Congressional Research Service

Economic Growth and the Unemployment Rate

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October 28, 2011

Congressional Research Service
7-5700
www.crs.gov
R42063

CRS Report for Congress
Prepared for Members and Committees of Congress

Summary

A persistently high unemployment rate is of concern to Congress for a variety of reasons, including its negative consequences for the economic well-being of individuals and its impact on the federal budget (i.e., deficit growth due to lower revenue and higher expenditures). The unemployment rate was 9.5% when the economy emerged from the 11th postwar recession in June 2009, and it climbed further to a peak of 10.1% in October 2009. The unemployment rate very slowly declined in 2010. It settled at about 9.0% during the first three quarters of 2011.

The stalled rebound of the labor market has renewed calls for new measures to stimulate economic growth amid speculation about a double-dip recession, such as occurred during the early 1980s. The economy contracted in July 1981, just 12 months into the recovery from the January-July 1980 recession. The unemployment rate had not fallen to its pre-recession level before the 1981-1982 recession began.

After most postwar recessions, it took at least eight months for the unemployment rate to fall by one full percentage point. The slowest decline occurred after the expansion that ended in November 2001, when the unemployment rate was a comparatively low 5.5%. About 3½ years elapsed before the rate fell just one-half of one percentage point. In contrast, the recovery from the severe July 1981-November 1982 recession began with the highest unemployment rate of the postwar period (10.8%). In that instance, it took only eight months for the rate to fall more than one percentage point. Although some had hoped that the unemployment rate would fall as quickly after the Great Recession, the rate one year later was the same as at the outset of the recovery (9.5% in both June 2009 and 2010). The unemployment rate more than two years into the economic expansion is only about 0.5 percentage points lower than at its start.

What appears to matter for a reduction in the unemployment rate is the rate of actual economic growth compared with the rate of growth in potential output (i.e., the output gap). Potential output is a measure of the economy's capacity to produce goods and services when resources, such as labor, are fully utilized. The rate of growth of potential output is a function of the growth rates of potential productivity and the labor supply when the economy is at full employment. If, as projected, potential output growth is about 2.3% annually, then the growth rate in real gross domestic product (GDP) would have to be greater to yield a declining unemployment rate. How much it is above that level will determine the speed with which the unemployment rate declines.

Although real GDP initially grew at a high rate, its pace slowed in the first three quarters of 2011. Improvement in the unemployment rate stalled as a result. The Congressional Budget Office (CBO) projects that the annual average growth rate of real GDP will not much exceed potential output until the 2013-2016 period. Unless the economy grows more strongly than currently projected, the unemployment rate is expected to remain close to 9.0% through 2013 before approaching its pre-recession level of 5.0% in 2016.

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Despite the resumption of economic (output) growth in June 2009, the unemployment rate remains at an historically high level more than two years into the recovery from the 11th recession of the postwar period. The unemployment rate, which is the number of unemployed persons divided by the number of persons in the labor force, has settled at about 9.0% during the first three quarters of 2011.

The stalled rebound of the labor market through September 2011 has prompted speculation about a double-dip recession[1] and renewed calls for measures to stimulate the economy beyond those Congress has previously enacted.[2] From a public policy perspective, the main driver of the unemployment rate is the pace of output growth. This report first examines the long-run relationship between the two economic variables and then narrows its focus to the periods of recovery from the postwar recessions.

The Relationship Between Growth and Unemployment

In the short run, the relationship between economic growth and the unemployment rate may be a loose one. It is not unusual for the unemployment rate to show sustained decline some time after other broad measures of economic activity have turned positive.[3] Hence, it is commonly referred to as a lagging economic indicator. One reason that unemployment may not fall appreciably when economic growth first picks up after a recession's end is that some firms may have underutilized employees on their payrolls because laying off workers when product demand declines and rehiring them when product demand improves has costs. As a result, employers may initially be able to increase production to meet rising demand at the outset of a recovery without hiring additional workers. In other words, firms may be able to increase output by raising the productivity of their current employees. This temporarily boosts labor productivity growth above its trend (long-run) rate.

Once the labor on hand is fully utilized, however, output can grow no faster than the rate of growth of labor productivity until firms begin adding workers. As the economic expansion progresses, output growth will be determined by the combined rates of growth in the labor supply and labor productivity. As long as growth in real gross domestic product (GDP) exceeds growth in labor productivity, employment will rise. If employment growth is more rapid than labor force growth (the total number of employed and unemployed persons), the unemployment rate will fall. (Recall that the unemployment rate is the number of unemployed persons divided by the number of persons in the labor force.)

Over an extended period of time, there is a strong link between changes in the rates of real GDP growth and unemployment. This stable long-run relationship between the two economic variables

[1] For additional information, see CRS Report R41444, *Double-Dip Recession: Previous Experience and Current Prospect*, by Craig K. Elwell.

[2] For additional information, see CRS Report R41578, *Unemployment: Issues in the 112th Congress*, by Jane G. Gravelle, Thomas L. Hungerford, and Linda Levine.

[3] CRS Report R40798, *Unemployment and Employment Trends Before and After the End of Recessions*, by Linda Levine.

was most famously pointed out in the early 1960s by economist Arthur Okun. "Okun's Law"[4] has been included in a list of "core ideas" that are widely accepted in the economics profession.[5] Over the postwar period, economic growth of about 3.5% has been associated with a stable unemployment rate. Absent a change in the productivity growth rate, this suggests that if output growth were above 3.5% today, the unemployment rate would decline.[6]

The key to the long-run relationship between changes in the rates of GDP growth and unemployment is the rate of growth in potential output. In brief, potential output is an unobservable measure of the capacity of the economy to produce goods and services when available resources, such as labor and capital, are fully utilized. The rate of growth of potential output is a function of the rate of growth in potential productivity and the labor supply when the economy is at full employment.[7] When the unemployment rate is high, as it is now, then actual GDP falls short of potential GDP. This is referred to as the output gap.

In the absence of productivity growth, as long as each new addition to the labor force is employed, growth in output will equal growth in the labor supply. If the rate of output growth falls below the rate of labor force growth, there will not be enough new jobs created to accommodate all new job seekers. As a result, the proportion of the labor force that is employed will fall. Put differently, the unemployment rate will rise. If the rate of economic growth exceeds the rate of labor force growth, some of the new jobs created by employers to satisfy the rising demand for their goods and services will be filled by drawing from the pool of unemployed workers.[8]

As productivity increases over time, it takes fewer and fewer workers to produce a given quantity of goods and services. If output growth equals labor force growth in the presence of productivity growth, more people will be entering the labor force than are needed to produce a given amount

[4] Using real-time data from the late 1940s through early 1960s that would have been available to Okun, Knotek estimated that real output growth of 4% was consistent with a stable unemployment rate, which means that faster output growth usually coincided with a decreasing unemployment rate whereas output growth below 4% usually coincided with an increasing unemployment rate. See Edward S. Knotek, "How Useful is Okun's Law?," Federal Reserve Bank of Kansas City, *Economic Review*, fourth quarter 2007.

[5] Alan Blinder, "Is There A Core of Practical Macroeconomics That We Should All Believe?," *American Economic Review*, vol. 87, no. 2, May 1997.

[6] There are times, however, when the long-run relationship temporarily breaks down or weakens. A change in the rate of productivity growth in the short run can cause the economic growth rate and the unemployment rate to change in the same direction. In 1993, for example, the economic growth rate fell to 2.7% from 3% in 1992 and the unemployment rate fell to 6.9% from 7.5%. The reason was a decline in productivity growth in 1993 after a brief surge in the previous year. Another surge in the rate of productivity growth occurred in 2009, which explains the unemployment rate increasing more than would have been expected by Okun's Law. (See, respectively, David Altig, Terry Fitzgerald, and Peter Rupert, "Okun's Law Revisited: Should We Worry about Low Unemployment?," Federal Reserve Bank of Cleveland, *Economic Commentary*, May 15, 1997; and Mary Daly and Bart Hobijn, "Okun's Law and the Unemployment Surprise of 2009," Federal Reserve Bank of San Francisco, *Economic Letter*, March 8, 2010.)

[7] Full employment is said to be achieved when the unemployment rate is at a level consistent with a stable (non-accelerating) inflation rate.

[8] Once unemployment reaches relatively low levels, the increased demand for labor is more likely to be satisfied by rising wages than by higher levels of employment. There may be a risk of accelerating inflation as a result. The Congressional Budget Office estimated that the rate close to which that becomes a risk (which is referred to as the nonaccelerating inflation rate of unemployment or NAIRU) may be about 5%. (See Robert Arnold, "Reestimating the Phillips Curve and the NAIRU," CBO, Working Paper 2008-06, August 2008.) At the current level of the unemployment rate, the risk of accelerating wages and inflation seems low. It also seems low at even higher estimates of NAIRU, which ranged from 6.2% to 8.2% for the first quarter of 2011 according to estimates by Weidner and Williams (*Update of "How Big is the Output Gap?,"* Federal Reserve Bank of San Francisco, July 7, 2011).

of goods and services. The share of the labor force that is employed will fall. Conversely, the unemployment rate will rise. Only as long as the growth in output exceeds the combined growth rates of the labor force and productivity will the unemployment rate fall in the long run.

Knowing what that rate of economic growth is might be useful to policymakers interested in undertaking stimulus policies to bring down the unemployment rate. But as just stated, the rate of output growth necessary to lower the unemployment rate requires knowledge of the rates of labor force and productivity growth. Between 1949 and 2000, the civilian labor force grew at an average annual rate of 1.6%. The growth rate slowed since then and is projected to continue doing so partly as a result of the aging of the baby-boom generation.[9] Between 2000 and 2010, the annual rate of labor force growth fell to 0.9%. It is projected to fall further, to 0.6% per year on average, between 2010 and 2020.[10]

Predicting productivity growth, however, is more difficult than predicting labor force growth. Economists have identified three time periods that correspond with three different trend rates of growth in productivity.[11] Between 1947 and 1973, output per hour of labor in the private nonfarm business sector grew at an annual rate of 2.8%. Between 1973 and 1995, labor productivity grew at a 1.4% rate. Between 1995 and 2009, labor productivity grew at a 2.6% annual rate. If recent trends in labor force and productivity growth continue, real GDP growth above 3.5% will be needed to push down the unemployment rate from its currently elevated level.

The Unemployment Rate During Postwar Recoveries

As previously discussed, it is not unusual for some time to elapse between the start of an economic recovery and the start of a declining unemployment rate. Suppose that two successive monthly declines are taken as the beginning of a meaningful downward trend in the unemployment rate. **Table 1** shows how long it has taken following the end of each of the 11 economic contractions for that trend to begin. At one extreme, it was well over a year following the start of the economy's rebound from the 1990-1991 and 2001 recessions before the unemployment rate began to steadily decline. This contributed to the two periods being labeled jobless recoveries. At the other extreme, the unemployment rate began trending downward at five or fewer months after the end of five earlier recessions. The current recovery lies within but closer to the high-end of this range: the unemployment rate experienced two successive monthly declines 12 months after the start of the recovery from the 2007-2009 recession.

[9] Mitra Toossi, "Labor Force Projections to 2018: Older Workers Staying More Active," *Monthly Labor Review*, November 2009.

[10] Mitra Toossi, "A New Look at Long-Term Labor Force Projections to 2050," November 2006.

[11] For example, see J. Bradford DeLong, "Productivity Growth in the 2000s," National Bureau of Economic Research *Macroeconomics Annual*, vol. 17 (2000), and CRS Report RL34677, *Productivity Growth: Trends and Prospects*, by Brian W. Cashell.

Table 1. Months Between the Start of a Recovery and Two Successive Declines in the Unemployment Rate

Date of Start of Recovery	Months After Recovery's Start and Two Successive Declines in Unemployment Rate
October 1949	4
May 1954	6
April 1958	5
February 1961	9
November 1970	11
March 1975	4
July 1980	2
November 1982	5
March 1991	17
November 2001	21
June 2009	12

Source: Calculated by CRS based on business cycle troughs from the National Bureau of Economic Research and unemployment rates from the U.S. Bureau of Labor Statistics.

Not only has the length of time for the unemployment rate to begin falling varied, but its pace of decline also has varied. After eight of the eleven postwar recessions, it took at least eight months for the unemployment rate to fall by one full percentage point.[12] The slowest decline occurred after the recession that ended in November 2001 when the unemployment rate stood at 5.5%, the lowest unemployment rate recorded at the start of an expansion. About 3½ years elapsed (June 2005) before the unemployment rate fell *one-half* of a percentage point. In contrast, the expansion that followed the July 1981-November 1982 downturn began with the highest unemployment rate of the postwar period (10.8%). In that case, it took only eight months for the unemployment rate to fall more than one percentage point (to 9.4%).

The two extremes involve the recoveries following the 1948-1949 recession and double-dip recessions of the early 1980s. Two years following the October 1949 business cycle trough, the unemployment rate was 4.4 percentage points lower than it had been at the recession's end. Two years following the July 1980 business cycle trough, the unemployment rate was 9.8%—two percentage points higher than it had been at the recession's end. In that case, the expansion only lasted a year and another recession began in July 1981.

Some have suggested that the nation may be heading toward the same situation today, that is, two recessions so close in time that they are referred to collectively as a double-dip recession. The unemployment rate has not risen above its level at the 2007-2009 recession's trough, however. The rate has instead stalled at about 9.0% during the first three quarters of 2011.[13] This results

[12] They are the recoveries from the 1960-1961, 1969-1970, 1973-1975, 1980, 1981-1982, 1990-1991, 2001, and 2007-2009 recessions.

[13] As reported by the Bureau of Labor Statistics, the unemployment rates from January to September 2011 have (continued...)

from slow positive annual growth in real GDP of 0.4% in the first quarter, 1.3% in the second quarter, and 2.5% in the third quarter of 2011,[14] following a period of growth rates high enough (somewhat above 3.5%) to produce a downward trend in the unemployment rate. Nonetheless, estimates suggest that there remains a sizeable gap between actual and potential economic growth that must be narrowed substantially for the unemployment rate to approach its pre-recession level of 5.0%.[15]

The Outlook for the Unemployment Rate in the Next Few Years

According to estimates by economist Robert J. Gordon, potential output has grown at an average annual rate of 3.4% since 1875.[16] Gordon doubts, however, that growth in potential GDP will be that rapid over the next 20 years. He argues that the acceleration in productivity growth of the late 1990s was temporary and finds that productivity growth slowed between 2004 and 2008 because gains from information technology investments were beginning to diminish. His assumption of slower productivity growth along with the previously discussed expected declines in labor force growth led him to project a 2.4% rate of growth in potential output over the next 20 years. If that view is correct, then real economic growth in excess of 2.4% (rather than 3.5%) would be likely to yield a declining rate of unemployment.

Economists Susanto Basu and John G. Fernald also examined the current outlook for growth in potential output.[17] They point out that there has been a significant decline in household net worth during the 2007-2009 recession. That drop in wealth will likely make it more difficult to afford leisure time (e.g., retirement). Consequently, the supply of labor may be larger in the near term than it might otherwise have been, and that would tend to temporarily raise growth in potential output. At the same time, they expect that disruptions in financial markets will tend to constrain growth in potential output over the near term because of higher risks associated with investment spending. Those factors tend to offset and mainly serve to emphasize how uncertain estimates of growth in potential output can be.

Weidner and Williams examined the relationship between real economic growth and the strength of past recoveries. The economists estimate that potential output growth was comparatively rapid during the initial expansions of the 1960s through 1980s (at 3.6%). In contrast, potential output was much more moderate (2.5%) during the first two years of recovery from the 1990-1991 and 2001 recessions. They estimate potential GDP growth at the outset of the recovery from the

(...continued)

fluctuated narrowly between 8.8% and 9.2%.

[14] U.S. Bureau of Economic Analysis, *National Income and Product Accounts, Gross Domestic Product, 3rd quarter 2011 (advance estimate)*, news release, October 27, 2011.

[15] Estimates of how much actual output growth fell short of potential output growth in the first quarter of 2011 ranged from a high of 6.3% to a low of 1.3% according to Justin Weidner and John C. Williams, *Update of "How Big is the Output Gap?,"* Federal Reserve Bank of San Francisco, July 7, 2011.

[16] Robert J. Gordon, "The Slowest Potential Output Growth in U.S. History: Measurement and Interpretation," presented at the Center for the Study of Innovation and Productivity at the Federal Reserve Bank of San Francisco, November 2008.

[17] Susanto Basu and John G. Fernald, "What Do We Know and Not Know About Potential Output?," Federal Reserve Bank of San Francisco, Working Paper, March 2009.

"Great Recession" was a more sluggish 2.1%, "likely reflecting the low prevailing rate of labor force growth."[18] If they are correct, real economic growth greater than 2.1% would likely produce a falling unemployment rate.

The Congressional Budget Office (CBO) publishes projections of growth in potential output. In the August 2011 update of its economic outlook, CBO projects that potential output of the overall economy will grow at an average annual rate of 2.3% between 2011 and 2016.[19] In sharp contrast, CBO estimated a considerably higher average annual growth rate of potential GDP over the 1950-2010 period**.** The lower projections going forward chiefly reflect CBO's diminishing projection over time of potential labor force growth.

CBO projects that the annual average growth rate of real GDP will not be much above potential output until the 2013-2016 period.[20] As a result, the unemployment rate is projected to remain close to 9.0% for the next few years (i.e., 8.9% in 2011, 8.7% in 2012 and 2013) before approaching its pre-recession level of 5.0% in 2016.[21]

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[18] Justin Weidner and John C. Williams, "The Shape of Things to Come," Federal Reserve Bank of San Francisco, Economic Letter, May 17, 2010.

[19] Congressional Budget Office, *The Budget and Economic Outlook: An Update*, August 2011.

[20] Specifically, CBO projects potential output growth will average 2.3% over the 2011-2016 period and real GDP growth will accelerate from 2.4% in 2011 and 2.6% in 2012 to 3.6%, on average, between 2013 and 2016.

[21] CBO projects an unemployment rate of 7.9% in 2014, 6.1% in 2015, and 5.4% in 2016.