

# Regulatory Alert

## Regulatory Insights for Financial Services

May 2024

### Climate Risk: FRB Report on Scenario Analysis Pilot

#### **KPMG Insights:**

- **Scenario Expectations:** A bellwether for evolving regulatory expectations for financial institutions (regardless of size) to strengthen quantitative climate exposure analysis—both physical and transitional, and across credit portfolios, geographies, etc. over time.
- **Different Approaches:** Construction of detailed risk scenarios today varies and is largely driven by business models, risk views/appetite, access to data and foreign jurisdiction regulatory experiences.
- **Data Gaps:** Current gaps in data (real estate exposures, insurance, etc.) are filled via third-party vendor models/data and/or proxy estimates; data gaps challenge estimates on climate risks and the role of insurance to mitigate.
- **Enhancing Risk Management:** Expansion of risk governance, internal controls/audits and model risk management needed for the pilot and evolving climate scenario analyses.

The Federal Reserve Board (FRB) issues a [summary report](#) outlining results and insights from its pilot climate scenario analysis (CSA) exercise with six large U.S. bank holding companies (“participants”). The CSA exercise was initially announced in September 2022 and began in January 2023 with the intention of enhancing both supervisors’ and companies’ capabilities for identifying, estimating, monitoring, and managing climate-related financial risks. The summary report is similarly intended to provide aggregated insights from the exercise to help inform companies’ approaches to climate risk management and scenario analysis.

Key features of the report outline the:

1. Pilot CSA Exercise Design and Execution
2. Pilot CSA Exercise Insights
3. Physical Risk Module
4. Transition Risk Module
5. Governance and Risk Management

Details from the report are highlighted below.

**1. Pilot CSA Exercise Design and Execution.** The exercise was comprised of two independent modules, a physical risk module and a transition risk module (see discussion below), each having specific forward-looking scenarios, including core climate, economic, and financial variables.

- Participants estimated the impacts of the scenarios on relevant subsets of their loan portfolios over a future time horizon.
  - The physical risk scenario focused on estimating the effect on directly held residential and commercial real estate (RRE and CRE, respectively) credit exposures over a one-year horizon in 2023.
  - The transition risk module focused on estimating the effect on corporate and CRE loan portfolios over a 10-year horizon from 2023-2032.

- For each scenario, participants calculated traditional credit risk parameters (e.g., probability of default, risk rating grade, loss given default, etc.) for each loan.
- Participants submitted supporting documentation and responses to qualitative questions oriented around four areas:
  - Governance and risk-management practices.
  - Measurement methodologies.
  - Results (including risk metrics and data challenges).
  - Lessons learned and future plans.

**2. Pilot CSA Exercise Insights.** Key findings from the exercise are outlined in the table below:

Insights	Description
<b>Resiliency</b>	Participants used climate scenario analysis to assess resiliency against various climate scenarios (impacts of climate shocks, macroeconomic and loan-level variables on credit risk models) and explore potential vulnerabilities (e.g., probability of default, loss given default, risk rating grade) over short- and longer-term time horizons.
<b>Varying Approaches</b>	Participants utilized different approaches to construct detailed physical and transition risk scenarios and to translate those scenarios into estimates of climate-adjusted credit risk parameters. The differences were largely influenced by business models, views on risk, access to data, and participation in climate scenario analysis exercises in foreign jurisdictions. The report also notes that participants generally used existing credit risk models to estimate climate-related impacts on credit risk parameters.
<b>Data Gaps</b>	Participants noted a range of data gaps related to real estate exposures, insurance, obligors' transition risk management, and infrastructure, and reportedly filled these gaps by sourcing data and/or models from third-party vendors, or by using proxies to provide an estimate. Data gaps presented challenges to the participants, especially in estimating indirect impacts of climate risks and the role of insurance in mitigating these risks.
<b>Additional, Voluntary Analyses</b>	Most participants considered indirect impacts and/ or chronic risks in the physical risk module, such as adjustments to macroeconomic variables in models (e.g., county- or state-level GDP, unemployment, or real estate prices) or effects of insurance coverage and premiums or labor/material costs associated with rebuilding efforts. Some participants also conducted deep dive analyses to understand how obligors intend to manage transition risks over time (i.e., business strategies, profitability, capital needs, etc.). Participants reported that a better understanding and monitoring of indirect impacts and chronic risks, as well as insurance market dynamics, is important for overcoming modeling challenges and managing climate-related financial risks.
<b>Key Design Choices</b>	Participants identified key design choices that meaningfully impacted the insights drawn from the exercise. These included choices related to the scope of the shocks, scenario severity, the starting point of the exercise, insurance assumptions, and balance sheet assumptions.
<b>Risk Management Frameworks</b>	Participants noted the uncertain and challenging nature of designing scenario analysis exercises and measuring climate-related risks, but plan to invest in enhancing their capabilities and integrate it into overall risk-management frameworks.

**3. Physical Risk Module.** Participants were required to consider future climate conditions in the year 2050 and estimate the credit risk impact of different types of acute physical hazards with varying degrees of severity on their RRE and CRE portfolios. The exercise required analysis of a common shock for all participants (e.g., a hurricane in the Northeast region with three scenarios of varying severity) and participants also selected idiosyncratic shocks (e.g., floods, wildfires, convective

storms, winter storms, additional hurricanes, etc.) based on the materiality to their business model and exposures.

- **Damage Estimation.** The two-step process involved identifying physical hazards and estimating resultant property damages. Participants largely relied on external vendor models to simulate physical risk events and estimate property-level damages.

- **Credit Risk Models.** Existing credit risk models were adapted to estimate the impact of climate-related physical risks on credit portfolios, with adjustments made to input variables reflecting the projected damages. Participants focused primarily on estimating the impact of damages to properties in the path of the physical hazard with less work on indirect impacts or broader impacts from chronic changes in climate conditions.
- **Impact Estimates.** Physical risk impacts were estimated for both RRE and CRE loan portfolios under various severity scenarios.

**4. Transition Risk Module.** Participants were required to estimate the credit risk impacts of two scenarios developed by the Network for Greening the Financial System (NGFS), “Current Policies” and “Net Zero 2050”, with different combinations of economic, technological, and policy assumptions and estimates for economic and financial variables (e.g., GDP growth, carbon prices) for each that were used to estimate credit risk impacts on corporate and CRE loan portfolios over the 10-year time horizon.

- **Measurement Methodologies.** Existing stress testing approaches were adapted and, in some cases, new methodologies were developed to estimate property and obligor-level transition risks.
- **Impact Estimates.** Estimates showed higher average probabilities of default in the “Net Zero 2050” scenario for both corporate and CRE loans compared to the “Current Policies” scenario.

**5. Governance and Risk Management.** Participants utilized or adapted existing governance structures to oversee the exercise, with some establishing dedicated working groups or councils. Examples include:

- **Internal Controls.** Participants used existing internal controls where applicable, and instituted

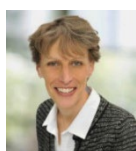
some new controls for the exercise, which were primarily focused on compliance with the Participant Instructions. Other controls related to model inputs, processing, output and estimates, and submission verifications. Most participants noted that time constraints, data limitations, and the nature of the exercise precluded participants from applying a full control framework, which would typically include model validation.

- **Internal Audit.** Participants’ internal audit coverage varied, with primarily limited scope monitoring engagements rather than discrete events. Practices ranged from conducting exercise-specific audits or incorporating testing of the exercise into broader audits of climate risk methodologies to approaching internal audit through continuous monitoring of aspects of the exercise. Most participants reported that time constraints precluded full audits of the exercise.
- **Model Risk Management.** Participants relied on existing model risk-management frameworks to develop the models used for the exercise, but cited several challenges in conducting reviews of modeling frameworks, including limited data, lack of back-testing capabilities, nonlinear risks, scenario horizon, heavy reliance on judgment, limited reliability of model output, and time constraints.

Note: See related KPMG Regulatory Alerts [here](#), [here](#), and [here](#).

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