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 6 percent at the end of 2021 to 2 percent at the end of the scenario. The unemployment rate declines gradually from close to 4¼ percent at the end of 2021 to 3½ percent by the end of the scenario, and Consumer Price Index (CPI) inflation also declines from around 8¼ percent at the end of 2021 to about 2¼ percent by the end of the scenario. The scenario includes increases in interest rates. The 3-month Treasury rate increases from 0 percent to 1½ percent at the end of the scenario. Ten-year Treasury yields increase from around 1½ percent to around 2½ percent at the end of the scenario. Equity prices remain steady throughout the scenario. Equity market volatility, as measured by the Chicago Board Options Exchange Volatility Index (VIX), declines in 2022 by about 6½ points before gradually increasing to reach about 28 at the end of the scenario, which is slightly below its level at the start of the scenario. The baseline scenario for international economic activity and inflation features a relatively steady expansion in activity, albeit one that proceeds at different rates across countries.

The ***severely adverse scenario*** is characterized by a severe global recession accompanied by a period of heightened stress in commercial real estate and corporate debt markets. The U.S. unemployment rate rises 5¾ percentage points from the starting point of the scenario in the fourth quarter of 2021 to its peak of 10 percent in the third quarter of 2023. The sharp decline in economic activity is also accompanied by increases in market volatility, widening of corporate bond spreads, and collapse in asset prices, including a nearly 40 percent decline in commercial real estate prices. The international component of the scenario features deep recessions in four countries or country blocs followed by declines in inflation and large swings in the value of the U.S. dollar against those countries' currencies.

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 2022 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 2022 and extend through the first quarter of 2025. 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 19 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. 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 8, 2021.

Baseline Scenario

The baseline outlook for U.S. real activity, inflation, and interest rates is similar to the October 2021 and January 2022 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 is an economic expansion over the 13-quarter scenario period. The unemployment rate declines gradually from close to 4¼ percent at the end of 2021 to about 3½ percent by the end of the scenario. Real GDP growth declines from about 6 percent at the end of 2021 to around 2 percent at the end of the scenario. CPI inflation also declines from around 8¼ percent at the end of 2021 to about 2¼ percent by the end of the scenario. The scenario includes increases in interest rates. The 3-month Treasury rate increases from around 0 percent to about 1½ percent at the end of the scenario. Ten-year Treasury yields increase from around 1½ percent to around 2½ percent at the end of the scenario. The prime rate increases in line with short-term interest rates, whereas yields on BBB-rated corporate bonds and mortgage rates increase in line with long-term interest rates.

Equity prices remain steady throughout the scenario. Equity market volatility, as measured by the VIX, declines in 2022 by about 6½ points by early 2023, before gradually increasing to reach nearly 28 at the end of the scenario, which is slightly below its level at the start of the scenario. Nominal house prices increase gradually by about 3 percent per year throughout the scenario. Nominal commercial real estate prices also increase gradually by about 3 percent per year.

The baseline paths for the international variables are similar to the trajectories reported in the January 2022 *Blue Chip Economic Indicators* and the International Monetary Fund's October 2021 *World Economic Outlook*.[5] In the baseline scenario, real GDP growth in developing Asia rises from about 4 percent at the end of 2021 to more than 6½ percent in the third quarter of 2022; thereafter, the growth rate declines and remains relatively stable at about 5 percent for the remainder of the scenario. Real GDP growth in the euro area declines from about 4½ percent at the end of 2021 to about 1½ percent by the end of the scenario. Real GDP growth in the United Kingdom follows a very similar path to that of the euro area. Japan also experiences a decline in GDP growth from around 3¾ percent to below ½ percent by the end of the scenario.

[4] The near-term forecast is similar to the January 2022 release, while the long-range forecast is similar to the October 2021 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 2021), https://www.imf.org/en/Publications/WEO/Issues/2021/10/12/world-economic-outlook-october-2021. The January 2022 update to the *World Economic Outlook* was released after the finalization of the scenarios.

Consumer price inflation in the euro area rapidly declines from about 7½ percent at the end of 2021 to 1½ percent by the end of 2022 and averages about 2 percent for the remainder of the scenario. Consumer price inflation gradually declines in the United Kingdom from about 4¼ percent at the end of 2021 to about 2 percent by the third quarter of 2023 and then gradually increases to 2¾ percent by the end of the scenario. Inflation rates are relatively stable in Japan and in developing Asia throughout the scenario, averaging around 1 and 2½ percent, respectively.

Severely Adverse Scenario

The severely adverse scenario is characterized by a severe global recession accompanied by a period of heightened stress in commercial real estate and corporate debt markets. In this scenario, the economic downturn is amplified by the prolonged continuation of remote work, which leads to larger commercial real estate price declines, that, in turn, spill over to the corporate sector and affect investor sentiment. The developments in foreign economies reflect greater stress in emerging market economies, partly driven by building risks in the Chinese economy. This is a hypothetical scenario designed to assess the strength and resilience of banking organizations 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 2023, a 5¾ percentage point increase relative to its fourth-quarter 2021 level. This year's scenario features a sharp decline in real GDP in 2022 followed by a robust recovery. Real GDP declines more than 3½ percent from the fourth quarter of 2021 to its trough in the first quarter of 2023. The rising unemployment and the rapid decline in aggregate demand for goods and services lead to significantly reduced inflationary pressures. CPI inflation falls from an annual rate of 8¼ percent at the end of 2021 to an annual rate of about 1¼ percent in the third quarter of 2022 and then gradually increases above 1½ percent by the end of the scenario.

Short-term interest rates as measured by the 3-month Treasury rate remain near zero throughout the scenario. Long-term interest rates as measured by the 10-year Treasury yield drop to ¾ percent during the first quarter of 2022 and remain unchanged in the second and third quarters of 2022, after which they gradually rise to 1½ percent by the end of the scenario. Because short-term interest rates remain near zero, the path of the yield curve slope, as defined by the difference between the 10-year Treasury yield and the 3-month Treasury rate, follows that of long-term interest rates.

Conditions in corporate bond markets deteriorate markedly. The spread between yields on investment-grade corporate bonds and yields on 10-year Treasury securities widens to 5¾ percentage points by mid-2022, an increase of close to 4¾ percentage points relative to the fourth quarter of 2021. 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 mid-2022 before declining to slightly above 1½ percentage points at the end of the scenario.

Asset prices drop sharply in the severely adverse scenario. Equity prices fall 55 percent from the fourth quarter of 2021 through the fourth quarter of 2022, accompanied by a rise in the VIX, which reaches a peak value of 75 in the second quarter of 2022. House prices and commercial real estate prices also experience large declines. At their trough at the end of 2023, house prices are 28½ percent below their level at the end of 2021. Commercial real estate prices experience larger declines, reaching a level in the fourth quarter of 2023 that is nearly 40 percent below the level at the end of 2021.

The international component of the severely adverse scenario includes rapid declines in GDP across all four countries or country blocs at the start of the scenario followed by recoveries of various speeds relative to the baseline scenario. The recoveries in the euro area, the United Kingdom, and Japan are faster than those in developing Asia given the greater stresses in that country bloc.

Inflation declines significantly in all four countries or country blocs. Japan and developing Asia experience a prolonged period of deflation. The euro area also experiences a period of deflation. The U.S. dollar appreciates against the euro, the pound sterling, and the currencies of developing Asia, while it 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. The fall 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, hotels in urban locations or that cater to business travelers, shopping malls, and strip malls. Declines in U.S. house prices and U.S. commercial real estate prices should also be assumed to be representative of the risks to house prices and commercial real estate prices in foreign regions and economies that experienced rapid price gains before the pandemic and were significantly affected by the event.

Moreover, although the weakness in euro area economic conditions reflects a broad-based contraction in euro area demand, this contraction should be assumed to be more protracted in countries with less ability to use fiscal policy to lean against the slowdown in economic activity. The growth slowdown in developing Asia, which is greater than in advanced foreign economies, should be assumed to be representative of conditions across many emerging market economies outside of Latin America. Conditions across Latin American economies should be assumed to be comparable to the sharp slowdown in the global economy on aggregate.

Comparison of the Current Severely Adverse Scenario and the 2021 Severely Adverse Scenario

Consistent with improving economic conditions, the current severely adverse scenario features a greater increase in the unemployment rate in the United States but a lower peak unemployment rate as compared to the 2021 severely adverse scenario. In line with the greater increase in the unemployment rate, the current scenario also incorporates larger declines in real GDP. The paths of interest rates in the current scenario imply a larger decline in long-term interest rates relative to the 2021 severely adverse scenario.

The continued heightened uncertainty from the pandemic increases asset-price vulnerabilities, particularly for residential properties and commercial real estate. The current scenario features larger declines in house prices and similarly large declines in commercial real estate prices as compared to the previous year's scenario. The potential for spillover effects in asset markets and sharp revisions in investor sentiment are captured by higher increases in market volatility and corporate bond spreads relative to last year's scenario. The decline in equity prices is the same.

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 8, 2021,[7] for the current stress testing cycle) to project mark-to-market losses.[8]

The global market shock is a set of hypothetical shocks to a large set of risk factors reflecting general market distress and heightened uncertainty. Generally, these shocks involve large and sudden changes in asset prices, interest rates, and spreads, reflecting general market distress and heightened uncertainty. It is important to note that global market shocks included in the severely adverse scenario are not forecasts, but rather are hypothetical scenarios designed to assess the strength and resilience of banking organizations in the event of sudden and significant deterioration in market environments.

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;

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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 4-8, 2021). 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.

- 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 – 2022 Severely Adverse Scenario

The 2022 global market shock component for the severely adverse scenario is characterized by a sharp curtailment in global economic activity, a tightening of financial conditions, and a worsening of existing supply-chain disruptions. An increase in term risk premia drives an increase in Treasury rates and a steepening of the yield curve. Benchmark bank lending rates rise sharply, reflecting tighter financial conditions.

The drop in economic activity and additional supply-chain disruptions lead to lower corporate profits, resulting in substantial public equity price declines and increases in public equity volatility across global markets. The U.S. dollar appreciates against the currencies of emerging market economies due to substantial flight-to-safety flows and appreciates more modestly against the currencies of most developed economies, while the yen appreciates against the U.S. dollar due to the unwinding of positions. The strains on supply chains more than offset the impact of weaker economic activity and lead to price increases across commodities.

Higher longer-term Treasury rates drive up mortgage rates; valuations of assets related to residential and commercial real estate fall sharply in line with the decline in economic activity. Private equity asset values experience sizable declines, particularly holdings related to real estate.

The combination of a weakened economic environment, further supply-chain disruptions, high

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

levels of debt, and mutual fund redemptions leads to widespread bankruptcies and drives asset sales. As a result, corporate bond spreads widen sharply and leveraged loans experience large price declines. Non-investment-grade debt, which experiences especially high default rates and record low recovery rates, sees a particularly large widening of spreads.

For U.S. state and local governments, revenue declines due to the slowdown in economic activity are combined with significant spending increases and lead to a widening in municipal bond spreads and increased risk of defaults. Mutual funds holding municipal debt face redemptions and outflows that exceed historical experience.

Comparison of the Current Severely Adverse Scenario and the 2021 Severely Adverse Scenario

The global market shock for the current severely adverse scenario differs from the 2021 severely adverse scenario, particularly in the behavior of interest rates and commodities prices. Treasury rates rise in the current severely adverse scenario with larger increases specified for longer tenors, resulting in a steeper yield curve. In the 2021 severely adverse scenario, Treasury rates declined progressively along the term structure, resulting in a flattening of the yield curve. Furthermore, most interest rate volatility shocks are larger in the current scenario, with near-term volatility shocks for the U.S. significantly larger than in the 2021 scenario.

Benchmark bank lending rates generally see larger increases for shorter-term rates, while longer-term rates rise instead of fall. Similarly, inflation breakeven rates increase in the current scenario, while they dropped in the 2021 scenario.

Non-precious metals and other commodities such as oil and natural gas face price appreciation in the current scenario, whereas price declines were applied in last year's scenario. Commodities volatility shocks tend to be smaller in this year's scenario. U.S. public equity and agency RMBS markets experience greater stress in the current scenario, while most asset-backed securities suffer lower market value declines compared to the earlier scenario.

Counterparty Default Component for the Supervisory Severely Adverse Scenario

For DFAST 2022, 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

[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.

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 8, 2021—the same date as the global market shock.[12]

[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 4-8, 2021). Losses will be assumed to occur in the first quarter of the projection horizon.