Annual Stress Test Baseline, Adverse, and Severely Adverse Scenarios

January 28, 2016

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 2½ percent per year. The unemployment rate declines to 4½ percent and Consumer Price Index (CPI) inflation rises to 2½ percent at an annual rate before dropping back to about 2 percent. Accompanying the moderate expansion, Treasury yields are assumed to rise steadily across the maturity spectrum. Asset prices rise modestly. 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 period of deflation in the United States and in the other countries. In the U.S., consumer prices fall about ½ percent over the four quarters of 2016. Reflecting weak economic conditions and deflationary pressures, short-term interest rates in the United States remain 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 heightened period of corporate financial stress and negative yields for short-term U.S. Treasury securities. Corporate financial conditions are severely stressed, reflecting mounting credit losses, heightened investor risk aversion, and strained market liquidity conditions. The international component of the severely adverse scenario features severe recessions in the euro area, the United Kingdom, and Japan, and a mild recession in developing Asia. As a result of acute economic weakness, all foreign economies included in the scenario experience a pronounced 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 OCC.[1] This note provides a narrative on the three scenarios to be used for the stress test. These scenarios were developed in coordination with the Federal Reserve Board and the Federal Deposit Insurance Corporation.[2]

The scenarios start in the first quarter of 2016 (2016:Q1) and extend through the first quarter of 2019 (2019:Q1). Each scenario includes 28 variables. 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 property 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 corporate security; the interest rate associated with a conforming, conventional, fixed-rate, 30-year 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/foreign currency 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 SAR, 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

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[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 Web site 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 March 1, 2016. These banks will be required to apply the global market shocks to their trading and counterparty positions as of January 4, 2016.

Baseline Scenario

The baseline outlook for U.S. real activity, inflation, and interest rates is similar to the January 2016 consensus projections from *Blue Chip Economic Indicators*.[3]

The baseline scenario for the United States is a moderate economic expansion through the projection period. Real GDP grows at an average rate of 2½ percent per year. The unemployment rate declines to 4½ percent in the middle of 2017 and remains near that level through the end of the scenario period. CPI inflation rises to 2½ percent at an annual rate by the middle of 2017 before dropping back to about 2 percent in the first quarter of 2018 and remaining near that level thereafter.

Accompanying the moderate economic expansion, Treasury yields are assumed to rise steadily across the maturity spectrum. Short-term Treasury rates increase from about ½ percent at the beginning of 2016 to about 2¾ percent by the beginning of 2019, while the yields on 10-year Treasury securities rise from 2½ percent to about 3¾ 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 rates. Reflecting strengthening 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 an average of about 4¾ percent per year and equity market volatility is assumed to remain near its historical average level. Nominal house prices rise an average of 2¾ percent per year and commercial real estate prices rise an average of 4¼ percent per year.

The outlook for international variables is similar to that reported in the January 2016 *Blue Chip Economic Indicators* and the International Monetary Fund's October 2015 *World Economic Outlook*. 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 6 percent per year over the scenario period; real GDP growth in the United Kingdom averages 2¼ percent per year; and real GDP growth in the euro area and Japan averages 1¾ percent per year and 1 percent per year, respectively.

Adverse Scenario

The adverse scenario is characterized by weakening economic activity across all countries or country blocks included in the scenario. The economic downturn is accompanied by a period of deflation in the United States and in the other countries and country blocks. It is important to

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[3] See Wolters Kluwer Legal and Regulatory Solutions (2016), "Blue Chip Economic Indicators," vol. 41, no. 1 (January 10).

note that this is a hypothetical scenario designed to assess the strength of banking organizations and their resilience to adverse economic conditions.

The adverse scenario features a moderate U.S. recession that begins in the first quarter of 2016. Real GDP in the United States falls 1¾ percent from the pre-recession peak in the fourth quarter of 2015 to the recession trough in the first quarter of 2017, while the unemployment rate rises steadily, peaking at 7½ percent in the middle of 2017. The U.S. recession is accompanied by a mild deflationary period, with consumer prices falling about ½ percent over the four quarters of 2016.

Reflecting weak economic conditions and deflationary pressures, short-term interest rates in the United States remain near zero over the projection period. The 10-year Treasury yield declines to 1¼ percent in early 2016 before rising gradually thereafter to 3 percent in the first quarter of 2019. Financial conditions tighten for corporations and households during the recession, with spreads between investment-grade corporate bond yields and 10-year Treasury yields and spreads between mortgage rates and 10-year Treasury yields widening through the end of 2016.

Asset prices decline in the adverse scenario. Equity prices fall approximately 25 percent through the fourth quarter of 2016, accompanied by a moderate rise in equity market volatility. Aggregate house prices and commercial real estate prices experience moderate declines; commercial real estate prices fall 12 percent through the third quarter of 2017 and house prices fall 12 percent through the third quarter of 2018.

Following the end of the recession in the United States, real activity picks up slowly at first and then gains speed; real U.S. GDP growth rises from 1¼ percent at an annual rate in the second quarter of 2017 to 3 percent at an annual rate by the middle of 2018. The unemployment rate declines modestly, to about 7 percent by the end of the scenario period. Consumer prices begin to rise slowly in the first quarter of 2017 and inflation remains subdued through the end of the scenario window. Consumer price inflation reaches 1¾ percent at an annual rate in the first quarter of 2019.

Outside of the United States, the adverse scenario features moderate recessions in the euro area, the United Kingdom, and Japan, as well as below-trend growth in developing Asia. Weakness in global demand results in deflation across all of the foreign economies under consideration as well as a broad-based decline in commodity prices. Headline consumer prices decline modestly through the end of 2016 in the euro area and the United Kingdom, and decline through the middle of 2017 in developing Asia. Japan experiences a sharper and more prolonged deflationary period, with prices falling through the second quarter of 2018. The U.S. dollar appreciates relative to the currencies of the countries and country blocks under consideration, reflecting flight-to-safety capital flows; the dollar appreciates most strongly against the euro and the currencies of developing Asia.

Comparison of 2015 Adverse Scenario and 2016 Adverse Scenario

The main difference relative to the 2015 adverse scenario is that this year's adverse scenario features a decline in the CPI—i.e., deflation—in the United States. Deflation in the euro area and

Japan was featured as a component of the 2015 adverse scenario, but that scenario also featured a considerable rise in headline U.S. inflation. In this year's adverse scenario, U.S. deflation implies substantially different paths of U.S. Treasury yields relative to the paths in last year's scenario. In this year's scenario, the yield curve is lower and initially flatter than under baseline assumptions, but then steepens over the scenario period. In last year's scenario, by contrast, the yield curve was higher and flatter than under baseline assumptions.

Compared with the 2015 adverse scenario, the period of U.S. deflation that is featured in the 2016 adverse scenario may be expected to reduce nominal household income growth and raise real effective interest rates. These are conditions that may be expected to reduce loan repayments and increase credit losses. The lower path of Treasury rates may be expected to reduce pre-provision net revenue (PPNR), largely through reduced net interest income.

Additional Key Features of the Adverse Scenario

As in last year's adverse scenario, the slowdown in euro area economic activity should be interpreted as a broad-based contraction in euro area demand, not as a contraction that is concentrated in a few specific economies. In addition, the slowdown in developing Asia should be interpreted as a weakening in economic conditions across emerging market economies and not merely as a weakening in Asia-specific conditions. Declines in aggregate U.S. 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, accompanied by a period of heightened corporate financial stress and negative yields for short-term U.S. Treasury securities. 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.

In this scenario, the level of U.S. real GDP begins to decline in the first quarter of 2016 and reaches a trough in the first quarter of 2017 that is 6¼ percent below the pre-recession peak. The unemployment rate increases by 5 percentage points, to 10 percent, by the middle of 2017 and headline consumer price inflation rises from about ¼ percent at an annual rate in the first quarter of 2016 to about 1¼ percent at an annual rate by the end of the recession.

Asset prices drop sharply in the scenario, consistent with the developments described above. Equity prices fall approximately 50 percent through the end of 2016, accompanied by a surge in equity market volatility, which approaches the levels attained in 2008. House prices and commercial real estate prices also experience considerable declines, with house prices dropping 25 percent through the third quarter of 2018 and commercial real estate prices falling 30 percent through the second quarter of 2018. Corporate financial conditions are stressed severely, reflecting mounting credit losses, heightened investor risk aversion, and strained market liquidity

conditions; the spread between yields on investment-grade corporate bonds and yields on long-term Treasury securities increases to 5¾ percent by the end of 2016.

As a result of the severe decline in real activity and subdued inflation, short-term Treasury rates fall to negative ½ percent by mid-2016 and remain at that level through the end of the scenario. For the purposes of this scenario, it is assumed that the adjustment to negative short-term interest rates proceeds with no additional financial market disruptions. The 10-year Treasury yield drops to about ¼ percent in the first quarter of 2016, rising gradually thereafter to reach about ¾ percent by the end of the recession in early 2017 and about 1¾ percent by 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 mild recession in developing Asia. As a result of acute economic weakness, all foreign economies included in the scenario experience a pronounced decline in consumer prices. Reflecting flight-to-safety capital flows during weak economic conditions, the U.S. dollar is assumed to appreciate against the euro, the pound sterling, and the currencies of developing Asia. The dollar is assumed to depreciate modestly against the yen, also in line with flight-to-safety capital flows.

Comparison of 2015 Severely Adverse Scenario and 2016 Severely Adverse Scenario

This year's severely adverse scenario features a more severe downturn in the U.S. economy as compared to last year's scenario. In line with the more severe U.S. recession, this year's severely adverse scenario also features a path of negative short-term U.S. Treasury rates. Furthermore, this year's scenario does not feature the pronounced increase in inflation that was featured in last year's scenario.

Compared with the 2015 severely adverse scenario, weaker economic conditions in the 2016 severely adverse scenario may be expected to result in higher credit losses on a wide range of loans and securities. Lower interest rates on Treasury securities suggest larger gains on the existing portfolio of these securities. Negative short-term interest rates may be expected to reduce banks' net interest margins and ultimately, to lower PPNR.

Additional Key Features of the Severely Adverse Scenario

As in the adverse scenario, the weakness in euro area economic conditions should be interpreted as a broad-based contraction in euro area demand, although the impact of this contraction should be assumed to be more protracted in countries with little room for fiscal policy intervention. The sharp slowdown in developing Asia is distributed unevenly across countries, with decelerations more pronounced in the larger economies. Economic conditions in developing Asia should be assumed to be representative of conditions across emerging market economies. In Europe as well as in emerging markets, the economic downturn heightens investor concerns about credit risk for countries with high levels of public debt. Spreads on credit default swaps for these countries increase by magnitudes in line with those experienced by Italy, Portugal, and Spain during 2011 and by emerging markets in 2008.

Declines in aggregate U.S. commercial and residential 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, particularly where real estate prices have been growing at a fast clip. Domestically, credit losses on commercial real estate loans backing commercial mortgage-backed securities are greater than would be expected given the general economic and financial stress in the scenario, prompting widespread investor pull-back. Spreads on commercial mortgage-backed securities widen to attain the same peaks reached in the 2007–2009 recession.