Daily Comment

By Bill O'Grady and Thomas Wash

Looking for something to read? See our Reading List; these books, separated by category, are ones we find interesting and insightful. We will be adding to the list over time.

[Posted: January 17, 2019—9:30 AM EST] Global equity markets are generally lower this morning. The EuroStoxx 50 is down 0.4% from the last close. In Asia, the MSCI Asia Apex 50 was unchanged from the prior close. Chinese markets were lower, with the Shanghai composite down 0.4% and the Shenzhen index down 0.9%. U.S. equity index futures are signaling a higher open. With 27 companies having reported, the S&P 500 Q4 earnings stand at $40.40, lower than the $40.86 forecast for the quarter. The forecast reflects a 13.4% increase from Q4 2017 earnings. Thus far this quarter, 77.8% of the companies reported earnings above forecast, while 18.5% reported earnings below forecast.

Equities are drifting lower this morning. Here is what we are watching:

Brexit: After facing the largest defeat in modern Parliamentary history, PM May survived a no-confidence vote but not by a great margin.[1] We have been discussing Brexit at length, so we don't have much to add this morning. But, here are a few points:

1. To some extent, Brexit is probably signaling realignments within the major U.K. parties.[2] Although it's still unclear what exactly the British want, we think there are majorities for two goals—leaving the EU for border protection and having as little trade disruption as possible. To achieve those goals, the U.K. political system needs to realign, with centrists in both Labour and the Conservatives banding across party lines to build a Brexit that people can live with. Perhaps the Liberal party makes a resurgence as the home for these potential defectors. But, it looks like neither Labour nor the Tories, as currently constituted, can come up with a workable solution.
2. The EU isn't giving anything more to the U.K. They want the British to offer a new plan. And, the EU is starting to make active plans for a hard Brexit. Overall, a hard Brexit won't be pleasant for the EU either.[3]

[1] https://www.nytimes.com/2019/01/16/world/europe/brexit-theresa-may-no-confidence-vote.html?emc=edit_mbe_20190117&nl=morning-briefing-europe&nlid=567726720190117&te=1
[2] https://www.nytimes.com/2019/01/16/world/europe/brexit-jeremy-corbyn.html?emc=edit_mbe_20190117&nl=morning-briefing-europe&nlid=567726720190117&te=1 and https://www.ft.com/content/e3cb91d0-1985-11e9-9e64-d150b3105d21?emailId=5c3fd5fda9dcea00042c1321&segmentId=22011ee7-896a-8c4c-22a0-7603348b7f22 and https://www.ft.com/content/9b40ef02-1974-11e9-9e64-d150b3105d21?emailId=5c3fd5fda9dcea00042c1321&segmentId=22011ee7-896a-8c4c-22a0-7603348b7f22
[3] https://www.nytimes.com/2019/01/16/opinion/what-to-expect-when-youre-expecting-brexit.html?emc=edit_mbe_20190117&nl=morning-briefing-europe&nlid=567726720190117&te=1 and

3. Given the uncertainty on both sides, it is reasonable to think that the March 29 exit date will be delayed.[4] However, that will require a change on the part of the EU, which has indicated it won't give an extension without a good reason, e.g., new elections, new referendum, new plan. We suspect this is a bluff on the EU's part, but it is possible that the lack of a Plan B from London and intransigence from Brussels will lead to a hard Brexit. The financial markets are probably underestimating the chances of this outcome.

Trade and China: One the one hand, we are seeing talks progress. Vice Premier Liu has confirmed he will visit the U.S. for talks at the end of the month.[5] On the other hand, actions against Huawei (002502.sz, CNY 4.23) and other Chinese tech firms are accelerating. There is legislation in Congress designed to ban the sale of U.S. components to Chinese companies that violate U.S. sanctions or export control laws.[6] These laws would force the administration to reduce tech trade between China and the U.S. Meanwhile, the DOJ is investigating Huawei for stealing trade secrets.[7] Essentially, U.S. and Chinese negotiators are trying to make some sort of trade deal while there are active steps being taken to restrict technology trade between the two nations.[8] Although this would seem to doom current talks, we think both Presidents Trump and Xi are working on two time frames, short term and long term. In the long run, both leaders realize the relationship between China and the U.S. is fracturing into a classic established versus rising superpower clash, a factor that will dominate the next decade. However, in the short run, both need a deal that will boost confidence and economic activity. Xi can clearly see that the Chinese economy is slumping and needs trade relief. Trump can clearly see the U.S. economy is slumping and needs something to bolster confidence. Thus, we can have a short-term agreement in the midst of what may turn out to be the next major global conflict.

On a side note, President Trump's obsession with trade tariffs remains unabated. He is expected to threaten car sanctions on the EU in order to open European agricultural trade.[9] The EU has opposed opening the European market to American agriculture because it would upset the delicate system of preferences and subsidies that maintains peace in the EU.[10]

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https://www.washingtonpost.com/world/2018/12/13/heres-what-eu-has-lose-event-no-deal-brexit/?utm_term=.557c02f715b7&wpisrc=nl_todayworld&wpmm=1

[4] https://www.politico.eu/article/brexit-what-now-theresa-may-jeremy-corbyn-no-confidence-vote-no-deal/?utm_source=POLITICO.EU&utm_campaign=15a77a5fb6-EMAIL_CAMPAIGN_2019_01_17_05_42&utm_medium=email&utm_term=0_10959edeb5-15a77a5fb6-190334489

[5] https://uk.reuters.com/article/uk-usa-trade-china-visit/china-confirms-vice-premier-liu-to-visit-u-s-for-trade-talks-jan-30-31-idUKKCN1PB0K5

[6] https://www.reuters.com/article/us-usa-china-huawei-tech/u-s-legislation-steps-up-pressure-on-huawei-and-zte-china-calls-it-hysteria-idUSKCN1PA2LU

[7] https://www.wsj.com/articles/federal-prosecutors-pursuing-criminal-case-against-huawei-for-alleged-theft-of-trade-secrets-11547670341

[8] It's not just the U.S. https://www.reuters.com/article/us-germany-china-huawei/germany-considering-ways-to-exclude-huawei-from-5g-auction-report-idUSKCN1PA32B

[9] https://www.reuters.com/article/us-autos-trade/trump-inclined-to-impose-new-u-s-auto-tariffs-senator-idUSKCN1PA31S and https://www.ft.com/content/a852539e-19d7-11e9-9e64-d150b3105d21?segmentId=a7371401-027d-d8bf-8a7f-2a746e767d56

[10] https://www.ft.com/content/59735580-18e1-11e9-b93e-f4351a53f1c3?segmentId=a7371401-027d-d8bf-8a7f-2a746e767d56

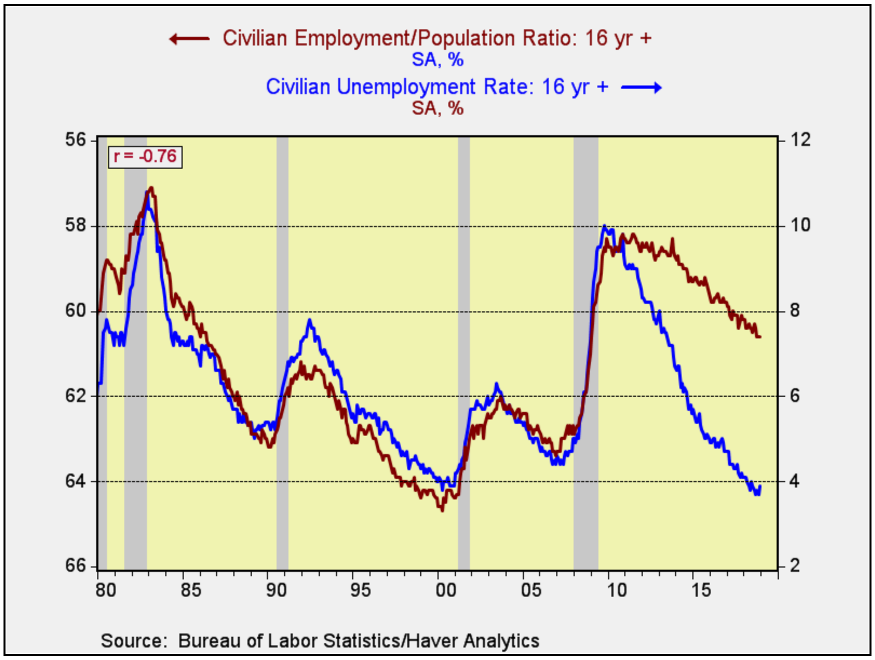
A depressed Beige Book: The Federal Reserve released the Beige Book yesterday, which is an overall survey of economic activity at the regional district level. Although eight of the 12 district banks reported "modest to moderate" growth levels, and all reported tight labor markets, company sentiment is weakening on trade uncertainty and financial market volatility. We note that many of the regional Fed manufacturing reports have weakened recently as well. We suspect the Beige Book report reflects the recent shift of a pause in tightening.[11]

An important defense signal: Germany is nearing a decision on replacing the Luftwaffe's 85 Tornado fighters, a mid-1970s air platform.[12] Berlin is considering either the Typhoon, an Airbus (EADSY, USD 26.37) plane built by a group of European nations, or one of three American platforms, the F-35, F/A-18E/F or the F-15E. Selecting a U.S.-built aircraft would be welcomed by the Trump administration and might ease trade tensions. However, shunning the Eurofighter will likely doom Airbus's defense business to near irrelevance. To some extent, it all comes down to Germany's perception of NATO and future relations with the U.S.[13] If Germany sees Trump as a "one-off," a political accident that won't be repeated, then it should select a U.S. airframe. The Typhoon can't carry nuclear weapons and thus can't fulfill its treaty obligations with the U.S. that state European nations must provide aircraft for U.S. pilots carrying American nuclear missiles to protect Europe. On the other hand, if Germany views Trump as a symptom of a deeper retreat from U.S. hegemony, a reflection of a trend rather than a fluke, then it will likely choose the Eurofighter, the Typhoon, because Europe will need its own indigenous airframe as the relationship with the U.S. becomes uncertain. We will be watching to see what Germany decides in the coming months.

Tsipras survives: Greek PM Tsipras survived a no-confidence vote following the name-change vote in Northern Macedonia. The margin was close, 151-148. It looks like Greece will be heading toward elections soon as Tsipras is now running a minority government.[14]

A take on the labor markets: One of our most iconic graphs in this recovery has been the divergence between the employment/population ratio and the unemployment rate.

[11] https://www.ft.com/content/0a942fde-19d6-11e9-9e64-d150b3105d21?segmentId=a7371401-027d-d8bf-8a7f-2a746e767d56
[12] https://www.ft.com/content/8a3ef664-8373-11e8-96dd-fa565ec55929
[13] https://www.ft.com/content/34a7a78e-15cf-11e9-a581-4ff78404524e?segmentId=a7371401-027d-d8bf-8a7f-2a746e767d56
[14] https://www.nytimes.com/2019/01/16/world/europe/greece-tsipras-confidence-vote.html?emc=edit_mbe_20190117&nl=morning-briefing-europe&nlid=56772672020190117&te=1



From 1980 to 2010, the correlation between these two series was -95% (the employment/population ratio scale is inverted on the above graph). Adding the next eight years has reduced the correlation to the current level of -76%. This chart represents the biggest unknown for monetary policymakers. If the unemployment rate is the accurate representation of slack in the economy then the policy rate is too low and the Fed needs to tighten aggressively. If the employment/population ratio is actually the better measure of slack then the Fed has achieved policy neutrality.

Confirming data supports both sides of the argument, although the preponderance of data tends to favor the employment/population ratio. Until recently, wages have been stagnant and it is unclear whether the recent rise is due to demand or minimum wage legislation. The labor force has tended to rise even when the unemployment rate would suggest that additions to the labor force should be difficult. On the other hand, the JOLTS report shows that hires exceed job openings by a persistently wide margin.

A recent report from Axios[15] suggests that firms, facing a tight labor market, have taken unusual steps to draw the long-term unemployed back into the labor market with training and other forms of unconventional job support. These include helping homeless people find housing, reliable transportation and childcare as part of the hiring process. This population includes the recently incarcerated[16]or currently incarcerated.[17]

These reports suggest there is much more slack in the labor market than the unemployment rate indicates. It is true that reducing this slack will depress profit margins; firms are required to

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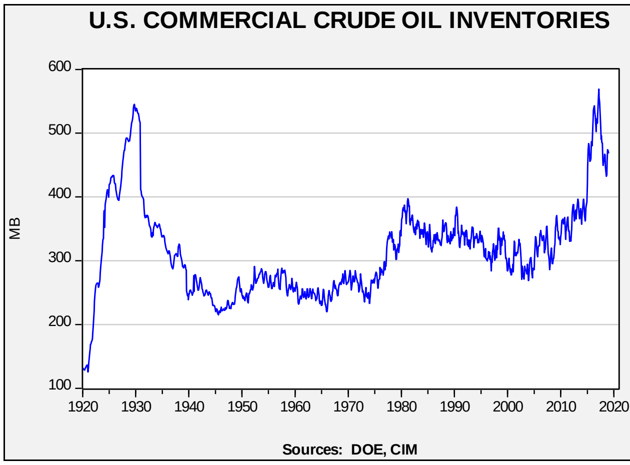
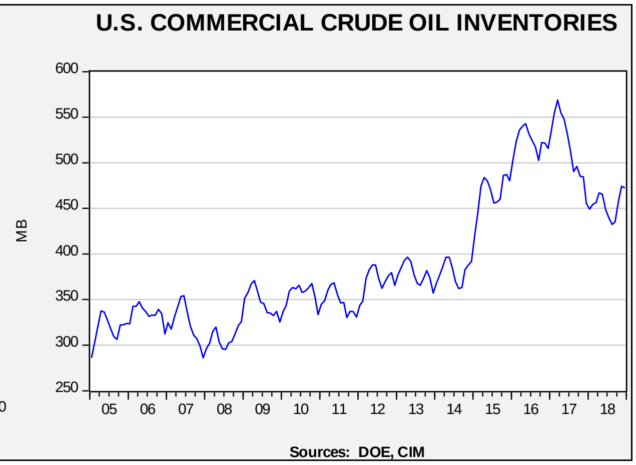
[15] https://www.axios.com/companies-cities-help-long-term-unemployed-fb8fd55a-450c-4924-b294-7b06cdf4cbd9.html
[16] https://www.cnbc.com/2018/09/18/why-companies-are-turning-to-ex-cons-to-fill-slots-for-workers.html
[17] https://www.nytimes.com/2018/01/13/business/economy/labor-market-inmates.html

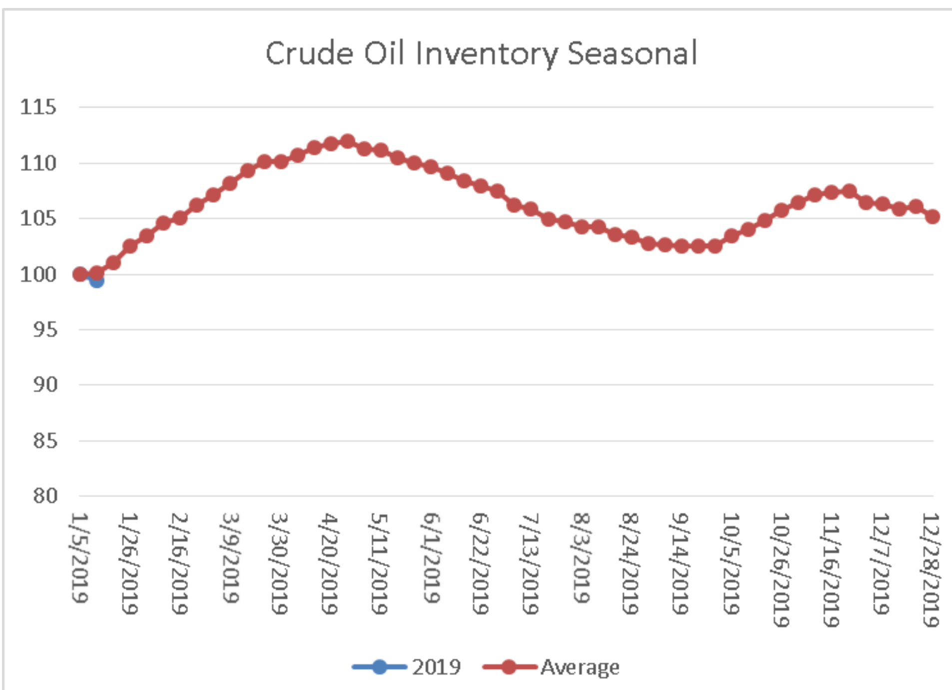
deploy measures to find and employ these workers, costing money that they otherwise wouldn't have to spend. But, socially, this is a trend the Fed should support.

Energy update: Crude oil inventories fell 2.7 mb last week compared to the forecast decline of 2.5 mb.



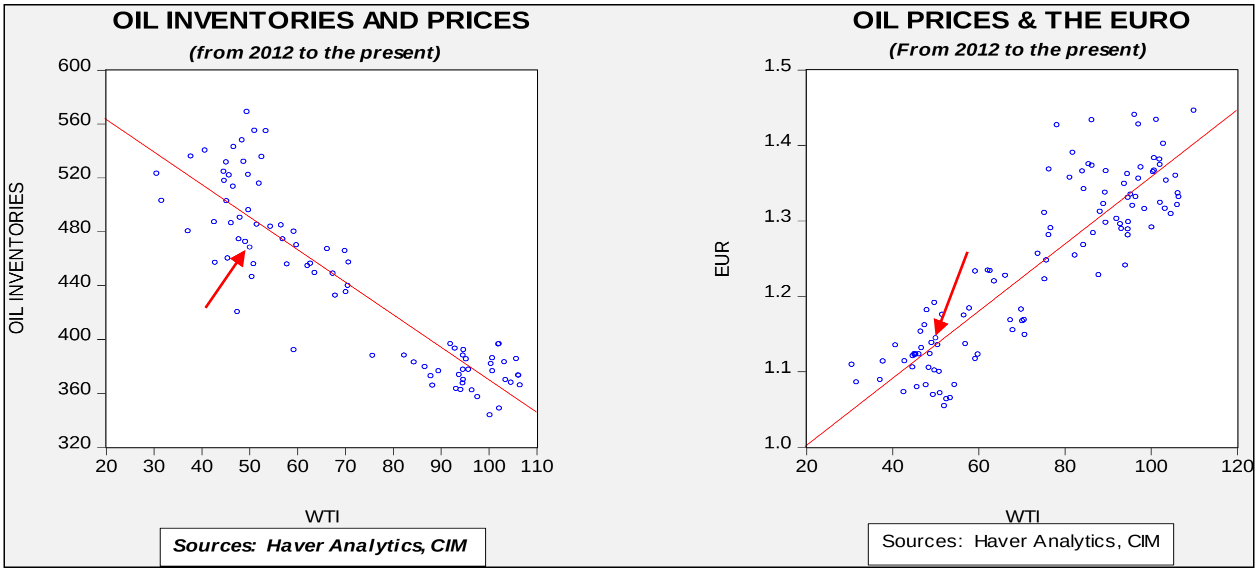


In the details, estimated U.S. production rose 0.2 mbpd to a record 11.9 mbpd. Crude oil imports fell 0.3 mbpd, while exports rose 0.8 mbpd. Refinery runs declined 1.5% and should continue to fall in Q1. Product inventories rose significantly and the rise in product stockpiles will soon lead to a seasonal decline in refining activity.



(Source: DOE, CIM)

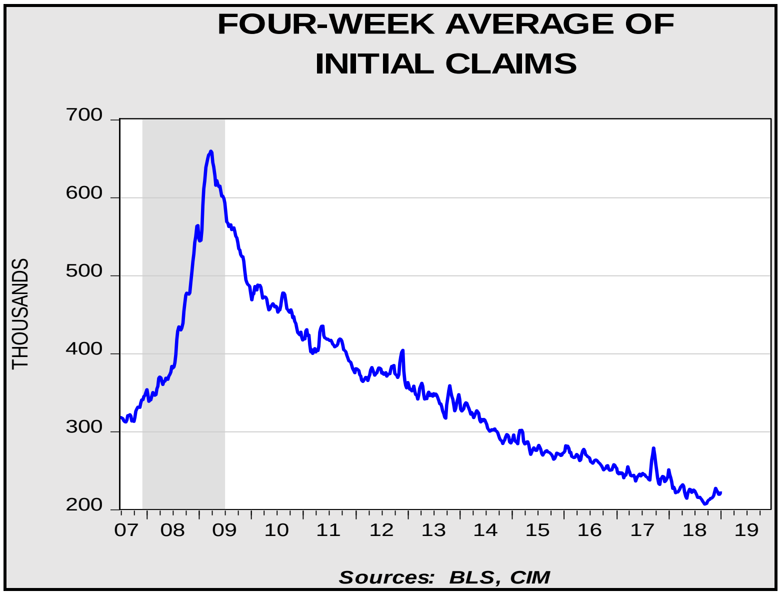
This is the seasonal pattern chart for commercial crude oil inventories. Starting next week, we would expect to see a rapid increase in inventories that will peak in early May. If we follow the usual pattern, oil inventories will peak at 489 mb (excluding pipeline oil; including this oil adds approximately 31 mb, putting the total estimate at 520 mb). Last year, inventories didn't rise mostly due to oil exports. We will be watching to see if that pattern repeats this year.



Based on oil inventories alone, fair value for crude oil is $61.61. Based on the EUR, fair value is $58.08. Using both independent variables, a more complete way of looking at the data, fair value is $57.37. By all these measures, current oil prices are generally in the neighborhood of fair value. However, we still expect prices to move toward $60 in the coming weeks.

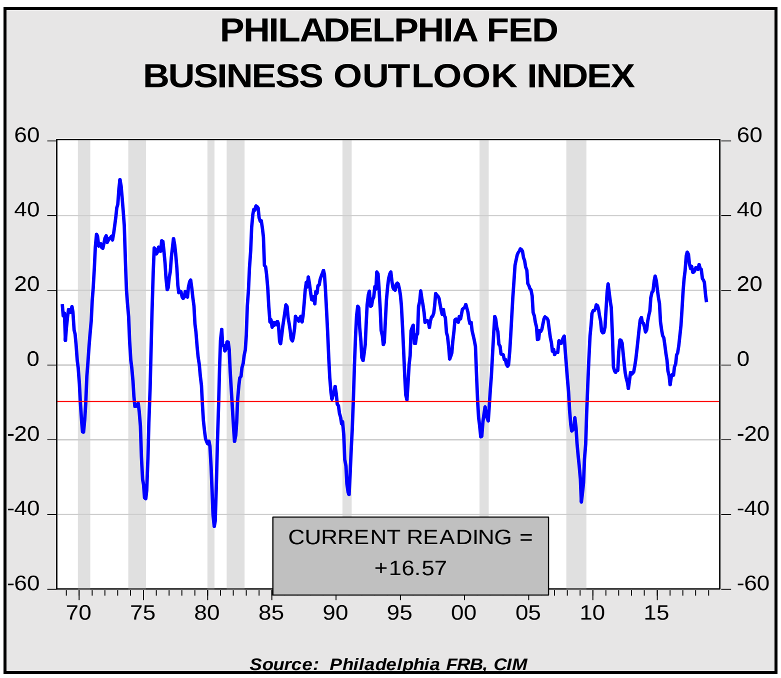
U.S. Economic Releases

Initial jobless claims came in below expectations at 213k compared to the forecast of 220k.



The chart above shows the four-week moving average of initial claims. The four-week moving average decreased from 221.00k to 220.75k.

The December Philadelphia FRB Business Outlook Index came in above expectations at 17.0 compared to estimates of 9.5.



We smooth the data on the above chart with a six-month moving average. The current reading is near cycle highs and is well above the recession signal of -10. What makes this index important is that it measures business sentiment for the Mid-Atlantic region, where most of the Fed governors work and live, at least part of the time. No matter how data-sensitive one is, the economic activity that one directly observes will tend to affect one's outlook. Thus, a robust local economy in the Mid-Atlantic region could lead Fed governors to lean hawkish even if the rest of the nation's economy is less robust, and vice versa.

The table below shows the economic releases and Fed events scheduled for the rest of the day.

Economic Releases						
EDT	**Indicator**			**Expected**	**Prior**	**Rating**
9:45	Bloomberg Consumer Comfort	m/m	jan		58.5	**
9:45	Bloomberg Economic Expectations	m/m	jan		50.0	**
Fed speakers or events						
EST	**Speaker or event**	**District or position**				
10:45	Randal Quarles Speaks at Insurance Industry Forum	U.S. Federal Reserve Vice Chairman for Supervision				

Foreign Economic News

We monitor numerous global economic indicators on a continuous basis. The most significant international news that was released overnight is outlined below. Not all releases are equally significant, thus we have created a star rating to convey to our readers the importance of the various indicators. The rating column below is a three-star scale of importance, with one star being the least important and three stars being the most important. We note that these ratings do change over time as economic circumstances change. Additionally, for ease of reading, we have also color-coded the market impact section, which indicates the effect on the foreign market. Red indicates a concerning development, yellow indicates an emerging trend that we are following closely for possible complications and green indicates neutral conditions. We will add a paragraph below if any development merits further explanation.

Country	Indicator			Current	Prior	Expected	Rating	Market Impact
ASIA-PACIFIC								
Australia	Home Loan Value	m/m	nov	-0.9%	2.2%	-1.5%	**	Equity and bond neutral
	Owner-Occupier Loan Value	m/m	nov	-1.4%	3.5%		**	Equity and bond bearish
New Zealand	REINZ House Sales	y/y	dec	-12.9%	2.6%		**	Equity and bond bearish
EUROPE								
Eurozone	Construction Output	y/y	dec	0.9%	1.8%		**	Equity and bond neutral
	CPI Core	y/y	dec	1.0%	1.0%	1.0%	***	Equity and bond neutral
	CPI	y/y	dec	1.6%	1.9%	1.6%	***	Equity and bond neutral
Italy	Trade Balance	y/y	nov	3.843 bn	3.784 bn		**	Equity and bond neutral
U.K.	RICS House Price Balance	y/y	dec	-19.0%	-11.0%	-13.0%	*	Equity bearish, bond bullish
AMERICAS								
Brazil	Economic Activity	y/y	nov	1.9%	3.0%	1.8%	**	Equity and bond neutral

Financial Markets

The table below highlights some of the indicators that we follow on a daily basis. Again, the color coding is similar to the foreign news description above. We will add a paragraph below if a certain move merits further explanation.

	Today	Prior	Change	Trend
3-mo Libor yield (bps)	277	278	-1	Up
3-mo T-bill yield (bps)	236	237	-1	Neutral
TED spread (bps)	41	41	0	Neutral
U.S. Libor/OIS spread (bps)	240	241	-1	Up
10-yr T-note (%)	2.71	2.72	-0.01	Neutral
Euribor/OIS spread (bps)	-31	-31	0	Neutral
EUR/USD 3-mo swap (bps)	0	1	-1	Down
Currencies	**Direction**			
dollar	flat			Neutral
euro	flat			Up
yen	up			Neutral
pound	flat			Neutral
franc	down			Neutral

Commodity Markets

The commodity section below shows some of the commodity prices and their change from the prior trading day, with commentary on the cause of the change highlighted in the last column.

	Price	Prior	Change	Explanation
Energy Markets				
Brent	$60.51	$61.32	-1.32%	Global tensions
WTI	$51.50	$52.31	-1.55%	
Natural Gas	$3.55	$3.38	4.93%	
Crack Spread	$13.67	$13.86	-1.35%	
12-mo strip crack	$15.94	$16.09	-0.96%	
Ethanol rack	$1.40	$1.40	-0.06%	
Metals				
Gold	$1,294.31	$1,293.67	0.05%	
Silver	$15.58	$15.59	-0.06%	
Copper contract	$266.75	$267.35	-0.22%	
Grains				
Corn contract	$ 375.25	$ 374.00	0.33%	
Wheat contract	$ 513.00	$ 512.50	0.10%	
Soybeans contract	$ 898.25	$ 894.50	0.42%	
Shipping				
Baltic Dry Freight	1055	1096	-41	
DOE inventory report				
	Actual	**Expected**	**Difference**	
Crude (mb)	-2.7	-2.5	-0.2	
Gasoline (mb)	7.5	3.0	4.5	
Distillates (mb)	3.0	1.5	1.5	
Refinery run rates (%)	-1.50%	-0.80%	-0.70%	
Natural gas (bcf)		-71.0		

Weather

The 6-10 and 8-14 day forecasts show cooler temperatures for most of the country. Precipitation is expected for most of the eastern half of the country.

Asset Allocation Weekly Comment

Confluence Investment Management offers various asset allocation products which are managed using "top down," or macro, analysis. We report asset allocation thoughts on a weekly basis, updating this section every Friday.

January 11, 2019

Does the Federal Reserve adjust policy for asset prices? This is perhaps one of the most controversial topics in U.S. monetary policy. Alan Greenspan faced this issue in the early 1990s. Both Volcker and Greenspan wanted to focus monetary policy on containing inflation. But, Larry Lindsey, a Fed governor at the time, noted that if outside forces, such as technology and trade, were keeping inflation down then the Fed could engage in easy monetary policy without the risk of rising price levels. He warned this could cause asset bubbles.[18] Greenspan, an adept corporate infighter, prevented Lindsey's position from gathering any momentum. But, as the "irrational exuberance" speech showed on December 20, 1996, he became concerned about overheating financial markets.[19] However, the reaction to the speech led the powerful Greenspan to realize there wasn't much upside in conducting monetary policy to quell asset bubbles. Instead, policy evolved to address the aftermath of bubbles.

Still, the idea of low interest rates triggering asset inflation never really went away. The Great Financial Crisis proved that the costs of cleaning up after a bubble could be considerable. It was one thing to have a bubble in technology stocks; in general, technology becomes obsolete so quickly that excess capacity in that sector doesn't have a lasting effect. On the other hand, a bubble in housing can depress economic activity for years. Jeremy Stein, a Fed governor from 2012 to 2014, raised concerns about financial excesses.[20]

In the current configuration of the FOMC, shown below, we rate them according to their policy bias (on a 1 to 5 scale, with 1 being the most hawkish and 5 most dovish) and by theoretical inclination. The latter reflects traditional hawks, characterized by a restrictive view of the Phillips Curve, traditional doves, who have an expansive view of the Phillips Curve, moderates, who make policy based on a variety of factors but tend to be "data-dependent" (in practice, atheoritical and not tied to the Phillips Curve) and financial asset-sensitive. The table below shows the breakdown. The number shows policy bias based on our analysis of comments and voting patterns. The colors show what we view as their theoretical background. Among the voters this year, the average is nearly 3, suggesting a moderate voting bloc. This year, there is only one dove and one hawk, five moderates and three financial market-sensitive voters. The doves tend to raise rates reluctantly; hawks tend to cut rates with the same distaste. Moderates are mostly a diverse group from a theoretical perspective. For our purposes, the important difference of this group compared to the traditional hawks and doves is skepticism about the Phillips Curve. These voters tend to watch trends in the overall economy and make policy decisions. Interestingly enough, three of the governors appointed by President Trump have been moderates and he also promoted Jerome Powell to chair of the FOMC. For a president who

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[18] Mallaby, Sebastian. (2016). *The Man Who Knew: The Life and Times of Alan Greenspan*. New York, NY: Penguin Books. (pp. 435-36.)

[19] Ibid, pp. 504-506.

[20] https://fraser.stlouisfed.org/title/1163/item/2372 and https://fraser.stlouisfed.org/title/1163/item/476707

seems to prefer doves, he has been steered into appointing moderates. Finally, there are three members who, in the comments, seem much attuned to the behavior of financial markets. Governor Brainard has voted as a dove but has expressed concern about market overheating and has used that position to support recent rate hikes.

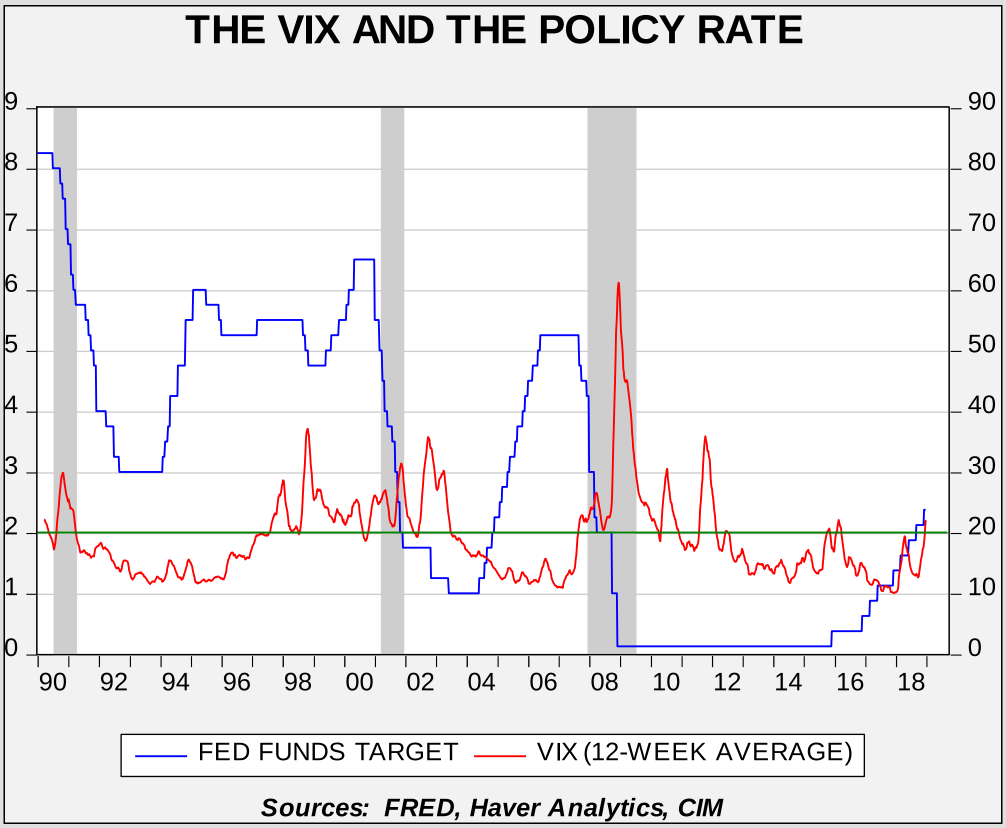
		all	2019	2020
Powell		3	3	3
Clarida		3	3	3
Brainard		4	4	4
Bowman		3	3	3
Quarles		2	2	2
Goodfriend				
Vacant				
Williams NY		2	2	2
Evans CHI		4	4	
Bullard STL		5	5	
George KC		1	1	
Barkin RICH		2		
Bostic ATL		3		
Daly SF		4		
Mester CLEV		2		2
Rosengren BOS		2	2	
Kashkari MINN		5		5
Kaplan DAL		3		3
Harker PHI		3		3
		3.00	2.90	3.00
DOVE				
MODERATE				
TRADITIONAL HAWK				
FINANCAL SENSITIVE				

This year, we have three voters we dub as "financial-sensitive." Thus, financial market behavior may be important to the path of policy this year.

However, as Greenspan noted, it's hard in real time to determine whether an asset market is in a bubble. And, it can be equally difficult to determine whether the cost of raising rates to prevent the bubble is less expensive than addressing the aftermath. The key problem with asset bubbles is that they leads to malinvestment. In a long-lasting asset, that can mean years of technical inefficiency because capacity can't be fully utilized. Thus, a housing bubble can lead to too much real estate that can take years to absorb; cutting interest rates can help slow the inevitable decline in prices but may actually expend the period necessary to balance the market. On the other hand, a bubble in wheat lasts one growing season and policymakers shouldn't bother to address the problem.

In addition, it would be politically explosive for policymakers to raise rates solely because equity or home prices have risen "excessively." The backlash would threaten central bank independence. Thus, if the Fed is worried about an asset bubble, it would need some measure other than valuation to raise rates.

One possibility we have examined recently is volatility. Does the FOMC adjust rates based on the equity market VIX? There appears to be some evidence that policymakers may be sensitive to market volatility.



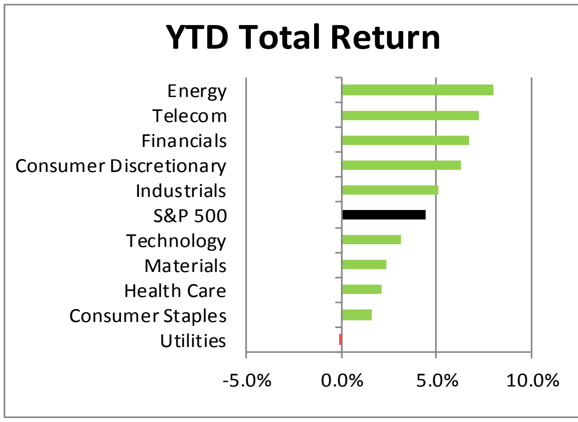
This chart shows the weekly fed funds target with the 12-week average of the CBOE VIX index. We have placed a bold line at 20 for the VIX. Since the late 1990s, we note that the FOMC was inclined to keep lowering rates with a VIX above 20; a reading under 20 would tend to support policy tightening. So, in 2002, Chair Greenspan kept cutting rates even though the economy was in clear recovery. It may have been due to perceptions that investor sentiment was overly negative. The 2004-06 tightening cycle occurred with a VIX persistently below 20. In fact, rate cuts seemed to occur as the VIX rose. We also note that the 2016 pause occurred after the VIX rose back above 20, and tapering was announced in 2016 after a prolonged period of a low VIX. The current pause coincides with the recent lift in volatility.

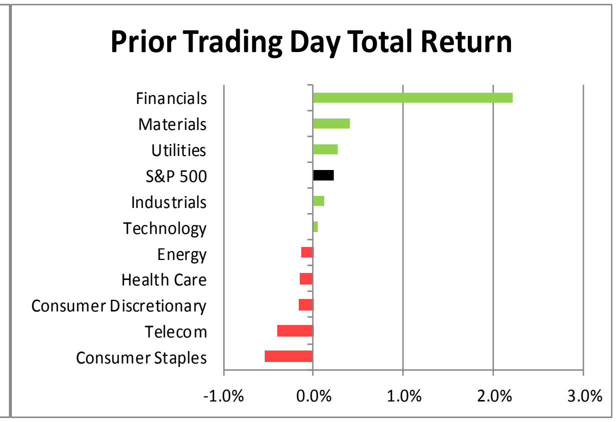
We also examined adding the VIX to the Mankiw Rule model variations. What we found is that the index is statistically significant in three of the variations and the correct sign in two. However, in the variations it did correctly affect, it didn't necessarily improve the forecasting accuracy by more than 10 bps. This performance suggests that the VIX may have an impact on policy but the Phillips Curve variables, labor market data and inflation, are still more important. However, the hard part to divine is the impact of the VIX on the moderate voters. Even if all of the market-sensitive members pay attention to the VIX, the moderates may only pay attention at extremes.

Therefore, in conclusion, we can probably say the following—when the VIX is below 20, the Fed is probably more likely to consider tightening policy. A reading above 20 may lead to a pause or could encourage further easing. However, the relationship isn't precise, which suggests the traditional hawks and doves don't pay much attention to market volatility. The VIX may be the way that market-sensitive FOMC members can incorporate financial markets into their policy decisions without overtly targeting valuations or returns.

Data Section

U.S. Equity Markets – (as of 1/16/2019 close)

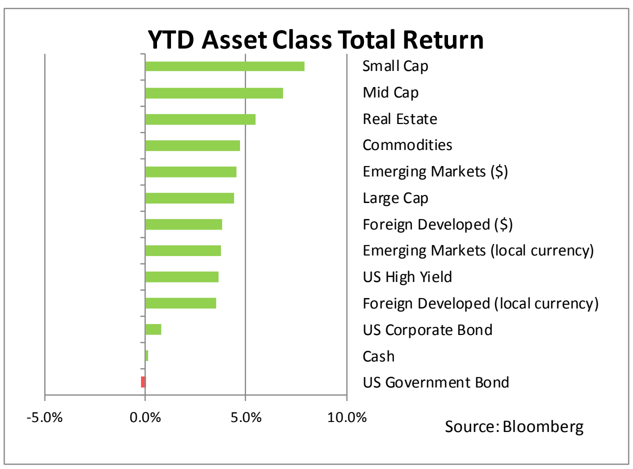




(Source: Bloomberg)

These S&P 500 and sector return charts are designed to provide the reader with an easy overview of the year-to-date and prior trading day total return. Sectors are ranked by total return; green indicating positive and red indicating negative return, along with the overall S&P 500 in black.

Asset Class Performance – (as of 1/16/2019 close)

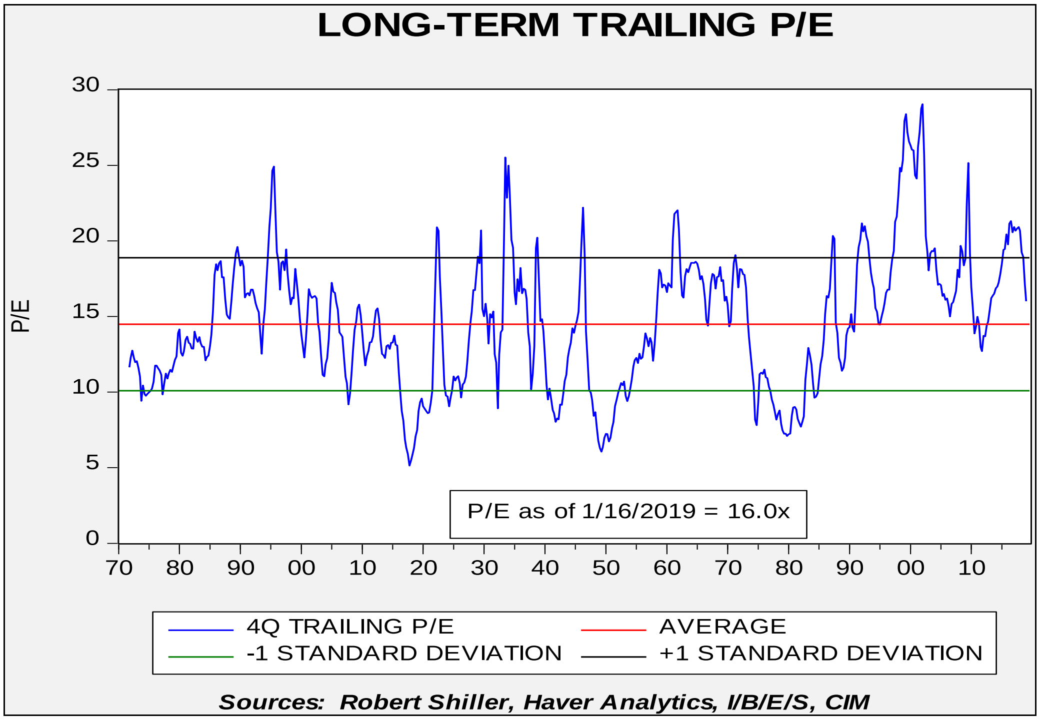


This chart shows the year-to-date returns for various asset classes, updated daily. The asset classes are ranked by total return (including dividends), with green indicating positive and red indicating negative returns from the beginning of the year, as of prior close.

Asset classes are defined as follows: Large Cap (S&P 500 Index), Mid Cap (S&P 400 Index), Small Cap (Russell 2000 Index), Foreign Developed (MSCI EAFE (USD and local currency) Index), Real Estate (FTSE NAREIT Index), Emerging Markets (MSCI Emerging Markets (USD and local currency) Index), Cash (iShares Short Treasury Bond ETF), U.S. Corporate Bond (iShares iBoxx $ Investment Grade Corporate Bond ETF), U.S. Government Bond (iShares 7-10 Year Treasury Bond ETF), U.S. High Yield (iShares iBoxx $ High Yield Corporate Bond ETF), Commodities (Bloomberg total return Commodity Index).

P/E Update

January 17, 2019



Based on our methodology,[21] the current P/E is 16.0x, up 0.3x from last week. The rebound in equities and a decline in earnings estimates led to the rise in the multiple.

[21] This chart offers a running snapshot of the S&P 500 P/E in a long-term historical context. We are using a specific measurement process, similar to *Value Line*, which combines earnings estimates and actual data. We use an adjusted operating earnings number going back to 1870 (we adjust as-reported earnings to operating earnings through a regression process until 1988), and actual operating earnings after 1988. For the current quarter, we use the I/B/E/S estimates which are updated regularly throughout the quarter; currently, the four-quarter earnings sum includes two actual quarters (Q2 and Q3) and two estimates (Q4 and Q1). We take the S&P average for the quarter and divide by the rolling four-quarter sum of earnings to calculate the P/E. This methodology isn't perfect (it will tend to inflate the P/E on a trailing basis and deflate it on a forward basis), but it will also smooth the data and avoid P/E volatility caused by unusual market activity (through the average price process). Why this process? Given the constraints of the long-term data series, this is the best way to create a long-term dataset for P/E ratios.