

Employment outlook: 2010–2020

The U.S. economy in 2020: recovery in uncertain times

Real GDP is expected to grow 3.0 percent annually over the next decade, faster than the 1.6-percent-per-year growth experienced over the 2000–2010 period, but slower than the 3.4-percent growth from 1990 to 2000; recovery of the housing market, improved consumer confidence, strong business investment, rising medical expenses, and narrowing of the trade deficit also characterize the outlook

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More than two-and-a-half years after the official end of the longest and deepest recession since World War II,¹ the United States is continuing to undergo a slower-than-average recovery, similar to the experience of other countries facing financial crises.² The recovery started strong, with growth in the nation's gross domestic product (GDP) averaging 3.0 percent over the first six quarters after the official end of the recession, but slowed considerably in the first half of 2011.³ Many analysts have referred to the recovery to date as “modest” or “disappointing.”⁴ The unemployment rate fell from a peak of 10.0 percent in late 2009 to 8.5 percent by December 2011. The slow recovery of the unemployment rate has been accompanied by a 2-percentage-point decline in the labor force participation rate since the onset of the recession. The long-term unemployed, those out of work for 27 or more weeks, account for an unprecedented share of the unemployed. Home prices, as measured by the Case-Shiller Home Price Indexes, declined by more than 30 percent from their peak in early 2006, and housing starts remain at or very near record lows.

The recovery is expected to take a stronger hold over the coming decade, with GDP growth registering 3.0 percent annually from

2010 to 2020, faster than the 1.6-percent annual growth over the 2000–2010 period, but slower than the 3.4-percent growth experienced from 1990 to 2000. The projected growth rate reflects both the relatively low starting point of GDP in 2010, still below its 2007 peak, as well as the projected behavior of the labor force and the assumption of a full-employment economy in 2020, the projection year. Real GDP is projected to increase by nearly \$4.4 trillion, reaching \$17.5 trillion in 2020. Recovery in the housing market, increased consumer confidence, renewed business investment in both capital and labor, and expansion of exports are expected to support the projected GDP growth.

After 6 years of steep decline in the U.S. housing market, a sizable recovery is expected over the coming decade, though not to levels experienced during the peak of the housing boom. Improvement within the construction sector is anticipated to have reverberating effects throughout the economy. Building homes requires substantial inputs of goods and services, such as carpets, granite countertops, lumber, and the trucking of materials to the construction site. Moreover, home buyers stimulate economic growth when they furnish their homes. Home values are expected to increase somewhat over

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the next decade, contributing to improved consumer confidence and spending over 2010–2020, compared with the 2000–2010 period.

Corporate profits fell by more than 20 percent from 2006 to 2008, but were fully recovered by 2010, surpassing the previous peak by 12 percent.⁵ To date, businesses have generally held onto these earnings rather than expanding their payrolls through hiring or by increasing wages. An improved housing market, increased consumer spending, and the easing of uncertainty are expected to contribute to a 5.7-percent annual growth in business fixed investment between 2010 and 2020. This growth rate represents an impressive recovery from a loss of 1.4 percent annually over the previous decade, but is slower than the 6.8-percent annual growth experienced from 1990 to 2000. The trade deficit is projected to narrow considerably between 2010 and 2020 as the United States experiences a strong export growth rate, in line with that exhibited in the 1990s. Increased consumption will stimulate imports over the coming decade, although the growth in imports will be somewhat dampened by the declining dollar and an increasing portion of consumer expenses devoted to health care.

The labor force growth rate slowed considerably, from 1.3 percent yearly over the 1990s to 0.8 percent during 2000–2010. This slowdown is explained by the aging baby boomers moving into cohorts with lower participation rates as well as by the impact of the 2007–2009 recession. As the nation continues to age and youths stay out of the labor force for longer than they used to, the labor force is projected to continue to grow more slowly, by 0.7 percent annually from 2010 to 2020. Household employment⁶ increased by only 2.2 million during 2000–2010, with the slowdown in growth attributable to the elevated unemployment rate and slower growth of the labor force. Given the labor force projection and an assumed 5.2-percent rate of unemployment in the projection year, BLS projects that household employment will increase by 16.8 million from 2010 to 2020. This increase represents annual growth of 1.1 percent, a considerable improvement over the 0.2-percent annual growth between 2000 and 2010, and more in line with the growth of 1.4 percent per year experienced over the 1990–2000 period.

Meanwhile, after years of higher-than-average growth from the 1990s through about 2005, and a couple of rapid growth years after the 2007–2009 recession, labor productivity, as measured by output per hour, is expected to settle down from 2.5-percent annual growth over 2000–2010 to a rate more in line with its long-run historical behavior, growing by 2.0 percent annually over 2010–2020. Employment growth over the coming decade

is expected to be concentrated in construction, home health care, and business services. Because these industries tend to be labor intensive, this trend is expected to hold back productivity growth somewhat in comparison to that experienced from 1996 to 2004.

BLS develops a set of 10-year projections biennially that analyzes long-term economic growth and its implications for the structure of employment by industry and occupation. The macroeconomic projections provide aggregate solutions for more detailed projections of output and employment discussed in later articles within this issue of the *Review*. Because of the level of detail required of the projections and the caveat that macroeconomic projections provide constraints on aggregate quantities arrived at in later steps, it was necessary for the macromodel solution to be largely completed by the summer of 2011. By the time the results are published, events will have occurred that were not incorporated into the projections.

The severity of the 2007–2009 recession and the relatively slow recovery to date have rendered the data for 2010, the jumping-off point for the 2020 projections, low in comparison to historical trend behavior. Analysis of the BLS projections focuses on a comparison of the projection of the upcoming decade relative to the nation's economic behavior over the past one or two 10-year periods. Growth rates exhibited over 2000–2010 are generally lower than average, oftentimes much lower, because of the impact of the recession on the 2010 data. Therefore, projected growth rates for the upcoming decade are frequently higher owing to the relatively low starting point.⁷

The macroeconomic model

In order to arrive at the economic projections presented herein, BLS employs a macroeconomic model provided by Macroeconomic Advisers, LLC, a St. Louis, Missouri, based forecasting group.⁸ The model comprises 744 variables, 543 of which are estimated through equations that describe the U.S. economy. The remaining 201 variables are exogenous: their values must be provided to the model in order to calculate a solution for the period in question. Relatively few of the exogenous variables have a major impact on the long-term projections of the value of GDP and its demand makeup, as well as on the level of employment necessary to produce that value of GDP. This article discusses critical exogenous and target variables, such as monetary and fiscal policy, future energy prices, and demographics, including population growth. The exogenous data are provided to the model, which is subsequently solved for the 134 behavioral equations and the remaining

409 identities. Key BLS assumptions are listed in table 1.

Main assumptions

To arrive at a 10-year projection of the U.S. economy, the values of certain variables are explicitly assumed because the outcomes of those variables are greatly dependent on unforeseeable behavior. Business cycle dynamics, government legislation, and the exchange rate are examples of variables that are considered highly unpredictable, especially over the longer run. The values assumed for these variables are made explicit within the BLS macroeconomic projections and are discussed in detail next.

Unemployment assumptions. The unemployment rate more than doubled over the most recent recession, peaking at 10.0 percent in October 2009 from 4.7 percent in November 2007. The recovery to date has been slower than usual, with the unemployment rate falling only as low as 8.5 percent in December 2011. The slow recovery in employment has been accompanied by a decline in the labor force participation rate, with many long-term unemployed workers having grown discouraged and dropping out of the labor force.

Because of the unpredictability of the business cycle over a 10-year period, BLS has long assumed that the economy will be at full employment in the given projection

Table 1. Major assumptions affecting aggregate projections, 1990, 2000, 2010, and projected 2020

Exogenous variables	Billions of chained 2005 dollars (unless otherwise noted)				Annual rate of change		
	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Monetary policy related:							
Federal funds rate (percent)	8.1	6.2	0.2	4.5	–2.6	–30.0	38.4
Ninety-day Treasury bill rate (percent)	7.5	5.8	.1	4.2	–2.5	–31.3	41.0
Yields on 10-year Treasury notes (percent)	8.6	6.0	3.2	5.5	–3.4	–6.1	5.5
Fiscal policy, tax related:							
Effective federal marginal tax rate on wages and salaries (percent)	20.8	23.3	21.4	21.4	1.1	–.8	.0
Effective federal marginal tax rate on interest income (percent)	21.1	25.3	23.0	23.0	1.8	–1.0	.0
Effective federal marginal tax rate on dividend income (percent)	23.7	28.9	22.5	22.5	2.0	–2.4	.0
Effective federal marginal tax rate on capital gains (percent)	25.7	18.8	15.0	15.0	–3.1	–2.2	.0
Maximum federal corporate tax rate (percent)	34.0	35.0	35.0	35.0	.3	.0	.0
Fiscal policy, government outlays related:							
Defense intermediate goods and services purchased	174.0	147.2	289.8	224.4	–1.7	7.0	–2.5
Defense gross investment	75.0	50.3	110.2	131.5	–3.9	8.2	1.8
Nondefense Intermediate goods and services purchased	65.4	74.5	137.8	93.9	1.3	6.3	–3.8
Nondefense gross investment	23.9	31.7	50.5	46.4	2.8	4.8	–.8
Federal grants-in-aid, Medicaid and other (billions of current dollars)	111.4	247.3	531.5	614.4	8.3	8.0	1.5
Federal transfer payments, Medicare (billions of current dollars)	107.6	219.1	518.5	987.0	7.4	9.0	6.7
Energy related:							
Refiners' acquisition cost of imported oil (nominal dollars per barrel)	22.2	27.7	75.9	119.4	2.2	10.6	4.6
Domestic oil product	31.9	29.3	26.5	24.0	–.8	–1.0	–1.0
Demographic related:							
Total population, including overseas Armed Forces (millions)	250.1	282.5	310.4	341.8	1.2	.9	1.0
Population ages 16 and older (millions)	189.2	212.6	237.8	263.0	1.2	1.1	1.0

SOURCE: Historical data, U.S. Federal Reserve Board, Bureau of Economic Analysis, Energy Information Administration, Census Bureau; projected data, U.S. Bureau of Labor Statistics, Energy Information Administration, Census Bureau.

year. Labor supply that year is assumed to be equivalent to labor demand, except for a small amount of frictional unemployment, generally estimated by the nonaccelerating inflation rate of unemployment. Given the severity of labor market impacts related to the recent recession, there has been much discussion regarding the impact on the nonaccelerating rate. On the basis of literature reviews and forecasts by other agencies and firms, BLS set the unemployment rate associated with a full-employment economy in 2020 at 5.2 percent.⁹

Monetary policy assumptions. At the onset of the recent financial crisis, the Federal Reserve Board (the Fed) responded aggressively, loosening the federal funds rate in order to stimulate economic activity through lowering the cost of borrowing.¹⁰ The federal funds rate fell from about 5.25 percent in mid-2007 to 0.16 percent in December 2008.¹¹ A Federal Open Market Committee meeting statement issued at that time informed readers that “economic conditions are likely to warrant exceptionally low levels of the federal funds rate for some time.”¹² In August 2011, shortly after Standard & Poor’s downgraded the U.S. credit rating from AAA to AA+, the Fed modified the statement as follows: “economic conditions . . . are likely to warrant exceptionally low levels for the federal funds rate at least through mid-2013.”¹³

As the unemployment rate remained elevated, and with the funds rate already at its lower bound, the Fed responded by implementing several other unconventional measures to stabilize financial markets and increase the availability of credit to businesses and consumers. In response to the distress in the housing and financial markets, the Fed embarked on two large-scale asset purchase programs, or “quantitative easing efforts,” driving down mortgage rates to the lowest levels since the 1940s. As a result, the Fed’s reserve holdings grew from less than \$1 trillion in September 2008 to \$2.7 trillion in May 2011.¹⁴ The BLS macroeconomic projections assume that no additional large-scale monetary initiatives, such as quantitative easing efforts, will occur over the projection period and that programs in place will end as planned.

In developing its projections, BLS assumes that, in the long term, the Fed will continue to set monetary policy to fulfill its dual mandate of price stability and maximum employment.¹⁵ On the one hand, if inflation falls below the target range, the Fed is expected to loosen monetary policy until it anticipates that inflation will rise back into the range. On the other hand, if prices rise faster than the target range, the Fed is expected to tighten monetary policy. Accordingly, over the coming decade, as the labor mar-

ket and economy recover, the Fed is expected to tighten the federal funds rate back up to levels that eventually will be more consistent with historical norms. The funds rate is assumed to be 4.5 percent in 2020. Yields on 10-year Treasury notes are projected to grow from 3.2 percent in 2010 to 5.5 percent in 2020. Improvement in the economy and lower perceived risk in financial markets are together expected to result in a narrowing spread as yields on 10-year notes grow more slowly than the Fed funds rate.

Fiscal policy assumptions. The fiscal policy of the federal government encompasses activities in two arenas: spending and tax policy. Tax-related assumptions largely affect estimates of federal government revenues. In this regard, effective marginal tax rates—the percentage of an additional dollar of income that will have to be paid in taxes—are assumed to be constant at their 2010 levels over the 2010–2020 timeframe. (See table 1.) In contrast, the average federal tax rate is projected to rise considerably over the decade, as a cyclical response to the recovery from a relatively deep recession. As incomes rise, individuals are expected to move into higher tax brackets, generating additional revenue for the federal government.

Discretionary spending is generally assumed to be at a peak in the near term, giving way to fiscal restraint over the coming decade. In response to the recent recession, several fiscal stimulus programs were enacted, including the Troubled Asset Relief Program (TARP) and the American Recovery and Reinvestment Act (ARRA).¹⁶ In 2010, Congress voted to delay the expiration of the Bush-era tax cuts, extend unemployment benefits, and temporarily reduce the payroll tax. Current fiscal programs are expected to end as enacted, with no new major programs announced. The only exception to this expectation is the Bush-era tax cuts, which, according to the model, are assumed to remain in place over the 2010–2020 period, except for a sunset provision on the top tax bracket. Under the Budget Control Act of 2011, Congress agreed to make substantial reductions in federal government discretionary spending over the coming decade. Details of how the spending cuts will be implemented have not yet been decided upon and are not included in the BLS 2020 macroeconomic projections.

Trade. The broad trade-weighted exchange rate for the U.S. dollar more than doubled from the mid-1980s through 2002, but has since fallen by nearly 20 percent as of 2010.¹⁷ As the dollar bought relatively more imported goods, the trade deficit and current account balance widened notably. Even as the exchange rate began to fall, the strength of the U.S. economy, foreign demand for U.S. se-

curities, and heightened consumption all contributed to a further widening of the trade deficit through 2006. Since then, through the recessionary period and subsequent slow recovery, the real trade deficit has fallen by more than 40 percent and the current account balance has declined from roughly 6 percent of GDP in 2006 to closer to 3 percent in 2009 and 2010.

Underlying the macroeconomic projections, the exchange rate is assumed to continue falling, although at a rate slower than that experienced between 2002 and 2010. Foreign ownership of U.S. securities is expected to put downward pressure on the value of the dollar over the long run. Foreign output growth is generally expected to follow its long-run path. The falling exchange rate is anticipated to accompany strong export growth over the coming decade, as discussed in further detail later.

Analysis of other key variables

In addition to explicit assumptions made for the variables discussed in the previous section, other key variables are solved through external models. Although their solutions are supplied as exogenous data to the macromodel, these variables are explicitly modeled rather than assumed to follow a given path from 2010 to 2020. Demographic variables, for example, are estimated through external BLS models and supplied as exogenous variables to the macromodel. Other data within the macromodel, such as oil prices, are provided by projections from other government agencies. Moreover, the BLS projections generally are prepared with certain selected endogenous variables more carefully evaluated than others within the model. Foreign trade and housing starts were two of the key variables that were carefully analyzed for the projections presented in this article. Target ranges for these variables are determined through consultation with other analysts and through external model analysis. Determining target ranges for key variables helps BLS economists define the parameters around which the aggregate projections are evaluated.

Demographics. Demographic factors play a key role in determining the growth potential of the economy over the long term. Population and labor force projections are among the most critical exogenous variables supplied to the macromodel. The growth rate of the population, changes in the composition of the population, and changes to labor force participation affect key model results, including the unemployment rate, housing starts, prices, income-related measures, and many other variables. BLS projections in these areas are based on the Census Bureau's middle-series

population projection, including Armed Forces overseas.¹⁸ The U.S. population is projected to reach 341.8 million in 2020, up from 310.4 million in 2010, an annual growth rate of 1.0 percent over the decade.

Given the Census Bureau's population projection, adjusted by BLS to reflect the civilian noninstitutional population, BLS expects that the labor force will grow at 0.7 percent annually, from 153.9 million in 2010 to 164.4 million in 2020. The 77 million baby boomers constituted nearly a quarter of the U.S. population in 2010. As the boomers move out of prime working-age groups and into brackets with substantially lower participation rates, downward pressure is expected on the overall labor force participation rate. From the onset of the 2007–2009 recession, in December 2007, the rate has declined from 66.0 percent to 64.0 percent in December 2011. Prior to the recession, the 64.0-percent figure was the lowest labor force participation rate since January 1984. For the projections presented here, BLS posits that the decline was largely structural in nature and expects that it will persist over the coming decade, with the labor force participation rate projected to fall further, to 62.5 percent in 2020.

Energy prices. Projections of nominal oil prices are consistent with those published in the reference case scenario of the Energy Information Administration's 2011 *Annual Energy Outlook*.¹⁹ Assuming no changes in current laws and regulations, no major supply shocks, and higher production costs associated with unconventional liquid fuels, the Energy Information Administration expects that oil prices will increase to about \$119 per barrel in 2020, from \$76 per barrel in 2010.

From 1986 through 2003, oil prices remained under \$40 per barrel.²⁰ Prices then increased dramatically, reaching \$133.88 per barrel in June 2008. As the economic downturn became global in scope, demand for oil, and subsequently the price, fell, bottoming at \$39.09 in February 2009. Since then, the price has increased again, to \$98.53 in December 2011. Although oil prices have tended to be volatile in the short run, over the next 10 years they are expected to be determined largely on the basis of long-run trends in consumption and production. The Energy Information Administration projects that world demand for oil will continue growing, with much of the increase concentrated in countries such as China, India, and Brazil. Growing demand will require increased dependence on more costly resources, putting upward pressure on prices. As world oil prices rise, the United States is expected to increase its consumption of alternative fuels and supply a higher share of its oils domestically—for example, by

producing more biofuels.

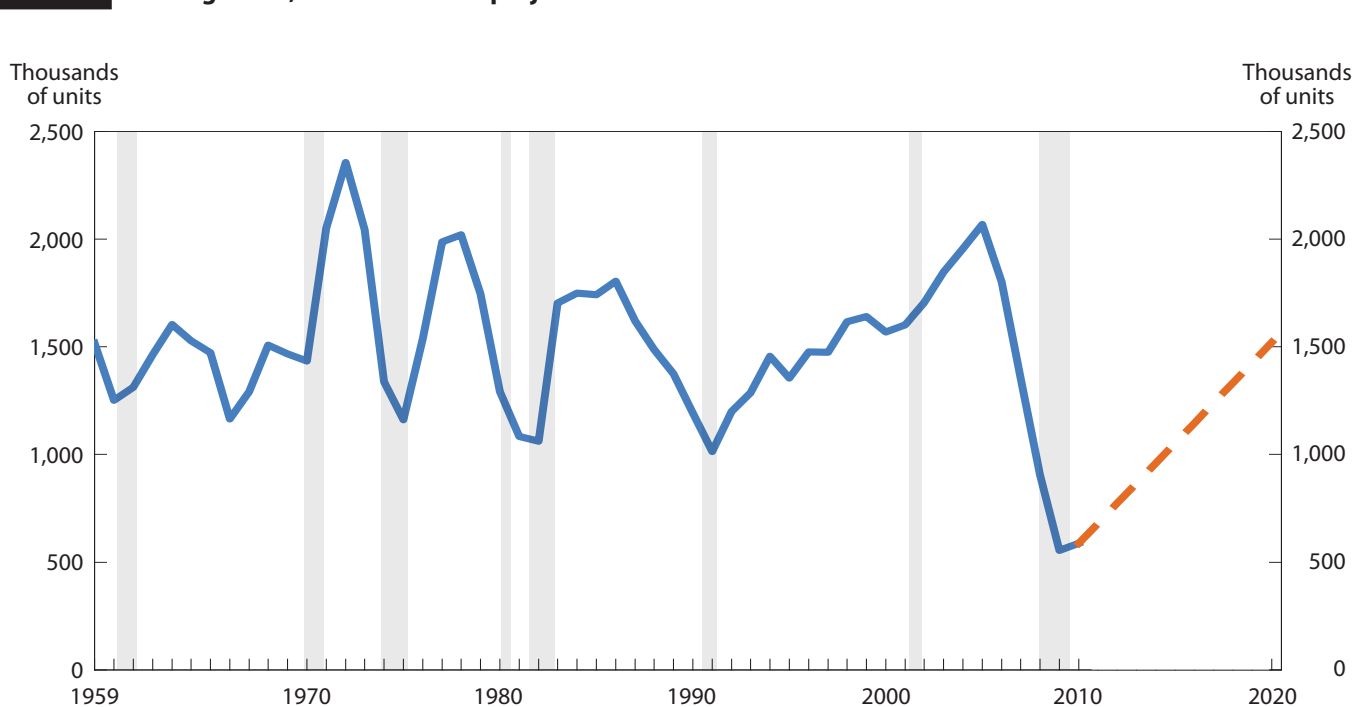
Inflation. Between the early 1990s and the early 2000s, inflation, as measured by the chain-weighted GDP price index, remained relatively low, between 1 percent and 2.5 percent. Rising home, health care, and oil prices played a part in inflation, growing by more than 3 percent in 2005 and 2006. Since then, inflation, again as measured by GDP, has slowed to about 1 percent annually, in both 2009 and 2010. Over the long run, inflation is a monetary phenomenon, and BLS expects, as mentioned previously, that the Fed will attempt to keep inflation within a targeted range consistent with the Federal Open Market Committee’s dual mandate of maximum employment and price stability.²¹ As measured by the chain-weighted GDP price index, inflation is expected to grow at a moderate rate of 2.0 percent annually over 2010–2020, in line with the 2.1-percent growth registered between 1990 and 2000 and only slightly slower than the 2.3-percent annual growth exhibited between 2000 and 2010.

Housing starts. Private housing starts are the key determinant in residential investment and are expected to play an important role in GDP growth over the coming decade. In

2005, housing starts peaked at more than 2 million units; since then they have plummeted to the lowest levels since at least 1959, when the Census Bureau started publishing this data series. In fact, according to the Census Bureau’s estimates, housing starts had never been less than 1 million units before 2009 and 2010, when they fell below 600,000 in each of those years. (See chart 1.) The “shadow” inventory market (including foreclosures, homes in serious delinquency, and bank-owned properties), tight mortgage credit terms, and limited demand for, and availability of, builder financing are all contributing to considerably fewer private housing starts than is consistent with long-run trends.

BLS projects that the excess supply of housing, including the overhang of shadow inventory, will clear by 2020, with the market expected to be based once again largely on demographics and overall economic trends. Recovery in the housing market—not just new housing as measured by starts, but also sales of existing homes—is anticipated to play a critical role in the overall recovery of the economy. The loss of wealth due to home price declines in recent years has weighed heavily on consumer psychology, as has the inability to access credit. As home prices appreciate, consumers are expected to lower their savings

Chart 1. Housing starts, 1959–2010 and projected 2020



NOTE: BLS does not project specific data for each of the years between 2010 and 2020. Interim years to the 2020 projection point are expressed by a dashed straight line only. Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: Historical data, U.S. Census Bureau; projected data, U.S. Bureau of Labor Statistics.

rate, stimulating demand and overall economic recovery. Housing starts are projected to reach 1.5 million units in 2020, much higher than the 584,900 posted in 2010, but still considerably lower than the peak of 2.1 million starts reported in 2005.

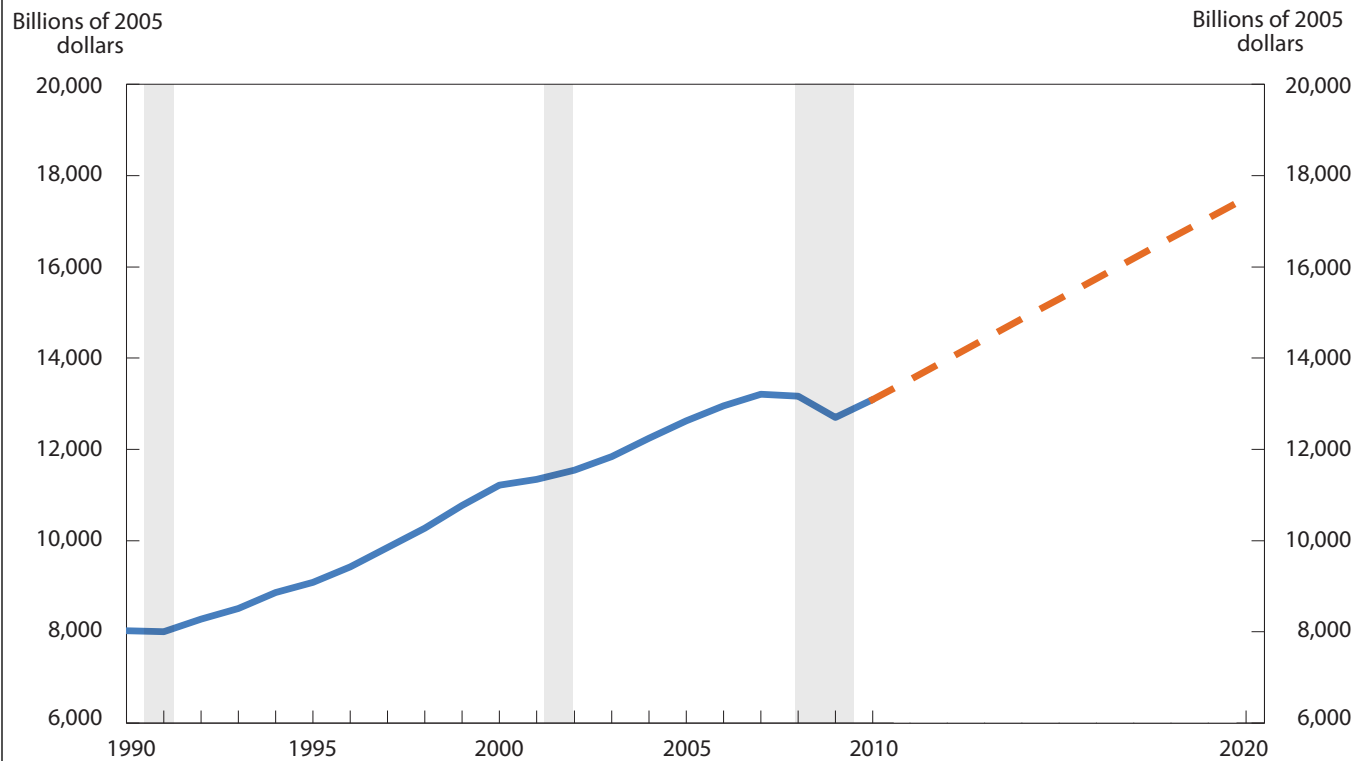
GDP from the demand side

Although the recent recession lasted from December 2007 until June 2009, sustained economic weakness stemming from the most severe economic contraction in more than a generation has continued to pose the same challenges to the 2020 projections that persisted during the release of the 2018 projections: an aging population, rising demand and costs for medical care, low housing investment, and reduced consumer demand. Consumers remain hesitant to return to the previous level of high consumption, focusing instead primarily on reducing debt and continuing the recent slowdown in the consumption of discretionary items.²² Housing investment is seen as a key element of a full economic recovery during the 2010–2020 period. Trade, in both exports and imports, is likely to grow more

rapidly than in the previous decade. Export growth is expected to be larger than import growth from 2010 to 2020, contributing to a narrowing of the trade deficit. Real federal government expenditures in consumption and investment are projected to decline as the cost of social benefit programs continues to rise. The legacy effects of debt accumulated during and after the 2007–2009 recession are seen as contributing to the slowing expenditure rates over the next 10 years. State and local government consumption and investment expenditures are projected to rise over the next decade, although some downward pressures may remain.

BLS projects GDP growth of 3.0 percent per year from 2010 to 2020, returning to a level more consistent with its long-run trend. (See chart 2.) This rate is faster than the 1.6-percent growth experienced during 2000–2010, but slower than the 3.4-percent growth witnessed from 1990 to 2000. (See table 2.) On a per capita basis, BLS projects that GDP will grow at an annual rate of 2.0 percent, much higher than the 0.6-percent growth seen during the 2000–2010 period and on a par with the 2.1-percent growth exhibited between 1990 and 2000. Although GDP

Chart 2. Gross domestic product, 1990–2010 and projected 2020



NOTE: BLS does not project specific data for each of the years between 2010 and 2020. Interim years to the 2020 projection point are expressed by a dashed straight line only. Shaded areas denote recessions as determined by the National Bureau of Economic Research.

SOURCE: Historical data, U.S. Bureau of Economic Analysis, projected data, U.S. Bureau of Labor Statistics.

Table 2. Real gross domestic product, by major demand category, 1990, 2000, 2010, and projected 2020

Category	Billions of chained 2005 dollars				Annual rate of change			Contribution to percent change in real GDP		
	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020	1990–2000	2000–2010	2010–2020
Gross domestic product	\$8,027.1	\$11,216.5	\$13,088.0	\$17,512.9	3.4	1.6	3.0	3.4	1.6	3.0
Personal consumption expenditures	5,313.7	7,604.6	9,220.9	12,063.4	3.6	1.9	2.7	2.6	1.4	1.9
Gross private domestic investment	989.9	1,963.1	1,714.9	2,945.1	7.1	–1.3	5.6	1.1	–.2	.8
Exports	599.7	1,187.4	1,663.3	3,065.1	7.1	3.4	6.3	.8	.4	.9
Imports ¹	672.6	1,638.7	2,085.0	3,258.4	9.3	2.4	4.6	–1.1	–.4	–.8
Federal defense consumption expenditures and gross investment	584.9	453.5	718.2	692.6	–2.5	4.7	–.4	–.1	.2	.0
Federal nondefense consumption expenditures and gross investment	213.9	244.4	357.7	314.3	1.3	3.9	–1.3	.0	.1	.0
State and local consumption expenditures and gross investment	1,062.1	1,400.2	1,487.0	1,779.4	2.8	.6	1.8	.4	.1	.2
Residual ²	–64.7	2.0	11.1	–88.5	...	...	...	...	...	...
Addendum:										
GDP per capita, chained 2005 dollars	32,098	39,701	42,163	51,232	2.1	.6	2.0	—	—	—

¹ Imports are subtracted from the other components of GDP because they are not produced in the United States.

² The residual is calculated as real gross domestic product, plus imports, less other components.

NOTE: Dash indicates data not applicable.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

by itself focuses on the country's output, GDP per capita measures output per person and is seen as a different option for measuring the purchasing power of various goods and services within the economy.

Personal consumption expenditures. Comprising approximately two-thirds of GDP, personal consumption expenditures (PCE) make up the largest component of demand in the U.S. economy. (See table 3.) Annual growth in PCE during 1990–2000 was a robust 3.6 percent. The 2000–2010 period saw similar growth in the first several years that was later countered by decline in 2008 and 2009, resulting in growth of a weaker 1.9 percent annually over the decade. Households that had seen substantial financial and real estate losses, including reduced income from job losses, changed their spending habits to build up their savings while reducing their debt and their consumption of discretionary goods and services.

BLS projects a modest improvement in PCE growth, with an annual rate of 2.7 percent during 2010–2020. (Such a rate does not match that of either the 1990s or the early 2000s; see table 2.) PCE contributed 2.6 percent of the 3.4-percent annual GDP growth from 1990 to 2000, or 75.7 percent of economic activity. Consumer purchases

accounted for 1.4 percent of the 1.6-percent annual GDP growth from 2000 to 2010, or 87.4 percent of economic activity. The 87.4-percent figure is a change from previous patterns of consumers' use of perceived wealth in assets to drive spending; consumer purchases are seen declining to just 63.8 percent of GDP growth by 2020, accounting for 1.9 percent of the 3.0-percent annual growth in the economy over the 2010–2020 period.²³

BLS generally divides PCE into three main categories, to reflect the type of consumption each represents: services, nondurable goods, and durable goods. Of these three, services make up the majority of PCE. Spending on services grew 1.6 percent annually from 2000 to 2010, but is projected to return to a more trendlike 2.7-percent growth rate in the 2010–2020 decade. (See table 4.) Expenditures for medical services continued to grow during the recession, a result of increasing demand from an aging population, the use of advanced medical technologies such as imaging, and the adoption of medical delivery methods like home health care. Still, budgetary pressures affecting federal, state, and local government are expected to slow spending on medical services, likely forcing consumers to pay more for their own health care. As a result, BLS projects medical spending by consumers to grow 2.9 percent

Table 3. Nominal gross domestic product, by major demand category, 1990, 2000, 2010, and projected 2020

Category	Billions of current dollars				Percent distribution			
	1990	2000	2010	2020	1990	2000	2010	2020
Gross domestic product	\$5,800.5	\$9,951.5	\$14,526.5	\$23,669.5	100.0	100.0	100.0	100.0
Personal consumption expenditures	3,835.4	6,830.4	10,245.5	16,600.5	66.1	68.6	70.5	70.1
Gross private domestic investment	861.0	1,772.2	1,795.1	3,604.3	14.8	17.8	12.4	15.2
Exports	552.1	1,093.2	1,839.8	4,257.9	9.5	11.0	12.7	18.0
Imports ¹	629.8	1,475.3	2,356.7	5,034.6	10.9	14.8	16.2	21.3
Federal defense consumption expenditures and gross investment	373.9	371.0	819.2	980.5	6.4	3.7	5.6	4.1
Federal nondefense consumption expenditures and gross investment	133.6	205.0	403.6	451.8	2.3	2.1	2.8	1.9
State and local consumption expenditures and gross investment	674.2	1,154.9	1,780.0	2,809.0	11.6	11.6	12.3	11.9

¹ Imports are subtracted from the other components of GDP because they are not produced in the United States.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

per year from 2010 to 2020, identical to the growth rate experienced from 2000 to 2010.

The catchall category “other services,” which includes telecommunications, computer services, and personal care services, suffered during the 2007–2009 recession, declining from an annual growth rate of 4.2 percent during 1990–2000 to 1.0 percent in the decade ending in 2010. BLS anticipates that, as the economy rebuilds in the coming years, these services will grow by 2.8 percent annually from 2010 to 2020. Like “other services,” housing services suffered from the recession, with annual growth retreating from 2.7 percent during 1990–2000 to 1.7 percent from 2000 to 2010. The housing bust caused housing demand to collapse, pulling home prices down substantially and flattening the real value of imputed rents. With residential investment expected to contribute to economic growth, consumer housing services are seen to rise at an annual growth rate of 2.4 percent in the decade ending in 2020. (See table 4.)

Nondurable goods—goods with a short-term life of less than 3 years—exhibited a 2.8-percent rate of growth from 1990 to 2000, followed by a 1.8-percent rate during 2000–2010. Nondurable goods include items such as food, clothing, gasoline, and medicines. Consumers tend to be less sensitive to price changes in these goods than in durables; however, the recession of 2007–2009 brought about job losses that led to reduced incomes and less overall spending on nondurables. The slower spending on these items is expected to continue into the coming decade. BLS projects a 2.0-percent annual growth rate for nondurable goods from 2010 to 2020, less than during the 1990–2000 period. (See table 4.)

Durable goods—goods with a life of 3 years or longer—are split between motor vehicles and other durable goods.

Sales of light vehicles peaked in 2000 at 17.3 million units, through a combination of industry incentives and eased lending standards. The effects of the 2007–2009 recession on the auto industry are now widely known, with declining sales and high cost structures forcing reorganizations of two of the Detroit “Big Three.” Unit sales of cars and trucks were a modest 11.5 million in 2010, a lingering effect of the economic downturn. Technological advancements in motor vehicles, along with a release of some pent-up demand, should spur sales going forward, with 16.2 million units projected to be sold in 2020. Still, sales are expected to remain lower than their 2000 peak as consumers continue rebuilding their household balance sheets.

The category “other durable goods” tends to exhibit a cyclical consumption pattern over time. Items in this category include televisions, large kitchen appliances, and laundry equipment. Expenditures on these goods have grown much faster than expenditures on any other consumption category over the last 20 years. From 1990 to 2000, the annual growth rate was 8.9 percent, after which it dropped to 6.4 percent from 2000 to 2010. Because BLS expects consumers to continue to shift more of their disposable income to nondurable goods like food and medicines over the coming decade, as well as to slow down their spending on discretionary durables such as jewelry and new luggage, “other durable goods” is projected to grow at a 4.9-percent annual rate from 2010 to 2020. (See table 4.)

Nonresidential investment. Nonresidential investment fell considerably during the recession of 2007–2009 and then snapped back at a rapid pace once the economic decline ended. This return of nonresidential investment to its long-term trend was expected after the substantial drop.

Table 4. Personal consumption expenditures, 1990, 2000, 2010, and projected 2020

Category	Billions of chained 2005 dollars				Annual rate of change		
	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Personal consumption expenditures	\$5,313.7	\$7,604.6	\$9,220.9	\$12,063.4	3.6	1.9	2.7
Durable goods	422.9	818.0	1,188.4	1,828.2	6.8	3.8	4.4
Motor vehicles and parts	242.9	356.1	330.1	476.9	3.9	–8	3.7
Other durable goods	198.9	464.9	863.7	1,388.7	8.9	6.4	4.9
Nondurable goods	1,295.5	1,714.6	2,041.3	2,480.2	2.8	1.8	2.0
Services	3,673.8	5,093.6	5,991.8	7,843.8	3.3	1.6	2.7
Housing services	1,083.3	1,413.6	1,669.2	2,106.5	2.7	1.7	2.4
Medical services	872.9	1,081.6	1,442.9	1,924.2	2.2	2.9	2.9
Other services	1,721.1	2,597.5	2,879.4	3,810.1	4.2	1.0	2.8
Residual ¹	–100.8	–23.7	–5.8	–123.1	...	...	...

¹ The residual is the difference of the first line and the sum of the most detailed lines, for each first-level category.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

BLS projects that nonresidential investment will grow at a 5.4-percent annual rate from 2010 to 2020, lower than the 7.9-percent growth during 1990–2000, but much faster than the 0.1 percent experienced from 2000 to 2010. (See table 5.) The various components of this major category exhibited behavior similar to that of the category itself in the last several years.

Investment in equipment and software has historically grown much faster than investment in structures. During the high-growth period from 1990 to 2000, equipment and software breached the 10-percent mark, growing at 10.3 percent per year. The dot-com bust and subsequent recession in 2001, along with the economic slide that took place from 2007 to 2009, contributed to a lower growth rate of 1.4 percent annually over 2000–2010. In spite of these setbacks, this sector is projected to grow at an annual 6.2-percent pace from 2010 to 2020. The primary driver is expected to be computers and software, a category that is projected to grow at a 10.3-percent rate from 2010 to 2020. (See table 5.) Contributors to rising growth in this category are anticipated to be continuing increases in the use of digital and social media, in mobile computing, in Internet and enterprise security, and in the implementation of electronic health records.

Investment in nonresidential structures weakened considerably during the recession of 2007–2009. After growing at a 1.5-percent annual rate from 1990 to 2000, nonresidential structure investment posted two large declines over the next decade, with a real-value drop of 33.7 percent between 2008 and 2010 alone. (See chart 3.) Even after residential investment peaked in 2005, nonresidential construction continued rising through 2008. With respect to the timing of the peaks, residential investment was a leading indicator of the recession

of 2007–2009 while nonresidential investment was a lagging indicator. Despite the recession's having hit this sector quite hard, BLS projects that nonresidential investment in structures will improve to a 3.2-percent annual growth rate during 2010–2020. (See table 5.) Infrastructure projects are expected to be part of the recovery, although other buildings, such as schools, medical facilities, offices, and industrial parks, are also seen to contribute to the growth.

Residential investment. Demand for residential investment continues to remain at levels at or near those of 1983. Growth in fixed residential structures was 4.2 percent annually from 1990 to 2000. Then, during 2000–2010, residential investment plummeted, declining 5.5 percent per year, a result of the housing bust and the financial crisis. (See table 5.) The economic malaise has left lingering effects that still pose problems for a housing investment recovery. Lending institutions have tightened standards in response to mortgage losses, although they have been seeking to lend more recently.²⁴ The shadow inventory of foreclosures, of homes in serious delinquency, and of bank-owned properties, among other factors, are likely keeping prices from rising, although as this inventory is reduced, prices are expected to increase. Unemployment remains high, at 8.5 percent in December 2011, also keeping many potential buyers from entering the demand side of the market.²⁵

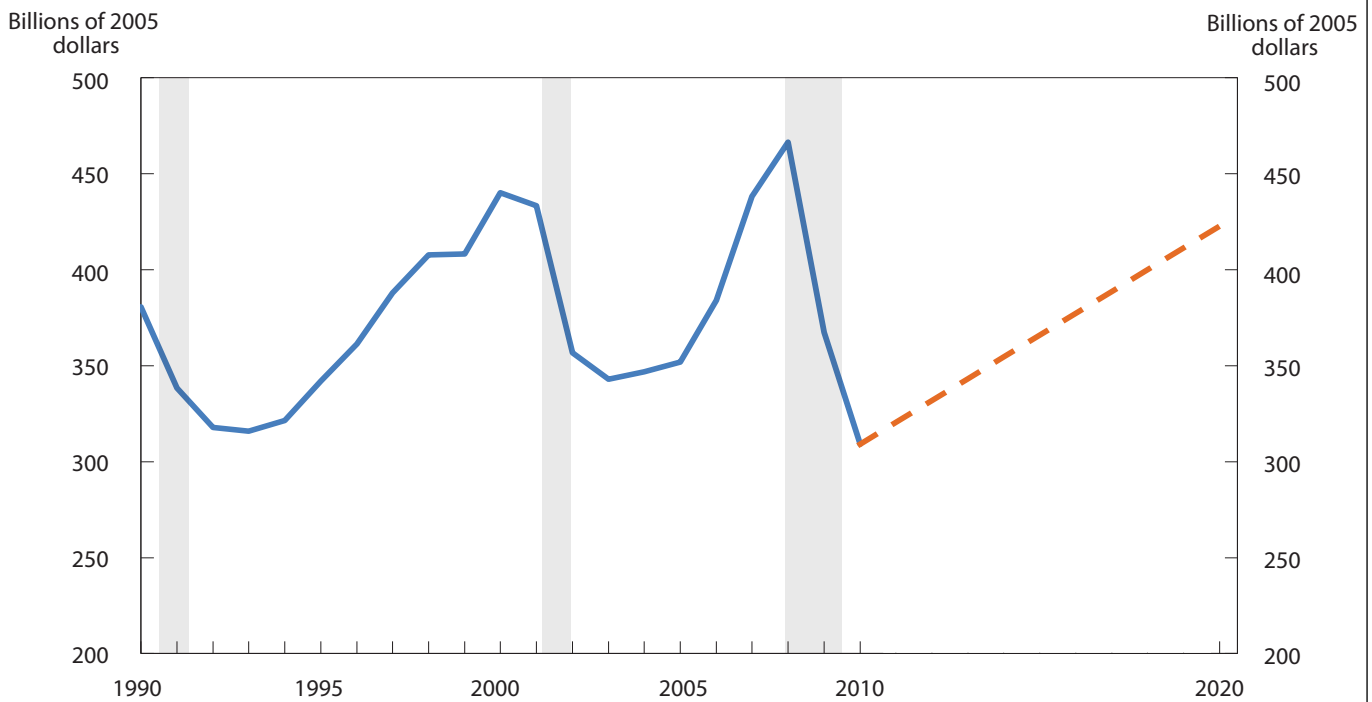
BLS projects residential investment to grow at a seemingly high 7.0-percent annual rate from 2010 to 2020. This rate, however, includes a recovery from unusually low levels and results in a level that is still 15.8 percent below the peak of the housing bubble. Assistance to the housing rebound will come from single-family as well as

Table 5. Gross private domestic investment, 1990, 2000, 2010, and projected 2020

Category	Billions of chained 2005 dollars				Annual rate of change		
	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Gross private domestic investment	\$989.9	\$1,963.1	\$1,714.9	\$2,945.1	7.1	–1.3	5.6
Fixed nonresidential investment	614.8	1,311.3	1,319.2	2,235.7	7.9	.1	5.4
Equipment and software	332.1	889.3	1,019.4	1,857.7	10.3	1.4	6.2
Computers and software	26.5	224.9	395.4	1,052.0	23.8	5.8	10.3
Other equipment	365.2	672.0	633.4	908.9	6.3	–6	3.7
Structures	380.6	440.1	309.2	422.7	1.5	–3.5	3.2
Fixed residential structures	386.1	580.0	330.8	652.7	4.2	–5.5	7.0
Single family	205.1	315.0	114.6	337.7	4.4	–9.6	11.4
Multifamily	33.5	35.4	12.0	30.4	.6	–10.2	9.7
Other	146.8	229.4	206.7	293.9	4.6	–1.0	3.6
Change in business inventories	16.5	60.2	58.8	48.3	13.8	–2	–1.9
Residual ¹	–184.5	–14.0	–15.2	–148.9	...	...	...

¹ The residual is the difference of the first line and the sum of the most detailed lines, for each first-level subcategory.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

Chart 3. Investment in nonresidential structures, 1990–2010 and projected 2020

NOTE: BLS does not project specific data for each of the years between 2010 and 2020. Interim years to the 2020 projection point are expressed by a dashed straight line only. Shaded areas denote recessions as determined by the National Bureau of Economic Research.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

multifamily housing, with both showing a rise from historic lows. Investment in single-family structures grew at a 4.4-percent annual rate from 1990 to 2000, dropped by 9.6 percent over 2000–2010, and is projected to grow 11.4 percent per year from 2010 to 2020. Investment in multifamily structures grew at a much smaller 0.6-percent

annual rate from 1990 to 2000, declined precipitously by 10.2 percent in the decade ending in 2010, and is expected to grow at a 9.7-percent annual rate over the 2010–2020 timeframe. Investment in other structures, which includes improvements and brokers' commissions, also fell substantially from 2000 to 2010, at a 1.0-percent annual rate, al-

though the category is projected to recover to a 3.6-percent annual rate of growth from 2010 to 2020. (See table 5.)

Gross private domestic business investment, including both nonresidential and residential investment, is expected to contribute 15.2 percent of total GDP in 2020, on a nominal basis. This percentage is a decrease from the 17.8 percent the category contributed in 2000, but is still a large improvement from the 12.4 percent registered in 2010. (See table 3.) On a real, or inflation-adjusted, basis, business investment is projected to grow 5.6 percent annually from 2010 to 2020, compared with the previous decade's 1.3-percent annual decline. Over the 2010–2020 period, private business investment is seen to contribute 0.8 percent, or more than one-quarter, of the projected 3.0-percent GDP growth. The vast majority of investment growth is expected to be in equipment and software, with residential construction adding just 0.2 percent of the 3.0-percent annual GDP growth during the coming decade.

Foreign trade in goods and services and the current account. Trade expectations, especially over the longer run, are dependent largely on highly unpredictable behaviors across the entire world market. Therefore, trade-related results are often considered the most uncertain part of the long-term macroeconomic outlook. Oil prices, for example, play a large role in the anticipated trade situation and have exhibited particularly volatile behavior in recent years. As mentioned earlier, BLS relies upon oil price projections

published by the Energy Information Administration, but these estimates are subject to considerable uncertainty. Other areas of recognized risk include the extent and impact of the European sovereign debt crisis, unanticipated behavior of the exchange rate, and the impact on the market of shocks or changes to world demand and supply of a particular commodity.

In light of the recognized uncertainty, the United States is expected to continue to become increasingly integrated into the world trade market over the coming decade, with both more imports and more exports. The real trade deficit narrowed somewhat in the late 1980s and early 1990s before swelling from a low of \$35.2 billion in 1992 and peaking at \$729.4 billion in 2006. As the trade deficit grew, the personal savings rate declined by nearly 5 percent, with consumers supporting import growth at an annual rate of more than 8 percent. Impacts of the recent financial crisis, including improvements to the personal savings rate, a decline in business investment, and a falling exchange rate, have contributed to a narrowing of the U.S. trade deficit. BLS projects that the real trade deficit will continue to narrow appreciably over the coming decade, from \$421.8 billion in 2010 to \$193.3 billion in 2020. (See table 6.)

A continued decline in the exchange rate, as well as general world economic recovery, is expected to support strong export growth of 6.3 percent annually over 2010–2020, faster than the 3.4 percent exhibited from 2000 to

Table 6. Exports and imports of goods and services, 1990, 2000, 2010, and projected 2020

Category	Billions of chained 2005 dollars				Annual rate of change		
	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Exports of goods and services	\$599.7	\$1,187.4	\$1,663.3	\$3,065.1	7.1	3.4	6.3
Goods	395.3	843.4	1,164.9	2,114.0	7.9	3.3	6.1
Nonagricultural	348.6	778.3	1,077.3	2,016.5	8.4	3.3	6.5
Agricultural	46.9	64.1	86.1	110.6	3.2	3.0	2.5
Services	209.0	343.5	498.9	955.2	5.1	3.8	6.7
Residual ¹	–4.8	1.6	1.0	–17.2	...	...	...
Imports of goods and services	672.6	1,638.7	2,085.0	3,258.4	9.3	2.4	4.6
Goods	512.3	1,366.7	1,729.3	2,815.3	10.3	2.4	5.0
Nonpetroleum	412.8	1,153.6	1,503.5	2,616.5	10.8	2.7	5.7
Petroleum	140.6	215.9	227.0	265.8	4.4	.5	1.6
Services	171.3	271.7	357.4	448.0	4.7	2.8	2.3
Residual ²	–52.2	–2.5	–2.9	–71.9	...	...	...
Trade surplus/deficit	–72.8	–451.3	–421.8	–193.3	20.0	–.7	–7.5

¹ Difference of the aggregate category “exports of goods and services” and the sum of the most detailed lines, for each first-level subcategory of “exports of goods and services.”

² Difference of the aggregate category “imports of goods and services”

and the sum of the most detailed lines, for each first-level subcategory of “imports of goods and services.”

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

2010, but somewhat less than the 7.1-percent growth over 1990–2000. (See table 6.) Exports of services are projected to increase slightly more quickly than exports of goods, 6.7 percent and 6.1 percent, respectively. However, goods are still expected to make up the majority of exports in the next 10 years. As with exports, import growth is expected to pick up from the previous decade's figures, from 2.4 percent over 2000–2010 to 4.6 percent over 2010–2020. As the U.S. economy recovers, consumers and businesses are anticipated to increase their purchases, including demand for imports. Consumers, however, are expected to devote a growing portion of their spending to medical expenses, somewhat limiting the growth of imports.

The nominal trade balance has been in deficit every year since 1976, but never exceeded \$150 billion until 1998. By 2006, the deficit had grown fivefold, to \$769.3 billion. Since then, the deficit has receded somewhat, to \$516.9 billion in 2010. BLS expects that by 2020 the nominal trade deficit will grow to \$776.6 billion, nearly equivalent to the 2006 level. Because the world is becoming increasingly interconnected, imports and exports are each expected to make up a more substantial share of GDP by 2020. On balance, the trade deficit held back GDP by less than 1 percent in the early 1990s, but by 2006 it accounted for –5.8 percent of GDP. As the trade deficit contracted, the share fell to –3.6 percent of GDP in 2010; it is projected to stay relatively constant at –3.3 percent of GDP in 2020.

The growing nominal trade deficit and an increase in foreign investment in the United States have resulted in a rapid rise in the current-account deficit (the excess of imports and income flows to foreigners over exports and foreign income to Americans) since the late 1990s. Economic prosperity contributed to making the nation an attractive destination for foreign investors, enabling the current-account balance to grow from roughly 1.5 percent of GDP in the mid-1990s to a peak of 6 percent in 2006. As the stock market fell and the financial crisis took hold, the current-account deficit receded to 3.3 percent of GDP in 2010. BLS projects a similar level of 3.5 percent of GDP in 2020.²⁶

Federal government. Like personal consumption expenditures, medical care and income support are projected to rise as an aging and longer lived society demands more of these services, pushing prices higher for all consumers. Although Medicare will see increased costs, reimbursement rates are being reduced over the next decade, slowing the overall growth of that social insurance program. Social Security also is expected to consume more resources. As military operations in Afghanistan continue

and those completed in Iraq are assessed, worn equipment will need to be replaced, further necessitating government spending. The dominant trend is expected to be fiscal stimulus giving way to fiscal restraint, leading to federal government consumption and investment of \$1.0 trillion in 2020, down nearly \$70 billion from 2010, or an annual decline of 0.7 percent. (See table 7.) Previous policies and current programs enacted in response to the recession have contributed to large budget deficits and a larger national debt over the last few years. BLS assumes that policy will largely finish as planned and no new major stimulus programs will be enacted. In light of these developments, BLS anticipates that the 2010 budget deficit of almost \$1.3 trillion, or 8.8 percent of GDP, will decline to \$846.1 billion, or 3.6 percent of GDP, by 2020 as economic and employment recoveries drive revenue increases and as stimulus programs come to an end.

The leading edge of the baby-boomer generation became eligible for limited Social Security benefits in 2008 and Medicare benefits in 2010. As this age cohort begins demanding more sophisticated medical care for age-related maladies, costs of administering the care, including the use of new medical technologies, are expected to grow considerably faster than GDP. As a share of nominal federal government spending, these two programs grew from 27.9 percent in 1990 to 33.1 percent in 2000, before dropping slightly to 32.6 percent in 2010 from the impact of the earlier recession. By 2020, Social Security and Medicare are expected to continue rising, to approximately 39.7 percent of nominal federal government expenditures.²⁷ (See table 8.)

In 2010, the Congress passed, and the President signed into law, the Patient Protection and Affordable Care Act. Although there is considerable uncertainty over whether the act will reduce costs or add to the deficit, the general provisions of the law aim to expand health care coverage to roughly 30 million people. The end result of the law was initially an estimated reduction in the federal deficit of between \$132 and \$210 billion over 10 years; however, final estimates were not available from the Congressional Budget Office at the time of this writing.²⁸

Military operations still underway in Afghanistan and those recently completed in Iraq are likely to warrant substantial replacement spending for wornout equipment in the coming decade. However, the costs associated with investing in new machinery and maintaining current troop levels of approximately 1.4 million around the world²⁹ are expected to decline somewhat from a record of \$718.2 billion in 2010 to \$692.6 billion in 2020, an annual growth rate of –0.4 percent, in stark contrast to a rate of 4.7 per-

Category	Billions of chained 2005 dollars				Annual rate of change		
	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Government consumption expenditures and gross investment	\$1,864.1	\$2,097.8	\$2,556.8	\$2,792.8	1.2	2.0	0.9
Federal government consumption and investment	799.1	698.1	1,075.9	1,007.3	-1.3	4.4	-.7
Defense consumption and investment	584.9	453.5	718.2	692.6	-2.5	4.7	-.4
Consumption expenditures	506.5	403.8	608.9	567.0	-2.2	4.2	-.7
Compensation, military	182.4	131.1	162.8	169.2	-3.2	2.2	.4
Compensation, civilian	99.0	65.8	78.8	78.1	-4.0	1.8	-.1
Consumption of fixed capital	68.4	65.7	83.2	101.2	-.4	2.4	2.0
Intermediate goods and services purchased	174.0	147.2	289.8	224.4	-1.7	7.0	-2.5
Less own-account investment	2.6	1.5	2.3	2.4	-5.7	4.5	.3
Less sales to other sectors	3.2	2.4	3.1	2.4	-3.1	2.8	-2.6
Gross investment	75.0	50.3	110.2	131.5	-3.9	8.2	1.8
Own-account investment	2.6	1.5	2.3	2.4	-5.7	4.5	.3
Other investment	72.2	48.8	108.0	129.3	-3.9	8.3	1.8
Nondefense consumption and investment	213.9	244.4	357.7	314.3	1.3	3.9	-1.3
Consumption expenditures	191.8	212.4	307.5	268.4	1.0	3.8	-1.4
Compensation	130.3	124.7	147.7	146.5	-.4	1.7	-.1
Consumption of fixed capital	14.3	22.4	31.2	37.7	4.6	3.4	1.9
Intermediate goods and services purchased:							
Commodity credit corporation purchases	-1.6	.8	-.1	.0	—	—	—
Other	67.0	73.7	137.9	93.9	1.0	6.5	-3.8
Less own-account investment	4.2	2.6	2.9	3.0	-4.6	1.0	.5
Less sales to other sectors	7.6	5.4	6.4	5.4	-3.4	1.7	-1.6
Gross investment	23.9	31.7	50.5	46.4	2.8	4.8	-.8
Own-account investment	4.2	2.6	2.9	3.0	-4.6	1.0	.5
Other investment	20.4	29.1	47.6	43.3	3.6	5.1	-.9
State and local government consumption and investment	1,062.1	1,400.2	1,487.0	1,779.4	2.8	.6	1.8
Consumption expenditures	880.0	1,133.7	1,213.0	1,436.8	2.6	.7	1.7
Compensation	729.1	842.9	895.9	953.1	1.5	.6	.6
Consumption of fixed capital	63.5	96.2	128.7	165.3	4.2	3.0	2.5
Intermediate goods and services purchased	297.4	480.4	519.4	727.1	4.9	.8	3.4
Less own-account investment	13.5	17.6	18.4	24.0	2.7	.5	2.7
Less sales to other sectors	188.7	267.7	312.3	385.3	3.6	1.6	2.1
Gross investment	183.2	266.6	274.3	343.5	3.8	.3	2.3
Own-account investment	13.5	17.6	18.4	24.0	2.7	.5	2.7
Other investment	169.8	249.1	256.0	319.7	3.9	.3	2.2
Residual ¹	-22.6	-4.6	-8.3	-2.7	...	...	...

NOTE: Dash indicates data not computable or not applicable.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

¹The residual is the difference of the first line and the sum of the most detailed lines, for each first-level subcategory.

cent from 2000 to 2010. (See table 7.) Military activities are seen to decrease during 2010–2020. In fact, nominal defense spending as a proportion of GDP is projected to be 4.1 percent in 2020, a reduction from 5.6 percent in 2010. (See table 3.)

The recession of 2007–2009 brought about federal measures supporting and maintaining aggregate demand and aimed at preventing another recession. TARP cash infusions into several large banking institutions and automakers, extensions to unemployment benefits, payments to

states, infrastructure investments, other provisions of the ARRA, and lower revenues as a result of the recession increased the deficit as a percentage of GDP over the last few years to levels not seen since the Second World War. More recently, the Budget Control Act of 2011 was passed to avert default on the U.S. government's debt and to outline means by which budgets must be trimmed going forward. As discussed earlier, BLS assumes that no additional monetary or fiscal stimulus programs or quantitative easing efforts will be implemented during the 2010–2020 decade. Details regarding deficit reduction legislation were not yet resolved in time to be included in the 2020 projections. In light of the preceding assumptions, BLS projects a budget deficit of \$846.1 billion in 2020, representing an annual decline of 4.0 percent from the 2010 deficit of \$1.3 trillion. (See table 8.)

As the decade continues and economic output resumes more normal patterns, revenues are expected to increase from corporate and individual tax receipts. Federal government receipts, on a nominal basis, are projected to grow 6.8 percent annually from 2010 to 2020, much faster than the 1.7-percent rate seen during 2000–2010, but only slightly faster than the 6.6 percent registered over the 1990–2000 period. (See table 8.) Growth in nominal expenditures is expected to decline from 7.1 percent over 2000–2010 to 4.1 percent in the decade ending in 2020. The latter percentage is historically in line with the 4.0-percent growth rate seen during 1990–2000. BLS projects federal government interest payments to increase from 7.6 percent of nominal federal spending in 2010 to 18.7 percent in 2020.

State and local governments. Although federal government consumption and investment are expected to decline slightly over the next 10 years, state and local government consumption and investment are anticipated to grow. BLS projects state and local consumption and gross investment to increase at 1.8 percent annually from 2010 to 2020. This growth rate is triple the 0.6-percent growth exhibited in the decade ending in 2010, but less than the 2.8-percent growth seen from 1990 to 2000. (See table 2.) The expenditures seen in 2020 equate to 11.9 percent of nominal GDP, down slightly from 12.3 percent in 2010, though close to the 11.6 percent experienced in 1990 and 2000. (See table 3.)

States are currently experiencing budgetary pressures rising from the revenue losses associated with the recession of 2007–2009. For example, federal grants-in-aid are expected to be less generous as the aforementioned federal budgetary issues persist. In 2020, these grants are projected to be

18.2 percent of states' total receipts, a large drop from the 25.7-percent share observed in 2010. (See table 9.) Adding to current fiscal problems, most states are typically required by law to maintain a balanced budget or to quickly eliminate any deficits they run. Increased Medicaid and similar social benefit expenses are expected to lead to reductions in other state programs in order for states to operate within these budgetary constraints in the near term.

BLS projects that, as the economic recovery continues, nominal state and local revenues will increase from 4.6-percent annual growth during 2000–2010 to 5.1 percent from 2010 to 2020. At the same time, expenditure growth is seen to decrease from 5.0 percent in the decade ending in 2010 to 4.7 percent for the 2010–2020 period. The combination of anticipated higher revenues and lower spending is expected to result in state surpluses totaling \$89.4 billion by 2020. (See table 9.)

Personal income

GDP, the value of the goods and services produced in the nation, is measured by both an expenditure approach, as discussed in the previous section, and an income approach. In theory, the sum of purchases by final users is equivalent to all of the incomes earned and all of the costs of production. Real personal income, from the income side of the GDP accounts, slowed from 5.9 percent annual growth over 1990–2000 to 3.8 percent over 2000–2010. (See table 10.) This slowdown over the past decade can be explained largely by a decline of 4.3 percent from 2008 to 2009, the first decline since 1949, attributable mostly to decreases in personal income on assets and in wage and salary disbursements. As the economy recovers from the 2007–2009 recession, personal income is expected to resume growing at 5.2 percent annually over 2010–2020, with sizable recoveries to both wages and asset income.

One mark of the 2007–2009 recession is that social benefits made up a larger share of personal income in 2010 than in earlier years; likewise, compensation, or labor income, accounted for a smaller share that year. Social benefits include programs such as Social Security, Medicaid, and Medicare, which are growing with the aging baby boomers, but also include welfare and unemployment insurance programs, both heavily affected by the high rate of unemployment in 2010. Therefore, personal current transfer receipts, made up of government social benefits and a small amount of business transfer payments, are expected to decline somewhat, from 18.4 percent of personal income in 2010 to 16.5 percent in 2020, as social

Category	Billions of current dollars				Percent distribution				Annual rate of change		
	1990	2000	2010	2020	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Receipts	\$1,082.8	\$2,057.1	\$2,429.6	\$4,674.4	100.0	100.0	100.0	100.0	6.6	1.7	6.8
Tax receipts	642.2	1,309.6	1,340.7	2,940.5	59.3	63.7	55.2	62.9	7.4	.2	8.2
Personal taxes	470.1	995.5	896.3	2,335.4	43.4	48.4	36.9	50.0	7.8	–1.0	10.1
Corporate income taxes	118.1	219.4	329.6	397.6	10.9	10.7	13.6	8.5	6.4	4.2	1.9
Taxes on production and imports	50.9	87.3	101.4	186.3	4.7	4.2	4.2	4.0	5.5	1.5	6.3
Taxes from the rest of the world	3.0	7.3	13.3	21.2	.3	.4	.5	.5	9.2	6.2	4.8
Contributions for social insurance	402.0	698.6	970.9	1,603.1	37.1	34.0	40.0	34.3	5.7	3.3	5.1
Income receipts on assets	29.6	24.5	36.1	38.7	2.7	1.2	1.5	.8	–1.9	3.9	.7
Interest receipts	27.0	19.3	29.9	34.3	2.5	.9	1.2	.7	–3.3	4.5	1.4
Rents and royalties	2.6	5.2	6.2	4.4	.2	.3	.3	.1	7.0	1.8	–3.4
Transfer receipts	14.3	25.7	69.7	95.1	1.3	1.3	2.9	2.0	6.1	10.5	3.1
From business	10.8	15.0	48.8	64.4	1.0	.7	2.0	1.4	3.3	12.5	2.8
From persons	3.5	10.7	21.0	30.7	.3	.5	.9	.7	12.0	6.9	3.9
Surplus of government enterprises	–5.3	–1.2	–4.8	–2.9	–.5	–.1	–.2	–.1	–13.6	14.7	–4.8
Expenditures	1,259.2	1,871.9	3,703.3	5,520.4	100.0	100.0	100.0	100.0	4.0	7.1	4.1
Consumption expenditures	419.0	496.0	1,054.0	1,249.6	33.3	26.5	28.5	22.6	1.7	7.8	1.7
Transfer payments	576.2	1,047.3	2,313.6	3,182.3	45.8	55.9	62.5	57.6	6.2	8.2	3.2
Government social benefits	451.2	777.8	1,724.9	2,508.9	35.8	41.5	46.6	45.4	5.6	8.3	3.8
Social Security benefits	244.1	401.4	690.2	1,202.6	19.4	21.4	18.6	21.8	5.1	5.6	5.7
Medicare benefits	107.6	219.1	518.5	987.0	8.5	11.7	14.0	17.9	7.4	9.0	6.7
Unemployment benefits	18.2	20.8	138.7	50.3	1.4	1.1	3.7	.9	1.3	20.9	–9.6
Other benefits to persons	75.1	127.9	361.0	244.2	6.0	6.8	9.7	4.4	5.5	10.9	–3.8
Benefits to the rest of the world	6.2	8.6	16.6	24.8	.5	.5	.4	.4	3.4	6.7	4.1
Other transfer payments	125.0	269.5	588.8	673.4	9.9	14.4	15.9	12.2	8.0	8.1	1.4
Grants-in-aid to state and local government	111.4	247.3	531.5	614.4	8.8	13.2	14.4	11.1	8.3	8.0	1.5
Transfer payments to the rest of the world	13.5	22.2	57.3	59.0	1.1	1.2	1.5	1.1	5.1	9.9	.3
Interest payments	237.4	283.2	279.9	1,032.0	18.9	15.1	7.6	18.7	1.8	–.1	13.9
To persons and businesses	196.7	198.7	143.8	418.0	15.6	10.6	3.9	7.6	.1	–3.2	11.3
To the rest of the world	40.8	84.5	136.1	614.0	3.2	4.5	3.7	11.1	7.6	4.9	16.3
Subsidies	26.6	45.3	55.8	56.5	2.1	2.4	1.5	1.0	5.5	2.1	.1
Less wage accruals, less disbursements	.1	.0	.0	.0	—	—	—	—	—	—	—
Net federal government saving	–176.4	185.2	–1,273.7	–846.1	—	—	—	—	—	—	–4.0
Surplus or deficit as percentage of gross domestic product	–3.0	1.9	–8.8	–3.6	—	—	—	—	—	—	—

NOTE: Dash indicates data not computable or not applicable.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

programs relating to the recession wind down. However, receipts remain elevated from their 12.7-percent contribution in 2000 as the impacts of an aging society persist. Meanwhile, compensation is projected to continue to follow its long-run trend of declining as a share of personal income, whereas interest and dividend income are ex-

pected to make up a growing share.

As displayed in table 10, income is disaggregated by two accounting methods: sources of income and uses of income. Within uses are consumption, taxes, interest payments, transfer payments, and personal savings. Personal consumption, equivalent to the measurement of GDP on

Table 9. State and local government receipts and expenditures, 1990, 2000, 2010, and projected 2020

Category	Billions of current dollars				Percent distribution				Annual rate of change		
	1990	2000	2010	2020	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Receipts	\$738.0	\$1,322.6	\$2,064.7	\$3,383.6	100.0	100.0	100.0	100.0	6.0	4.6	5.1
Tax receipts	519.1	893.2	1,307.9	2,328.4	70.3	67.5	63.3	68.8	5.6	3.9	5.9
Personal taxes	122.6	236.7	297.5	505.7	16.6	17.9	14.4	14.9	6.8	2.3	5.4
Corporate income taxes	22.5	35.2	57.8	153.0	3.0	2.7	2.8	4.5	4.6	5.1	10.2
Taxes on production and imports	374.1	621.3	952.5	1,669.8	50.7	47.0	46.1	49.3	5.2	4.4	5.8
Sales taxes and other	212.5	366.6	521.9	928.2	28.8	27.7	25.3	27.4	5.6	3.6	5.9
Property taxes	161.5	254.7	430.6	741.7	21.9	19.3	20.9	21.9	4.7	5.4	5.6
Contributions for social insurance	10.0	10.8	20.8	34.3	1.4	.8	1.0	1.0	.7	6.8	5.1
Income receipts on assets	68.5	94.3	91.0	192.0	9.3	7.1	4.4	5.7	3.2	–4	7.8
Interest receipts	64.1	86.7	75.0	159.3	8.7	6.6	3.6	4.7	3.1	–1.4	7.8
Dividends	.3	1.4	2.6	4.6	.0	.1	.1	.1	18.4	6.7	5.9
Rents and royalties	4.2	6.3	13.4	28.2	.6	.5	.6	.8	4.2	7.9	7.7
Transfer receipts	133.4	313.9	655.9	822.5	18.1	23.7	31.8	24.3	8.9	7.6	2.3
Federal grants–in–aid	111.4	247.3	531.5	614.4	15.1	18.7	25.7	18.2	8.3	8.0	1.5
From business (net)	7.1	28.6	50.3	88.2	1.0	2.2	2.4	2.6	15.0	5.8	5.8
From persons	14.9	38.0	74.1	119.8	2.0	2.9	3.6	3.5	9.8	6.9	4.9
Surplus of government enterprises	6.9	10.4	–10.8	6.4	.9	.8	–.5	.2	4.2	—	—
Expenditures	731.8	1,281.3	2,090.0	3,294.3	100.0	100.0	100.0	100.0	5.8	5.0	4.7
Consumption expenditures	547.0	930.6	1,443.5	2,256.8	74.7	72.6	69.1	68.5	5.5	4.5	4.6
Government social benefit payments to persons	127.7	271.5	534.6	850.9	17.4	21.2	25.6	25.8	7.8	7.0	4.8
Medicaid	78.2	205.0	421.1	690.9	10.7	16.0	20.1	21.0	10.1	7.5	5.1
Other	49.5	66.4	113.5	160.1	6.8	5.2	5.4	4.9	3.0	5.5	3.5
Interest payments	56.8	78.8	110.3	184.5	7.8	6.1	5.3	5.6	3.3	3.4	5.3
Subsidies	.4	.6	1.6	2.0	.1	.0	.1	.1	3.2	11.1	2.4
Less wage accruals, less disbursements	.0	.0	.0	.0	.0	.0	.0	.0	—	—	—
Net state and local government saving	6.2	41.3	–25.3	89.4	—	—	—	—	20.9	—	—

NOTE: Dash indicates data not computable or not applicable.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

the product side, discussed earlier, is expected to decline from 82.8 percent of income in 2010 to 80.7 percent in 2020. As consumption falls slightly as a share of GDP, taxes are expected to recover, moving from 9.6 percent of income in 2010 to 13.8 percent in 2020, with the latter percentage in between their 1990 and 2000 contributions. The recovery of wage growth, coupled with the assumption of more fiscal restraint over the coming decade, implies increasing personal tax payments over the decade.

As household net worth rose by about 7 percent annually, the savings rate fell from roughly 7 percent in the late 1980s to 1.5 percent in 2005, rebounded somewhat to 2.6 percent in 2006, and dropped slightly to 2.4 percent in 2007. As home values declined and credit conditions

tightened, consumers increased their savings rate to 5.4 percent in 2008; it stayed relatively stable at that level for 3 years. A couple of factors are expected to exert downward pressure on the savings rate. First, household balance sheets have shown considerable recovery and credit conditions are expected to improve, allowing consumers once again to rely more heavily upon credit and slow their savings. Second, the aging of the baby boomers leads to a rising share of income from medical and Social Security transfer payments, and the marginal propensity to consume out of this type of income is higher than that for labor income.³⁰ Preliminary data for the third quarter of 2011 indicate that the savings rate was 3.8 percent, slightly higher than the projected rate for 2020.

Table 10. Personal income, 1990, 2000, 2010, and projected 2020

Category	Billions of current dollars				Percent distribution				Annual rate of change		
	1990	2000	2010	2020	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Sources											
Personal income	4,846.7	8,559.4	12,373.5	20,573.7	100.0	100.0	100.0	100.0	5.9	3.8	5.2
Compensation of employees	3,326.2	5,788.9	7,971.4	12,878.2	68.6	67.6	64.4	62.6	5.7	3.3	4.9
Wage and salary disbursements	2,741.1	4,827.7	6,408.2	10,320.5	56.6	56.4	51.8	50.2	5.8	2.9	4.9
Supplements to wages and salaries	585.0	961.2	1,563.1	2,557.8	12.1	11.2	12.6	12.4	5.1	5.0	5.0
Proprietors' income	365.2	817.5	1,036.4	1,770.8	7.5	9.6	8.4	8.6	8.4	2.4	5.5
Rental income	49.8	215.3	350.2	484.2	1.0	2.5	2.8	2.4	15.8	5.0	3.3
Personal income on assets	920.8	1,360.7	1,721.2	3,680.6	19.0	15.9	13.9	17.9	4.0	2.4	7.9
Personal interest income	752.0	984.2	1,003.4	2,393.4	15.5	11.5	8.1	11.6	2.7	.2	9.1
Personal dividend income	168.9	376.5	717.7	1,287.2	3.5	4.4	5.8	6.3	8.4	6.7	6.0
Personal current transfer receipts	594.9	1,083.0	2,281.2	3,397.3	12.3	12.7	18.4	16.5	6.2	7.7	4.1
Federal social benefits	445.0	769.1	1,708.3	2,484.1	9.2	9.0	13.8	12.1	5.6	8.3	3.8
State and local social benefits	127.7	271.5	534.6	850.9	2.6	3.2	4.3	4.1	7.8	7.0	4.8
Other, from business (net)	22.2	42.5	38.3	62.2	.5	.5	.3	.3	6.7	-1.0	5.0
Less social insurance contribution	412.1	709.4	991.7	1,637.4	8.5	8.3	8.0	8.0	5.6	3.4	5.1
Uses											
Personal income	4,846.7	8,559.4	12,373.5	20,573.7	100.0	100.0	100.0	100.0	5.9	3.8	5.2
Personal consumption	3,835.4	6,830.4	10,245.5	16,600.5	79.1	79.8	82.8	80.7	5.9	4.1	4.9
Personal taxes	592.7	1,232.3	1,193.9	2,841.1	12.2	14.4	9.6	13.8	7.6	-.3	9.1
Personal interest payments	111.3	200.3	173.4	316.0	2.3	2.3	1.4	1.5	6.0	-1.4	6.2
Personal transfer payments	30.6	83.4	168.0	258.6	.6	1.0	1.4	1.3	10.5	7.3	4.4
To government	18.4	48.8	95.1	150.5	.4	.6	.8	.7	10.2	6.9	4.7
Federal	3.5	10.7	21.0	30.7	.1	.1	.2	.1	12.0	6.9	3.9
State and local	14.9	38.0	74.1	119.8	.3	.4	.6	.6	9.8	6.9	4.9
To the rest of the world (net)	12.2	34.6	72.9	108.2	.3	.4	.6	.5	11.0	7.7	4.0
Personal savings	276.7	213.1	592.8	557.5	5.7	2.5	4.8	2.7	-2.6	10.8	-6
Addenda											
Disposable personal income	4,254.0	7,327.2	11,179.7	17,732.5	—	—	—	—	5.6	4.3	4.7
Disposable personal income, chained 2005 dollars	5,893.6	8,157.9	10,061.7	12,886.0	—	—	—	—	3.3	2.1	2.5
Per capita disposable income	17,010.9	25,934.7	36,015.5	51,874.9	—	—	—	—	4.3	3.3	3.7
Per capita disposable income, chained 2005 dollars	23,567.2	28,875.1	32,414.0	37,696.8	—	—	—	—	2.1	1.2	1.5
Savings rate (percent)	6.5	2.9	5.3	3.1	—	—	—	—	-7.7	6.2	-5.1

NOTE: Dash indicates data not computable or not applicable.

SOURCE: Historical data, U.S. Bureau of Economic Analysis; projected data, U.S. Bureau of Labor Statistics.

Employment

BLS compiles in-house projections of the labor force and labor force participation rate that are then fed into the macromodel as exogenous data. The Census Bureau expects that the population growth of those ages 16 years and older will continue to slow, from 1.2-percent annual growth over 1990–2000, to 1.1 percent for 2000–2010, to 1.0 percent in 2010–2020. (See table 11.) BLS projects that, as the large cohort of baby boomers continues to move into retirement age and young adults increasingly delay entering the labor

market, civilian labor force growth also will slow, from 0.8 percent annually over 2000–2010 to 0.7 percent from 2010 to 2020.

BLS projections of employment are highly dependent on demographic expectations and the assumption of full employment. The recession of 2007–2009 had a considerable impact on the labor market, leaving nonfarm payroll employment almost 2 million jobs lower in 2010 than 10 years earlier. (See table 11.) As the economy struggled and employment declined, the unemployment rate peaked at 10.0 percent in October 2009, the second-highest peak in

Table 11. Labor supply and factors affecting productivity, 1990, 2000, 2010, and projected 2020

Category	Levels				Annual rate of change		
	1990	2000	2010	2020	1990–2000	2000–2010	2010–2020
Labor supply (millions):							
Total population	250.1	282.5	310.4	341.8	1.2	0.9	1.0
Population ages 16 and older	189.2	212.6	237.8	263.0	1.2	1.1	1.0
Civilian labor force	125.8	142.6	153.9	164.4	1.3	.8	.7
Civilian household employment	118.8	136.9	139.1	155.9	1.4	.2	1.1
Nonfarm payroll employment	109.5	131.8	129.8	149.5	1.9	–.2	1.4
Unemployment rate (percent)	5.6	4.0	9.6	5.2	–3.4	9.2	–6.0
Productivity:							
Private nonfarm business output per hour (billions of chained 2005 dollars)	35.0	43.1	55.1	67.4	2.1	2.5	2.0

SOURCE: Historical data, U.S. Bureau of Economic Analysis, Bureau of Census, U.S. Bureau of Labor Statistics; projected data, U.S. Bureau of Labor Statistics.

the postwar period; only the peak in late 1982 was higher, at 10.8 percent. Although labor force growth is expected to slow slightly over the next decade, the unemployment rate is assumed to recover to a level consistent with “full employment”: 5.2 percent by 2020. Consequently, BLS expects that, as the economy recovers from the recession, employment will slowly recover as well, growing by 1.4 percent per year and adding nearly 20 million nonfarm jobs from 2010 to 2020. Civilian household employment is projected to increase by 1.1 percent annually over the same period, resulting in an increase of 16.8 million workers.³¹ (Employment projections are discussed in more detail in other articles in this issue of the *Review*.)

Productivity

Labor productivity, measured as output per hour in the private nonfarm business sector, is a critical contributing factor to GDP growth because greater productivity results in more output at a given level of employment. Increased output in turn results in declining prices, higher wages, increased profits, or some combination thereof, all of which contribute to improvements in living standards. U.S. productivity growth was relatively strong from 1996 to 2004, at 3.1 percent annually. Improvements in productivity over this period, especially before the 2001 recession, are generally agreed upon to have stemmed largely from information technology,³² including advances in computing power, greater software efficiency, and sophistication of communication capabilities. Continued growth in productivity after the 2001 recession and through 2004 allowed firms to increase output without boosting their payrolls.

Between 2005 and 2009, productivity in the United

States grew at a much slower rate of 1.4 percent annually. However, productivity is one area within the U.S. economy that has experienced a strong recovery since 2009, growing by an impressive 4.1 percent in 2010. Because productivity is a procyclical measure, much of the recovery from the recent recession is expected to have been completed by the end of 2010. Firms have yet to use their productivity gains to increase wages or to expand their workforces and instead have been holding on to profits. Although research is still needed to explain why recent recoveries have included rapid upturns in productivity accompanied by slower improvement in the labor markets, some preliminary results indicate that uncertainty may play an important role in this behavior.³³ BLS projects that productivity will grow by 2.0 percent per year over 2010–2020 (see table 11), slower than the growth experienced from the mid-1990s to the early 2000s, but similar to its long-run trend behavior. The strong projected GDP growth of 3.0 percent annually is therefore supported more through employment recovery than productivity growth.

Sensitivity analysis

Although the model’s outcomes are based on an econometric approach developed by Macroeconomic Advisers, changing the expectations of certain exogenous variables necessarily results in a different economic projected growth path. BLS performed a sensitivity analysis examining the impact of changes to some exogenous variables on key outcomes of the model, particularly the effect on projected GDP. Long-term outlooks tend to rely heavily upon historical trends in the data. Therefore, changing most exogenous variables affects the model’s outcomes only minimally; changing the values of demographic vari-

ables likely has the greatest effect.

The most important variable projected within the macromodel, for BLS purposes, is employment, because it serves as a constraint on the much more detailed projections of industries and occupations. As regards the aggregate employment projection, BLS tries to ensure risks to both the upside and downside. As the recovery progresses and the unemployment rate remains elevated, there seems to be growing support in the literature for assuming a long-term nonaccelerating inflation rate of unemployment higher than 5.2 percent. However, BLS expects that the labor force will grow by 0.7 percent annually over the coming decade, compared with 0.8 percent in 2000–2010 and 1.3 percent during 1990–2000. This slowed growth has important implications. To begin with, according to the structure of the equations in the macromodel, annual growth of 0.7 percent in the labor force requires a monthly increase in household employment of 140,100 over the decade in order to reach the assumed unemployment rate of 5.2 percent. If the labor force were to grow 0.1 percent faster—that is, by 0.8 percent annually—an additional employment increase of 13,000 per month, or 1.6 million additional workers over the decade, would be required.

In a similar vein, if the labor force were to grow by an additional 0.1 percent annually, the GDP solution within the macromodel also would be projected to grow by 0.1 percent faster per year from 2010 to 2020. In order to run this 0.1-percent-faster-labor-growth scenario and maintain the full-employment assumption, the real federal funds rate was adjusted to register 3.8 percent in 2020, lower than the assumed 4.5 percent within the published projections. Interest-rate-related measures fell accordingly. Other notable changes to the published results included a decline in the savings rate, which fell to 2.4 percent in 2020, compared with the published projection of 3.1 percent, and a retreat of the federal budget deficit to 2.9 percent of GDP rather than 3.6 percent of GDP.

Uncertainty and economic projections

The BLS macroeconomic projections are based on the model structure set up by Macroeconomic Advisers. This structure accommodates BLS expectations for certain key and exogenous variables. The results should be understood as a projection, not a forecast. The distinction is important: economic forecasts tend to foretell the near future and generally attempt to anticipate actual behavior, including the dynamics of the business cycle; projections, by contrast, tend to be longer in scope and do not attempt to forecast behavior, but rather focus on long-term growth

paths based on assumptions regarding certain variables. Understanding the purpose of BLS macroeconomic projections is important in interpreting the results.

The macroeconomic model sets the stage for publication of the more detailed BLS projections, including output and employment projections for nearly 200 industries and more than 700 occupations. A detailed projected input–output system is developed in order to determine commodity and industry output, which, in turn, is the key determinant of industry employment, broken out into occupations. The macromodel is intended to provide an accounting system for the employment and output projections, ensuring that models of detailed employment and output variables arrive at sound, defensible results for aggregate categories. The macroeconomic projections are generally finalized about 5 to 6 months ahead of publication, with only minor adjustments made afterwards. Wage and salary employment is held, at the whole, to the macroeconomic projection. Final demand categories, including consumption, investment, imports, exports, defense, nondefense, and State and local government, also are supplied by the macromodel and then disaggregated by other in-house models. The macromodel outcomes, in general, set up the framework for the discussion regarding more detailed results within the projections. For example, the number of light-vehicle sales from the model gives guidance in projecting automotive employment. Similarly, estimates of construction employment are dependent on housing starts and other construction-related projections produced by the model.

The macromodel projects that household employment will grow by 1.1 percent annually, from 139.1 million in 2010 to 155.9 million in 2020, adding 16.8 million workers over the coming decade. Nonfarm payroll employment is projected to increase slightly faster, at 1.4 percent per year, adding 19.7 million jobs between 2010 and 2020. According to both measures, employment is expected to recover from very slow growth or contraction that took place over the 2000–2010 decade, exhibiting growth slightly slower than that experienced between 1990 and 2000. On the basis of these employment results and a general expected recovery from a rather deep recession, GDP is projected to increase by 3.0 percent per year from 2010 to 2020. Underlying this growth in GDP, strong recovery is expected within the housing market, resulting in improved consumer confidence and, therefore, more spending. As the recovery takes hold and uncertainty subsides, businesses are expected to invest recent profits more heavily, increasing both employment and wages, in turn stimulating consumption further. The broad trade-weighted exchange rate of the U.S. dollar

is assumed to continue falling, contributing to a narrowing of the real trade deficit to \$193.3 billion in 2020, less than half its 2010 reading. As tax revenues increase during the recovery, state and local governments are expected to grow by 1.8 percent annually from 2010 to 2020. Over the same period, federal government consumption and investment are each projected to decline by 0.7 percent annually as fiscal restraint takes hold after heightened expenditures in response to the 2007–2009 recession.

Projections are always subject to considerable uncer-

tainty as the unexpected occurs, with unanticipated influences. However, the uncertainty surrounding the set of projections presented here is particularly elevated relative to past BLS projections, because of the severity of the 2007–2009 recession and unknown structural changes that may ensue. Specific examples are given in detail in the overview article.³⁴ With the points discussed there in mind, readers will be better able to grasp and appreciate the projections and estimates presented in this issue of the *Review*. □

Notes

¹ According to the National Income and Product Accounts published by the Bureau of Economic Analysis (BEA) at the time of this publication, the recession was the deepest in the postwar period, as measured by the decline in gross domestic product. The National Bureau of Economic Research, the arbiter of beginning and ending dates of U.S. recessions, has determined that the recession of 2007–2009 lasted 18 months. The 1973–1975 and 1981–1982 downturns each lasted 16 months. (See “US Business Cycle Expansions and Contractions,” (Cambridge, MA, National Bureau of Economic Research, Jan. 19, 2012, updated daily), <http://www.nber.org/cycles/cyclesmain.html>).

² See Carmen M. Reinhart and Kenneth Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton, NJ, Princeton University Press, 2009).

³ Estimates of levels cited in this article are chain-weighted measures based on constant real 2005 dollars unless stated otherwise. For a discussion of the chain-weighting methodology, see J. Steven Landefeld and Robert P. Parker, “BEA’s Chain Indexes, Time Series, and Measures of Long-Term Economic Growth,” *Survey of Current Business*, May 1997, <http://www.bea.gov/scb/pdf/national/nipa/1997/0597od.pdf>.

⁴ See, for example, “American Economic Policy: Running Out of Road,” *The Economist*, June 16, 2011, <http://www.economist.com/node/18834323>; Andrew Tilton, “The Outlook for the U.S. Economy,” white paper (New York, Goldman Sachs Asset Management, October 2011), http://www2.goldmansachs.com/gsam/docs/fundgeneral/general_education/economic_and_market_perspectives/wp_economic_outlook.pdf; and *Monetary Policy Report to the Congress, submitted pursuant to section 2B of the Federal Reserve Act* (Board of Governors of the Federal Reserve System, July 13, 2011), http://federalreserve.gov/monetarypolicy/files/20110713_mprfullreport.pdf.

⁵ As measured by corporate profits with inventory valuation and capital consumption adjustments within BEA’s National Income and Product Accounts. (See Table 1.16, “Sources and Uses of Private Enterprise Income” (Bureau of Economic Analysis, Dec. 23, 2011), <http://www.bea.gov/national/index.htm#gdp>).

⁶ As measured by the Current Population Survey (CPS), a monthly survey of about 60,000 households conducted by the Census Bureau for the Bureau of Labor Statistics. The CPS provides a comprehensive body of data on the labor force, employment, unemployment, persons not in the labor force, hours of work, earnings, and other demographic and labor force characteristics.

⁷ The overview article in this issue of the *Review* presents a detailed discussion of the impact of the recession on the BLS projections. (See Dixie Sommers and James C. Franklin, “Overview of projections to 2020,” this issue, pp. 3–20, <http://www.bls.gov/opub/mlr/2012/01/>

[art1full.pdf](#).)

⁸ Macroeconomic Advisers developed, and continues to support, the Washington University Macro Model, used as a central analytical tool for both short- and long-term forecasts of the U.S. economy. BLS has relied on this model to prepare its economic projections since May 2002.

⁹ BLS arrives at the target unemployment rate associated with a full-employment economy on the basis of an extensive literature review, as well as a consideration of both the nonaccelerating inflation rate of unemployment and unemployment estimates by a number of other agencies and firms, such as the Congressional Budget Office, the Federal Open Market Committee (which submits a monetary policy report to Congress), the Council of Economic Advisors (whose chairperson writes the *Economic Report of the President*), and Blue Chip. Among the research works reviewed were Mary Daly, Bart Hobijn, and Rob Valletta, “The Recent Evolution of the Natural Rate of Unemployment,” IZA discussion paper no. 5832 (Bonn, IZA, July 2011), <http://ftp.iza.org/dp5832.pdf>; and Rob Valletta and Katherine Kuang, “Is Structural Employment on the Rise?” *FRSBF Economic Letter* (San Francisco, Federal Reserve Bank, Nov. 8, 2010), <http://www.frbsf.org/publications/economics/letter/2010/el2010-34.html>. The first paper concludes that, although there has been a sizable short-term impact on the natural rate, considerable slack remains in the labor market and only about 0.5 percent will persist in 5 years, at which time the nonaccelerating inflation rate of unemployment will be 5.5 percent. The second paper finds that the recent uptick in the nonaccelerating inflation rate of unemployment can likely be explained by (1) Congress’ extending the number of weeks a worker may receive unemployment insurance and (2) unemployed construction workers needing to find work in other sectors of the economy. As the authors state, “The effects of both of these factors are likely to be transitory rather than permanent.”

¹⁰ The federal funds rate is the Fed’s target for the rate that banks charge other banks for overnight loans. (For more information, see “Open Market Operations” (Board of Governors of the Federal Reserve System, Jan. 26, 2010), <http://www.federalreserve.gov/monetarypolicy/openmarket.htm>.)

¹¹ Based on monthly data on the effective federal funds rate reported by the Federal Reserve Bank of St. Louis. (See “Effective Federal Funds Rate (FEDFUNDS),” *Economic Research* (St. Louis, Federal Reserve Bank, Jan. 10, 2012), <http://research.stlouisfed.org/fred2/series/FEDFUNDS>.)

¹² See “Press Release” (Board of Governors of the Federal Reserve System, Dec. 16, 2008), <http://www.federalreserve.gov/newsevents/press/monetary/20081216b.htm>.

¹³ See “Press Release” (Board of Governors of the Federal Reserve

System, Aug. 9, 2011), <http://www.federalreserve.gov/newsevents/press/monetary/20110809a.htm>.

¹⁴ See “Table 2, Factors supplying reserve balances: overview,” <http://www.federalreserve.gov/releases/h41/hist/h41hist2.pdf>.

¹⁵ See “Monetary Policy Report to the Congress, submitted pursuant to section 2B of the Federal Reserve Act (Board of Governors of the Federal Reserve System, Mar. 1, 2011, http://www.federalreserve.gov/monetarypolicy/mpr_20110301_part4.htm).

¹⁶ The Troubled Asset Relief Program (TARP), established in late 2008, initially authorized \$700 billion in funds for the Treasury Department to purchase “troubled assets” in order to stabilize the financial system. As of March 2011, the Congressional Budget Office (CBO) estimated that \$432 billion had been disbursed through the program. Already, \$244 billion has been repaid, and CBO estimates that the final cost of the subsidy will be less than \$20 billion. (For more information, see *Report on the Troubled Asset Relief Program* (Congressional Budget Office, March 2011), <http://www.cbo.gov/ftpdocs/121xx/doc12118/03-29-TARP.pdf>.)

The American Recovery and Reinvestment Act (ARRA) followed TARP as a fiscal stimulus measure. The act was originally estimated at nearly \$800 billion, including tax cuts, increased spending on entitlement programs such as an extension of unemployment benefits, and spending on contracts, grants, and loans. (For a more detailed discussion of ARRA, see *The Economic Impact of the American Recovery and Reinvestment Act of 2009: Seventh Quarterly Report* (Executive Office of the President, Council of Economic Advisers, July 1, 2011), http://www.whitehouse.gov/sites/default/files/cea_7th_arra_report.pdf?wparam=1323202656.)

¹⁷ Historical data for the broad trade-weighted exchange rate for the U.S. dollar appear in Macroeconomic Advisers’ database, where this variable corresponds to the Federal Reserve Board’s broad nominal exchange rate index.

¹⁸ For a further discussion of population and labor force projections, see Mitra Toossi, “Labor force projections to 2020: a more slowly growing workforce,” this issue, pp. 43–64, <http://www.bls.gov/opub/mlr/2012/01/art2full.pdf>.

¹⁹ For more information, see *Annual Energy Outlook 2011* (U.S. Energy Information Administration, Apr. 26, 2011), <http://www.eia.gov/forecasts/aeo/index.cfm>.

²⁰ See “Petroleum & Other Liquids: Monthly Cushing, OK WTI Spot Price FOB” (U.S. Energy Information Administration, Jan. 11, 2012), <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=M>.

²¹ Under U.S. law, the Federal Open Market Committee, an arm of the Federal Reserve System, is charged with overseeing the Fed’s buying and selling of United States Treasury securities.

²² David Leonhardt, “We’re Spent,” *The New York Times*, July 16, 2011.

²³ In the National Income and Product Accounts, the personal savings rate is defined as the percentage of personal after-tax income that is neither spent on consumption, nor paid as interest, nor given to foreigners. The savings rate does not take into account gains from rising stock prices or the appreciation of owned homes. Thus, people’s assets could be growing even as they spend more of their pay.

²⁴ See “The October 2011 Senior Loan Officer Opinion Survey on Bank Lending Practices” (The Federal Reserve Board, Nov. 7, 2011),

<http://www.federalreserve.gov/boarddocs/snloansurvey/201111/default.htm>.

²⁵ See “Employment Situation Summary,” *Economic News Release* (U.S. Bureau of Labor Statistics, Jan. 6, 2012), <http://www.bls.gov/news.release/empisit.nr0.htm>.

²⁶ On the basis of national accounting identities, the national savings rate is calculated by adding the current-account balance (exports less imports, with net factor income added) to gross investment and dividing the resulting sum by GDP. In other words, the current-account balance is the mathematical difference of national savings and domestic investment. Thus, a decrease in the national savings rate reflects a widening of the external deficit.

²⁷ See *The Budget and Economic Outlook: An Update* (Congressional Budget Office, August 2011), p. 16, <http://cbo.gov/ftpdocs/123xx/doc12316/08-24-BudgetEconUpdate.pdf>. The macromodel assumes that current policy will be left in place during the next decade. Changes to law based on the outcome of the Budget Control Act’s Committee on Deficit Reduction may alter the course of spending and cost growth for health care and other social programs.

²⁸ See “Testimony (Statement of Douglas W. Elmendorf, Director), CBO’s Analysis of the Major Health Care Legislation Enacted in March 2010, before the Subcommittee on Health, Committee on Energy and Commerce, U.S. House of Representatives” (Congressional Budget Office, Mar. 30, 2011), p. 2, <http://www.cbo.gov/ftpdocs/121xx/doc12119/03-30-HealthCareLegislation.pdf>.

²⁹ Current military force levels are anticipated to continue over the next 10-year period. Current data appear in *National Defense Budget Estimates for FY 2012* (Office of the Under Secretary of Defense (Comptroller), March 2011), p. 45, http://comptroller.defense.gov/defbudget/fy2012/fy12_Green_Book.pdf.

³⁰ The consumer sector of the macromodel is built on a life-cycle model of household consumption and saving.

³¹ Historical data on civilian household employment are a count of persons supplied by the CPS. Payroll employment data are a count of jobs and are based on the Current Employment Statistics (CES) survey, a BLS survey of establishments. Although the employment measures from the two surveys show similar trends over the long term, shorter term differences have arisen. (For further information, see Mary Bowler and Teresa L. Morisi, “Understanding the employment measures from the CPS and CES survey,” *Monthly Labor Review*, February 2006, pp. 23–28, <http://www.bls.gov/opub/mlr/2006/02/art2full.pdf>. BLS maintains a monthly update on CES and CPS employment trends; see “Employment from the BLS household and payroll surveys: summary of recent trends” (U.S. Bureau of Labor Statistics, Jan. 6, 2012), http://www.bls.gov/web/empisit/ces_cps_trends.pdf.)

³² See, for example, Dale W. Jorgenson, Mun S. Ho, and Kevin J. Stiroh, “A Retrospective Look at the U.S. Productivity Growth Resurgence,” Staff Report no. 277 (New York, Federal Reserve Bank, February 2007), http://www.newyorkfed.org/research/staff_reports/sr277.pdf.

³³ See Edouard Schaal, “Uncertainty, Productivity and Unemployment in the Great Recession” (Princeton, NJ, Princeton University, Oct. 7, 2010), http://www.princeton.edu/economics/seminar-schedule-by-prog/macro-f10/pdfs/schaal_job_market.pdf.

³⁴ Sommers and Franklin, “Overview of projections.”