Annual Stress Test Baseline, Adverse, and Severely Adverse Scenarios

February 3, 2017 (revised February 10, 2017)

Brief Description of the Scenarios

The ***baseline scenario*** for the United States is a moderate economic expansion. Real Gross Domestic Product (GDP) grows at an average rate of about 2¼ percent per year. The unemployment rate declines to 4½ percent and Consumer Price Index (CPI) inflation rises to a little under 2½ percent at an annual rate before dropping back to about 2¼ percent. Accompanying the moderate expansion, Treasury yields are assumed to rise steadily across the maturity spectrum. Equity prices rise by an average of about 5 percent per year. The baseline scenario for international economic activity and inflation features an expansion in activity, albeit one that proceeds at different rates across countries.

The ***adverse scenario*** is characterized by weakening economic activity across all countries included in the scenario. The economic downturn is accompanied by a slowing of inflation in the United States and elsewhere. Reflecting weak economic conditions, short-term interest rates in the United States decline to near zero over the projection period. Financial conditions tighten for corporations and households during the recession and asset prices decline in the adverse scenario.

The ***severely adverse scenario*** is characterized by a severe global recession, accompanied by a period of heightened stress in corporate loan and commercial real estate markets. U.S. real GDP declines 6½ percent from its pre-recession peak, with unemployment reaching 10 percent and CPI inflation falling as low as 1¼ percent at an annual rate. The international component of the severely adverse scenario features severe recessions in the euro area, the United Kingdom, and Japan, and a marked economic slowdown in developing Asia. As a result of acute economic weakness, all foreign economies included in the scenario experience a decline in consumer prices.

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.

Baseline, Adverse, and Severely Adverse Scenarios

The annual stress test required by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (DFA) as implemented by the Annual Stress Test final rule published on October 9, 2012, requires national banks and federal savings associations with total consolidated assets of more than $10 billion (covered institutions) to conduct annual stress tests using a minimum of three scenarios (baseline, adverse, and severely adverse) provided by the Office of the Comptroller of the Currency (OCC).[1] This note provides a narrative on the three scenarios to be used for the stress test. The OCC developed these scenarios in coordination with the Federal Reserve Board and the Federal Deposit Insurance Corporation.[2]

The scenarios start in the first quarter of 2017 and extend through the first quarter of 2020. 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:** percent changes (at an annual rate) in real and nominal GDP, the unemployment rate of the civilian non-institutional population aged 16 and over, percent changes (at an annual rate) in real and nominal disposable personal income, and the percent change (at an annual rate) in the CPI;
- **Four aggregate measures of asset prices or financial conditions:** indices of house prices, commercial real estate prices, equity prices, and U.S. stock-market volatility; and,
- **Six measures of interest rates:** the rate on the 3-month Treasury bill; the yield on the 5-year Treasury bond; the yield on the 10-year Treasury bond; the yield on a 10-year BBB-rated corporate security; the interest rate associated with a conforming, conventional, 30-year fixed-rate mortgage; and the prime rate.

For the variables describing international economic conditions, each scenario includes three variables in four countries or country blocks:

- **The three variables for each country or country block:** the percent change (at an annual rate) in real GDP, the percent change (at an annual rate) in the CPI or local equivalent, and the level of the U.S. dollar exchange rate.
- **The four countries or country blocks included:** 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.

The following sections describe the baseline scenario, the adverse scenario, and the severely adverse scenario. The specific values for all variables included in the scenarios are provided as

[1] 12 CFR part 46.
[2] See 78 FR 64153 (October 28, 2013) (Policy Statement on the Principles for Development and Distribution of Annual Stress Test Scenarios).

an Excel spreadsheet on the OCC's website at http://www.occ.treas.gov/tools-forms/forms/bank-operations/stress-test-reporting.html. Further, the OCC will provide a qualitative summary of the global market shocks to certain banks with significant trading activity by February 15, 2017. These banks will be required to apply the global market shocks to their trading and counterparty positions as of January 3, 2017.

Baseline Scenario

The baseline outlook for U.S. real activity, inflation, and interest rates is similar to the January 2017 consensus projections from *Blue Chip Economic Indicators*.[3] This scenario does not represent the forecast of the OCC.

The baseline scenario for the United States is a moderate economic expansion through the projection period. Real GDP grows on average about 2¼ percent per year, with a slightly faster pace of growth over the first half of the scenario period. The unemployment rate initially declines from around 4¾ percent at the start of the scenario period to slightly under 4½ percent in the fourth quarter of 2018. It subsequently rises slightly above that level through the rest of the scenario period. CPI inflation moves to a little under 2½ percent at an annual rate by the end of 2018, before dropping back to about 2¼ percent and remaining near that level through the end of the scenario period.

Accompanying the moderate economic expansion, Treasury yields are assumed to rise steadily across the maturity spectrum through the scenario period. Short-term Treasury rates increase from ½ percent at the beginning of 2017 to about 2¼ percent by the beginning of 2019, while yields on 10-year Treasury securities rise from 2¼ percent to a little more than 3¼ percent over the same period. The prime rate increases in line with short-term Treasury rates and mortgage rates rise in line with long-term Treasury yields. Reflecting steady growth and stable economic conditions, spreads between yields on investment-grade corporate bonds and yields on long-term Treasury securities narrow modestly over the scenario period. Equity prices rise by an average of about 5 percent per year and equity market volatility is assumed to remain near its historical average level. Nominal house prices rise by an average of 2¾ percent per year and commercial real estate prices rise by an average of 4¼ percent per year.

The outlook for the international variables is similar to that reported in the January 2017 *Blue Chip Economic Indicators* and the International Monetary Fund's October 2016 *World Economic Outlook*.[4] The baseline scenario features an expansion in international economic activity, albeit one that proceeds at different rates in the four countries or country blocks under consideration. Real GDP growth in developing Asia averages about 6 percent per year over the scenario period; real GDP growth in both the euro area and the United Kingdom averages about 1½ percent per year; and real GDP growth in Japan averages ¾ percent per year.

[3] See Wolters Kluwer Legal and Regulatory Solutions (2017), "Blue Chip Economic Indicators," vol. 41, no. 1 (January 10).
[4] See International Monetary Fund (2016), "World Economic Outlook," www.imf.org/external/pubs/ft/weo/2016/02.

Adverse Scenario

The adverse scenario is characterized by weakening economic activity across all of the economies included in the scenario. This economic downturn is accompanied by a global aversion to long-term fixed-income assets that, despite lower short rates, brings about a near-term rise in long-term rates and steepening yield curves in the United States and the four countries/country blocks in the scenario. It is important to note that this is a hypothetical scenario designed to assess the strength of banking organizations and their resilience to adverse economic conditions. This scenario does not represent a forecast of the OCC.

In the adverse scenario, the U.S. economy experiences a moderate recession that begins in the first quarter of 2017. Real GDP falls slightly more than 2 percent from the pre-recession peak in the fourth quarter of 2016 to the recession trough in the first quarter of 2018, while the unemployment rate rises steadily, peaking at about 7¼ percent in the third quarter of 2018. The U.S. recession is accompanied by an initial fall in inflation through the third quarter of 2017, with the rate of increase in consumer prices then rising steadily and reaching 2 percent by the middle of 2018.

Reflecting weak economic conditions, short-term interest rates in the United States fall and remain near zero for the rest of the scenario period. With the increase in term premiums, 10-year Treasury yields gradually rise to a little less than 2¾ percent by the second half of 2018. Financial conditions tighten for corporations and households during the recession. Spreads between investment-grade corporate bond yields and 10-year Treasury yields widen to about 3¾ percentage points by the end of 2017, while spreads between mortgage rates and 10-year Treasury yields widen to 2½ percentage points over the same period.

Asset prices decline in the adverse scenario. Equity prices fall approximately 40 percent through the fourth quarter of 2017, accompanied by a rise in equity market volatility. Aggregate house prices and commercial real estate prices experience less sizable but more sustained declines compared to equity prices; house prices fall 12 percent through the first quarter of 2019 and commercial real estate prices fall 15 percent through the fourth quarter of 2018.

Following the recession in the United States, real activity picks up slowly at first and then gains momentum; growth in real U.S. GDP accelerates from an increase of 1 percent at an annual rate in the second quarter of 2018 to an increase of 3 percent at an annual rate by the middle of 2019. The unemployment rate declines modestly, from its peak of about 7¼ percent in the third quarter of 2018 to under 7 percent by the end of the scenario period. Consumer price inflation remains at roughly 2 percent from the middle of 2018 through the end of the scenario period. Ten-year Treasury yields show little change after the second half of 2018 and remain around 2¾ percent.

Outside of the United States, the adverse scenario features recessions in the euro area, the United Kingdom, and Japan, as well as below-trend growth in developing Asia. The declines in activity in the euro area and the United Kingdom are broadly similar and less pronounced than in Japan. Weakness in global demand results in a slowing of inflation in all of the foreign economies under consideration. Japan experiences outright deflation through the first quarter of 2019. Reflecting flight-to-safety capital flows, the U.S. dollar appreciates against the euro, the pound sterling, and the currencies of developing Asia. The dollar depreciates modestly against the yen, also in line with flight-to-safety capital flows.

Comparison of 2016 Adverse Scenario and 2017 Adverse Scenario

The main difference relative to the 2016 adverse scenario is that this year's adverse scenario features higher long-term rates and a steeper yield curve across all of the economies during the recession. Another difference from last year's scenario is the incidence and extent of deflationary episodes. The 2016 adverse scenario featured wide-spread deflation across all of the economies included in the scenario. In this year's adverse scenario, deflation is regionally concentrated—more pronounced in Japan, less severe in the euro area and developing Asia and absent in the United Kingdom and United States.

Additional Key Features of the Adverse Scenario

As in last year's adverse scenario, the slowdown in euro area economic activity reflects a broad-based contraction in euro area demand, not a contraction that is concentrated in a few specific economies. Similarly, the slowdown in developing Asia reflects a weakening in economic conditions across emerging market economies, not merely a weakening in Asia-specific conditions. Declines in aggregate U.S. residential real estate prices and commercial real estate prices should be assumed to be concentrated in regions that have experienced rapid price gains over the past several years. Declines in prices of U.S. housing and commercial real estate should also be assumed to be representative of risks to house prices and commercial real estate prices in foreign regions and economies that have experienced rapid price gains over the past several years.

Severely Adverse Scenario

The severely adverse scenario is characterized by a severe global recession that is accompanied by a period of heightened stress in corporate loan markets and commercial real estate markets. It is important to note that this is a hypothetical scenario designed to assess the strength of banking organizations and their resilience to unfavorable economic conditions. This scenario does not represent a forecast of the OCC.[5]

In this scenario, the level of U.S. real GDP begins to decline in the first quarter of 2017 and reaches a trough in the second quarter of 2018 that is about 6½ percent below the pre-recession peak. The unemployment rate increases by about 5¼ percentage points, to 10 percent, by the third quarter of 2018. Headline consumer price inflation falls to about 1¼ percent at an annual rate by the second quarter of 2017 and then rises to about 1¾ percent at an annual rate by the middle of 2018.

As a result of the severe decline in real activity, short-term Treasury rates fall and remain near zero through the end of the scenario period. The 10-year Treasury yield drops to ¾ percent in the

[5] The set of hypothetical conditions in the severely adverse scenario is distinct from the set of hypothetical conditions in the adverse scenario, unless otherwise noted.

first quarter of 2017, rising gradually thereafter to around 1½ percent by the first quarter of 2019 and to about 1¾ percent by the first quarter of 2020. Financial conditions in corporate and real estate lending markets are stressed severely. The spread between yields on investment-grade corporate bonds and yields on long-term Treasury securities widens to about 5½ percentage points by the end of 2017, an increase of 3½ percentage points relative to the fourth quarter of 2016. The spread between mortgage rates and 10-year Treasury yields widens to over 3½ percentage points over the same time period.

Asset prices drop sharply in this scenario. Equity prices fall by 50 percent through the end of 2017, accompanied by a surge in equity market volatility, which approaches the levels attained in 2008. House prices and commercial real estate prices also experience large declines, with house prices and commercial real estate prices falling by 25 percent and 35 percent, respectively, through the first quarter of 2019.

The international component of this scenario features severe recessions in the euro area, the United Kingdom, and Japan and a marked growth slowdown in developing Asia. As a result of the sharp contraction in economic activity, all foreign economies included in the scenario experience a decline in consumer prices. As in this year's adverse scenario, the U.S. dollar appreciates against the euro, the pound sterling, and the currencies of developing Asia but depreciates modestly against the yen because of flight-to-safety capital flows.

Comparison of 2016 Severely Adverse Scenario and 2017 Severely Adverse Scenario

This year's severely adverse scenario features a slightly more severe downturn in the U.S. economy as compared to last year's scenario. Furthermore, this year's scenario does not feature a path of negative short-term U.S. Treasury rates that was featured in last year's scenario. In addition, this year's severely adverse scenario features a larger decline in commercial real estate prices. The international dimension of the scenarios shows recessionary episodes that, relative to last year's scenario, are more severe in the euro area and United Kingdom but less severe in developing Asia.

Additional Key Features of the Severely Adverse Scenario

As in the adverse scenario, the weakness in euro area economic conditions reflects a broad-based contraction in euro area demand, although this contraction should be assumed to be more protracted in countries with less room for fiscal policy intervention. The sharp slowdown in developing Asia is distributed unevenly across countries, with decelerations more pronounced in the larger economies. The economic slowdown in developing Asia should be assumed to be representative of conditions across emerging market economies. .

Declines in aggregate U.S. commercial and residential real estate prices should be assumed to be concentrated in regions and property types that have experienced rapid price gains over the past several years. In particular, given that prices of multifamily properties have risen rapidly in recent years, they should be assumed to decline by more than the CRE index. Declines in prices of U.S. housing and commercial real estate should also be assumed to be representative of risks to house prices and commercial real estate prices in foreign regions and economies, particularly where real estate prices have been growing at a fast pace. Spreads on commercial mortgage-backed securities widen to attain the same peaks reached in the 2007–2009 recession.