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DFAST 2023 – A review of the evolution of DFAST results over 10 years

Summary

A review of the past 10 years of DFAST stress test results[1] shows that banks are now better prepared than ever to face credit market volatility. We observe that the level of hypothetical losses remains very stable over the period although the composition of where the losses are coming from changes drastically as the level of capital in the system keeps rising. We will caveat that the stress test was designed to address the resiliency of bank balance sheet to credit events as such our comments are made in that light recent events made it clear that bank runs, yields shocks on the securities book are not well captured by the exercise.

For the review, only the severely adverse scenario was considered, and we keep our remarks for the full set of institutions participating to provide a good overall benchmark of performance, which is useful prior to diving into any specific institution. In general, we consider 2013 as our base period and 2023 as our current review period to provide informed differences. We also note that the 10-year panel sample approximates an economic cycle—recovery, recession, and stressed conditions in the real economy provided a range of starting points for bank portfolios to evaluate the impact of a severely adverse turn of events.

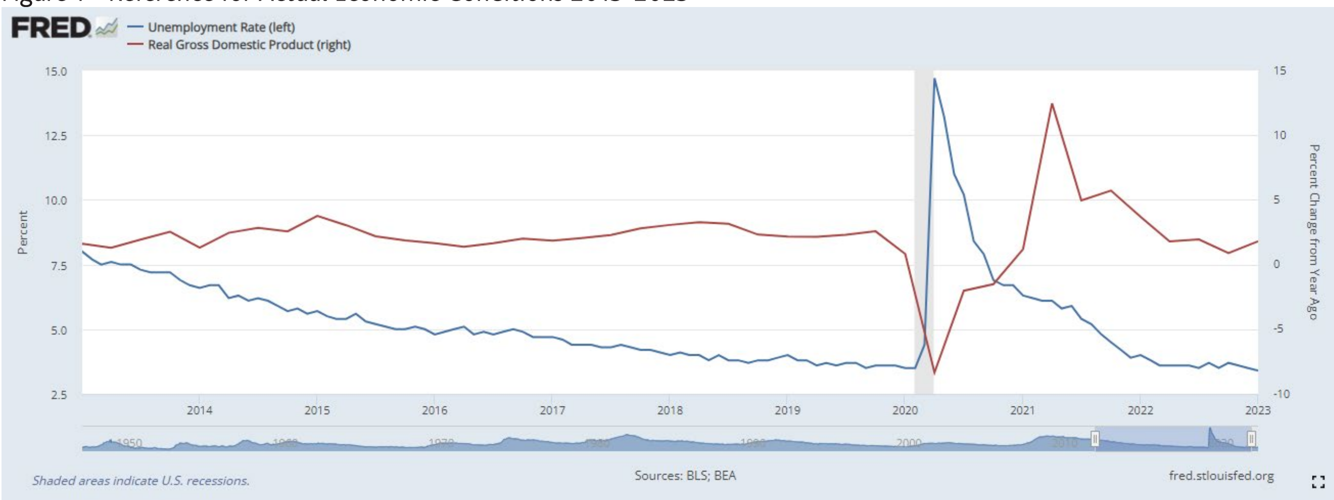
Two principles of credit and macroeconomic behavior inform our emphasis of the severely adverse scenario results, and our interpretation of variances across the panel sample:

1. Performance of the economy is bounded at the tails—the further away the economy is from the mean, the lower the impact of an economic shock.
2. Credit loss is a non-linear function of economic conditions (there is asymmetry of loss between downside and upside economic scenarios).

[1] The 10 year history of DFAST results includes the 2 instances in 2020 – in all our graphs the 2nd dot for 2020 represents the COVID stress test conducted in 2020.

Using the severely adverse scenario focuses our resilience conclusions on downside risks and the overall loss anticipated varies depending on the starting point of economic conditions in the scenario relative to the long-term mean. Approximating a full economic cycle with our panel dataset (2013-2023 includes multiple periods of recovery, a recession, and previously unobserved extremes in macroeconmic behavior) provides a broad contextual framework for industry-wide conclusions, and a starting point for more detailed analysis of individual firms.

Figure 1 - Reference for Actual Economic Conditions 2013-2023



Sources: U.S. Bureau of Labor Statistics, Unemployment Rate [UNRATE] and U.S. Bureau of Economic Analysis, Real Gross Domestic Product [GDPC1], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/UNRATE, July 12, 2023.

We provide links to the DFAST data and materials provided by the federal reserve for further analysis.

Table of Contents

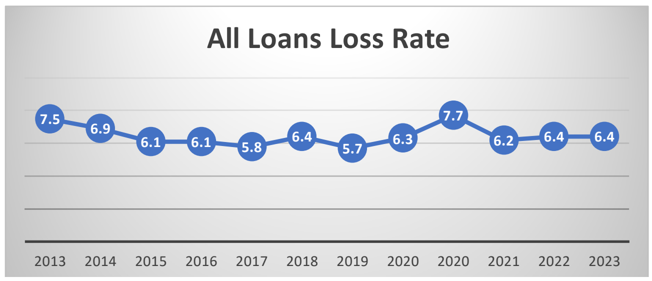
Losses

Overall losses

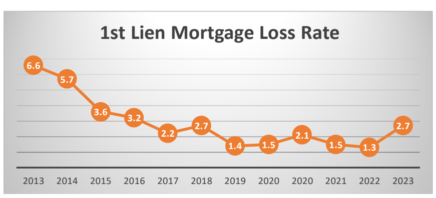
Credit losses are one of the key elements of the regulatory stress test exercise and are the main component today used to test downside risk resilience of each banking institution. Total losses over the past 10 years of the exercise have remained within a very tight range given that the breadth of scenarios and economic starting points over those 10 years has been vastly different. The evolution of the mix of losses over time is quite striking as we shift from residential sensitivity to a more commercial and unsecured credit loss focus for the latest stress test.

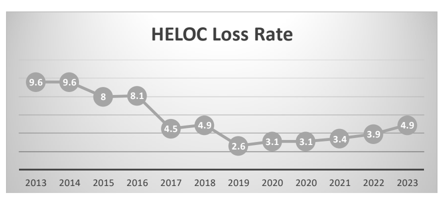
One of the major tests for banks is their ability to withstand credit losses on their asset portfolios. The stress test was put in place to re-assure all banking system stakeholders in the banking system management of downside risk while preserving the ability to keep lending in a downturn.

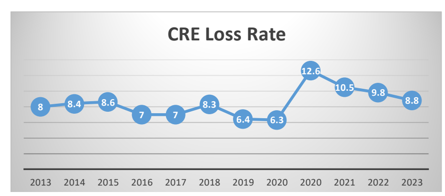
We observe that for the base period the total loss rate was 7.5% and the current period loss rate is 6.4% and a decrease of ~12%.

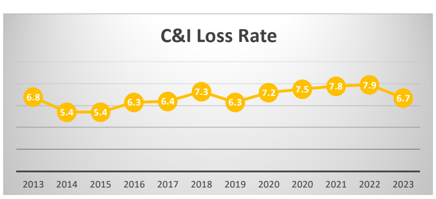


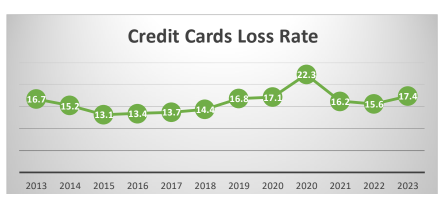
We provide for illustration purpose graphs of the evolution of losses for each sub-portfolios to provide a brief view of the shift of the loss composition for the panel data. Residential mortgage and HELOC have taken a turn for the better, due to the decreasing loan to values over the period, while CRE, C&I and other loans seem to perform much worse from the base period to today. The increase is reflected as part of the scenario severity for specifically CRE. On the other hand, we also observe that the HPI drop is smaller in the base period that in the current period scenario so the change in mix could be attributed to both portfolio quality change mix and scenario shift from previous periods.

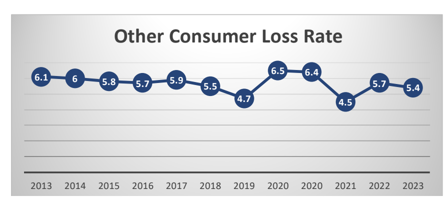


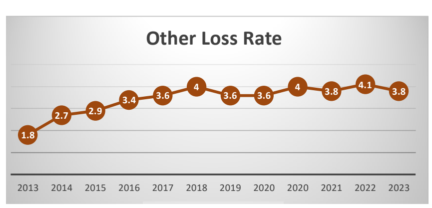












Equity Capital

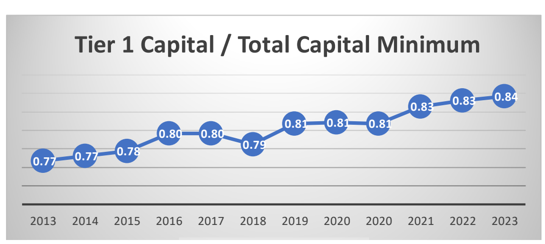
By multiple measures of capital, the banking system's resilience to credit losses substantially increased across the panel time series. The interaction of credit risk inherent in a bank's assets, available starting capital and pre-provision net revenue results under stress are key factors in interpreting an individual firm's stress results, but summary results show how the industry has progressed against capital expectations. A critical counterfactual to regulatory capital and risk weighted asset assumptions is provided by recent events. Market dislocations in March 2023 reveal the degree to which interest rate risk can impact liquidity and customer behavior (including perception of bank solvency)—these will likely claim a wider share of future stress tests and certainly impact current capital planning and asset liability management assumptions.

Industry increases in capital are evident in both core and total capital measures and show resilience when stress is applied. This growth was driven by a focus on high quality capital, as evidenced by the growing share of Total Capital composed of Tier 1 capital throughout the time series. Our analysis noted a peak in capital in 2021—this reflects multiple post-pandemic effects, including: excess deposits invested in high quality liquid assets, capital distribution restrictions, new capital buffer rules, and lower loan growth, which collectively increased capital and reduced the risk-weighted assets in the ratio.

Starting Tier 1 capital demonstrates how banks' capital going into each test has increased throughout the panel time series. Base period Starting Tier 1 capital was 12.4% whereas the latest Starting Tier 1 capital was 14.1%—a 13.7% increase from the base period.

Of course, the goal of the stress test is to test the viability of the system under stress and the minimum level reached is often the best indicator of bank resilience. Reflecting the previously noted consistency in total losses applied by each test, as well as increases in starting capital, Tier 1 Capital minimums have increased throughout the panel dataset.

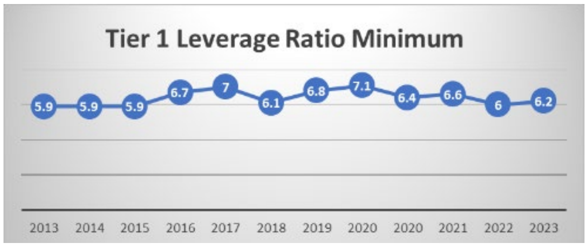
The 2023 Tier 1 capital minimum of 11.8% is 32.5% higher than the base period, and only slightly below the peak observed in 2021.



2023 Total Capital Minimum of 0.84% is 9.1% higher than the base period.

Tier 1 Leverage Ratio

The leverage ratio is another measure of resilience which looks at Tier 1 capital over total assets. Whereas Tier 1 capital ratio uses risk weighted assets, the leverage ratio uses total assets as the denominator. We can see that the ratio has been declining over the past 3 years in sync with the COVID crisis potentially due to the accumulation of investment securities and deposits on Banks balance sheets.



Regulators typically look for a ratio above 5% to ensure that a bank is well capitalized and has enough liquidity on hand to meet its obligations. In the latest results the stress minimum ratio of the 9 quarters horizon still sits at 6.2% well above the ratio regulators view as well capitalized and 5% higher than it was at the base period.

Pre-Provision Net Revenue (PPNR)

PPNR is an important consideration within the stress test, as it represents the revenue to be generated over the 9-quarter horizon to absorb the losses suffered under the test. In essence, it highlights each bank's ability to earn their way out of trouble.

Contrary to the ratios previously discussed, the PPNR results under the stress tests have not been trending in a positive direction over the course of the 10 years. As a result, we are observing a reduction in the overall ability to absorb losses. The reason for this observation has been disputed due to the Federal Reserve models' possibly under-estimating non-interest income; a point of contention between the banks and the regulators as detailed in a recent paper by BPI[2]. However, some analysts have also argued that this trend is accurate, and that in a "real life" stress situation the actual PPNR could be worse as the DFAST scenarios account for adjustments to yield curves that may or may not occur in a real situation.

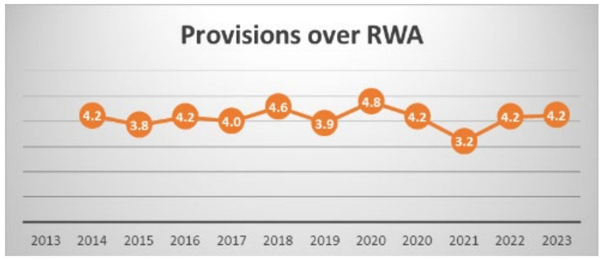
While not fully conclusive in the results, PPNR results remain worthy of further analysis.

Provisions

Our intent for looking at this ratio was to observe if there had been a shift in reserving over time. We can conclude that there hasn't been much change other than, we assume, the composition of reserves which aren't provided as part of the results. This should be expected given that overall losses haven't significantly changed either.

Provisions under the DFAST exercise is typically composed of the sum of the next 4 quarters of losses under all scenarios. It provides a good approximation for the reserves to be put aside during stressed period. Although CECL came into effect in 2020 for all banks in the sample, the CECL reserving methodology is not yet being used. We compute this ratio by taking total provisions over the 9-quarter horizon divided by the ending period RWA.

This year's provisions as a percentage of RWA is the same as it was in 2014, the information for the base period was not available – we used the first period when RWA became available as part of the stress test results as our base.



Conclusion

Over the past 10 years of the DFAST stress test exercise, banks have built a considerable amount of capital while managing the downside risk of their portfolios. As a whole the level of losses have largely stayed the same but the mix of losses has changed considerably since the inception of the stress test. Although banks seemed to not generate as much PPNR as previous periods, the overall capital under the severely adverse scenario between the base period and today has increased by over 32% while PPNR has decreased by 25% correspondingly. Finally, we do not have any information yet on the impact of the new reserving methodology as part of the stress testing exercise as this new methodology has not been incorporated yet into the Fed exercise.

Our conclusion should be that banks have built a much more resilient capital cushion to stress. However, we know that the stress test was designed for a specific purpose and that is to test the resiliency of the balance sheet to credit losses. It was not designed to consider specific factors that came into play recently for things like:

Liquidity – what happens when depositors withdraw $30B in a day? Or if we face continued deposit flight out of the banking system?

Yield curve inversion – what happens to PPNR if the yield curve stays steeply inverted for 9 quarters?

Tangible Common Equity volatility – will recent swings relative to regulatory capital introduce additional scenarios or objections for liquidity and capital distributions?

It is important to remind ourselves that the next crisis won't be like the last one, so having a baseline stress test exercise while maintaining the ability to think creatively about what could materialize is critical to maintain a vigilant stance for what comes next. The stress tests have proven beyond a doubt based on the panel data that participants have build a more robust capital cushion for credit losses.

Further Reading

Results of the DFAST stress test are published annually by the federal reserve regulators. Here are some useful links to the DFAST inputs and output files as well as the methodology documents published by the Federal Reserve.

Dodd-Frank Act Stress Test 2023 - https://www.federalreserve.gov/supervisionreg/dfa-stress-tests-2023.htm

DFAST historical exsercises - https://www.federalreserve.gov/supervisionreg/ccar-by-year.htm

Supervisory stress test historical exercises - https://www.federalreserve.gov/supervisionreg/dfast-archive.htm

June 2023 Stress Test Methodology - https://www.federalreserve.gov/publications/files/2023-june-supervisory-stress-test-methodology.pdf

Historical Restult 2013-2023 - https://www.federalreserve.gov/supervisionreg/files/public_results_DFAST_2023.csv