

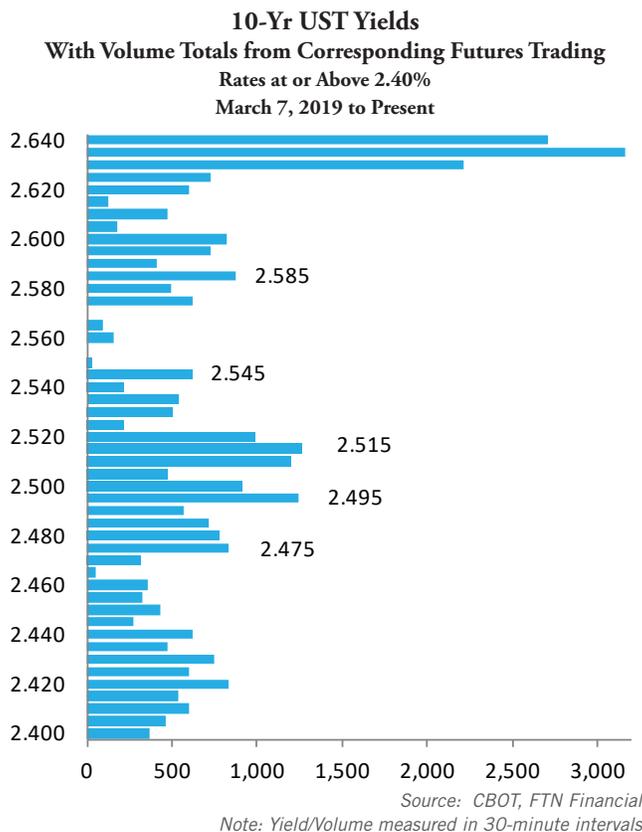
# THE WEEKLY REPORT

Until Friday, 10-yr UST yields appeared content to trade around 2.50% at low volumes until the middle of next week. The 10-yr auction at 2.466% on Wednesday was aggressive, but not unfair. Auction results, however, couldn't stop overseas sellers from a blistering run after China's large, but not seismic March data reports the night of April 11.

Rates that had not traded any volume above 2.535% surged into the gap between 2.530-2.585%. Where 2.585% appeared as strong support based on trading between March 15 and April 5, resetting the technical scale in the chart introduces older support levels from huge trading volume in early March. The strength of support at 2.65% becomes obvious.

Trading has been too sporadic even on the busiest days this week to do much more than fill an old gap at 2.47% and then encroach into an even older one above the mid-2.50s. The second article explains FTN's view about why the sell-off over reacted against the core Fed outlook. Traders, though, are well aware of how low negative economic momentum can take rates and how high positive momentum can push them. So, technicals have to take that into consideration.

By the same token, the quick price retreat opens the possibility of a price recovery that gets 10-yr UST yields to 2.50% next week. China data late Tuesday will need to confirm the import/export and loan growth indicators. For the US, the important release arrives Thursday morning as the government catches up with the retail sales release cycle. The "control group" series that corresponds reasonably well to GDP calculations is expected to rebound to .4% growth over February's depressed level.



## CONTENTS

### INFLATION LAB I

P. 2

The Fed has the difficult job of explaining its policy choices in response to the US economy. Basically, it must provide the "why?" of a complex system. Its favorite tools are models that fit observable data with an explanation. But, it takes its job so seriously it never wants to leave behind a model that no longer works, the way any market analyst constantly does. Fixed income managers, though, can move beyond the Fed-favorite Phillips Curve and understand how to reassemble its pieces in a way to incorporate inflation into a rate forecast.

### MARKET UPDATE

P. 8

Four recommendations following April 12's sell-off in UST. Intermediate yields were propelled by higher real rates that ran past almost everything the market learned about Fed policy in the last three weeks. Yields below 2.25% on 5s may have been too low, and above 2.35% are now out of line.

### INFLATION LAB II

P. 13

The first piece lists four steps portfolio managers should watch to understand inflation. That's what Inflation Lab does on a monthly basis after the CPI report. March's .148% in the core sets the table for further Fed consideration of its 2% target if the next two months fall in the same range.

Jim Vogel, CFA  
 901.435.8056  
 jim.vogel@ftnfinancial.com

Disclaimer is on the last page of this report.

## Phillips Curve Conundrum: A Portfolio Manager's Guide to Inflation Policy

For want of a better theory, the Phillips Curve remains the key to central bank thinking about inflation. As an inflation forecasting tool, on the other hand, it remains worthless today – just at a time inflation forecasting is vital. Naturally then, how and why inflation stays stubbornly at or below 2.0% is hotly debated.

Bond investors cannot wait for the Fed to figure out inflation theory. Through a series of charts that track the history and current reality of the Phillips Curve for wages and general inflation, these highlights are obvious:

Low unemployment has a strong relationship to faster wage growth. The wage response to more jobs, though, is less than it was from 2006-2014. With unemployment at 3.5-4.0%, traders should expect average hourly earnings growth to top out under 4.0%.

Core inflation has been beneath the level that matches Phillips Curve math for 15 consecutive years. Expecting the unemployment/inflation relationship to “kick in” anytime now because unemployment is at multi-decade lows is an expression of dogmatic belief rather than observation of the economy.

The net observation of the first two bullets is wages no longer dominate general price indexes as they once did.

Inside the major components of CPI, the housing component produces the tightest Phillips Curve. Unlike wages, however, housing costs hit a plateau as unemployment improves. Housing does not accelerate like wages. In addition, regional variances in the growth of housing costs are unusually high for this late in an economic recovery, adding more complexity to the Fed's task of targeting 2% on a sustained basis. See page [15](#).

For many years, the Fed's unstated goal appeared to be a “fix” for the Phillips Curve with enough tweaks to bring it into the 21<sup>st</sup> century. The new goal is to consider different approaches to inflation targeting itself. Fed governors are on a “listening tour” to collect community and scholastic input before launching a 12-month policy review this summer. See [Economic Weekly](#) for the latest from the minutes and the tour with regard to old and new inflation thinking at the Fed.

*Not only should fixed income managers not wait for the Fed's sincere work and energy, they are best advised to downplay the chances the Fed implements new inflation targeting.* The Fed is simply not likely to produce changes that can be implemented into policy in the next several years. The critical trigger for investors is evidence broad price indexes are reconnecting with wage growth.<sup>1</sup>

### Unemployment impact on wage growth has shifted lower

When Fed vice chair Richard Clarida discussed the Phillips Curve on the listening tour this week, he said:

Another key development in recent decades is that inflation appears less responsive to resource slack. That is, the short-run Phillips curve appears to have **flattened**, implying a change in the dynamic relationship between inflation and employment.

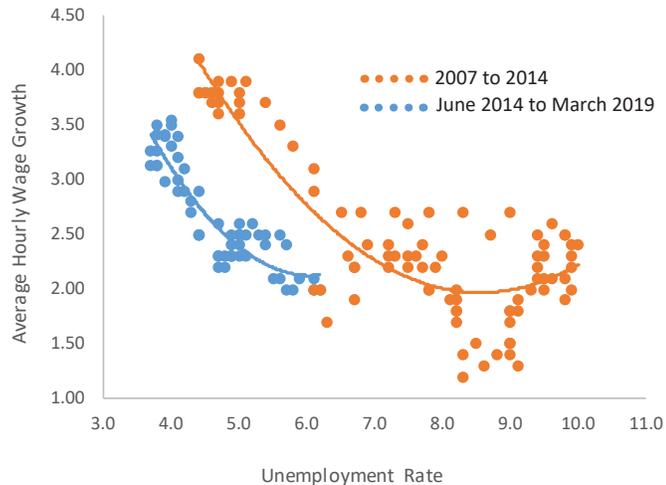
[emphasis added]

<sup>1</sup> This is an extensive topic for 2H 2019.

He is correct, the curve has flattened. But, it's an incomplete description. Look at the steep slopes for the two periods in the chart. It compares wage growth with unemployment.

When unemployment approaches the lower limits on the left, wage growth accelerates in classic Phillips Curve fashion.

**Average Hourly Wage Growth vs Unemployment Rate**  
**2007 to 2014 and 2014 to 2019**  
 Wage Growth Lagged 9 Mos to Unemployment



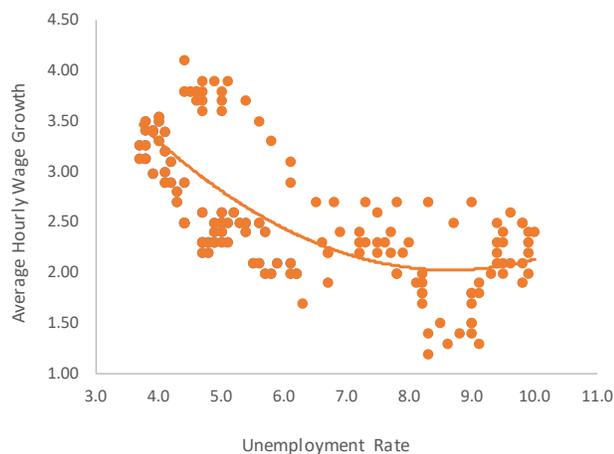
Source: BLS, FTN Financial

Note: Through 2019, wage growth estimated for most recent 9 months

Central banks are always ready to cool the economy as unemployment falls under recent lows or a perceived 'naturally' low barrier exactly because of that observable acceleration. Looking at the recent surge in the labor market, though, the last five years have produced what is most likely a structural shift in the curve lower and to the left. Although the Fed wonders about possible structural change, officials are always tempted to conclude they are temporary. Note in Clarida's quote the talking point about the short-run Phillips Curve...as though five years or 15 years don't tell the whole story.

From a 15-yr perspective, combining the two curves above does present a flatter profile.

**Average Hourly Wage Growth vs Unemployment Rate**  
**2007 to 2019**  
 Wage Growth Lagged 9 Mos to Unemployment



Source: BLS, FTN Financial

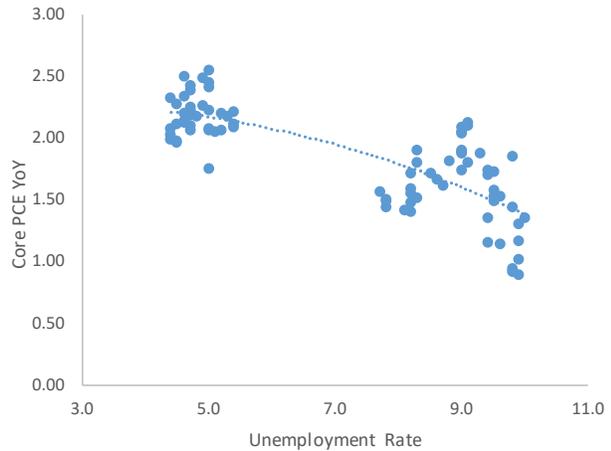
*Operating without the benefit of an underlying theory about inflation and unemployment, however, a neutral observer – in other words a rational fixed income investor – would segregate the two periods as show in the first chart. The second chart presumes a straight forward supply/demand equation has changed. The first chart assumes supply/demand now intersects at a different and lower price.*

**Step #1:** Watch wage growth over the next six months. Extrapolating the recent trendline puts monthly average hourly wage growth between 3.6%-3.9% for the balance of 2019. Sustained year-over-year growth at or above 3.9% – versus 3.2% last month and a max of 3.4% this cycle – is sign the labor market is a bigger threat to bond prices. The 3.9% threshold assumes unemployment falls as low as 3.5%

**The “classic” Phillips Curve is most influenced by extreme conditions**

To find a functional curve that ties core PCE to unemployment, the analysis below excludes the worst of the financial crisis from early 2008 to early 2009. Unlike the R<sup>2</sup> fit of 80+% of the two periods in the wage/unemployment, the fit below is barely 60%.

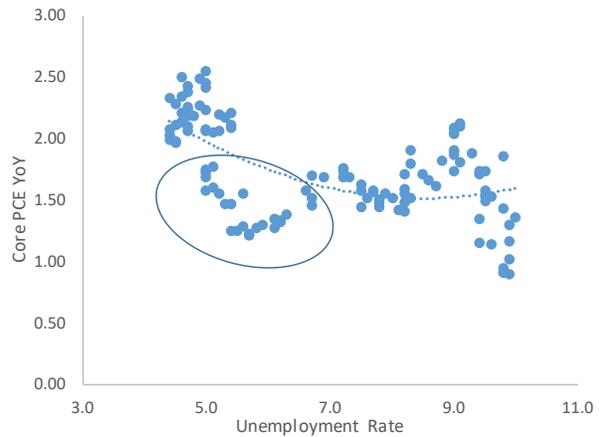
**Core PCE vs Unemployment Rate  
2005 to 2012**  
PCE Lagged 9 Mos to Unemployment



Source: BLS, BEA, FTN Financial  
Note: Data exclude Feb 2008-Jan 2009

What’s even more striking – against the smooth curves for wages/unemployment during roughly the same period – is the wide gap in the middle. Including the middle ground improvement in the labor market by extending the period to include 2015 creates the odd island of data highlighted in the next chart. It’s like a detached, mini-Phillips Curve in the middle of two poles.

**Core PCE vs Unemployment Rate  
2005 to 2015**  
PCE Lagged 9 Mos to Unemployment

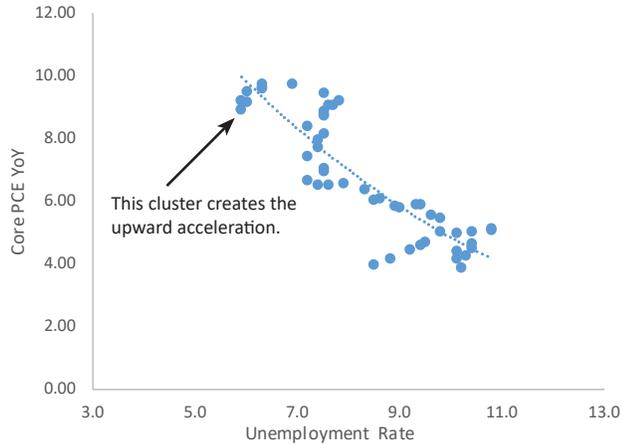


Source: BLS, BEA, FTN Financial  
Note: Data exclude Feb 2008-Jan 2009

*The two poles in the two previous charts illustrate why the Fed hasn't given up on the Phillips Curve, but the data island demonstrates why it's so frustrated it hasn't worked as expected.* To Fed officials, the island is transitory. After all it is new so it can be watched for a self-correcting move. Again, however, a data analyst will look at this chart and conclude the island signifies a trend that has been forced to cover too many years. Something underneath the surface is changing and trying to explain away the poor fit is a waste of time.

The most recent “pure” expression of the Phillips Curve, unfortunately, was a relatively brief run from 1979 to 1984. Even then, the extremes of an economy running from 6% to 11% unemployment was necessary to produce a curve that resembles one in an economics textbook.

**Core PCE vs Unemployment Rate**  
1979 to 1984  
PCE Lagged 9 Mos to Unemployment



Source: BLS, BEA, FTN Financial

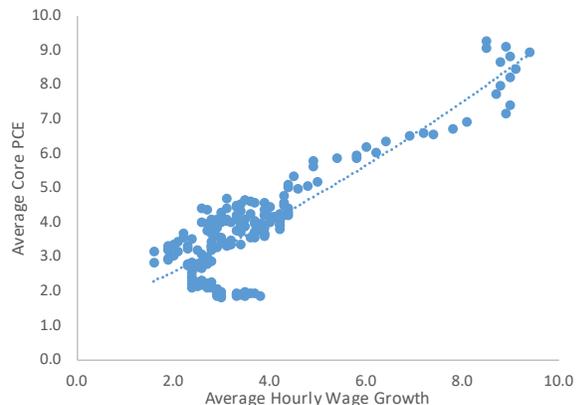
Many economists have over studied the period after 1984 when inflation began its long downward trek below 4%, never to return. They still believed in the centrality of the curve theory but introduced lower inflation expectations as a new variable to explain the arrival of lower inflation amid lower unemployment. Indeed, leading economists proved their data analysis ability in that fashion, helping promote the idea the Phillips Curve merely needs adjustments to remain a viable monetary policy tool.

**Step #2.** Resist warnings inflation can return to significantly higher levels as unemployment remains low. It's not “just a matter of time.” The next section explains why.

**Wages' influence on core inflation now a fraction vs former economy**

With the next two charts, we are circling back to the question “What happened to the Phillips curve and why?” For almost two decades during the modern era, wage growth and core inflation were closely linked. They were occasionally noisy and the fit functioned best between very high and very low rates of change. Still, the graph is powerful

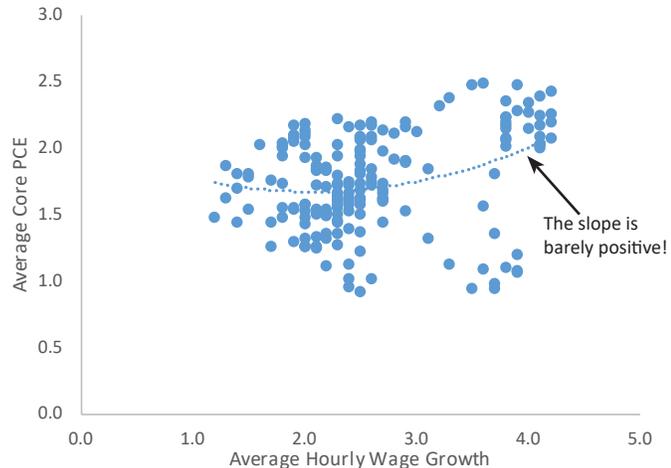
**Core PCE vs Average Hourly Wage Growth**  
1980 to 1997  
PCE Lagged 6 Mos to Unemployment



Source: BLS, BEA, FTN Financial

During the most recent 15 years, there is no period that produces a coherent line with an  $R^2$  better than 50%. There are traces here of a positive slope, but you really have to dig deep to find anything that suggests wages exert a dominant push to inflation at low unemployment. It just is not there.

**Core PCE vs Average Hourly Wage Growth**  
**Growth**  
**2003 to 2018**  
 PCE Lagged 6 Mos to Wage Growth



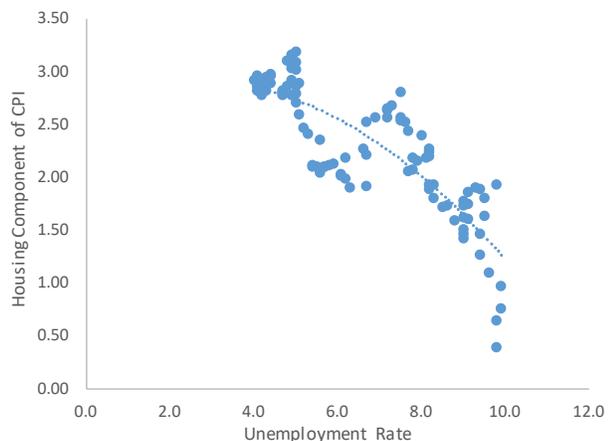
Source: BLS, BEA, FTN Financial

**Step #3.** Key on any arrival of an increasing pass-through of higher labor costs into the parts of the economy most dependent on personnel expense. It would be in the services industry and it's not visible at all today. Until it appears, don't sweat the labor market until average hourly growth heats up, per Step #1.

**Since 2010, housing CPI tracks unemployment**

Before the US housing market changed sharply in 2007, the housing component of CPI reflected a host of factors. By a wide margin, easier credit terms drove home prices to push old-fashioned ideas such as wage growth and income stability out of the decision matrix. Post the crisis, two things changed quickly to make the housing component of CPI sensitive to the wage/unemployment equation. Note, however, the slope of the line doesn't accelerate; it is currently tempered at lower unemployment levels.

**Housing Component of CPI vs Unemployment Rate**  
**2010 to 2018**  
 Housing Costs Lagged 12 Months



Source: BLS, FTN Financial

Preliminary analysis concludes:

1. Mortgage eligibility and rent levels became dependent on income, so wages rose quickly in importance. That was particularly true as annual home price inflation crested near 6% into the first half of 2018.
2. The most attractive industries have centered on high growth, urban areas where the opportunities created by new jobs are more important to employees than housing costs. This isn't true in the long run, necessarily, but in the kind of rapid labor market improvement seen in tech and other fields it can work for several years. The time constraint could explain the flattening of the curve in the chart as unemployment sinks below 4%.

Phillips Curve die-hards have studied inflation/unemployment data in selected markets and found direct evidence the curve is alive and well. Given the localized influence of housing costs, and their inclusion in city level and metro level inflation data, it is quite possible there are individual Phillips Curves that exist today. The obvious problem is the curves don't apply to the entire economy. That's not surprising given the disparity in regional housing costs.

**Step # 4:** Monitor any influence the cost of housing has on other major segments of inflation series.

### Summary

Behavioral economics studies the psychological responses of consumers and others in the economy that frequently do not act as "rational" players. Perhaps the craft should spend more time considering the behavior of economists. Market analysts are as subject to biased views as any professional, but there are few who would look at the behavior of inflation and conclude the Phillips Curve is important or would discover the power of low inflation expectations on actual inflation. As a former chair of the Fed has observed, it's not even clear whose inflation expectations are the most influential.

Central banks are always a marginal force in setting interest rates. But, increasingly they bend (very very slowly) in the directions set by i) data and ii) structural trends that determine the shape of the yield curve. It was just three years ago that the Fed started talking in earnest about a structural downshift in the natural rate of interest... seven years after it fell below 1% in 2009 and has failed to recover since.

**With this brief historical and math review of the breakdown in a function the Fed is still waiting to reappear, portfolio managers have a visible path around the Fed's stagnant views of inflation policy.** Inflation tail risk should not govern key aspects of a bond portfolio until inflation itself – rather than models – demonstrates potential risk in the next two years.

## Yields Retrace on China Improvement, Faulty Reappraisal of Fed Outlook

A big turn in March data from China ushered in a quick bear flattener to the Treasury curve on Friday. The pounding concentrated on the intermediate maturities, taking the inflation-adjusted yield on 5-yr UST near levels immediately prior to the March 20 FOMC meeting.

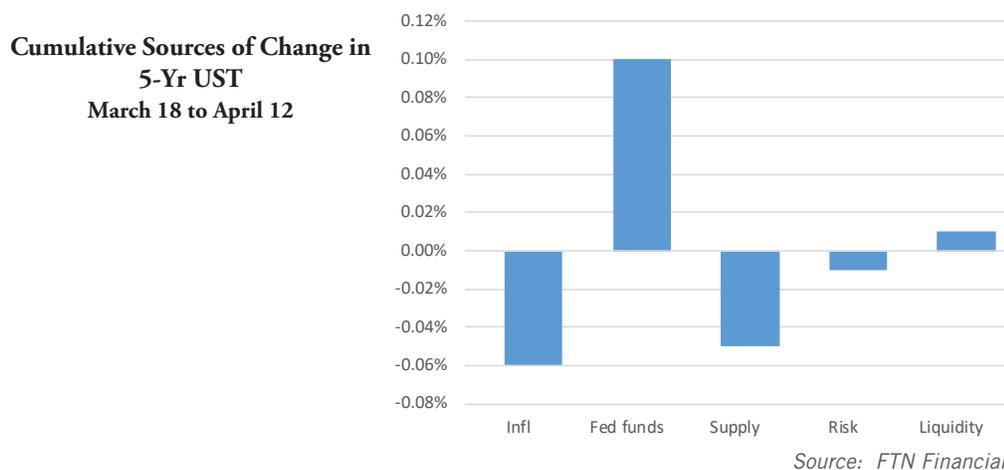
**Bottom Line:** Even if China's economy gets a boost from additional leverage this spring, the Fed's outlook is geared to a longer global horizon and laggard inflation. We have said for six weeks the risk in the bond market is higher inflation expectations, and 5-yr bonds reflect no fears of rising prices. Instead, the odds of any Fed rate are near zero at current yields...and fundamental odds should be closer to 40% of a rate cut in 2020 or earlier.

### Recommendations:

- On-the-run 5s do not offer enough relative liquidity to give away 2bp of yield. After all, they were not that liquid in Friday's sell-off. Versus March 2024 yields at 2.362%, the December 2023s at 2.361% offers value for a lighter duration. June 2024 at 2.38% is the first spot to consider past March 2024.
- In other fixed income markets, shopping in the 4 to 6.5 year maturity area to find a targeted yield is the right play.
- With 3-yr yields up 4bp in one day, we would normally have that on the shopping list. The issue on a relative value basis, however, is that 3s have still embed about 15% odds of a two-quarter rate decline in late 2021. Those odds are too low but they are not near zero as they are in 5s.
- From a performance perspective into the end of 2020, FTN's four scenarios do suggest some an allocation of up to 30% for longer duration bonds and still not suffer undue portfolio price risk with rates up 50bp.

*Note: Yields in the first bullet are as of noon Central on April 12.*

In looking at the net total decline in 5-yr yields from March 18 to April 12 of 3bp, the Fed outlook does not warrant a 10bp increase in real yields tied to more aggressive Fed policy.

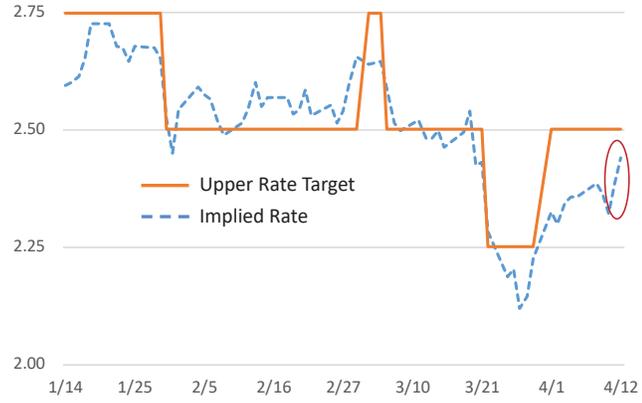


The components in the chart follow the yield change analysis in *The Weekly Report* from two weeks ago which tracked the 5-yr to a low of 2.18% on March 25. Expressing this week's chart in a different fashion, just because the market's impression of the Fed sent yields too low last month it doesn't mean good economic news warrants a move too high this month. Page [12](#) refreshes the step-by-step table from the March 29 edition ([TWR 3.29.19.pdf](#)).

**Market already lowered odds of a 2020 rate cut last week**

The chances of an “insurance” rate cut to 2.25% in response to inflation well below the 2% target fell last week. The chart shows how the market narrowed the expectations gap in just one day (noted by the red circle).

**Fed Funds Upper Target 12 Months Forward Implied by UST Curve**  
January 14 to Present  
Daily



Source: FTN Financial, Bloomberg

Near-term curve inversion has almost disappeared.

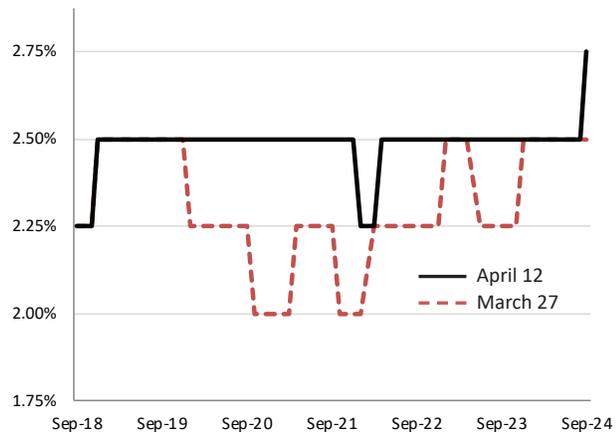
**18-Month Fwd 3-Mo Bill Yield less Current 3-Mo Bill**  
November 1 to Present  
Daily



Source: FTN Financial, Bloomberg

Finally, a look at the UST-implied fed funds target to close this week versus the confused and illiquid trading that accompanied the intra-week lows on March 27.

**FOMC Rate Expectations Implied from UST Curve vs Dot Plot Range**  
April 2 vs March 27

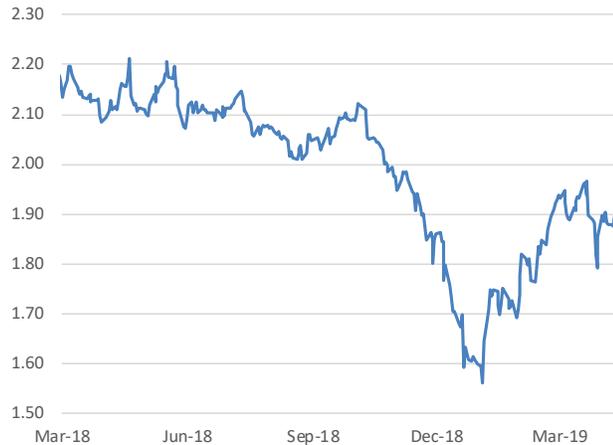


Source: FTN Financial, Federal Reserve

**No inflation risk premium in 5-yr breakevens**

Typically, traders would look at a recovering economic profile from China and sell fixed income based on inflation fears. China’s weaker growth last year and US/China trade negotiations are the go-to explanation for the pesky failure of inflation to respond as it should to a tighter labor market. All that has happened in 5-yr breakevens, however, has been a rebound off the spiked low at the end of the first quarter.

**5-Year Inflation Breakevens**  
 March 2018 to Present  
 Daily



Source: FTN Financial

**Sell-off not matched by global risk-on move**

US stocks did perk up on Friday thanks to the China news and early earnings reports. There was no appreciable change in global sentiment, however.

**Global Risk-On/Off Index**  
 September 4 to Present  
 Daily



Source: Bloomberg

**Brief update on Chinese March data**

*This is an updated version from Chris Low's note on April 12*

Chinese exports rose 14.2% year-on-year in March, while imports fell 7.6%, resulting in a trade surplus of \$32.65bn. The markets saw the export surge indicating stronger international demand for Chinese goods, which should benefit the Chinese economy. The import weakness, however, is a reminder China's domestic demand has cooled, too, and is not yet rebounding. Because the Chinese New Year was in February, March data are likely to overstate strength. In past years, data tended to be understated in the month containing the New Year's holiday and overstated the month after.

The good news on trade was accompanied by good news on Chinese lending, with new loans at 1.69 trillion yuan, well above the 1.25 trillion forecast (or \$255 billion in USD against a forecast of \$185 billion). And, both aggregate lending and M2 growth rose more than expected. The same seasonal caveats applied to the trade data apply here. Nevertheless, given the credit slowdown at the heart of China's economic slowdown, this too was greeted as double good news by traders.

**5-Yr UST Yields: Timetable from March 18 and Net Yield Change Attributions**

	Yield		Major Themes
February 26	2.46%		<u>February 26 - March 18</u>
Infl Expectations		0.02%	Oil price gains
Real Ylds (Fed funds)		-0.06%	Supportive Fed official commentary
Real Ylds (Supply)		-0.02%	Jan 20 Minutes sink in
Risk Premium		-0.01%	
Liquidity		<u>0.01%</u>	
		-0.06%	
March 18	2.40%		<u>March 18 - March 25</u>
Infl Expectations		-0.07%	Price data not alarming
Real Ylds (Fed funds)		-0.03%	Fed pause thru Dec '19
Real Ylds (Supply)		-0.07%	Major reinvestment announcement
Risk Premium		-0.03%	EU risk concerns
Liquidity		<u>-0.02%</u>	Huge buying flows
March 25	2.18%	-0.22%	
			<u>March 25 - April 4</u>
Infl Expectations		0.00%	Price data not alarming
Real Ylds (Fed funds)		0.07%	Lower odds of rate cuts before 2021
Real Ylds (Supply)		0.02%	Traders focus on corporate supply
Risk Premium		0.02%	EU risk concerns
Liquidity		<u>0.02%</u>	Reversed quarter-end liquidity bid
April 4	2.31%	0.13%	
			<u>April 4 - April 12</u>
Infl Expectations		0.01%	China leverage growth in March
Real Ylds (Fed funds)		0.05%	Near zero odds of rate cut for 5 yrs
Real Ylds (Supply)		-0.01%	
Risk Premium		0.00%	
Liquidity		<u>0.01%</u>	Intense overseas selling
April 12	2.37%	0.06%	
<b>Total</b>	2.46%		
Infl Expectations		-0.04%	
Real Ylds (Fed funds)		0.03%	
Real Ylds (Supply)		-0.08%	
Risk Premium		-0.02%	
Liquidity		<u>0.02%</u>	
	2.37%	-0.09%	

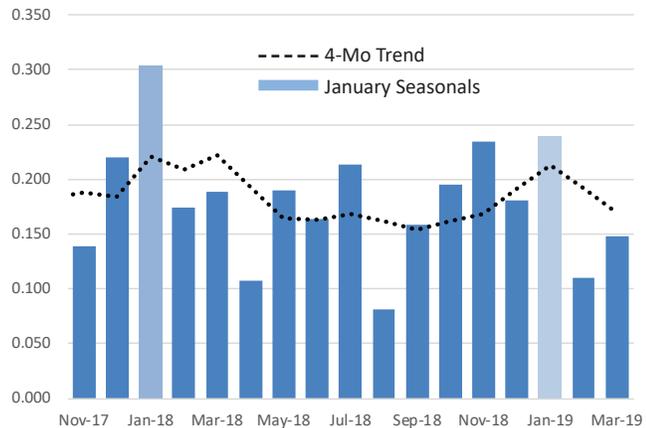
Source: FTN Financial

## Core Prices Resist Higher Energy and Labor Costs

Inflation is supposed to move with a lag to economic growth and input costs. If that were the case, then the first half of this year is a ripe time for core inflation to pick up steam. March numbers, then, are going to add to the Fed’s confusion by the absence of “greater signs of firming in response to strong labor market conditions and rising nominal wage growth,” in the words of the FOMC minutes from March.

The four-month trend of monthly changes is gradually moving back where it was in the middle of the fourth quarter where it incorporated a mix of modest prints in the third quarter with faster moves to end the year.

**Monthly Change in Core CPI**  
Last 17 Months

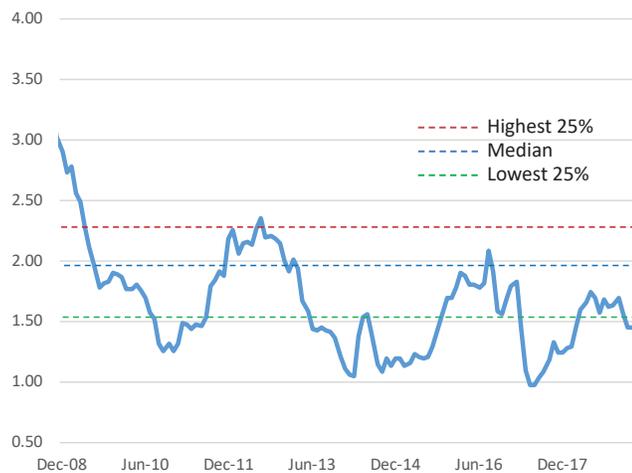


Source: BLS

It’s almost better for the decline in inflation to be more gradual than the plunge in February, which gave off vapors of being a one-off result. It was not. With two more moderate monthly releases, the Fed will have further reason to cast a skeptical eye at the run-up that loomed so importantly at the end of 2018.

Moving beyond the headline core deeper into the numbers, slower-to-move inflation outside housing was flat in March relative to the annual pace in February. This is the first of any number of charts that emphasize how much housing dominates core readings where the year-over-year numbers were 2.04% last month.

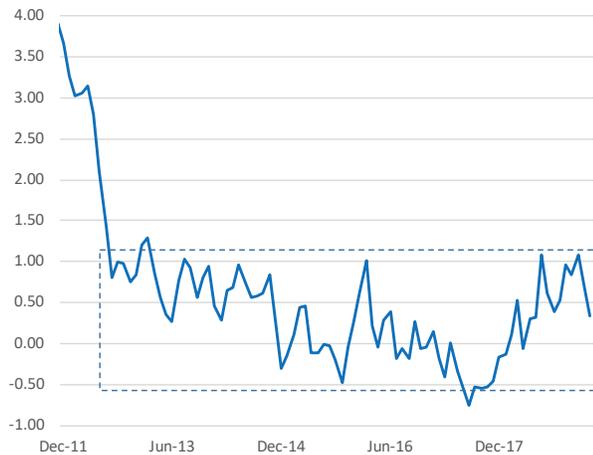
**Sticky Core Inflation, Ex-Housing**  
Year over Year  
2009 to March 2019  
Monthly



Source: Federal Reserve Bank of Atlanta, FTN Financial

The flexible components of CPI plunged, important in terms of sensitivity to rising labor costs. Away from the Federal Reserve Bank of Atlanta “sticky” and “flexible” series, changes in service costs, ex-rent, also remained well below recent averages.

**Flexible Components of Core CPI**  
 12-Month % Change  
 2012 to January 2019  
 Monthly



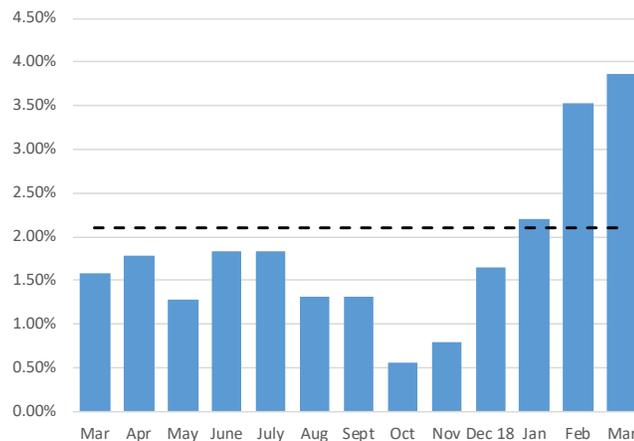
Source: Federal Reserve Bank of Atlanta, FTN Financial

**Food surprises to upside again**

The biggest CPI sector outside the core is food, moving again to push non-seasonally adjusted CPI above widespread expectations. That was good for a big, one-day pop in TIPS prices on Wednesday compared with UST coupons. For all of 2018, food wasn't volatile at all. Its tame behavior actually worked against TIPS in the last three quarters of 2018.

Another two months of food price inflation will bring notice from bond traders.

**Food Cost Increases**  
 Annualized 4-Month Changes  
 March 2018 to March 2019



Source: BLS, FTN Financial

The one place we consistently find an influence from higher personnel costs is in food away from home. It has averaged 2.6% annual inflation the last five years and in March it rose to 3.0%, much faster than the rise in food costs alone.

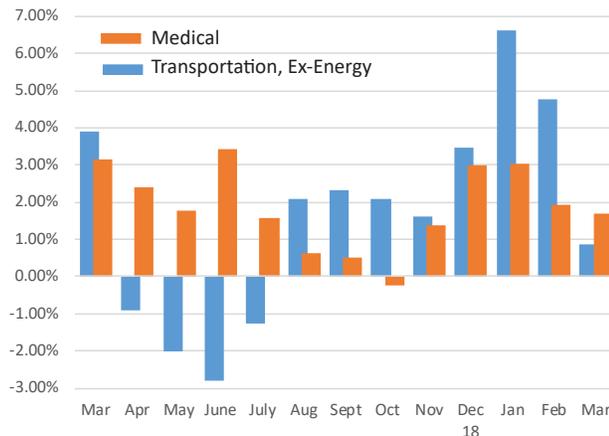
**Food Away from Home**  
**Year-over-Year Change**  
**June 2014 to March 2019**  
**Monthly**



Source: BLS

But as has been the case for years, March inflation didn't post a one-way sign. Two sectors that combine for 25% of the core CPI show an annualized pace comfortably under 2.0% for the last four months – transportation ex-energy and medical costs.

**Transportation and Medical Costs**  
**Annualized 4-Month Changes**  
**March 2018 to March 2019**

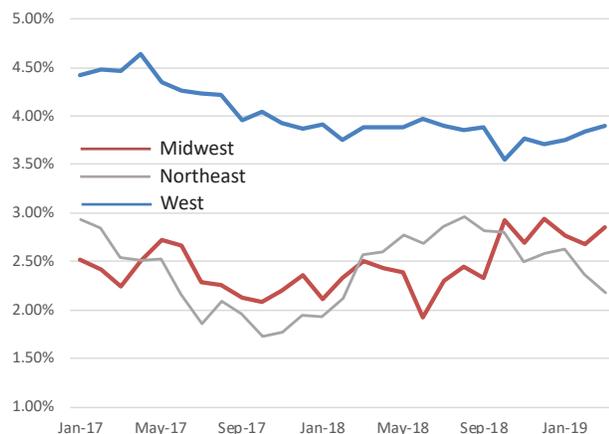


Source: BLS, FTN Financial

**Housing costs near 4% again in the West**

Inflation Lab has tracked the consistently faster CPI increases in the Western region, ascribing the primary differential to housing prices. To demonstrate the differential – also referenced in the final section of the previous piece [link] – the chart compares three of the four regional urban house price indexes compiled by the BLS. Index levels for the South and the Midwest are virtually identical, so the South series is omitted (but available upon request).

**Urban Housing Costs by Region**  
**2017 to March 2019**  
**Nonseasonally Adjusted, Year over Year**  
**Monthly**



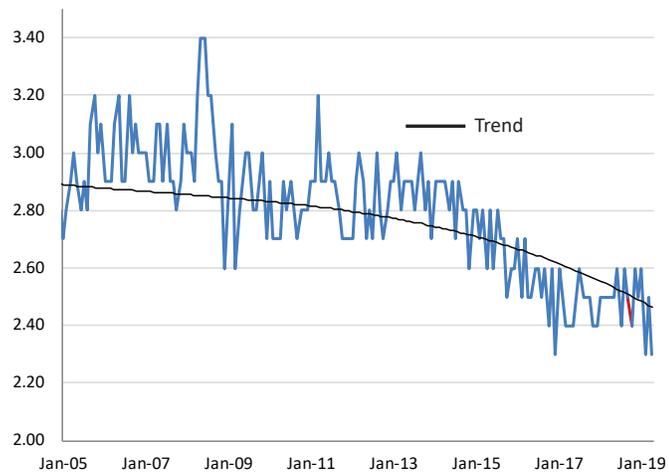
Source: Bureau of Labor Statistics, FTN Financial

On the growth trend for the Northeast, it is tempting to look at the recent downshift there and consider the negative impact of caps on state and local tax deductions in 2017's tax legislation. Equally interesting, though, is the peak in growth was August 2018 following a rapid increase compared with the rest of the country after the legislation was passed. Was there a lag before the size of the penalty was reflected?

**Consumer inflation expectations still declining**

The University of Michigan consumer survey has seen its longer run inflation forecasts dip to 2.3% before the most recent April reading. Then, it would bounce back to 2.6% again. In the last three surveys, though, it has fallen to 2.3% twice with a smaller bounce. The trend line does not indicate any pending turns upward.

**Food Away from Home  
Year-over-Year Change  
June 2014 to August 2018  
Monthly**



Source: University of Michigan Consumer sentiment Survey

This material was produced by an FTN Financial Strategist and is not considered research and is not a product of any research department. Strategists may provide information to investors as well as to FTN Financial's trading desk. The trading desk may trade as principal in the products discussed in this material. Strategists may have consulted with the trading desk while preparing this material and the trading desk may have accumulated positions in the securities or related derivatives products that are the subject of this material. Strategists receive compensation which may be based in part on the quality of their analysis, FTN Financial revenues, trading revenues, and competitive factors.

The views expressed herein accurately reflect the author's personal views about the subject securities or issuers. No part of their compensation was, is or will be directly or indirectly related to the specific recommendations or views contained in the Notes.

Although this information has been obtained from sources which we believe to be reliable, we do not guarantee its accuracy, and it may be incomplete or condensed. This is for informational purposes only and is not intended as an offer or solicitation with respect to the purchase or sale of any security. All herein listed securities are subject to availability and change in price. Past Agency updates not indicative of future results, while changes in any assumptions may have a material effect on projected results. Ratings on all securities are subject to change.

FTN Financial Group, FTN Financial Capital Markets, FTN Financial Portfolio Advisors and FTN Financial Municipal Advisors are divisions of First Tennessee Bank National Association (FTB). FTN Financial Securities Corp (FTSC), FTN Financial Main Street Advisors, LLC, and FTN Financial Capital Assets Corporation are wholly owned subsidiaries of FTB. FTSC is a member of FINRA and SIPC—<http://www.sipc.org/>.

FTN Financial Municipal Advisors is a registered municipal advisor. FTN Financial Portfolio Advisors is a portfolio manager operating under the trust powers of FTB. FTN Financial Main Street Advisors, LLC is a registered investment advisor. None of the other FTN entities including, FTN Financial Group, FTN Financial Capital Markets, FTN Financial Securities Corp or FTN Financial Capital Assets Corporation are acting as your advisor and none owe a fiduciary duty under the securities laws to you, any municipal entity, or any obligated person with respect to, among other things, the information and material contained in this communication. Instead, these FTN entities are acting for their own interests. You should discuss any information or material contained in this communication with any and all internal or external advisors and experts that you deem appropriate before acting on this information or material.

FTN Financial Group, through FTB or its affiliates, offers investment products and services. Investment Products are not FDIC insured, have no bank guarantee and may lose value.