Annual Stress Test Baseline, Adverse, and Severely Adverse Scenarios

November 1, 2013

Brief Description of the Scenarios

The ***baseline scenario*** tracks the average projections from surveys of economic forecasters. The United States shows a moderate expansion in economic activity. Real GDP growth accelerates while the unemployment rate edges down in 2014. Interest rates remain flat in 2014 but then increase steadily with short-term Treasury rates reaching nearly 2½ percent by year-end 2016. Both equity and property prices would appreciate, albeit at a modest rate, through 2016. The baseline scenario for economic activity, inflation, and exchange rates outside the United States is characterized by an expansion in activity, albeit with divergent growth patterns.

The ***adverse scenario*** is characterized by a weakening in economic activity across all of the economies included in the scenario combined with a global aversion to long-term fixed income assets that bring about a rapid rise in long-term rates and a steeper yield curve in the United States and the four countries/country blocks.

The ***severely adverse*** scenario is characterized by a substantial weakening in economic activity across all of the economies included in the scenario. The scenario features a significant reversal of recent improvements to the U.S. housing market and the euro area outlook. The sharp slowdown in developing Asia in this year's severely adverse scenario is intended to represent a severe weakening in conditions across all emerging market economies. The larger decline in U.S. house prices in this year's severely adverse scenario—which assumes some additional reversal of recent increases in house prices—is viewed as a development that is particularly relevant for states or metropolitan statistical areas that have experienced brisk gains in house prices over the past year.

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 (Stress Test 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. 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 and the Federal Deposit Insurance Corporation.

All scenarios start in the fourth quarter of 2013 (2013:Q4) and extend through the fourth quarter of 2016 (2016:Q4). Each of the three scenarios include 28 variables. For domestic variables, each scenario includes the following:

- Six measures of economic activity and prices: annualized percent changes in real and nominal Gross Domestic Product (GDP), the unemployment rate of the civilian non-institutional population aged 16 and over, annualized percent changes in real and nominal disposable personal income, and the annualized Consumer Price Index (CPI);
- Four aggregate measures of asset prices or financial conditions: indexes 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 prime rate; and the interest rate associated with a conforming, conventional, fixed-rate, 30-year mortgage.

For international variables, each scenario includes three variables in four countries/country blocks:

- The three variables for each country/country block are the annualized percent change in real GDP, the annualized percent change in the CPI or local equivalent, and the U.S. dollar/foreign currency exchange rate.
- The four countries/country blocks included are the euro area, the United Kingdom, developing Asia, and Japan. The euro area is defined as the 17 European Union member states that have adopted the euro as their common currency, and developing Asia is defined as the nominal GDP-weighted aggregate of China, India, South Korea, Hong Kong SAR, and Taiwan.

The 28 variables provided this year include all of the variables provided last year and two new variables—the yield on the 5-year Treasury bond and the prime rate.[1] The motivation for adding

[1] Equity prices in this year's macro scenarios are measured by the Dow Jones Total Stock Market (Float Cap) Index. The Dow Jones Total Stock Market (Full Cap) Index that was used in last year's scenarios was discontinued by Dow Jones in November 2012 in favor of the Float Cap Index.

the yield on the 5-year Treasury bond is that—together with the rate on the 3-month Treasury bill and the yield on the 10-year Treasury bond—it provides a more thorough characterization of the Treasury yield curve. The motivation for adding the prime rate is that it is a commonly used base rate for many types of loan products.

The following sections describe the broad contours of the baseline scenario, the adverse scenario, and the severely adverse scenario. The specific values for all variables included in the scenarios are shown in this document and are also provided as 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 is providing a qualitative summary of the global market shocks that will be provided to some firms with significant trading activity by November 15, 2013. These firms will be required to apply the global market shocks to their trading and counterparty positions as of October 16, 2013.

Baseline Scenario

The baseline scenario follows a contour very similar to the average projections from surveys of economic forecasters. For example, the outlook for U.S. real activity and inflation in the baseline is in line with the October 2013 consensus projections from *Blue Chip Economic Indicators*.

The baseline scenario for the United States shows a moderate expansion in economic activity. Real GDP growth accelerates during 2014 and averages a little less than 3 percent per year during the scenario horizon, while the unemployment rate edges down in 2014 and falls slowly thereafter, reaching a level slightly below 6 percent by the end of 2016. CPI inflation rises slowly over the scenario horizon and averages a little more than 2 percent per year.

Consistent with the moderate pace of economic activity, equity prices increase about 5 percent per year and equity-market volatility remains low. Nominal house prices increase nearly 3 percent per year, on average, over the scenario. Commercial real estate prices increase about 4 percent per year during the scenario horizon.

Short-term Treasury rates in the baseline scenario remain at 10 basis points for most of 2014, and then increase about 25 basis points per quarter to reach nearly 2½ percent by year-end 2016. This path is consistent with the average projections from surveys of economic forecasters. Long-term Treasury yields move up steadily over the scenario horizon from their third quarter level near 2¾ percent to more than 4¼ percent by the end of 2016. Consistent with the strengthening economy, the BBB corporate spread narrows slightly during the scenario period; as a result, corporate yields increase by a bit less than similar-maturity Treasury yields. The prime rate moves up, following the contour of short-term Treasury rates, and mortgage rates move up, following the contour of long-term Treasury yields.

For international variables, the baseline outlook is similar to that reported in the October 2013 *Blue Chip Economic Indicators* and the International Monetary Fund's *World Economic Outlook*, also issued in October.

The baseline scenario for economic activity, inflation, and exchange rates outside the United

States is characterized by an expansion in activity, albeit with divergent growth patterns across the four countries/country blocks. There is a sustained recovery in the euro area as growth increases to a little over 1½ percent in 2015 and 2016, while real GDP growth in Japan slows to a little below 1¼ percent in 2016. For the United Kingdom and developing Asia, economic activity advances at a steady pace of around 2 percent and 6½ percent, respectively, each year.

Adverse Scenario

The following adverse scenario is qualitatively different from the 2013 adverse scenario released in November 2012. The main difference is the nature of the shock impacting the yield curve. In particular, the adverse scenario issued last year featured a sudden rise in U.S. inflation that resulted in a higher and flatter yield curve. In this year's adverse scenario, there is a global aversion to long-term debt instruments that results in a rapid rise in long-term rates and a steeper yield curve.

Scenario: The adverse scenario is characterized by a weakening in economic activity across all of the economies included in the scenario combined with a global aversion to long-term fixed income assets that bring about a rapid rise in long-term rates and a steeper yield curve in the United States and the four countries/country blocks..

The adverse scenario features a moderate recession in the United States that begins in the fourth quarter of 2013 and lasts through the end of 2014; during this period, the level of real GDP declines approximately 1 percent, and the unemployment rate rises to 9 ¼ percent. There is an initial slowing in CPI inflation before it picks up and returns to 2 percent by the middle of 2015. Equity prices fall 36 percent by the middle of 2014 and are just below their pre-recession level by the end of the scenario. The equity market volatility index doubles from its third-quarter 2013 level to 35 percent at the start of the scenario. House prices and commercial real estate prices decline approximately 10 percent and 20 percent, respectively, before stabilizing and starting to rise in early 2016.

Reflecting the weaker economy, short-term interest rates remain near zero over the scenario horizon. The assumed aversion to long-term debt instruments results in a sharp increase in the yield on the long-term Treasury bond to 5¾ percent by the end of 2014. With short-term interest rates flat, this increase results in a steepening of the yield curve of approximately 300 basis points by the end of 2014. Corporate borrowing rates and mortgage rates both rise sharply through 2014, reflecting a moderate increase in credit spreads on top of the sharp rise in Treasury yields.

A slow recovery begins in 2015, with GDP rising 2 percent that year and nearly 3¼ percent in 2016. The strengthening expansion results in the unemployment rate declining from its peak of 9¼ percent in the middle of 2015 to 8¾ percent at the end of 2016.

The international component of the adverse scenario features recessions in the euro area, the United Kingdom, and Japan in the early part of the scenario period and, over the same period, below-trend growth in developing Asia. Compared to the euro area and Japan, the recession in the United Kingdom is less severe.

Weaker economic activity results in a brief period of deflation with modest price declines in the euro area, while there is a sustained period of deflation with steeper price declines in Japan.

In this scenario, the aversion of investors to long-term fixed income assets is global, and consequently there are equivalent increases in sovereign yields across all countries. However, the euro, the pound, and the currencies of developing Asia depreciate against the dollar as a result of flight-to-safety capital flows associated with the global recession in the scenario. The yen appreciates modestly against the dollar, also reflecting flight-to-safety capital flows.

Severely Adverse Scenario

This severely adverse scenario is similar to the 2013 supervisory severely adverse scenario released in November 2012. On the domestic side of the scenario, the most notable difference between this year's and last year's severely adverse scenario is a larger decline in U.S. house prices. This difference arises because the scenario this year assumes an additional reversal of some of the house price gains over the past year. On the international side of the scenario, the main qualitative difference between this year's and last year's severely adverse scenario is a more substantial slowdown in developing Asia and, as a consequence, Japan. The severely adverse scenario issued last year featured a sharp slowdown in economic activity in China that had substantial spillovers to activity in the rest of developing Asia. In this year's severely adverse scenario, China continues to experience a sharp slowdown in economic activity, but other large economies of developing Asia now also experience similar sharp slowdowns that, moreover, originate in their own economies. Thus, the scenario assumes a more severe overall slowdown in developing Asia that significantly impacts Japan. These additional features of this year's severely adverse scenario are designed to assess the effect on large U.S. banks of a sharp turnaround in current developments in U.S. housing markets and a sizeable weakening of economic activity in emerging market economies.

Scenario: The severely adverse scenario is characterized by a substantial weakening in economic activity across all of the economies included in the scenario. In addition, the scenario features a significant reversal of recent improvements to the U.S. housing market and the euro area outlook.

In the United States, the severely adverse scenario features a severe recession in which the unemployment rate increases 4 percentage points from current levels (an amount similar to that seen in severe contractions over the past half-century) and peaks at 11¼ percent in the middle of 2015. Notably, the unemployment rate from late 2014 to mid-2016 remains above any level experienced during the past 70 years. Real GDP declines nearly 4¾ percent between the third quarter of 2013 and the end of 2014, and the four-quarter change in the CPI declines to less than 1 percent by the end of 2014 before moving back up to 1½ percent from the end of 2015 through 2016. Equity prices fall nearly 50 percent over the course of the recession and the equity market volatility index reaches a peak of 68 percent. House prices decline 25 percent during the scenario period, while commercial real estate prices decline nearly 35 percent.

Short-term interest rates remain near zero through 2016. The yield on the long-term Treasury note declines to 1 percent in 2014 before edging up approximately 1 percentage point by the end of 2016. Spreads on corporate bonds ramp up from about 200 basis points to roughly 500 basis points over the course of 2014. As a result, despite lower long-term Treasury yields, corporate borrowing rates rise and reach a peak just below 6¼ percent in mid-2014. Mortgage rates remain largely unchanged, with the decline in long-term Treasury yields offset by the widening in credit spreads. A slow recovery takes hold in 2015, and real GDP expands 2 percent that year and nearly 4 percent in 2016.

The international component of the severely adverse scenario features recessions in the euro area, the United Kingdom, and Japan, and below-trend growth in developing Asia. The euro area slips into recession in the fourth quarter of 2013 and remains in this state until the end of 2014. During this period, the level of euro area real GDP contracts 5¾ percent and the level of real GDP in the United Kingdom contracts 3 percent. In addition, there is a notable weakening of conditions in developing Asia and a recession in Japan, which begins in the fourth quarter of 2013 and lasts until 2015:Q3. When combined with spillovers from developing Asia, the recession in Japan implies a contraction in Japanese real GDP that is modestly larger than in the recent financial crisis.

The recoveries in the euro area, the United Kingdom, and Japan that follow their recessions are sluggish in this scenario: in the euro area, real GDP growth averages a little less than 2 percent per year from 2015:Q1 to 2016:Q4; in the United Kingdom, real GDP increases at a similarly modest pace of about 2 percent; in Japan, real GDP growth expands to a little more than 1¾ percent in 2016. In developing Asia, real GDP growth increases above trend by then end of 2014 and remains above trend in 2015 and 2016. In the severely adverse scenario, the U.S. dollar appreciates relative to the euro, the pound, and the currencies of developing Asia, and depreciates relative to the yen.

Additional Key Features of the Scenarios

The sharp slowdown in developing Asia featured in this year's severely adverse scenario is intended to represent a severe weakening in conditions across all emerging market economies and not simply a sharp slowdown specific to the developing Asia region. Likewise, the larger decline in U.S. house prices in this year's severely adverse scenario—which assumes some additional reversal of recent increases in house prices—is viewed as a development that is particularly relevant for states or metropolitan statistical areas that have experienced brisk gains in house prices over the past year.

Additionally, the widening of U.S. corporate borrowing spreads featured in the two stressful scenarios is intended to represent a corresponding widening in spreads across all corporate borrowing rating tiers and instruments, particularly those—such as, high-yield corporate bonds and leveraged loans—that are at present experiencing particularly narrow spreads.

The intended features of the adverse and severely adverse scenarios described above should be reflected in the paths of additional variables that companies may need to project for their company-run stress tests.

Global Market Shock Components for Adverse and Severely Adverse Scenarios

By November 15, 2013, the OCC will provide to certain firms global market shock components of adverse and severely adverse scenarios to be used for the current stress test.[2] 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 16, 2013 forthe current stress testing cycle) to project mark-to-market losses.[3]

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

The global market shock component for the severely adverse scenario is built around four key themes.

1. Globally, government and sovereign yield curves undergo marked shifts in level and shape. In most advanced economies, long-term rates rise sharply while short-term rates remain essentially unchanged. In emerging economies and some advanced economies, such as peripheral euro area economies, both short-term and long-term rates rise. The magnitudes of increases in rates differ by country.
2. Emerging market sovereigns and corporates experience credit shocks that are more severe than those experienced during the second half of 2008.
3. The euro area experiences a credit-themed crisis, manifested by sharp increases in government yields, the widening of corporate credit spreads, and increases in sovereign credit default swap spreads. While these effects are most pronounced in the so-called peripheral countries, the reverberations are felt across the entire euro area, most notably in the form of a large depreciation in the euro against the major currencies.
4. Market moves in all other asset classes and risk factors—in particular, in credit and equity markets—closely mirror the experiences of the second half of 2008.

The core of the global market shock component for the adverse scenario consists of market shocks that are, by and large, similar in structure, but not as severe as those assumed in the severely adverse scenario. Emerging market economies experience asset price declines and market dislocations that are similar in magnitude to those of the second half of 2008.

Please note:

[2] The global market shock component includes shocks to a large number of risk factors that include a wide range of financial market variables that affect asset prices, such as a credit spread or the yield on a bond, and, in some cases, the value of the position itself (e.g., the market value of private-equity positions).
[3] Currently, five national banks are subject to global market shocks: Bank of America Corporation; Citigroup Inc.; JPMorgan Chase & Co.; Morgan Stanley; and Wells Fargo & Company.

- The global market shock is a separate and additional component of the scenario applied only to the largest banks with complex trading portfolios[4]
- 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.

Taken together, the extreme movements in risk factors described in the market shock and the severe economic downturn in the macro scenario describe a major financial dislocation, featuring large declines in asset prices and large increases in asset price volatility and credit spreads, followed by a severe economic contraction, circumstances reminiscent of the experience during the recent financial crisis. While interest rates generally increase in the global trading shock components, and most rates fall in the initial quarters in the severely adverse macroeconomic scenario, these combinations are not inconsistent with the experience during the recent financial crisis, when interest rates increased sharply on certain days even as they ultimately fell on net. Indeed, some of the largest increases observed in Treasury rates occurred in the depths of the financial crisis, amid an environment of reduced liquidity and heightened investor uncertainty.

[4] The global market shock is a component of the macro scenario but does not need to be directionally consistent with the macro scenario.