Dodd-Frank Act Stress Test (DFAST) Baseline and Severely Adverse Scenarios

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Brief Description of the Scenarios

In the ***baseline scenario*** for the United States, real Gross Domestic Product (GDP) growth declines from about 1¾ percent at the end of 2022 to around negative ¾ percent by the middle of 2023 before gradually increasing to about 2¼ percent by the second half of 2024 and then declining slightly. The unemployment rate rises steadily from just over 3½ percent at the end of 2022 to near 5 percent by the first quarter of 2024, before declining slightly. Consumer Price Index (CPI) inflation declines from a little less than 3¼ percent to a trough of about 2 percent in the second quarter of 2024 before rising slightly. The 3-month Treasury rate increases from around 4 percent at the end of 2022 to about 4¾ percent in the second quarter of 2023, then declines to about 3 percent by the end of the scenario. Ten-year Treasury yields decline steadily from a bit below 4 percent to around 3¼ percent at the end of the scenario. Equity prices remain at their level for the fourth quarter of 2022 throughout the scenario. Equity market volatility, as measured by the U.S. Market Volatility Index (VIX), falls modestly in the first three quarters of the scenario before increasing to around 28½, where it stays for the remainder of the scenario. The baseline scenario for international economic activity features early downturns in the UK and Japan, gradual recovery in Europe, and steady growth in developing Asia, while inflation rates in most countries are projected to decline over the course of the scenario and settle closer to their longer-term averages.

The ***severely adverse scenario*** is characterized by a severe global recession accompanied by a period of heightened stress in both commercial and residential real estate markets, as well as in corporate debt markets. The U.S. unemployment rate rises nearly 6½ percentage points from the starting point of the scenario in the fourth quarter of 2022 to its peak of 10 percent in the third quarter of 2024. The sharp decline in U.S. economic activity is also accompanied by an increase in market volatility, widening corporate bond spreads, and a collapse in asset prices, including a 38 percent decline in house prices and a 40 percent decline in commercial real estate prices. The international portion of the scenario features recessions in four countries or country blocs, with heightened stress in advanced economies, followed by declines in inflation and an appreciation in the value of the U.S. dollar against those countries' currencies, except for the Japanese yen.

It is important to recognize that these scenarios are not forecasts. Rather, they are designed to assess the strength and resilience of covered institutions in varying economic environments.

Introduction

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (DFA),[1] as implemented in the stress testing rule issued by the Office of the Comptroller of the Currency (OCC), requires certain national banks and federal savings associations to conduct periodic stress tests using scenarios provided by the OCC.[2] This note provides a narrative on the two scenarios to be used for the 2023 stress test. The OCC developed these scenarios in coordination with the Board of Governors of the Federal Reserve System and the Federal Deposit Insurance Corporation.[3]

Supervisory Scenarios

Scenario timing and variables: The scenarios start in the first quarter of 2023 and extend through the first quarter of 2026. Each scenario includes 28 variables; this set of variables is the same as the set provided in last year's supervisory scenarios. The variables describing economic developments within the United States include:

- **Six measures of economic activity and prices:** quarterly percent changes (at an annual rate) in real and nominal GDP, real and nominal disposable personal income, the CPI, and the level of the unemployment rate of the civilian non-institutional population aged 16 years and over;
- **Four aggregate measures of asset prices or financial conditions:** indexes of house prices, commercial real estate prices, equity prices, and stock market volatility; and,
- **Six measures of interest rates:** the rate on 3-month Treasury securities; the yield on 5-year Treasury securities; the yield on 10-year Treasury securities; the yield on 10-year BBB-rated corporate securities; the interest rate associated with conforming, conventional, 30-year fixed-rate mortgages; and the prime rate.

The variables describing international economic conditions in each scenario include three variables in four countries or country blocs:

- **The three variables for each country or country bloc:** quarterly percent changes (at an annual rate) in real GDP and in consumer price indexes or local equivalent, and the level of the U.S. dollar exchange rate.
- **Four countries or country blocs:** the euro area (the 20 European Union member states that have adopted the euro as their common currency); the United Kingdom; developing Asia (the nominal GDP-weighted aggregate of China, India, South Korea, Hong Kong Special Administrative Region, and Taiwan); and Japan.

[1] Public Law 111-203, 124 Stat. 1376 (2010), codified at 12 USC 5365, as amended by the Economic Growth, Regulatory Relief, and Consumer Protection Act, Pub. L. 115-174, 132 Stat. 1296-1368 (2018).
[2] 12 CFR part 46. *See also* 77 Fed. Reg. 195 (Oct. 9, 2012); 84 FR 54472 (Oct. 10, 2019).
[3] *See* 78 FR 64153 (October 28, 2013) (Policy Statement on the Principles for Development and Distribution of Annual Stress Test Scenarios).

Baseline and Severely Adverse Scenarios

The following sections describe the baseline and severely adverse scenarios. The specific values for all variables included in the scenarios are provided as an Excel spreadsheet on the OCC's website at [http://www.occ.treas.gov/tools-forms/forms/bank-operations/stress-test-reporting.html.](http://www.occ.treas.gov/tools-forms/forms/bank-operations/stress-test-reporting.html) Further, this document provides a qualitative summary of the global market shock that certain banks with significant trading activity are required to apply to their trading and counterparty positions as of October 14, 2022.

Baseline Scenario

The baseline outlook for U.S. real activity, inflation, and interest rates is similar to the October 2022 and January 2023 consensus projections from *Blue Chip Economic Indicators* and *Blue Chip Financial Forecasts*.[4] This scenario does not represent a forecast of the OCC.

The baseline scenario for the United States features an initial slowdown and then a gradual recovery. The unemployment rate rises steadily from just over 3½ percent at the end of 2022 to near 5 percent by the first quarter of 2024, before declining to just over 4½ percent by the end of the scenario. Real GDP growth declines from about 1¾ percent at the end of 2022 to around negative ¾ percent by the middle of 2023 before gradually increasing to about 2 ¼ percent by the second half of 2024 and then settling near 2 percent at the end of the scenario. Inflation, measured as the quarterly change in the CPI and reported as an annualized rate, declines from a little less than 3¼ percent to a trough of about 2 percent in the second quarter of 2024 and remains near 2 ¼ percent in the rest of the scenario. The 3-month Treasury rate increases from around 4 percent at the end of 2022 to about 4¾ percent in the second quarter of 2023, then declines to about 3 percent by the end of the scenario. Ten-year Treasury yields decline steadily from a bit below 4 percent to around 3¼ percent at the end of the scenario. The prime rate follows a path similar to short-term interest rates, while yields on BBB-rated corporate bonds and mortgage rates follow a path similar to long-term interest rates.

Equity prices remain at their level for the fourth quarter of 2022 throughout the scenario. Equity market volatility, as measured by the VIX, falls modestly in the first three quarters of the scenario before increasing to around 28½, where it stays for the remainder of the scenario. Nominal house prices increase gradually by 2 percent per year and commercial real estate prices increase by 3 percent per year over the scenario.

The baseline paths for the international variables are similar to the trajectories reported in the January 2023 *Blue Chip Economic Indicators* and the International Monetary Fund's October 2022 *World Economic Outlook*.[5] In the baseline scenario, real GDP growth in developing Asia rises from about 4 percent at the end of 2022 to a peak of just under 5 percent by the end of 2023 and declines to around 4¾ percent at the end of the scenario. Real GDP growth in the euro area

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[4] The near-term forecast is similar to the January 2023 release, while the long-range forecast is similar to the October 2022 release. See Wolters Kluwer Legal and Regulatory Solutions, *Blue Chip Economic Indicators* and *Blue Chip Financial Forecasts*.

5 See International Monetary Fund, World Economic Outlook (October 2022), https://www.imf.org/en/Publications/WEO/Issues/2022/10/11/world-economic-outlook-october-2022. The January 2023 update to the World Economic Outlook was released after the finalization of the scenarios.

increases from about negative ¾ percent to a high of just above 2 percent in the third quarter of 2024, before declining to about 1½ percent by the end of the scenario. Real GDP growth in the United Kingdom declines early in the scenario, from around negative ¼ percent to a bit below negative 2 percent in the second quarter of 2023, before climbing to 2¾ percent in the third quarter of 2024 and then falling back to around 2 percent in the second quarter of 2025 and thereafter. GDP growth in Japan starts around 2¾ percent and declines to about negative ¼ percent in the third quarter of 2023 and then grows at an average annualized rate of about ¾ percent in the remainder of the scenario.

Consumer price inflation in the euro area declines rapidly from about 10¼ percent at the end of 2022 to about 1¾ percent in the third quarter of 2024 before rising and then settling around 2 percent. Consumer price inflation declines rapidly in the United Kingdom as well, falling from above 8½ percent at the end of 2022 to about 1¼ percent in the third quarter of 2024, and then stays below 1 percent for the remainder of the scenario. Inflation in Japan starts near 2½ percent before declining to 1¾ percent by the fourth quarter of 2023 and hovers below 1½ percent throughout the remainder of the scenario. Inflation rates in developing Asia start near 3 percent before declining to about 2¼ percent in the second quarter of 2025 and remain there for the rest of the scenario.

Severely Adverse Scenario

The severely adverse scenario is characterized by a severe global recession, with prolonged declines in both residential and commercial real estate prices, which spill over into the corporate sector and affect investment sentiment. The developments in foreign economies involve greater stress in advanced foreign economies. This is a hypothetical scenario designed to assess the strength and resilience of banks and does not represent a forecast of the OCC.

Under the severely adverse scenario, the U.S. unemployment rate climbs to a peak of 10 percent in the third quarter of 2024, roughly a 6½ percentage point increase relative to its fourth-quarter 2022 level. Real GDP declines nearly 8¾ percent from the fourth quarter of 2022 to its trough in the first quarter of 2024, before recovering. The rising unemployment rate and the rapid decline in aggregate demand for goods and services significantly reduce inflationary pressures. Inflation, measured as the quarterly change in the CPI and reported as an annualized rate, falls from below 3¼ percent at the end of 2022 to about 1¼ percent in the third quarter of 2023 and then gradually increases to above 1½ percent by the end of the scenario.

Short-term interest rates, as measured by the 3-month Treasury rate, fall significantly to near zero by the third quarter of 2023 and remain there for the remainder of the scenario. Long-term interest rates, as measured by the 10-year Treasury yield, fall by nearly 3¼ percentage points by the second quarter of 2023, and then gradually rise in late 2023 to about 1½ percent by the end of the scenario. These interest rate paths imply that the yield curve remains inverted through the second quarter of 2023. Thereafter, the slope of the yield curve becomes positive and steepens over the remainder of the scenario.

Conditions in corporate bond markets deteriorate markedly. The spread between yields on BBB-rated bonds and yields on 10-year Treasury securities widens to 5¾ percentage points by the third quarter of 2023, an increase of more than 3½ percentage points relative to the fourth quarter of 2022. Corporate bond spreads then gradually decline to 2¼ percentage points by the end of the scenario. The spread between mortgage rates and 10-year Treasury yields widens to 3 percentage points by the third quarter of 2023 before narrowing to about 1½ percentage points at the end of the scenario.

Asset prices drop sharply in the severely adverse scenario. Equity prices fall 45 percent from the fourth quarter of 2022 through the fourth quarter of 2023, and do not return to their initial level until the end of the scenario. The maximum quarterly value of the VIX reaches a peak value of 75 in the second quarter of 2023, then declines to about 32½ at the end of the scenario. House prices and commercial real estate prices also experience large declines. House prices fall sharply through the third quarter of 2024, reaching a trough that is about 38 percent below their level in the fourth quarter of 2022. Commercial real estate prices experience a slightly larger decline, reaching a trough in the fourth quarter of 2024 that is 40 percent below their level at the end of 2022. House prices and commercial real estate prices recover slowly and are well below their fourth quarter of 2022 values at the end of the scenario.

The international component of the severely adverse scenario involves sharp declines in real GDP in three of the four countries or country blocs at the start of the scenario. Japan experiences the most severe contraction, followed by the euro area and United Kingdom, while developing Asia experiences only a moderate decline. In Japan, the euro area, and the United Kingdom, GDP levels surpass their 2022 fourth-quarter levels by the end of the scenario. By contrast, in developing Asia, where output fell less, the level of GDP surpasses its fourth quarter of 2022 level by the end of 2023.

Inflation declines significantly in all four countries or country blocs. All areas experience a period of deflation at various points in the scenario, although deflation is more severe and protracted in Japan and developing Asia. The U.S. dollar appreciates against the euro, the pound sterling, and the currencies of developing Asia, but depreciates against the yen.

Additional Key Features of the Severely Adverse Scenario

Stress on corporate borrower balance sheets and resulting credit losses on corporate loans should be assumed to be higher for lower-rated nonfinancial corporate borrowers. Declines in aggregate U.S. house prices should be assumed to be concentrated in regions that have experienced rapid price gains over the past two years. Declines in commercial real estate prices should be assumed to be concentrated in properties most at risk of a sustained drop in income and asset values: offices that may be affected by remote work or hospitality sectors that continue to be affected by reduced business travel. Declines in U.S. house prices and U.S. commercial real estate prices should also be assumed to be representative of the declines in house prices and commercial real estate prices in foreign regions and economies, especially those that experienced rapid price gains before the pandemic and were significantly affected by the event.

The weakness in euro area economic conditions reflects a broad-based contraction due to geopolitical risks, in part due to the conflict in Ukraine. Conditions across Latin American economies should be assumed to feature a slowdown comparable to the average slowdown in the global economy. Conditions in other emerging economies outside of Latin America should be assumed to feature a slowdown similar to the one in developing Asia.

Comparison of the Severely Adverse Scenario and the 2022 Severely Adverse Scenario

The current severely adverse scenario features a greater increase in the unemployment rate in the United States as compared to the 2022 severely adverse scenario.

The current scenario features a significantly higher starting level of interest rates compared to the previous year's scenario, which allows interest rates to decline more forcefully in response to the hypothetical drop in economic activity and inflation. The scenario also features a larger and more rapid decline in house prices, as compared to their declines in the previous year's scenario. This decline reflects the significantly higher housing valuations at the end of 2022. The potential for spillover effects in asset markets and sharp revisions in investor sentiment are captured by a decline in equity prices and an increase in corporate bond spreads, although these changes are somewhat less severe relative to last year's scenario. These less severe changes reflect the moves in those markets over the course of 2022 and limits procyclicality in the scenario.

Global Market Shock Component for the Severely Adverse Scenario

The OCC will provide to certain banks a global market shock component for the severely adverse scenario to be used in the current stress test.[6] Under the DFA stress testing rules, large, complex institutions with significant trading activity must apply these components to their trading and counterparty exposures as of a specific date (October 14, 2022,[7] for the current stress testing cycle) to project mark-to-market losses.[8]

The global market shock component for the severely adverse scenario (global market shock) is a set of hypothetical shocks to a large set of risk factors reflecting general market distress and heightened uncertainty. Banking organizations with significant trading activity must consider the global market shock as part of their supervisory severely adverse scenario. The losses associated with the global market shock are recognized in the first quarter of the projection horizon. In addition, certain large and highly interconnected firms must apply the same global market shock to project losses under the counterparty default scenario component. The global market shock is applied to positions held by the banks on a given as-of date, which is October 14, 2022, for the 2023 supervisory stress test.

The design and specification of the global market shock differs from the macroeconomic scenarios for several reasons. First, profits and losses from trading and counterparty credit are measured in mark-to-market terms, while revenues and losses from traditional banking are generally measured using the accrual method. Another key difference is the timing of loss recognition. The global market shock affects the mark-to-market value of trading positions and

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[6] The global market shock component consists of hypothetical shocks to a large set of risk factors that include a wide range of financial market variables that affect asset prices, such as credit spread or the yield on a bond, and also include, in some cases, shocks to the value of a position itself (for example, the market value of private-equity positions). *See* 12 CFR 46.5(c).
[7] A bank may use data as of the date that corresponds to its weekly internal risk reporting cycle as long as it falls during the business week of the as-of date for the global market shock (*i.e.*, October 11-14, 2022). Losses from the global market shock will be assumed to occur in the first quarter of the planning horizon.
[8] Currently, four national banks are subject to global market shocks: Bank of America, N.A.; Citibank, N.A.; JPMorgan Chase Bank, N.A.; and Wells Fargo Bank, N.A.

counterparty credit losses in the first quarter of the projection horizon. This timing is based on the observation that market dislocations can happen rapidly and unpredictably at any time under stressed conditions. Applying the global market shock in the first quarter ensures that potential losses from trading and counterparty exposures are incorporated into banks' capital ratios in each quarter of the scenario.

The global market shock is specified by a large set of risk factors that include, but are not limited to:

- Equity prices of key developed markets and developing and emerging market economies along with selected points along term structures of implied volatilities;

- Foreign exchange rates of most major and some minor currencies, along with selected points along term structures of option-implied volatilities;

- Selected-maturity government yields (*e.g.*, for 10-year U.S. Treasuries), swap rates, and other important interest rates for key developed economies and developing and emerging market economies;

- Selected maturities and expiries of implied volatilities that are key inputs to the pricing of interest rate derivatives;

- Selected expiries of futures prices for energy products including crude oil (differentiated by country of origin), natural gas, and power;

- Selected expiries of futures prices for metals and agricultural commodities; and

- Credit spreads or prices for selected credit-sensitive products, including corporate bonds, credit default swaps, and loans; non-agency residential mortgage-backed securities (RMBS) and commercial mortgage-backed securities (CMBS); sovereign debt; and municipal bonds.

Please note:

- The global market shock is a separate and additional component of the scenario applied only to the largest banks with complex trading portfolios.
- Changes to risk factors comprising the global trading shock are assumed to occur instantaneously, while the macro scenario describes the evolution of variables over time.[9]

Global Market Shock – 2023 Severely Adverse Scenario

The 2023 global market shock component (global market shock) is characterized by market

[9] The global market shock is a component of the macro scenario but is not necessarily directionally consistent with the macro scenario.

expectations of severe recessions in the United States and other countries. Financial conditions tighten and inflation expectations decline.

Treasury rates fall as short-term rates decline sharply. Longer-term rates also decrease, although to a lesser extent, reflecting flight-to-safety considerations. Most government interest rates in Europe and other advanced economies fall less than U.S. Treasury rates, contributing to the U.S. dollar depreciating against the euro and other advanced country currencies. The U.S. dollar appreciates against most emerging market currencies, reflecting expectations for more acute recessions in those countries

Generally, commodity prices fall as demand declines from the expected economic slowdown, though precious metals see price increases. Most emerging market sovereign CDS spreads widen severely reflecting expectations of severe recessions in those countries.

The expected decline in economic activity leads to large public equity price declines across global markets, while financial market uncertainty drives an increase in public equity volatility. Private-equity values experience sizable declines as well in response to a weak economic outlook.

An increase in expected defaults leads to a large widening in corporate credit spreads. A decline in expected demand and falling real estate prices lead to large disruptions in the residential and commercial real estate sectors. As a result, non-agency RMBS and CMBS market values fall significantly.

Comparison of the 2023 Global Market Shock Component and the 2022 Global Market Shock Component

The 2023 global market shock features fading inflationary pressures, while last year's global market shock was characterized by worsening supply chain disruptions that put upward pressure on inflation. Since then, interest rates have risen across tenors, inflation has been elevated and the dollar has strengthened relative to most other currencies. Accordingly, the current global market shock mainly differs from the 2022 global market shock in the behavior of interest rates, foreign exchange rates, and commodities prices.

Treasury rates fall in the current global market shock, with large declines specified for shorter tenors and milder declines specified for longer tenors. In the 2022 global market shock, Treasury rates increased across the term structure, resulting in an upward shift in the yield curve. Similarly, inflation breakeven rates decrease in the current scenario, while they increased in the 2022 global market shock.

The U.S. dollar depreciates against the currencies of other advanced countries in the 2023 component, while it mostly appreciated against advanced country currencies in the 2022 component. Non-precious metals and other commodities, such as oil and natural gas, face large price declines in the current component, while commodity prices increased in the 2022 component due to supply chain disruptions.

Counterparty Default Component for the Supervisory Severely Adverse Scenario

For DFAST 2023, banks that are completing the global market shock must incorporate a counterparty default scenario component in the severely adverse scenario.[10] The counterparty default scenario component involves the unexpected default of the bank's largest counterparty.[11]

In connection with the counterparty default scenario component, these banks will be required to estimate and report the potential losses and related effects on capital associated with the unexpected default of the counterparty that would generate the largest losses across their derivatives and securities financing activities, including securities lending and repurchase or reverse repurchase agreement activities. The counterparty default scenario component is an add-on to the severely adverse scenario.

The largest counterparty of each bank will be determined by net stressed losses. Net stressed losses are estimated by applying the global market shock to revalue securities financing transactions and derivatives, including collateral posted or received. The as-of date for the counterparty default scenario component is October 14, 2022—the same date as the global market shock.[12]

[10] These are the same national banks that are subject to the global market shocks, see footnote 8 above.
[11] In selecting its largest counterparty, a bank will not consider certain sovereign entities (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) or designated central clearing counterparties or the bank's own affiliates.
[12] As with the global market shock, a bank subject to the counterparty default component may use data as of the date that corresponds to its weekly internal risk reporting cycle as long as it falls during the business week of the as-of date for the counterparty default scenario component (*i.e.*, October 11-14, 2022). Losses will be assumed to occur in the first quarter of the projection horizon.