

DFAST 2022: Volatility, Capital Increases, and the Implications for the U.S Economy

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EXECUTIVE SUMMARY

The DFAST 2022 results released last week strongly suggest that capital requirements of many large banks will increase later this year, in some cases significantly. Some of the increase is driven by scenario design and lower allowances for credit losses at the start of the test. However, another portion of the increase is driven by noise in the Federal Reserve's net revenue projections that arbitrarily inflate expenses (including operational risk losses) of banks that received a large influx of deposits during the pandemic. Very little—if any—of the increase reflects actual increased risk in the portfolios of banks.

Based on current dividends and analysts' projections of dividend payouts, BPI expects the aggregate stress capital buffer to increase 40 basis points to 3.7 percent. We project that Category I banks (also known as global systemically important banks or GSIBs) will experience an increase of 60 basis points. Compared with other jurisdictions, the U.S. already had very high capital requirements. These further increases are likely to raise the cost of credit from the banking sector and [slow U.S. economic growth](#).

Part of this year's increase in capital requirements reflects the Fed's scenario choices, such as a higher jump in the unemployment rate compared with last year's scenario. An even more important factor is the decline in banks' allowances relative to the pandemic-era peak. However, the abrupt increase in banks' balance sheets during the pandemic is also causing the Federal Reserve's models (specifically, pre-provision net revenue (PPNR) and operational risk models) to overstate noninterest expense projections of large banks. Very briefly, some of the net revenue models used by the Federal Reserve assume fee income, expenses and operational risk losses increase due to an expansion in bank balance sheets. This happens even when that expansion has resulted from increased holdings of reserve balances at Federal Reserve Banks and other types of high-quality liquid assets, rather than an increase in higher-risk assets. It is challenging to quantify the effect of this overstatement on the stress capital buffer (SCB) of banks, because many important details about Federal Reserve models are not known to the public. But for example, aggregate projected losses from operational-risk events rose \$44 billion between DFAST 2020 and 2022, or about 40 basis points relative to current aggregate risk-weighted assets, even though the scenario was generally more severe in DFAST 2020.

WHY ARE DFAST RESULTS SO IMPORTANT FOR BANKS?

DFAST results directly feed into banks' effective capital requirements for the coming year. This was not always the case. Back in 2013, when the Federal Reserve started publishing the results from the Dodd-Frank Act Stress Tests (DFAST), the most important results were those released one week later, under the title "Comprehensive Capital Analysis and Review" (or CCAR). This second wave of stress test results combined the Fed's stress projections for each bank under DFAST with banks' own planned capital distributions projections. At that time, the focus was on the CCAR exercise's "pass-fail" feature. Based on the Fed's own stress projections, banks tried to guess how much capital they could distribute to their shareholders without falling below their minimum capital requirement, and thereby failing CCAR.

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The Federal Reserve now operates a different process, whereby stress testing is not a pass-fail exercise but instead produces an explicit capital charge. Under this regime, capital to cover projected losses under the stress tests, the SCB, corresponds to the maximum decline in each bank's common equity tier 1 (CET1) capital ratio under the DFAST's severely adverse scenario. In addition, the SCB also requires a bank to "prefund" one year of common stock dividends and is floored at 2.5 percent. The SCB is then added to 4.5 percent, any GSIB surcharge and any countercyclical capital buffer to produce each bank's total CET1 requirement.¹

Under the SCB framework, banks' projected capital distributions are part of their ongoing capital requirements. These requirements are not part of the international Basel standards and therefore make U.S. capital requirements more stringent than most other jurisdictions. The fact that even the Federal Reserve projects that banks would still have more than twice the minimum capital required *even after* going through an extreme stress scenario demonstrates that U.S. banks start the stress tests with already elevated capital ratios because they are subject to very high capital requirements.²

HOW WILL LARGE BANKS' CAPITAL REQUIREMENTS CHANGE WITH THE DFAST 2022 RESULTS?

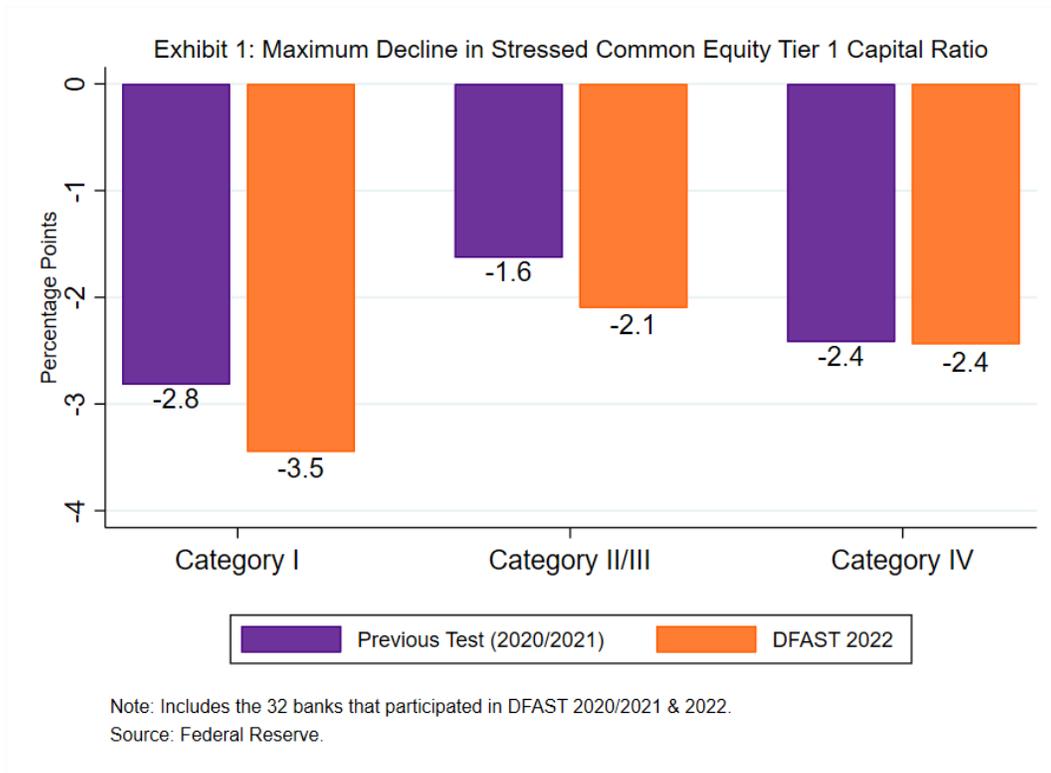
We project that banks' capital requirements will generally increase. The scenario considered in this year's stress tests is more extreme than last year's stress scenario. This is consistent with the Federal Reserve's stress testing policy, which provides that stress scenarios will be more severe when the unemployment rate is low at the start of the scenario. Even more importantly, because economic conditions have improved over the past two years, bank allowances for credit losses have declined significantly. Lower allowances at the start of the stress tests require banks to increase provisions even more, which results in larger declines in banks' CET1 capital ratios.

Therefore, it is not surprising that the maximum decline in banks' stressed CET1 capital ratios increased across most bank types shown in Exhibit 1.³ Compared with last year, the aggregate CET1 capital ratio declines more steeply for banks in Categories I, II and III, but is almost unchanged for banks in Category IV. For banks in Category I, the aggregate decline in this year's stress tests was 3.5 percentage points. This represents a 0.7-percentage point rise compared with last year. For banks in Category II and III, the 2.1-percentage point decline is 0.5 percentage points higher than the decline in DFAST 2021.

¹ If a bank's CET1 capital ratio falls below the sum of its SCB and the regulatory minimum (and the GSIB surcharge for Category I banks), it becomes subject to restrictions on capital distributions.

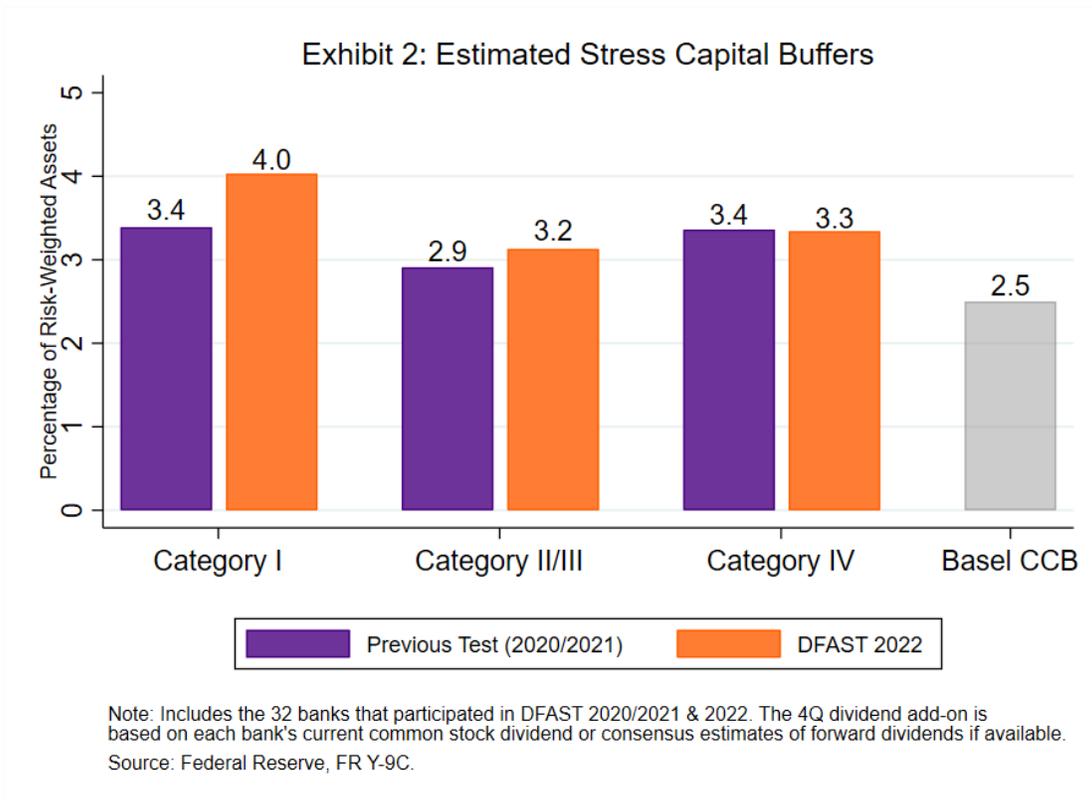
² The fact that no banks failed the stress test does not indicate that the test is too easy. Banks adjust their capital levels so that they expect to pass the test with high confidence because failing is costly. A Fed plan to implement a test each year so surprisingly tight that some banks fail can only end with all banks funded 100 percent with capital, which would not be sound economic policy.

³ Category I banks are the U.S. global systemically important banks (GSIBs); Category II/III banks are those with at least \$250 billion in total assets or at least \$75 billion in cross-jurisdictional activity, nonbank assets, weighted short-term wholesale funding, or off-balance sheet exposure and that do not meet the criteria for Category I; and Category IV banks are those with at least \$100 billion in total assets and that do not meet the criteria for Categories I, II, or III.



To determine how the results of the stress tests translate into a bank’s capital requirement, it is necessary to add the common stock dividends that each bank plans to distribute to shareholders over the next year, since the SCB framework essentially requires banks to prefund these dividends. Banks have two business days after the release of the stress test results to determine this. As of the posting of this note, banks have not yet announced their dividends for the next year. The estimated stress capital buffers shown in Exhibit 2 therefore either assume that dividends stay at their current level or, in a few cases, rely on consensus estimates of forward dividends available between the second quarter of 2022 and the third quarter of 2023.⁴

⁴ These estimates of forward dividends are generally slightly higher compared with the current dividend payouts.



Based on this year's stress test results and common dividend assumptions, BPI projects the average SCB across Category I banks will increase from 3.4 percent to 4.0 percent. At the bank level, we estimate that the three largest banks will see an increase in their SCBs of about 1 percentage point. This is a very sizable increase in capital requirements for those banks, especially against the current backdrop of rising interest rates (which drives unrealized losses on securities up and reduces common equity tier 1 capital for banks subject to Category I or II standards⁵) and growth in risk-weighted assets due to the ongoing strength in bank lending (lending that could help avoid or mitigate a possible recession).

In addition, even before the release of the DFAST 2022 results, the average SCB of Category I banks was already 90 basis points higher than Basel's CCB (represented by the gray bar in Exhibit 2). The CCB is the component of Basel capital requirements that the SCB replaces in the United States. This year's results push the average SCB of Category I banks to 150 basis points higher than the Basel CCB requirement of 2.5 percent.

BPI projects that the average SCB of Category II and III banks will increase 30 basis points to 3.2 percent and therefore 70 basis points above the Basel CCB requirement of 2.5 percent. Finally, we project the aggregate SCB of Category IV firms to decline slightly to 3.3 percent (though it is possible that some Category IV firms may decide to increase the dividend after the market closes on June 27, which would increase their SCBs). That said, there are sizable moves in the SCBs of the individual Category IV banks, and we project that one firm will experience a 240-basis-point increase in its SCB.

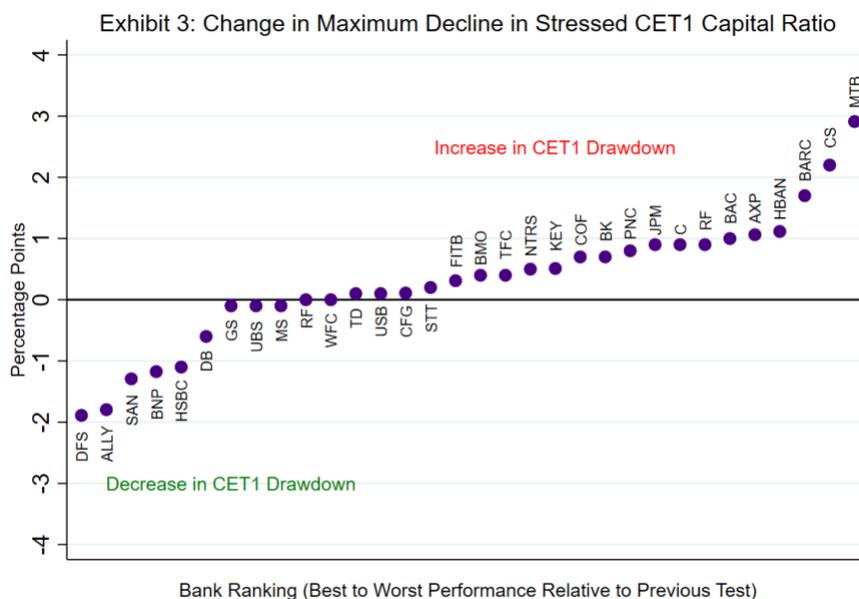
⁵ Only banks subject to Category I or II standards must include accumulated other comprehensive income in their capital calculation. However, investors also look at measures of tangible common equity that also excludes unrealized losses on investment securities.

WHAT DOES BANK-LEVEL VOLATILITY IN THIS YEAR'S STRESS TEST RESULTS TELL US ABOUT CHANGES IN BANKS' RISK LEVELS?

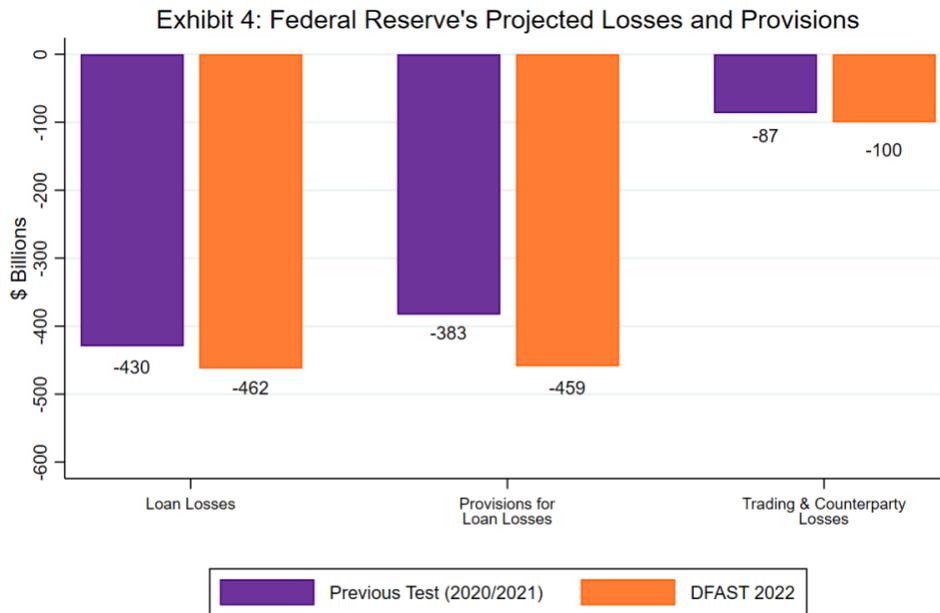
As noted, stress scenarios were more draconian, by design. This year's test assumed a bigger jump in the unemployment rate, a larger decline in house prices, and a steeper increase in bond spreads. The stress scenario also includes heightened stress in commercial real estate and corporate debt markets. Furthermore, because economic conditions improved over the past year, bank allowances for credit losses were lower at the start of the stress test than they were at the start of the previous tests. This required increased provisions for loan losses and resulted in a higher capital decline under stress.

However, some of the results are also being driven by the assumptions used in the Federal Reserve's models. To be precise, some of the capital requirement increases for the largest banks are being driven by the inflation in the Fed's expense projections (which also includes operational risk losses). We will show here that some (or most) of the increase in expenses is spurious and not tied to increases in bank risk. This is especially true for the components of revenues and expenses normalized by bank size, considering the abrupt increase in banks' balance sheets over the past couple of years.

To give a more complete picture of changes in bank-specific results, Exhibit 3 shows the changes in each bank's bank-level stress test outcomes between DFAST 2022 and its most recent stress test result (some of the smaller banks were not required to participate in DFAST 2021). The banks are ranked—that is, ordered from left to right—from best to worst relative performance, based on the projected decline in their CET1 capital ratios. The bank that ranks first shows the most improved CET1 drawdown between its DFAST 2022 results and the previous test. Some of the changes in stressed CET1 capital ratios are sizable, with about one-third of the banks seeing increases in CET1 drawdowns of close to 1 percentage point or more.



As shown in Exhibit 4, loan losses rose \$32 billion compared with the previous test; and provisions for loan losses increased \$76 billion, reflecting both the higher losses and lower provisions at the start of this year's stress test.



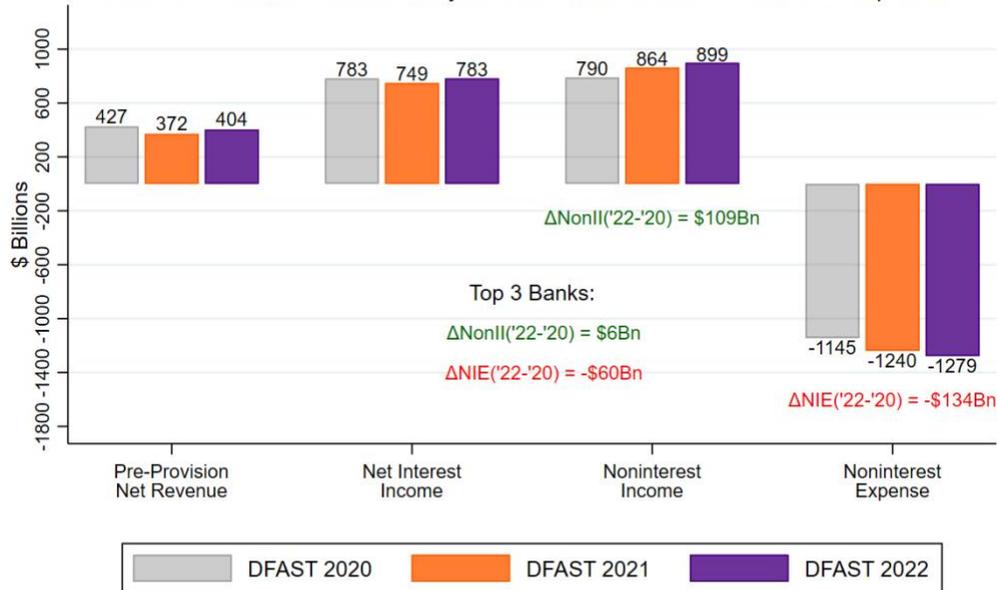
Note: Includes the 32 banks that participated in DFAST 2020/2021 & 2022.
 Source: Federal Reserve.

The increase in loan losses and provisions were broadly in line with BPI’s own projections (see our [February 2022 note](#) for details). However, at the portfolio level, loss rates on commercial and industrial and all other loans were higher than expected, and losses on credit card loans were better than we projected. Because the Fed’s projections are based on confidential loan-level data from the firms, we assume that credit risk in banks’ portfolios has decreased more for consumer loans than for corporate exposures.

The heightened stress in CRE markets was also an important driver in the increased CET1 capital ratio drawdowns observed at some regional banks, especially those only required to participate in the stress tests every other year (e.g., MTB and HBAN).

For banks subject to the global market shock, the more severe shocks in this year’s scenario drove trading and counterparty losses \$13 billion higher, as shown by the rightmost two bars in Exhibit 4.

Exhibit 5: Federal Reserve's Projected Pre-Provision Net Revenue Components



Note: Includes the 32 banks that participated in DFAST 2020/2021 & 2022. To have the same number of banks in 2021, we carried over DFAST 2020 projections for the missing Category IV banks.

Source: Federal Reserve.

Another highly important set of projections in the stress tests is the revenues banks generate under stress, which are the first line of defense against both loan and trading losses. As shown in Exhibit 5, aggregate projections of PPNR rose about \$32 billion compared with the prior test. However, the increase in PPNR was not enough to offset the increase in provisions and trading and counterparty losses.⁶ Obviously, changes in PPNR do not need to offset the increase in total losses, but the increase in banks' balance sheets since the start of the pandemic has led to an overstatement of noninterest expenses, as we discuss next.

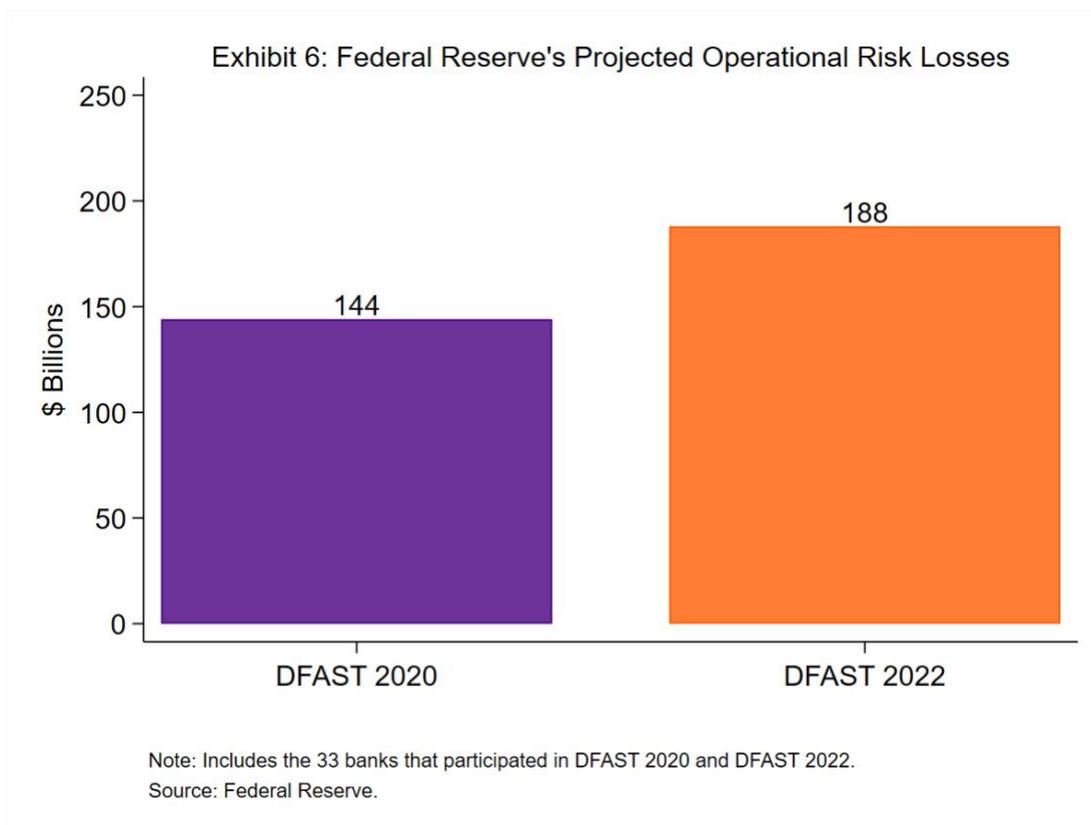
Fortunately, we have some ability to scrutinize these projections because, in 2019, the Federal Reserve started to report bank-specific projections on the main components of PPNR: net interest income, noninterest income and noninterest expense. Looking at the change of those projections relative to DFAST 2020 helps isolate how the balance sheet increase have affected the DFAST results (and therefore the capital requirements) of the largest U.S. banks, because the increase in banks' balance sheets did not affect the results of the 2020 stress test. The notes in Exhibit 5 show the changes in PPNR components between the 2020 and 2022 results.

In aggregate, projections of net interest income, noninterest income and noninterest expense have all increased in this year's stress tests compared with DFAST 2021. However, if we look back at the changes in the projections relative to DFAST 2020, Exhibit 5 shows flat net interest income, along with an increase in expenses exceeding the rise in noninterest income by approximately \$25 billion. This does not appear to be a large number, but the increase in expenses is much more concentrated at the largest banks relative to the increase in noninterest income. For example, according to the Fed's projections in the stress tests, the three largest U.S. banks saw a \$60-

⁶ Other losses on fair-valued loans also increased significantly and help explain firm-level results. However, given this small share in total losses, we did not include this in the chart.

billion increase in expenses between DFAST 2020 and DFAST 2022, only \$6 billion (just 10 percent) of which was offset by an increase in noninterest income.

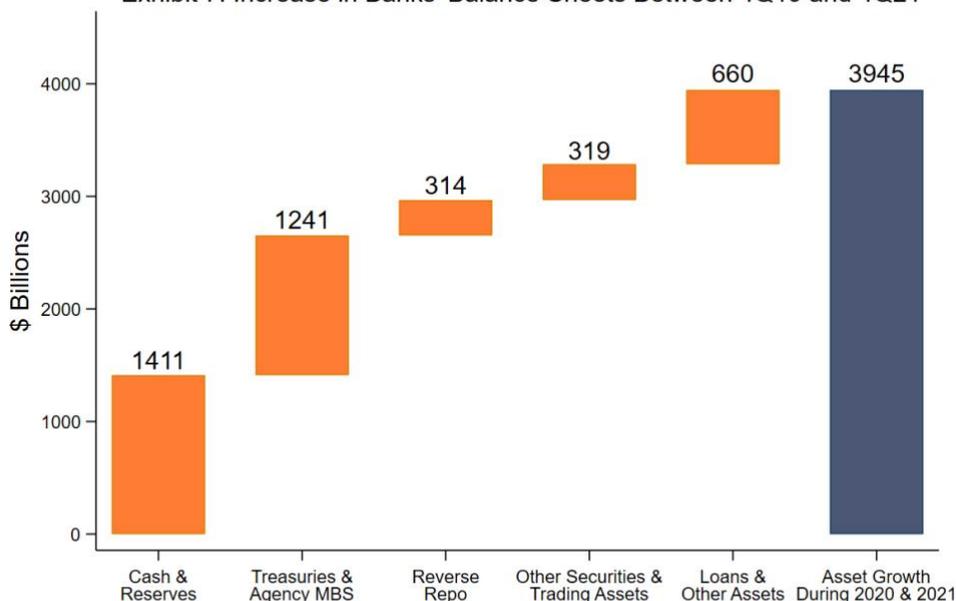
Another piece of the puzzle driving the increase in expenses is the losses associated with operational-risk events (which are included in noninterest expenses). In DFAST 2020, operational risk losses totaled \$144 billion across all 33 banks participating in the stress tests, as shown in Exhibit 6. In the DFAST 2022 stress tests, operational risk losses increased to \$188 billion. Unfortunately, the Federal Reserve does not publish bank-specific projections for operational risk losses, so it is not possible to look at the same sample of banks across DFAST 2020 and 2022. However, the 30-percent estimated increase in operational risk losses is approximately accurate, since the sample differences are small.



WHAT EXPLAINS THE SPURIOUS VOLATILITY IN RESULTS?

Results are volatile in part because the Fed's projections for expenses appear to be inflated because of the sizable increase in banks' holdings of reserve balances and other safe assets during the pandemic. Total assets of the 32 large banks that participated in both DFAST 2020 and 2022 increased more than \$3.9 trillion—close to 24 percent—between the fourth quarter of 2019 and the fourth quarter of 2021. This increase is unprecedented and largely driven by the Federal Reserve's asset purchases and the fiscal stimulus required to overcome the economic fallout from the onset of the COVID-19 pandemic. As shown in Exhibit 7, cash and reserve balances increased \$1.4 trillion at stress-tested banks. Treasuries and agency MBS accounted for \$1.2 billion more growth in total assets. The combined increase in reserve balances, Treasuries, and agency MBS accounted for nearly 70 percent of the increase in total assets at large banks during that period.

Exhibit 7: Increase in Banks' Balance Sheets Between 4Q19 and 4Q21



Source: S&P Global Market Intelligence.

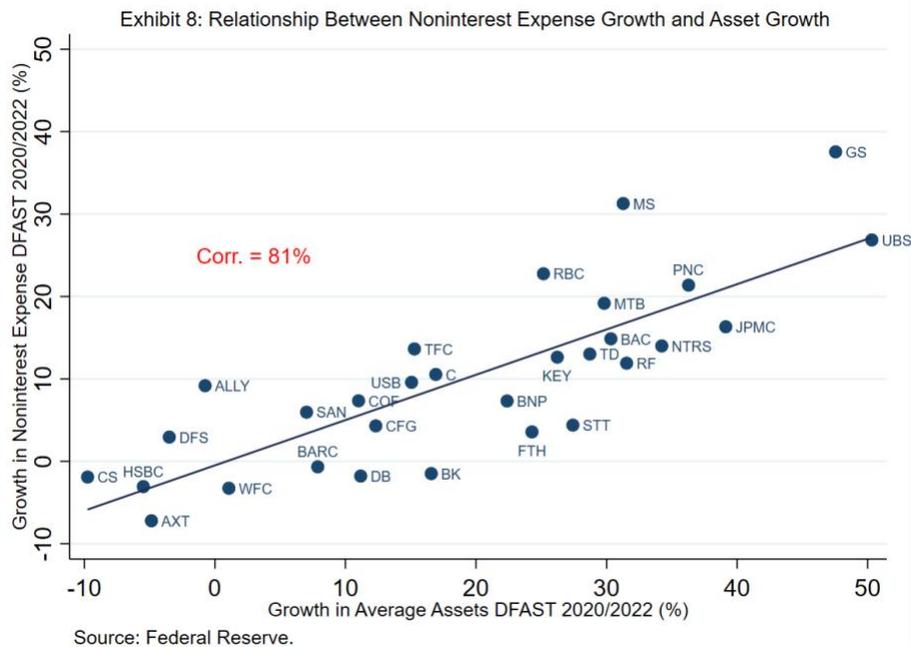
Note that loans also increased \$660 billion from expansion in some firms' businesses. But for the top three banks, the bulk of the increase in bank size is explained by an increase in high-quality liquid assets (reserve balances, U.S. Treasury securities and agency MBS). Put simply, adding a deposit funding to hold a reserve at its Federal Reserve Bank or a Treasury security to a bank's balance sheet does not measurably increase its expenses or its operational risk losses under stress, but the Federal Reserve's models assume that it would.

The Fed's projections of expenses (compensation, fixed assets and other noninterest expense) and the two noninterest income components (investment banking fees and other noninterest income) are overstated as a result of increases in bank size, because those components are normalized by total assets in the Fed's models. In practice, when bank size is rising rapidly, retraining model coefficients in real time is challenging, and therefore model projections converge to a steady-state value that is too high.

This comovement between bank size and expenses is an unrealistic property of the Fed's models, since expense levels are mainly affected by operating revenues and not by larger balance sheets. This observation is even more relevant when most of the increase in bank size is explained by a rise in the holdings of safe assets such as reserve balances, Treasuries and agency MBS, which would carry minimal overhead and operational risk.

The relationship between the growth in banks' balance sheets and growth in expense projections is quite evident in the DFAST data. The scatterplot in Exhibit 8 shows a very high correlation (81 percent) between balance sheet growth and growth in the projections of noninterest expenses in DFAST 2022 relative to DFAST 2020. The x-axis measures the growth in average total assets of each bank between DFAST 2020 and DFAST 2022.⁷ The y-axis captures the growth in noninterest expenses across the same two exercises. For example, JPM shows a nearly 40-percent growth in total assets and 16 percent growth in noninterest expense projections.

⁷ We can calculate average assets in DFAST, since the Fed reports information on components of PPNR as a share of average assets.

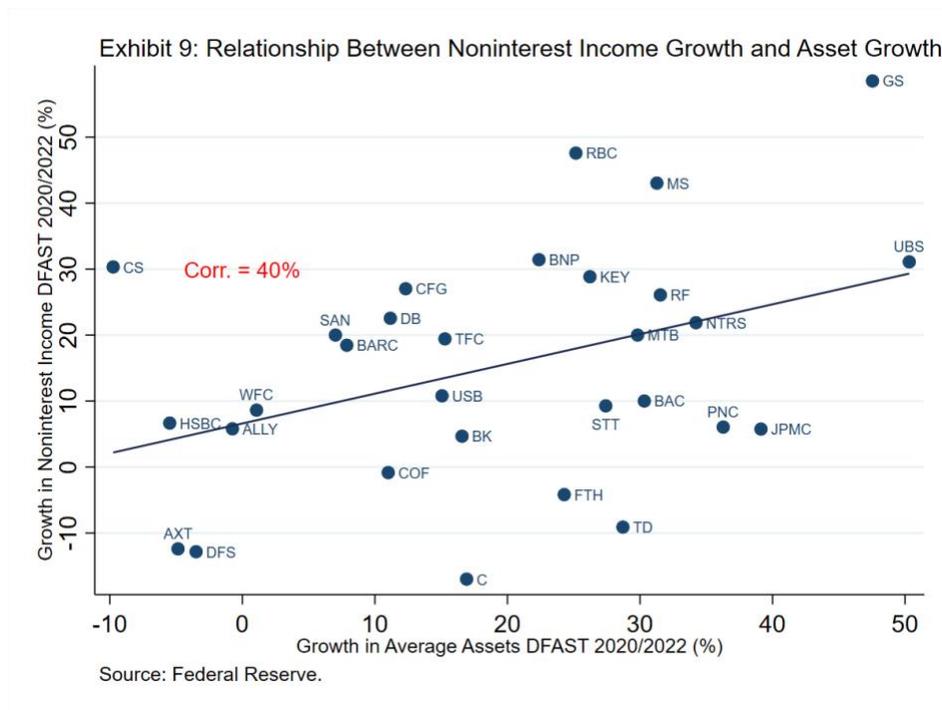


The evidence of the relationship between the growth in bank size and noninterest income is much weaker, for three reasons. First, only two of the six components of noninterest income are normalized by total assets. By contrast, all three components of expenses are scaled by bank size. In addition, at least one of the models used to project operational risk losses (included in expenses) is also closely related to bank size.

Second, the scatterplot in Exhibit 9 shows a much weaker correlation between asset growth and the growth in projected noninterest income in DFAST 2022 compared with DFAST 2020 (40 percent). For instance, JPM shows a nearly 40-percent growth in total assets and about 5 percent growth in noninterest income projections. Note that we excluded an outlier bank (BMO), because the Fed projected a 168-percent growth in noninterest income across the two tests. Including that bank would have reduced the correlation between noninterest income and bank size to a mere 14 percent.⁸ The low correlation indicates that increases in bank size had less of an effect on projected stress revenues compared with projected expenses.

Third, banks' capital market activities performed well during the pandemic, and the Fed's model projections put a sizable weight on bank performance over prior quarters. A significant portion of the increase in noninterest income is therefore genuine, and less of an artifact of the dependence of noninterest income components on bank size.

⁸ We also excluded BMO from the noninterest expense chart and excluded HBAN from both scatter plots (due to the latter's merger).



Based on this evidence, more work needs to be done to assess the forecasting performance of supervisory models in stress conditions. The data from the pandemic present a natural experiment to assess performance of those models, especially in light of the large changes in banks’ balance sheets. In addition, the path of several of the macroeconomic variables during the COVID event (i.e., unemployment rate, stock prices, GDP growth) were broadly in line with the path of those series in the severely adverse scenario in the most recent stress tests. Moreover, the COVID-19 shock was unanticipated, so arguably firms did not have the opportunity to take action to ameliorate the impact of the crisis on their expenses.

IMPORTANT TAKEAWAYS FROM DFAST 2022

The annual DFAST 2022 stress test results released last week showed a 0.3-percentage point higher maximum decline in the stressed CET1 capital ratio compared with last year’s stress tests. This will translate into higher stress capital buffer requirements for many of these banks on October 1, 2022. We showed that U.S. banks are already subject to very high capital requirements, and the new stress test results will increase those requirements further.

Furthermore, arbitrary [volatility in capital requirements](#) from year to year hinders banks’ ability to manage their capital effectively, further increasing the costs of the credit that they offer. Moreover, since the probability of the U.S. entering a recession has increased significantly in recent months, an increase in banks’ capital requirements is not desirable at this time.

Our analysis also indicates the SCB of some banks continues to be overstated, because of the inflation of noninterest expenses (including losses associated with operational risk events). We strongly encourage the Federal Reserve to revisit the performance of PPNR models under stress conditions and reduce the reliance of the projections on bank size. Improvements to those models would help ease unhelpful annual volatility in banks’ capital requirements.

It is also worth noting that for Category I banks, increasing SCBs are not the only factor driving capital requirements upward. Economic growth and the abrupt rise in banks' balance sheets during the pandemic have also increased the GSIB capital surcharge. Currently, the average GSIB capital surcharge under the United States' Method 2 is at 2.7 percent—already 1 percentage point higher than the average surcharge calculated under the [Basel method \(called "Method 1" in the United States\)](#). Moreover, several of the Category I banks are also in a higher GSIB surcharge bucket, but the higher capital charge applicable to banks in this bucket will only become fully effective in 2023 and 2024. Factoring in this future increase in the surcharge adds yet another ½ percentage-point increase in the average charge. This results in an average GSIB surcharge of 3.2 percent—150 basis points above the Basel method. In summary, in the very near future, Category I banks will be subject to capital requirements at least 300 basis points above those of the Basel capital framework.⁹

⁹ The Collins Floor increases the capital requirements of U.S. banks even further. However, it is more challenging to calculate the effect, and it will also depend on the U.S. implementation of the Basel III Endgame rules.