

April 17, 2014

Using State-Level Data to Estimate How Labor Market Slack Affects Wages

At a [recent speech in Miami](#), Atlanta Fed President Dennis Lockhart had this to say:

Wage growth by most measures has been very low. I take this as a signal of labor market weakness, and in turn a signal of a lack of significant upward unit cost pressure on inflation.

This *macroblog* post examines whether the data support this assertion (answer: yes) and whether wage inflation is more sensitive to some measures of labor underutilization than other measures (answer: apparently, yes). San Francisco Fed President John Williams touched on the latter topic in a [recent speech](#) (emphasis mine):

We generally look at the overall unemployment rate as a good yardstick of labor market slack and inflation pressures. However, its usefulness may be compromised today by the extraordinary number of **long-term unemployed—defined as those out of the workforce for six months or longer**... Standard models of inflation typically do not distinguish between the short- and long-term unemployed, because they're assumed to affect wage and price inflation in the same way. **However, recent research suggests that the level of long-term unemployment may not influence inflation pressures to the same degree as short-term unemployment.**

And Fed Chair Janet Yellen said this at her March 19 [press conference](#):

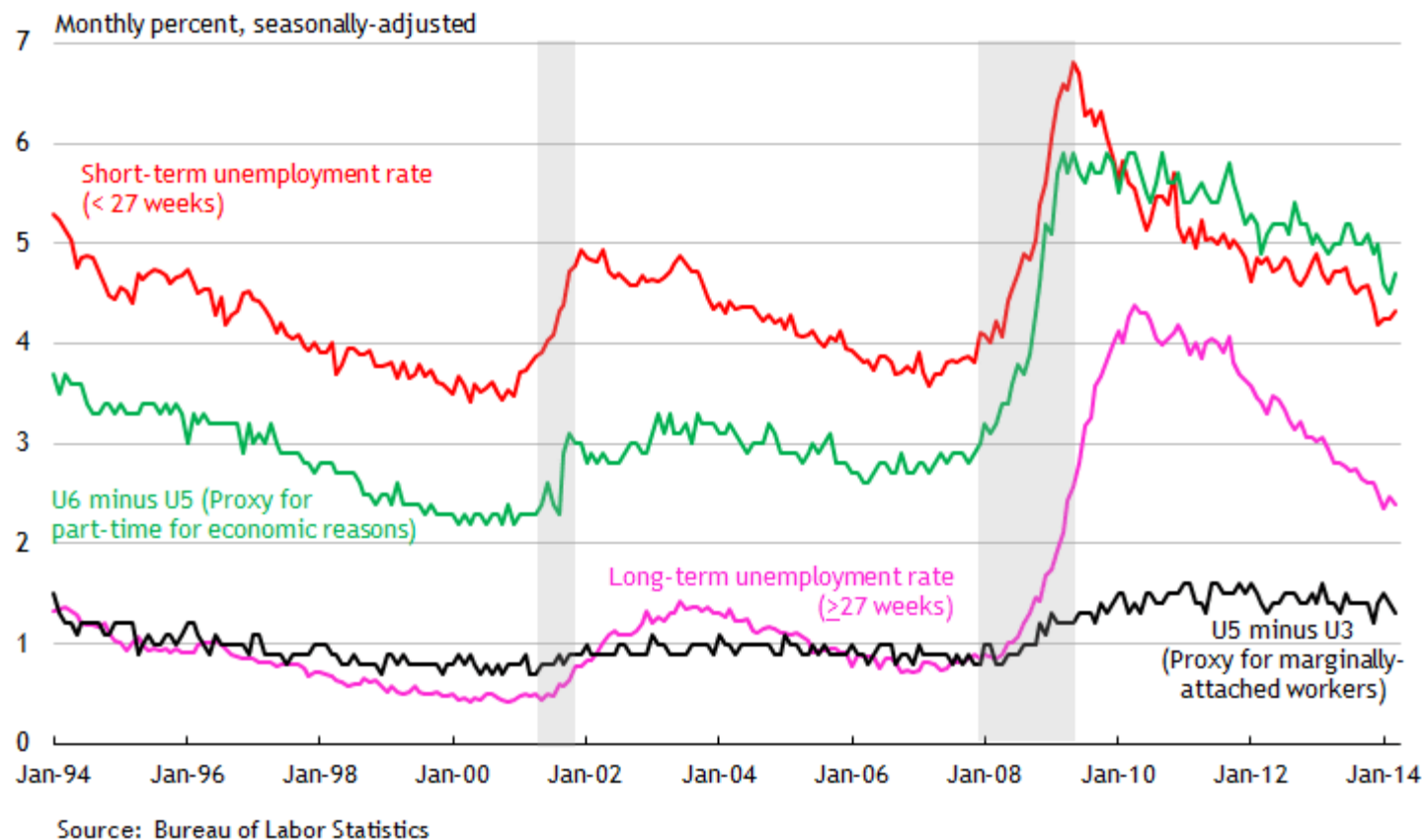
With respect to the issue of short-term unemployment and its being more relevant for inflation and a better measure of the labor market, I've seen research along those lines. I think it would be tremendously premature to adopt any notion that says that that is an accurate read on either how inflation is determined or what constitutes slack in the labor market.

The research to which President Williams refers are papers by economists [Robert Gordon](#) and [Mark Watson](#), respectively. (For further evidence, see [this draft](#) by Princeton economists Alan Krueger, Judd Cramer and David Cho.)

The analysis here builds on this research by broadening the measures of labor underutilization beyond the short-term and long-term unemployment rates that add up to the standard unemployment rate called U-3. The U-5 underutilization measure includes both conventional unemployment and "marginally attached workers" who are not in the labor force but who want a job and have actively looked in the past year. The difference between U-5 and U-3 is a very close proxy for the number of marginally attached relative to the size of the labor force.

U-6 encompasses U-5 as well as those who work less than 35 hours for an economic reason. The difference between U-6 and U-5 is a very close proxy for the share of "part-time for economic reason" workers in the labor force. These nonoverlapping measures of labor underutilization rates are all shown in the chart below.

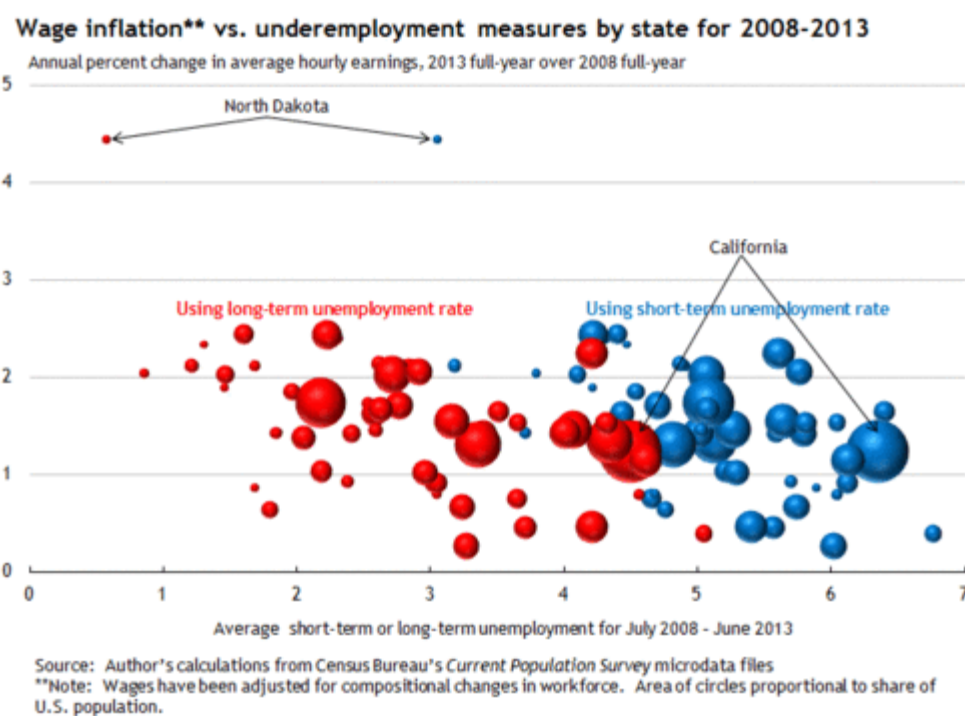
Alternative measures of labor underutilization



[\(enlarge\)](#)

The series are highly correlated, making it difficult to isolate the impact of any particular labor underutilization rate on wage inflation (e.g., "How much will wage inflation change if the short-term unemployment rate rises 1.0 percentage point, holding all of the underutilization measures in the above figure constant?").

We follow the approach of [Staiger, Stock, and Watson \(2001\)](#) by using state-level data to relate wage inflation to unemployment in a so-called "wage-Phillips curve." Because the 2007–09 recession hit some states harder than others, we can use the cross-sectional variation in outcomes across states to arrive at more precise estimates of the separate impacts of the labor underutilization measures on wage inflation (see the chart).



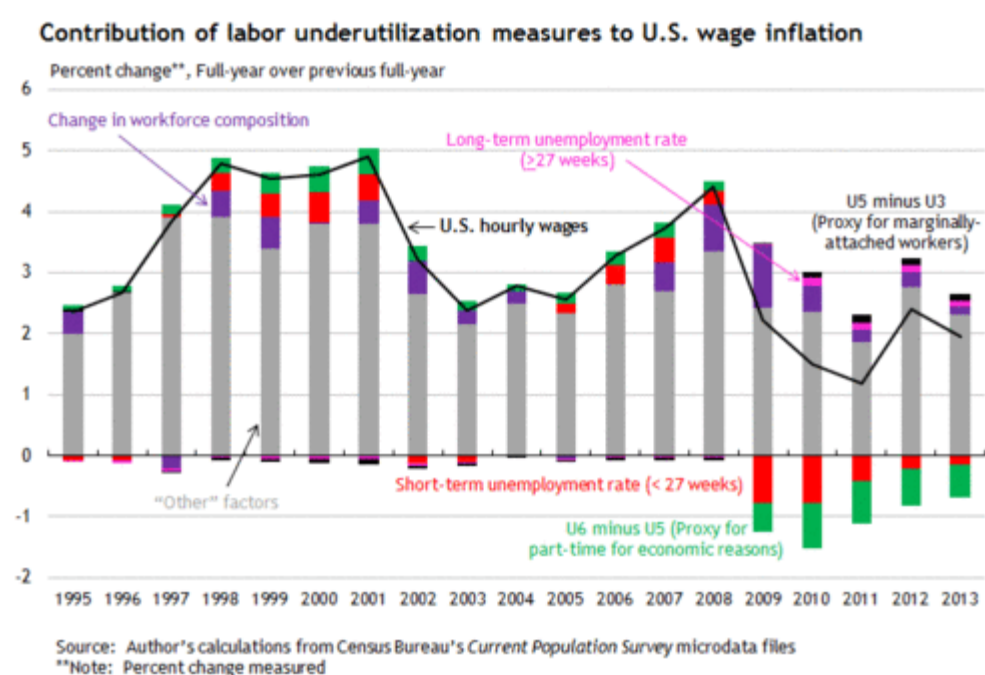
[\(enlarge\)](#)

Five-year state-level wage inflation rates for 2008–13, using [monthly Current Population Survey\(CPS\) microdata](#), are shown on the vertical axis. The CPS microdata are also used to construct all of the labor underutilization measures. Each circle represents an individual state (red for long-term unemployment and blue for short-term unemployment), and each circle's area is proportional to the state's population share. Two noteworthy states are pointed out for illustration. North Dakota has had lower unemployment and (much) higher wage inflation than the other states (presumably because of its energy boom). And California has had higher unemployment and (somewhat) lower wage inflation than average. Even after excluding North Dakota, we see a clear negative relationship between wage inflation and underutilization measured with either short-term or long-term unemployment.

Because short-term and long-term unemployment are highly correlated (also apparent in the above plot), one can't tell visually if one underutilization measure is more important for wage inflation than the other. To make this assessment, we need to estimate a regression. The regression—which also includes both U-5 minus U-3 and U-6 minus U-5—adjusts wages for changes in the composition of the workforce. This composition adjustment, also made by [Staiger, Stock and Watson \(2001\)](#), controls for the fact that lower-skilled workers tend to be laid off at a disproportionately higher rate during recessions, thereby putting upward pressure on wages. The regression also weights observations by population shares.

The regression estimates imply that short-term unemployment is the most important determinant of wage inflation while U-6 minus U-5—the proxy for "part-time for economic reason" workers—also has a statistically significant impact. The other two labor underutilization measures do not affect wage inflation statistically different from zero. Rather than provide regression coefficients, we

decompose observed U.S. wage inflation for 1995–2013 into contributions from the labor underutilization measures, workforce composition changes, and everything else (see the chart).



[\(enlarge\)](#)

Both short-term unemployment and workers who are part-time for economic reasons have pushed down wage inflation. But the "part-time for economic reason" impact has become relatively more important recently because of the stubbornly slow decline in undesired part-time employment.

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Editor's note: Upon [request](#), the programming code used in this *macroblog* post is available from the author.

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