FEDERAL RESERVE BANK *of* ST. LOUIS

When Will U.S. Inflation Return to Target?

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President and CEO

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Any opinions expressed here are my own and do not necessarily reflect those of the Federal Open Market Committee.

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Introduction

Key themes in this talk

- Inflation in the U.S. has surprised to the downside this year.
- U.S. real economic performance has been better during the second half of 2017, but 2018 growth is expected to slow.
- U.S. financial conditions are considered easy, but this observation does not have strong predictive content for the economy.
- Implications for near-term U.S. monetary policy: The current level of the policy rate is likely to remain appropriate over the near term.

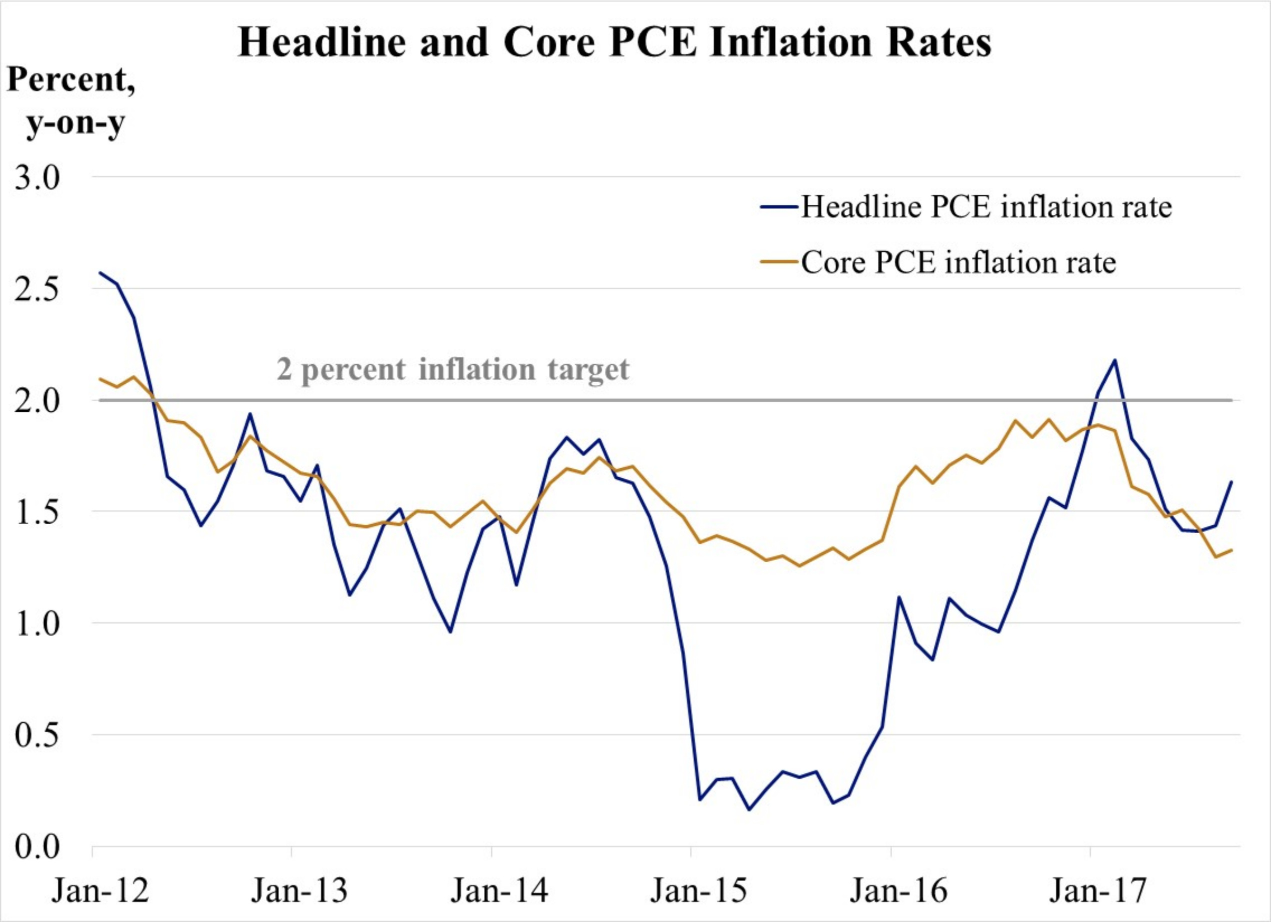
The 2017 Inflation Surprise

U.S. inflation in 2017

- The U.S. inflation rate has been below the 2 percent inflation target since 2012.*
- Inflation data during 2017 have surprised to the downside and call into question the idea that U.S. inflation is reliably returning toward target.

** The inflation target is in terms of the annual change in the price index for personal consumption expenditures (PCE).*

U.S. inflation has been mostly below target since 2012



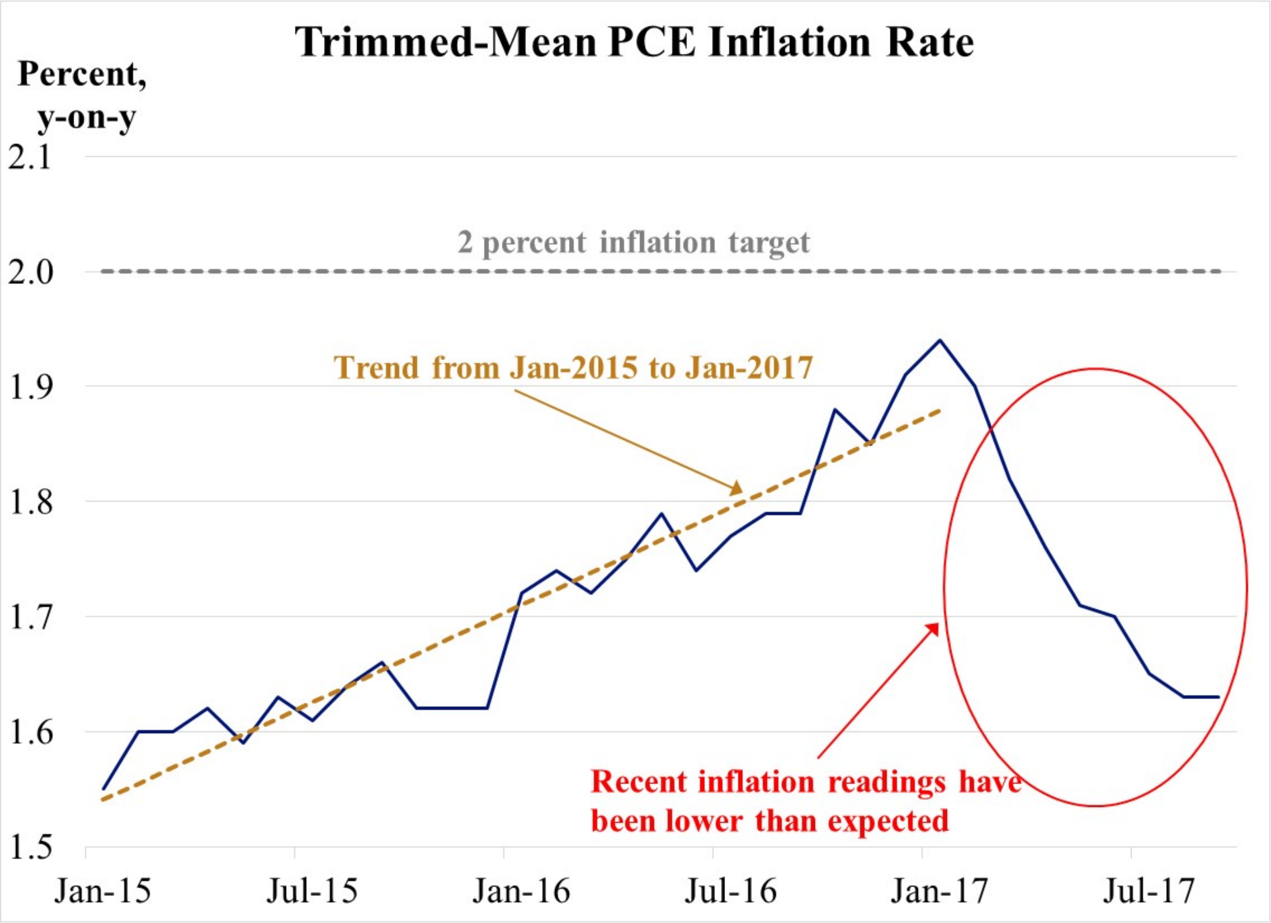
Source: Bureau of Economic Analysis. Last observation: September 2017.

Smoothed inflation readings are lower in 2017

Inflation measure	Dec-2016	Last obs.	Difference
Sticky CPI (FRB of Atlanta)	258	212	-46
Median CPI (FRB of Cleveland)	250	217	-33
Core CPI	220	170	-50
Trimmed-mean PCE (FRB of Dallas)	191	163	-28
Core PCE	187	133	-54

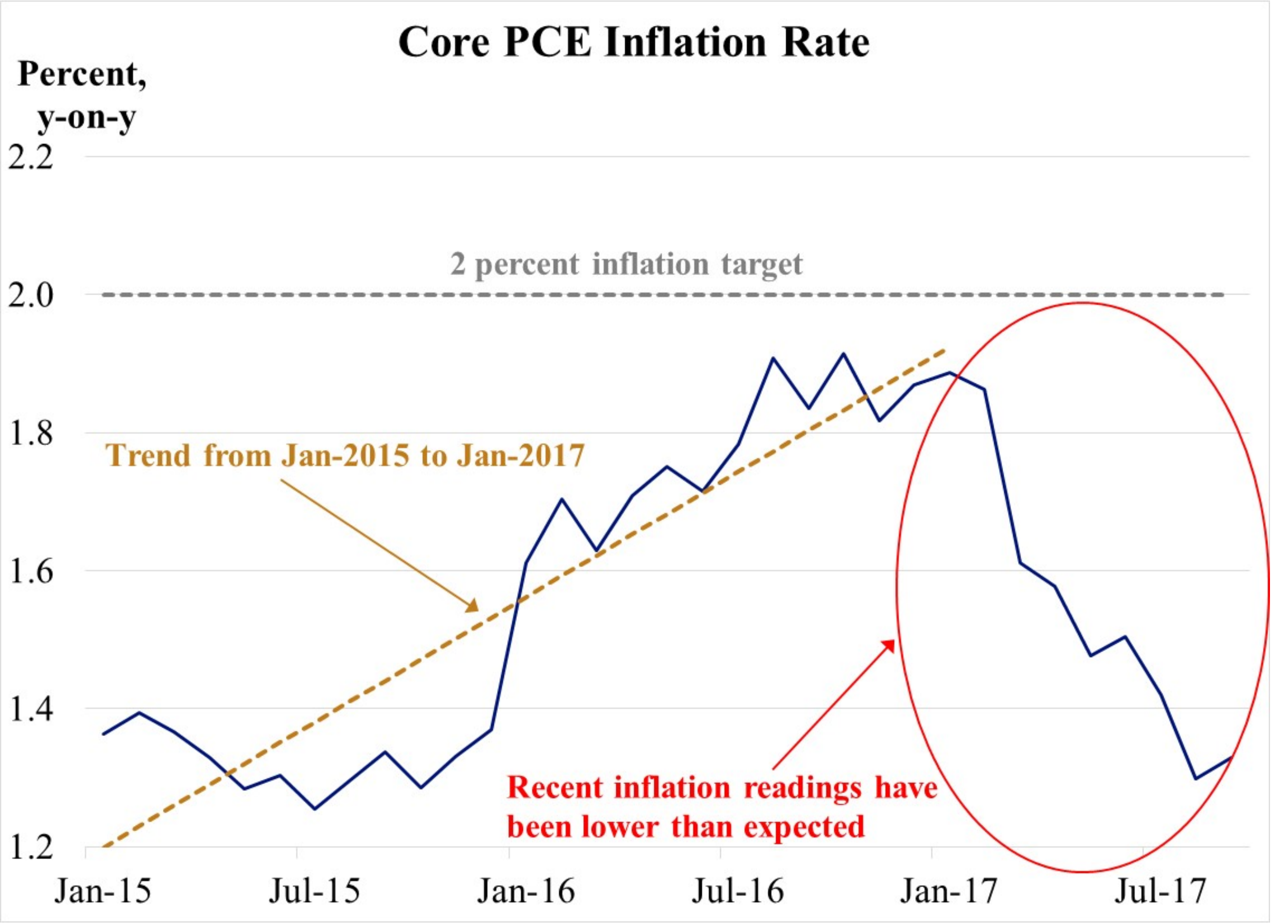
Values are expressed in basis points. Inflation rates are measured as percent changes from one year earlier.
Sources: Bureau of Labor Statistics, FRB of Cleveland, FRB of Atlanta, Bureau of Economic Analysis, FRB of Dallas and author's calculations. Last observation: September 2017.

Trimmed-mean PCE inflation lower than expected



Sources: FRB of Dallas and author's calculations. Last observation: September 2017.

Core PCE inflation lower than expected



Sources: Bureau of Economic Analysis and author's calculations. Last observation: September 2017.

The FOMC's take on the 2017 inflation surprise

- The Federal Open Market Committee (FOMC) makes projections for core PCE inflation.
- The current median projection for core PCE inflation is 1.5 percent at the end of 2017.*
- If the Committee is going to hit the inflation target, it will likely have to occur in 2018 or 2019.
- The two most cited factors that could drive inflation higher are inflation expectations and a faster pace of economic expansion.
- Let's now turn to considering these factors.

** See the September 2017 Summary of Economic Projections.*

Inflation Expectations

Inflation expectations remain low

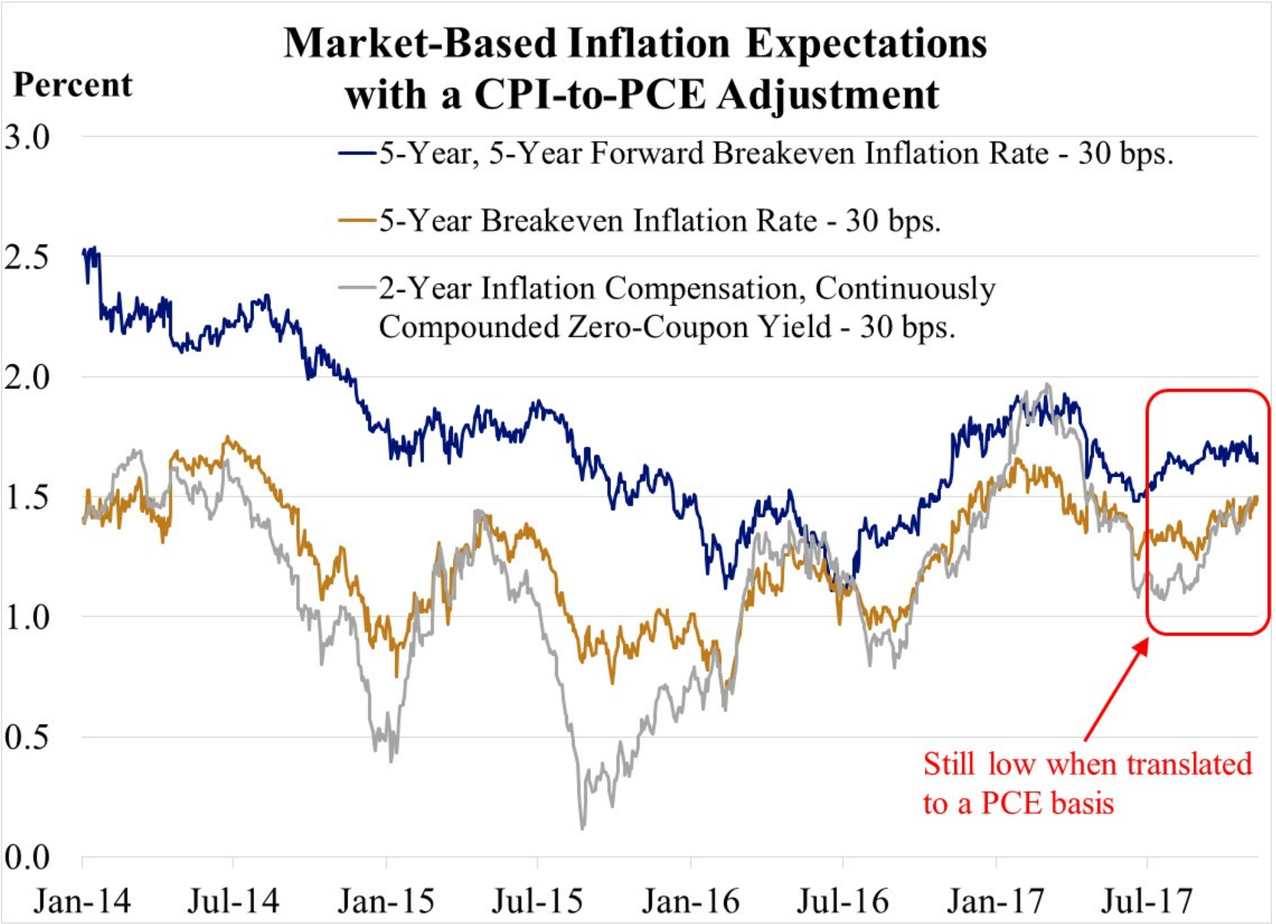
- One important influence on actual inflation is the state of inflation expectations.
- Expected inflation measures based on Treasury Inflation-Protected Securities (TIPS) remain relatively low.
- Survey-based measures have also slipped in the last year.
- Inflation expectations are sometimes sensitive to movements in oil prices, and oil prices have increased in recent trading.

Market-based inflation expectations

- TIPS-based inflation compensation is based on headline consumer price index (CPI) inflation.
- Survey-based measures are less specific about the inflation index.
- Historically, CPI inflation has run somewhat higher than PCE inflation, with an adjustment of about 30 basis points at an annual rate.*
- Other factors can influence TIPS-based expected inflation.

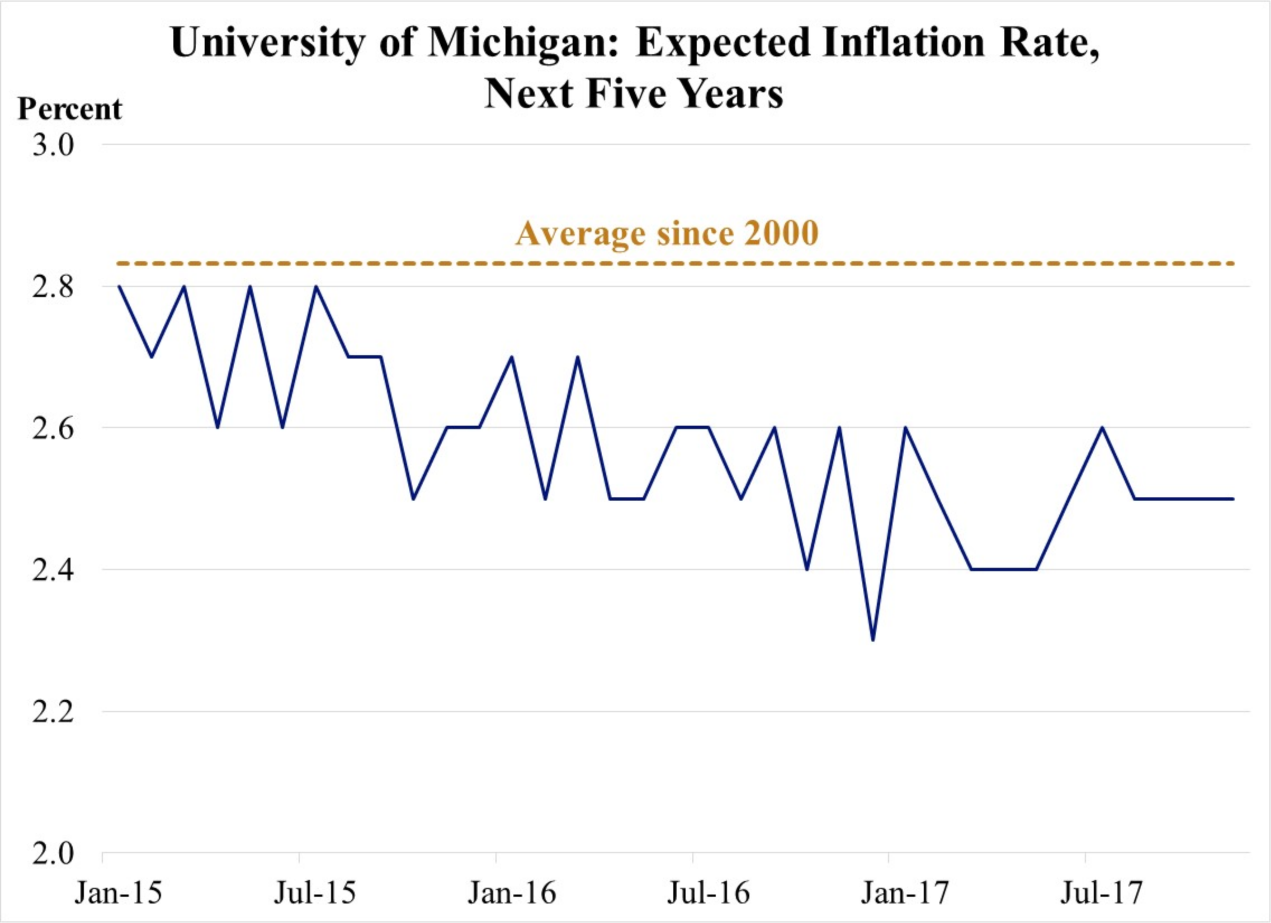
** This adjustment is conservative. The difference between CPI and PCE inflation since January 1960 was, on average, 46 basis points.*

Market-based inflation expectations



Source: Federal Reserve Board. Last observations: Nov. 10 (breakeven inflation rates) and Nov. 3, 2017.

Survey-based inflation expectations

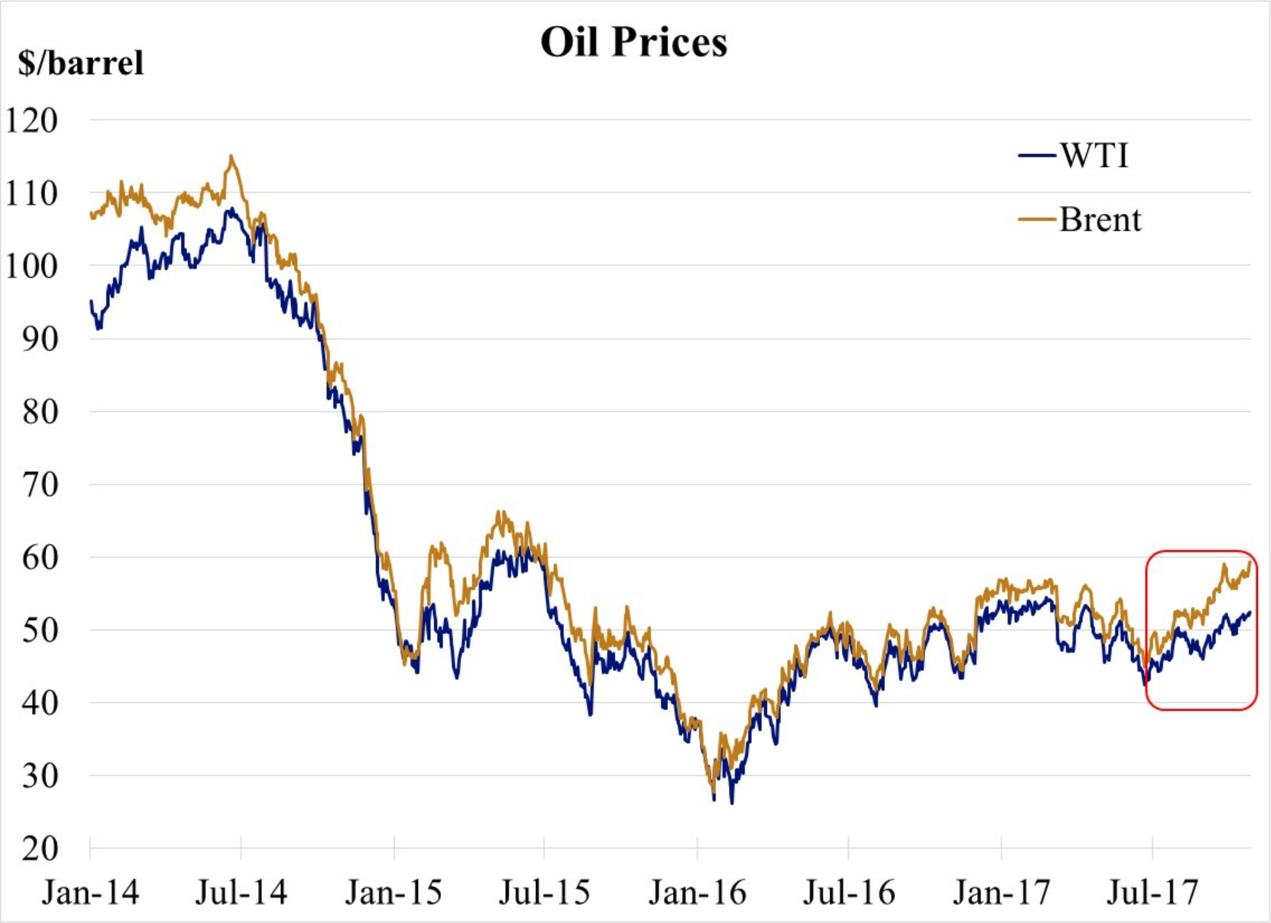


Source: Surveys of Consumers, University of Michigan. Last observation: November 2017.

Oil prices and inflation

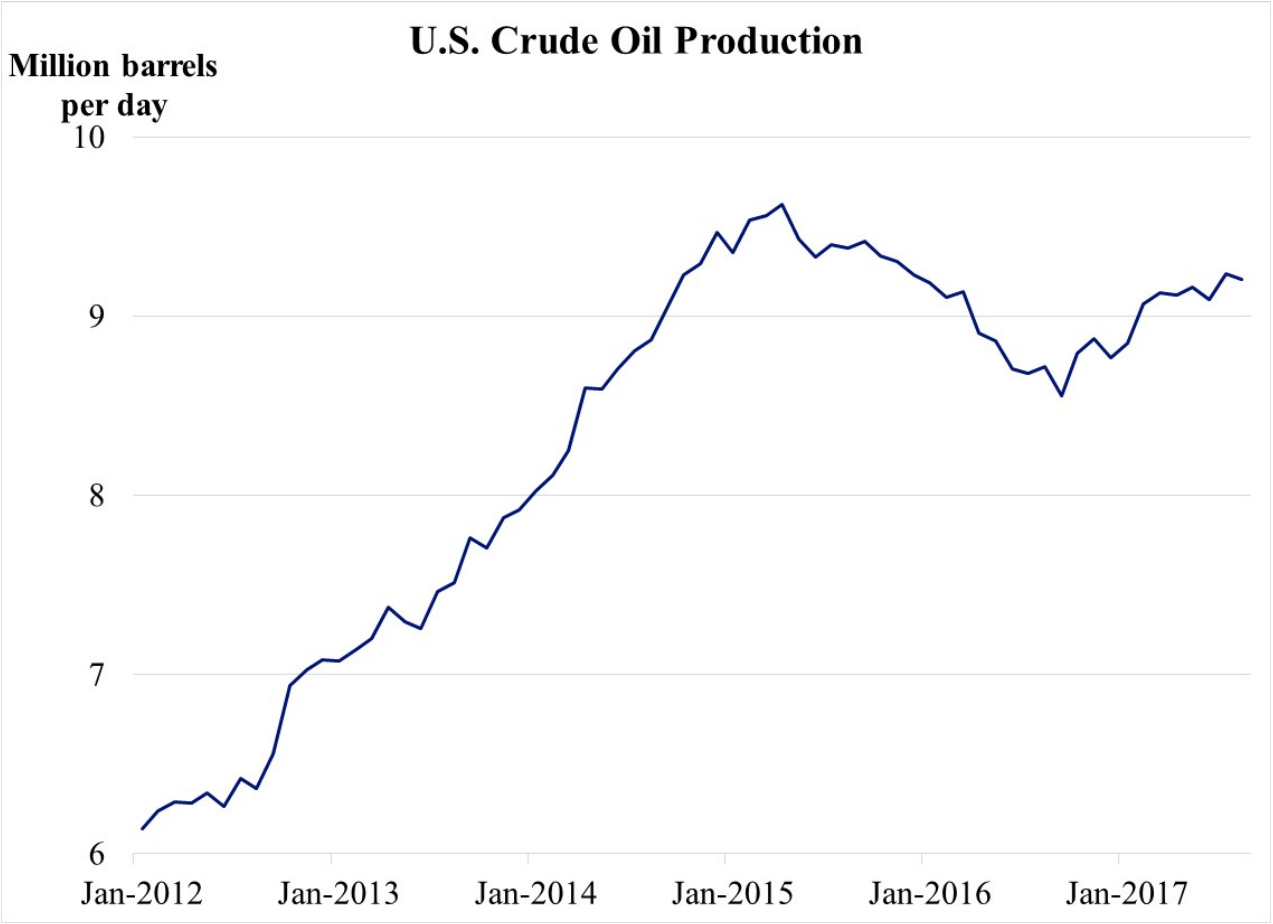
- Global oil prices fell dramatically during 2014 and then stabilized.
- Headline inflation and inflation expectations can be sensitive to oil price movements.
- Recent trading has generated upward movements in oil prices due in part to political developments in Saudi Arabia.
- U.S. production, which is substantial, tends to increase when prices rise, limiting price movements.

Oil prices somewhat higher since June



Sources: Energy Information Administration and Financial Times. Last observations: Nov. 8 and Nov. 10, 2017.

U.S. as a marginal producer



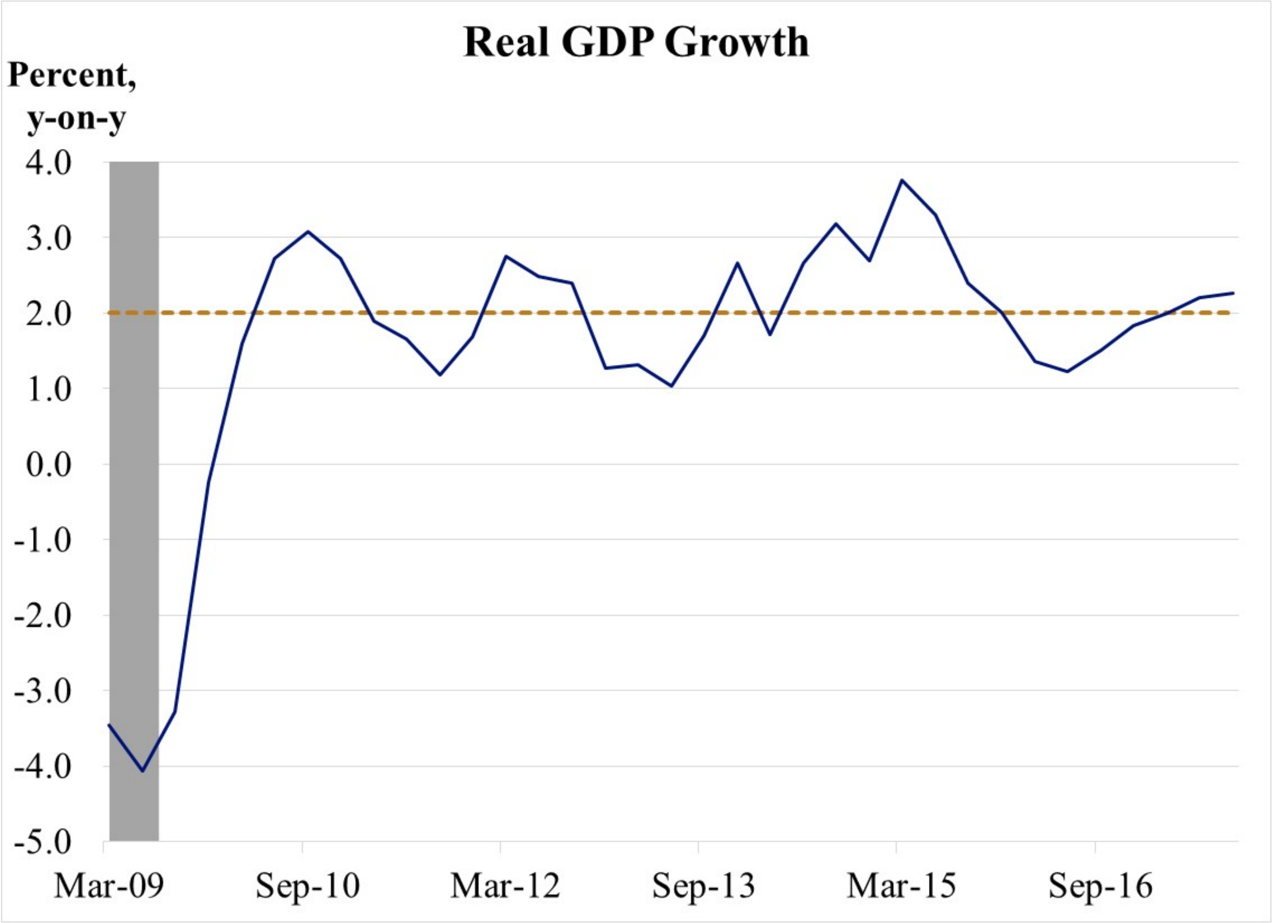
Source: Energy Information Administration. Last observation: August 2017.

Real GDP Growth Likely Slower in 2018

U.S. real GDP growth in 2017

- The data since the financial crisis suggest that the U.S. has converged to 2 percent real GDP growth.
- The current estimate for U.S. real GDP growth in the first half of 2017 is 2.1 percent at an annual rate.
- Second-half real GDP growth is showing some improvement from the first half of the year, with current tracking estimates near 3 percent.
- Real GDP growth will likely be slower in 2018 than it has been in the second half of 2017.

The 2 percent growth regime since the recession



Source: Bureau of Economic Analysis. Last observation: 2017-Q3. The shaded area indicates NBER recession.

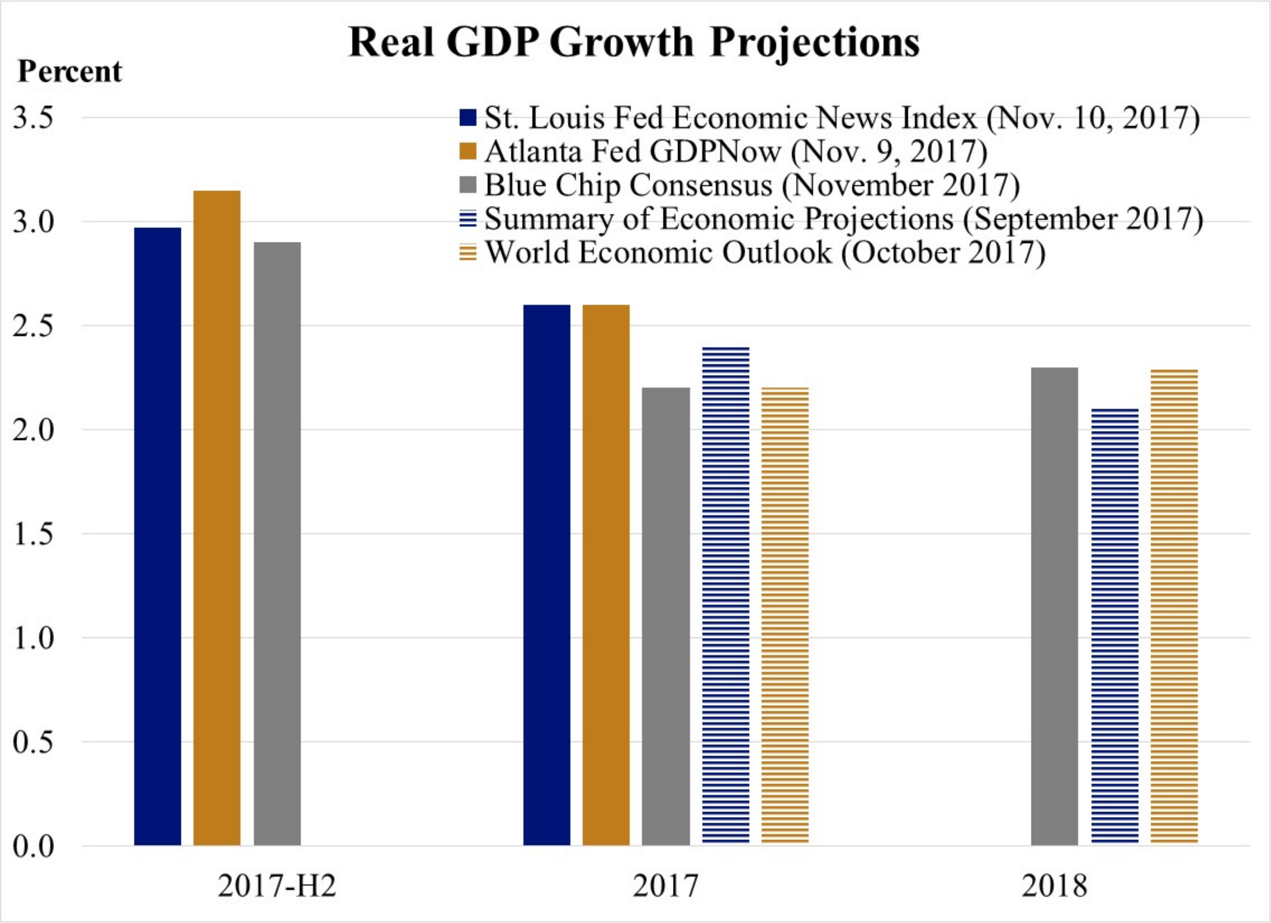
Tracking estimates for 2017-Q4 U.S. real GDP growth

Source	Date	Estimate*	2017†
Atlanta Fed GDPNow	Nov. 9	3.3%	2.6%
CNBC Moody's Consensus (median)	Nov. 9	2.8%	2.5%
Blue Chip Consensus	Nov. 10	2.7%	2.5%
St. Louis Fed Economic News Index	Nov. 10	3.0%	2.6%
FRBNY Staff Nowcast	Nov. 10	3.2%	2.6%
Macroeconomic Advisers	Nov. 10	2.5%	2.4%

** percent change from the previous quarter, annualized*

† average of Bureau of Economic Analysis' 2017-Q1, Q2, Q3 estimate (1.2%, 3.1% and 3%, respectively) and 2017-Q4 estimates

2018 real GDP growth



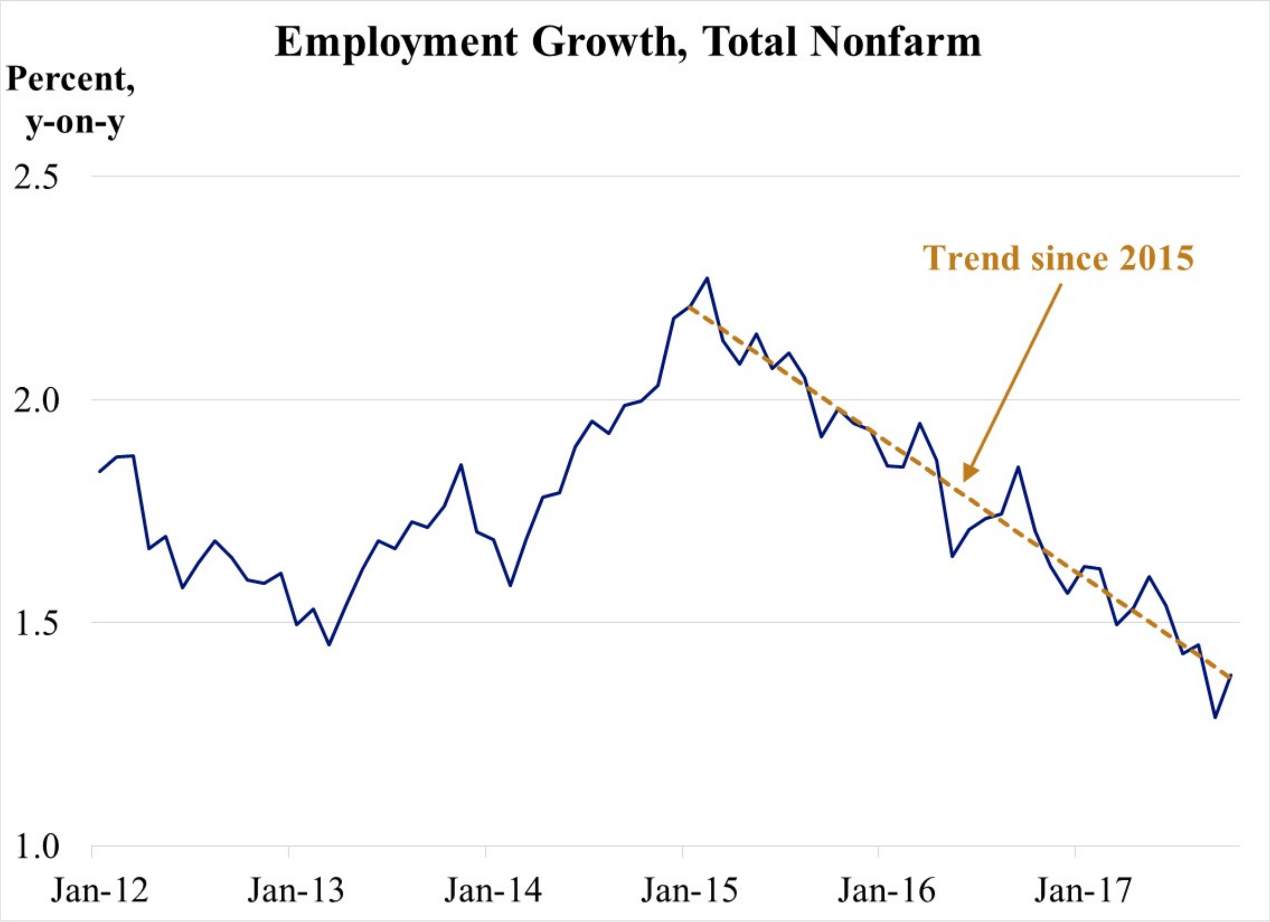
Sources: FRB of St. Louis, FRB of Atlanta, Federal Reserve Board, International Monetary Fund and Blue Chip Economic Indicators.

Note: For 2017 and 2018, growth rates are Q4-on-Q4 except for the World Economic Outlook (y-on-y).

U.S. labor market performance

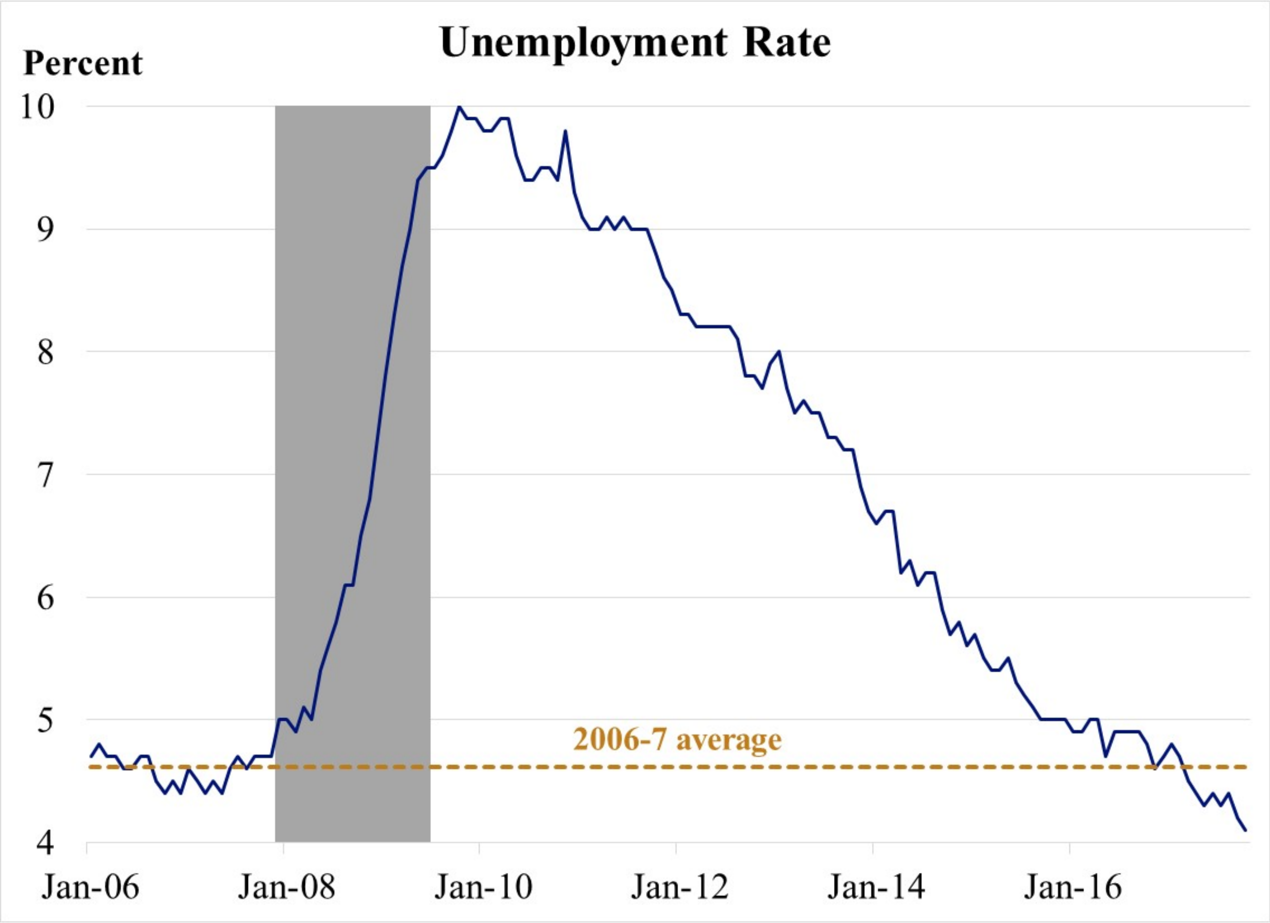
- The pace of growth in employment has been generally slowing since January 2015.
- The unemployment rate is relatively low.
- The statistical relationship between unemployment and inflation has broken down during the last 20 years.
  - This means low unemployment is probably not a harbinger of higher inflation.

Employment growth has slowed since 2015



Sources: Bureau of Labor Statistics and author's calculations. Last observation: October 2017.

The unemployment rate is low



Sources: Bureau of Labor Statistics and author's calculations. Last observation: October 2017. The shaded area indicates NBER recession.

Will low unemployment drive inflation higher?

- The U.S. unemployment rate was 4.1 percent in the October reading.
- Does this mean that U.S. inflation is about to increase substantially?
- The short answer is no, based on current estimates of the relationship between unemployment and inflation.

The estimated influence of unemployment on inflation

- Let's consider one study, Blanchard (2016), which estimates a Phillips curve relationship for the U.S.*
- Let's suppose the unemployment rate continued to fall from current levels.
- How much would the inflation rate increase according to these estimates?

** See O. Blanchard, 2016, "The U.S. Phillips Curve: Back to the 60s?" Peterson Institute for International Economics,* Policy Brief No. PB16-1.

The estimated influence of unemployment on inflation

If the unemployment rate was …	The predicted core PCE inflation rate would be …
4.1% *	1.3% *
4.0%	1.3%
3.5%	1.4%
3.0%	1.5%

* *current value (October 2017 for unemployment, September 2017 for inflation)*

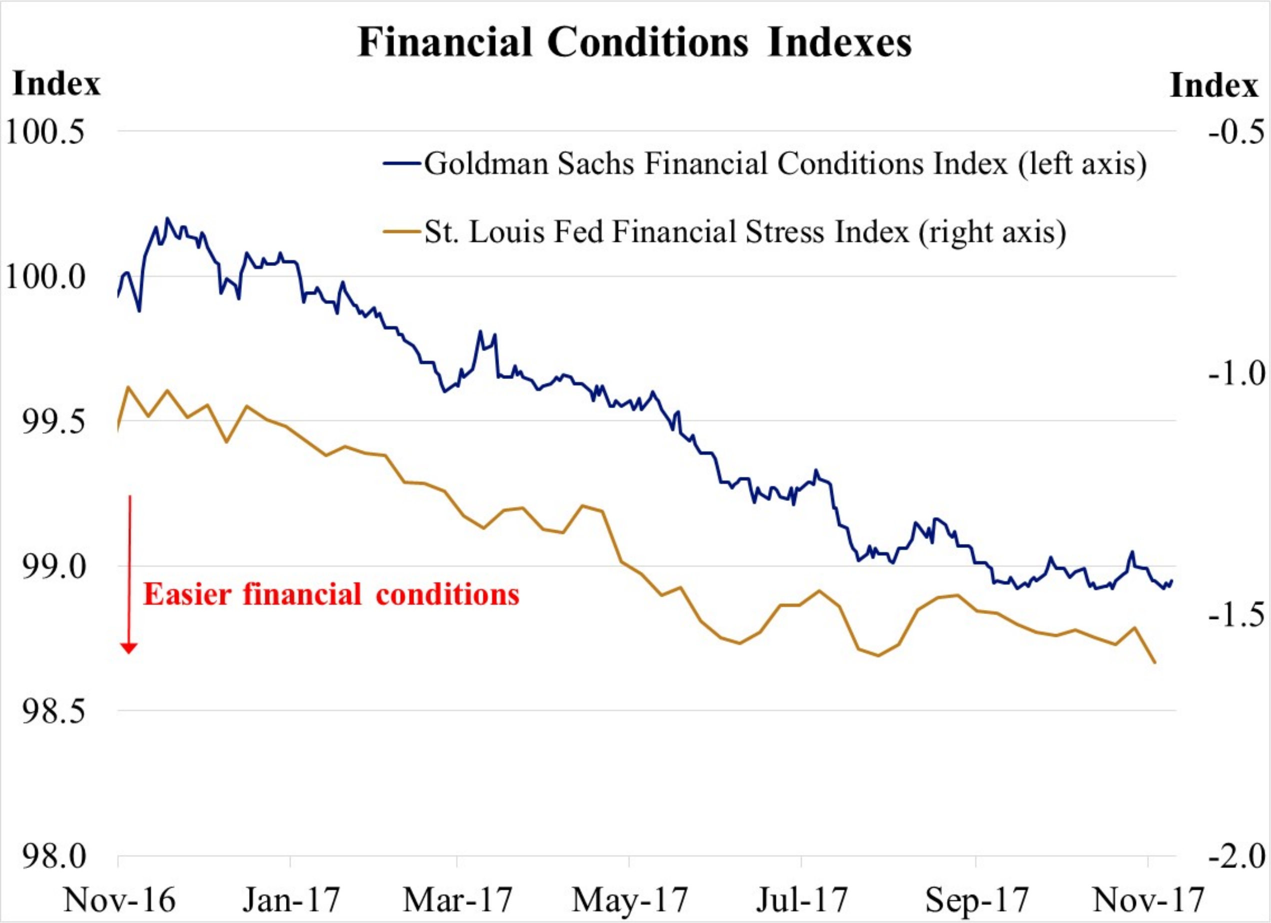
- Bottom line: Even if the U.S. unemployment rate declines substantially further, the effects on U.S. inflation are likely to be small.

U.S. Financial Conditions

U.S. financial conditions are easy

- U.S. financial conditions are considered easy, or "low stress," according to commonly used indexes.
- The indexes take into account factors such as market volatility (which has been low) and interest rate spreads (which have been relatively narrow).
- However, these indexes have an important asymmetry:
  - High-stress readings are associated with economic weakness.
  - Low-stress readings do not reliably predict future economic outcomes.
  - The current low readings probably do not contain any important signal at this point.

Financial conditions have improved during the past year



Sources: FRB of St. Louis and Goldman Sachs. Last observations: Week of Nov. 3, and Nov. 9, 2017.
Note: Lower readings mean improved financial conditions.

Conclusion

Conclusion

- Inflation has surprised to the downside in 2017.
- Inflation expectations remain below the level that would be historically consistent with the FOMC's inflation target.
- Real GDP growth looks like it may surprise to the upside during the second half of 2017 before shifting toward slower growth in 2018.
- Low unemployment readings are probably not an indicator of meaningfully higher inflation over the forecast horizon.
- The current level of the policy rate is appropriate given current macroeconomic data.

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