Economic Brief

February 2015, EB15-02

How Should the Fed Interpret Slow Wage Growth?

By Marianna Kudlyak, Thomas A. Lubik, and Karl Rhodes

During the current recovery, policymakers have debated whether slow wage growth indicates labor market "slack" that is not adequately reflected in the unemployment rate alone. The relationship—or lack thereof—between the unemployment rate and wage growth has challenged macroeconomists for decades. Empirical studies using micro data find that individual wages are procyclical, but attempting to use aggregate measures of wage growth to determine the level of "slack" in the labor market would be highly difficult and potentially misleading.

The unemployment rate has declined considerably during the past two years from 7.9 percent in December 2013 to 5.6 percent in December 2014, a rate of improvement that has surprised many policymakers and commentators. Yet the behavior of aggregate wages has continued to disappoint, with the major wage series reporting an annual nominal growth rate around 2 percent for the past four years.[1]

Some monetary policymakers have questioned whether this slow wage growth indicates "slack" in the labor market that is not adequately reflected in the unemployment rate alone.[2] This is an important question because evidence that a rapidly improving unemployment rate overstates labor market performance might suggest that highly accommodative monetary policy should continue in an attempt to stimulate aggregate demand even after the unemployment rate returns to prerecession levels. The keys to answering this question lie in understanding what constitutes the average "aggregate" wage and investigating the relationship—or lack thereof—between the unemployment rate and wage growth.

What Relationship? The Macro Puzzle

In 1958, the economist A.W. Phillips described a stable relationship between the rate of change in wages and the level of unemployment and the rate of change in unemployment.[3] He hypothesized that "when the demand for labour is high and there are very few unemployed we should expect employers to bid wage rates up quite rapidly, each firm and each industry being continually tempted to offer a little above the prevailing rates to attract the most suitable labour from other firms and industries."

Phillips found empirical evidence to support this procyclical view among wage and unemployment data in the United Kingdom from 1861 through 1957. "On the other hand," he hedged, "it appears that workers are reluctant to offer their services at less than the prevailing rates when the demand for labour is low and unemployment is high so that wage rates fall only very slowly." Over the years, economists have confirmed that aggregate wages can be quite "sticky." In other words, they adjust very slowly to changes in the unemployment rate, sometimes appearing to be vir-

tually unrelated to the business cycle. Quite often, aggregate wage growth moves in the opposite direction of the unemployment rate, but there are periods when aggregate wage growth moves in the same direction as the unemployment rate, most notably from 1982 to 1986 and from 2010 to 2012. (See Figure 1.) In fact, many macroeconomic models, such as optimization-based New Keynesian models or earlier models of the 1970s and 1980s, attribute a substantial portion of cyclical unemployment to inflexible wages.[4]

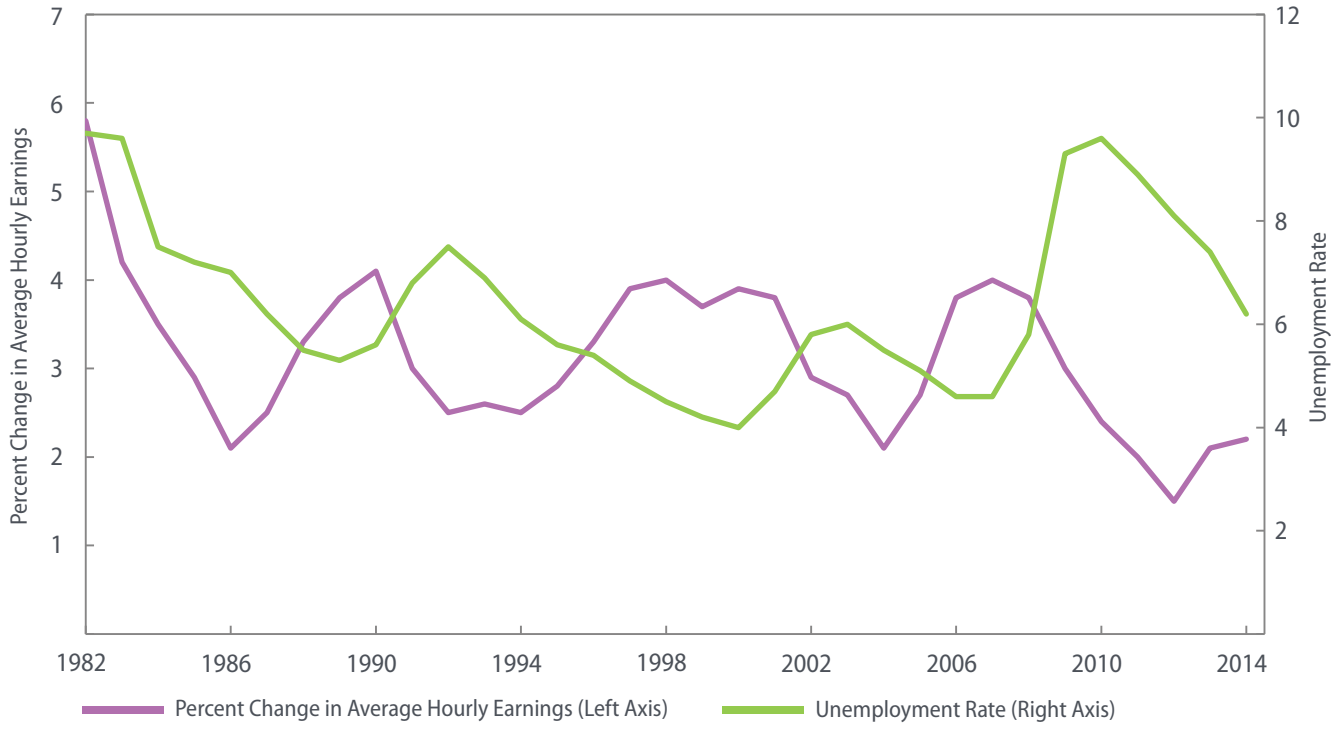
More recently, Federal Reserve Chair Janet L. Yellen suggested that slow wage growth during the recovery may reflect "pent-up wage deflation."[5] In this interpretation, many firms may have wanted to cut wages during the recession of 2007–09 but were unable or unwilling to do so. Indeed, researchers at the San Francisco Fed recently found that "downward nominal wage rigidities cause recessions to result in substantial pent-up wage deflation. This leads to a simultaneous deceleration of wage inflation and a decline in the unemployment rate during the ensuing recovery period."[6] If that were, in fact, the case during the 2007–09 recession, then employers might now be able to slowly revert to a perceived underlying wage trajectory without having to raise wages much to attract qualified workers. In other words, instead of reducing wages during recessions and raising them during recoveries, firms may prefer to smooth out the wage profile over time.[7]

What Wages? The Micro Pieces

Wage rigidity may help explain the weak relationship between the unemployment rate and the average aggregate wage at the macro level, but that explanation seems to conflict with empirical studies using micro data. Several such studies have concluded that real wages of individual workers do indeed rise as the unemployment rate falls and fall as the unemployment rate rises.[8]

One way to reconcile this apparent conflict is what economists call the composition effect. This effect recognizes that changes in aggregate wages arise not

Figure 1: Comovement of the Unemployment Rate and Average Hourly Earnings



Sources: Bureau of Labor Statistics, FRED Economic Data, Federal Reserve Bank of St. Louis.
Note: Average hourly earnings are for production and nonsupervisory workers. Percent changes are year-over-year based on annual averages. Unemployment rates are annual averages.

only from changes in the wages of individual workers but also from changes in the types of employees and jobs in the workforce. For example, the mix of high-skill and low-skill workers and the mix of high-pay and low-pay jobs evolve continuously. These changes may be driven by both cyclical and structural factors. As a result, movements in aggregate wages might not reflect movements in the price of labor to firms and, hence, need not be connected in a systematic manner to movements in the unemployment rate.

To better understand how the average aggregate wage and individual wages can behave differently, consider a lawn-mowing enterprise that lost customers during a recession and laid off George, its lowest-paid and least-productive employee. George was earning $250 a week and mowing two lawns per day. Each of the company's two remaining employees earned $300 a week and mowed three lawns per day. Laying off George increased the company's average aggregate wage even though the individual wages of the two remaining employees did not increase. Once the economy improved and the company wanted to hire another worker, it could not find anyone who was willing to mow two lawns per day for $250 a week, so it decided to rehire George, who was able to negotiate up to $275 a week because the labor market had become tighter. Rehiring George decreased the company's average aggregate wage even though George's wage increased and the individual wages of his coworkers remained the same.

George may be inefficient at mowing lawns, but he does double duty in this example by illustrating two sources of the composition effect—highly productive employees versus less-productive employees and newly hired workers versus previously hired workers. This example also illustrates pent-up wage deflation. Instead of laying off George, the company could have cut everyone's wages. Because of downward rigidity, however, the wage for the other two employees remained high. When the economy improved, wages for the remaining employees did not rise in tandem. Relative to where wages should be, theirs are notionally depressed and may therefore signal "slack" in the labor market where there is none—George ended up being rehired after all.

The Ever-Changing Mix of Workers and Jobs

George and his coworkers demonstrate that the ever-changing mix of workers in the labor market is one important source of the composition effect. In 2010, one of the authors of this *Economic Brief* (Kudlyak) surveyed the empirical literature on the behavior of individual wages over the business cycle and found that wages of newly hired workers have a clear, procyclical relationship to the unemployment rate.[9] In a 2014 study, Kudlyak further argued that in hiring decisions, firms take into account not only the wage paid to a worker at the time of hiring but also the level of the present value of wages to be paid to the worker during the entire employment relationship. She found that the present value of wages of workers hired during recessions tends to be lower than the present value of wages of workers hired during booms.[10]

Another important source of the composition effect is the ever-changing mix of jobs in the labor market. During the 2007–09 recession, for example, the economy lost many higher-paying jobs in construction and manufacturing. These sectors have been slow to recover, but jobs in lower-paying industries, such as leisure and hospitality, have increased substantially during the recovery.[11]

Economists have observed similar patterns in previous recoveries, but researchers at the Federal Reserve Bank of Philadelphia stated in 2013 that the current cycle appears to be different. Loretta J. Mester and Elif Sen observed "sharper cuts in low-pay jobs than high-pay jobs during the recession and faster growth in high-pay jobs than low-pay jobs during the recovery."[12] One important caveat, as noted by the authors, is that Mester and Sen classified jobs as high-pay (above average) or low-pay (below average) without further distinguishing between jobs that pay well above (or below) average and those that pay only a little above (or below) average. Therefore, the lowest of their high-paying jobs does not yield much more than the highest of their low-paying jobs. In fact, manufacturing jobs crossed the threshold from high-pay to low-pay in 2006, just one year before the recession started. When the authors performed a counterfactual analysis counting manufacturing

positions as high-pay jobs, "the patterns during the Great Recession and the Not-So-Great recovery looked similar to the two previous cycles."

A conclusion that can be drawn from this research is that interpreting aggregate wage growth data will be tricky until there is agreement among economists on how to adjust for the various sources of the composition effect.

Wayward Wages

Explaining the relationship—or lack thereof—between the unemployment rate and wage growth is challenging to say the least. In keeping with long-term observations of downward wage rigidity, some researchers have suggested that slow wage growth during the current recovery may reflect pent-up wage deflation during the recent recession instead of "slack" in the labor market.

Wage rigidity might help explain slow wage growth during the recovery, but that explanation seems to conflict with empirical studies that find individual real wages are solidly procyclical. The composition effect may reconcile the difference between these findings, but if the composition effect underlies the weak relationship between the unemployment rate and the average aggregate wage, then slow wage growth during the current recovery should not necessarily concern monetary policymakers.

Accommodative monetary policy that increases aggregate demand might increase the procyclical wages of newly hired workers. But other sources of the composition effect might reflect structural influences, such as the rise of low-pay service jobs and the decline of high-pay manufacturing jobs (or simply the transition of manufacturing jobs from high-pay to low-pay). These structural sources of stagnation in the average aggregate wage are unlikely to be remedied by monetary policy.

In short, attempting to use aggregate measures of wage growth to determine the level of "slack" in the labor market would be highly difficult and potentially misleading. ■

Marianna Kudlyak is an economist, Thomas A. Lubik is group vice president for macroeconomics and financial economics, and Karl Rhodes is an economics writer in the Research Department at the Federal Reserve Bank of Richmond.

Endnotes

[1] Policymakers and commentators focus on two main aggregate wage series: average hourly earnings (AHE) and the employment cost index (ECI). Both series are collected monthly by the Bureau of Labor Statistics and cover industries, regions, and occupations at various levels of disaggregation. A good overview of these series, in addition to compensation per hour (CPH), is provided by Ritter, Joseph A., "Opening Pandora's Box: The Measurement of Average Wages," Federal Reserve Bank of St. Louis *Review*, March/April 1996.

[2] For example, see Yellen, Janet L., "Labor Market Dynamics and Monetary Policy," Remarks at the Federal Reserve Bank of Kansas City Economic Symposium in Jackson Hole, Wyoming, August 22, 2014.

[3] See Phillips, A.W., "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957," *Economica*, New Series, November 1958, vol. 25, no. 100, pp. 283–299.

[4] For example, see Erceg, Christopher J., Dale W. Henderson, and Andrew T. Levin, "Optimal Monetary Policy with Staggered Wage and Price Contracts," *Journal of Monetary Economics*, October 2000, vol. 46, no. 2, pp. 281–313; also see Krause, Michael U., and Thomas A. Lubik, "The (Ir)Relevance of Real Wage Rigidity in the New Keynesian Model with Search Frictions," *Journal of Monetary Economics*, April 2007, vol. 54, no. 3, pp. 706–727.

[5] Yellen, 2014.

[6] See Daly, Mary C., and Bart Hobijn, "Downward Nominal Wage Rigidities Bend the Phillips Curve," Federal Reserve Bank of San Francisco Working Paper 2013-08, January 2014.

[7] During the recession of 1990–91, economist Truman F. Bewley attempted to illuminate the underlying causes of downward wage rigidity by interviewing more than 300 business executives, labor leaders, recruiters, and career counselors. He concluded that employers were reluctant to cut wages during the downturn because they believed that doing so would hurt morale and make it more difficult to motivate workers. See Bewley, Truman F., *Why Wages Don't Fall during a Recession*, Cambridge, Mass.: Harvard University Press, 2002.

[8] See Daly, Mary C., Bart Hobijn, and Theodore S. Wiles, "Dissecting Aggregate Real Wage Fluctuations: Individual Wage Growth and the Composition Effect," Federal Reserve Bank of San Francisco Working Paper 2011-23, May 16, 2012. The authors cite several studies that suggest "a 1 percent increase in the unemployment rate reduces real-wage growth of individuals by about 1.3 percentage points."

[9] See Kudlyak, Marianna, "Are Wages Rigid Over the Business Cycle?" Federal Reserve Bank of Richmond *Economic Quarterly*, Second Quarter 2010, vol. 96, no. 2, pp. 179–199.

[10] See Kudlyak, Marianna, "The Cyclicality of the User Cost of Labor," *Journal of Monetary Economics*, November 2014, vol. 68, pp. 53–67.

[11] Percent changes in employment by industry during the recession are available from Goodman, Christopher J., and Steven M. Mance, "Employment Loss and the 2007–09 Recession: An Overview," Bureau of Labor Statistics *Monthly Labor Review*, April 2011, p. 6. Percent changes in employment by industry during the recovery are available from the Bureau of Labor Statistics, "Recession and Recovery: Employment Change by Industry," June 2014.

[12] See Mester, Loretta J., and Elif Sen, "Has Job Quality Been 'Job One' in the Economic Recovery?" Federal Reserve Bank of Philadelphia *Research Rap*, Special Report, August 14, 2013.