



Economic Growth and the Unemployment Rate

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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. It climbed further to peak at 10.1% in October 2009. The rate then slowly declined before stalling at about 9.0% for most of 2011. Although the unemployment rate has resumed its decline, at slightly above 8.0% in early 2012, it remains at an historically high level.

The slow rebound of the labor market has prompted calls for new measures to stimulate economic growth to avoid a so-called double-dip recession, such as occurred during the early 1980s. The economy contracted in July 1981, 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. Some observers have from time to time expressed concern that another shock (e.g., the slowdown of European economies) might push the nation back into recession.

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 following the 2001 recession's end, 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 1981-1982 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 over one percentage point. Some hoped the unemployment rate would fall as quickly after the Great Recession, but the speed of improvement has been more typical of the so-called jobless recovery from the 2001 recession.

What appears to matter for a reduction in the unemployment rate is the size of the output gap, that is, the rate of actual economic growth compared with the rate of potential output growth. Potential output is a measure of the economy's capacity to produce goods and services when resources (e.g., labor) are fully utilized. The growth rate 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 potential output growth is about 2.5% annually at full employment, then the growth rate in real gross domestic product (GDP) would have to be greater to yield a falling unemployment rate. How much greater will determine the speed of improvement in the unemployment rate, according to a rule of thumb known as Okun's law.

Some observers recently have suggested that the decline in the unemployment rate from 9.0% in September 2011 to 8.5% in December 2011 defied Okun's law because real GDP growth appears to have been too low to have produced such a large fall in unemployment. With the Congressional Budget Office (CBO) projecting that real GDP growth will stay below potential output growth for years to come, the unemployment rate may remain about where it is today (above 8.0%) through 2014, before falling to less than 6.0% by 2017.

Contents

The Relationship Between Growth and Unemployment	1
The Unemployment Rate During Postwar Recoveries	3
The Outlook for the Unemployment Rate in the Next Few Years	6

Tables

Table 1. Months Between the Start of a Recovery and Two Successive Declines in the Unemployment Rate	4
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Contacts

Author Contact Information.....	7
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Despite the resumption of economic (output) growth in June 2009, the unemployment rate remains at an historically high level almost three years into the recovery from the 11th recession of the postwar period. The unemployment rate has settled at a little over 8.0% during the first few months of 2012.

The slow rebound of the labor market has renewed calls for measures to stimulate the economy beyond those Congress has previously enacted.¹ It has, from time to time, prompted speculation about a so-called double-dip recession² that might result from another shock to the U.S. economy (e.g., the slowdown of European economies).

From a public policy perspective, the main driver of the unemployment rate is the pace of economic 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. 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. (This is referred to as labor hoarding.) As a result, employers may initially be able to increase output to meet rising demand at the outset of a recovery without hiring additional workers 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 an 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 unemployment rate will fall.

Over an extended period of time, there is an inverse (negative) relationship between changes in the rates of real GDP growth and unemployment. This long-run relationship between the two economic variables was most famously pointed out in the early 1960s by economist Arthur Okun. "Okun's law" has been included in a list of "core ideas" that are widely accepted in the economics profession.³ Okun's law, which economists have expanded upon since it was first

¹ For additional information, see CRS Report R41578, *Unemployment: Issues in the 112th Congress*, by Jane G. Gravelle, Thomas L. Hungerford, and Linda Levine.

² For additional information, see CRS Report R41444, *Double-Dip Recession: Previous Experience and Current Prospect*, by Craig K. Elwell.

³ Alan Blinder, "Is There A Core of Practical Macroeconomics That We Should All Believe?," *American Economic Review*, vol. 87, no. 2, May 1997.

articulated, states that real GDP growth about equal to the rate of potential output growth usually is required to maintain a stable unemployment rate.⁴

Thus, 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. 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.⁵ 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 GDP 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 output 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. In other words, the unemployment rate will fall.⁶

If GDP 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 of goods and services. The share of the labor force that is employed will fall. Expressed differently, the unemployment rate will rise. Only as long as GDP growth exceeds the combined growth rates of the labor force and productivity (potential output) will the unemployment rate fall in the long run.

Knowing what that rate of GDP 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. Both have changed over time.

Between 1950 and 2000, the civilian labor force grew at an average annual rate of 1.6%.⁷ The growth rate has slowed since then and is expected to continue doing so partly as a result of the

⁴ Knotek updated Okun's analysis, which covered the 1948-1960 period, to 2007 and came to much the same conclusion. Specifically, real output growth of about 4.0% is consistent with a stable unemployment rate. This means that in the long run 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. (Hereafter referred to as Knotek, *How Useful is Okun's Law*.)

⁵ Full employment is said to be achieved when the unemployment rate is at a level consistent with a stable (non-accelerating) inflation rate.

⁶ 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).

⁷ Mitra Toossi, "A Century of Change: the U.S. Labor Force, 1950-2050," *Monthly Labor Review*, May 2002.

aging of the baby-boom generation. Between 2000 and 2010, the annual rate of labor force growth fell to 0.8%. It is projected to fall further, to 0.7% per year on average, between 2010 and 2020.⁸

Predicting productivity growth is more difficult than predicting labor force growth. Economists had, until recently, identified three time periods that correspond with three different trend rates of growth in productivity.⁹ 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, productivity slowed to an annual average rate of 1.4%. Between 1995 and 2005, it accelerated to 2.9% per year. Since then (2005-2011), the rate of productivity growth has slowed to 1.6% annually.¹⁰

If recent trends in labor force and productivity growth continue, real GDP growth above about 2.5% will be needed to push down the unemployment rate from its currently elevated level. “More specifically, according to currently accepted versions of Okun’s law, to achieve a 1 percentage point decline in the unemployment rate in the course of a year, real GDP must grow approximately 2 percentage points faster than the rate of growth of potential GDP over that period.”¹¹

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. As the unemployment rate experienced two successive monthly declines 12 months after the start of the recovery from the 2007-2009 recession, it too was dubbed a jobless recovery.

⁸ Mitra Toossi, “Labor Force Projections to 2020: A More Slowly Growing Workforce,” January 2012.

⁹ See for example Michael Chernousov, Susan E. Fleck, and John Glaser, “Productivity Trends in Business Cycles,” *Monthly Labor Review*, June 2009; and J. Bradford DeLong, “Productivity Growth in the 2000s,” National Bureau of Economic Research, *Macroeconomics Annual*, vol. 17 (2000).

¹⁰ Calculated by CRS from BLS productivity data, available at <http://www.bls.gov>.

¹¹ Chairman Ben S. Bernanke at the National Association for Business Economics annual conference, Washington, DC, March 26, 2012, available at <http://www.federalreserve.gov/newsevents/speech/bernanke20120326a.htm>. (Hereafter referred to as Bernanke, NABE conference address.)

Table I. 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 by recovery, 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 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 a still high 9.4%).

Some have from time to time suggested that the nation may be heading toward another recession so close in time to the end of the 2007-2009 recession that they are referred to collectively as a double-dip recession. This rare situation last occurred following the 1980 recession: the unemployment at almost three years after its June 1980 trough was above 10.0%, more than 2 percentage points higher than at the recession's end; this occurred because the expansion only lasted a year before another recession began in July 1981. In contrast, the unemployment rate of slightly above 8.0% almost three years into the recovery from the 2007-2009 recession remains below its level of 9.5% at the recession's trough in June 2009. This suggests that a double-dip recession is not in the offing absent a shock to the U.S. economy from the slowdown in the economies of Europe, for example.

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

A debate recently broke out over the applicability of Okun's law to changes in economic growth and the unemployment rate in 2011.¹³ Following a period of growth rates early in the recovery high enough (above 3.5%) to have produced a downward trend in the unemployment rate, the unemployment rate stalled at about 9.0% in the first three quarters of 2011. This resulted from slow annual growth in real GDP of 0.4% in the first quarter, 1.3% in the second quarter, and 1.8% in the third quarter of 2011.¹⁴ Output growth accelerated at an annual rate of 3.0% in the fourth quarter of 2011, and the unemployment rate resumed its downward trend—dropping 0.5 percentage points to 8.5% in December 2011.

But as noted by the chairman of the Federal Reserve Board at a March 2012 conference of economists,

the decline in the unemployment rate over the course of 2011 was greater than would seem consistent with GDP growth over that period. Indeed, with last year's real GDP growth below 2 percent, less than what most economists would estimate to be the U.S. economy's potential rate of growth, one might have expected little change in the unemployment rate last year or even a slight increase.¹⁵

Bernanke suggests that this temporary disconnect may be compensating for an earlier deviation from Okun's law. In 2009, workers were laid off and the unemployment rate rose beyond the level commensurate with the contraction in economic growth.

Neither Bernanke nor Burgen, Meyer, and Tasci at the Cleveland Federal Reserve Bank think that much of the Okun's law puzzle will be solved after the Bureau of Economic Analysis makes its periodic revisions of the quarterly GDP estimates for 2011.¹⁶ When McCarthy, Potter, and Ng at the New York Federal Reserve Bank examined a longer recovery period after the trough of the last three recessions,¹⁷ they estimated that Okun's law underpredicted the actual decline in the unemployment rate. The analysis led them to conclude that Okun's rule of thumb "has not been a reliable indicator of unemployment declines over long periods of recent expansions"—particularly during the jobless recoveries that followed the 1990-1991 and 2001 recessions.¹⁸ Others similarly have demonstrated periods of instability in the long-run relationship between economic growth and unemployment. Some of the variation appears to be due to the state of the business cycle, both in terms of recessions compared with recoveries and the longer-than-average length of expansions following recent recessions.¹⁹

¹³ See for example Nin-Hai Tseng, "Jobless Numbers Defy Economic Theory," *CNNMoney*, March 15, 2012, available at <http://finance.fortune.cnn.com/2012/03/16/okuns-law/>.

¹⁴ U.S. Bureau of Economic Analysis, National Income and Product Accounts data available at <http://www.bea.gov>.

¹⁵ Bernanke, NABE conference address.

¹⁶ Emily Burgen, Brent Meyer, and Murat Tasci, "An Elusive Relation between Unemployment and GDP Growth: Okun's Law," *Cleveland Federal Reserve Economic Trends*, April 5, 2012.

¹⁷ Years two through five from the end of the 1981-1982, 1990-1991, and 2001 recessions.

¹⁸ Jonathan McCarthy, Simon Potter, and Ging Cee Ng, "Okun's Law and Long Expansions," Federal Reserve Bank of New York, March 27, 2012, available at <http://libertystreeteconomics.newyorkfed.org/2012/03/okuns-law-and-long-expansions.html>.

¹⁹ Knotek, *How Useful Is Okun's Law*.

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 1875.²⁰ Gordon doubts, however, that growth in potential GDP will be that rapid over the next 20 years as gains from information technology investments have been diminishing. 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% 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.²¹ They point out that household net worth declined significantly during the 2007-2009 recession. That drop in wealth, they argue, will make it more difficult for workers 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. This would tend to temporarily raise growth in potential output. At the same time, Basu and Fernald 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. These offsetting factors 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 Great Recession was a more sluggish 2.1% due to the slow rate of labor force growth.²² 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 its latest economic outlook, CBO forecast that potential output of the overall economy will grow at an average annual rate of 2.3% between 2012 and 2022.²³ In contrast, CBO estimated a considerably higher average annual growth rate of potential GDP over the 1950-2010 period (3.3%). The lower projection of potential output growth going forward chiefly reflects CBO's projection of diminishing potential labor force growth.

According to CBO's most recent forecast for the 2012-2022 period, the annual average growth rate of real GDP will stay below potential output for several years to come. As a result, CBO

²⁰ 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.

²¹ 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.

²² Justin Weidner and John C. Williams, "The Shape of Things to Come," Federal Reserve Bank of San Francisco, Economic Letter, May 17, 2010.

²³ Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2012 to 2022*, January 2012.

projects that the unemployment rate will remain above 8.0%—about where it is today—through 2014, before declining to less than 6.0% by 2017.

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