

Climate stress tests in banking: Navigating risk and climate finance

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A. Introduction

Banking regulators can play an important role for climate change through two primary objectives: safeguarding financial stability by managing climate related risks and through promoting climate finance.¹ This research examines whether climate stress tests can serve this dual purpose: safeguarding financial stability by managing climate-related risks while promoting climate finance. It provides a dual perspective on sustainability law as applied to banking regulation and explores the methodological limits of current approaches and the challenges of extending prudential tools to broader climate policy objectives.

1 European Banking Authority, Report on the Role of Environmental and Social Risks in the Prudential Framework, 12 October 2023, EBA/REP/2023/34.

Traditionally, the primary mandate of banking supervisors has been to ensure the safety and soundness of the banking sector using conventional risk management tools.² Consequently, regulators have adopted a risk-based approach to climate change as they acknowledged climate crisis primarily as a financial risk driver. While they recognise the potential role of banking finance in directing financial flows towards climate goals, their capacity to mobilise capital has been mostly limited by purely risk-based strategies.³ This tension, coupled with the difficulty of quantifying the unprecedented risks pertaining to climate change,⁴ has hindered the development of a more proactive regulatory framework. So, even though reaching a common ground has been challenging, one common approach seems to be the adoption of climate stress tests.

Evident in the use of such tests by the supervisors worldwide, climate stress tests have emerged as a key regulatory response.⁵ They have been studied in the literature, however their dual role, risk management versus climate finance promotion, and the connection between the two have yet to be critically assessed. They are promising testing frameworks for understanding these dual climate objectives of banking regulations, ensuring the safety and soundness of the banking system while fostering a green transition. Thus, these tests will be analysed below to understand what they can offer and what they cannot solve concerning these two objectives.

To conduct this assessment, the methodology for the research combines a systematic literature review, an analysis of the ECB's 2022 climate stress test, and a doctrinal legal review of the EU regulatory framework and relevant Basel Committee publications.

2 Basel Committee on Banking Supervision, *Basel III: A global regulatory framework for more resilient banks and banking systems*, 1 June 2011.

3 Jerome H. Powell, 'Statement on principles for climate-related financial risk management for large financial institutions' (Speech, Federal Reserve, 24 October 2023), <https://www.federalreserve.gov/newsevents/pressreleases/powell-statement-20231024b.htm> (last accessed: 8 September 2025).

4 Patrick Bolton/Morgan Després/Luiz Awazu Pereira da Silva/Frédéric Samama/Romain Svartzman, 'The Green Swan: Central Banking and Financial Stability in the Age of Climate Change' (2020), Bank for International Settlements, <https://www.bis.org/publ/othp31.htm> (last accessed 22 July 2025).

5 See European Central Bank, *Climate Stress Test Report, 2022*; Bank of England, *Results of the 2021 Climate Biennial Exploratory Scenario, 2022*.

B. Climate stress tests

Stress testing has been a critical risk management tool and core element in banking supervision especially since the 2008 financial crisis. In these tests, the resilience of individual banks or the whole banking sector is assessed using scenarios involving a variety of adverse exogenous shocks like market volatility, sharp changes in GDP and employment. These shocks usually consist of extremely severe, but quantifiable, parameters. Upon generating such scenarios, banks are tested to see whether they can withstand such tail risks with their present capital. In the event that it is determined that the amount of capital was not enough to survive such shocks, the relevant capital requirement is adjusted upward.⁶

Climate stress tests build on this practice but differ in methodology and focus. The focus of these regulatory tools is to measure the level of exposure of sector participants to climate change related risks. Also, unlike conventional stress tests, the methodology also needs to account for new risk drivers introduced by climate change. These risks materialize through two primary channels: physical risks, arising from the direct impacts of extreme weather events such as sea level rise, wildfires etc. and transition risks, arising due to the policy, technological, legal, and market changes in the transition to low-carbon economy.⁷

In order to assess climate-related shocks, climate stress tests require the development of forward-looking scenarios based on different transition pathways and their impacts on banks and the financial system. These scenarios evaluate exposure to both physical and transition risks capturing the vulnerabilities from sectoral carbon dependencies, asset location such as mortgages, and long-term climate policy trajectories.⁸

The Network for Greening the Financial System (NGFS) has been a front runner in developing the scenarios used in these climate stress tests.⁹ Their scenarios provide a common and up-to-date reference point for understanding how climate change and climate policy and technology trends

6 John Armour et al. (2016), p. 636.

7 Bolton et al., *Principles of Financial Regulation* (2020).

8 Basel Committee on Banking Supervision, *The Role of Climate Scenario Analysis in Strengthening the Management and Supervision of Climate-Related Financial Risks*, 16 April 2024.

9 Viral V Acharya/Richard Berner Robert Engle/Hyeyoon Jung./Johannes Stroebe/Xuran Zeng/Yihao Zhao, 'Climate Stress Testing' (2023), 15 *Annual Review of Financial Economics*, pp. 497 et seqq.

could evolve in different futures. Each scenario offers a distinct perspective on how climate physical risks and transition risks can present themselves in different future contexts. In addition to these risk drivers, further models are used to translate these climate risks into economic and financial variables such as GDP and interest rates which are then used for stress tests.¹⁰

C. Analysis of climate stress testing from dual perspective

This section is the summary of preliminary findings on the strengths and limitations of climate stress testing for both prudential and climate transition purposes. The analysis is conducted through a systemic review of academic literature, policy documents, and selected supervisory exercises, including the ECB's 2022 climate stress test. Following an initial reading of the main body of work, recurring themes were identified and used to guide a more structured assessment of the sources. These themes formed the basis for the categories used in the analysis. They represent most cited and dominant benefits and limitations, and regulatory implications of climate stress testing as a regulatory tool in light of the initial findings. While the prudential role of climate stress testing can be assessed in terms of its strengths and methodological constraints, its potential role in promoting climate finance is more contested. Building upon the clearer account in Section I of what stress tests currently achieve for prudential purposes, Section II turns to the opportunities and barriers involved in extending these tools to support broader climate policy objectives.

I. Climate stress testing for risk identification and management

Stress testing is already a familiar supervisory instrument, and its application to climate risks has been trialled in practice. These exercises provide valuable insights into risk identification, but also expose the limitations of using risk-based tools to respond to climate crisis. This section reviews the extent to which these tests can succeed in this mission and explore their potential limitations.

10 NGFS, NGFS Climate Scenarios: Technical Documentation (January 2025), <https://www.ngfs.net/system/files/2025-01/NGFS%20Climate%20Scenarios%20Technical%20Documentation.pdf> (last accessed 21 July 2025).

1. Prudential strengths

a) System wide analysis and closing information gaps

One key objective of climate stress testing is that it allows banks to understand their level of exposure and vulnerability to climate change-related risks. As a risk management tool, stress testing enables a granular assessment of transition and physical risks over a longer time horizon than regular risk assessments.¹¹

In the ECB's 2022 stress testing for transition risk, this meant focusing on loan-level data for exposures to 22 carbon-intensive sectors, and for physical risks, mapping exposures at the asset level using location-specific data. Both approaches indicate a granular assessment of climate risks, enabling banks to bridge the gap in understanding how specific assets, sectors, or regions are more exposed. This is essential due to the varying nature of climate risks depending on geography, industry, and time horizon. Stress testing thereby offers significant potential to eliminate the information gap around climate risks in the banking sector.¹²

The lack of data on the risks associated with climate change has been identified as one of the key challenges in sustainable finance. The initiatives and voluntary standards developed to bridge this gap have also created a subsequent problem: inconsistency and incomparability of sustainability data.¹³ In contrast, standardised disclosure frameworks, such as those based on regulatory stress testing results, have the potential to meet the demand for consistent and comparable data. In particular, supervisory stress testing

11 Mercy Berman DeMenno, 'Environmental Sustainability and Financial Stability: Can Macropprudential Stress Testing Measure and Mitigate Climate-Related Systemic Financial Risk?' (2023), 24 *Journal of Banking Regulation*, p. 445.

12 It is worth noting that there is growing discussion in the literature about how the scenarios used in climate stress testing create additional data challenges and are often criticized for their lack of granularity. However, since the goal of regulatory stress testing is the sectoral and geographical quantification of climate risks, this study considers granularity a benefit compared to other regulatory tools.

13 Nathan de Arriba-Sellier, 'The International Regulation and Coordination of Sustainable Finance', in Daniëlla Dam-de Jong/Fabian Amtenbrink (eds), *Netherlands Yearbook of International Law 2021: A Greener International Law—International Legal Responses to the Global Environmental Crisis* (2023), p. 191.

exercises¹⁴ address the systemic nature of climate-related financial risks and reveal results for all stakeholders, including supervisors and regulators.¹⁵

Supervisory climate stress tests aggregate firm-level data and present a comprehensive, system-wide analysis of climate change impacts across the financial sector and broader economy by addressing correlated exposures, contagion effect, and risk propagation.¹⁶ As a unique form of systemic risk, climate change has the potential to trigger both exogenous and endogenous sources of systemic instability. The contagion effects captured through climate scenarios show how climate shocks can be magnified within a complex financial system and guide regulators on the true potential impact on the stability of the banking system.¹⁷

The sophistication of climate stress testing as a risk management tool enables both granular analysis and system-wide assessment of exposures. By breaking down risks by sector and location, these tests reveal climate hotspots.¹⁸ The results provide regulators with a roadmap to introduce targeted regulatory measures.¹⁹ Finally, the disclosure of the data collected and analysed through such exercises enhances market transparency and closes data gaps for market participants to better understand the climate change related financial risks.²⁰

14 Such as the one prescribed under Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms [2013] OJ L176/338, art 100, as amended by Directive (EU) 2019/878 [2019] OJ L150/253.

15 DeMenno (2023), pp. 449 seqq.

16 Ibid.

17 Although current models still do not capture this accurately, regulators and policy-makers such as the EBA are focusing on this area to incorporate contagion effects into scenario pathways.

18 ECB, Climate Stress Test Report (2022).

19 Matthias Täger/Simon Dikau, 'Purposeful Scenario Analysis: A Framework to Guide Central Banks and Financial Supervisors in the Selection and Design of Climate Scenarios' (2023), Grantham Research Institute on Climate Change and the Environment <https://www.lse.ac.uk/granthaminstitute/publication/purposeful-scenario-analysis/> (last accessed: 21 July 2025).

20 As also prescribed by Financial Stability Board, Supervisory and Regulatory Approaches to Climate-Related Risks: Interim Report (29 April 2022) <https://www.fsb.org/2022/04/supervisory-and-regulatory-approaches-to-climate-related-risks-interim-report/> (last accessed: 21 July 2025).

b) Forward-looking analysis

Climate-related financial risks present unprecedented, unique, and erratic features that can only be effectively managed through forward-looking methods.²¹ Scenario analysis and stress testing relying on scenarios have been highlighted by the Basel Committee²² and policy makers as one of the most suitable tools for this purpose.²³

Traditional risk assessment models typically rely on historical data.²⁴ For example, most risk models banks utilise, calculates the probability of default as the average historical default rate for a given counterparty by analysing 5 to 7 years of historical data on the counterparty and calibrating the rate to the maturity date. This is also prescribed by relevant provisions in the Basel standards.²⁵ This reliance on historical data within both the Basel and EU regulatory frameworks creates a significant challenge when integrating forward-looking risks, such as climate-related financial risks.²⁶

Because no historical precedent exists for physical or transition risk events, traditional models are insufficient for estimating their broader economic effects. The forward-looking nature of scenario analysis and stress testing, gives them a noticeable advantage over other regulatory tools for identifying and managing climate-related risks. This is particularly due to their use of scenario design and economic modelling such as DICE.²⁷

c) Scenario development and international cooperation

Process of developing scenarios for climate stress testing leads to improvement in overall climate risk management. This process supports the identification of risks as well as building stronger international cooperation and

21 Bolton et al. (2020).

22 Ebbe Rogge, 'Climate Change Stress Testing for the Banking System', Leiden Law School Research Paper, Hazelhoff Research Paper Series No 14, (2023), <https://ssrn.com/abstract=4453047> (last accessed 21 July 2025).

23 Laurent Clerc, 'Managing Climate Change Risks: The Role of Governance and Scenario Analysis' (2021), 15(1) *Journal of Risk Management in Financial Institutions*, p. 38.

24 Armour et al. (2016), p. 455.

25 Basel Committee on Banking Supervision, Basel III (2011).

26 Basel Committee on Banking Supervision, Climate-Related Financial Risks – Measurement Methodologies, 14 November 2021.

27 Basel Committee on Banking Supervision (2024).

a common language among banking supervisors. NGFS plays a key role in this area and is frequently referenced by both regulators and financial institutions for their own scenario analysis exercises.²⁸ Although not all supervisors adopt the NGFS scenarios directly, almost all use them as a common baseline and supplement them with additional scenarios relevant to their own economies.²⁹

To mitigate climate-related financial risks, the first step is to identify and quantify how climate shocks impact portfolios of banks and, consequently, the financial system. This is an immensely challenging task due to the unprecedented nature of climate change as a financial risk driver, but it remains essential.³⁰ In this effort, the development of climate scenarios contributes significantly to a deeper understanding of climate-related risks.³¹

The models used in scenario analysis and the translation of these scenarios into economic metrics also enhance understanding of climate risks.³² The extensive academic literature developed to improve these scenarios supports more accurate estimations. As DeMenno points out, the process of scenario development may also help refine the frameworks for green taxonomies, sustainable accounting methodologies, and climate risk disclosure schemes, thereby advancing climate risk analytics.³³

Furthermore, the use of common scenarios in climate stress testing promotes international cooperation to identify and mitigate climate-related financial risks.³⁴ Since climate risks often cross-national borders, regulators must work beyond the limits of their jurisdictions. The use of shared scenarios offers a strong foundation for coordination among jurisdictions. Enhanced collaboration between financial and environmental authorities ensures a more accurate translation of climate models into financial risk scenarios, despite differing assumptions.³⁵

28 Rogge (2023).

29 Acharya et al. (2023).

30 Basel Committee on Banking Supervision (2021).

31 Täger/Dikau (2023).

32 Ibid.

33 DeMenno (2023), p. 455.

34 Banque de France, *Climate Scenario Analysis to Assess Financial Risks: Some Encouraging First Steps*, 8 July 2022.

35 DeMenno (2023).

2. Technical and methodological challenges

a) Radical uncertainty

Stress testing introduces innovative ways to integrate climate change into risk management, but, it still does not resolve the fundamental challenge posed by the radical uncertainty of climate related financial risks.³⁶ These risks involve immeasurable probabilities due to complex environmental, social, and economic interactions.³⁷ This complexity also limits the effectiveness of stress testing because these tools rely heavily on assumptions used during scenario design.³⁸ The climate related financial risks are deeply connected to variables such as environmental tipping points, social transitions, and feedback loops. Because these variables are hard to quantify, climate stress test models often fall insufficient.³⁹

There is also uncertainty on the trajectories of transition risks especially considering today's rapidly evolving geopolitical landscape. It is unclear which policies will be adopted to address climate change, and the consequences of those policies for the financial sector are similarly uncertain. While current transition scenarios rely on reasonable assumptions, future developments may follow a different path. As a result, transition risks also remain difficult to assess, even though they are recognised as significant.⁴⁰ This applies to all models based on random variation, but it is especially relevant here because of the significant uncertainty that affects every aspect of climate scenario modelling.⁴¹

36 Bolton et al. (2020).

37 María J Nieto/Chryssa Papathanassiou, 'Financing the Orderly Transition to a Low Carbon Economy in the EU: The Regulatory Framework for the Banking Channel' (2022), 24 *Journal of Banking Regulation*, p. 87.

38 Christine M Albano/Maureen I McCarthy/Michael D Dettinger/Stephanie A McAfee, 'Techniques for Constructing Climate Scenarios for Stress Test Applications' (2021), <https://doi.org/10.1007/s10584-021-02983-4> (last accessed: 21 July 2025).

39 Hugues Chenet/Josh Ryan-Collins/Frank van Lerven, 'Finance, Climate-Change and Radical Uncertainty: Towards a Precautionary Approach to Financial Policy' (2021), 183 *Ecological Economics* 106957.

40 Olaf Weber, 'Climate Stress Testing in the Financial Industry' (2022), 146 *Journal of Business Research*, p. 463.

41 Basel Committee on Banking Supervision (2021).

b) Other methodological challenges

Preliminary findings of this study reveal substantial number of methodological challenges highlighted in the literature that limit the effectiveness of stress testing in identifying and managing climate related financial risks. The following is a selected subset of these challenges.

One major concern relates to the design of economic scenarios. Models commonly used in these exercises, rely heavily on discretionary assumptions. There remains significant uncertainty about how climate change will influence parameters such as interest rates, inflation and financial volatility which are integral inputs for almost all economic models used in stress testing. Current evidence is mixed, and most scenarios assume that lower economic growth due to climate change will result in declining inflation and interest rates. However, these models often overlook complex interactions between climate dynamics and social or economic systems.⁴²

Quantifying contagion effects, which are necessary for system wide analysis also presents a significant challenge. Some researchers have noted that stress tests have not provided reliable early warnings neither for traditional financial risks in the past. As a result, their usefulness as an early warning tool for climate impacts also remains in doubt.⁴³

Time horizons present another important limitation. The effects of climate change extend over several decades, while many financial instruments, such as loans, have much shorter maturities. This mismatch between the duration of climate risks and the exposure period of financial contracts makes alignment difficult.⁴⁴

II. Climate stress testing and promotion of climate finance

Stress tests are a traditional prudential policy tool for identifying and quantifying the risks banks are exposed. This is also true of climate stress

42 Luca Bongiorno/Andrew Claringbold/Lisa Eichler/Claire Jones/Bert Kramer/Louise Pryor/Nick Spencer, 'Climate Scenario Analysis: An Illustration of Potential Long-Term Economic and Financial Market Impacts' (2022), 27 *British Actuarial Journal*, p. 1.

43 Claudio Borio/Mathias Drehmann/Kostas Tsatsaronis, 'Stress-Testing Macro Stress Testing: Does It Live Up to Expectations?' (2014), 12 *Journal of Financial Stability*, p. 3.

44 Rosella Carè, 'Climate-related Financial Risks: Exploring the Known and Charting the Future' (2023), 65 *Current Opinion in Environmental Sustainability* 101385.

tests. However, the scale of banking finance in many economies means that banks must redirect financial flows towards pathways that align with climate pledges. Assessing whether stress tests can support this objective and contribute to the mobilisation of climate finance is therefore crucial. Such an assessment goes beyond evaluating the strengths and limitations of the tool in prudential terms. It also raises questions about the legitimacy of using supervisory instruments to pursue broader policy goals that extend beyond the traditional mandate of safeguarding the safety and soundness of the banking system.

For such purposes, this section explores how stress testing may contribute to the mobilisation of climate finance, while also identifying the obstacles to its effectiveness in this more contested role.

1. Potential for supporting climate finance

a) Evidence based regulatory intervention and legal legitimacy

Stress testing is a critical tool for regulators, providing concrete evidence that supports further regulatory action.⁴⁵ Climate stress tests offer valuable insights into how climate related financial risks may develop into systemic risks and how they affect particular portfolios. This understanding highlights the need for banking regulators and supervisors to implement targeted microprudential and macroprudential regulations.⁴⁶

Banking regulation and supervision operate under strict mandates that require strong evidence to support any regulatory intervention. Core Principles for Effective Banking Supervision⁴⁷ defines the primary objective of banking regulation without leaving any margin for hesitation: *the primary objective of banking supervision is to promote the safety and soundness of banks and the banking system*. Therefore, to leverage banking supervision in combating climate change, the first step is to understand its effects on the safety and soundness of banks. The results from stress tests, showing the impact of the climate change on the banks and banking system, thus can provide the necessary evidence to justify regulatory actions to address climate change.⁴⁸

45 Nieto/Papathanassiou (2022).

46 DeMenno (2023).

47 Basel Committee on Banking Supervision, Core Principles for Effective Banking Supervision, 25 April 2024.

Legal concerns regarding the scope of supervisory authority are frequently raised in discussions about the role of banking regulators in promoting climate finance. This is particularly evident in the United States, where prudential tools and supervisory actions often undergo more legal scrutiny.⁴⁹ As a result, new initiatives aimed at addressing climate risks may face significant delays. However, stress testing stands out as a tool that falls within the core mandate of banking regulators, the safety and soundness of the banking system, and thus satisfies legal and institutional legitimacy.

b) Incentives for banks and investors

As a market-based solution, climate stress testing has the potential to incentivise banks and investors to shift away from investments and institutions that are more exposed to climate change risks and therefore carry higher financial risk. To explore this potential, several studies have examined whether climate stress tests influence investor decisions specifically, whether test results prompt investors to divest from banks with weak climate risk management practices, such as those heavily engaged with carbon intensive and less climate aligned sectors.⁵⁰

While the findings are not unanimous, there is a growing body of evidence supporting the conclusion that climate stress tests can guide financial institutions towards low carbon lending by exposing the risks associated with misalignment with climate goals. For example, one empirical study on the stock reactions to the ECB climate stress testing concludes:

We find that the worst effect was caused by the publication of results (i.e., 08 July 2022), with a sharp decline in both raw and abnormal cumulative returns around the announcement. This is consistent with the main results of the ECB stress test: the exercise revealed many deficiencies, data gaps and inconsistencies across institutions, still at a very early stage in the measurement and management of climate risks.⁵¹

48 Nieto/Papathanassiou (2022), p. 120.

49 Rory Van Loo, 'Stress Testing Governance' (2022), 75 *Vanderbilt Law Review*, p. 553.

50 Romain Hubert/Alexandre Hilke, 'Connecting the Dots Between Climate Risk Management and Transition Finance' (2024), <https://www.i4ce.org/wp-content/uploads/2024/02/Connecting-the-dots-between-climate-risk-management-and-transition-finance.pdf> (last accessed: 22 July 2025).

This finding also suggests a financial incentive for banks to reduce exposure to carbon intensive assets and counterparties in order to maintain investor confidence.

2. Why potential remains limited?

a) Environmental impacts vs. financial risk and return

Although climate change is an established source of financial risk,⁵² the carbon intensity of an asset or a loan does not necessarily reflect its exposure to climate related physical risks. This mismatch between environmental harm and financial risk-return results is a significant shortfall for the use of stress testing.⁵³ For this reason, even the stress tests that succeed in accurately identifying and quantifying climate risks, may not result in increased financing of green projects.

Additionally, climate related opportunities ie a greener portfolio is generally not included in these exercises. For example, while the risk of stranded assets is typically included, the potential upside of low carbon or green investments is rarely considered.⁵⁴

b) Lack of regulatory action

As explained in findings of ECB 2022 climate stress test, climate stress tests are currently conducted for exploratory purposes. Unlike regular stress tests, which have capital implications, the exploratory nature of climate stress tests means they have not yet led to any regulatory changes.⁵⁵ This lack of actionable outcomes means, without further development and commitment, climate stress tests may remain ineffective in mitigating climate-related financial risks.

51 Franco Fiordelisi/Ornella Ricci/Gianluca Santilli, 'Spotlight on Physical Risk: Assessing the Banks' Stock Reaction to the ECB Climate Stress Test' (2025), 98 *International Review of Financial Analysis*, 103882.

52 Kern Alexander, *Stability and Sustainability in Banking Reform: Are Environmental Risks Missing in Basel III?* (CISL and UNEP 2014).

53 Weber (2022).

54 Ibid.

55 Rogge (2023).

In conventional stress testing, if it is assessed that the amount of capital is insufficient to survive such shocks, the relevant capital requirement is adjusted upward. This is not yet the case for climate stress tests. It is also argued by some⁵⁶ that, although more innovative than other tools, stress testing still qualifies as a quantitative risk management method and therefore poses a danger by creating the illusion that banks have successfully identified and controlled the risks related to climate change. In reality, the assumptions used in a limited number of scenarios may reinforce blind spots in the risk management process and harm overall resilience.

c) Gaming the methodologies

The other side of international cooperation and harmonisation achieved through scenario development presents a challenge for the effective use of stress testing in mobilising capital. NGFS developing and making the climate scenarios accessible is a step forward for a more holistic and harmonised analytical framework.⁵⁷ However, the same transparency around the underlying methods and assumptions may lead to banks arranging their portfolios in line with the methodology of the stress tests so that there are no problems identified in their risk management, without actually increasing investment in climate friendly businesses and projects.⁵⁸

D. Conclusion

The preliminary results on the study reveal that climate stress tests can support both climate risk management and the climate transition as it provides a consensus of benefits. However, relying on them alone risks falling short, even of its core prudential objectives evident in the limitations discussed above. Banking regulators and supervisors thus can fulfil both objectives as complementary parts of a broader supervisory strategy, using stress tests as one tool among many.

56 James Fanto, 'Anticipating the Unthinkable: The Adequacy of Risk Management in Finance and Environmental Studies' (2009), 44 *Wake Forest Law Review*, pp. 731, 752.

57 Täger/Dikau (2023), p. 5.

58 DeMenno (2023); Ben S Bernanke, 'Stress Testing Banks: What Have We Learned?' (Maintaining Financial Stability: Holding a Tiger by the Tail Conference, Federal Reserve Bank of Atlanta, Stone Mountain, 8 April 2013).