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Receding Turbulence Clears Way for Growth Without Inflation

- The upbeat May employment release showed payrolls rising by 217K and the unemployment rate holding on to the steep April decline to 6.3 percent. The report confirmed that some of April's puzzling swings represented adjustments back to trend, suggesting that the May figures gave an accurate picture of the labor market. The implied healthy gains in income should support consumer spending going forward.

- Special factors have obscured the underlying path of consumer spending, but a careful decomposition shows that spending continued to grow at a healthy clip in the first quarter. Supportive fundamentals — rising incomes, favorable financial conditions, and pent-up demand for discretionary items — likely will power consumer spending in the 3 percent range into 2015.

- Receding slack in the US labor market, reinforced by today's report, has not produced evidence of incipient inflationary pressure. When can we expect inflation to rear its head? We bring two different, but mutually reinforcing perspectives from the labor market to bear on this question.

- The first is an estimate of the historical relationship between the unemployment rate and PCE inflation. Our main result is that the sensitivity of inflation to economic slack is very low, such that even rapid progress in the labor market implies a measured rise in inflation. At their current trajectory, labor market indicators imply core PCE inflation of 1.6 percent by end-2015, still below the Fed's target.

- Our second approach examines the relationship between wage inflation and price inflation. Measures of overall wage inflation do not have a tight relationship with subsequent rates of core PCE inflation, and hence offer little predictive content. We find evidence that wages in certain sectors — i.e., services sectors with low productivity growth — do a better job of presaging inflation. Nevertheless, even those sectors are not currently flashing signs of a large imminent acceleration in prices.

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Turbulence Recedes and Recovery Progresses

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The May employment report resolved some puzzling aspects of the April report.

We think the May employment report gave a pretty accurate assessment of current labor market conditions. It confirmed that much of the puzzling volatility in April represented adjustments back to trend. For example, many market participants were skeptical of the 0.4 percentage point decline in the April jobless rate because the labor force collapsed in that month. But the May unemployment rate held on to that improvement and the labor force posted a trend like gain. This may cause Fed officials to adjust down their projections for the unemployment rate at the June meeting, as the current 6.3% jobless rate was essentially at the yearend central tendency estimates. We project that the unemployment rate will fall to 6.0 percent by yearend. In addition, payrolls seemed to be moving beyond the payback from weather. Employment expanded by 217K in May, which was consistent with our view that the trend is approaching 200K per month. We view this report very favorably, especially as the implications for income were solid, which should continue to support consumer demand.

Productivity collapsed, but the decline will be reversed in 2Q.

The Commerce Department also released information this week that can further shed light on how the economy fared during the winter storms in the first quarter and the improving path into the second. The poor weather prompted firms to cut production much more sharply than hours worked, which caused nonfarm productivity to decline by 3.2 percent in the first quarter (a 5.5 percentage point swing from the 2.3 percent rise in the fourth quarter). Since workers continued to be compensated despite the weather, unit labor costs skyrocketed by 5.7 percent. We would not be surprised if first quarter productivity is revised down even further, as the trade report indicated a downward GDP revision to negative 1.5 percent. Although the trade number deteriorated again in April, we continue to expect second quarter GDP growth near 3.8 percent (and complete reversals of the first quarter productivity and cost changes). We believe the wider trade deficit (driven by a surge in imports) is not a drag on growth. Instead, it is a sign that firms anticipate a pickup in domestic demand. We will be focusing on the path of demand, especially consumer spending, in coming quarters.

Special factors clouded the picture for consumer spending.

Consumer spending increased by 3.1% in the first quarter, but special factors dominated, which made it difficult to discern the underlying spending path. Discretionary consumer spending — big ticket items and leisure, hospitality, and restaurant services — was dampened by the bad weather. Not surprisingly, spending on home heating fuels soared during the quarter, partly offsetting the weakness in discretionary items. In addition, the advent of the Affordable Care Act meant that health care spending jumped. The Commerce Department counted new spending for this program on an accrual basis, so the jump in health care expenditures was recorded the moment people signed up.

- Gas and electricity jumped by $27 billion, adding about 1.0 percentage point to first quarter real consumer spending.
- Health care increased by an estimated $15 billion more than trend, contributing an additional 0.6 percentage point.
- The pullback in discretionary spending subtracted $30 billion, or 1.1 percentage points, from spending growth.

The underlying spending path seems healthy.

The bottom line is that these one-time special factors largely offset each other. Without these factors, consumer spending growth would have been closer to 2.5 percent in the first quarter, which is still a healthy rise. We continue to expect solid spending gains in the second quarter of near 3 percent, despite a small April decline largely reflecting lower fuel bills as the weather normalized. Second quarter spending growth will benefit from the fact that the first quarter ended on

such a strong note — real spending jumped by 0.5 percent in February and 0.8 percent in March. Even though spending dipped in April, the level of spending at the start the second quarter still was so high that real consumer spending already was 1.8 percent annualized above the first quarter average.

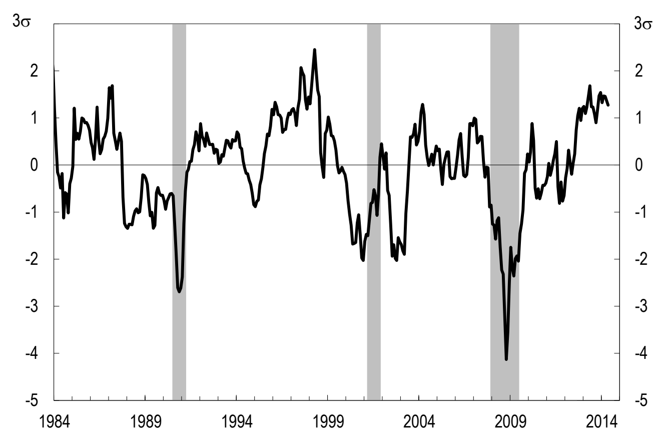
Recent soundings by retailers and automakers suggest further gains in discretionary spending.

We anticipate that solid consumer spending gains will carry into next year. Consumer spending is supported by decent income gains and extremely favorable financial conditions (**Figure 1**). In addition, we think there was a lot of pent-up demand for discretionary items following the severe winter. **Figure 2** shows that our measure of discretionary spending dipped sharply in the harsh weather, but the rise in necessities (including utilities and health care) provided an important offset. More recently, consumer discretionary spending has rebounded back to its former trend, and there have been indications of a further pickup. Just this week, auto companies reported that purchases of new vehicles hit 16.8 million in May, which was the highest reading since 2006. In addition, large retail chains have reported solid gains in same-store sales. Based on these assessments, we expect a healthy gain in May overall retail sales of 0.8 percent and core sales of 0.5 percent. That would put the May figures 9.3 percent and 6.0 percent annualized above their respective first quarter averages and support our view of a solid rise in real consumer spending.

Income gains should support spending growth.

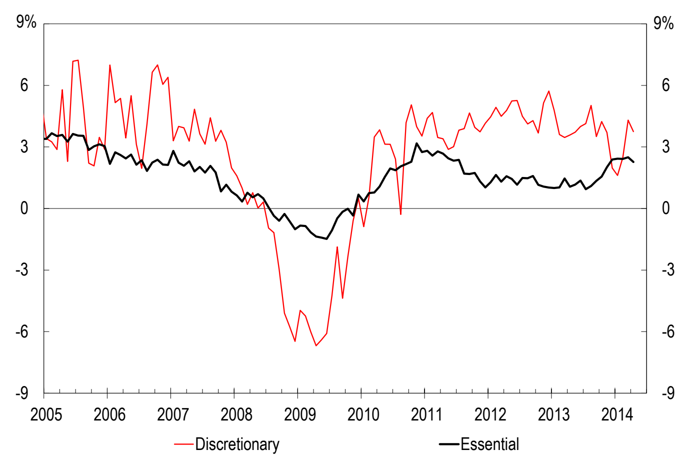
Looking forward, we think the continued gains in payrolls and wages will support a faster pace of spending growth. We see increases in consumer income prospects as a positive development for the recovery as it will add to demand growth. Importantly, we do not believe increasing wage gains would be inflationary. We noted last week that sky-high profit margins would act as a buffer for inflation, as firms would be more likely to pare back margins than raise prices. In the discussion below, we support that view by looking at the relationship between wages and inflation using the Phillips curve and Granger causality tests.

Figure 1. Citi Financial Conditions Index, 1984-April



Note: Shaded regions denote recessions.
Source: Citi Research.

Figure 2. Real Discretionary and Essential Personal Consumption (Year-to-Year Percent Change), 2005-April 2014



Note: Discretionary spending includes consumer durables and some services like air travel, restaurants and lodging. All else is called "essential."
Sources: Bureau of Economic Analysis and Citi Research.

Canaries in the Inflation Mine: Alive & Chirping

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Receding slack in the US labor market, reinforced by today's labor report, has not produced evidence of incipient inflationary pressure. Diminishing slack often presages inflationary pressures that could prompt Fed policy tightening. In this section, we assess ongoing slack-wage-price dynamics with two different, but mutually reinforcing, perspectives.

The first is an estimate of the historical relationship between the unemployment rate and consumer price inflation. This relationship, embodied in an equation called the Phillips curve, allows us to forecast inflation using only a narrow set of assumptions about the speed of recovery in the labor market. Our second approach examines the set of available measures of wage inflation and examines whether they help predict future consumer price inflation.

When can we expect rapid inflation to rear its head? Indicators of tightness in the labor market suggest that core PCE inflation is due to rise very gradually over the coming years.

To summarize our results, our estimates of the Phillips curve imply that the sensitivity of inflation to economic slack is low, which means that even rapid absorption of labor market slack would influence prices at a very measured pace. Thus, at their current pace labor market improvements would raise core PCE inflation to roughly 1.6 percent by the end of 2015, still well below the Fed's target.[1]

We then examine the linkages between wage and price inflation. We find that measures of *aggregate* wage inflation do not have a tight relationship with subsequent rates of price inflation, and hence offer little predictive content. We do, however, find evidence that certain more detailed measures of wage growth at the sector level do a better job of foreshadowing inflation. Nevertheless, wage growth in those sectors we identify as being relatively better signals has not hastened recently in a manner that would suggest that high PCE inflation is imminent.

Labor Market Tightness and Inflation

We examine the relationship between inflation and labor market slack using the Phillips curve.

We examine the relationship between inflation and economic slack using the Phillips curve, and then look at that relationship's implied forecast of inflation. The Phillips curve models the current inflation rate as a function of: (i) expectations of future inflation and (ii) some measure of slack.[2]

As seen in **Figure 3**, the Phillips curve does reasonably well at matching the general movements of core PCE inflation up until 2008. However, it predicts much less inflation during and after the crisis than what actually transpired. This suggests that the relationship between inflation and inflation expectations or slack (as measured by the unemployment gap) may have changed.

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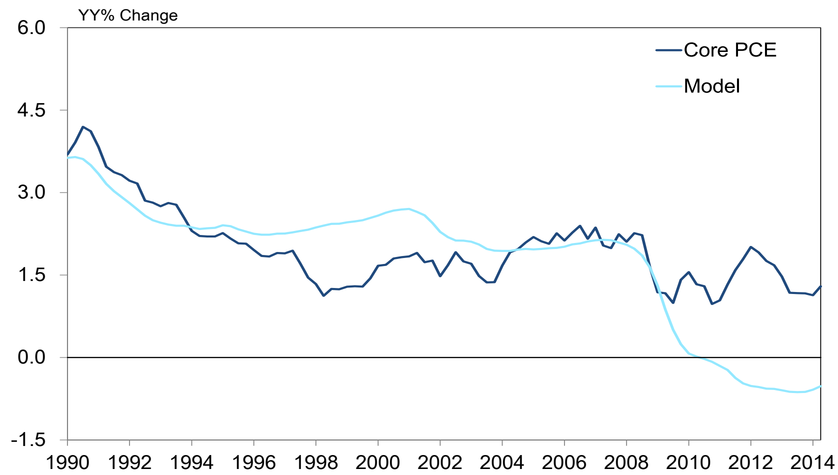
[1] A detailed description of this analysis can be found in our recent essay, "Missing Inflation? Explaining the Behavior of U.S. Consumer Prices," *Perspectives*, May 1, 2014. In this U.S. Economics Weekly, we update our estimates to take into account new labor market data for April and May.

[2] The role of expectations in the acceleration and deceleration of prices has to do with the way consumer expectations affect spending activity; faster expected price growth in the future leads consumers to spend more today, which in turn bids up prices. Economic slack has a dampening effect on prices insofar as it reflects downtrodden demand. Typically, the slack term in the Phillips curve is represented by the unemployment gap, which is the difference between today's unemployment rate and the long-run 'natural' rate. As is done with most Phillips curve estimates, we model expectations of future inflation using a Phillips curve forecast, meaning that the expectations themselves can be modelled as a series of lags of inflation and the unemployment gap. Combining these terms gives us a baseline Phillips curve specification for inflation today:

$$\pi_t = \sum_{i=1}^{2} \alpha_i \pi_{t-i} + \sum_{i=0}^{4} \beta_i (U_{t-i} - U^*) + \varepsilon_t$$

We use the BEA's monthly core PCE deflator to measure π, the BLS's monthly headline unemployment rate for U and the Congressional Budget Office's quarterly estimate of the natural rate of unemployment (U*). ε denotes an error term with mean zero.

Figure 3. Phillips Curve Inflation Forecast



Note: The model is estimated from 1987 to 2007, using dynamic out-of-sample forecasts post-2007.
Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Congressional Budget Office and Citi Research.

Structural shifts in the labor market have been distorting the unemployment rate as a measure of slack. We therefore consider a wider array of indicators.

In previous editions of the US Economics Weekly, we have shown that structural shifts — predominantly a structural decline in labor force participation and a lesser structural increase in long-term unemployment — are likely behind this change.[3] A more holistic view of the labor market, using an array of indicators less prone to these distortions, helps to restore the predictive ability of the Phillips curve.[4]

The structural changes distorting the official unemployment rate as a measure of economic slack are illustrated in **Figure 4**, which shows that there have been changes to the historical relationship between the unemployment rate and: (i) the short-term unemployment rate, (ii) the level of nonfarm payroll employment, and (iii) initial claims for unemployment insurance.[5] There is evidence of a break to the fairly tight and stable relationship between the official rate and the other variables between 1987 and 2001. In the early 2000s, that relationship began to unhinge.

On an apples-to-apples basis, the alternate labor force indicators have been improving much more rapidly than the official unemployment rate.

Consistent with structural changes distorting the unemployment rate, since the Great Recession **the alternative labor market indicators have improved much more rapidly than the official rate**; in other words, the levels of the other indicators would normally be associated with an unemployment rate of about 5 percent, which is much lower than the current official rate of 6.3 percent. Used in the Phillips Curve model, these measures perform substantially better at tracking the behavior of post-crisis core PCE inflation.

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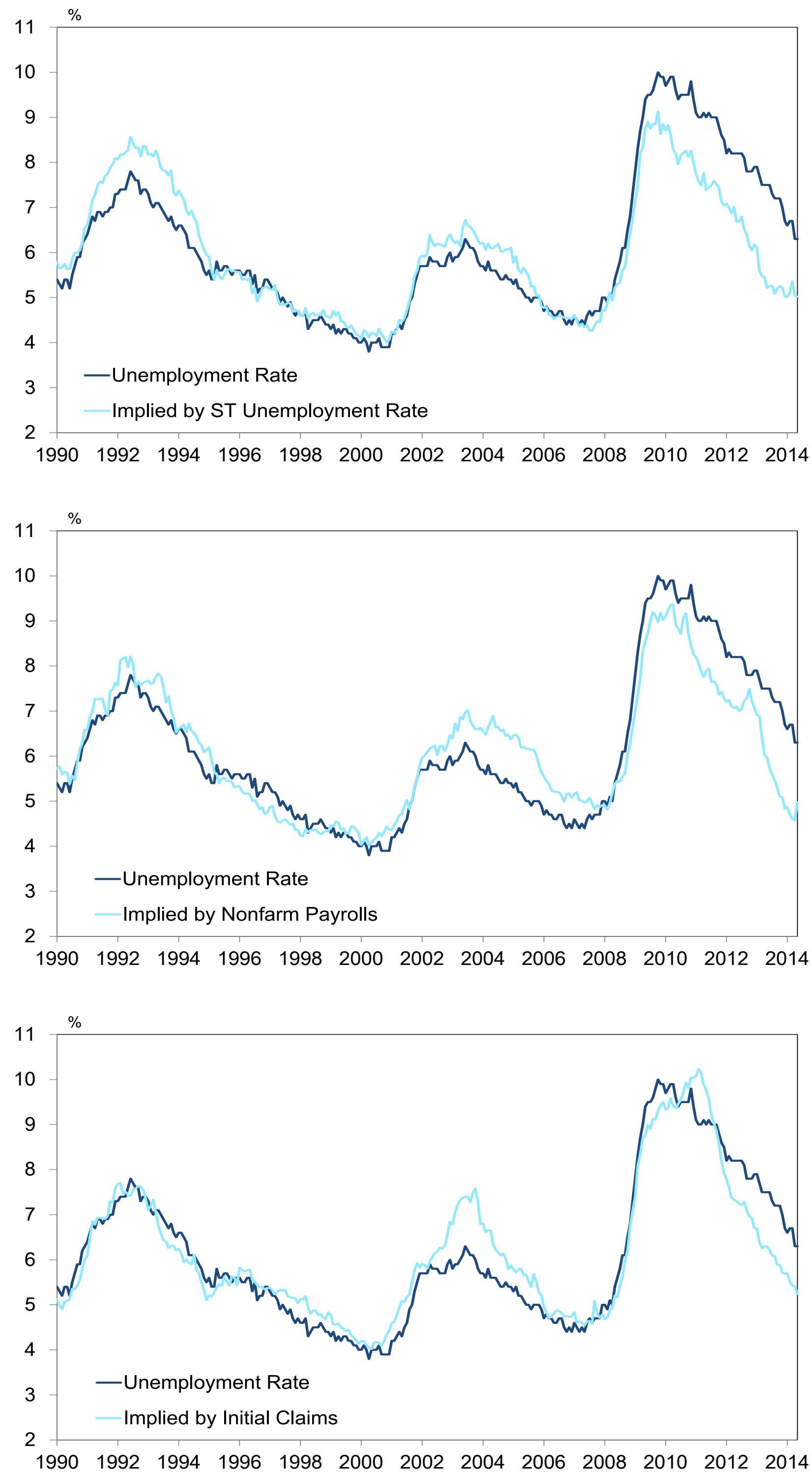
[3] See William Lee and Benjamin Mandel, U.S. Economics Weekly: Market and Policy Comments - Fed's Employment Mandate: Cyclical and Structural Forces Clash, May 9, 2014 and Peter D'Antonio and William Lee, U.S. Economics Weekly: Market and Policy Comments - NY Fed Views On Revised Exit Strategy and Long-term Unemployed, May 23, 2104.

[4] The shift from the unemployment rate to a broader set of measures has already been actively adopted by policymakers, evident in the FOMC's March 2014 decision to drop the unemployment rate threshold from its forward guidance and to emphasize 'a wide range of information' in the evaluation of its policy stance. The measures we use draw on the selection of indicators published by the New York Fed (Just Released: Beyond the Unemployment Rate: Eight Different Faces of the Labor Market).

[5] We estimate the following relationship between the unemployment rate and lags of non-farm payroll employment (NFP) since 1987:

$$U_t = \sum_{i=0}^{48} \alpha_i NFP_{t-i} + \varepsilon_t$$

Figure 4. Unemployment Rate Dynamics Implied by Other Labor Market Indicators



Sources: Bureau of Labor Statistics and Citi Research.

However, due to the low sensitivity of core PCE inflation to slack, even robust progress in the labor market would only translate into core PCE inflation of 1.6 by end-2015.

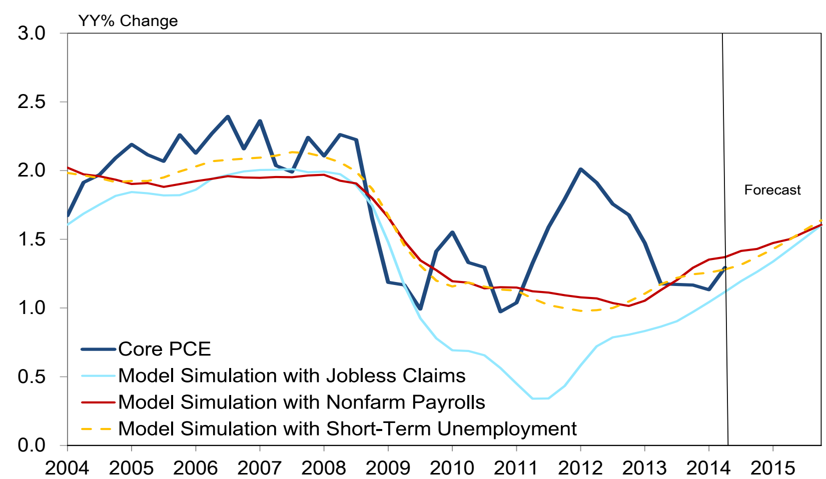
Under assumptions consistent with Citi's outlook, the trajectory of these other labor market indicators used in our estimated Phillips curve provide a forecast of moderate future core PCE inflation (**Figure 5**). Somewhat counterintuitively, assuming a continuation of the solid labor market improvements of the past 12 months — namely, monthly payroll employment growth at 200 thousand and initial claims and the short-term unemployment rates falling at the same rate as they have been — core PCE is predicted to rise only gradually to about 1.6 percent year over year by the end of 2015.

The fact that more robust measures of labor market recovery still do not generate any significant near-term acceleration in prices is a direct result of our very low estimates of the responsiveness of inflation to slack. This small responsiveness, reflecting slow transmission of slack into prices, is a steadfast feature of the Phillips curve estimated over the past 25 years, a period often referred to (prior to the Great Recession) as the Great Moderation.

These projections rely crucially on the assumption that inflation expectations remain anchored.

In short, it ends up being difficult to break free from the fact that when inflation expectations are anchored, innovations to trend inflation tend to be slow and incremental. If inflationary expectations were to become unmoored, the impact of diminishing slack could be much more amplified than what is implied by our estimates. Indeed, during the late seventies, the Fed was less vigilant about containing inflation, and hence wage-price spirals were much more common.

Figure 5. Phillips Curve Forecasts of Inflation



Note: The projections assume a constant NAIRU of 5.5 percent, consistent with CBO estimates.
Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, the Congressional Budget Office and Citi Research.

What Signal from Wage Inflation, If Any?

Are the wage measures we have on hand good indicators of acceleration in consumer prices in the future?

We now turn from the unemployment gap as a gauge of labor market tightness to wages. In last week's US Economics Weekly, we noted that elevated corporate profits are providing firms with a relatively large buffer against near-term wage growth.[6] Now we go a step further to ask whether, as a general matter, the wage measures we have on hand are good indicators of acceleration in consumer prices in the future? If so, where should we train our eyes for signs that inflation is looming?

[6] See Peter D'Antonio, U.S. Economics Weekly: Market and Policy Comments - No Pressure From Wages, May 30, 2014.

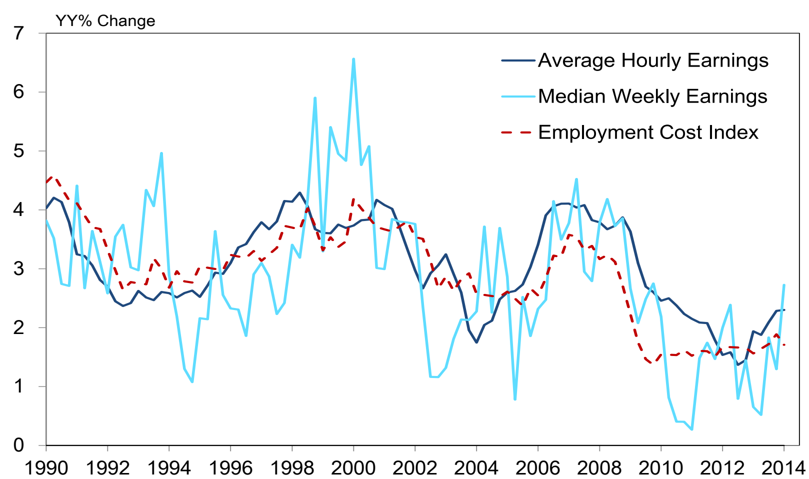
Wage inflation as measured by four common indicators has been subdued. More generally, however, the measures give conflicting signals about the rate and trajectory of wage growth.

As a starting point in answering these questions, the following are four commonly cited measures of the growth in worker compensation:

Measure	Source	% YoY (Q1)
Average hourly earnings of production and non-supervisory workers on private non-farm payrolls	BLS Establishment Survey	2.3%
Median usual weekly earnings for full-time wage and salary workers	BLS Household Survey	2.7%
Employment cost index for wages and salaries, total civilian workers	BLS National Compensation Survey	1.7%
Total wages for employees covered by state/federal unemployment insurance programs	BLS Quarterly Census of Employment and Wages	3.7%

Wage inflation as measured by all these indicators has been subdued. Not surprisingly, however, these four measures — drawing on completely different data sources — can give highly conflicting signals of both the rate and trajectory of wage growth at any given moment. For instance, while average weekly earnings have jumped over the past two quarters, usual weekly earnings have had a more sustained but shallower increase, and the employment cost index has been on an extremely gradual upward climb for an even longer time (**Figure 6**).[7]

Figure 6. Aggregate Measures of Wage Inflation



Source: Bureau of Labor Statistics and Citi Research.

Additionally, *none* of these aggregate measures of wage inflation are statistically useful in forecasting core PCE inflation.

In addition to differences in the level and volatility of these measures, there is a fairly weak statistical link between changes in these four aggregate measures of wage inflation and subsequent changes in core PCE inflation. Testing for Granger causality running from wages to core PCE prices, we find that *none* of these four aggregate measures of wage inflation are statistically useful in forecasting core PCE inflation.[8] These findings are also consistent with other published research.[9]

[7] We omit covered employee wages from Figure 4 since its high volatility makes it difficult to compare on the same scale as the other measures.

[8] The Granger tests we ran on these measures of wage inflation and core PCE inflation cover the period from Q1 1990 to Q1 2014. We also ran Granger tests on first differences of the wage and price inflation data to account for stationarity issues, which could bias the Granger tests. However, the first-differenced Granger tests also do not suggest that aggregate wage inflation leads price inflation. Finally, we tried running wage-price Granger tests controlling for economy-wide productivity growth, as measured by real output per hour in the business sector, but those too did not provide sufficient evidence to say that wage inflation has historically led price inflation. All test results are available on request.

[9] See: Gregory Hess and Mark Schweitzer (2000), “Does Wage Inflation Cause Price Inflation?” Federal Reserve Bank of Cleveland.

Certain factors make wages in specific sectors better gauges of future inflation.

Why are wages such blunt instruments for forecasting consumer prices? First, wages tend to be ‘stickier’ than output prices, meaning that they adjust even more slowly in response to a given economic shock. Second, for some sectors they have weak connections to the prices of the final goods bought by consumers – e.g., globalization of production reduces the impact of U.S. wage increases on traded goods. Third, U.S. wage increases would likely most affect inflation stemming from labor-intensive service sectors. Finally, differences in productivity growth across sectors might be obscuring the link to consumer prices; if growing wages reflect underlying productivity growth, then their effect on output prices will be muted.

Recognizing that some of these reasons need not apply to all sectors of the economy equally, we perform a similar statistical exercise using average hourly earnings data at the sector level. Analogous to our Phillips curve specification, we regress core PCE inflation on lags of itself and lagged wage growth in each sector. The resulting estimates are as follows, where the numbers can be interpreted as the percent change in core PCE inflation that tends to follow a one percent increase in each variable:[10]

Statistically Significant Variables (1 Percent)	Estimated Coefficient
Lagged PCE Inflation	0.926
Education and Healthcare	0.079
Trade, Transportation and Utilities	0.072
Leisure and Hospitality	0.070
Financial Activities	-0.070

Sources: Bureau of Economic Analysis, Bureau of Labor Statistics and Citi Research.

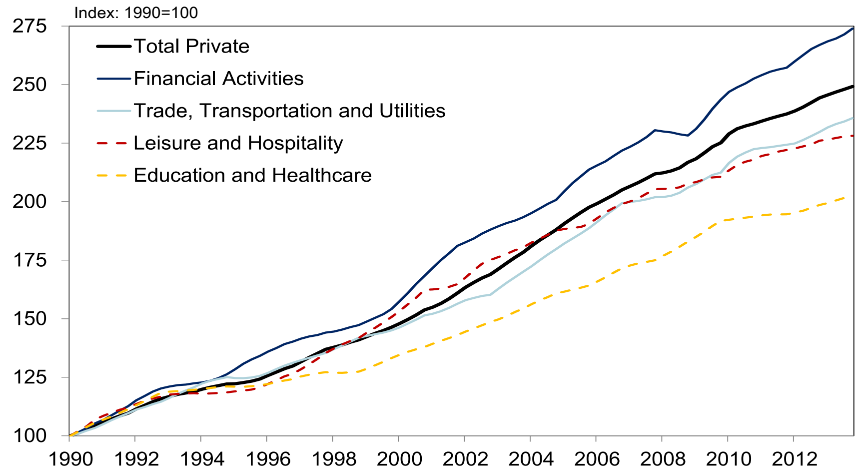
We find that services sectors, particularly ones with low productivity growth, do better at predicting inflation.

For example, due to the high persistence of core PCE inflation (an empirical fact owing to the anchoring of expectations), lags of inflation pass-through almost completely into current values; a one percentage point increase in past inflation increases the current value by 0.93 percentage point. Intuitively, the pass-through from individual sectors is lower. A one percent increase in the Education and Healthcare wage index is typically associated with a 0.08 percent increase in core PCE inflation in the following quarter, and so on for the other sectors.

First, we note that the only statistically significant relationships between wages and prices are for services industries; not shown in the table are the goods producing sectors for which the estimates were not statistically different from zero. Second, the heterogeneity in the estimates appears to be at least in part driven by differences in productivity growth across sectors. Faster wage growth in education and healthcare, trade, transportation and utilities, as well as in leisure and hospitality tends to precede faster core PCE inflation. These sectors jointly account for roughly a quarter of total payroll employment. They also tend to be sectors where productivity growth has been relatively slow (**Figure 7**), and hence the connection between wages and output prices is clearer. Meanwhile, faster wage growth in financial activities — a high productivity growth sector – is negatively correlated with core PCE inflation.

[10] Specifically, each variable is in log-differences, and we include one-period lags of the sector-level wage variables and four lags of core PCE inflation. The regression is estimated using OLS, applying the HAC estimator to account for serial correlation in the error term.

Figure 7. Productivity Indexes by Sector

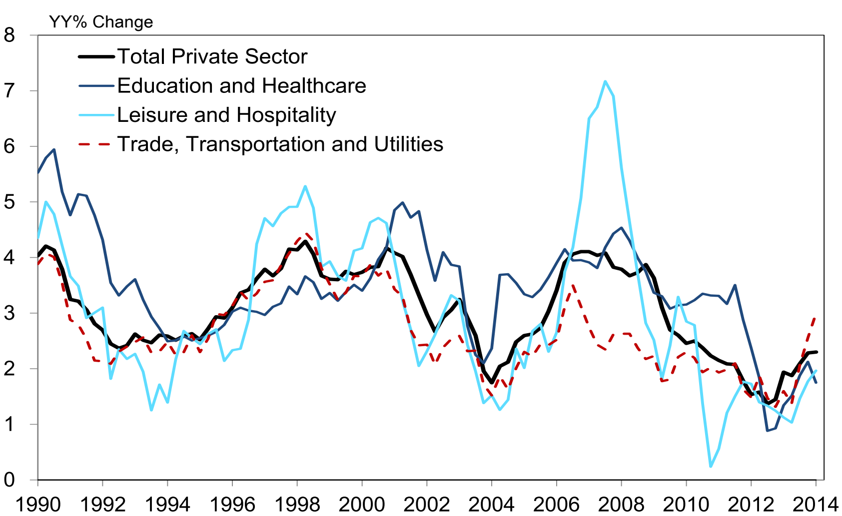


Note: We proxy productivity at the sector level as gross value added per hour worked.
Source: Bureau of Economic Analysis, Bureau of Labor Statistics and Citi Research.

However, at present, service sectors with low productivity growth are not flashing signs of an imminent acceleration in prices.

Having identified some potential canaries in the inflation mine, namely service sectors with low productivity growth, we conclude by noting that even these sectors are not flashing signs of imminent acceleration in core PCE prices. At present, wage pressures in education and healthcare and in leisure and hospitality appear relatively muted and remain at levels below the average for the private sector as a whole (**Figure 8**). Wage growth in trade, transportation and utilities has picked up faster than the aggregate measure recently; however, that sector represents a smaller share of total payroll employment than the others.

Figure 8. Wage Growth by Sector



Source: Bureau of Labor Statistics and Citi Research.

June 2014

Monday	Tuesday	Wednesday	Thursday	Friday
2 ISM Manufacturing PMI Prices Apr 54.9 56.5 May 55.4 60.0 Construction PIP Mar 0.6% Apr 0.2% Auction 3 & 6 Mth. Bills: $48.0B	**3** Factory Orders Ord. Inv. Mar 1.5% 0.2% Apr 0.7% 0.4% Total Vehicle Sales Apr 16.0M May 16.7M Auction 1 Mth. Bill: $45.0B	**4** Mortgage Applications ADP Employment Nonfarm Productivity Prod ULC 1QP -1.7% 4.2% 1QR -3.2% 5.7% International Trade Balance Mar -$44.2B Apr -$47.2B ISM Non-Manufacturing PMI Prices Apr 55.2 60.8 May 56.3 61.4 **Beige Book**	**5** Jobless Claims 5/31 312 Thous Ann. 3-Yr. Note: $28.0B Ann. 10-Yr. Note(r): $21.0B Ann. 30-Yr. Bond(r): $13.0B	**6** Employment Apr May Payrolls 282K 217K Unemp. Rate 6.3% 6.3% Avg. Hrly. Earn. 0.0% 0.2% Priv. Wrkwk 34.5H 34.5H Consumer Credit Mar $19.5B Apr $26.8B
9 Flow of Fund (1Q) Auction 3 & 6 Mth. Bills: $48.0B(E)	**10** Small Business (May) Wholesale Inventories Mar 1.1% Apr(E) 1.0% Auction 3-Yr. Note: $28.0B(E) Auction 1 Mth. Bill: $35.0B(E)	**11** Mortgage Applications Federal Budget Balance May 13 -$138.7B May 14 Auction 10-Yr. Note(r):$21.0B(E)	**12** Jobless Claims 6/7 315 Thous(E) Import Price Index Total ExPetro Apr -0.4% -0.2% May(E) 0.2% 0.1% Retail Sales Total ExAuto Apr 0.1% 0.0% May(E) 0.8% 0.5% Business Inventories Mar 0.4% Apr(E) 0.6% Ann. 30-Yr. TIPS(r): $7.0B(E) Auction 30-Yr. Bond(r): $13.0B(E)	**13** Producer Price Index Final Demand ExF&E Apr 0.6% 0.5% May(E) 0.1% 0.1% Reuters/Michigan Sentiment MayF 81.9 JunP(E) 82.0
16 Empire State Manufacturing May 19.0 Jun(E) Industrial Prod. & Cap. Util. Apr -0.6% 78.6% May(E) Housing Market Index May 45 Jun Auction 3 & 6 Mth. Bills: $48.0B(E)	**17** Consumer Price Index Total ExF&E Apr 0.3% 0.2% May(E) Real Earnings (May) Housing Starts and Permits May 1,072K 1,059K Jun(E) **FOMC Meeting** Auction 1 Mth. Bill: $30.0B(E)	**18** Mortgage Applications Current Account 4Q 13 -$81.1B 1Q 14(E) **FOMC Meeting**	**19** Jobless Claims 6/14 Philly Outlook Survey May 15.4% Jun(E) Leading Indicators Apr 0.4% May(E) Ann. 2-Yr. FRN(r): $13.0B(E) Ann. 2-Yr. Note: $30.0B(E) Ann. 5-Yr. Note: $35.0B(E) Ann. 7-Yr. Note: $29.0B(E) Auction 30-Yr. TIPS(r): $7.0B(E)	**20**
23 Existing Home Sales Apr 4.65M May(E) Auction 3 & 6 Mth. Bills: $48.0B(E)	**24** S&P/CaseShiller (Apr) FHFA (Apr) New Home Sales Apr 433K May(E) Consumer Confidence May 83.0 Jun(E) Auction 2-Yr. Note: $30.0B(E) Auction 1 Mth. Bill: $30.0B(E)	**25** Mortgage Applications Durable Goods Orders Total ExTrans Apr 0.6% 0.3% May(E) GDP & Chain Price Index 1Q14P -1.0% 1.3% 1Q14F(E) Corporate Profits (1QR) Auction 2-Yr. FRN: $13.0B(E) Auction 5-Yr. Note: $35.0B(E)	**26** Jobless Claims 6/21 Personal Income & Consumption Apr 0.3% -0.1% May(E) Auction 7-Yr. Note: $29.0B(E)	**27** Reuters/Michigan Sentiment JunP(E) 82.0 JunF(E)

(E) Indicates Citigroup estimates. (A) Advance. (P) Preliminary. (F) Final. (UNCH) Unchanged. (R) Revised. Contributors: Martha Berasain and Cathy Gaeta.

Notes

Appendix A-1

Analyst Certification

The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each of these analyst(s) certify, with respect to the section(s) of the report for which they are responsible, that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc and its affiliates. No part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this report.

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