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Fed Chart Book

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Fed's Dual Mandate

Established Objectives of Federal Reserve Monetary Policy:

Stable Prices ("Price Stability"): 2 percent inflation rate as measured by the annual change in the price index for personal consumption expenditures (Headline PCE YoY). The Powell Fed views the core (excluding food and energy) PCE as a better indication of future inflation. It is worth noting that the Fed interprets the inflation objective as symmetric, meaning they are trying to prevent persistent deviations, either above or below, from their 2 percent inflation target.

Maximum Employment: The highest utilization of labor resources that is sustainable over time, i.e., the unemployment rate that is consistent with low and stable inflation over the longer term- often estimated as the "natural rate of unemployment." The natural rate of unemployment comprises both the "frictional" unemployment of people who are temporarily between jobs or searching as they have reentered the labor force and the more "structural" unemployment of people whose skills or physical location are not a good match for the jobs available. In other words, the Fed aims to reduce "cyclical" unemployment. As Powell likes to point out, the unemployment rate that is consistent with maximum employment is largely determined by nonmonetary factors (i.e., not heavily influenced by Fed policy). The Fed has no fixed goal for this rate, the current longer run estimate for unemployment is 4.5%, from the June 2018 Fed Summary of Economic Projections.

Fed Policy Tools

Federal Funds Rate: the primary policy tool of the Fed, it is the overnight benchmark interest rate. The Powell Fed aims for this rate to be at the estimated normal longer-run level when the policy objectives are met (i.e., inflation is running at the target rate of 2% and the economy is operating at maximum employment)

Fed Balance Sheet: Quantitative Easing ("QE") is Fed balance sheet expansion via bond purchases using "printed money," Quantitative Tightening ("QT") is essentially the opposite, i.e., Fed balance sheet contraction via allowing bonds to mature without reinvesting the proceeds.

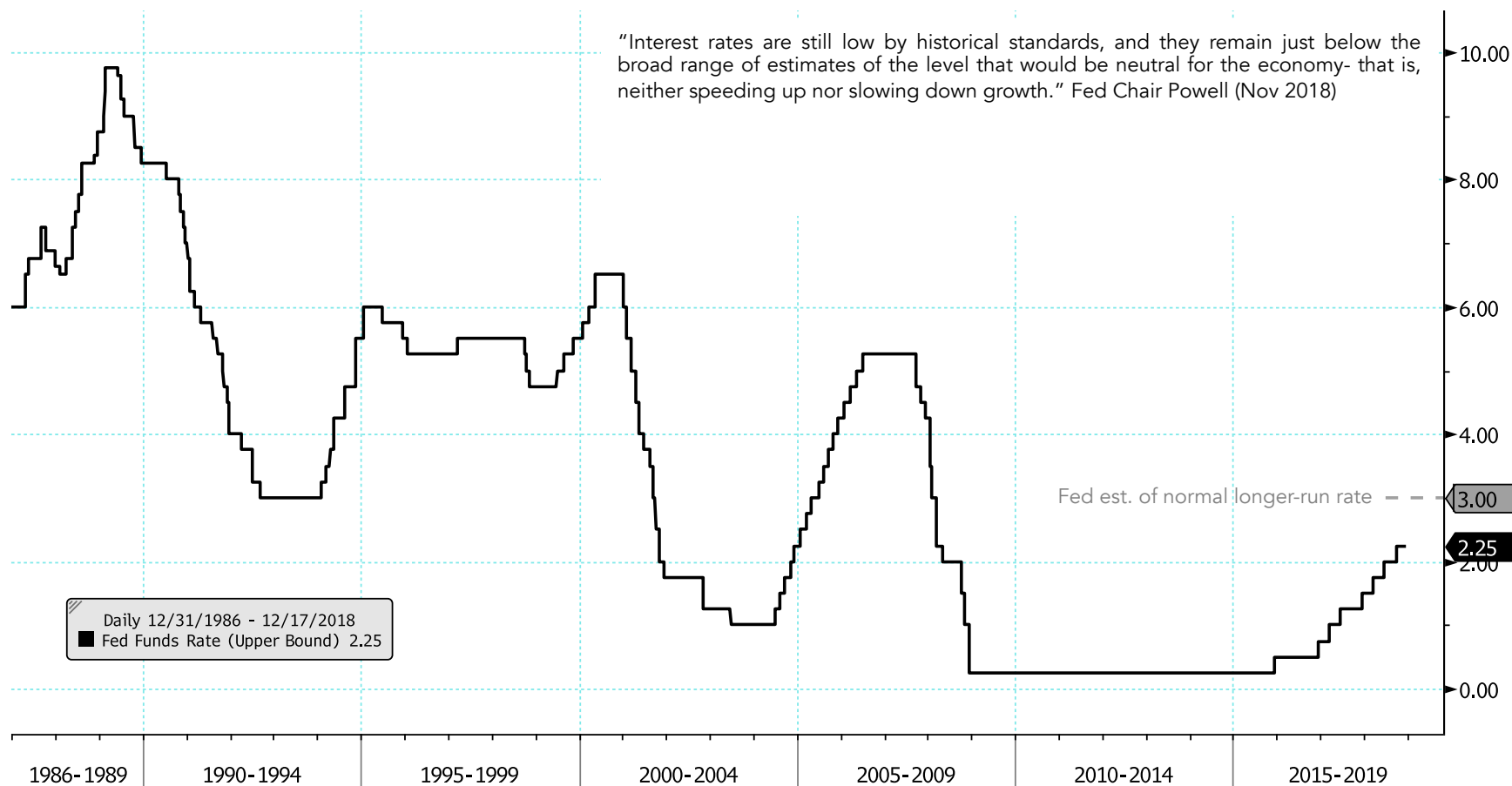
Forward Guidance: a commitment to hold rates at a certain level (e.g., zero) over a certain period of time

Fed Key Concepts

Data Dependency: The Fed describes its policy making process as data dependent, which might be best summarized by Chair Powell's words: "Our views about appropriate monetary policy in the months and years ahead will be informed by incoming economic data and the evolving outlook. If the outlook changes, so too will monetary policy." Many of the following charts represent the relevant data followed by the Fed, and specifically by Chair Powell.

Fed Estimate of Normal Longer-run Rate

The summary of economic projections from the Sep 2018 Fed meeting show a median longer-run projection of 3.00%



Source: Bloomberg, © Merk Investments LLC

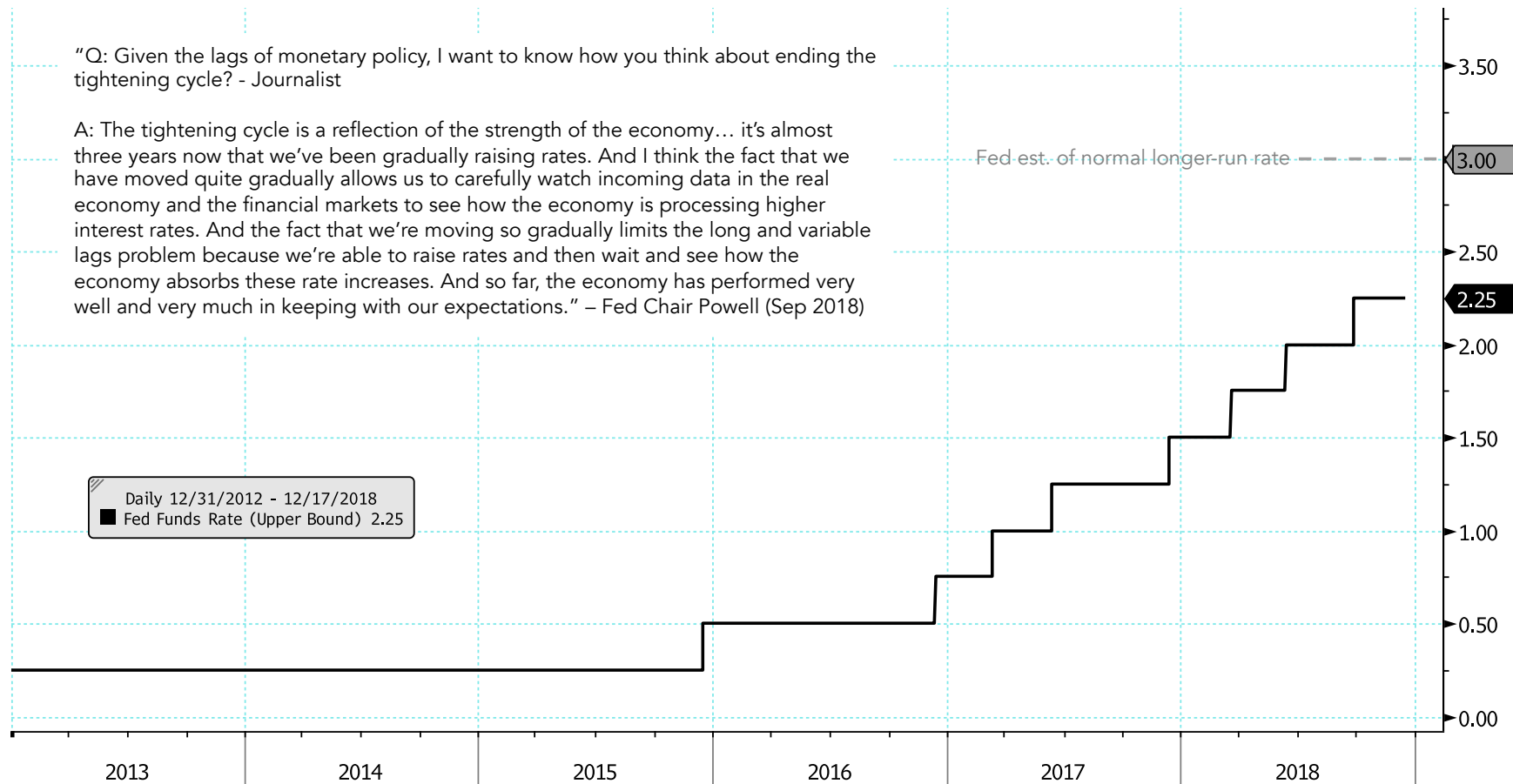
Analysis: Powell views the current gradual rate hikes as a process of removing accommodation, not as tightening per se. If the Fed were to hike rates to what they determine to be the normal longer run rate (currently estimated at 3.00%), that would represent a neutral monetary policy, and anything above the normal longer-run rate estimate would represent restrictive monetary policy. Powell's view is that gradually reducing monetary policy accommodation will sustain a strong labor market (consistent with the maximum employment mandate) while fostering a return of inflation to 2 percent on a sustained basis (consistent with the price stability mandate). Gradual seems to mean about three or four 25 basis point rate hikes per year, dependent on the incoming data continuing to suggest that inflation is trending up and the labor market remains strong.

Fed Rate Hiking Cycle

The summary of economic projections from the Sep 2018 Fed meeting show a median longer-run projection of 3.00%

"Q: Given the lags of monetary policy, I want to know how you think about ending the tightening cycle? - Journalist

A: The tightening cycle is a reflection of the strength of the economy... it's almost three years now that we've been gradually raising rates. And I think the fact that we have moved quite gradually allows us to carefully watch incoming data in the real economy and the financial markets to see how the economy is processing higher interest rates. And the fact that we're moving so gradually limits the long and variable lags problem because we're able to raise rates and then wait and see how the economy absorbs these rate increases. And so far, the economy has performed very well and very much in keeping with our expectations." – Fed Chair Powell (Sep 2018)



Source: Bloomberg, © Merk Investments LLC

Analysis: Powell seems committed to a gradual and data dependent approach to the hiking cycle.

Fed Estimate of the Natural Real Rate of Interest

"R-star" is the natural real rate of interest



Source: Bloomberg, © Merk Investments LLC

Analysis: If the natural real rate of interest is about 1% and inflation is about 2%, the neutral nominal rate should be about 3% (1% + 2%), which is roughly consistent with the Fed's longer run normal rate estimate shown on the previous slide.

Market Expectations of Fed Funds Rate in 1 year

What's Priced-in based on the +1-year Fed Funds Futures contract

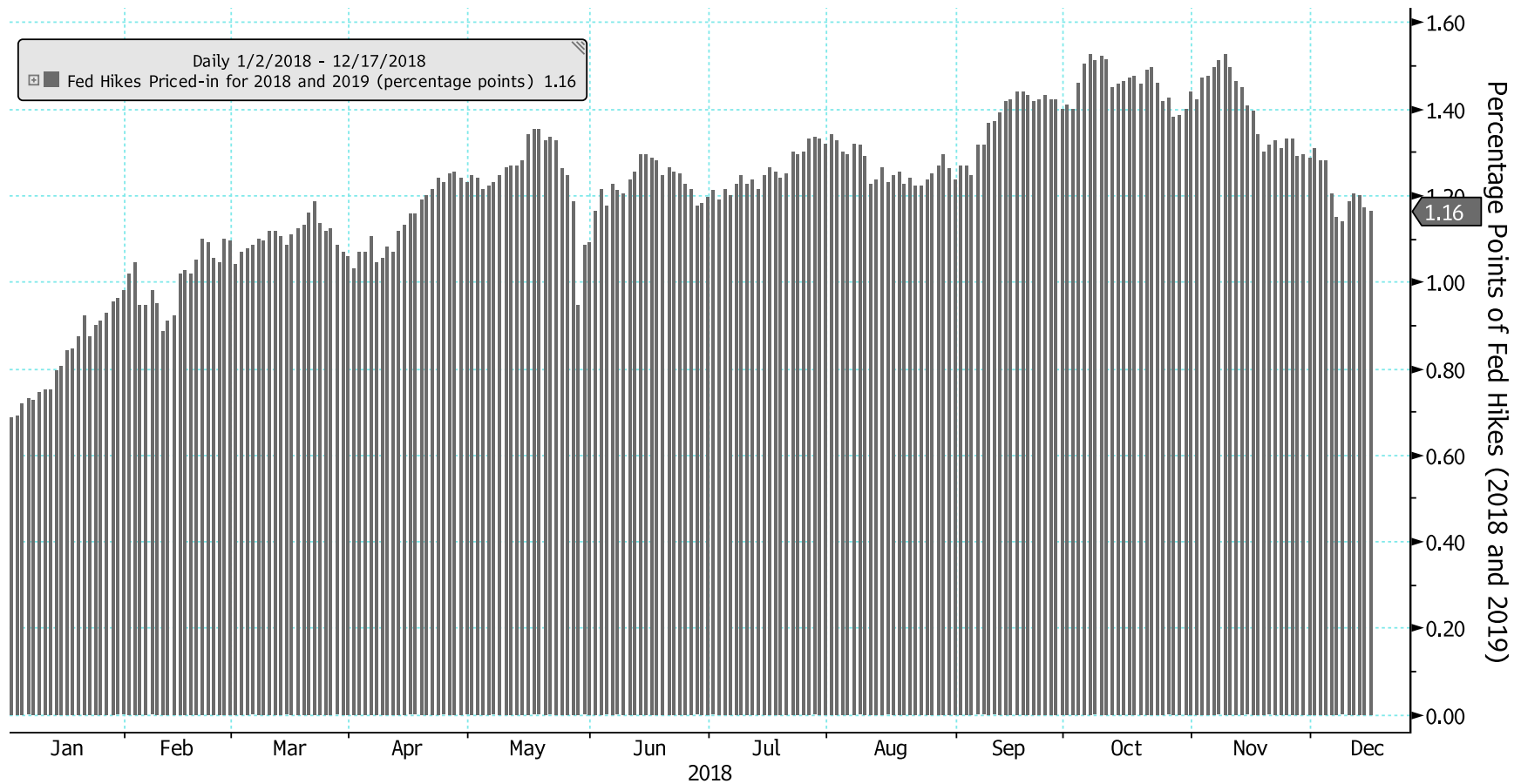


Source: Bloomberg, © Merk Investments LLC

*Analysis: The market is pricing the Federal Funds rate in 1 years time at 2.60%.
(Fed funds futures are priced on the effective rate which is between the upper and lower bounds of the target range,
the current Fed funds target midpoint is at 2.125% (between 2.00 and 2.25))*

Fed Hikes Priced-in for 2018 and 2019 Combined

Based on Fed Funds futures

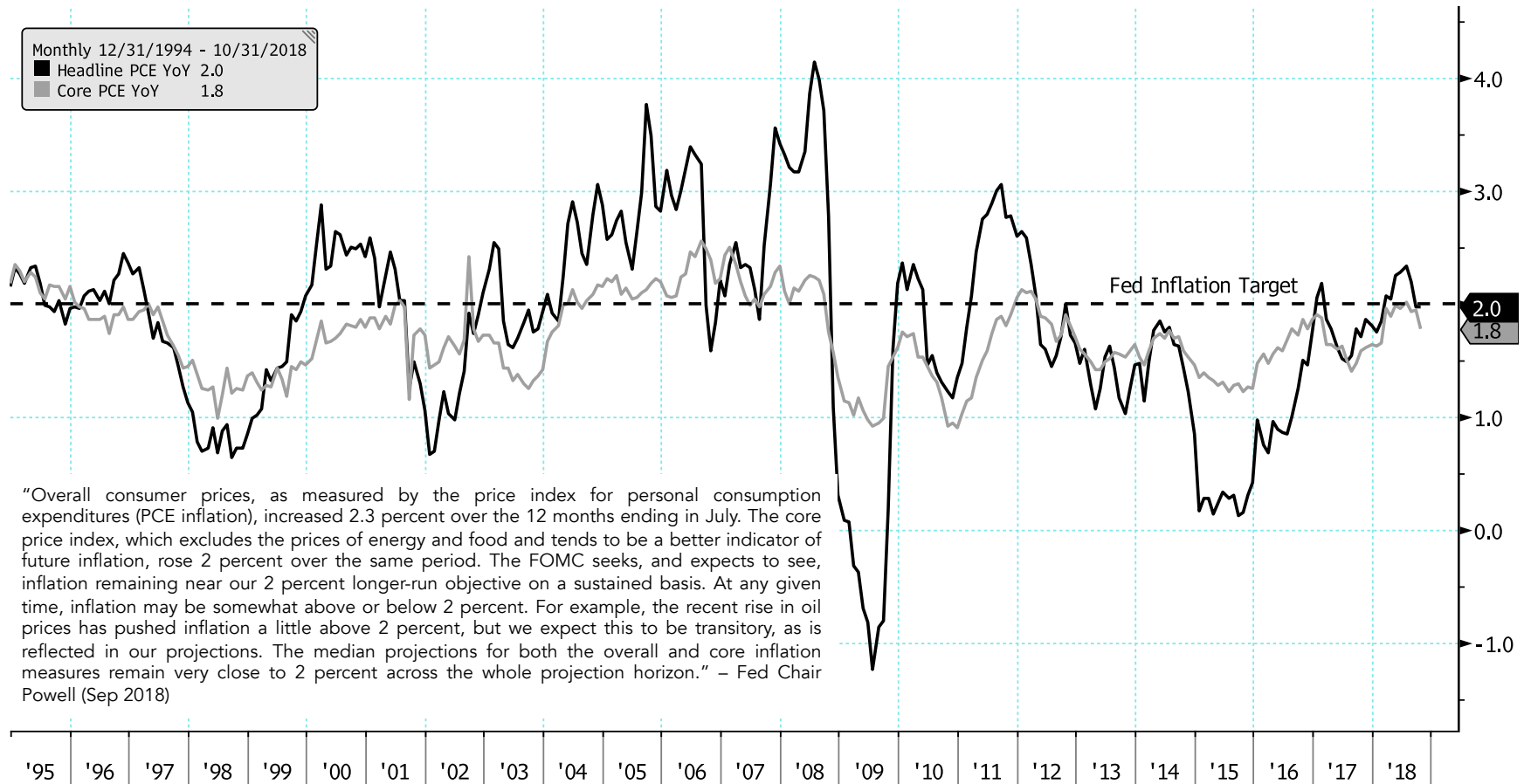


Source: Bloomberg, © Merk Investments LLC

Analysis: The market is pricing about 3.86 hikes for this year and about 0.78 hikes next year for a total of about 4.6 hikes for this year and next (assuming 25bp hikes, i.e., $1.16/0.25 = 4.64$). Three hikes for 2018 are already in the books (the Mar, Jun, and Sep 2018 Fed meetings).

Inflation Readings

The Headline and Core (excluding volatile food and energy prices) Personal Consumption Expenditures (PCE) Index YoY Seasonally Adjusted



Source: Bloomberg, © Merk Investments LLC

*Analysis: The September PCE data shows the headline inflation rate at 2.0%, right at the target of 2.0%. The Core PCE YoY, Chair Powell's preferred measure, is at 1.8%. The Fed expects PCE YoY to run at 2.1% and 2.1% in 2019 and 2020 respectively according to the Fed's latest Summary of Economic Projections. *This chart relates to the price stability mandate**

Market-based Inflation Expectations

10-year "breakeven" basically means the inflation rate that is implied by 10 year Treasury Inflation Protected Securities (TIPS)



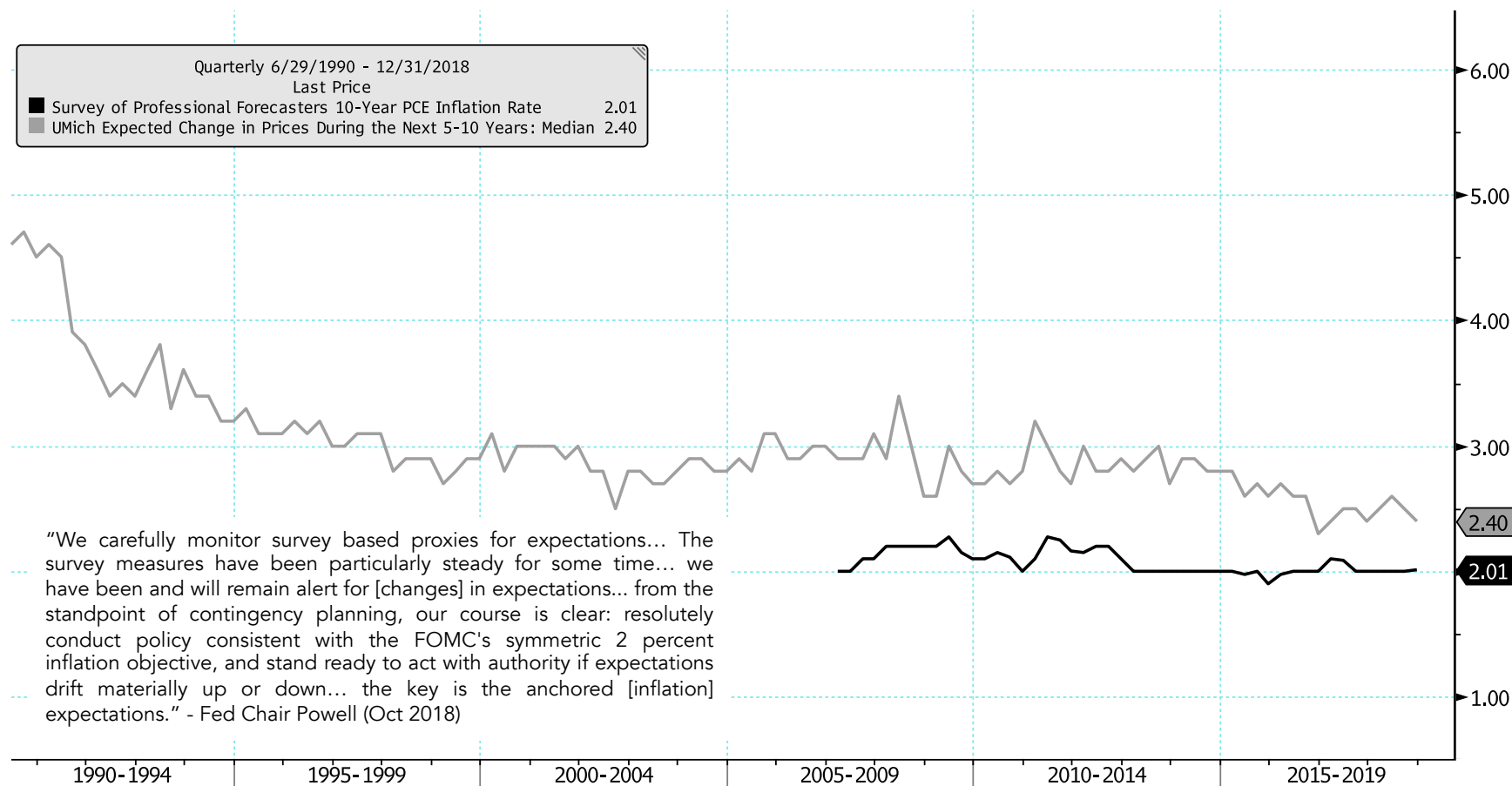
Source: Bloomberg, © Merk Investments LLC

Analysis: The market is suggesting average annual inflation over the next 10 years might be around 1.8%, based on the TIPS. This inflation expectation is calculated by subtracting the 10yr TIPS yield (real rate) from the 10yr US Treasury yield (nominal rate). This is considered a market-based measure, the Fed also looks at other market-based measures as well as survey-based measures. Market based inflation expectations have fallen recently, in my view in large part due to the recent decline in oil prices.

This chart relates to the price stability mandate

Survey-based Inflation Expectations

University of Michigan Consumer Inflation Expectations and Survey of Professional Forecasters Expectations



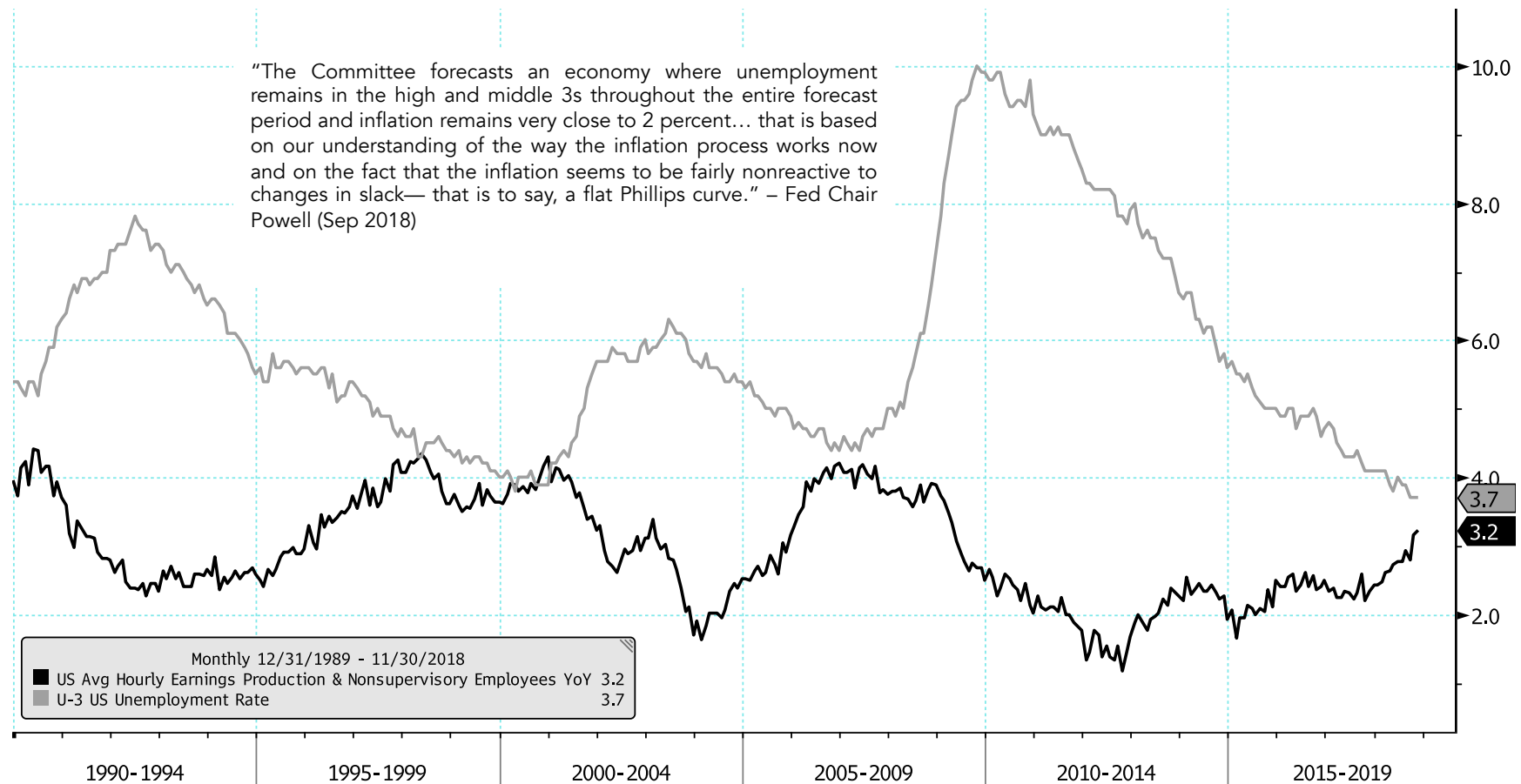
Source: Bloomberg, © Merk Investments LLC

Analysis: Powell is particularly focused on the role of anchored inflation expectations in terms of meeting the Fed's price stability mandate over the medium term. Based on a speech and presentation given in October 2018, it appears he watches the above survey based indicators to monitor for material changes.

This chart relates to the price stability mandate

Unemployment Rate and Wages

The relationship between the unemployment rate and wages is referred to as the “Phillips Curve”



Source: Bloomberg, © Merk Investments LLC

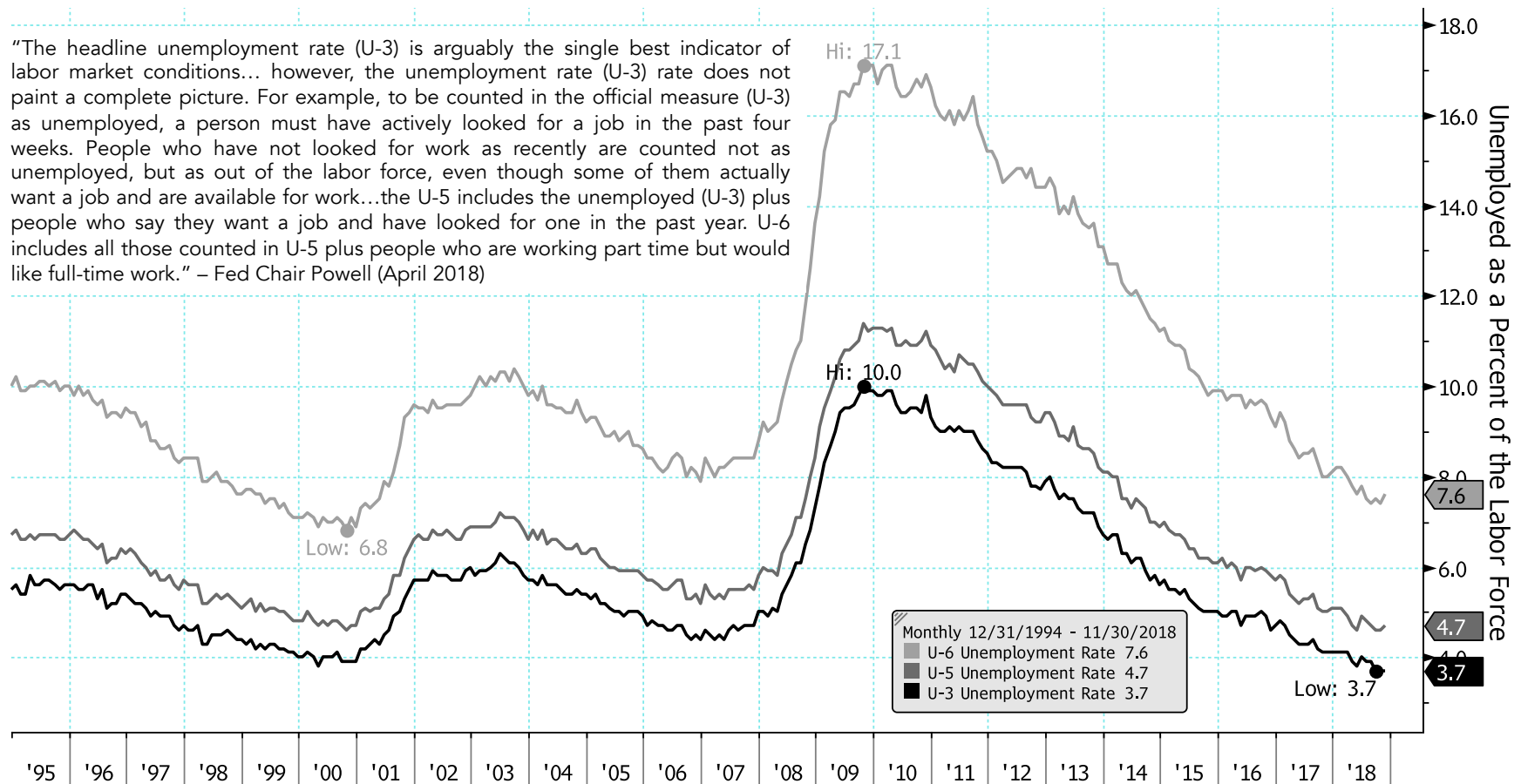
Analysis: Fed policy makers have been surprised by the lack of wage inflation (and general inflation) in recent years. I think in Powell's mind that suggests the labor market might not be at maximum employment yet. Having said that, the wage inflation rate seems to be finally picking up.

This chart relates to both the price stability mandate and the maximum employment mandate

Unemployment Rate Measures

U-3, U-5, U-6 Unemployment Rates

"The headline unemployment rate (U-3) is arguably the single best indicator of labor market conditions... however, the unemployment rate (U-3) rate does not paint a complete picture. For example, to be counted in the official measure (U-3) as unemployed, a person must have actively looked for a job in the past four weeks. People who have not looked for work as recently are counted not as unemployed, but as out of the labor force, even though some of them actually want a job and are available for work...the U-5 includes the unemployed (U-3) plus people who say they want a job and have looked for one in the past year. U-6 includes all those counted in U-5 plus people who are working part time but would like full-time work." – Fed Chair Powell (April 2018)

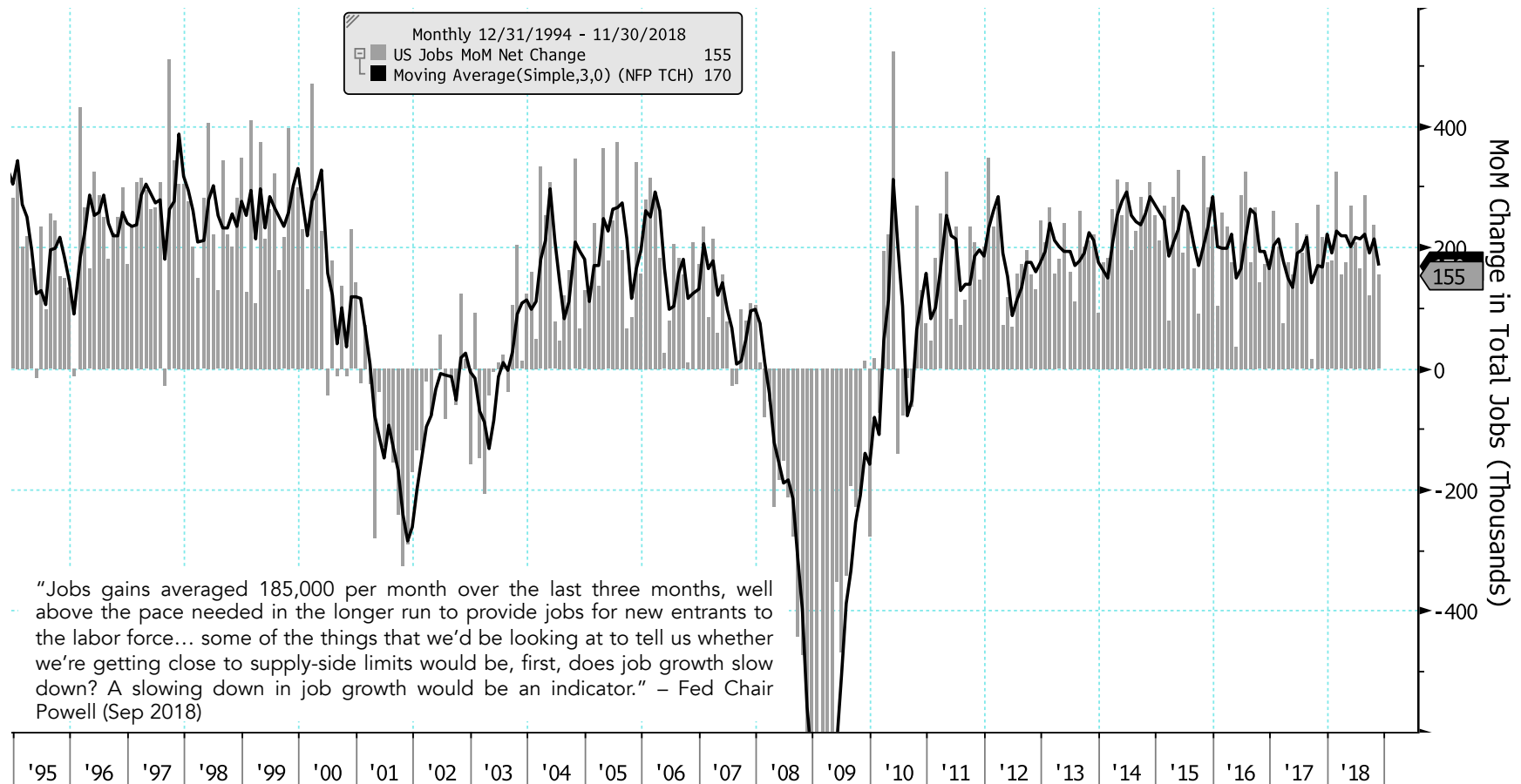


Source: Bloomberg, © Merk Investments LLC

*Analysis: The U-3 rate remained stable at 3.7% in the latest jobs report, at the cycle low.
*This chart relates to the maximum employment mandate**

Job Gains

The Net Monthly Change in Non-farm Payrolls with 3-month Moving Average



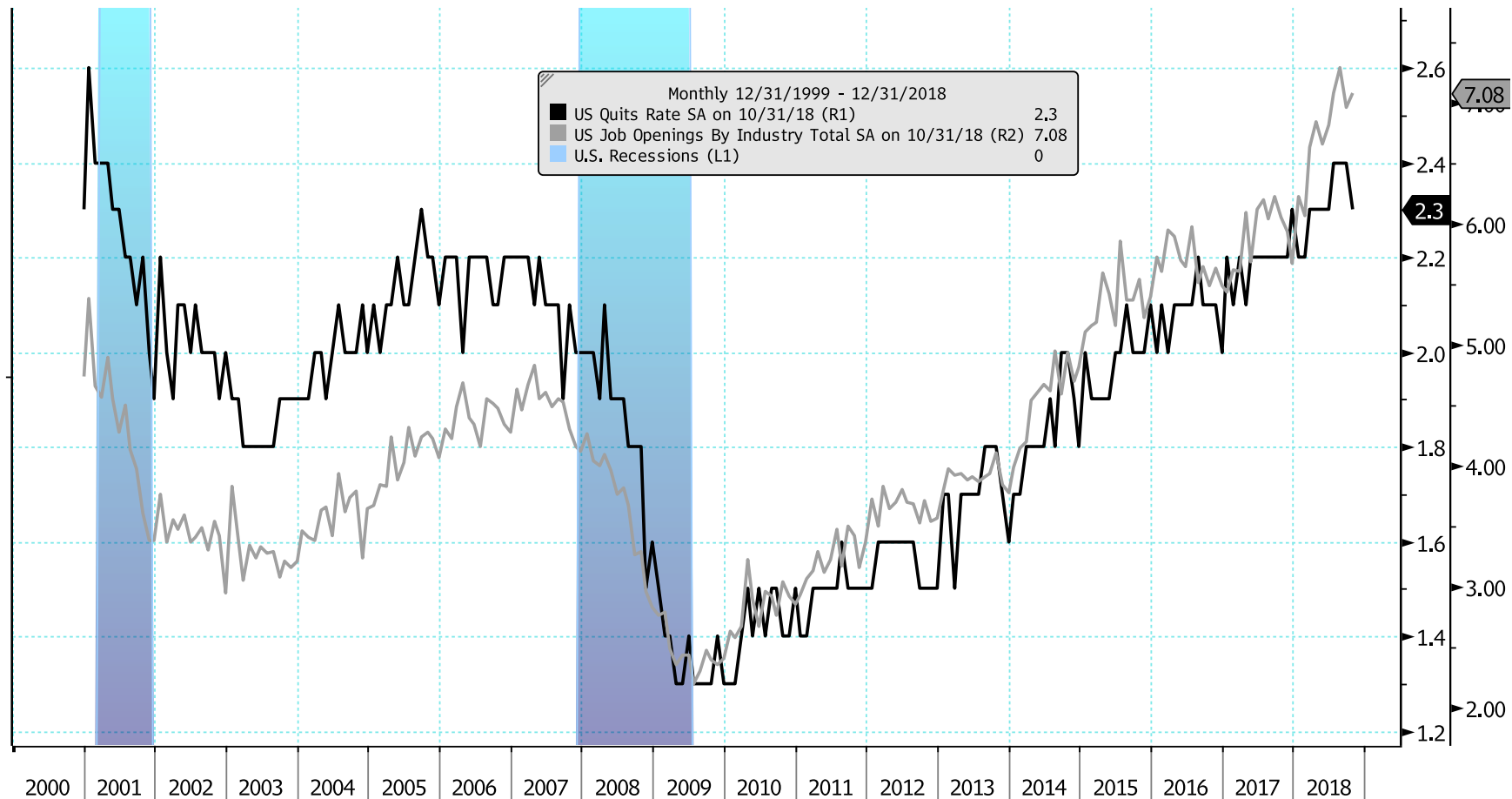
Source: Bloomberg, © Merk Investments LLC

Analysis: The 3-month moving average of the change in non-farm payrolls is at 170k, likely above the pace needed to provide jobs to new entrants into the labor force.

This chart relates to the maximum employment mandate

Jobs Openings and Labor Turnover Survey (JOLTS)

Jobs Openings (millions) and Quits Rate (percent)



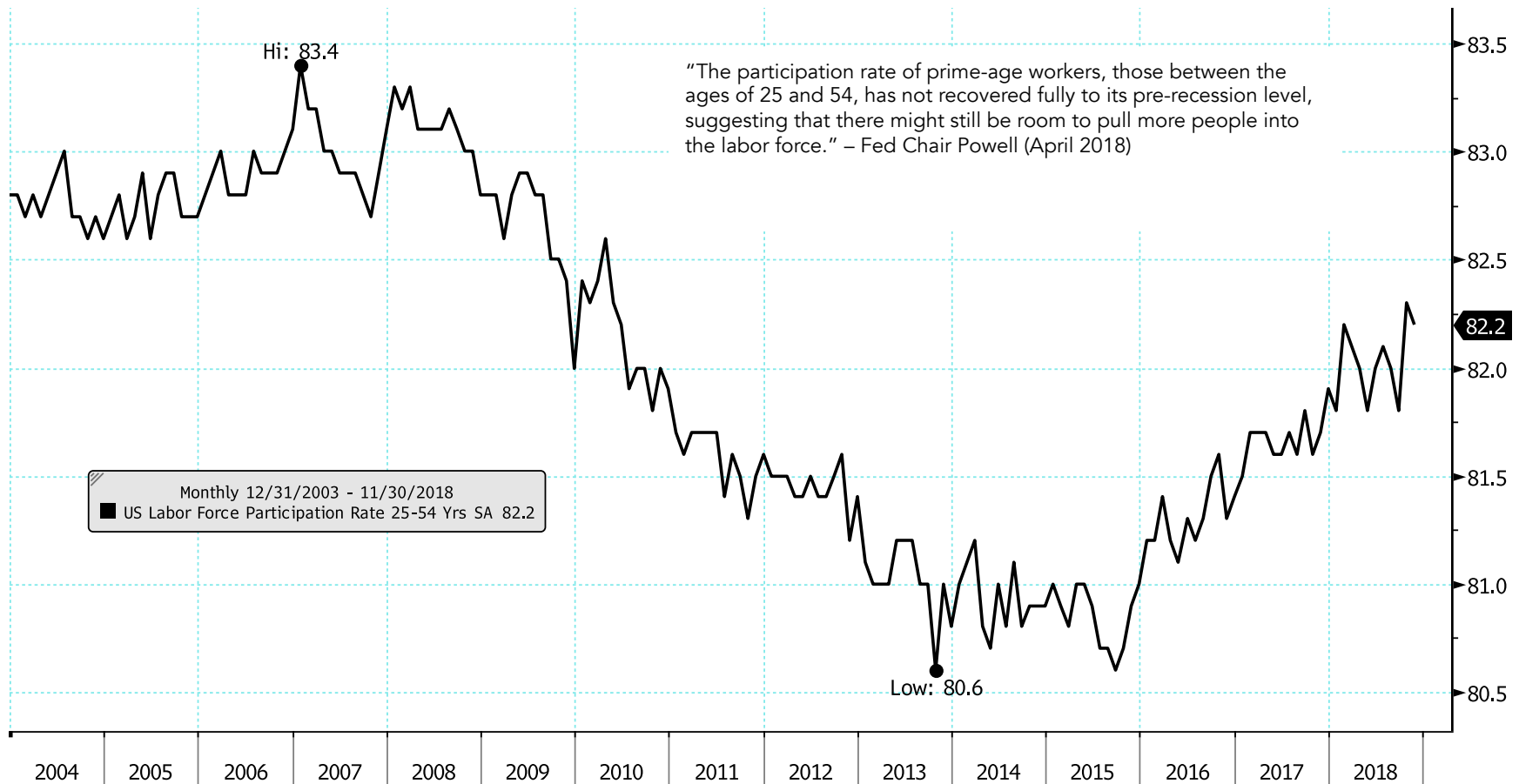
Source: Bloomberg, © Merk Investments LLC

Analysis: Former Fed Chair Yellen was an advocate of looking at the JOLTS report for guidance on the labor market. For the time being the JOLTS report continues to look positive as the Job Openings and Quits Rate are high and trending higher still- generally a strong sign for the labor market.

This chart relates to the maximum employment mandate

Prime-age (25-54) Labor Force Participation Rate

The labor force is the percent of the population that is either working or actively looking for work, in this case between the ages of 25-54



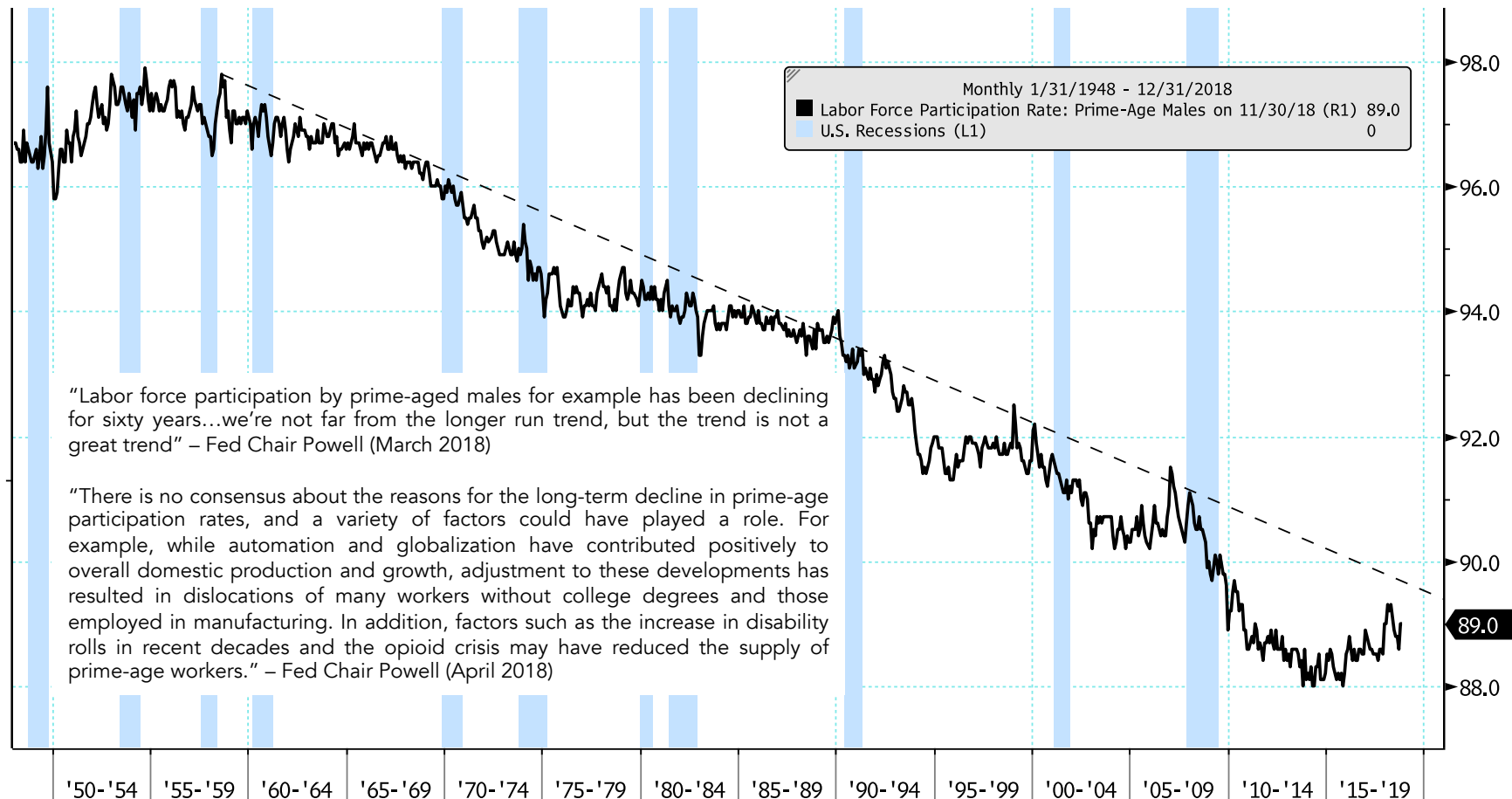
Source: Bloomberg, © Merk Investments LLC

*Analysis: The prime-age participation rate is below the previous cycle high (although trending higher).
 I think in Powell's mind that suggests the labor market might not be at maximum employment yet.*

This chart relates to the maximum employment mandate

Prime-age (25-54) Male Labor Force Participation Rate

The labor force is the percent of the population that is either working or actively looking for work, in this case males between the ages of 25-54



Source: Bloomberg, © Merk Investments LLC

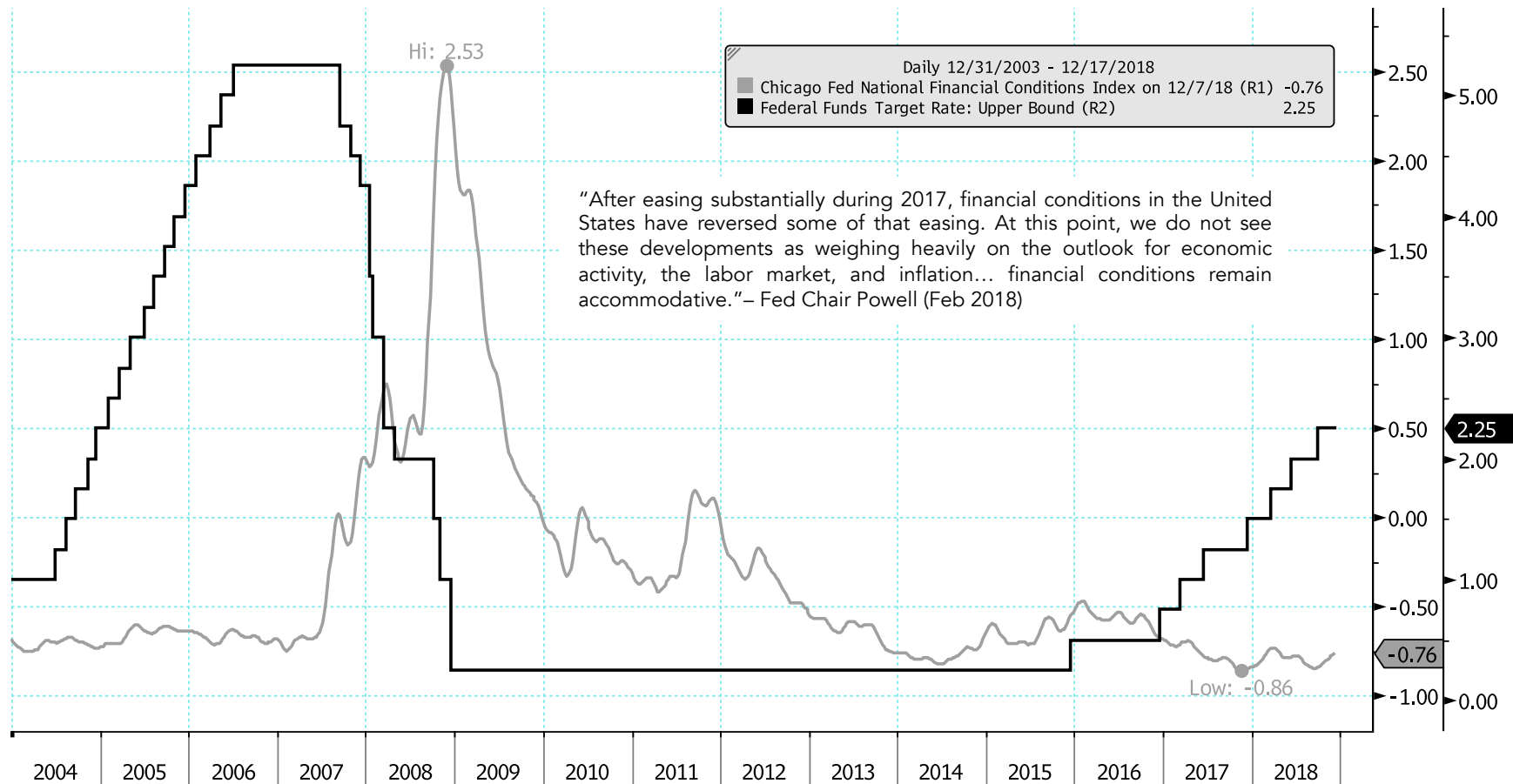
Analysis: A prime-age male labor force participation rate above the dotted line might represent a labor market that is close to maximum employment in Powell's framework.

The latest data point shows an uptick.

This chart relates to the maximum employment mandate

Fed Funds Rate and Financial Conditions

Chicago Fed National Financial Conditions Index and the Fed Funds Rate

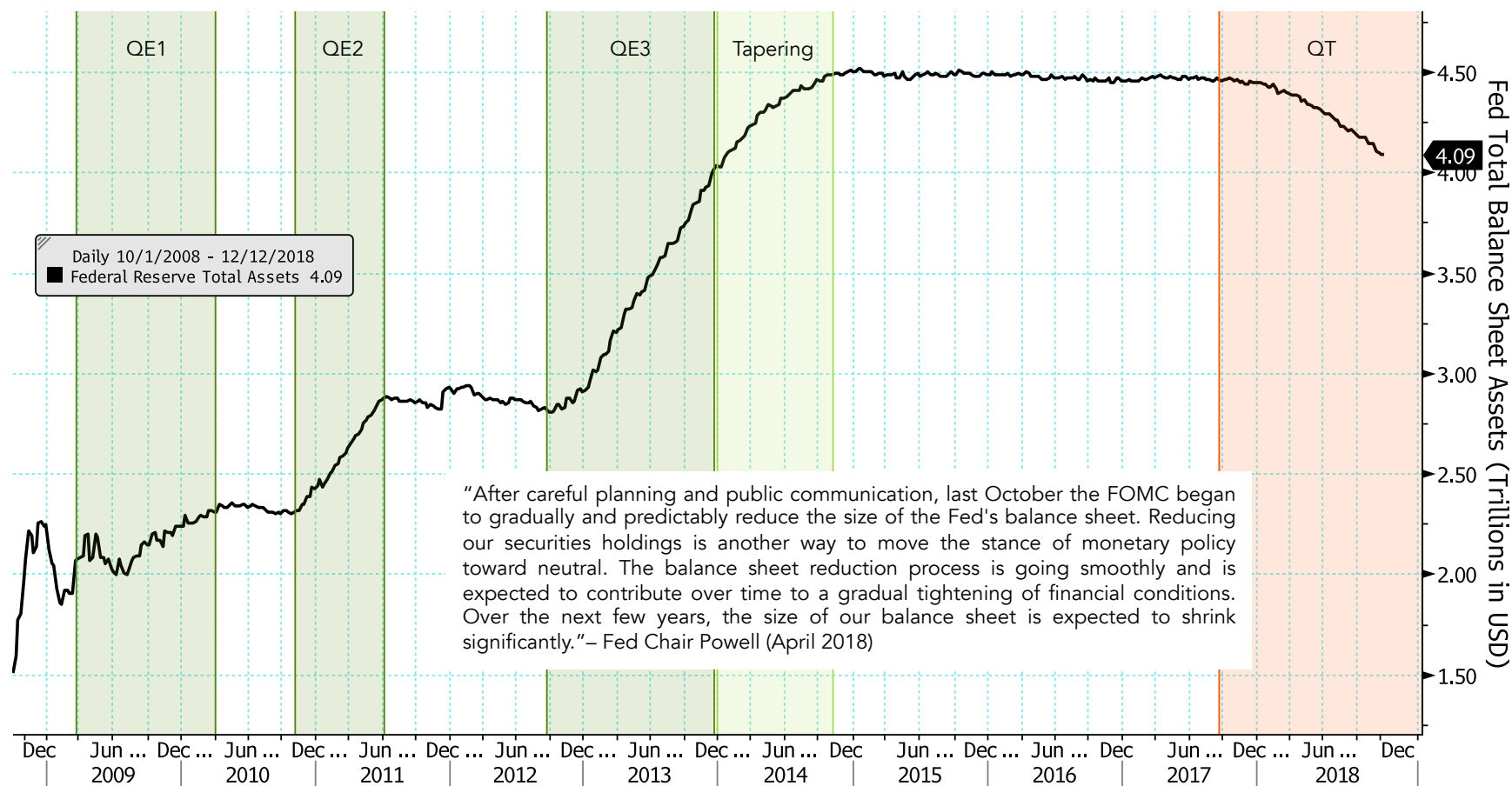


Source: Bloomberg, © Merk Investments LLC

Analysis: Financial stability, which can be measured by financial conditions, is sometimes thought of as an implicit third mandate of the Fed. Fed hikes so far have had little impact on financial conditions, although Fed officials have historically commented that monetary policy acts with a lag (some estimates suggest an 18 month lag). The financial conditions index has recently started to show an uptrend, meaning tighter financial conditions.

Fed Balance Sheet

Federal Reserve Balance Sheet Total Assets and QE/QT Operation Phases

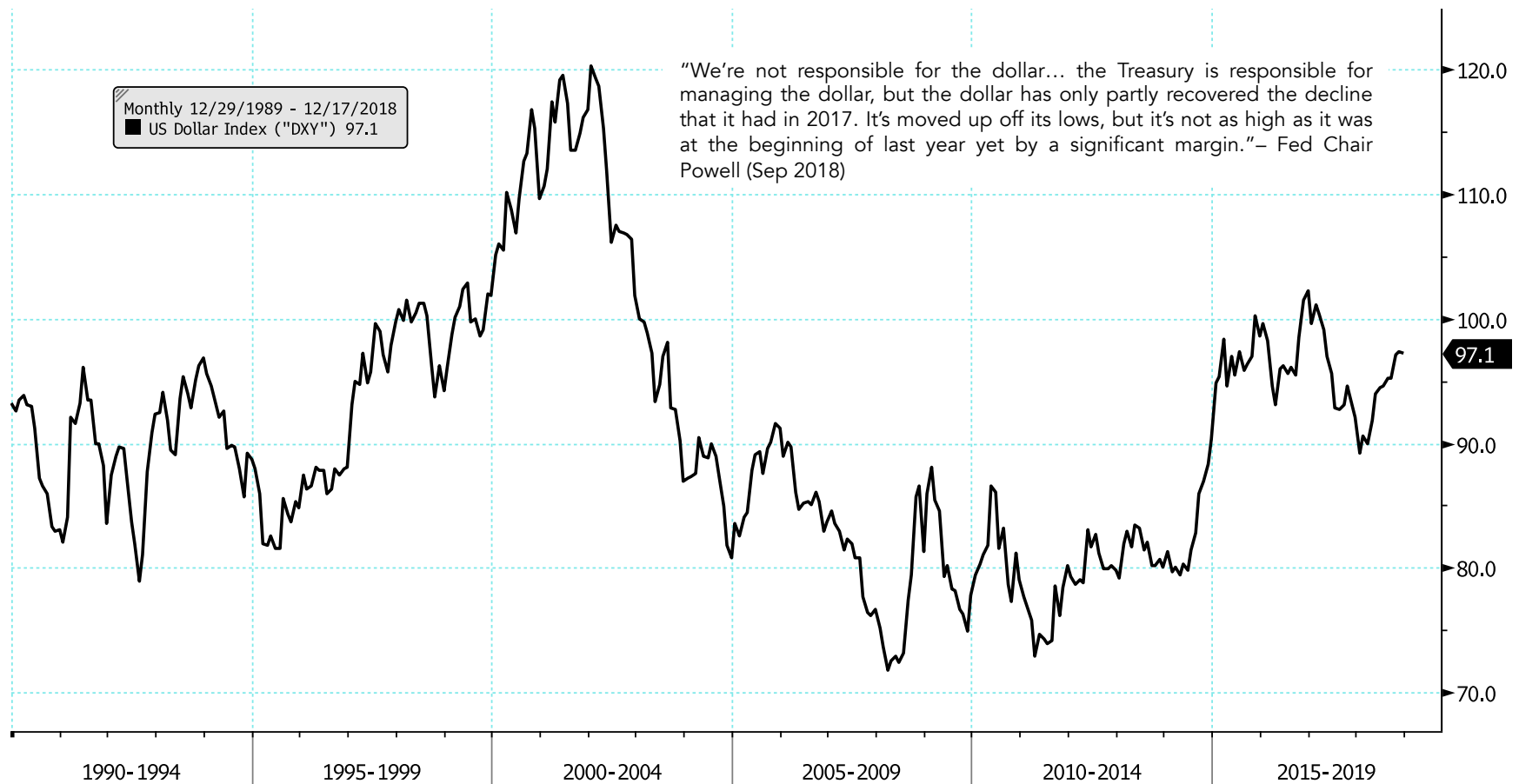


Source: Bloomberg, © Merk Investments LLC

Analysis: Fed balance sheet contraction might get financial conditions to tighten more than the rate hikes have, and balance sheet normalization is set on “auto-pilot” whereas the rate hike decisions are made on a meeting by meeting basis and are data dependent. As mentioned on the previous slide, monetary policy can act with a lag, the rate hikes and Fed balance sheet action from 2017 might not be fully felt until mid-2019. As of October 2018 normalization is now running at full pace after a gradual ramp up from October 2017 to October 2018.

U.S. Dollar

Dollar Index ("DXY")

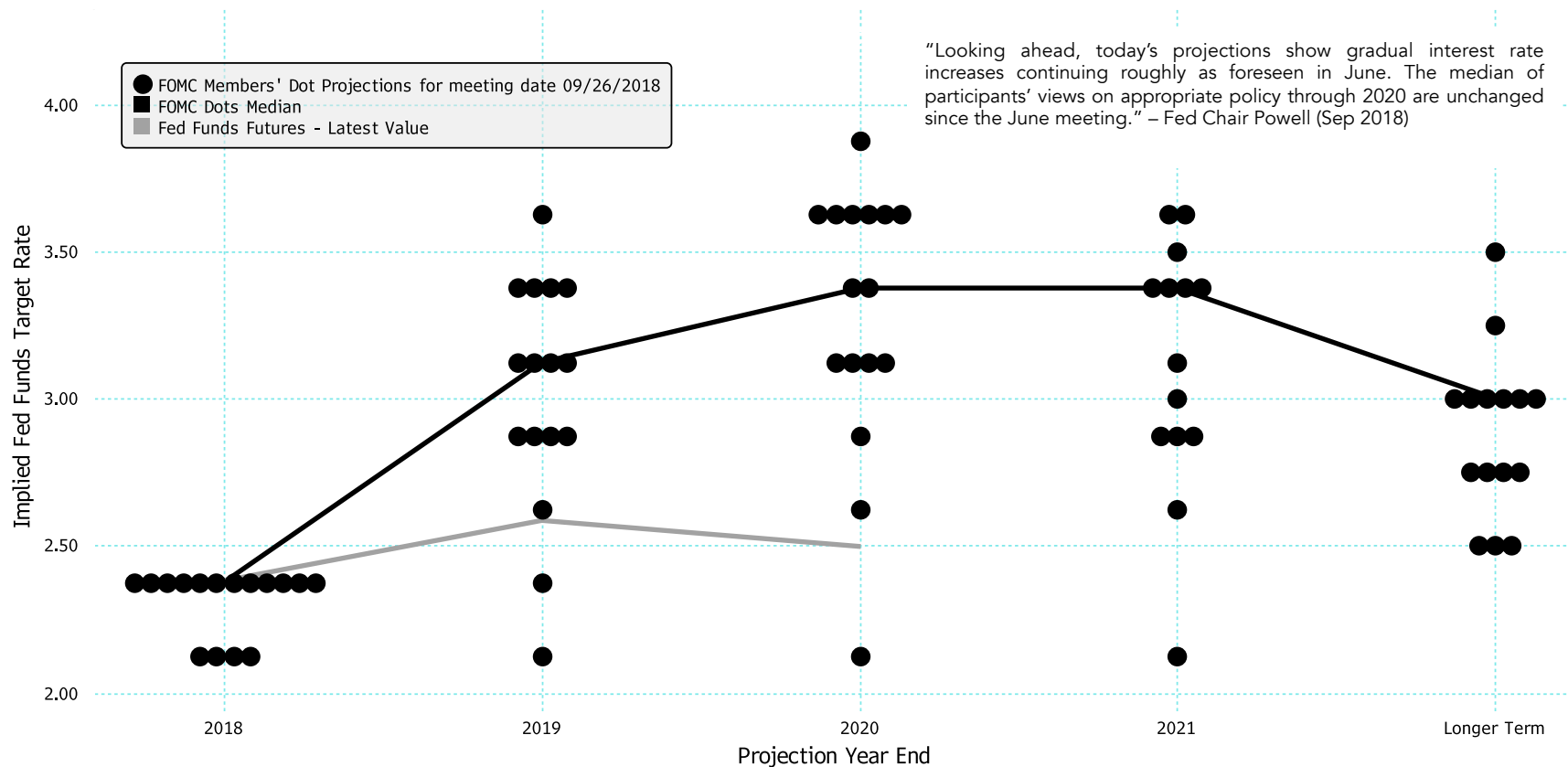


Source: Bloomberg, © Merk Investments LLC

Analysis: The Powell Fed does not seem to be concerned about the dollar currently.

Fed "Dot Plot"

FOMC participants' assessments of appropriate monetary policy from September 2018 Meeting, and Fed Funds Futures from 12/17/18



Source: Bloomberg, © Merk Investments LLC

Analysis: The dots represent FOMC participants' assessments of appropriate monetary policy. The market pricing, represented by the Fed Funds Futures (grey line) is near the median dot for year end 2018 but is substantially below the median dots for year end 2019 and 2020. The Fed will update the dot plot at the December meeting, market participants will be watching for any shift lower in the dots.

Fed Median Economic Projections: Sep 2018

FOMC participants' economic projections are under their individual assessments of projected appropriate monetary policy

Variable	2018	2019	2020	Longer run
Change in Real GDP	3.1%	2.5%	2.0%	1.8%
Unemployment Rate	3.7%	3.5%	3.5%	4.5%
PCE Inflation	2.1%	2.0%	2.1%	2.0%
Core PCE Inflation	2.0%	2.1%	2.1%	N/A
Fed Funds Rate	2.4%	3.1%	3.4%	2.9%

Source: Federal Reserve, © Merk Investments LLC

Analysis: The above economic projections of Federal Reserve Board members and Federal Reserve Bank presidents are made under their individual assessments of projected appropriate monetary policy, which are represented in the previous dot chart.

The longer run inflation expectation is 2.0%, the longer run Fed Funds rate projection is 2.9% (3.0% in terms of the upper range of the Fed funds target rate), which represents the Fed's best guess of the natural rate of interest. The natural rate can be disaggregated into a natural real rate (i.e., net of inflation) and an inflation rate. The Fed's longer run inflation projection is 2.0% which suggests they view the natural real rate of interest around 1.0%, which is roughly consistent with NY Fed President Williams' academic work on estimating the natural real rate of interest.

The longer run unemployment rate projection is 4.5%, which is the Fed's best guess of the natural unemployment rate. At the current rate of 3.7% there is some chance that the economy is operating above capacity.

Who's Who at the Fed

Category	Name	Role	Status	Dove-Hawk Scale*
Board of Governors	Jerome Powell	Chair	Voter	Neutral
Board of Governors	Richard Clarida	Vice Chair	Voter	Neutral
Board of Governors	Lael Brainard	Governor	Voter	Neutral/Dovish
Board of Governors	Randal Quarles	Governor	Voter	Neutral
Board of Governors	Michelle Bowman	Governor	Voter	Neutral/Hawkish
Board of Governors	[Nellie Liang (nominee)]	Governor	[Voter]	
Board of Governors	[vacant]	Governor	[Voter]	
Regional President	John Williams	New York Fed President	Voter	Neutral/Hawkish
Regional President	Eric Rosengren	Boston Fed President		Neutral/Hawkish
Regional President	Patrick Harker	Philadelphia Fed President		Neutral
Regional President	Loretta Mester	Cleveland Fed President	Voter	Neutral/Hawkish
Regional President	Thomas Barkin	Richmond Fed President	Voter	Neutral/Hawkish
Regional President	Raphael Bostic	Atlanta Fed President	Voter	Neutral/Dovish
Regional President	Charles Evans	Chicago Fed President		Neutral/Dovish
Regional President	James Bullard	St. Louis Fed President		Dovish
Regional President	Neel Kashkari	Minneapolis Fed President		Dovish
Regional President	Esther George	Kansas City Fed President		Hawkish
Regional President	Robert Kaplan	Dallas Fed President		Neutral/Hawkish
Regional President	Mary Daly	San Francisco Fed President	Voter	Neutral/Dovish

Source: Bloomberg, © Merk Investments LLC

Analysis: All board members vote. The NY Fed President always votes, and then four rotating regional presidents vote. There are three vacancies on the board, two of which President Trump has yet to nominate. President Trump nominated Nellie Liang for the Board in early September. John Williams took over for William Dudley at the NY Fed in June. The SF Fed named Mary Daly as Williams's replacement- she started October 1st.

**The dove-hawk scale relates to the views on appropriate monetary policy: with hawks likely representing the upper end of the spectrum on the dot plot and the doves likely representing the lower end of the spectrum.*

Conclusion/Thoughts

The Fed's monetary policy has important implications for the bond, stock, and currency markets, and the economic cycle generally. In this chart series my goal is to track the data that I think the Fed officials, and Chair Powell specifically, are most focused on based on ongoing public communications.

Powell has emphasized a gradual approach to raising the federal funds rate. He views the current monetary policy stance as accommodative and aims to bring the federal funds rate up to the normal longer-run rate (currently estimated at 3.00%) in line with the timing of inflation moving to the 2 percent target on a sustainable basis and the labor market moving to a state of maximum employment. In Powell's framework a federal funds rate at the normal longer-run rate would represent a neutral monetary policy stance, neither accommodative nor restrictive.

Powell's approach is probably best summarized in this quote from the June Fed Meeting press conference statement:

"We continue to believe that a gradual approach for increasing the federal funds rate will best promote a sustained expansion of economic activity, strong labor market conditions, and inflation near our symmetric 2 percent goal. We are aware that raising rates too slowly might raise the risk that monetary policy would need to tighten abruptly down the road in response to an unexpectedly sharp increase in inflation or financial excesses, jeopardizing the economic expansion. Conversely, if we raise interest rates too rapidly, the economy could weaken, and inflation could continue to run persistently below our objective."

Four rate hikes this year (three already done) and three rate hikes next year, would bring the federal funds rate to 3.25%. That is the rate path suggested by the median Fed estimates on the Summary of Economic Projections (SEP) Dot Plot from September. The market, as of writing, is pricing-in less than five rate hikes combined for this year and next, about 3.86 hikes this year only 0.78 hikes next year, which would suggest a likely federal funds rate between 2.50% and 2.75% at the end of next year. The market, as of writing, is pricing in about an 80% chance for a rate hike at the December Fed meeting.

-Nick Reece, CFA

Disclosure

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