

2. ECONOMIC ASSUMPTIONS AND INTERACTIONS WITH THE BUDGET

This chapter presents the economic forecast on which the 2016 Budget projections are based.¹ When the President took office in January 2009, the economy was in the midst of an historic economic crisis. The first order of business for the new Administration was to arrest the rapid decline in economic activity that threatened to plunge the country into a second Great Depression. The President and the Congress took unprecedented actions to restore demand, stabilize financial markets, and put people back to work. These steps included passage of the American Recovery and Reinvestment Act (ARRA), signed by the President just 28 days after taking office. They also included the Financial Stability Plan, announced in February 2009, which encompassed wide-ranging measures to strengthen the banking system, increase consumer and business lending, and stem foreclosures and support the housing market. These and a host of other actions walked the economy back from the brink. The economy bottomed out in June 2009 and gradually started to recover in late 2009.² Further measures to aid the recovery were taken in December 2010, such as temporarily cutting payroll taxes and continuing extended unemployment insurance.

At the start of 2013, the American Taxpayer Relief Act of 2012 (ATRA) prevented income tax increases on the vast majority of taxpayers and provided greater certainty for the years ahead. However, sequestration cuts that took effect in March 2013 reduced Gross Domestic Product (GDP) and employment growth by 0.6 percentage points and 750,000 jobs, respectively, in calendar year 2013 according to estimates from the Congressional Budget Office (CBO). The government shutdown and debt limit standoff in October 2013 also took a toll on the economy. The Bureau of Economic Analysis estimated that the reduction in hours worked by federal employees during the October 2013 shutdown reduced real GDP growth in the fourth quarter of 2013 by 0.3 percentage points.

Over the past 14 months, the Administration and Congress have come together to enact bipartisan legislation mitigating the harmful austerity imposed by sequestration and providing greater certainty. In December 2013, the President signed into law the Bipartisan Budget Act (BBA), undoing a portion of sequestration for 2014 and 2015. Congress followed this action with the enactment of full year appropriations for 2014 in January of last year and full year appropriations for 2015 for almost all departments and agencies in December. In December

¹Economic performance is discussed in terms of calendar years. Budget figures are discussed in terms of fiscal years. Economic growth figures are in real (inflation-adjusted) terms unless otherwise noted.

²The dating of U.S. business cycles is done by the National Bureau of Economic Research, a private institution that has supported economic research on business cycles and other topics for many decades.

2013, the Council of Economic Advisers estimated that the relaxation of sequestration achieved through the BBA would add about 350,000 jobs (cumulative) over the two-year period ending in 2015.

Over the past 21 quarters, through the third quarter of 2014, real GDP has grown at an average annual rate of 2.3 percent, and since February 2010, 11.2 million jobs have been added in the private sector. Job growth accelerated during 2014, with the most jobs created in any calendar year since 1999. Meanwhile, the unemployment rate has fallen fairly steadily from its October 2009 peak of 10.0 percent to 5.6 percent in December.

The economy is projected to grow at a three percent pace in 2015 and in 2016 and at 2.7 percent in 2017. With healthy economic growth, the unemployment rate is expected to reach the level consistent with full employment by the end of 2015 and continue to decline to 4.8 percent by the end of 2017. The unemployment rate then stabilizes at 5.2 percent by 2020.

This chapter contains several sections:

- The first section reviews recent economic performance.
- The second section discusses the Administration's economic projections.
- The third section compares the Administration's assumptions with other forecasts and with the Administration's projection in last year's Budget.
- The fourth section describes how changes in assumptions about key economic variables result in changes in receipts, outlays, and the deficit.
- The fifth section presents information on past forecast errors for growth, inflation, and interest rates and how these forecast errors compare with those for forecasts made by the Congressional Budget Office (CBO) and the private-sector Blue Chip Consensus.
- The sixth section shows a probabilistic range of budget outcomes based on past errors in projecting the deficit.
- The last section discusses the relationship between structural and cyclical deficits, showing how much of the actual deficit is related to the economic cycle (e.g., the recent recession) and how much would persist even if the economy were at full employment.

Recent Economic Performance

The accumulated stresses from falling house prices and shrinking homebuilding and the resulting strains on financial markets brought the 2001-2007 expansion to an end in December 2007. In its early stages, the 2008-2009 recession was relatively mild, but financial conditions worsened sharply in the fall of 2008 and from that point forward the recession became more severe. By the time it ended, real GDP had fallen further and the downturn had lasted longer than any previous post-World War II recession. The recovery began in the third quarter of 2009, with real growth averaging 2.3 percent since that point, including 2.7 percent for the most recent four quarters, ending 2014-Q3. While the recovery strengthened over the past year, the unemployment rate is still elevated and the long-term unemployment rate remains particularly high. The Administration's proposals will help to accelerate the return to full employment while also contributing to stronger growth in wages.

Accelerating Progress in the Labor Market.—The unemployment rate peaked in 2009 at 10 percent, but has since declined to 5.6 percent. Private employment has grown for the past 58 straight months and December marked the eleventh consecutive month of job growth above 200,000. Moreover, the pace of job creation has jumped from about 195,000 per month in 2012-13 to 235,000 in 2014. However, the unemployment rate remains somewhat above the level consistent with stable inflation, estimated at about 5.2 percent. The rate of long-term unemployment (those out of work for more than 6 months) remains higher than normal for this stage of a recovery, although it has declined 0.7 percentage points over the past year.

Domestic Energy Boom and Decline in Oil Prices.—In the last five years, there has been a dramatic increase in domestic energy production. The United States is now the world's largest producer of oil and gas. Over the past year, domestic production of crude oil exceeded imports of oil for the first time since 1995. This broad-based energy boom supports jobs directly in production and distribution, as well as indirectly by making the United States more attractive as a location for manufacturing by multinational firms in energy-intensive industries.

The increase in U.S. production, combined with a decline in worldwide oil consumption due to slow growth abroad, increased energy efficiency, and alternative fuel production, led to a dramatic decline in oil prices over the last few months of 2014. The price of West Texas Intermediate crude declined from \$107 per barrel in late June to less than \$60 per barrel in December. Retail gasoline prices tumbled from \$3.78 per gallon to less than \$2.50/gallon in December. Although the lower prices may reduce domestic oil production somewhat in the near-term, the net effect on the economy is positive since the United States is still a net oil importer, and consumers and nonoil businesses will benefit from the price drop.

Housing Markets Show Further Strength.—The housing market, a major cause of the financial crisis and recession, has shown clear signs of recovery. In 2006-

2007, housing prices peaked and, from 2007 through 2008, housing prices fell sharply according to all available measures.³ During the downturn, as house prices fell, investment in housing plummeted, reducing the rate of real GDP growth by an average of 1 percentage point per year. Housing prices started to rise again in 2012 with a cumulative gain of 16 percent over the last seven quarters, according to the Case-Shiller index. Residential investment began to increase steadily in the second quarter of 2011 and rose at an annual rate of about 14% in 2012 with smaller net increases in 2013 and 2014.

In April 2009, housing starts fell to an annual rate of just 478,000 units, the lowest level on record for this series, which dates from 1959. Housing starts rose modestly over the next two years and increased to about one million units per year during 2014. Typically, about 1.65 million starts a year are needed to accommodate the needs of an expanding population with an increasing number of households and to replace older units, indicating potential for a substantial housing rebound. The Administration forecast assumes a continued recovery in housing activity that adds to real GDP growth over the forecast horizon, especially over the next three years.

Consumption Steady.—Between the first quarter of 2007 and the first quarter of 2009, the real net worth of American households declined by \$15 trillion at 2009 prices (19 percent) – the equivalent of one year's GDP. A precipitous decline in the stock market, along with falling house prices over this period, were the main reasons for the drop in household wealth. Since then, real household wealth, including financial assets, has risen substantially and now exceeds its previous peak. Most of this rebound is accounted for by the rise in equity prices. The turnaround in housing prices has raised residential wealth, although it remains well below its previous peak.⁴

In recent quarters, real consumption spending has increased at about a 2-1/2 to 3 percent rate, at or slightly above the long-run growth of the economy. The dramatic fall in oil prices in late 2014 will reduce nominal spending on gasoline and other petroleum products, boost real disposable income, and enable an increase in real spending on other consumer goods and services.

Rebound in Business Investment.—Business fixed investment fell sharply during the 2008-2009 contraction. It rose rapidly in 2010 through 2014 and real investment at the end of 2013 exceeded its pre-recession levels for the first time. Real nonresidential fixed investment increased by almost 9 percent in the four quarters ending 2014-Q3 and should remain strong during the next stage of the recovery. The cost of capital is low and American corporations at the end of 2014 held substantial levels of cash reserves, which could provide funding for future investments as the economy continues to recover and

³There are several measures of national housing prices. Two respected measures that attempt to correct for variations in housing quality are the S&P/Case-Shiller Home Price Index and the Federal Housing Finance Agency (FHFA) Purchase-Only House Price Index. The Case-Shiller index peaked in 2006, while the FHFA index peaked in 2007.

⁴Real wealth is computed by deflating household net worth from the Flow-of-Funds Accounts by the Chained Price Index for Personal Consumption Expenditures. Data are available through 2014:Q3.

consumption remains relatively strong. Nevertheless, the pace of future growth could prove to be uneven, as investment tends to be volatile.

Fiscal Drag Has Peaked.—Fiscal policy restraint substantially slowed the expansion in 2012-13, but was a much smaller factor in 2014 as the reduction in Federal Government expenditures slowed. In the four quarters ending 2014-Q3, real Federal spending fell by 0.6 percent and was offset by an increase in State and local spending of 0.9 percent. In the prior four quarters, Federal spending fell 7 percent while State and local outlays increased only 0.8 percent. In 2015 and going forward, real government purchases are expected to have a roughly neutral impact on economic growth.

Economic Projections

The economic projections underlying the 2016 Budget estimates are summarized in Table 2-1. The assumptions are based on information available as of mid-November 2014. This section discusses the Administration's projections. The next section compares these projections with those of the Federal Reserve's Open Market Committee (FOMC), the CBO, and the Blue Chip Consensus of private forecasters. As discussed below, the Administration's economic forecast, as always, is based on the assumption that the Budget proposals are enacted in full.

Real GDP.—Real GDP grew 2.7 percent during the four quarters ending 2014-Q3. The Administration projects the economic recovery that began in mid-2009 will continue with real GDP growing at an average annual rate of 2.8 percent over the next four years. Real GDP growth is projected to ease to 2.3 percent by 2019 and to remain at that rate for the final years of the forecast. The slower growth in the last few years is due to the exhaustion of the cyclical factors that are still present in the near term. Demographic factors also lower the labor force participation rate as the baby boom generation retires.

Recent recoveries have been somewhat weaker than average, but the last two expansions that began in 1991 and 2001 were preceded by mild recessions, leaving relatively little pent-up demand after conditions improved. Because of the depth of the most recent recession, there was much more room for a rebound in spending and production than was true either in 1991 or 2001. On the other hand, lingering impediments from the credit crisis and other special factors limited the pace of the recovery in the first stages of the expansion, while less favorable demographics also slowed growth relative to previous recoveries.

The U.S. economy has substantial room for growth, although there are factors that could continue to limit that growth in the years ahead. On the positive side, the unemployment rate has fallen substantially since the recession trough and further progress in the labor market is expected in 2015-16. Monetary policy likely will continue to support growth as inflation remains below the Federal Reserve's target. However, some European and Asian markets have been troubled by weak economic growth. The drag from a slowdown in foreign countries could hamper the growth of the U.S. economy.

Long-Term Growth.—The Administration's forecast does not attempt to project cyclical developments beyond the next few years. The long-run projection for real economic growth and unemployment assumes that they will maintain trend values in the years following the return to full employment. Real GDP grows at a rate of 2.3 percent in the final years of the projection. That is markedly slower than the average growth rate of real GDP since 1947 of 3.2 percent per year. In the 21st Century, real GDP growth in the United States is likely to be slower than it was in earlier eras because of a slowdown in labor force growth, initially due to the retirement of the post-World War II baby boom generation, and later due to a decline in the growth of the working-age population. As discussed below, these projections do not include the labor force effects of immigration reform, which has the potential to boost labor force growth.

Unemployment.—In December 2014, the overall unemployment rate was 5.6 percent. In line with the increased growth in the economy projected after 2014, the unemployment rate is expected to decline to 4.8 percent by the end of 2017 and rebound modestly to 5.2 percent during the period of trend growth during the last few years of the forecast. The temporary reduction in the unemployment rate compared with the so-called 'natural rate' is a consequence of inflation running below the Federal Reserve target rate of 2 percent as measured by the price index for personal consumption expenditures; this leaves room for a further drop in unemployment without inflation exceeding the Federal Reserve target.

Inflation.—The Consumer Price Index for all urban consumers (CPI-U) rose by 0.8 percent for the 12 months ending in December 2014, somewhat lower than in 2013. Excluding food and energy, "core" CPI inflation in 2014 was 1.6%, the same as in 2013. The lower rate of overall inflation as compared to the core index was due almost entirely to lower energy price inflation. By year's end gasoline prices had fallen to a multi-year low.

Weak demand, including from abroad, continues to hold down prices for many goods and services and continued elevated unemployment together with other measures of economic slack are expected to result in a relatively low inflation rate. As the economy recovers and the unemployment rate declines, the rate of inflation should remain near the Federal Reserve's target of around 2 percent per year. The Administration projects that the rate of change in the CPI-U will average 2.3 percent and that the GDP price index will increase at a 2.0 percent annual rate in the long run.

Interest Rates.—Interest rates on Treasury securities fell sharply in late 2008 as both short-term and long-term rates declined to their lowest levels in decades. Since then, Treasury rates have fluctuated, but they have not returned to the levels observed before the financial crisis. During 2014, the 10-year rate fell by over 50 basis points to 2-1/4 percent, reversing most of the rise that occurred in 2013 after a temporary rise following the Federal Reserve's announcement of a phased reduction in its program of quantitative easing. In the Administration's projections, interest rates are expected to rise, but only

Table 2-1. ECONOMIC ASSUMPTIONS¹
(Calendar years; dollar amounts in billions)

| | Actual 2013 | Projections | | | | | | | | | | | |
|--|----------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
| Gross Domestic Product (GDP): | | | | | | | | | | | | | |
| Levels, dollar amounts in billions: | | | | | | | | | | | | | |
| Current dollars | 16,768 | 17,394 | 18,188 | 19,039 | 19,933 | 20,847 | 21,770 | 22,717 | 23,705 | 24,736 | 25,812 | 26,934 | 28,106 |
| Real, chained (2009) dollars | 15,710 | 16,058 | 16,552 | 17,049 | 17,528 | 17,979 | 18,406 | 18,830 | 19,263 | 19,706 | 20,159 | 20,623 | 21,097 |
| Chained price index (2009 = 100), annual average ... | 106.7 | 108.4 | 109.9 | 111.7 | 113.8 | 116.0 | 118.3 | 120.7 | 123.1 | 125.6 | 128.1 | 130.6 | 133.2 |
| Percent change, fourth quarter over fourth quarter: | | | | | | | | | | | | | |
| Current dollars | 4.6 | 3.5 | 4.6 | 4.8 | 4.6 | 4.5 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| Real, chained (2009) dollars | 3.1 | 2.1 | 3.0 | 3.0 | 2.7 | 2.5 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Chained price index (2009 = 100) | 1.4 | 1.4 | 1.5 | 1.7 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Percent change, year over year: | | | | | | | | | | | | | |
| Current dollars | 3.7 | 3.7 | 4.6 | 4.7 | 4.7 | 4.6 | 4.4 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| Real, chained (2009) dollars | 2.2 | 2.2 | 3.1 | 3.0 | 2.8 | 2.6 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Chained price index (2009 = 100) | 1.5 | 1.5 | 1.4 | 1.6 | 1.8 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Incomes, billions of current dollars: | | | | | | | | | | | | | |
| Domestic Corporate Profits | 1,704 | 1,672 | 1,796 | 1,858 | 1,861 | 1,833 | 1,801 | 1,763 | 1,761 | 1,765 | 1,779 | 1,825 | 1,865 |
| Employee Compensation | 8,845 | 9,250 | 9,610 | 10,036 | 10,528 | 11,047 | 11,570 | 12,109 | 12,671 | 13,259 | 13,882 | 14,510 | 15,173 |
| Wages and salaries | 7,125 | 7,468 | 7,746 | 8,102 | 8,507 | 8,939 | 9,358 | 9,792 | 10,236 | 10,708 | 11,210 | 11,713 | 12,234 |
| Other taxable income ² | 4,012 | 4,134 | 4,266 | 4,506 | 4,771 | 5,084 | 5,396 | 5,708 | 5,997 | 6,278 | 6,554 | 6,829 | 7,121 |
| Consumer Price Index (all urban):³ | | | | | | | | | | | | | |
| Level (1982-84 = 100), annual average | 233.0 | 236.9 | 240.3 | 244.8 | 250.1 | 255.7 | 261.5 | 267.4 | 273.5 | 279.6 | 286.0 | 292.4 | 299.1 |
| Percent change, fourth quarter over fourth quarter ... | 1.2 | 1.5 | 1.8 | 2.0 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Percent change, year over year | 1.5 | 1.7 | 1.4 | 1.9 | 2.1 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Unemployment rate, civilian, percent: | | | | | | | | | | | | | |
| Fourth quarter level | 7.0 | 5.7 | 5.3 | 4.9 | 4.8 | 4.9 | 5.0 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 |
| Annual average | 7.4 | 6.2 | 5.4 | 5.1 | 4.9 | 4.9 | 5.0 | 5.1 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 |
| Federal pay raises, January, percent: | | | | | | | | | | | | | |
| Military ⁴ | 1.7 | 1.0 | 1.0 | 1.3 | NA |
| Civilian ⁵ | 0.0 | 1.0 | 1.0 | 1.3 | NA |
| Interest rates, percent: | | | | | | | | | | | | | |
| 91-day Treasury bills ⁶ | 0.1 | * | 0.4 | 1.5 | 2.4 | 2.9 | 3.2 | 3.3 | 3.4 | 3.4 | 3.5 | 3.5 | 3.5 |
| 10-year Treasury notes | 2.4 | 2.6 | 2.8 | 3.3 | 3.7 | 4.0 | 4.3 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |

* 0.05 percent or less.

NA = Not Available.

¹ Based on information available as of mid-November 2014.

² Rent, interest, dividend, and proprietors' income components of personal income.

³ Seasonally adjusted CPI for all urban consumers.

⁴ Percentages apply to basic pay only; percentages to be proposed for years after 2016 have not yet been determined.

⁵ Overall average increase, including locality pay adjustments. Percentages to be proposed for years after 2016 have not yet been determined.

⁶ Average rate, secondary market (bank discount basis).

gradually as financial concerns are alleviated and the economy continues to strengthen. The 91-day Treasury bill rate is projected to average about 0.4 percent in 2015, consistent with the Federal Reserve's announced intentions, and then to rise to 3.6 percent by 2023. The 10-year rate is expected to rise moderately in 2015 and reaches 4.5 percent by 2020. Consistent with the projections for GDP growth, the Administration forecast projects that interest rates will stabilize below their historical averages; both economic theory and historical data suggest that lower GDP growth is associated with lower interest rates.

Income Shares.— In the expansion that ended in 2007, hourly labor compensation tended to lag behind

the growth in productivity and that was also true for the surge in productivity growth in 2009-2010. Partly as a result, the share of labor compensation was extremely low by historical standards in 2014 at 53 percent of GDP. It is expected to stay near that level through 2018. As employment and wages increase, compensation is projected to rise slightly, reaching 54 percent of GDP in 2025. The share of wages and salaries is expected to rise from 43 percent of GDP in 2014 to 43-1/2 percent in 2025. The share of domestic corporate profits, presently near historic highs, is expected to decline gradually from almost 10 percent in 2014 to 6.6 percent in 2025.

Table 2-2. COMPARISON OF ECONOMIC ASSUMPTIONS IN THE 2015 AND 2016 BUDGETS
(Calendar years; dollar amounts in billions)

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Nominal GDP: | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 17,560 | 18,470 | 19,449 | 20,478 | 21,478 | 22,465 | 23,475 | 24,506 | 25,573 | 26,687 | 27,850 |
| 2016 Budget Assumptions | 17,394 | 18,188 | 19,039 | 19,933 | 20,847 | 21,770 | 22,717 | 23,705 | 24,736 | 25,812 | 26,934 |
| Real GDP (2009 dollars): | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 16,208 | 16,753 | 17,312 | 17,872 | 18,377 | 18,843 | 19,303 | 19,754 | 20,208 | 20,673 | 21,148 |
| 2016 Budget Assumptions | 16,058 | 16,552 | 17,049 | 17,528 | 17,979 | 18,406 | 18,830 | 19,263 | 19,706 | 20,159 | 20,623 |
| Real GDP (percent change):² | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 3.2 | 3.4 | 3.3 | 3.2 | 2.8 | 2.5 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 |
| 2016 Budget Assumptions | 2.2 | 3.1 | 3.0 | 2.8 | 2.6 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| GDP Price Index (percent change):² | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 1.6 | 1.8 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 2016 Budget Assumptions | 1.5 | 1.4 | 1.6 | 1.8 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Consumer Price Index (all-urban; percent change):² | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 1.6 | 2.0 | 2.1 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| 2016 Budget Assumptions | 1.7 | 1.4 | 1.9 | 2.1 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Civilian Unemployment Rate (percent):³ | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 6.9 | 6.4 | 6.0 | 5.6 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 |
| 2016 Budget Assumptions | 6.2 | 5.4 | 5.1 | 4.9 | 4.9 | 5.0 | 5.1 | 5.2 | 5.2 | 5.2 | 5.2 |
| 91-day Treasury bill rate (percent):³ | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 0.1 | 0.3 | 1.2 | 2.3 | 3.2 | 3.6 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 |
| 2016 Budget Assumptions | * | 0.4 | 1.5 | 2.4 | 2.9 | 3.2 | 3.3 | 3.4 | 3.4 | 3.5 | 3.5 |
| 10-year Treasury note rate (percent):³ | | | | | | | | | | | |
| 2015 Budget Assumptions ¹ | 3.0 | 3.5 | 4.0 | 4.3 | 4.6 | 4.7 | 4.9 | 5.0 | 5.0 | 5.0 | 5.0 |
| 2016 Budget Assumptions | 2.6 | 2.8 | 3.3 | 3.7 | 4.0 | 4.3 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |

* 0.05 percent or less.

¹ Adjusted for July 2014 NIPA revisions.

² Calendar year over calendar year.

³ Calendar year average.

Changes in Economic Assumptions from Last Year's Budget.—The 2016 Budget forecast reflects economic developments over the past year, but many of the forecast values are similar to those of the 2015 Budget, especially in the long run (see Table 2–2). The current Budget anticipates less rapid growth in 2014–2018 than the prior Budget, but assumes the same 2.3 percent rate of potential GDP growth in the long run. The ultimate projection for the unemployment rate has been lowered by 0.2 percentage point, and dips below that rate in the near term. Projected short- and long-term maturity interest rates are slightly lower over the forecast in this year's Budget, reflecting lower levels of interest rates than expected in 2014 and continued analysis of the relationship between GDP growth and interest rates. Inflation is lower in the near-term, but is projected to return to its long-run average consistent with Federal Reserve policy, estimated at 2.3 percent for the CPI-U and 2.0 percent for the GDP price index.

Comparison with Other Forecasts

Table 2–3 compares the economic assumptions for the 2016 Budget with projections by CBO, the Blue Chip

Consensus—an average of about 50 private-sector economic forecasts—and, for some variables, the Federal Reserve Open Market Committee. These other forecasts differ from the Administration's projections, but the differences are relatively small compared with the margin of error in all economic forecasts. Like the Administration's forecast, the other forecasts project that real GDP will continue to grow as the economy returns to a normal level of unemployment. The forecasts also agree that inflation will be low and that interest rates will eventually rise to more normal levels, but below the historical average.

The Administration projections were completed in mid-November, meaning that they do not reflect new data, such as the revision in real GDP to 5.0 percent in the third quarter of 2014. The nearly three-month lag between that date and the Budget release is due to the long lead time required to complete the estimates for agency programs that are incorporated in the Budget. The Blue Chip Consensus for 2015–2025 in this table was the latest available, from early January for projections through 2016 and from October for long-term projections. The CBO forecast is from the August 2014 update, because the January 2015 Budget Outlook was not available as

Table 2-3. COMPARISON OF ECONOMIC ASSUMPTIONS
(Calendar years)

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|------------|------------|------------|------------|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|
| Nominal GDP: | | | | | | | | | | | | |
| 2016 Budget | 17,394 | 18,188 | 19,039 | 19,933 | 20,847 | 21,770 | 22,717 | 23,705 | 24,736 | 25,812 | 26,934 | 28,106 |
| CBO | 17,336 | 18,204 | 19,169 | 20,119 | 21,009 | 21,916 | 22,855 | 23,821 | 24,816 | 25,839 | 26,886 | NA |
| Blue Chip | 17,434 | 18,258 | 19,154 | 20,084 | 21,019 | 21,975 | 22,975 | 23,997 | 25,064 | 26,179 | 27,344 | 28,560 |
| Real GDP (year-over-year): | | | | | | | | | | | | |
| 2016 Budget | 2.2 | 3.1 | 3.0 | 2.8 | 2.6 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| CBO | 1.5 | 3.2 | 3.5 | 3.0 | 2.4 | 2.3 | 2.3 | 2.2 | 2.2 | 2.1 | 2.0 | NA |
| Blue Chip | 2.4 | 3.2 | 2.9 | 2.7 | 2.5 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Real GDP (fourth-quarter-over-fourth-quarter): | | | | | | | | | | | | |
| 2016 Budget | 2.1 | 3.0 | 3.0 | 2.7 | 2.5 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| CBO | 1.5 | 3.4 | 3.4 | 2.7 | 2.3 | 2.3 | 2.2 | 2.2 | 2.1 | 2.1 | 2.0 | NA |
| Blue Chip | 2.5 | 2.9 | 2.8 | 2.7 | 2.4 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Federal Reserve Central Tendency ³ | 2.3 to 2.4 | 2.6 to 3.0 | 2.5 to 3.0 | 2.3 to 3.5 | ----- 2.0 to 2.3 longer run ----- | | | | | | | |
| GDP Price Index:¹ | | | | | | | | | | | | |
| 2016 Budget | 1.5 | 1.4 | 1.6 | 1.8 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| CBO | 1.7 | 1.8 | 1.7 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | NA |
| Blue Chip | 1.5 | 1.5 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 |
| Consumer Price Index (CPI-U):¹ | | | | | | | | | | | | |
| 2016 Budget | 1.7 | 1.4 | 1.9 | 2.1 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| CBO | 2.0 | 2.2 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | NA |
| Blue Chip | 1.6 | 0.8 | 2.2 | 2.3 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Unemployment Rate:² | | | | | | | | | | | | |
| 2016 Budget | 6.2 | 5.4 | 5.1 | 4.9 | 4.9 | 5.0 | 5.1 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 |
| CBO | 6.2 | 5.9 | 5.8 | 5.7 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.5 | 5.5 | NA |
| Blue Chip | 6.2 | 5.5 | 5.1 | 5.2 | 5.2 | 5.3 | 5.3 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 |
| Federal Reserve Central Tendency ³ | 5.8 | 5.2 to 5.3 | 5.0 to 5.2 | 4.9 to 5.3 | ----- 5.2 to 5.5 longer run ----- | | | | | | | |
| Interest Rates:² | | | | | | | | | | | | |
| 91-Day Treasury Bills (discount basis): | | | | | | | | | | | | |
| 2016 Budget | * | 0.4 | 1.5 | 2.4 | 2.9 | 3.2 | 3.3 | 3.4 | 3.4 | 3.5 | 3.5 | 3.5 |
| CBO | 0.1 | 0.3 | 1.1 | 2.1 | 3.1 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | NA |
| Blue Chip | * | 0.4 | 1.7 | 2.9 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 |
| 10-Year Treasury Notes: | | | | | | | | | | | | |
| 2016 Budget | 2.6 | 2.8 | 3.3 | 3.7 | 4.0 | 4.3 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| CBO | 2.8 | 3.2 | 3.8 | 4.2 | 4.6 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | NA |
| Blue Chip | 2.5 | 2.7 | 3.4 | 4.2 | 4.4 | 4.4 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |

* 0.05 percent or less.

NA = Not Available.

Sources: Administration; CBO, An Update to the Budget and Economic Outlook: Fiscal Years 2014 to 2024;

October 2014 and January 2015 Blue Chip Economic Indicators, Aspen Publishers, Inc.;

Federal Reserve Open Market Committee, December 18, 2013.

¹ Year-over-year percent change.

² Annual averages, percent.

³ Average of 4th quarter values.

this volume went to print. The FOMC members' central tendencies of their forecasts date from December 2014.

Real GDP Growth.—Between 2015 and 2018, the Administration expects slightly more growth than Blue Chip and CBO, partly because the forecast assumes that all of the Budget proposals will be enacted (see discussion below). In the out-years, the Administration projects the same growth as the Blue Chip consensus, but stronger GDP growth than CBO. The difference from the CBO

forecast principally reflects different assumptions about productivity.

The Administration projects that still-high levels of unemployment and low inflation imply a few years of higher-than-normal growth as employment increases, the unemployment rate falls temporarily below 5 percent, and real GDP makes up the lost ground. In the Blue Chip projections, real GDP growth exceeds its long-run average only briefly in the 11-year forecast period. CBO anticipates a stronger recovery than Blue Chip between 2015

and 2017—close to the Administration’s projection—but projects a sharper decline in growth in the later years than the Administration, Blue Chip, or the FOMC. CBO assumes slower growth in productivity and potential GDP in the long-term and also assumes that actual GDP will remain below potential after the economy has completed its cyclical recovery. The high end of the FOMC’s projections is about the same as the Administration’s.

All economic forecasts are subject to error, and looking back, past forecast errors are generally much larger than the forecast differences discussed above. As discussed in a section later in this chapter, past forecast errors among the Administration, CBO, and the Blue Chip have been roughly similar.

Unemployment, Inflation, and Interest Rates.—The Administration projects unemployment falling steadily over the next few years to a level of 4.8 percent at the end of 2017 and returning to 5.2 percent by the end of the forecast. The other forecasts are slightly less optimistic about employment in the long run.

The Administration, CBO, and the Blue Chip Consensus anticipate a subdued rate of inflation over the next two years. In the medium term, inflation is projected to return to a rate of around two percent per year, which is consistent with the Federal Reserve’s long-run policy goal. All forecasts have interest rates increasing substantially in the long run to similar levels.

Effects of policy on growth.—The Administration’s forecast assumes that the President’s Budget proposals will be enacted. The 50 or so private forecasters in the Blue Chip Consensus make differing policy assumptions, but it is safe to assume that they do not generally assume full enactment of the Administration’s budget proposals. CBO is required in making its projections to assume that current law will continue.

The Administration’s Budget proposals provide important support for growth. They include:

- A major investment in infrastructure through a six-year surface transportation reauthorization proposal, as well as additional investments in infrastructure, education and research.
- Business tax reform that will boost the economy by moving to a more neutral tax system and improving the allocation of investment.
- Policies to boost labor supply, particularly among female workers, such as expansion of child care subsidies and the Child and Dependent Care Tax Credit, support for State paid leave programs, and creation of a second earner tax credit, as well as an expansion of the Earned Income Tax Credit for workers without children and noncustodial parents.
- Comprehensive immigration reform. The Budget includes an allowance for immigration reform that takes into account its effects on population and the labor force. Therefore, the economic projections do not include the effects of immigration reform on population and employment, to avoid double counting. However, the allowance does not incorporate immi-

gration reform’s significant positive effects on total factor productivity.

- Deficit reduction. The Budget would reduce deficits to sustainable levels and put debt on a declining path as a share of GDP, with positive effects on private investment and growth.

Sensitivity of the Budget to Economic Assumptions

Both receipts and outlays are affected by changes in economic conditions. Budget receipts vary with individual and corporate incomes, which respond to real economic growth and inflation. At the same time, outlays for many Federal programs are directly linked to developments in the economy. For example, most retirement and other social insurance benefit payments are tied by law to consumer price indices. Medicare and Medicaid outlays are affected directly by the prices paid for medical services. Interest on the debt is linked to market interest rates and the size of the budget surplus or deficit, both of which in turn are influenced by economic conditions. Outlays for certain benefits such as unemployment compensation and the Supplemental Nutrition Assistance Program vary with the unemployment rate.

This sensitivity complicates budget planning because differences in economic assumptions lead to changes in the budget projections. Economic forecasting inherently entails uncertainty. It is therefore useful to examine the implications of changes in key economic assumptions. Many of the budgetary effects of such changes are fairly predictable and a set of general principles or “rules of thumb” embodying these relationships can aid in estimating how changes in the economic assumptions would alter outlays, receipts, and the surplus or deficit. These rules of thumb should be understood as suggesting orders of magnitude; they do not account for potential secondary effects.

The rules of thumb show how the changes in economic variables affect Administration estimates for receipts and outlays, holding other factors constant. They are not a prediction of how receipts or outlays would actually turn out if the economic changes actually materialized. The rules of thumb are based on a fixed budget policy which does not account for how policymakers might change taxes and spending should the economic outlook change substantially. For example, unexpected downturns in real economic growth, and attendant job losses, usually give rise to legislative actions to stimulate the economy with additional countercyclical policies. Also, the rules of thumb do not reflect certain “technical” changes that often accompany the economic changes. For example, changes in capital gains realizations often accompany changes in the economic outlook. On the spending side of the budget, the rules of thumb do not capture changes in deposit insurance outlays, even though bank failures are generally associated with weak economic growth and rising unemployment.

Economic variables that affect the budget do not always change independently of one another. Output and employ-

ment tend to move together in the short run: a high rate of real GDP growth is generally associated with a declining rate of unemployment, while slow or negative growth is usually accompanied by rising unemployment, a relationship known as Okun's Law. In the long run, however, the rate of growth of real GDP reflects mainly the rates of growth of productivity and the labor force because cyclical changes tend to offset each other over the longer term. Expected inflation and interest rates are also closely interrelated: a higher expected rate of inflation increases nominal interest rates, while lower expected inflation reduces them.

Changes in real GDP growth or inflation have a much greater cumulative effect on the budget if they are sustained for several years than if they last for only one year. However, even temporary changes can have lasting effects if they permanently raise or lower the level of the tax base or the level of Government spending. Moreover, temporary economic changes that affect the deficit or surplus change the level of the debt, affecting future interest payments. Highlights of the budgetary effects of these rules of thumb are shown in Table 2-4.

For real growth and employment:

- The first block shows the effect of a temporary reduction in real GDP growth by one percentage point sustained for one year, followed by a recovery of GDP to the base-case level (the Budget assumptions) over the ensuing two years. In this case, the unemployment rate is assumed to rise by one-half percentage point relative to the Budget assumptions by the end of the first year, then return to the base case rate over the ensuing two years. After real GDP and the unemployment rate have returned to their base case levels, most budget effects vanish except for persistent out-year interest costs associated with larger near-term deficits.
- The second block shows the effect of a reduction in real GDP growth by one percentage point sustained for one year, with no subsequent recoupment of the lost growth, accompanied by a permanent increase in the natural rate of unemployment (and of the actual unemployment rate) of one-half percentage point relative to the Budget assumptions. In this scenario, the level of GDP and taxable incomes are permanently lowered by the reduced growth rate in the first year. For that reason and because unemployment is permanently higher, the budget effects (including growing interest costs associated with larger deficits) continue to grow in each successive year.
- The budgetary effects are much larger if the growth rate of real GDP is permanently reduced by one percentage point even leaving the unemployment rate unchanged, as might result from a shock to productivity growth. These effects are shown in the third block. In this example, the cumulative increase in the budget deficit is many times larger than the effects in the first and second blocks.

For inflation and interest rates:

- The fourth block shows the effect of a one percentage point higher rate of inflation and one percentage point higher nominal interest rates maintained for the first year only. In subsequent years, the price level and nominal GDP would both be one percentage point higher than in the base case, but interest rates and inflation rates are assumed to return to their base case levels. Receipts increase by somewhat more than outlays. This is partly due to the fact that outlays for annually appropriated spending are assumed to remain constant when projected inflation changes. Despite the apparent implication of these estimates, inflation cannot be relied upon to lower the budget deficit, mainly because policymakers have traditionally prevented inflation from permanently eroding the real value of spending.
- In the fifth block, the rate of inflation and the level of nominal interest rates are higher by one percentage point in all years. As a result, the price level and nominal GDP rise by a cumulatively growing percentage above their base levels. In this case, again the effect on receipts is more than the effect on outlays. As in the previous case, these results assume that annually appropriated spending remains fixed under the discretionary spending limits. Over the time period covered by the budget, leaving the discretionary limits unchanged would significantly erode the real value of this category of spending.
- The effects of a one percentage point increase in interest rates alone are shown in the sixth block. The outlay effect mainly reflects higher interest costs for Federal debt. The receipts portion of this rule-of-thumb is due to the Federal Reserve's deposit of earnings on its securities portfolio and the effect of interest rate changes on both individuals' income (and taxes) and financial corporations' profits (and taxes).
- The seventh block shows that a sustained one percentage point increase in inflation in the CPI and GDP price index decreases cumulative deficits substantially, due in part to the assumed erosion in the real value of appropriated spending. Note that the separate effects of higher inflation and higher interest rates shown in the sixth and seventh blocks do not sum to the effects for simultaneous changes in both shown in the fifth block. This is because the gains in budget receipts due to higher inflation result in higher debt service savings when interest rates are also assumed to be higher in the fifth block than when interest rates are assumed to be unchanged in the seventh block.
- The last entry in the table shows rules of thumb for the added interest cost associated with changes in the budget deficit, holding interest rates and other economic assumptions constant.

Table 2-4. SENSITIVITY OF THE BUDGET TO ECONOMIC ASSUMPTIONS

(Fiscal years; in billions of dollars)

| Budget effect | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | Total of Effects, 2015–2025 |
|--|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------------|
| Real Growth and Employment: | | | | | | | | | | | | |
| Budgetary effects of 1 percent lower real GDP growth: | | | | | | | | | | | | |
| (1) For calendar year 2015 only, with real GDP recovery in 2015–17: | | | | | | | | | | | | |
| Receipts | -18.9 | -30.1 | -13.6 | -1.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.3 | 0.2 | -62.1 |
| Outlays | 5.6 | 14.3 | 8.1 | 2.8 | 2.9 | 3.2 | 3.3 | 3.4 | 3.6 | 3.7 | 3.8 | 54.7 |
| Increase in deficit (+) | 24.5 | 44.4 | 21.7 | 4.1 | 2.6 | 2.8 | 3.0 | 3.2 | 3.4 | 3.4 | 3.6 | 116.8 |
| (2) For calendar year 2015 only, with no subsequent recovery: | | | | | | | | | | | | |
| Receipts | -18.9 | -40.2 | -46.0 | -48.4 | -51.1 | -53.9 | -57.1 | -60.4 | -63.8 | -67.2 | -70.6 | -577.7 |
| Outlays | 5.6 | 17.4 | 21.1 | 24.3 | 27.7 | 31.0 | 34.5 | 38.5 | 42.9 | 47.5 | 52.4 | 342.9 |
| Increase in deficit (+) | 24.5 | 57.6 | 67.1 | 72.8 | 78.8 | 84.9 | 91.6 | 98.9 | 106.7 | 114.7 | 123.0 | 920.6 |
| (3) Sustained during 2015–2025, with no change in unemployment: | | | | | | | | | | | | |
| Receipts | -19.1 | -62.4 | -116.5 | -175.4 | -239.6 | -308.8 | -384.7 | -467.1 | -556.6 | -652.9 | -753.9 | -3,737.1 |
| Outlays | -0.1 | 0.1 | 2.2 | 6.6 | 13.2 | 22.3 | 33.6 | 47.6 | 64.2 | 84.0 | 106.7 | 380.4 |
| Increase in deficit (+) | 19.0 | 62.5 | 118.7 | 182.0 | 252.8 | 331.1 | 418.3 | 514.7 | 620.8 | 736.9 | 860.6 | 4,117.6 |
| Inflation and Interest Rates: | | | | | | | | | | | | |
| Budgetary effects of 1 percentage point higher rate of: | | | | | | | | | | | | |
| (4) Inflation and interest rates during calendar year 2015 only: | | | | | | | | | | | | |
| Receipts | 26.6 | 55.7 | 54.7 | 51.5 | 54.4 | 57.3 | 60.6 | 63.9 | 67.2 | 70.8 | 74.0 | 636.6 |
| Outlays | 27.3 | 44.7 | 38.1 | 38.3 | 38.2 | 38.1 | 36.2 | 36.5 | 34.5 | 34.4 | 34.7 | 401.0 |
| Decrease in deficit (-) | 0.7 | -11.0 | -16.6 | -13.2 | -16.2 | -19.3 | -24.3 | -27.4 | -32.6 | -36.4 | -39.4 | -235.6 |
| (5) Inflation and interest rates, sustained during 2015–2025: | | | | | | | | | | | | |
| Receipts | 26.6 | 86.5 | 148.2 | 208.2 | 277.0 | 356.9 | 443.2 | 534.8 | 635.1 | 743.6 | 858.5 | 4,318.6 |
| Outlays | 25.3 | 75.1 | 119.9 | 162.5 | 207.2 | 252.8 | 297.5 | 346.9 | 390.0 | 432.1 | 484.8 | 2,794.1 |
| Decrease in deficit (-) | -1.3 | -11.4 | -28.3 | -45.7 | -69.8 | -104.1 | -145.7 | -187.8 | -245.1 | -311.6 | -373.7 | -1,524.5 |
| (6) Interest rates only, sustained during 2015–2025: | | | | | | | | | | | | |
| Receipts | 7.4 | 24.2 | 33.0 | 34.9 | 39.2 | 48.1 | 54.8 | 59.0 | 63.0 | 66.3 | 69.1 | 499.0 |
| Outlays | 15.0 | 44.4 | 68.0 | 87.8 | 106.4 | 125.1 | 141.7 | 158.0 | 172.2 | 186.6 | 200.1 | 1,305.4 |
| Increase in deficit (+) | 7.6 | 20.2 | 35.0 | 52.9 | 67.2 | 77.0 | 86.8 | 99.0 | 109.3 | 120.3 | 131.0 | 806.4 |
| (7) Inflation only, sustained during 2015–2025: | | | | | | | | | | | | |
| Receipts | 19.1 | 61.9 | 114.6 | 172.4 | 236.5 | 307.1 | 386.3 | 473.3 | 569.1 | 673.8 | 785.2 | 3,799.4 |
| Outlays | 10.3 | 31.1 | 52.9 | 76.6 | 104.1 | 132.9 | 163.4 | 199.7 | 232.4 | 264.7 | 309.6 | 1,577.8 |
| Decrease in deficit (-) | -8.8 | -30.9 | -61.7 | -95.8 | -132.4 | -174.3 | -222.8 | -273.6 | -336.7 | -409.0 | -475.7 | -2,221.7 |
| Interest Cost of Higher Federal Borrowing: | | | | | | | | | | | | |
| (8) Outlay effect of \$100 billion increase in borrowing in 2015 | 0.1 | 1.1 | 2.3 | 3.0 | 3.5 | 3.9 | 4.2 | 4.4 | 4.6 | 4.8 | 4.9 | 36.7 |

¹The unemployment rate is assumed to be 0.5 percentage point higher per 1.0 percent shortfall in the level of real GDP.

The effects of changes in economic assumptions in the opposite direction are approximately symmetric to those shown in the table. The impact of a one percentage point lower rate of inflation or higher real growth would have about the same magnitude as the effects shown in the table, but with the opposite sign.

Forecast Errors for Growth, Inflation, and Interest Rates

As discussed in the previous section, the single most important variable that affects the accuracy of the budget

projections is the forecast of the growth rate of real GDP. The rate of inflation and the level of interest rates also have substantial effects on the accuracy of projections. Table 2-5 shows errors in short- and long-term projections in past Administration forecasts, and compares these errors to those of CBO and the Blue Chip Consensus of private forecasts for real GDP, inflation and short-term interest rates.⁵

⁵Two-year errors for real GDP and the GDP price index are the average annual errors in percentage points for year-over-year growth rates for the current year and budget year. For interest rates, the error is based on the average error for the level of the 91-day Treasury bill rate for the two-year and six-year period. Administration forecasts are

Table 2-5. FORECAST ERRORS, JANUARY 1982–PRESENT

| REAL GDP ERRORS | | | |
|--|--------|------|-----------|
| 2-Year Average Annual Real GDP Growth | Admin. | CBO | Blue Chip |
| Mean Error | 0.1 | -0.2 | -0.2 |
| Mean Absolute Error | 1.1 | 1.1 | 1.1 |
| Root Mean Square Error | 1.5 | 1.4 | 1.5 |
| 6-Year Average Annual Real GDP Growth | | | |
| Mean Error | 0.3 | 0.0 | 0.0 |
| Mean Absolute Error | 0.9 | 0.9 | 0.9 |
| Root Mean Square Error | 1.1 | 1.2 | 1.2 |
| INFLATION ERRORS | | | |
| 2-Year Average Annual Change in the GDP Price Index | Admin. | CBO | Blue Chip |
| Mean Error | 0.3 | 0.2 | 0.4 |
| Mean Absolute Error | 0.7 | 0.7 | 0.7 |
| Root Mean Square Error | 0.8 | 0.9 | 0.8 |
| 6-Year Average Annual Change in the GDP Price Index | | | |
| Mean Error | 0.4 | 0.5 | 0.7 |
| Mean Absolute Error | 0.6 | 0.7 | 0.9 |
| Root Mean Square Error | 0.8 | 0.9 | 1.0 |
| INTEREST RATE ERRORS | | | |
| 2-Year Average 91-Day Treasury Bill Rate | Admin. | CBO | Blue Chip |
| Mean Error | 0.3 | 0.4 | 0.6 |
| Mean Absolute Error | 1.0 | 0.8 | 1.0 |
| Root Mean Square Error | 1.2 | 1.1 | 1.2 |
| 6-Year Average 91-Day Treasury Bill Rate | | | |
| Mean Error | 0.6 | 1.1 | 1.3 |
| Mean Absolute Error | 1.2 | 1.3 | 1.4 |
| Root Mean Square Error | 1.5 | 1.6 | 1.7 |

In the forecasts made since 1982, over a two-year horizon, the average error in projecting the annual real GDP growth rate was near zero for the Administration, but over a six-year horizon growth was slightly overestimated. Over the two-year period, growth was slightly underestimated by the CBO and Blue Chip. Overall, the differences between the three forecasters were minor. The mean absolute error in the annual average growth rate was about 1.5 percentage point per year for all forecasters for two-year projections and was about one-quarter smaller for all three for the six-year projections. The greater accuracy in the six-year projections could reflect a tendency of real GDP to revert at least partly to trend, though professional opinions on whether GDP growth is mean reverting are mixed. Another way to interpret the result is that it is hard to predict GDP around turning points in the business cycle, but somewhat easier to project the six-year growth rate based on assumptions about the labor force, productivity, and other supply-side factors that affect GDP.

from the budgets released starting in February 1982 (1983 Budget) and through February 2012 (2013 Budget), so that the last year included in the projections is 2013. The six-year forecasts are constructed similarly, but the last forecast used is from February 2008 (2009 Budget). CBO forecasts are from “The Budget and Economic Outlook” publications in January each year, and the Blue Chip forecasts are from their January projections.

Inflation, as measured by the GDP price index, was overestimated by all forecasters (with Blue Chip having the largest errors) for both the two-year and six-year projections, with larger errors for the six-year projections. This reflects the gradual disinflation over the 1980s and early 1990s, which was greater than most forecasters expected. Average errors for all three sets of forecasts since 1994 were close to zero (not shown).

The nominal interest rate on the 91-day Treasury bill was also overestimated by all three forecasters, with errors larger for the six-year time horizon. Again this reflects the secular decline in nominal interest rates over the past 30 years, reflecting lower inflation for most of the period as well as a decline in real interest rates since 2000 resulting from weakness in the economy and Federal Reserve policy. The average errors were somewhat less for the Administration than for CBO and the Blue Chip forecasts.

Uncertainty and the Deficit Projections

The accuracy of the Administration’s budget projections depends not only on the accuracy of economic projections, but also on technical factors and the differences between proposed policy and enacted legislation. Table 2-6 shows total deficit errors as a percentage of GDP for the current-year forecast in each year’s budget as well as the errors

Table 2-6. DIFFERENCES BETWEEN ESTIMATED AND ACTUAL SURPLUSES OR DEFICITS FOR FIVE-YEAR BUDGET ESTIMATES SINCE 1986
(As a percent of GDP)

| | Current year estimate | Budget year estimate | Estimate for budget year plus | | | |
|--|-----------------------|----------------------|-------------------------------|------------------|--------------------|-------------------|
| | | | One year (BY+1) | Two years (BY+2) | Three years (BY+3) | Four years (BY+4) |
| Average difference ¹ | 0.6 | -0.4 | -1.3 | -1.8 | -2.2 | -2.5 |
| Average absolute difference ² | 0.9 | 1.4 | 2.2 | 2.8 | 3.2 | 3.5 |
| Standard deviation | 0.9 | 1.9 | 2.7 | 3.1 | 3.3 | 3.2 |
| Root Mean Squared Error | 1.1 | 1.9 | 3.0 | 3.6 | 4.0 | 4.1 |

¹ A positive figure represents an overestimate of the deficit or an underestimate of the surplus.
² Average absolute difference is the difference without regard to sign.

for the budget year and four following years. As expected, the size of the average absolute errors increases the farther ahead in the future for which the year the projection is made. Average errors have overestimated the current year’s deficit, but have underestimated future years by increasing amounts. The error measures can be used to show a probabilistic range of uncertainty of what the range of deficit outcomes may be over the next five years relative to the Administration’s deficit projection. Chart 2-1 shows this cone of uncertainty, which is constructed under the assumption that future forecast errors would be governed by the normal distribution with a mean of zero and standard error equal to the root mean squared error, as a percent of GDP, of past forecasts. The deficit is projected to be 2.5 percent of GDP in 2020, but has a 90 percent chance of being within a range of a surplus of 2.8 percent of GDP and a deficit of 7.7 percent of GDP.

level consistent with stable inflation, receipts are lower, outlays are higher, and the deficit is larger than it would be otherwise. These features serve as “automatic stabilizers” for the economy by restraining output when the economy threatens to overheat and cushioning economic downturns. They also make it hard to judge the overall stance of fiscal policy simply by looking at the unadjusted budget deficit.

An alternative measure of the budget deficit is the structural deficit. This measure provides a more useful perspective on the stance of fiscal policy than does the unadjusted budget deficit. The portion of the deficit traceable to the response of the automatic stabilizers to the effects of the business cycle is called the cyclical component. The remaining portion of the deficit is called the structural deficit. The structural deficit is a better gauge of the underlying stance of fiscal policy than the unadjusted deficit because it removes most of the effects of the business cycle. So, for example, the structural deficit would include fiscal policy changes such as the 2009 Recovery Act, but not the automatic changes in unemployment insurance or reduction in tax receipts that would have occurred without the Act.

Structural and Cyclical Deficits

As shown above, the budget deficit is highly sensitive to the business cycle. When the economy is operating below its potential and the unemployment rate exceeds the

Chart 2-1. Range of Uncertainty for the Budget Deficit

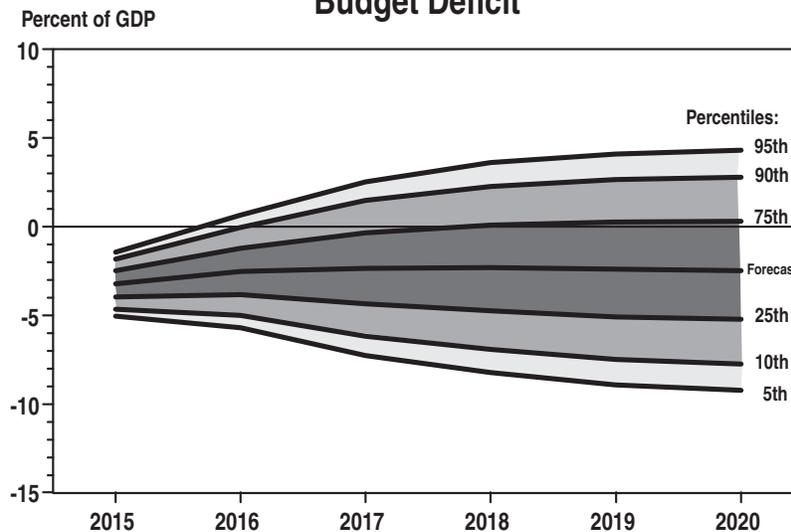


Table 2-7. THE STRUCTURAL BALANCE
(Fiscal years; in billions of dollars)

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|--|------|-------------|------------|-------------|------------|------------|------------|------------|------------|------------|-------------|-------------|------------|
| Unadjusted surplus (-) or deficit | 680 | 485 | 583 | 474 | 463 | 479 | 518 | 554 | 600 | 626 | 635 | 639 | 687 |
| Cyclical component | 344 | 308 | 241 | 156 | 74 | 24 | -6 | -10 | 3 | -1 | 0 | 0 | 0 |
| Structural surplus (-) or deficit | 335 | 176 | 342 | 318 | 389 | 455 | 523 | 564 | 598 | 627 | 634 | 639 | 687 |
| (Fiscal years; percent of Gross Domestic Product) | | | | | | | | | | | | | |
| Unadjusted surplus (-) or deficit | 4.1 | 2.8 | 3.2 | 2.5 | 2.3 | 2.3 | 2.4 | 2.5 | 2.6 | 2.6 | 2.5 | 2.4 | 2.5 |
| Cyclical component | 2.1 | 1.8 | 1.3 | 0.8 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Structural surplus (-) or deficit | 2.0 | 1.0 | 1.9 | 1.7 | 2.0 | 2.2 | 2.4 | 2.5 | 2.5 | 2.6 | 2.5 | 2.4 | 2.5 |
| CHANGE IN STRUCTURAL DEFICIT (FISCAL DRAG) .. | | -1.0 | 0.9 | -0.2 | 0.3 | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 | -0.1 | -0.1 | 0.1 |

NOTE: The NAIRU is assumed to be 5.2%.

Estimates of the structural deficit, shown in Table 2-7, are based on the historical relationship between changes in the unemployment rate and real GDP growth, as well as relationships of unemployment and real GDP growth with receipts and outlays. These estimated relationships take account of the major cyclical changes in the economy and their effects on the budget, but they do not reflect all the possible cyclical effects on the budget because economists have not been able to identify the cyclical factor in some of these other effects. For example, the sharp decline in the stock market in 2008 pulled down capital gains-related receipts and increased the deficit in 2009 and beyond. Some of this decline is cyclical in nature, but economists have not identified the cyclical component of the stock market with any precision and, for that reason, all of the stock market's effect on capital gains receipts is counted in the structural deficit.

Another factor that can affect the deficit and is related to the business cycle is labor force participation. Since the official unemployment rate does not include workers who have left the labor force, the conventional measures of potential GDP, incomes, and Government receipts understate the extent to which potential work hours are under-utilized because of a decline in labor force participation. The key unresolved question here is to what extent changes in labor force participation are cyclical and to what extent they are structural. By convention, in estimating the structural budget deficit, all changes in labor force participation are treated as structural, which probably understates the cyclical contribution to changes in deficits.

There are also lags in the collection of tax revenue that can delay the impact of cyclical effects beyond the year in which they occur. The result is that even after the unem-

ployment rate has fallen, receipts may remain cyclically depressed for some time until these lagged effects have dissipated. The recent recession added substantially to the estimated cyclical component of the deficit, but for all the reasons stated above, the cyclical component is probably understated. As the economy recovers, the cyclical deficit is projected to decline and turns negative after unemployment falls below 5.2 percent, the level assumed to be consistent with stable inflation. During that period, the structural deficit exceeds the total deficit. The estimated cyclical component returns to zero in the out years as unemployment returns to 5.2 percent, leaving only the structural deficit.

Despite these limitations, the distinction between cyclical and structural deficits is helpful in understanding the path of fiscal policy. The large increase in the deficit in 2009 and 2010 is due to a combination of both components of the deficit. There was a large increase in the cyclical component because of the rise in unemployment. That is what would be expected considering the severity of the recent recession. In addition, there was a large increase in the structural deficit because of the policy measures taken to combat the recession. This reflects the Government's decision to make active use of fiscal policy to lessen the severity of the recession and to hasten economic recovery. The structural deficit shrank by seven percentage points between 2009 and 2014, reflecting the relatively sharp fiscal tightening measures taken during that period. Between 2015 and 2018, the cyclical component of the deficit is projected to decline sharply and falls below zero as the economy recovers at an above-trend rate of GDP growth and the unemployment rate declines temporarily to 4.8 percent.