriorate. Similarly, climate and economic tipping points can have large and compounding

non-linear effects on economic and financial outcomes and the impact of these types of tipping points are difficult to capture when using historical data. Indirect effects such as spillovers to the local economy through impacts on economic activity or asset values can bring additional losses that might not be captured in empirical studies of particular events.

From the risk management perspective of large banks, Fulvi and Stiroh (2026) review the public disclosure of six large bank in the U.S. and report that banks continue to invest in risk management capabilities related to governance, strategy, risk management approaches, and risk management tools, even as they reduce their focus on a related set of issues such as net zero commitments or sectoral goals related to financed emissions. For example, large U.S. banks exited the Net Zero Banking Alliance, which subsequently ended, and these banks are focusing less of their disclosure to topics related to net zero goals and more disclosure of core risk management tools and process.

It is important to emphasize two caveats about these conclusions. First, these conclusions are generally based on public disclosures, and it is difficult to know whether large banks are disclosing all relevant information and whether they are acting differently or just talking about climate-related risks in a different manner, i.e., the so-called shift from “greenwashing” to “greenhushing.” Second, this type of evaluation has focused on the largest banks in U.S. There is very little systematic information about what small banks are doing.

This is concerning because smaller financial institutions tend to have more concentrated portfolios with lending focused on specific regions and sectors. Moreover, smaller financial institutions tend to have few resources to devote to the development of the new data, models, and expertise that are required to incorporate climate-related risks drivers into existing enterprise risk management frameworks. Of course, financial institutions also benefit from deep knowledge of local economies, e.g., “relationship banking” and “soft information” that can protect them from these types of local hazards. For example, Blicke et al. (2025) report that “local banks avoid mortgage lending where floods are more common than official flood maps would predict, suggesting local knowledge may also mitigate disaster impacts.”

Finally, the recent U.S. experience stands in sharp contrast to the developments in other countries. As a few examples:

- The Bank of England (BoE, 2025) issued SS5/25, which has a goal to promote effective risk assessment and risk management capabilities in the banks and insurers under their supervision.
- The European Central Bank (ECB, 2026) issued a document covering “good practices” that outlined a broad set of effective climate and nature risk management practices.

- The Office of the Superintendent of Financial Institutions (OSFI, 2025) published guideline on climate risk management for banks and insurance companies.

This divergence is interesting for two reasons. First, it reflects different assessments of the relative risks associated with climate-related shocks. Ultimately, that is an empirical question, and it would be helpful to understand the different analytical approaches and models that led to such different conclusions about relative risks and policy actions. Second, a common concern expressed by international banking organizations is the desire for harmonization in supervisory approaches and expectations as a way to reduce supervisory burden, reduce the complexity of the international regulatory regime, and improve efficiency. This divergence in how supervisors think about climate-related risk drivers can contribute to differences in approaches that hamper effective risk management and financial intermediation, which are the traditional goals of bank supervisors.

4. LOOKING FORWARD

This evolution and divergence around climate-related risk management practices raises important questions about the best ways to promote effective risk management in world of new risk drivers. This note concludes with a few high-level principles that might help describe how supervisory and regulatory activities can effectively incorporate climate-related risk drivers.

- *Clarity.* Supervisors and regulators need to be clear on what problem they are trying to solve and how it fits into the existing statutory mandate and responsibilities. In the case of climate-related financial risks, for example, traditional supervisors and regulators need to be clear that the goal is effective risk management, and not broader social goals related to things like promoting a transition to a low-carbon economy or the energy transition. This will help avoid the “strawman” argument that supervisors and regulators are expanding supervisory powers to achieve objectives that are outside of their core mandates and responsibilities. For example, the Basel Committee on Banking Supervision (Basel Committee) explicitly focused on traditional prudential goals in its work. From the perspective of a particular bank, this suggests supervisors should be looking within the enterprise risk management functions and not to those related to corporate social responsibility such as a sustainability function (Fulvi and Stiroh, 2026).
- *Risk-Focused.* The critical first step for any risk management exercise is an assessment of the current and potential future materiality of the risk. This requires careful analytical work that relies on forward-looking assessments through tools such as stress testing and scenario analysis. Moreover, because the impact is likely to vary across different types of geographic exposure, sectoral exposure, bank business model, and risk appetite, a proportionate and risk-focused approach that is tied directly to each bank’s particular risks is likely most appropriate.

- *Broad-based Approach.* The transmission of climate-related shocks to economic and financial outcomes is complex and difficult to model and would likely be most effectively addressed through a combination of many tools, rather than pushing on a single one. For example, the Basel Committee initially undertook a “holistic approach” that included efforts related to all three pillars of the Basel Framework - supervision, regulation, disclosure. For example, the Basel Committee published work on risk management principles for banks and supervisors (Basel Committee, 2022a), frequently asked questions around regulatory issues (Basel Committee, 2022b), and a voluntary disclosure framework for climate-related financial risks (Basel Committee, 2025).
- *Embedded.* As discussed above, the traditional perspective for climate-related financial risks is through enterprise risk management. This follows from the starting point of climate as a risk driver of traditional prudential risks. As such, it is likely to be more effective when this perspective is integrated into existing, business-as-usual practices, rather than developed separately and managed somewhere else. Fulvi and Stiroh (2026), for example, report that most banks view climate as a cross-cutting risk driver that include multiple prudential risks such as credit, market, and operational risks.
- *Flexible.* A core attribute of climate-related financial risk is the inherent uncertainty related to things like climate sensitivity, the relationship between climate factors and economic ones, the behaviour of consumers and firms, and policy responses. As such, a policy approach that builds in flexibility seems appropriate, rather than one that is based on rigid rules or labels that adjust only slowly. It is important to recognize that much remains unknown about how climate-related risks drivers will materialize and impact the real economy and financial sector, so it seems helpful to avoid hard definitions, specific cutoffs, very precise ex-ante ways to classify things as brown or green or high risk or low risk activities.
- *Engagement.* The unprecedented nature of the evolving climate, large scale shifts in the economy, and policy responses raises challenges for all actors including the private sector and the official sector. This suggests that it would be effective to continue to engage, share best practices, and build capacity. For example, the Federal Reserve’s pilot climate scenario analysis exercise was explicitly designed to “enhance the ability of large banking organizations and supervisors to identify, estimate, monitor, and manage climate-related financial risks” (Federal Reserve Board, 2024). Moreover, policy solutions are more likely to be effective and durable if they incorporate a broad range of perspective and insights.

It is also useful to think about this from the perspective of a bank interested in supporting its clients, managing its risk, and meeting the needs of stakeholders. One plausible hypothesis is that identifying, measuring, and managing climate-related risks will prove to be a competitive advantage for commercial banks. If so, banks will have some private incentives to manage these risks. This is true even in a world where there are some market failures that might lead banks

to take excess risk from society's perspective, so supervisors can observe and learn from the risk management approaches pursued across the financial sector.

The discussion of what banks can then do to manage these risks is sometimes framed as choice among two extremes — ignore climate-related risk drivers or completely stop lending and exit the market. This seems extreme, and the reality likely falls in between with a range of actions that banks can take to work with their clients, seek opportunities, and manage the risks that they face.

At one end, it might be perfectly appropriate for a business-as-usual approach for certain risks using the existing data, using the existing approaches for certain risks for certain banks. This depends on the materiality assessment and reflects the underlying heterogeneity of the shocks and the exposures. In other cases, it might be more appropriate for banks to invest in new data, new models, and new expertise to better monitor and understand these risk drivers. Other banks may want to engage with their clients to understand how they are managing their risk, which is ultimately the bank's risk. Banks may want to invest in the business resilience of their own operations, i.e., manage their own operational risk by including different types of physical risk drivers in their business continuity plans to ensure their supply chains, data centers, and branch networks are sufficiently robust. Banks may employ traditional risk management tools that incorporate climate-related factors for things like underwriting decisions and loan pricing, setting concentration limits, or enhanced internal controls. These are all traditional risk management decisions that banks can consider. Finally, in certain circumstances for certain banks, for certain exposures, there might be a strategic solution that involves broader strategic questions such as operating in a particular region, asset class or sector.

5. CONCLUSIONS

This note makes three related points about the link between climate-related risk drivers and traditional prudential supervision that is focused on promoting the safety and soundness of financial institutions.

First, supervisors expect banks to manage all material risks in order to continue to provide critical financial services to the real economy, so the question about climate-related risk drivers is an empirical one and not a conceptual one. If climate-related risks drivers can lead to material risks, then they should be incorporated into banks' existing risk management frameworks and supervisory oversights in a way that is consistent with risks that each bank faces.

Second, it is critical to do the analytical work to make an informed assessment of materiality. It is unlikely to be effective to just assume that past processes and approaches will be sufficient in

a changing world where climate-related risk drivers are evolving. In an environment where the underlying distribution of shocks is shifting, for example, it seems necessary to do a forward-looking empirical assessment of potential materiality in order to make informed judgments about emerging risks and risk management priorities.

Third, both the private sector and official sector need to recognize that the outcome is likely to be heterogeneous across banks depending on their exposures, geographical footprint, sectoral focus, business models, etc. There is no one-size-fits-all solution. The appropriate response, for both financial institutions and for their supervisors and regulators, will depend on the specific bank and its exposure, business model, and risk appetite.

REFERENCES

BANK OF ENGLAND. (2025). SS5/25 - Enhancing banks' and insurers' approaches to managing climate-related risks, Supervisory Statement 5/25, December, 2025. "PS25/25 - Enhancing banks' and insurers' approaches to managing climate-related risks - Update to SS3/19," Policy Statement 25/25, December 2025. "Press Release," December 3, 2025.

BASEL COMMITTEE ON BANKING SUPERVISION. (2021). Climate-related risk drivers and their transmission channels. April.

BASEL COMMITTEE ON BANKING SUPERVISION. (2022a). Principles for the Effective Management and Supervision of Climate-Related Financial Risks. June 13.

BASEL COMMITTEE ON BANKING SUPERVISION. (2022b). Frequently Asked Questions on Climate-Related Financial Risks. December 8.

BASEL COMMITTEE ON BANKING SUPERVISION. (2025). A Framework for the Voluntary Disclosure of Climate-Related Financial Risks. June 13.

BLICKLE, K. S., HAMERLING, S. N., MORGAN, D. P. (2025). How Bad Are Weather Disasters for Bank? *FRBNY Staff Report*, 990. Revised October 2025.

CARNEY, M. (2015). *Breaking the Tragedy of the Horizon – Climate Change and Financial Stability*. Bank of England, September 29.

DE BANDT, O., KUNTZ, L-CH., PANKRATZ, N., PEGORARO, F., SOLHEIM, H., SUTTON, G., TAKEYAMA, A., and XIA, D. (2024). The Effects of Climate Change-Related Risks on Banks: A Literature Review. *Journal of Economic Surveys*, 39(4), 1553-1594, September 2025.

EUROPEAN CENTRAL BANK. (2026). Good Practices for Climate and Nature Risk Management - Observations from the ECB's Five-Year Climate and Nature Risk Programme (2020-25). May.

FEDERAL DEPOSIT INSURANCE CORPORATION, FEDERAL RESERVE BOARD, OFFICE OF THE COMPTROLLER OF THE CURRENCY. (2025). Agencies Announce Withdrawal of Principles for Climate-Related Financial Risks. October 16.

FEDERAL RESERVE BOARD. (2024). Pilot Climate Scenario Analysis Exercise: Summary of Participants Risk-Management Practices and Estimates. May 9.

FULVI, CH., and STIROH, K. (2026). How Large U.S. Banks Manage Climate-Related Financial Risks. Policy Insight. Center for Economic Transition Expertise, August.

GLENDON, S., KOUSKY, C., and SCHAUBLE, B. (2025). Is the Future Insurable? *Probable Futures*, August 13.

JONES, D. (2025). The Uninsurable Future: The Climate Threat to Property Insurance, and How to Stop It. *The Yale Law Journal Forum*, December 3.

MICHAEL, M. (2025). *The Uninsurable Future is Nearly Here - How Climate Change is Pushing the Global Economy into Systemic Risk*. August 18.

MISHKIN, F. S. (2001). Prudential Supervision: Why is it Important and What are the Issues? In F. S. Mishkin (ed.), *Prudential Supervision: What Works and What Doesn't*. January.

OFFICE OF SUPERINTENDENT OF FINANCIAL INSTITUTIONS. (2025). Climate Risk Management. March 7.

SASTRY, P., and SEN, I. (2025). Perspectives on Insurance and Climate Risk. *Journal of Finance: Insights and Perspectives*, forthcoming, December.

SECURITIES EXCHANGE COMMISSION. (2025). SEC Votes to End Defense of Climate Disclosure Rules, 2025-58, March 27.

STIROH, K. J. (2016). The Theory and Practice of Supervision. April 11.

STIROH, K. J. (2025). The Evolving View of Climate-Related Financial Risks in the US Financial Sector. *Common Resources*, Resources for the Future Blog, December 15.

SWISS RE. (2026). Natural Catastrophes in 2025: The Persistent Rise of Wildfire and Storm Risk. *Sigma*, No 1/2026, March 16.

U.S. DEPARTMENT OF TREASURY. (2025). Readout: Financial Stability Oversight Council Meeting on September 10, 2025. September 10.