

Testimony of Francisco Covas

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Before the U.S. House Financial Services Committee, Subcommittee on Financial
Institutions and Monetary Policy

“Stress Testing: What’s Inside the Black Box?”

June 26, 2024

Chairman Barr, Ranking Member Foster and members of the Subcommittee, thank you for giving me the opportunity to testify today. My name is Francisco Covas, and I am the Head of Research at the Bank Policy Institute, which is a research and advocacy group supported by banks with more than \$100 billion in U.S. assets. As our membership comprises the full range of banks covered by the Federal Reserve’s stress tests, we welcome the opportunity to testify today.

The stress-testing regime that underpins the capital framework for large banks has consistently demonstrated that U.S. banks are well capitalized and can continue to support the economy during economic downturns. Since 2020, stress-test results have been used to set a stress-capital buffer that in effect is one element of banks’ minimum capital requirements.

As codified in the Federal Reserve’s Stress Capital Buffer (SCB) rule, the supervisory stress tests, and by extension the supervisory models and scenarios they use, play a significant role in determining banks’ capital requirements. Therefore, these models and scenarios have real-world implications for the cost and availability of credit to households and businesses, and for the role banks play in intermediation of capital markets. Firms use the results of the Fed’s stress test to allocate capital across business lines and products, to better reflect the capital requirements they face.

Banks support the use of a stress capital buffer as a component of their overall capital requirements, but the Fed’s current stress-test models and scenarios are rules that should be subject to notice-and-comment process under the Administrative Procedure Act (APA). In violation of the APA, the Fed discloses limited details on the construction of the scenarios; has failed to adopt and adhere to a standard for constructing those scenarios; fails to publicly disclose many important details of its internal models; and adopts changes to the stress tests each year without granting the public an opportunity to comment, despite the significant effects on the covered banks as well as financial markets and the broader economy.

Economic Implications of Lack of Transparency in the Stress Tests

The lack of transparency in the Federal Reserve’s stress-testing regime has significant economic costs that can adversely affect the U.S. financial system and the broader economy. Stress tests are designed to assess the resilience of large banks during severe economic downturns. The process involves Fed staff projecting loan losses and revenues for each bank under a hypothetical recession scenario. However, the opacity and inaccuracy of the Fed’s models create uncertainty among large banks regarding the level of capital they are required to hold. This uncertainty leads banks to hold excess “uncertainty

buffers” of capital, which increases the costs of providing financial intermediation between borrowers and savers, ultimately reducing credit availability and market intermediation.

A seminal paper by Ben Bernanke, former Fed Chairman, was one of the first to formally analyze the impact of uncertainty on business investment.¹ In his paper, Dr. Bernanke demonstrated that increased uncertainty depresses current investment, particularly for long-lived investment projects and decisions that are economically costly to reverse. The capital requirements for large banks are partially determined by supervisory stress tests. As a result, uncertainty about banks’ post-stress regulatory capital ratios, caused by the lack of accuracy and the volatility in the projections of the Fed’s models, is likely to lead to an underinvestment in banks’ financial intermediation activities.

Banks play a crucial role in the economy by transforming short-term liabilities, such as deposits, into longer-term illiquid assets, such as loans. This maturity transformation function is inherently a long-term investment that is illiquid, making it particularly vulnerable to the uncertainty induced by the U.S. stress tests. Consequently, this uncertainty is expected to depress bank lending, leading to suboptimal outcomes for the economy. By increasing the transparency of the stress tests, the uncertainty surrounding banks’ capital requirements would be reduced. This reduction in uncertainty would boost financial intermediation more broadly, improve banking efficiency and promote a better allocation of capital, as suggested by the academic literature.

Banks also serve as critical intermediaries in capital markets, providing market-making, underwriting and liquidity provision services that facilitate efficient price discovery and capital allocation. Capital markets play a critical role in economic growth, providing about 72 percent of equity and debt financing for non-financial corporate issuers.² However, the Global Market Shock (GMS) component of stress tests significantly increases capital requirements for trading and capital markets activities. The GMS assumes unrealistically long periods of market illiquidity during which banks cannot hedge or rebalance portfolios, and imposes these stresses instantaneously, creating implausibly severe scenarios. As a result, banks have been forced to misallocate capital away from capital market activities, potentially reducing economic growth and market efficiency.

Several academic papers have documented the impact of stress tests on the availability of credit in the United States. The academic literature has mainly focused on the severity of the scenarios included in the stress tests. However, this is highly intertwined with the lack of transparency of the models, because both components contribute to the overall stringency of the test.

Acharya, Berger, and Roman (2018) find that banks subject to stress tests have reduced the supply of credit to borrowers with less than pristine credit scores and to cyclical firms, including small businesses.³ Calem, Correa, and Lee (2021) show that stress tests has led to the reduction in originations

¹ See Bernanke, Ben S., “Irreversibility, Uncertainty, and Cyclical Investment,” *Quarterly Journal of Economics*, February 1983, Vol. 98, No.1, pp. 85–106.

² SIFMA, *US Capital Markets Are the Largest in the World: 2023 Capital Markets Fact Book (2023)*, available at <https://www.sifma.org/wp-content/uploads/2022/07/2023-SIFMA-Capital-Markets-Factbook.pdf>

³ Acharya, Viral, Allen Berger, and Raluca Roman, “Lending Implications of U.S. Bank Stress Tests: Costs or Benefits?,” *Journal of Financial Intermediation*, April 2018, Vol. 34, pp. 58–90.

of jumbo mortgage loans.⁴ Chen, Hanson, and Stein (2018) demonstrate that the four largest banks significantly cut back on lending to small businesses after the Global Financial Crisis (GFC) relative to the rest of the banking sector.⁵ Crucially, they show that this reduction in small business lending led to a decline in the fraction of businesses that expand employment. A cut in such lending also results in slower employment growth, a higher unemployment rate and slower wage growth in counties where the largest banks had a significant presence.

Moreover, Cortés, Demyanyk, Li, Loutskina, and Strahan (2020) showed that banks most affected by the stress tests reduced their supply of small business loans by increasing loan rates and shifting their portfolios toward safer loans.⁶ Brauning and Fillat (2020) found that since the implementation of the annual stress tests in 2011, the portfolios of stress-tested banks have become more similar.⁷ Banks that had poor stress-test results adjusted their portfolios to resemble those of banks that performed well. Although stress testing has led to more diversified individual bank portfolios, it has also resulted in a more concentrated overall portfolio among large banks. Furthermore, banks with worse stress-test results have reduced lending in loans most sensitive to the stress-test scenarios, leading to real economic effects for borrowers. Importantly, the act of banks shifting lending to portfolios that perform well in the stress test without transparency into the approach may lead banks to make decisions based on opaque criteria rather than sound risk assessment, potentially introducing new vulnerabilities into the financial system.

Finally, uncertainty around capital requirements also poses significant challenges for banks as an investment asset class. U.S. banks have experienced a decline in their market value relative to book value over the past decade, partly due to increased regulation.⁸ This trend makes banks less attractive to investors, as evidenced by their low price-to-tangible-book-value ratios compared to the broader market. This regulatory uncertainty makes it difficult for investors to accurately value banks and assess their risk-return profiles. The result is a higher cost of capital for banks, as investors demand higher returns to compensate for the increased risk and unpredictability. These higher costs are ultimately passed on to customers and businesses in the form of higher interest rates or fees. Moreover, during periods of severe financial stress, this diminished investor appetite could significantly impair banks' ability to raise new capital when it is most needed, exacerbating economic downturns and limiting banks' capacity to support lending and economic growth.

⁴ Calem, Paul, Ricardo Correia, and Seung Jung Lee, "Prudential Policies and their Impact on Credit in the United States," *Journal of Financial Intermediation*, April 2020, Volume 42, pp. 1008–26.

⁵ Chen, Brian, Samuel Hanson, and Jeremy Stein, "The Decline of Big-Bank Lending to Small Business: Dynamic Impacts on Local Credit and Labor Markets," NBER Working Paper No. 23843.

⁶ Cortés, Kristle, Yuliya Demyanyk, Li Lei, Elena Loutskina, and Philip Strahan, "Stress Tests and Small Business Lending," *Journal of Financial Economics*, April 2020, Vol. 136, Issue 1, pp. 260–279.

⁷ Brauning, Falk and Jose L. Fillat, "The Impact of Regulatory Stress Tests on Bank Lending and its Macroeconomic Consequences," FRB of Boston Working Paper No. 20–12.

⁸ See Sarin, Natasha and Lawrence H. Summers, "Understanding Bank Risk Through Market Measures," Brookings Papers on Economic Activity, Fall 2016. Available at <https://www.brookings.edu/wp-content/uploads/2017/02/sarintextfall16bpea.pdf>

In conclusion, the lack of transparency in the Fed's stress-testing regime imposes significant economic costs, including reduced credit availability (particularly for small businesses), slower employment growth, diminished market liquidity, and less efficient capital allocation across the banking sector. While reduced credit for riskier borrowers and lower market liquidity could be optimal if stress scenarios were reasonable and models accurate, we believe neither is currently the case. To address these issues, policymakers should establish a cogent standard for stress scenarios, allow public comment on them and provide full transparency on the models used. By reducing the opacity of supervisory models and subjecting scenarios to notice and comment, policymakers can decrease uncertainty and foster a more efficient financial system that better serves the needs of the U.S. economy.

On the Importance of Notice and Comment on the Models Used to Calculate the Stress Capital Buffer

The current SCB framework faces several critical issues that hinder the ability of banks and other stakeholders to effectively assess and manage capital requirements:

- One major issue is the excessive volatility of the SCB, which can fluctuate significantly from year to year, often without reflecting actual changes in a bank's risk profile. This volatility makes it difficult for banks to plan and manage their capital efficiently.
- The lack of transparency in the SCB framework makes it challenging for banks, investors and other stakeholders to understand how the capital buffer requirement is determined and to propose improvements.
- The stress test also produces inaccurate and counterintuitive results inconsistent with more granular bank models and recent market experience, such as trading and counterparty losses during the COVID-19 pandemic.
- The current reconsideration process for the SCB does not give banks a meaningful opportunity to appeal the stress-test results.

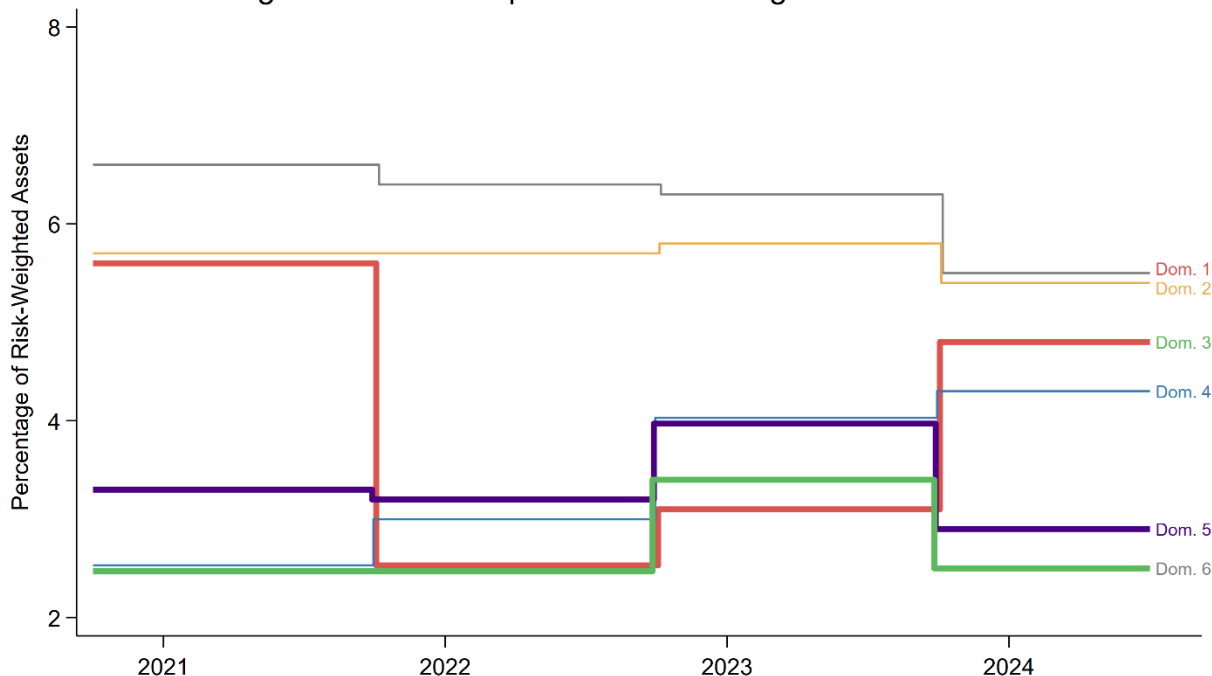
The remainder of this section presents concrete examples of the inaccuracy and volatility of supervisory stress-testing models used to calculate the stress capital buffer. If the Fed made the models transparent, there would likely be substantial review by experts, academics, and banks could then make suggestions to the Fed to update the models to be more accurate and avoid some of the problems that will be discussed next.

SCB Changes Significantly Year Over Year and Often Does Not Align with Changes in a Bank's Risk Profile

The first significant issue with the current stress capital buffer framework is its excessive volatility. Although some volatility in the SCB is necessary and expected as the scenarios change each year to reflect evolving economic conditions, emerging risks and changes to bank portfolios, the current level of volatility appears excessive and disconnected from actual changes in banks' risk profiles. This unpredictability makes it challenging for banks to effectively plan and manage their capital requirements, since there is only one quarter between receiving the stress-test results and the new requirement

becoming effective. By contrast, banks have two years to comply with changes to the global systemically important banks (GSIB) capital surcharge.

Figure 1: Stress Capital Buffers of Large Domestic Banks

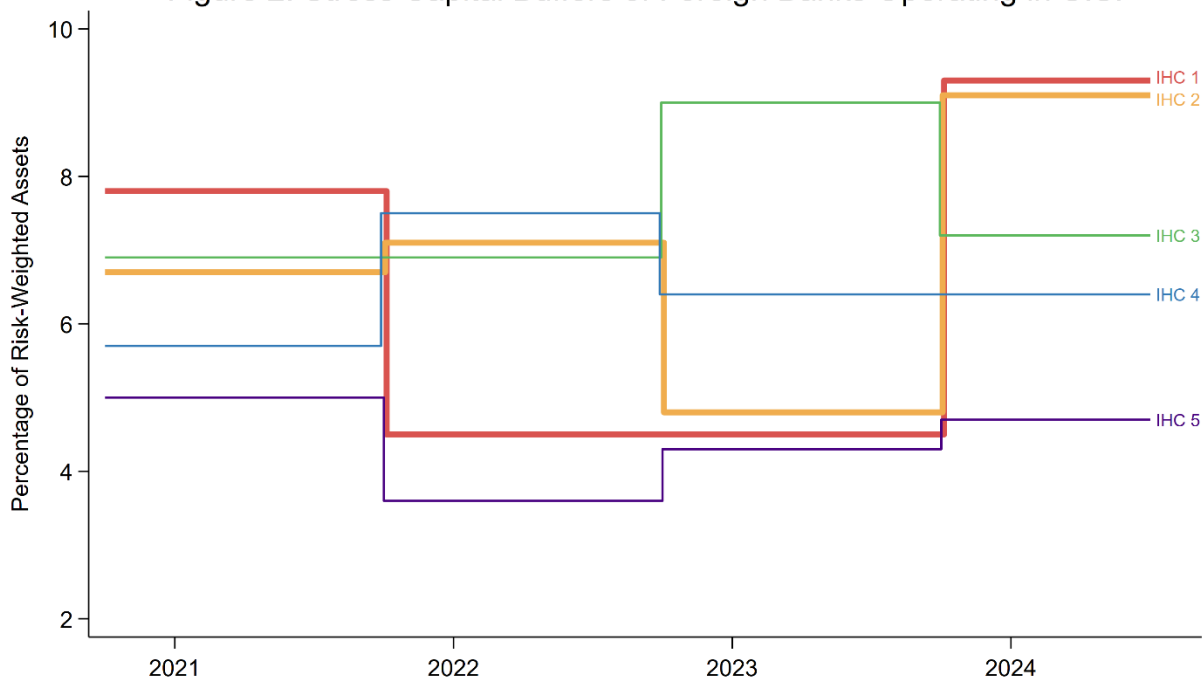


Source: Federal Reserve Board, Large Bank Capital Requirements.

Figure 1 illustrates the time-series variation of six large domestic banks’ SCBs since the inception of the framework in 2020. The significant year-over-year fluctuations in SCBs are readily apparent. For instance, the bank denoted as “Dom. 3” (red line) exhibits an SCB of 5.6 percent in 2020, which declines to 2.5 percent in 2021 before rising again to 3.1 percent in 2022 and 4.8 percent in 2023. These annual variations in the SCB translate to changes in capital requirements ranging from 2 to 3 percentage points. To put these findings into perspective, such changes are comparable in magnitude to the increase in capital requirements that would result from the adoption of the Basel III Endgame proposal from July 2023. As has been widely reported, this proposal has encountered substantial opposition from both banks and a range of end users, including civil rights organizations, farmers, pension funds, small businesses and housing groups.⁹ Furthermore, banks are required to comply with the new SCB-based capital requirements in the quarter following the announcement of their SCB. Figure 1 also shows that the banks labeled “Dom. 5” (purple line) and “Dom. 6” (green line) had an approximately 1-percentage-point increase in their capital requirements in 2022, which subsequently retreated to levels at or below their respective 2021 levels in 2023.

⁹ See Latham & Watkins LLP, “Comments on the Basel III Endgame Proposal,” February 2, 2024. Available at [Comments on the Basel III Endgame Proposal \(lw.com\)](https://www.lw.com/insights/publications/2024/02/02/comments-on-the-basel-iii-endgame-proposal)

Figure 2: Stress Capital Buffers of Foreign Banks Operating in U.S.



Source: Federal Reserve Board, Large Bank Capital Requirements.

Figure 2 plots the year-over-year changes in the SCB for foreign banks operating in the United States, revealing even more pronounced fluctuations compared with their domestic counterparts. For instance, the bank designated as “IHC 1” (red line) has an SCB of 7.8 percent in 2020, which declines to 4.5 percent in 2021 before surging to 9.8 percent in 2023. Managing the allocation of capital across business lines to accommodate such significant changes in capital requirements within a relatively short time poses a formidable challenge for banks. Similarly, the bank labeled “IHC 2” (orange line) also saw a considerable variation in its SCB between 2022 and 2023, amounting to a staggering 4.3-percentage-point increase. This substantial increase in the SCB of these two banks in 2023 coincided with changes implemented by the Federal Reserve to the pre-provision net revenue (PPNR) models for intermediate holding companies during that year. However, the lack of transparency in supervisory models makes it impossible to determine with certainty whether this is the primary reason for the large increases in capital requirements between 2022 and 2023 for those two banks.

PPNR Projections Are Inaccurate and Volatile

As we noted, one important source of the excessive volatility in a bank’s SCB is from undue fluctuations in the projections of PPNR, the amount of pre-tax profits a bank earns before deductions taken for expected future loan losses and other losses. These projections are one of the main determinants of bank performance in the stress tests.¹⁰ The modeling of PPNR was an important

¹⁰ PPNR is defined as net interest income (interest income earned less interest expense) plus noninterest income minus noninterest expense.

innovation introduced by the U.S. stress tests, but it also remains a major weakness of the supervisory stress tests.¹¹ The supervisory stress test models pertaining to PPNR rely heavily on the following criteria:

- Bank-specific effects and autoregressive parameters are overly sensitive to changes in the sample period.
- The macroeconomic variables included in the supervisory scenarios tend to have low explanatory power in most cases (the notable exception being interest rates in the net interest income projections).
- Supervisory projections of PPNR have been a key driver of year-over-year changes in stress-test results and corresponding stress capital buffer requirements for individual banks. These projections have been volatile. As a result, several banks have submitted reconsideration requests regarding PPNR projections, which the Federal Reserve has rejected.

The supervisory stress tests in 2021 and 2022 revealed that the SCB of several banks increased, partly due to changes in the composition of bank assets. Specifically, the growth in bank holdings of reserve balances and other high-quality liquid assets had an impact on the projected noninterest expense, a subcomponent of PPNR. This experience has reinforced concerns that transitory factors unrelated to bank risk, such as the Federal Reserve's quantitative easing, combined with the lack of accuracy in the supervisory projections of several important PPNR subcomponents, may be unduly influencing the stress-test results and driving excessive volatility.

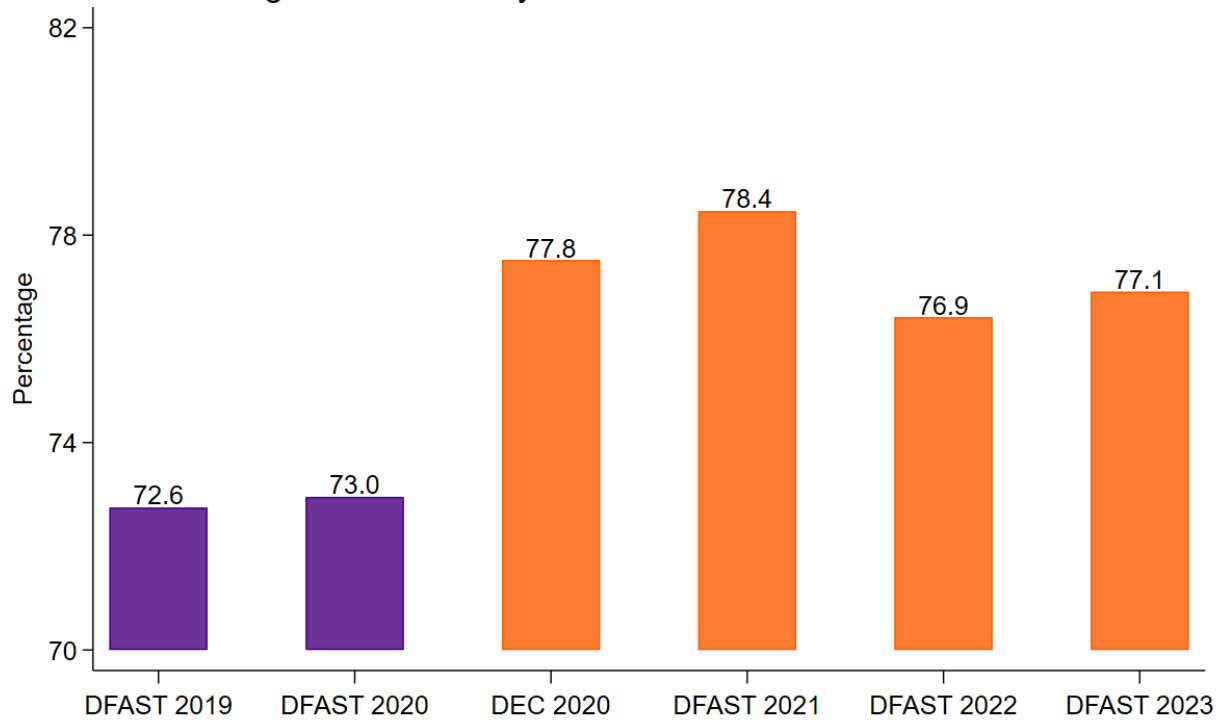
During the COVID-19 pandemic, the Federal Reserve's balance sheet expansion led to a sudden increase in reserve balances and other high-quality liquid assets held by banks. Because the Fed's models assume that noninterest expense is proportional to total assets, even though holding reserve balances entails little or no noninterest expense, the supervisory stress test models overstated the noninterest expense projections of large banks. This overstatement led to larger maximum declines in banks' regulatory ratios and a corresponding increase in capital requirements. The increase in the SCB of several banks was driven in part by these transitory factors unrelated to bank risk, underscoring and reinforcing concerns about the reliability and stability of the projections of several important PPNR components.

As shown in Figure 3, the supervisory projections for the December 2020, DFAST 2021, 2022, and 2023 stress-test results show a material increase in the efficiency ratio compared with the pre-COVID stress tests.¹² Although certain supervisory-modeled revenue items are also normalized by total assets, under the Federal Reserve's methodology, there was a disproportionately higher effect of balance sheet growth on noninterest expense projections.

¹¹ See Hirtle, Beverly (2018), "The Past and Future of Supervisory Stress Testing Design." Federal Reserve Bank of New York. Available at <https://www.newyorkfed.org/newsevents/speeches/2018/hir181009>.

¹² The Federal Reserve started disclosing the projections of the subcomponents of PPNR, which are required to calculate the implied efficiency ratio, after the 2019 stress tests (inclusive).

Figure 3: Efficiency Ratios in 2019-2023 Stress Tests

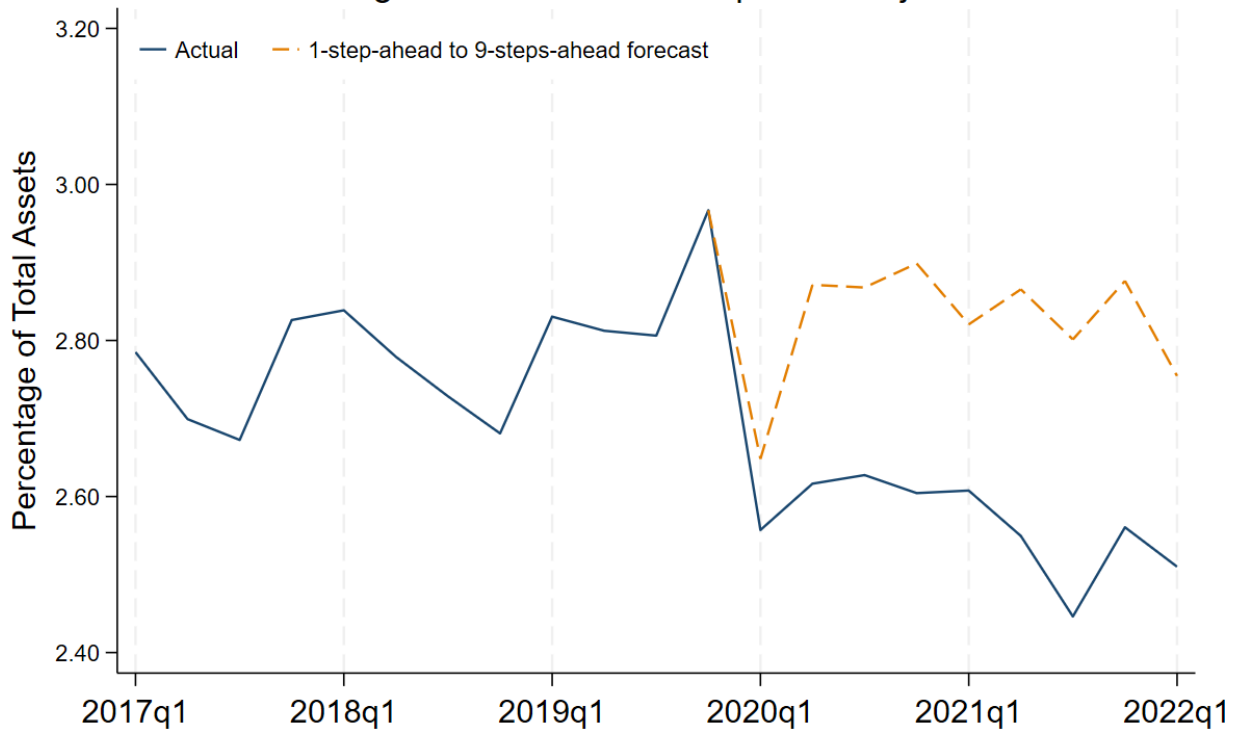


Note: The efficiency ratio is calculated by dividing a bank's noninterest expense by its net revenue (the sum of net interest income and noninterest income).

Source: Federal Reserve Stress Test Results.

Another way of showing the distortion of balance sheet growth on expense projections is to analyze the out-of-sample forecasts over the post-COVID-19 period based on models that approximate the supervisory models for noninterest expenses. The Federal Reserve's description of the expense models offers some information about the functional form of the regression models. Based on this description and an analysis of prior stress results, we constructed models similar to those used by the Federal Reserve and applied them to generate the out-of-sample forecasts.

Figure 4: Noninterest Expense Projections



Source: Federal Reserve Board Dodd-Frank Act Stress Tests, BPI calculations.

Figure 4 shows a substantial deterioration in the accuracy of forecasts of noninterest expense post-COVID. The graphed lines plot the 1-step-ahead to 9-steps-ahead aggregate forecasts of noninterest expense for all stress-tested banks. The model did a reasonable job capturing the initial decline in expenses to assets, but it overstated expenses over the rest of the 9-quarter forecasting horizon.¹³

In summary, the implied efficiency ratios derived from the supervisory projections of expenses and net operating revenues indicates that an increase in bank size as a result of the COVID-19 pandemic had a disproportionate effect on the projections of expenses relative to noninterest income because of the inaccuracy of supervisory models.

Operational Risk Loss Models Are Inaccurate

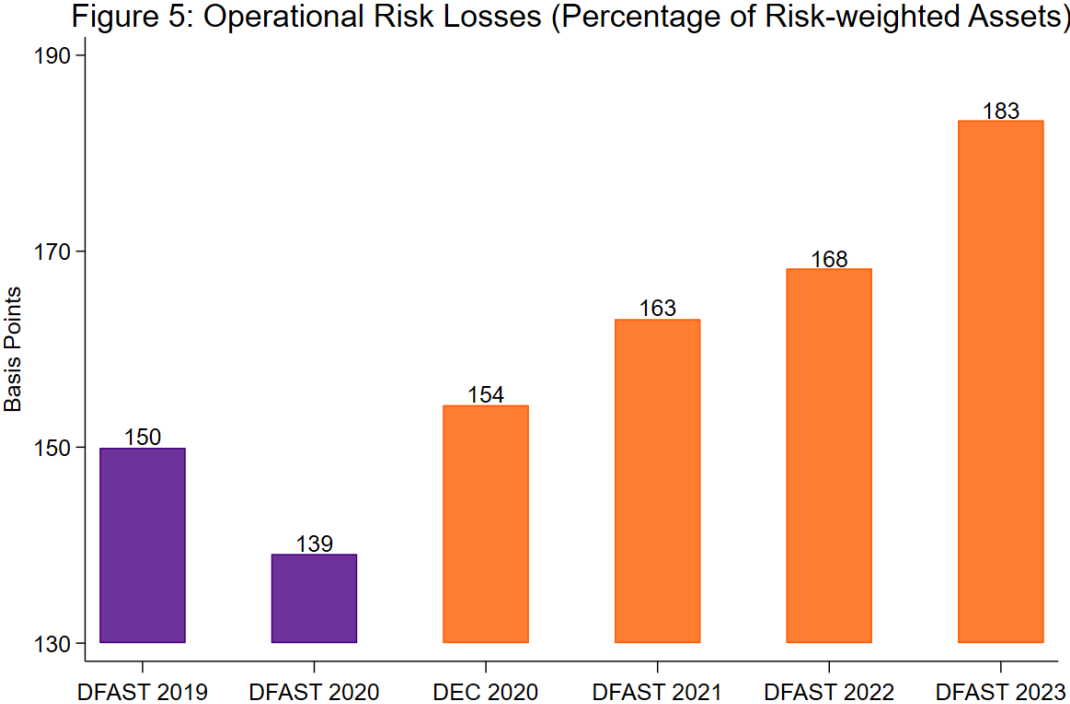
Operational risk encompasses losses resulting from inadequate or failed internal processes, people, systems or external events, including a wide range of potential loss events, such as fraud,

¹³ Moreover, the model picks up the decline in expenses to assets in the first quarter of 2020 for the wrong reason. The driver of the decline in projected expenses to assets is from a decline in compensation due to negative stock returns, whereas in the data, the decrease in expense to assets was caused by an increase in bank size.

cyberattacks, natural disasters and legal or regulatory compliance failures. The Federal Reserve has established no standard for the size or type of hypothetical loss each bank would suffer, and the resulting number appears to be arbitrary. The Federal Reserve’s methodology for calculating operational risk losses in the stress tests lacks transparency, preventing oversight by the public and Congress.

Unlike credit and market risk losses, the Federal Reserve does not disclose bank-specific results on operational risk losses to the banks themselves. Furthermore, it does not report sufficient details on the models used, such as the specific percentile of the tail distribution employed to estimate the projected 9-quarter operational risk loss. This lack of transparency leaves banks with little to no visibility into their own operational risk losses as assessed by the Federal Reserve.

Interestingly, operational risk losses as a percentage of the stress capital charge are steadily increasing post-COVID. There is no evidence that banks are incurring losses to justify such a steady increase.



Source: Federal Reserve Stress Test Results.

In the 2023 stress tests, operational risk losses accounted for about 25 percent of total estimated losses, playing a significant role in the performance of banks over the 9-quarter planning horizon. As illustrated in Figure 5, operational risk losses are an important determinant of a bank’s stress capital buffer size. Estimated operational risk losses have been increasing significantly post-pandemic, but real-world operational losses have not had a similar rise (according to operational risk loss data provided by

ORX).¹⁴ For example, in the 2023 stress tests, losses associated with operational risk events were \$185 billion, which corresponds to more than 1.8 percentage points of risk-weighted assets across all participating banks. The increasing operational risk losses are believed to be linked to banks holding higher liquid asset balances post-pandemic.

Once the Basel III Endgame operational risk capital requirements are implemented by U.S. banks, this duplicative stress test operational risk calculation should be eliminated, since it will be unnecessary as well as inaccurate.

In Volatile Periods, Large Banks Make More Money Trading (Even Though the Fed's Models Say They Don't)

The Federal Reserve's stress-testing models reveal significant shortcomings with respect to the accuracy of their projections of trading revenues for the nine largest banks subject to the GMS component.¹⁵ The primary source of this inaccuracy lies in the insufficiently granular data employed to forecast trading revenues for these institutions. Notably, the trading revenue projections incorporate both the income generated by banks from their trading activities and the mark-to-market gains and losses resulting from fluctuations in the value of their trading assets.

The inclusion of mark-to-market gains and losses within trading revenues gives rise to a scenario in which trading revenues decline as stock market volatility increases. Consequently, this leads to an underestimation of trading revenues starkly at odds with historical experience, which has been that large banks typically generate higher trading profits during periods of heightened market volatility.

As illustrated in Figure 6, banks realized substantial trading income in the initial three quarters of 2020 during the COVID-19 pandemic.¹⁶ These trading revenues can help make up in loan losses during times of stress. However, the Federal Reserve's models do not adequately reflect this real-world dynamic.

¹⁴ See the numerical appendix of "Basel III and standardised approaches to capital Analysis of ORX global banking data in response to regulatory reforms", October 2023, available at

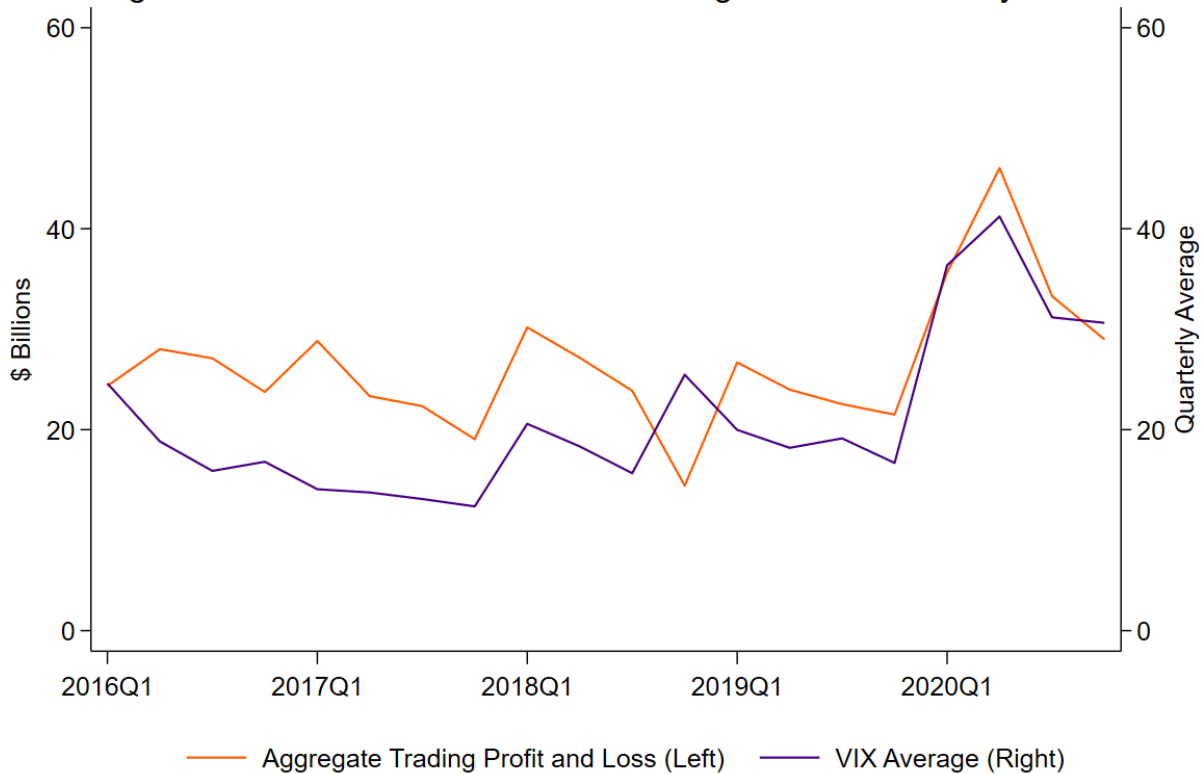
<https://orx.org/resource/basel-iii-and-standardised-approaches-to-capital>

¹⁵ The nine banks are Bank of America Corporation, Barclays U.S. LLC, Citigroup Inc., Credit Suisse Holdings (USA), Inc., DB USA Corporation, The Goldman Sachs Group, Inc., JPMorgan Chase & Co., Morgan Stanley, and Wells Fargo & Company.

¹⁶ See Abboud, Alice, et al., "COVID-19 as a Stress Test: Assessing the Bank Regulatory Framework COVID-19 as a Stress Test: Assessing the Bank Regulatory Framework," April 2021, Finance and Economics Discussion Series, Board of Governors of the Federal Reserve.

<https://www.federalreserve.gov/econres/feds/files/2021024pap.pdf>.

Figure 6: Comovement Between Trading P&L and Volatility Index



Source: Volcker Rule Quantitative Measurements (FR VV-1) and Bloomberg Finance LP.

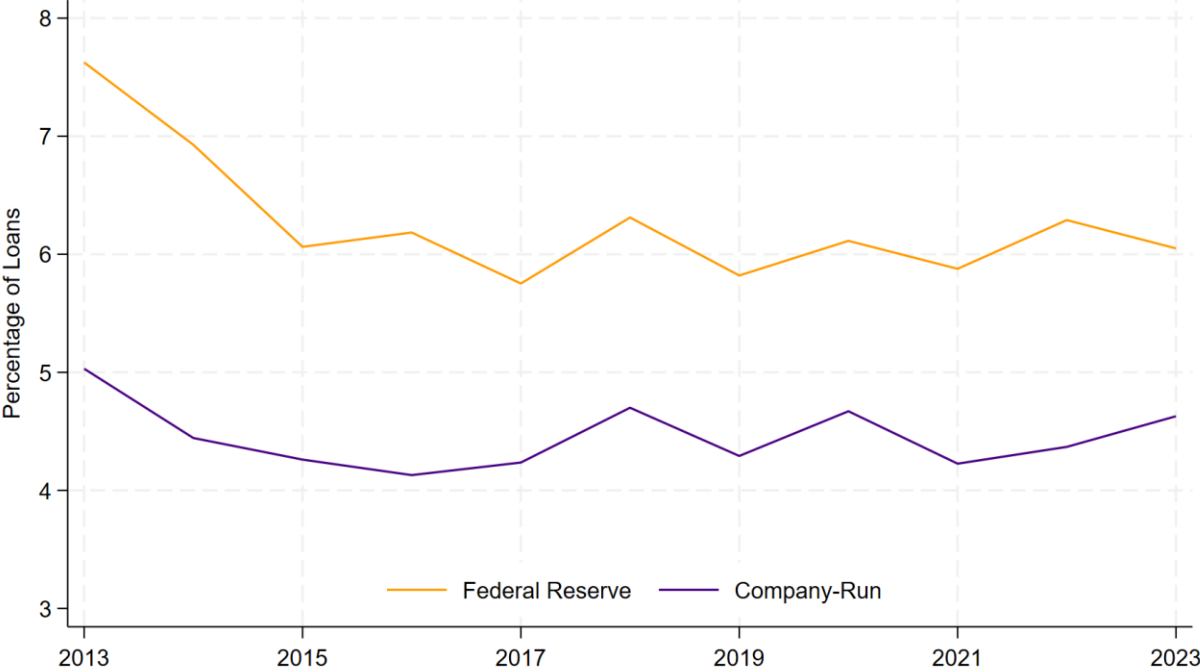
The Fed's PPNR models are particularly inaccurate for banks subject to the Global Market Shock (GMS), because the trading revenue data are not limited to the income banks derive from fees, commissions and the bid-ask spread when executing trades on behalf of their clients, but also include mark-to-market losses. However, the largest banks with significant trading operations are already subjected to a separate assessment of losses stemming from changes in the value of their trading assets, the GMS component. For banks falling within the scope of the GMS component, the amalgamation of income from client trading activities and gains and losses from changes in asset values effectively results in a double counting of losses from asset value fluctuations. This issue is further exacerbated by the substantial losses incurred during the 2008 financial crisis in mortgage and structured credit products. These losses distort the coefficients of the trading revenue model used to generate trading revenue projections, because those products are now far less significant in bank trading portfolios.

The Federal Reserve could rectify this issue and demonstrate the real-world positive correlation between trading revenue from client activities and market volatility by leveraging data already reported by banks through the Volcker Rule metrics or the FR Y-14 report series.

Loan Loss Models Are Inaccurate

The projections of loan losses generated by the Federal Reserve in its supervisory stress tests have consistently surpassed the internal projections of the participating banks (Figure 7).¹⁷ This divergence can be potentially attributed to differences in the loss-forecasting models and balance sheet assumptions used by the Fed and the banks. An analysis of loss rates at the portfolio level reveals that the Fed’s models yield higher projections across all loan portfolios, with the notable exception of credit card loans.

Figure 7: Projected Loss Rates Under Severely Adverse Scenario



Source: Federal Reserve Board and Company-Run (Annual Dodd-Frank Act Stress Test Results Disclosures).

The higher loan loss projections produced by the Fed’s models for all loan types, except credit card loans, indicate that these discrepancies could be attributable to the Fed’s inaccurate estimates of loss given default (LGD). The absence of such differences in credit card loan projections can be ascribed to the fact that the LGD for these loans typically approaches 100 percent. Unfortunately, the Fed does not present a breakdown of the portfolio-level loss rates into their key components, such as probability of default (PD) and LGD, making it difficult to definitively identify the source of the discrepancies. However, the Fed’s elevated loan loss projections for the other portfolios may stem from its failure to incorporate bank-specific effects in its projections, partly because it lacks the necessary data to capture the unique characteristics and business models of individual banks. These simplifications most likely contribute to inaccuracies in the Fed’s loan loss projections.

¹⁷ The chart in Figure 7 includes only Category I through III banks, which report company-run results at least once every two years.

Moreover, the Federal Reserve’s projected losses for fair value option (FVO) loans substantially exceed bank projections. This difference is solely due to the accounting classification of these loans as “fair value option” (FVO) rather than “held-for-investment” (HFI) simply by virtue of accounting classification. FVO loans are measured at fair value, with changes in fair value recognized in the income statement, whereas HFI loans are carried at amortized cost, with loan loss provisions based on expected credit losses. If the Federal Reserve were to apply industry average HFI loss rates to these FVO loan portfolios, the resulting projected losses would be reduced considerably, since the difference in loss rates is not due to any inherent variations in the risk or quality of the loans themselves.

The Reconsideration Process Is Inadequate

Finally, the reconsideration process for appealing the stress-test results is inadequate and lacks perceived independence and transparency. There is no dedicated independent group handling reconsiderations, and banks are granted little insight into the reasoning behind decisions, making it difficult to effectively appeal the SCB. Although there is an existing external advisory board for model validation, it appears to be largely ineffective.¹⁸ Since the SCB became effective in 2020, eight banks have submitted reconsideration requests. However, none of these requests has resulted in any meaningful adjustment to the appealing bank's SCB, raising questions about the effectiveness of the process. While the Fed has acknowledged concerns and indicated plans to review and modify their approach, there is little tangible evidence of changes. Furthermore, the lack of specified timelines for making modifications to the supervisory models creates uncertainty, impeding banks’ capital planning efforts. Establishing a truly independent review mechanism with clear procedures and timelines is crucial.

On the Importance of Notice and Comment on the Scenarios Used to Calculate the Stress Capital Buffer

The Path of the Macroeconomic Variables Violates the Federal Reserve’s Own Guidance

In 2014, the Federal Reserve released a policy statement outlining the Board’s approach to designing macroeconomic scenarios for annual supervisory and company-run stress tests. The Board’s Policy Statement on the Scenario Design Framework for Stress Testing states: “The Board intends to use a recession approach to develop the severely adverse scenario. In the recession approach, the Board will specify the future paths of variables to reflect conditions that characterize post-war U.S. recessions, generating either a typical or specific recreation of a post-war U.S. recession.”

¹⁸ At a Brookings BPEA conference in March 2024, a well-known academic who was part of the Fed’s model validation council suggested that the Fed’s existing advisory board is ineffective: “I remember the failure of SVB a moment for personal reflection. . . . Fortunately I got off the model validation council before SVB happened. . . . I was reflecting on the fact that not once the issues of interest rate risk and run risk that led to SVB came up. . . .” (<https://www.youtube.com/watch?v=l20WbKuWdfE>, 3:50:07)

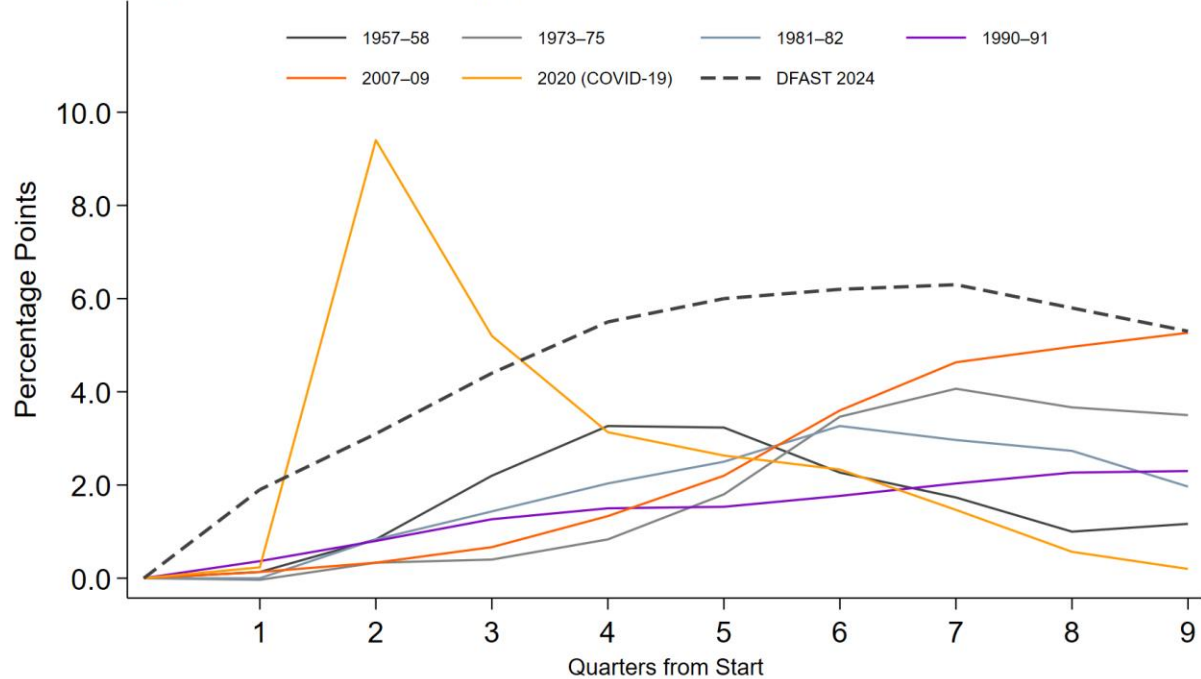
Regarding the unemployment rate, the policy statement emphasizes that the severely adverse scenario will reflect an unemployment rate observed in severe post-war U.S. recessions, measuring severity by the absolute level and relative increase in the unemployment rate. The Policy Statement identifies the severe recessions as those in 1957–1958, 1973–1975, 1981–1982 and 2007–2009. It also specifies that the unemployment rate should increase by either (1) 3 to 5 percent; or (2) the percentage required to reach a 10-percent unemployment rate, whichever is higher.

Following the trajectory of the unemployment rate, the Federal Reserve determines the path of the remaining macroeconomic and financial variables, based on the underlying structure of the scenario and consistent with the empirical relationships between those macroeconomic variables.

However, the 2024 stress scenarios do not align with historical experience or the Fed’s own guidance and should be substantially modified. First, the increase in the unemployment rate is substantially more sudden than experienced during the 2007–2009 Global Financial Crisis and any prior severe recession, with the exception of the COVID-19 pandemic-induced recession (Figure 8). This sudden jump in unemployment is expected to result in projected losses accumulating rapidly and in greater amounts over the stress-test planning horizon. Furthermore, although the increase to 10 percent is consistent with the Policy Statement, that requirement is inconsistent with all post-war recessions, save for the first quarter of the COVID-19 pandemic-induced recession of 2020.¹⁹

¹⁹ During the COVID-19 pandemic-induced recession, the unemployment rate reached 13 percent in the second quarter of 2020.

Figure 8: Path of Unemployment Rate under Stress Conditions/Scenarios

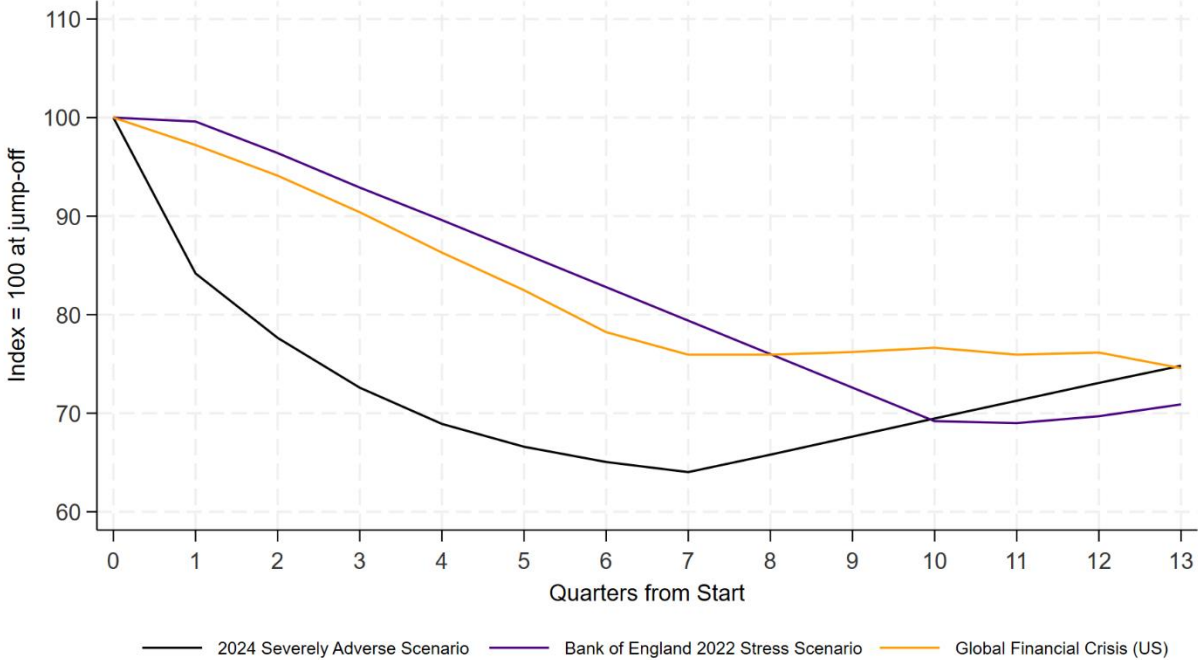


Source: Federal Reserve Board.

Second, several macroeconomic series in the 2024 scenario, such as the housing price index, commercial real estate prices and stock market drop, are significantly worse than in previous recessions, including the 2007–2009 GFC (Figure 9). For example, in the first quarter of the stress planning period alone (not annualized), the Fed projects a decline in the house price index greater than 15 percent, which is much more severe than during the 2007–2009 GFC. Although the differences in the peak decline between the Fed’s and Bank of England’s stress tests are less significant, the decline in the U.S. path is much more frontloaded and severe relative to historical experience and the U.K. stress tests. Given the U.S. housing market’s significant influence on the overall U.S. economy, such a steep decline in house prices leads to a sudden increase in unemployment and a steep drop in interest rates.²⁰

²⁰ The maximum increase in the unemployment rate is determined exogenously, but the duration and the “arc” of the change in the level of the unemployment rate are not. Instead, those dynamics are determined by the endogenous relationships between the macroeconomic variables.

Figure 9: Path of House Price Index under Stress Conditions/Scenarios



Source: Federal Reserve Board, Bank of England.

In summary, the frontloading of the shocks to the macroeconomic variables is likely to cause simulated losses to accumulate rapidly and in greater amounts over the stress period. This results in a scenario much more severe than what characterizes any of the post-World War II recessions. Moreover, the steep drop in interest rates causes net interest income of banks to fall faster than it would otherwise do. This frontloading of shocks further leads to heightened stress capital buffer requirements for banks as a result of how that buffer is calculated. Granting the public an opportunity to comment on the scenarios would ensure the Board amends the macroeconomic scenarios to be consistent with their own policy statement that the macroeconomic scenario should create a typical or specific postwar recession. This would also increase transparency around the choice of the path of the macroeconomic variables.

The Public Does Not Know What Scenario the GMS Represents

The Federal Reserve introduced the GMS component as part of the CCAR process in late 2010, recognizing the inadequacy of the then-prevailing Basel I capital framework for market risk in capturing the risks encountered during the GFC. Although the subsequent implementation of Basel II.5 addressed many of the shortcomings in Basel I for market risk, it was not a perfect solution. Consequently, the incorporation of the GMS component in the 2011 CCAR exercise represented a necessary step taken by the Federal Reserve to ensure that banks maintained sufficient capital to withstand market risk. Since its inception, the GMS has consistently subjected banks with significant trading activity to an extreme stress test.

The underlying principle behind the determination of the GMS component is that during a financial crisis, markets can become illiquid for extended periods, during which banks are unable to hedge or close out positions. The changes in market prices during these periods of illiquidity determine the magnitude of a bank's losses on its positions. If the illiquidity horizon is calibrated based on a stressed historical period, using a longer horizon will result in a larger shock. Similarly, if the shocks are selected from a certain percentile of market movements, such as the 99th percentile, longer horizons will also produce larger shocks. Therefore, the selection of the period of illiquidity essentially determines the severity of the GMS component.

In the Supervisory Capital Assessment Program (SCAP) exercise, a precursor to the CCAR, the Federal Reserve adopted a transparent calibration strategy. They applied the actual shocks observed over the six-month period from June 30, 2008, to Dec. 31, 2008, to the trading portfolios of the five firms with trading assets exceeding \$100 billion. The same methodology was used for the 2011 market stress test. However, it is unclear which proposed or historical crisis period this six-month illiquidity assumption is meant to portray, since it is inconsistent with historical experience. For example, during the COVID-19 pandemic crisis in 2020, trading revenues increased substantially, contrary to what would be expected during a significant period of illiquidity. Despite these inconsistencies, the GMS component during 2010 and 2011 was conducted transparently.

However, the calibration of subsequent GMS tests became less transparent over time. In the early stages of the stress-testing program, the Federal Reserve indicated that the GMS shocks for more liquid trading assets were generally calibrated to movements in asset prices observed over various periods during the latter half of 2008, with less liquid trading assets receiving larger shocks. More recently, the Fed has refrained from characterizing the shocks in terms of the 2008 crisis. The Fed noted in the 2023 CCAR exercise, for example, that it defined the shocks according to time horizons that reflect the inability to sell or hedge exposures during a period of extreme market stress. However, the Fed has not presented specific information about these horizons or the methodology used to determine them.

The GMS component is also equally unclear as to what the scenario represents, since it assumes that three to nine months of stress losses occur instantaneously, without any opportunity for banks to rebalance or hedge their portfolios. This assumption is unrealistic, because certain shocks have an implausibly low probability of happening. Furthermore, the assumption that the largest counterparty will default is deemed unrealistically conservative. Banks have various risk-mitigating tools at their disposal to reduce the impact of a deterioration in a large counterparty's financial condition.²¹

Transparency vs. Gaming the Stress Tests

One of the main objections raised against addressing the concerns about the lack of transparency in the Fed's stress-testing framework is the fear of banks gaming the system. Proponents of this view frequently note that subjecting scenarios and models to notice and comment would give banks

²¹ For additional details, see SIFMA "Global Market Shock and Large Counterparty Default Study, Recommendations for Reforms Based on a Statistical Analysis of Stress Testing Scenarios," August 2019, available at <https://www.sifma.org/wp-content/uploads/2019/09/SIFMA-GMS-LCD-Study-FINAL.pdf>

multiple ways to lower their capital requirements. The proponents fear that if banks knew the scenarios in advance, they could make strategic adjustments to their portfolios that would appear more favorable under those specific scenarios. Furthermore, with full knowledge of the model details, the proponents are concerned that banks could exploit inaccuracies in the models by making targeted changes to their exposures.

The main assumption underlying this gaming risk theory is that Federal Reserve staff are capable of developing scenarios and models to estimate banks' capital requirements but are unable to make changes to the stress-testing framework that would effectively discourage banks from taking advantage of flaws in the supervisory models.

Addressing Concerns About Banks Gaming Stress-Test Scenarios

Let's start by examining the claim that by putting scenarios out for notice and comment, banks would be able to game the scenario by adjusting their balance sheets to reduce their capital requirements. This concern is more relevant for the types of exposures subject to the GMS component than the loans subject to the macroeconomic scenario, since the latter is dictated by banks' business models and market demand.

For their trading positions, the largest banks are required to factor in an instantaneous shock to their trading assets, reflecting interruptions in market liquidity. To discourage window dressing, the Fed chooses a different date each year to which the scenario applies, and this date is not known to banks in advance.²² If concerns persist about banks gaming market risk (for example, by buying insurance against large changes in asset prices), the Fed has several options:

- Use more than one scenario to estimate trading and counterparty shocks.
- Check for unusual changes in banks' exposures as the stress test date approaches by examining whether the bank put on any unusually large, temporary trades that could not be explained by client demand and that also reduced GMS losses. If so, the Fed could disallow the reduction of the unusual trade on the GMS losses.
- Place limits on or disallow certain hedges from the calculation of market risk gains and losses to reduce the incentives for window dressing.

These measures would eliminate the risk of banks gaming the stress test scenarios, while still allowing for public comment and greater transparency in the scenario design process.

Addressing Concerns About Banks Gaming Stress-Test Models

The risk of banks gaming the Federal Reserve's stress-test models is less significant compared with the potential for gaming stress scenarios. It is more challenging for banks to change their own balance sheets to try to take advantage of Fed models than of scenarios, and they have no incentive to

²² Currently, the "as of" date varies between October 1 of the calendar year preceding the year of the stress test to March 1 of the calendar year of the stress test.

game models that overestimate the default risk of their loans or underestimate their revenues. Banks would only be motivated to game models that underestimate risk or overestimate revenues.

The most effective way for the Fed to eliminate the risk of gaming of the models is to make them more accurate. If the models are found to be inaccurate, they should be revised to improve accuracy, which would minimize banks' incentives to exploit any lack of granularity in the models for their own benefit. Subjecting the models to notice and comment would allow for extensive review by experts, academics, and banks, leading to increased model accuracy. This widespread review would also help identify any instances where the Fed's models underestimate risk. Improving model accuracy reduces rather than increases the risk of gaming.

Over the past decade, the Fed's severely adverse scenario has remained relatively stable, with occasional changes in the severity of commercial real estate, house prices and long-term interest rates. Consequently, banks have little further incentive to adjust their portfolios beyond their current practices. It is well documented that banks have significantly reduced their exposures to small and middle-market business loans and residential mortgage loans in response to stress tests and other post-crisis regulations. However, this is a natural response to the increased cost of funding those loans. Regarding market risk, the issue of banks exploiting inaccuracies in supervisory models does not arise, since the projections of trading and counterparty losses are generated using banks' own models.

In general, the notion that the details of the stress tests cannot be made public because those subject to the tests might align their behavior with its rules and standards is an untenable premise. To adapt to regulatory imperatives is not gaming or reverse engineering; it is obedience and compliance. It is entirely appropriate for firms to make capital allocation and other business decisions based on how certain exposures or activities are treated in stress tests, which offer a view into the Federal Reserve's beliefs on the riskiness of those exposures or activities. Indeed, the risk weights assigned by the banking agencies to assets and investments under the regulatory capital rules also influence the business decisions of banking organizations. Yet no one would argue that this fact should allow the banking agencies to withhold those risk weights from the public.

Legal Implications of Lack of Transparency in the Stress Tests

The current stress-testing framework is legally vulnerable in several respects. Note that under the Administrative Procedure Act, both the scenarios and the models are best viewed as legislative rules (or components of these rules) that must be adopted through notice and comment and, once finalized, published in the *Federal Register*.²³ The scenarios and the models that compose the stress-testing framework we have discussed have the force and effect of law because they change a bank's minimum capital requirements. Changes to the scenarios and models affect the stress-test results, which in turn automatically raise or lower a bank's mandatory stress capital buffer. The stress capital buffer imposes

²³ The Administrative Procedure Act defines "rule" broadly to include "the whole or part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or describing the organization, procedure, or practice requirements of an agency." 5 U.S.C. § 551(4). The Federal Reserve Board's stress-test scenarios and models apply generally to banks, and they have future consequences that implement "law or policy" concerning capital requirements.

legal restrictions on a bank's ability to make capital distributions or pay out discretionary bonuses. The Fed's rules impose severe restrictions on those payments if a bank's capital falls below the minimum requirements.

Summary

The lack of transparency in the Federal Reserve's stress-testing process has significant economic costs and impedes banks' ability to effectively manage their capital requirements. The current stress-capital buffer framework suffers from excessive volatility, inaccurate projections, and an inadequate reconsideration process. The Fed's projections of various components (such as PPNR, operational risk losses, trading revenues, and loan losses) are inaccurate and inconsistent with real-world observations.

Moreover, the stress scenarios violate the Fed's own guidance and are significantly more severe than historical recessions. Addressing concerns about banks "gaming" the stress tests can be achieved through various measures, while still allowing for the scenarios and the models to go through a notice-and-comment process.