

# An examination of the Phillips curve using city-level data

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The Phillips curve, an economic theory presented by A.W. Phillips in 1958, explains that labor market strengthening pushes up wages. However, in recent periods, the relationship between increasing wages and a strengthening labor market has weakened. In the October 16, 2017, *Economic Letter* from the Federal Reserve Bank of San Francisco titled “[Has the wage Phillips curve gone dormant?](#)” Sylvain Leduc and Daniel J. Wilson use city-level data to examine whether the sensitivity of wage growth to labor market tightness has changed over time.

The authors use these data to work around hard-to-measure macroeconomic factors affecting national wage growth and labor market tightness. By using city data, the authors can make comparisons while holding national and global factors constant, and the variation across areas helps with statistical estimation. Wage growth is measured against unemployment in 27 metropolitan statistical areas from 1991 to 2015. From 1991 to 2008, there is a clear negative relationship between wage growth and the unemployment rate, meaning declining unemployment was pushing up wages. In the 2009–2015 period, however, the correlation is close to zero, with an almost horizontal line, suggesting that falling unemployment did not signal faster wage growth during that time.

Three factors need to be accounted for, the authors say, when reviewing unemployment rate and wage growth correlations: (1) the difference between the actual unemployment rate and the natural rate (known as the unemployment gap), (2) city-specific inflation expectations, and (3) labor productivity growth. Using city-level data on wage growth, lagged inflation, and the unemployment gap, cross-city wage Phillips curve regression results imply that a 1-percentage-point city unemployment gap increase is associated with a 0.35 percentage point decline in its wage inflation rate. The slope for the regression is  $-0.35$ . A closer examination of the subperiods shows that the slope is  $-0.45$  over the 1991–2008 period and  $-0.14$  over the 2009–15 period, and the difference is statistically significant. Leduc and Wilson also use 7-year rolling sample regressions to compare the slopes. The results show a steady flattening beginning with the 2001–07 sample and continuing through the 2009–15 sample.

Because both a limited number of observations and important unobserved aggregate factors affect labor market tightness and wage growth simultaneously, the causal link between labor market tightness and wage growth is difficult to estimate. For example, interstate migration of U.S. workers to metropolitan areas with booming economies may result in a labor supply shock that lowers wage pressures.

The authors note that some explanations, such as a decline in wage bargaining power consistent with rising industry concentration ratios and a decline in the labor share, indicate the Phillips curve flattening is not likely to reverse in the near future. However, they say other research has shown that, although there was an employment

shift toward lower wage workers during the Great Recession, the cyclical composition is likely to dissipate and the Phillips curve flattening trend could be reversed in the coming years.