Wage Flexibility in Texas May Ease Impact of Tighter Monetary Policy

By Anil Kumar

ABSTRACT: Because wages are more flexible in Texas than in other parts of the U.S., the state's unemployment rate will be less prone to rise when interest rates increase.

At times of rising unemployment, wage growth tends to slow. This inverse relationship is one of economics' most enduring tenets and is captured in the work of economist A.W. Phillips and his Phillips curve.[1]

The Phillips curve helps determine the amount of expected price or wage inflation for a given change in the unemployment rate.[2]

The Phillips curve also remains an important tool for gauging the responsiveness of real (inflation adjusted) wages to unemployment. The steeper the curve, the more flexible or responsive are wages to unemployment rate shifts. The degree of wage rigidity helps policymakers assess the ability of monetary policy to affect output and unemployment.

The Phillips curve for Texas is steeper than the one for the U.S., based on a review of state-level unemployment rate data from the Bureau of Labor Statistics (BLS) and hourly wages from the Census Bureau's Current Population Survey (CPS) (*Chart 1*).[3] The steeper Phillips curve and greater wage flexibility suggest that when interest rates rise, unemployment will increase less in Texas than elsewhere.

Monetary policy can affect individual states differently because they vary widely in the timing, duration and stage of their business cycles and in the extent of labor availability, or slack.[4] Moreover, states' economies differ significantly with regard to industry composition, the presence of small versus large banks, and firm size—factors that can cause states to respond differently to monetary policy shocks.[5]

Because monetary policy is formulated at the national level, the sensitivity of wage growth to unemployment rate change generally focuses on activity across the country. But this national viewpoint often masks significant local differences. Conversely, state-level information yields more precise measurement of the Phillips curve relationship nationally. It also helps us understand the local effects of monetary policy changes in places such as Texas.

Texas Phillips Curve

Real wage growth tends to accelerate more rapidly in Texas than the nation when unemployment is low and decelerate more sharply when unemployment is high, as depicted in Chart 1. The graphic is drawn from aggregated CPS data for Texas and the U.S. from 1982 to 2013. The unemployment rate is calculated as the number of unemployed as a percent of all workers in the labor force. The real wage

Chart 1
Steeper Phillips Curve Indicative of Flexible Labor Markets

Real wage growth (percent)
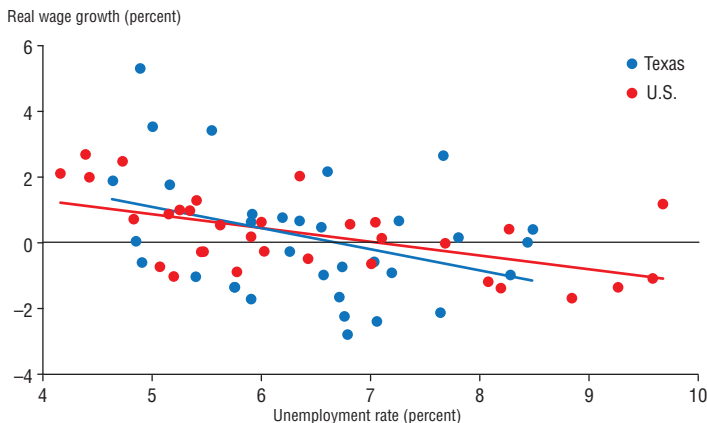
NOTE: Each dot represents annual average real wage growth and unemployment rate for a particular year from 1982 to 2013 for the U.S. and Texas.
SOURCES: Bureau of Labor Statistics' Current Population Survey; Census Bureau; author's calculations.

measure excludes overtime pay and fringe benefits.

The linear fit on the chart shows that the relationship between real wage growth and the unemployment rate has a steeper slope in Texas than in the nation, indicating that wages are more flexible in Texas. A percentage-point decline in the unemployment rate leads to real wage growth of 0.65 percentage points in Texas, compared with 0.42 percentage points for the U.S. The response of inflation-adjusted wage growth to a given change in the unemployment rate is therefore about 0.23 percentage points stronger than in the nation.

The heightened flexibility of Texas wages means they are more responsive to changes in the unemployment rate and adjust more freely. Texas ranks high among states on this measure of wage flexibility and is in the top quintile of responsiveness of wage change to movements in the unemployment rate (*Chart 2*).

Greater Wage Flexibility

The presence of wage rigidity is fundamental to the existence and persistence of unemployment. In standard economic models that assume flex-ible wages, unemployment arises only because workers are in the process of a job search or transitioning between jobs. Wages adjust instantaneously to clear the labor market. When such models are extended to incorporate real wage rigidity, structural or involuntary unemployment arises because the number of job seekers exceeds the number of workers firms are willing to hire at the prevailing real wage. An oversupply of labor is created.

Why can't wages adjust freely so that supply and demand of workers is in balance? There are several potential explanations.

First, a job can be viewed as an implicit contract between workers and firms in which risk-averse employees trade greater job security for more stable, though less lucrative, pay.[6] Second, many firms voluntarily pay above market-clearing wages to encourage worker effort rather than engage in costly labor monitoring to prevent shirking.[7] Such efficiency wages also limit worker turnover, helping firms save on new-employee training. Third, labor market imperfections such as internal labor markets—typically, the filling of positions from within companies rather than through open compe-tition—also prevent wages from fully adjusting.[8]

Additionally, some government policies prevent wages from falling enough to clear the surplus of workers over jobs. For example, more generous unemployment benefits raise the wage at which workers are willing to accept a new job. Indeed, higher jobless benefits raise the wage a firm must offer to attract available workers. Minimum-wage laws similarly hinder free adjustment of pay.

The degree of wage rigidity is correlated with other characteristics of labor markets. The prevalence of unions in certain industries is an important impediment to full adjustment of wages. Wage rigidity is further correlated with manufacturing's share of the economy and the concentration of public sector employment.

The presence of immigrant labor with less bargaining power than native workers often mitigates wage rigidity. Such workers are also less likely to be covered by union agreements. Moreover, undocumented immigrants may be more willing than others to work for less than the minimum wage.

Finally, wages tend to be more rigid in large companies than in small firms that can monitor worker effort more easily without having to pay efficiency wages to induce effort.

Given these explanations for wage rigidity, it is not surprising that wages in Texas are more flexible. The state has a lower minimum wage than other large states, provides less-generous unemployment benefits than the national average and has less union participation than the rest of the country. Immigrant workers are more common in Texas, where right-to-work rules and lighter government regulation help the state rank high on business-climate indicators.

Assessing Policy Implications

The consequence of wage rigidity can become particularly apparent during an economic downturn, when firms often choose between two options to reduce labor costs: cut wages and hours or lay off workers. If lowering wages is difficult, layoffs become the preferred choice. Because the supply of workers

Chart 2 | Texas Ranks High Among States in Real Wage Flexibility
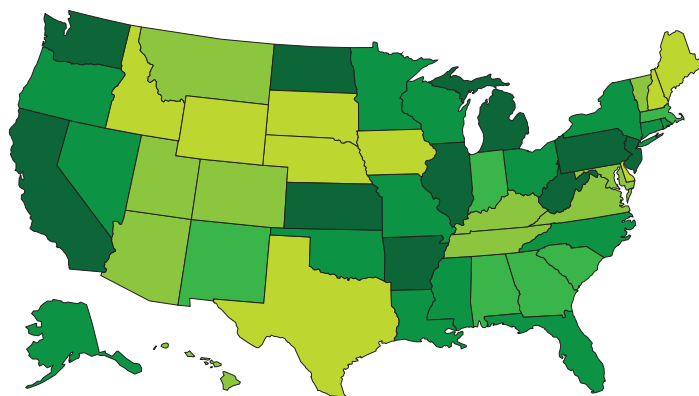
Lighter shades indicate more flexible wages:*

■ −1 to −.6   ■ −.6 to −.48   ■ −.48 to −.38   ■ −.38 to −.3   ■ −.3 to −.2

*Shades represent quintiles of states ranked by wage flexibility on the basis of the slope of the Phillips curve; for example, the lightest shade (−1 to −.6) indicates that the 20 percent of states with the most flexible wages have slopes between .6 and 1.

SOURCES: Bureau of Labor Statistics' Current Populations Survey; Census Bureau; author's calculations.

then exceeds demand at the prevailing pay, such wage rigidity is correlated with unemployment and other measures of labor market slack.[9] Inflexible wages can also contribute to unemployment persistence—when joblessness in one period fails to disappear in the next, a phenomenon called "hysteresis."[10]

Wage rigidity not only has a direct effect on the unemployment rate, it plays a key role in monetary policy's impact on employment and output. Economists have long suggested that monetary policy shocks can affect the real economy only if wages and prices are inflexible. The greater the wage rigidity, the more pronounced the impact of monetary policy on real personal income, gross domestic product and unemployment.

A contractionary monetary policy shock—for example, higher interest rates—could produce larger and more persistent increases in unemployment in states with significant wage rigidity. States with more flexible wages, such as Texas, will more easily adjust to an interest rate change. Previous research has also suggested that because of relatively stronger economic conditions in Texas than in the rest of the U.S., short-term interest rates could have been higher here than the near-zero rate that policymakers installed after the Great Recession began.[11]

Comparing Texas, U.S.

Measuring the response of wages to the unemployment rate over time helps draw the distinction between the U.S. and Texas. The depiction of the Phillips curve relationship in Chart 3 suggests that wages in the state were more sensitive to changes in unemployment than they were nationally during the period studied, 1999 to 2013.

The Phillips curve's slope—the change in wage growth for a given change in the unemployment rate—is estimated in decimal form for each year, using data from 1982 through the year shown. For example, the slope for 1999 is based on 19 years of data from 1982 to 1999; the slope for 2013 was based on data from 1982 to 2013.[12] Wages have become less flexible in recent years in both Texas and the U.S., with the slope edging closer to zero.

For the nation, the predicted decline in real wage growth for a 1-percentage-point increase in the unemployment rate—in absolute-value terms—peaked at 0.44 percentage points in 2006 and declined to 0.36 in 2013. The decline in Texas was even sharper—from 0.88 to 0.67. Increased wage rigidity is thought to be a key explanation for a surprising lack of wage stagnation during the Great Recession and for weak real wage growth during the recovery.[13]

If employers cannot sufficiently lower wages when the economy slumps, they will be slow to increase wages when conditions improve. Several factors may have contributed to generally heightened wage rigidity nationally and in Texas since 2008.

First, wage rigidity tends to be countercyclical, and increased rigidity during downturns typically lingers before subsiding.[14] Another possible explanation is the phased increase in the federal minimum wage, from $5.15 to $7.25 per hour, between 2007 and 2009. Apart from the national impact, the higher minimum wage may also have contributed—with some lag—to the post-2009 spike in wage rigidity in Texas.

The minimum wage increase mattered more in Texas than in the U.S.,

While lower unemployment rates lead to greater wage growth, higher unemployment rates do not lead to proportionately lower wage growth due to the relative inability of firms to reduce wages.

Chart 3 | Real Wages More Flexible in Texas Even as Flexibility Declines

Phillips curve slope
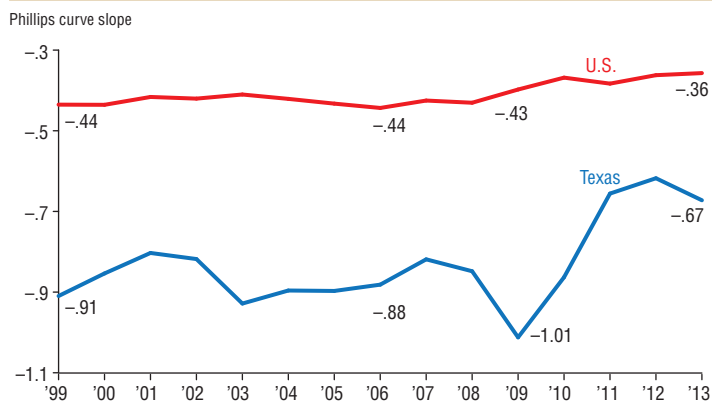
NOTE: The slope of the Phillips curve for the U.S. and Texas is estimated using a regression of real wage growth on the unemployment rate since 1982. The estimation accounts for other factors that differ across states and over time.
SOURCES: Bureau of Labor Statistics' Current Population Survey; Census Bureau; author's calculations.

on average, because many other states already had a higher minimum wage than the federal level. Additionally, Texas has a larger share of hourly paid workers who were likely affected by the increase. That said, the sharper spike in the state's wage rigidity vis-à-vis the nation may simply reflect more volatile labor market data at the state level.

Wage Growth Feeding Inflation

The Phillips curve slope also may vary with the unemployment rate. When economic conditions deteriorate and unemployment is high, firms have an incentive to lower pay to cut labor costs. While raising wages when the economy is hot and unemployment is low presents no particular challenge for firms, lowering wages when unemployment is greater is more difficult and results in a relatively flatter Phillips curve. Though this characteristic is difficult to detect at the state level, its presence can be easily established nationally and has important monetary policy implications.

The national Phillips curve slope is significantly steeper when the unemployment rate is below its long-term average than when it is above the average (*Chart 4*). An important implication is that continued declines in unemployment when the rate is already low may lead to significantly stronger real wage growth that can feed into overall inflation.

The Phillips curve slope at below-average unemployment has been stable at about -0.5, except for a period between 2003 and 2006 when wage flexibility at lower levels of unemployment hit a high. A potential explanation is a decline in public sector employment during those years that likely enabled wages to adjust more easily.

The slope of the Phillips curve at above-average unemployment remained largely stable until the onset of the Great Recession, although it has drifted toward zero since then, becoming less negative. This is not surprising because the data since 2008 correspond with a period when the unemployment rate was high and real wage growth was rather subdued.

Additionally, the downward movement in the Phillips curve slope following 2008 may partly reflect the effect of the minimum-wage increase that was fully phased in during 2009. The extended availability of unemployment benefits coming out of the Great Recession also may have impeded adjustment of wages because the payments effectively raised the wage firms needed to pay to attract potential workers.

Another reason real pretax wages may be more rigid post-2009 is that the "payroll tax holiday"—a temporary reduction in the payroll tax from 6.2 to 4.2 percent—was in effect between 2011 and 2013. This may have induced firms to limit increases in the pretax wage as worker take-home pay rose because of the tax-rate cut.

Differences Among States

The varied responses of wages in high- and low-unemployment rate situations have important implications for wage growth, particularly if there are significant differences in joblessness among states. Indications of a widening gap between high- and low-unemployment scenarios heightens the probable effect on wage growth.

Using data through 2000, previous research reveals that cross-state differences in labor market slack amplify the wage-growth response of a given change in the unemployment rate.[15]

If unemployment rates are uniform across states and equal the national long-term average of about 6 percent, the model used for Chart 4 implies modest real wage growth of about 0.1 percent in 2013.[16]

If the unemployment rate is 5 percent in half the states and 7 percent in the rest, the national average remains at 6 percent, the model predicts real wage growth of 0.66 percent for low-unemployment states and real wage deflation of 0.19 percent for high-unemployment states, making average real wage growth 0.24 percent.

Clearly, predicted wage growth when the unemployment rate differs across states is higher than when the unemployment rate is uniform. Thus, for a given national unemployment rate, greater divergence in labor market slack is associated with higher wage pressure.

The economic explanation for why cross-state diversity in unemployment rates yields higher wage growth stems from downward wage rigidity. While lower unemployment rates lead to greater wage growth, higher unemployment rates do not lead to proportionately lower wage growth due to the relative inability of firms to reduce wages.

A measure of unemployment rate variability across states shows that it is

Chart 4 | Phillips Curve Steeper When Unemployment Is Low

U.S. Phillips curve slope
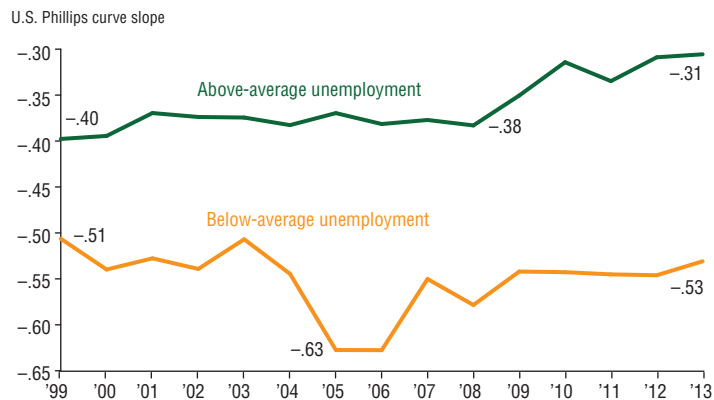
NOTE: The slope of the Phillips curve for the U.S. is estimated using a regression of real wage growth on the unemployment rate on data since 1982. The estimation accounts for other factors that differ across states and over time.
SOURCES: Bureau of Labor Statistics' Current Population Survey; Census Bureau; author's calculations.

significantly below the levels of the late 1980s and has remained largely stable since 1990 (*Chart 5*).[17]

The jobless recovery that followed the 2001 recession appears to have affected most states similarly, mitigating cross-state variability in unemployment rates. As a result, state-level differences account for wage pressures to a much smaller extent than in the 1980s. But insofar as modest cross-state differences in labor market slack persist, they remain a source of wage pressure.

Prospect of Higher Wages

Despite consistent tightening of labor market slack, wage growth has been remarkably restrained during the long recovery. One explanation is that unemployment rates haven't fallen far enough. But as the economy gains more steam and the unemployment rate drops further, the traditional responsiveness of wages—illustrated by the Phillips curve relationship—should reappear and begin to spur wage growth.

Tighter monetary policy may be warranted if and when wage growth picks up and starts feeding into consumer prices. A steeper Phillips curve and more flexible wages in Texas relative to the nation suggest that, all else equal, the state will experience a smaller increase in labor market slack when interest rates rise.

Kumar is a senior research economist in the Research Department at the Federal Reserve Bank of Dallas.

Notes

[1] The inverse relationship between unemployment and wages was originally found in "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957," by A.W. Phillips, *Economica*, vol. 25, no. 100, 1958, pp. 283–99.
[2] Closely linked to the Phillips curve is the concept of the natural rate of unemployment—a jobless rate consistent with stable inflation. [3] Hourly wages were measured following the procedure in "Creating a Consistent Hourly Wage Series from the Current Population Survey's Outgoing Rotation Group, 1979-2002," by John Schmitt, Center for Economic and Policy Research, 2003, p. 64.
[4] See "Business Cycle Phases in U.S. States," by Michael T. Owyang, Jeremy Piger and Howard J. Wall, *Review of Economics and Statistics*, vol. 87, no. 4, 2005, pp. 604–16.
[5] See "The Differential Regional Effects of Monetary Policy," by Gerald Carlino and Robert DeFina, *Review of Economics and Statistics*, vol. 80, no. 4, 1998, pp. 572–87.
[6] For details, see "Implicit Contracts and Underemployment Equilibria," by Costas Azariadis, *Journal of Political Economy*, vol. 83, no. 6, 1975, pp. 1,183–202.
[7] For details, see "Efficiency Wage Models of Unemployment," by Janet L. Yellen, *American Economic Review*, vol. 74, no. 2, 1984, pp. 200–05.
[8] For more on wage rigidity explanations, see *Fundamentals of Labor Economics*, by Thomas Hyclak, Geraint Johnes and Robert Thornton, Mason, Ohio: South-Western/Cengage Learning, 2012.
[9] See "The Determinants of Real Wage Flexibility," by Geraint Johnes and Thomas J. Hyclak, *Labour Economics*, vol. 2, no. 2, 1995, pp. 175–85.

[10] See "Hysteresis and the European Unemployment Problem," by Oliver J. Blanchard and Lawrence H. Summers, in *NBER Macroeconomics Annual 1986, Volume 1*, ed. Stanley Fischer, Cambridge, Mass.: MIT Press, 1986, pp. 15–90.
[11] See "Would a Texas Central Bank Set Rate Higher?" by Janet Koech and Mark A. Wynne, Federal Reserve Bank of Dallas *Southwest Economy*, no. 2, 2014, p. 15.
[12] See "A Closer Look at the Phillips Curve Using State Level Data," by Anil Kumar and Pia Orrenius, Federal Reserve Bank of Dallas Working Paper no. 1409, May 2014.
[13] See "Why is Wage Growth So Slow?" by Mary C. Daly and Bart Hobijn, Federal Reserve Bank of San Francisco *Economic Letter*, no. 1, 2015.
[14] See "The Path of Wage Growth and Unemployment," by Mary C. Daly, Bart Hobijn and Timothy Ni, Federal Reserve Bank of San Francisco *Economic Letter*, no. 20, 2013.
[15] See "U.S. Regional Business Cycles and the Natural Rate of Unemployment," by Howard J. Wall and Gylfi Zoega, Federal Reserve Bank of St. Louis *Review*, vol. 86, no. 1, 2004, pp. 23–31.
[16] Although real wage growth predicted by the model appears low, data from the Bureau of Labor Statistics show that average hourly earnings grew just 0.3 percent in 2013.
[17] Variability across states is measured using the coefficient of variation, which equals the standard deviation of the unemployment rate across states divided by its mean.

Chart 5: Dispersion in Unemployment Rates Falls, Stabilizes

Unemployment rate variability across states*
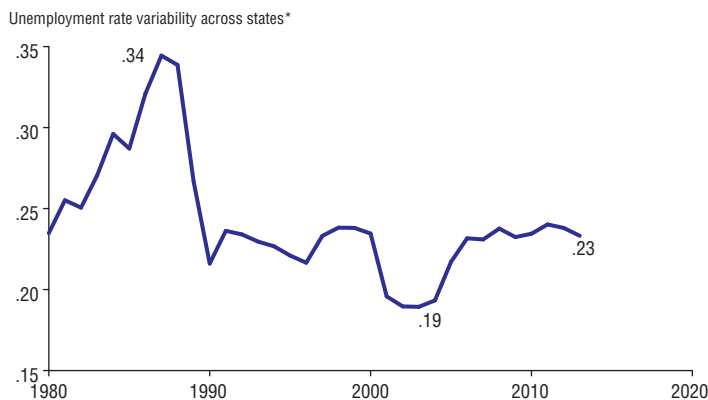
*Standard deviation of the unemployment rate across states divided by its mean.
SOURCES: Bureau of Labor Statistics' Current Population Survey; Census Bureau; author's calculations.