



## The Longbrake Letter\*

Bill Longbrake

September, 2017

### I. Good Times Prevail

Market participants returned from summer vacations in a good mood. Indeed, optimism in the domestic and global economic outlooks has ratcheted up a notch, but has not reached a euphoric level that often presages a building speculative bubble. Political drama in our nation's capital and a spate of global and domestic natural disasters have not dampened optimism.

Volatility in financial markets has almost totally disappeared. U.S. stock prices, while at all-time highs, have edged up only about 1.5 percent over the past two months. Bond yields remain lower currently than at the start of the year. Economic activity is grinding higher ever so slowly. Risks, which always lurk beneath the surface and which have a nasty habit of surprising markets, seem pretty bland at the moment.

Evercore ISI recently published a list "Investor Consensus Views" that summarizes well current sentiment:

- Synchronized global growth — for the first time in several years economic activity is accelerating simultaneously in all developing and emerging markets; the interactive feedbacks are reinforcing positive momentum.
- Restrained inflation — in spite of accelerating growth, there is little to no evidence of increasing inflationary pressures; indeed, inflation in the U.S. has declined and expected acceleration in wage growth is missing in action.
- Stimulative monetary policies — even though the Fed affirmed at the recent meeting of the Federal Open Market Committee that it is proceeding with "normalization" of U.S. monetary policy through reduction in balance sheet size and increases in the federal funds rate, U.S. monetary policy remains accommodative, as do the monetary policies of Europe and Japan.

---

\*The information contained in this newsletter does not constitute legal advice. This newsletter is intended for educational and informational purposes only.

- Positive S&P earnings outlook — forecast earnings continue to rise; even profits reported in the National Income Accounts, which are adjusted for inflation and depreciation, showed some improvement in the second quarter.
- China's economy OK — although recent data indicate a slight slowing in China's economy, it is gradual and not a matter of market concern.
- Increasing perceived odds of U.S. tax cuts — the congressional deal to suspend the federal debt ceiling and fund the federal government until December 6, prompted by President Trump, eliminated the threat of a nasty fight and possible shutdown of the government and shifted political activity toward tax reform and tax cuts; Senate Republicans are crafting a proposal for reasonably substantial individual and corporate tax cuts which would not be revenue neutral.
- Low perceived odds of recession any time soon
- U.S. growth may accelerate — most forecasters expect U.S. and global economic growth to be a little stronger in 2018; the prospect of tax cuts in the U.S. bolsters that expectation.

But, while the current optimism is soundly based and measured, it is fact that the U.S. economic expansion is mature — the output gap has been eliminated and the labor market is tight. In response, the Fed is gradually tightening monetary policy. Imbalances both in the U.S. and global economies exist and are building. Eventually, a correction, or more likely a recession, will occur. Predicting timing is always difficult as the good times always seem to go on a lot longer than expected. In the absence of flagrant speculation-driven bubbles, there is good reason to expect favorable economic conditions to prevail for the next several quarters.

With respect to risks and building imbalances in economic activity, I have enumerated in previous letters several “yellow flags” which well could be harbingers of worse times to come. These risks have not gone away, but for now, no financial markets crisis of any sort appears imminent.

“Yellow flags” to watch include:

- Restructuring of retailing
- Robotics and artificial intelligence
- Consumer spending, particularly autos
- Consumer credit — auto loans and student debt
- Business and commercial real estate credit and corporate debt
- Monetary policy
- Stock market valuations
- Real inflation-adjusted company earnings
- Investment — the tightening spread between the return on capital and the cost of capital
- Weak commodity prices

- Federal, state and local tax receipts
- China stimulative economic policy and rapid grow of debt leverage

## II. Outlook for U.S. Real GDP

Second quarter real GDP growth was strong and was relatively unaffected by unusual factors and statistical quirks. Prospects are favorable for similar strength in the third quarter. Optimists happily predict sustained economic expansion in the U.S. and elsewhere in the world. Pessimists worry about imbalances nascent risks lurking beneath the surface, which could derail good times.

For the time being, optimists hold sway and favorable economic momentum appears sufficient to guarantee good economic performance for several months to come.

### 1. “Preliminary Estimate” of Second Quarter GDP

The “**Preliminary Estimate**” of second quarter GDP growth of 3.0 percent was a little higher than what the consensus expected and improved upon the 2.6 percent estimate in the “**Advance Estimate**.”

Details of the “**Preliminary Estimate**” are shown in **Table 1**. The bottom four panels of **Table 1** show different measures of real GDP growth. These include the traditional “**Total GDP**” measure, and three alternatives — “**Final Sales**,” “**Private**,” and “**Private Domestic**.”

Reported quarterly “**Total GDP**” growth tends to be very volatile because of volatility in various GDP components, especially inventories, and the methodology of annualizing quarter growth rates which amplifies the impact of short-term aberrations in the growth of individual GDP components. “**Total GDP**” grew 3.05 percent in the second quarter “**Preliminary Estimate**” compared to 1.24 percent in the first quarter.

However, most of the difference between the first and second quarters’ measures of annualized real GDP growth is due to the change in the inventories component. The “**Final Sales**” measure of real GDP removes the contributions of changes in inventories. “**Final Sales**” grew 3.03 percent in the second quarter “**Preliminary Estimate**” compared to 2.70 percent in the first quarter and 2.62 percent in the third quarter of 2016. The anomaly for this measure of real GDP occurred in the fourth quarter of 2016 when “**Final Sales**” grew only 0.70 percent. But as will become clear in a moment, that aberration was due to another GDP component involving the contribution of exports and imports to real GDP growth.

“**Private**” GDP omits both inventory changes and government investment spending. Growth in government expenditures rises during periods of economic weakness and falls during periods of strength or when fiscal austerity is the order of the day.

“**Private Domestic**” GDP omits inventory changes, government spending and net exports. This measure gives the truest picture of the performance of the core of the U.S. economy, which accounts for approximately 87 percent to “**Total GDP**.” Annualized quarterly growth rates of this measure are very stable, varying over the past four quarters from 2.17 percent to 2.87 percent. The second quarter

**Table 1**  
**Composition of 2017 and 2016 Quarterly GDP Growth**

	Second Quarter 2017 Advance Estimate	Second Quarter 2017 Preliminary Estimate	Second Quarter 2017 Final Estimate	First Quarter 2017	Fourth Quarter 2016	Third Quarter 2016
Personal Consumption	1.93%	2.28%		1.32%	1.99%	1.92%
Private Investment						
Nonresiden- tial	.64%	.85%		.86%	.02%	.42%
Residential	-.27%	-.26%		.41%	.26%	-.18%
Inventories	-.02%	.02%		-1.46%	1.06%	.16%
Net Exports	.18%	.21%		.22%	-1.61%	.36%
Government	.12%	-.05%		-.11%	.03%	.09%
<b>Total</b>	<b>2.57%</b>	<b>3.05%</b>		<b>1.24%</b>	<b>1.76%</b>	<b>2.78%</b>
<b>Final Sales</b>	<b>2.59%</b>	<b>3.03%</b>		<b>2.70%</b>	<b>.70%</b>	<b>2.62%</b>
<b>Private</b>	<b>2.47%</b>	<b>3.08%</b>		<b>2.81%</b>	<b>.67%</b>	<b>2.53%</b>
<b>Private Domestic</b>	<b>2.29%</b>	<b>2.87%</b>		<b>2.59%</b>	<b>2.28%</b>	<b>2.17%</b>

“**Preliminary Estimate**” was 2.87 percent, reflecting steady upward improvement over the past four quarters.

Overall, the picture that the various measures of real GDP paint is one of gradual growth that is somewhat above the potential rate so that the output gap has been shrinking gradually, but steadily.

## 2. Growth Rates of Real GDP Components — 4-Quarter Moving Average

Because quarterly annualized GDP data in the customary **BEA** reports are highly volatile, without the kind of dissection of details discussed above quarterly data can be very misleading about the underlying trends in economic growth. **Table 2** and **Chart 1** show four-quarter moving averages of growth rates for GDP components as well as the four alternative measures of real GDP. This smooths out quarterly aberrations in the data and gives a clearer picture of the health and direction of the economy.

Since the second quarter of 2011 growth in “**Private**” GDP has been consistently greater than growth in “**Total GDP**.” Since 2015 fiscal policy has been mildly supportive of “**Total GDP**” growth. In recent quarters government contribution to real GDP growth has been small and diminishing, which has reduced the growth rate in “**Total GDP**” relative to “**Private**” GDP.

There are some important takeaways from **Chart 1**. First, all four measures of real GDP growth troughed in the fourth quarter of 2016 and have accelerated since then. Second, “**Private**” GDP, which

**Table 2**  
**Year-Over-Year Growth Rates for Components of Real GDP**

	GDP Component Weight	Second Quarter 2017	First Quarter 2017	Fourth Quarter 2016	Third Quarter 2016	Second Quarter 2016	First Quarter 2016	Fourth Quarter 2015
Personal Consumption	69.47%	2.80%	2.81%	2.73%	2.78%	2.99%	3.27%	3.64%
Private Investment	17.13%							
Nonresidential	13.34%	1.59%	.57%	-.59%	-.67%	-.24%	.84%	2.34%
Residential	3.51%	2.15%	3.34%	5.48%	7.41%	9.60%	10.43%	10.23%
Inventories	.12%	-61.5%	-69.7%	-66.8%	-66.3%	-45.7%	-14.8%	48.4%
Net Exports	-3.59%	5.97%	6.33%	7.51%	10.59%	18.89%	22.88%	27.49%
Exports	12.75%	1.98%	.76%	-.33%	-.93%	-1.19%	-.52%	.41%
Imports	-16.34%	2.83%	1.92%	1.27%	1.32%	2.50%	3.61%	4.96%
Government	17.16%	.12%	.28%	0.75%	1.05%	1.29%	1.55%	1.39%
Total	100.0%	1.89%	1.65%	1.49%	1.53%	1.75%	2.26%	2.86%
Final Sales	99.88%	2.10%	1.98%	1.90%	1.96%	2.04%	2.36%	2.67%
Private	82.72%	2.52%	2.35%	2.15%	2.15%	2.20%	2.53%	2.95%
Private Domestic	86.31%	2.66%	2.50%	2.36%	2.46%	2.78%	3.21%	3.72%

omits government spending and inventory accumulation, and “**Domestic Private**” GDP, which omits government spending, inventory accumulation and net exports, have been growing more rapidly than “**Total GDP**” and “**Final Sales.**”

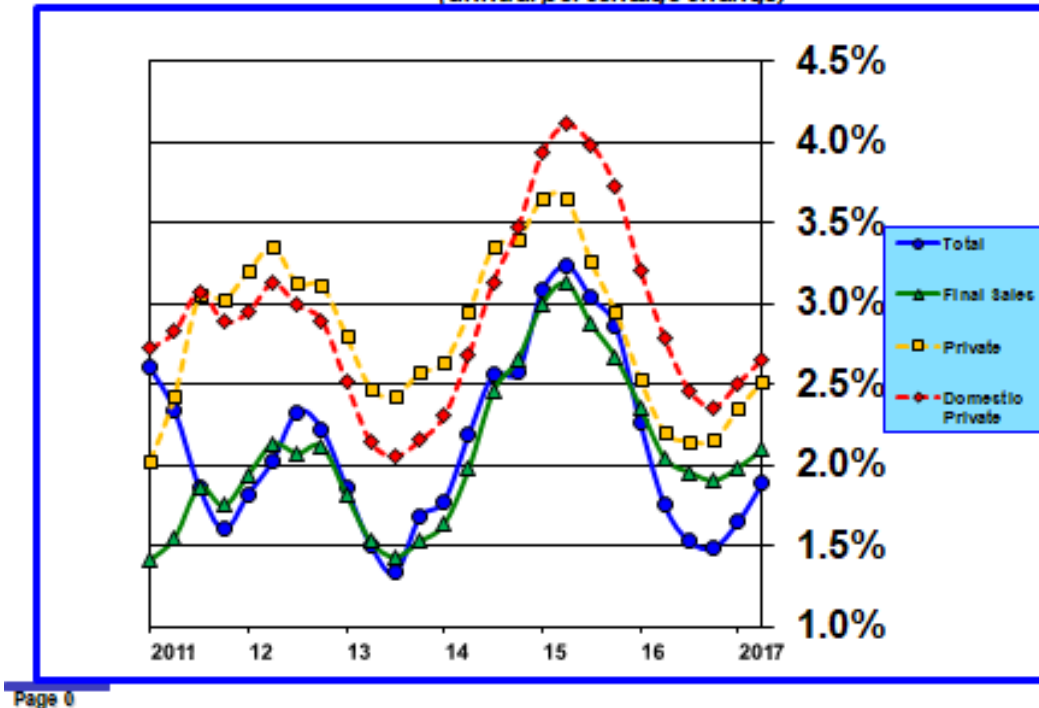
### 3. Consumption

Personal consumption contributed 2.28 percent to second quarter real GDP growth compared to 1.32 percent in the first quarter. First quarter consumption growth was initially reported as an implausibly low 0.44 percent but the revised figure is still unusually weak relative to strong employment growth. The four-quarter moving average trend is a more reliable indicator and it rose from 2.73 percent in the fourth quarter to 2.81 percent in the first quarter and 2.80 percent in the second quarter. The recent growth rate in consumption has been relatively stable in a range of 2.70 to 2.80 percent.

In the long run, growth in nominal disposable income and consumer saving preferences determine

## CHART 1 – Real GDP Growth – Alternative Measures

(annual percentage change)



Page 0

growth in nominal personal consumption. Nominal disposable income depends upon a lot of things but the most important ones are the level of employment and wage rates. Tepid growth in employment and lethargic growth in wage rates will result in slow growth in disposable income.

**Chart 2** shows annual rates of growth in real disposable income and real consumer spending from 2000 through the first half of 2017. The negative impact of the Great Recession on both disposable income and consumption growth is clear in **Chart 2**. So, too is the temporary depressing effect of the Obama tax increases on disposable income growth in 2012 but not on consumption growth.

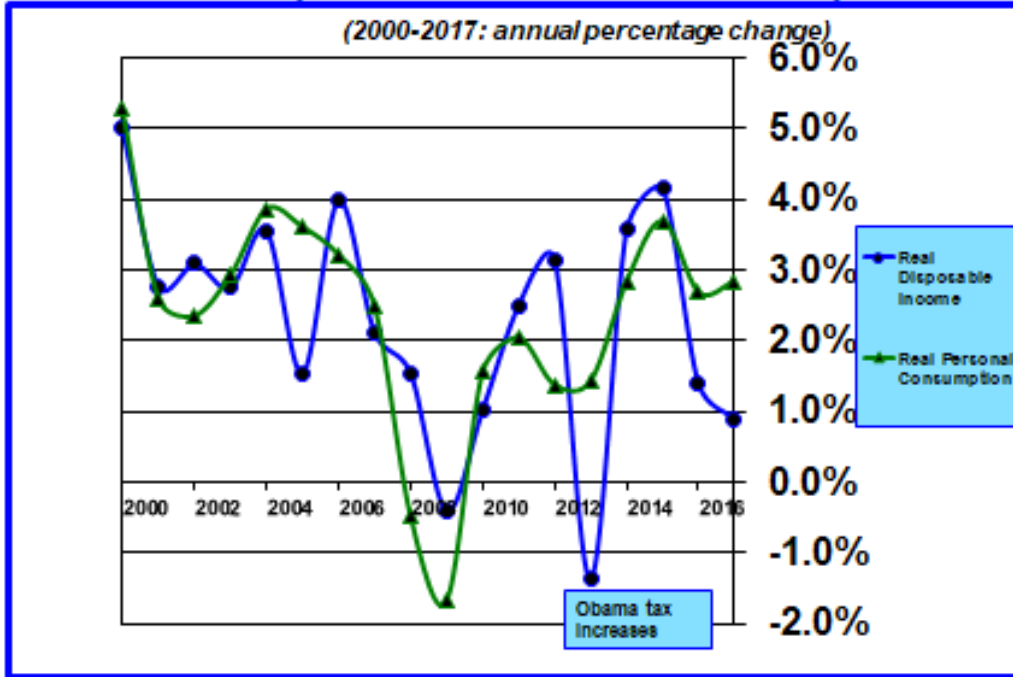
As can be seen in **Chart 3**, over the past two years, nominal disposable income growth has plunged while spending growth has remained relatively high and even increased over the past three quarters.

**Chart 3** shows the 4-quarter moving average growth rates in nominal disposable income and consumption from 2014 through the second quarter of 2017. Growth in consumption is typically less volatile than growth in disposable income. Consumer saving serves as the buffer (see **Chart 4**). When growth in disposable income is weak, the saving rate usually declines as consumers dip into savings and increase borrowing to sustain consumption. This phenomenon is consistent with the permanent income hypothesis which posits that consumers will plan consumption expenditures based upon expected long-run sustainable income rather than adjust consumption to short-term oscillations in disposable income.

As is evident in **Chart 4**, so far as the reported data are concerned, consumer spending has been supported by a collapse in the saving rate from over 6.0 percent during 2015 to less than 4.0 percent over the first seven months of 2017. All of this seems a bit strange since employment growth has been strong

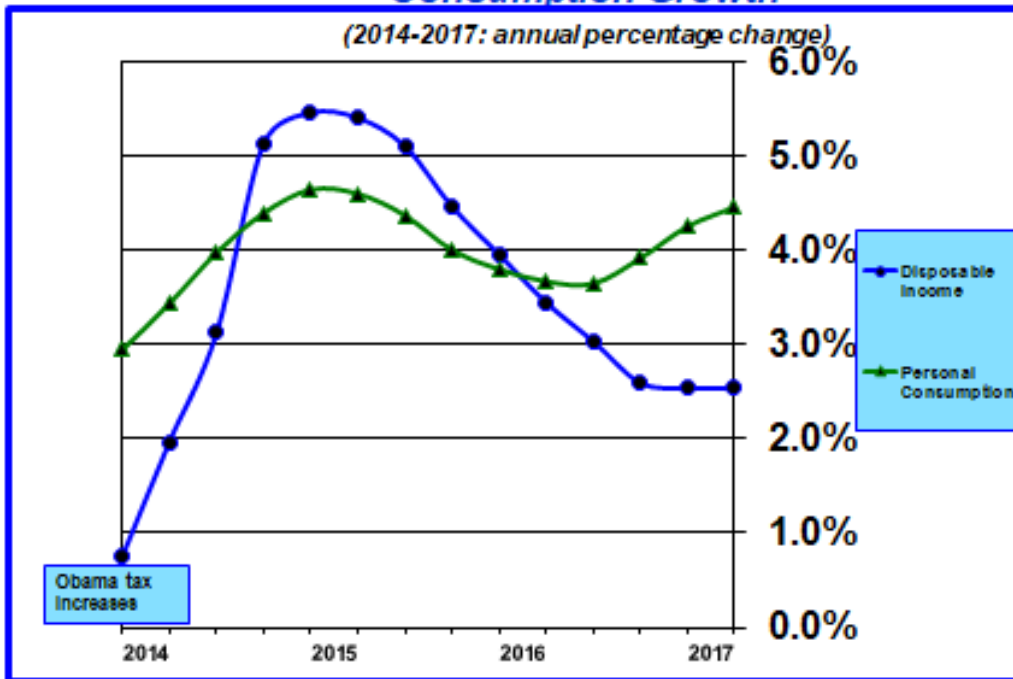
**CHART 2**

**– Real Disposable Income and Consumption Growth**



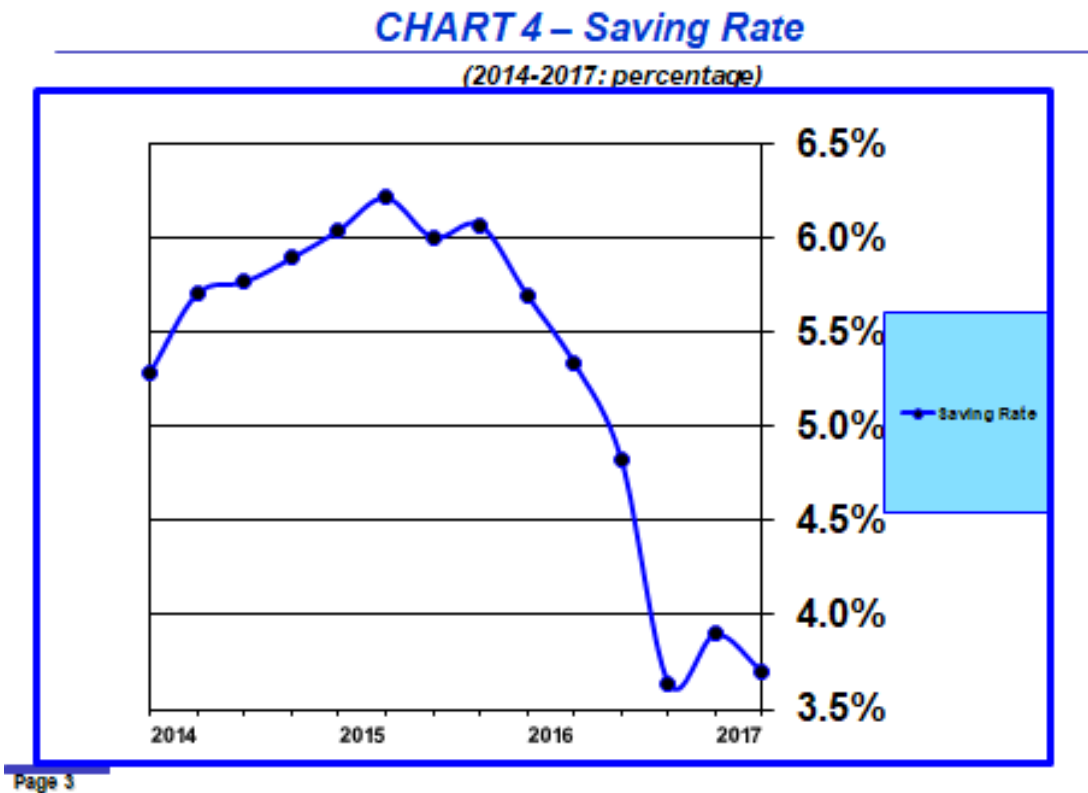
Page 1

**CHART 3 – Nominal Disposable Income and Consumption Growth**



Page 2

and nominal wage rates have edged a bit higher. Perhaps **BEA** will revise disposable income up in the future, but we will have to wait until July 2018 to see whether this occurs.



However, if the decline in disposable income growth has not been caused by incomplete disposable income data but is due to fundamental factors, then eventually growth in consumption will fall. In turn, since consumption is nearly 70 percent of total GDP, growth in GDP will decline.

Since the election of Donald Trump as president, consumer and business confidence has surged to high levels. Over the same time period, consumption growth has accelerated but income growth has merely stabilized at a relatively low level. Assuming the income data are reliable, which they might not be, income growth in coming months will need to accelerate to validate consumer optimism. Negligible acceleration in wage growth and slowing employment growth do not bode favorably.

Forecasts of growth in real consumer spending over the next several years are shown in **Table 3** and **Chart 5**. Real consumer spending increased 2.69 percent in 2016. This is not the final number as several more revisions will occur over the next few years.

Most forecasters expect real consumer spending growth to slow in coming years because the economy is at full employment and employment growth is set to slow in coming quarters to match the underlying demographic dynamics of aging and slowing population growth.

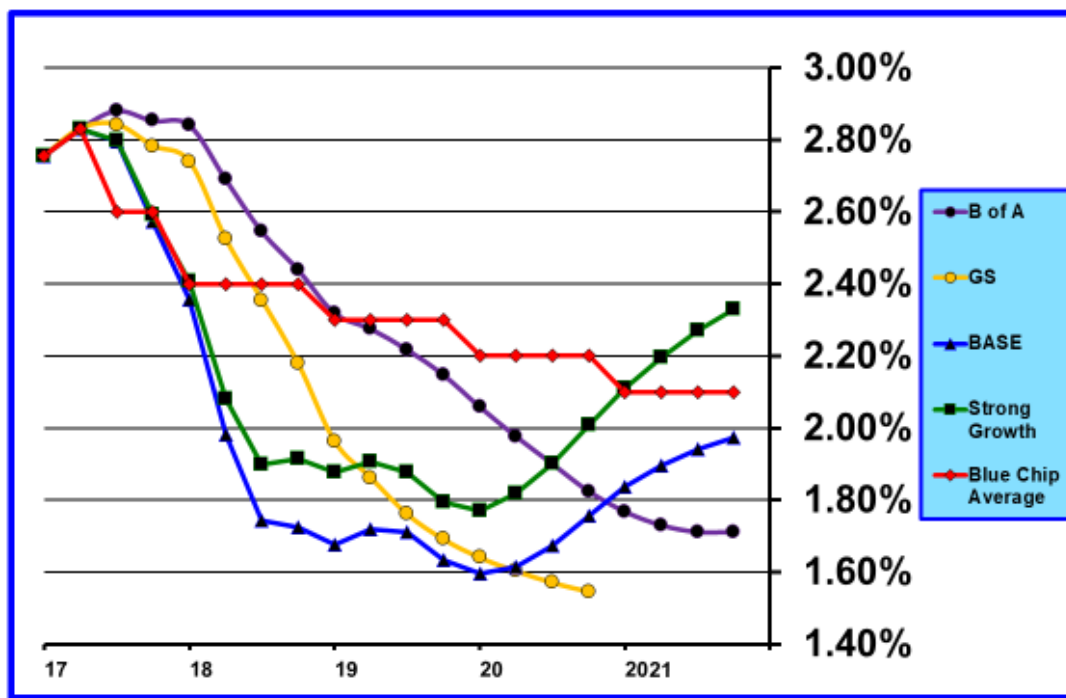
This slowing pattern is apparent in the data in **Table 3** and **Chart 5**. Growth in real wages might moderate the forecast decline in consumer spending growth, but only if the growth rate in real wages increases. That would require productivity to improve from its recent very low level. That would be a



**Table 3**  
**Real Personal Consumption Growth Rate Forecasts**

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Actual	1.43	2.84	3.70	2.69					
B of A					2.85	2.44	2.15	1.82	1.71
GS					2.78	2.18	1.69	1.55	
ISH Markit					2.60	3.00	2.80	2.50	2.50
Economy.com					2.70	2.70	2.20		
Blue Chip					2.60	2.40	2.30	2.20	2.10
Bill's BASE					2.57	1.72	1.63	1.76	1.97
Bill's Strong Growth					2.59	1.91	1.80	2.01	2.33

**CHART 5 – Real Consumer Spending Forecasts**  
*(annual rate of change)*



Page 4

welcome result, but is not at all assured.

Although all forecasters agree that consumer spending growth will slow, there are differences in my projections for spending growth in 2017 and 2018 compared to other forecasters. My 2017 and 2018 forecasts, shown in the “**BASE**” and “**Strong Growth**” scenarios, are below the forecasts of others. Beyond 2018, my forecasts of spending growth initially edge down a little more in 2019 in the “**BASE**” and “**Strong Growth**” scenarios, but then rise in 2020 and 2021. After 2017 **GS** is more pessimistic than others, with the exception of my scenarios, and expects a substantial decline in consumer spending growth; the same is the case to a somewhat lesser extent for **B of A** after 2019. Although **GS**’s and **B of A**’s long-term pessimism about real consumer spending growth may turn out to be good forecasts, their

estimates seem inconsistent with their assumptions about growth in employment and wage rates over the next few years.

With the exception possibly of **GS**, all forecasters appear to be overly optimistic about real consumer spending growth in 2018. ISH Markit's excessive optimism persists beyond 2018, perhaps because it believes that the Trump administration's 3 percent real GDP growth assumption is attainable. These kinds of forecasts point out the speculative nature of much of economic forecasting and weaknesses inherent in most econometric models.

#### 4. Business Investment

Real private investment consists of three principal categories — business investment, which is labeled “nonresidential” in the National Income Accounts, residential investment, and changes in inventories. While changes in inventories are volatile from quarter to quarter, over the very long run the growth rate in inventories closely tracks growth in business and residential investment.

**Table 4** shows growth rates for real private investment and separately for two of its three principal components — nonresidential (business) and residential investment. Residential investment is 20 percent of total investment, nonresidential investment is 77 percent, and growth in inventories accounts for approximately 3 percent.

**Table 4**  
**Real Private Investment (Residential and Nonresidential) Growth Rate Forecasts**

	2013	2014	2015	2016	2017	2018	2019	2020	Ave. 1947-2017
<b>REAL PRIVATE INVESTMENT</b>									
Actual	5.02	6.21	3.83	0.63					<b>3.73**</b>
B of A					4.03	3.94	4.06	3.41	
GS					3.95	3.84	2.70	2.28	
Bill's BASE					3.69	2.29	2.27	2.20	
Bill's Strong Growth					3.88	3.09	3.03	3.03	
<b>REAL NONRESIDENTIAL (BUSINESS) INVESTMENT</b>									
Actual	3.50	6.88	2.34	-0.59					<b>2.53*</b>
B of A					4.54	4.20	4.06	3.41	
GS					4.50	4.12	2.84	2.37	
<b>REAL RESIDENTIAL INVESTMENT</b>									
Actual	11.88	3.46	10.23	5.48					<b>-0.25*</b>
B of A					2.10	2.92	4.06	3.41	
GS					1.90	2.77	2.14	1.91	

\*Average 1999-2017

\*\*Real private investment = 1.60% for 1999-2017

**Nonresidential investment (business)** growth faltered in 2015 and was crushed in 2016 by the collapse in oil and commodity prices. But business investment was down in other sectors as well. Investment growth was negative -0.59 percent in 2016.

Nonresidential investment came out of deep slumber in the first half of 2017, rising at an annual rate

of 7.2 percent in the first quarter and 6.9 percent in the second quarter. A recovery in energy investment accounted for about half of the increase. Other sectors contributed as well. In addition, the acceleration in global growth had a favorable impact on nonresidential investment growth.

Forecasters expect **real private investment** growth to be strong and above the long-term trend for all of 2017 due to the recovery of investment in energy and stronger global growth. Possible benefits of tax reform and tax cuts have largely been removed from 2017 forecasts. Some optimism remains for a fiscal boost in 2018, but as can be seen in **Table 4, B of A** is more optimistic than **GS**.

Although **GS** expects growth in nonresidential investment to be 4.50 percent for all of 2017, its capital expenditures tracker registered about 7.0 percent in August. In addition to a continuation of the first half's momentum, **GS** expects easier financial conditions and stronger domestic demand, as implied by purchasing manager surveys, to make 2017 a good year. This might prove to be too optimistic based on declining auto demand, somewhat tighter credit access, and the declining spread between return on capital and cost of capital. Generally, in recent years, analyst forecasts of growth in business investment have proved to be optimistic.

Following 2017 and over the next several years **GS** expects **business investment (nonresidential investment)** to be close to trend growth of 2.53 percent that has prevailed over the last 19 years, while **B of A** expects growth to be above trend for 2017-2020. I have been consistently skeptical in the past about what I felt were overly optimistic forecasts for growth in business investment and that skepticism has been merited. **GS's** forecasts are now more consistent with my view. I continue to expect that investment growth will remain near the average of the past 19 years, even if Congress enacts public infrastructure investment stimulus legislation, which increasingly appears to be doubtful.

**B of A** is especially optimistic about the outlook for business investment growth to remain at a high level in 2018 and 2019 because it expects corporate profits to accelerate, credit conditions to remain benign and uncertainty to diminish. A potential weakness in **B of A's** business investment model is the possibility of cumulative negative effects over time of low interest rates and depressed innovation, as reflected in a slower rate of new business formation. Also, according to the Federal Reserve's data on capacity utilization, because firms are operating at less than full capacity, the incentive to invest is dampened.

Now that the labor market has exceeded full employment, one theory is that companies will increase capital investments to offset rising wage rates. There does appear to be some evidence which corroborates this expectation. Evercore ISI conducts a semi-annual survey of capital expenditures and hiring plans. In a survey, conducted between May 15 and June 7, Evercore ISI found that a net of 30 percent of Chief Financial Officers plan to increase capital expenditures in 2017 compared to 9 percent in the November 2016 survey. In addition, **GS's** capital expenditures tracker has strengthened over the last year. It attributes this primarily to the general improvement in domestic and international growth momentum.

Of course, plans do not necessarily translate into actual expenditures. Other considerations matter. Two important considerations are wages and existing capacity utilization.

**GS's** research indicates that a 1 percent increase in wage growth boosts growth in capital expenditures by 0.5 percent.<sup>1</sup> This is a relatively small amount and wage growth has risen far less than 1 percentage

---

<sup>1</sup>David Mericle and Ben Snider. "Will a Tighter labor Market Boost Capex?" US Daily, Goldman Sachs Economics Research, June 8, 2017.

point.

Capacity utilization, as measured by the Federal Reserve, was 76.7 percent in July compared to 75.9 in July 2016. Although this measure has been improving slowly, it is well below the 80.0 (the 45-year average for this measure is 79.9) percent level traditionally considered to be an indication of tight capacity utilization. It should be noted, however, that Tan Kai Xian of GavekalResearch, believes the Federal Reserve's measure understates the actual utilization rate.<sup>2</sup> He cites an alternative measure constructed by the Institute for Supply Management, which indicates capacity utilization is running above 80 percent. This measure is based on asking survey respondents to indicate their current operating rate compared to their "normal" capacity level. Tan Kai Xian also cites falling real corporate profits, in contrast to rising S&P nominal profits, as further evidence that the U.S. is operating above full capacity in both the labor and capital markets. But, assuming that this analysis is valid, it does not imply necessarily that capital expenditures will increase. If expected returns on new capital expenditures relative to the cost of capital are insufficient, companies will not make those investments, regardless of the tightness of capacity.

**Housing — Real residential investment** growth was very strong in 2015. Growth in 2016 slowed considerably but remained well above the long-term trend, which is not difficult considering that the annual rate of growth over the past 19 years has been slightly negative.

Housing inventories are lean and demand is relatively strong, resulting in upward pressure on housing prices. However, outsized housing price increases which are exceeding growth in wages and nominal disposable income will eventually dampen single-family residential demand and inventories should improve with the consequence that residential investment growth should slow in coming years. Forecasts reflect this scenario, although trend growth is expected to match (**GS**) or slightly exceed (**B of A**) that of overall real GDP growth.

Housing starts are still historically low relative to family formation rates. The trend rate in housing starts should be about 1.4 million based upon growth in household formation and replacement of existing homes. But, starts were 1.18 million in 2016, up 6.3 percent from 1.11 million in 2015. Housing starts have averaged 1.20 million in the first seven months of 2017, which was 2.6 percent above the pace of the first seven months of 2016.

Starts are expected to rise only modestly in 2017 and will still be below 1.4 million. **B of A** lowered its forecast recently and now expects housing starts will be only 1.20 million in 2017 and 1.30 million in 2018 because of lower than expected activity in multifamily housing construction. **GS's** forecast is similar — 1.22 million starts in 2017 and 1.30 million in 2018 and there is not much improvement after that.

According to **B of A**, the shortfall in housing starts relative to the level implied by demographics and historical trends in household formation can be traced to high levels of student debt, tighter credit standards, including higher down payment requirements, which many have difficulty meeting, and lifestyle changes among Millennials including delays in marriage and having children. The consequence is that Millennials have much lower homeownership rates, a phenomenon that seems likely to persist. This is depressing single family construction.

On the supply side, the number of homebuilders declined substantially during the Great Recession and has not recovered. Credit standards remain tight for construction loans and this is reducing the extent of

---

<sup>2</sup>Tan Kai Xian. "Mind The (Output) Gap," GavekalResearch, June 13, 2017.

speculative building. The July 2017 Federal Reserve's Senior Loan Officer quarterly survey indicated that lending standards in all categories of residential loans were unchanged or easier. The survey indicated a slight strengthening in residential loan demand. However, credit standards tightened for commercial real estate loans and demand weakened.

In summary, housing demand is depressed relative to demographics and historical trends in household formation and supply is weak. Overall housing inventory is very lean. In response, average housing prices have been rising faster than growth in nominal incomes. All else equal, this creates a feedback loop which depresses demand.

Housing prices were up 5.8 percent (S&P CoreLogic Case-Shiller National Home Price Index) in June over the prior year; the Federal Housing Finance Agency's purchase only housing price index was up 6.6% in the second quarter of 2017 compared to the second quarter of 2016. These increases are well above the 2.8 percent growth in aggregate nominal disposable income and 2.0 percent growth in per capita nominal disposable income over the past 12 months. This differential is eroding affordability and, thus, is not sustainable over the long run. Any increase in mortgage rates will simply make matters worse.

In summary, residential investment growth, which rose at a dismal annual rate of 1.9 percent in the first half of 2017, will continue to be weak in coming quarters because of higher housing prices and the potential for somewhat higher mortgage interest rates. I would place greater confidence in **GS's** conservative forecast relative to **B of A's** marginally more optimistic forecast.

## 5. Change in Inventories

Inventories subtracted 1.46 percent from "**Total**" GDP growth in the first quarter after adding 1.06 percent in the fourth quarter of 2016 (see **Table 1**). The change in inventories was very subdued in the second quarter, adding only .02 percent to real GDP.

As can be seen in **Table 5**, real inventory accumulation declined each quarter from the first quarter of 2015 to the second quarter of 2016. Inventory growth bounced back to \$63.1 billion in the fourth quarter of 2016, but sagged to \$1.2 billion in the first quarter and \$1.8 billion in the "**Preliminary Estimate**" for the second quarter.

Inventories generally add between 0.1 and 0.2 percent to annual real GDP growth. Based on the historical record, inventory accumulation in the second and third quarters of 2016 and the first and second quarters of 2017 was anomalous.

As can be seen in **Table 5**, initial inventory data are crude estimates and are subject to substantial revision over the next three years. The \$1.8 billion inventory accumulation in the second quarter "**Preliminary Estimate**" will be revised four more times in the next three years.

To add to the data quality problem, quarterly changes are annualized and this can greatly amplify the impact of data errors and contribute to misperceptions about the trend in real GDP growth. Volatile inventory data are especially troublesome in this regard.

There are two ways to gain a better sense of the underlying trend in real GDP growth. One way is to omit highly volatile data, especially data that are subject to substantial subsequent adjustment. That

**Table 5**  
**Quarterly Real Inventory Data**  
*(most recent data are in red)*

	Advance Estimate	Preliminary Estimate	Final Estimate	First Annual Revision	Second Annual Revision	Third Annual Revision
2017 Q2	-3	1.8				
2017 Q1	10.3	4.3	2.6	1.2		
2016 Q4	48.7	46.2	49.6	63.1		
2016 Q3	12.6	7.6	7.1	17.0		
2016 Q2	-8.1	-12.4	-9.5	12.2		
2016 Q1	60.9	69.6	68.3	40.7	40.6	
2015 Q4	68.6	81.7	78.3	56.9	68.2	
2015 Q3	56.8	90.2	85.5	70.9	96.2	
2015 Q2	110.0	121.1	113.5	93.8	105.6	
2015 Q1	110.3	95.0	99.5	112.8	114.4	132.2
2014 Q4	113.1	88.4	80.0	78.2	76.9	76.9
2014 Q3	62.8	79.1	82.2	79.9	66.8	85.6
2014 Q2	93.4	83.9	84.8	77.1	55.2	69.9
2014 Q1	87.4	49.0	45.9	35.2	36.9	38.7
2013 Q4	127.2	117.4	111.7	81.8	87.2	103.6
2013 Q3	86.0	116.5	115.7	95.6	93.6	109.0
2013 Q2	56.7	62.6	56.6	43.4	39.6	52.6

is why many analysts report the growth rate in “**Final Sales**,” which omits inventory data, as I do in **Tables 1** and **2**.

Another method that helps give a better sense of the underlying trend in real GDP growth is to focus on year-over-year growth rates, which are calculated by dividing the average of the most recent four quarters by the average of the preceding four quarters. The result of that calculation methodology can be seen in **Table 2** by comparing the growth rates in “**Total GDP**” and “**Final Sales**.” Quarterly data volatility in growth rates largely disappears — the impact of inventories on “**Total GDP**” growth is very small and the growth trends in “**Total GDP**” and “**Final Sales**” are very similar.

## 6. Government Investment

Government investment subtracted -0.05 percent from second quarter real GDP growth after subtracting -0.11 percent in the first quarter (see **Table 1**). This means that there has been virtually no growth in government investment spending during the first half of 2017.

Federal government spending declined at an annual rate of -0.27 percent and state and local spending

declined at an annual rate of -0.61 percent during the first half of 2017.

**Table 6** shows recent growth rates in government spending and forecasts for 2017-2021. Both **GS** and **B of A** expect government investment spending growth to be slightly positive during the remainder of 2017 and be close to zero for all of 2017. **GS** expects growth to improve a little in subsequent years and is slightly more optimistic than I am.

**Table 6**  
**Federal and State and Local Investment Spending Growth Rates**

	2013	2014	2015	2016	2017	2018	2019	2020
Federal	-5.82	-2.43	-0.08	0.05				
State and Local	-0.81	0.52	2.31	1.18				
Total Government	-2.86	-0.65	1.39	0.75				
GS Federal					-0.05	1.28	1.16	1.04
GS State and Local					0.05	1.73	2.30	2.09
GS Total					0.01	1.55	1.86	1.69
B of A Total					-0.11	0.02		
<b>BASE</b>					<b>0.02</b>	<b>1.02</b>	<b>1.10</b>	<b>1.10</b>
<b>Strong Employment</b>					<b>0.06</b>	<b>1.21</b>	<b>1.35</b>	<b>1.36</b>

After the election of Donald Trump as president last November I boosted my forecast of government investment spending based upon the expectation that Congress would adopt some form of infrastructure spending fiscal stimulus. Government infrastructure spending legislation increasingly appears unlikely to occur this year and the chances for later enactment have diminished. Accordingly, I have now eliminated additional government investment spending and reverted to a forecast that assumes an annual rate of increase in government spending of about 1.1 percent. This low rate of growth is not materially different from the annual 1.0 percent rate of growth in government investment spending over the past 18 years.

## 7. Net Exports

In the “**Preliminary Estimate**” net exports contributed 0.21 percent to second quarter real GDP growth after adding .22 percent to first quarter real GDP growth (see **Table 1**). This reversed the negative trend that prevailed in 2014, 2015 and 2016 as the dollar strengthened. The reversal reflects stronger growth in exports and has been driven by a weaker dollar and an acceleration in global growth.

Although the trade deficit in goods and services has been relatively stable, rising slightly from 2.70 percent of GDP in January 2014 to 2.76 percent of GDP in June 2017, the shares of both imports and exports as offsetting components of GDP have declined. Exports have declined from 9.64 percent to 7.98 percent of GDP since January 2014. Over the same period imports have declined from 13.88 percent to 12.10 percent of GDP. However, in recent months GDP shares of both imports and exports have stabilized and are showing preliminary signs of increasing.

Part of the decline in imports was related to the collapse in energy prices, but part was also due to a world-wide decline in trade. In recent months global trade volumes have begun to grow once again, probably reflecting the current strength of global economic activity. This reversal might prove temporary. There is some evidence that a longer-term downward secular trend in global trade is in place due to

technological advances and the related shift in economic activity toward knowledge-based services, which generally are located near the point of consumption. Prior to the recent upturn, the decline in trade was not limited to the U.S.; it has been a global phenomenon.

## 8. Second Quarter 2017 “Final Estimate”

**B of A** currently expects the “**Final Estimate**” for second quarter real GDP to edge up to 3.1 percent from the “**Preliminary Estimate**” of 3.0%.

## 9. Third Quarter 2017 Forecasts

Because of the impacts of Hurricanes Harvey and Irma, **GS** is currently forecasting third quarter to come in at 2.0 percent rather than its earlier forecast of 2.8%. **B of A**, which has also factored in the consequences of the recent hurricanes is forecasting third quarter GDP growth of 1.7 percent compared to its forecast of 2.9% prior to the two hurricanes.

## 10. Longer-Term Real GDP Forecasts

**Chart 6** shows quarterly real GDP growth projections from the third quarter of 2017 to the fourth quarter of 2020. **Table 7** includes annual real GDP growth for 2013-16 and forecasts for 2017 to 2021. Generally, forecasts are tightly clustered in 2017 between 2.0 and 2.2 percent. My “**BASE**” and “**Strong Growth**” forecasts are at the low end of the range in 2018, but move to the high end of the range by 2021.

**Table 7**  
**Real GDP Growth Forecast**  
(year-over-year average)

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Actual	1.68	2.57	2.86	1.49					
B of A					2.19	2.20	2.09	1.80	1.69
GS					2.11	2.39	1.83	1.56	1.75
IHS Markit					2.10	2.70	2.40	2.10	2.20
Economy.com					2.10	2.80	2.10		
Blue Chip Average					2.10	2.40	2.10	2.00	2.00
CBO					1.99	2.00	1.68	1.44	1.70
FOMC High*					2.20	2.20	2.00		
FOMC Low*					2.10	1.80	1.80		
Bill’s BASE					2.00	1.53	1.63	1.83	1.90
Bill’s Strong Growth					2.03	1.72	1.81	2.09	2.21

\*Q4 to Q4 — FOMC year-over-year 2017 equivalent is a range of approximately 2.10 to 2.20 percent, which is in line with other 2017 forecasts

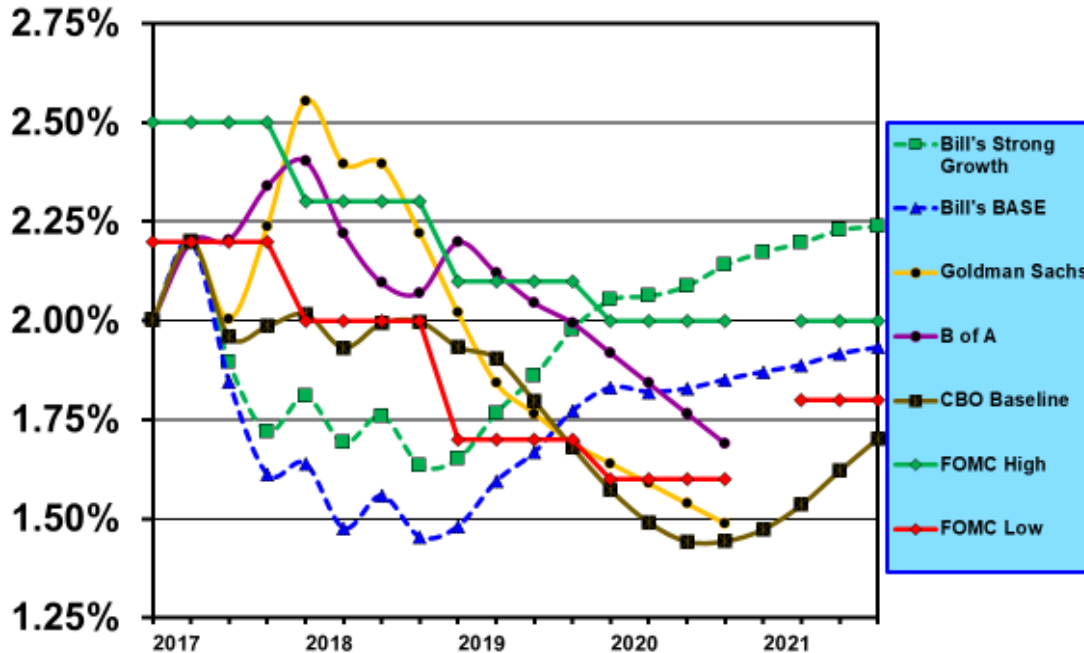
My “**BASE**” scenario is on the low end of the spectrum in 2018 because of lower assumed employment and productivity growth. However, most forecasters are relatively growth bullish for 2018 and some are



extremely optimistic, e.g. IHS Markit and Economy.com.

CBO’s forecasts, based upon its June update, are now generally similar to other forecasts in 2017 but, with the exception of GS’s forecasts, are somewhat more pessimistic in 2019 and 2020. The FOMC’s high and low estimates during the 2017-2019 periods reflect no improvement in growth over time and generally track expectations of other forecasters.

**CHART 6 – Real GDP Growth Forecasts**  
(four-quarter rate of change)



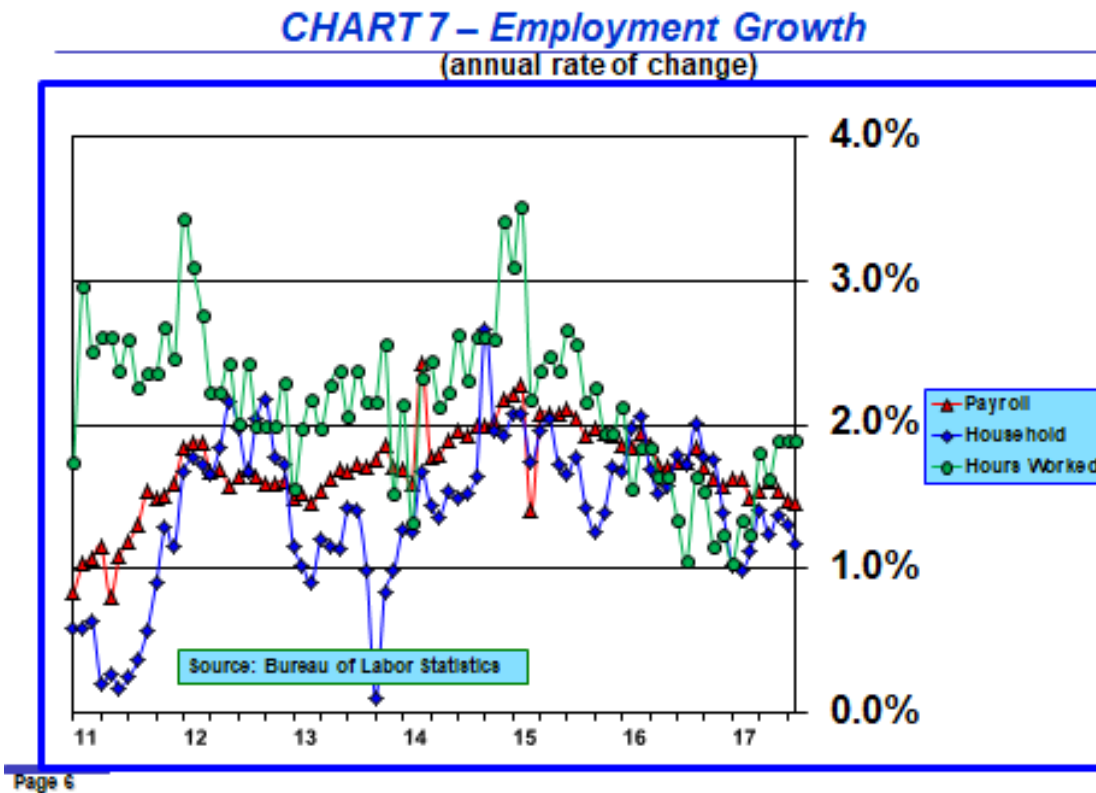
### III. U.S. Employment Developments

August’s payroll report disappointed many market participants but was consistent with an employment market that is at or above full employment in which slower growth is consistent with subdued long-term potential growth at full employment.

Strong monthly employment growth so far in 2017 has resulted in a decline in the unemployment rate to 4.44 percent, which is well below CBO’s full employment estimate of 4.74 percent. In coming months, monthly payroll employment gains are likely to converge to the underlying natural rate of growth in the labor force, which currently is in a range of 70,000 to 80,000. August’s increase, although less than expected, was still well above the long-run sustainable growth level. If monthly growth well above the natural rate continues over the next several months, the labor market will overheat and the FOMC will continue to raise the federal funds rate at a faster than expected pace with the intent to prevent an upside breakout in inflation.

## 1. Employment Growth

Payroll employment grew 156,000 in August, but 41,000 in downward revisions to the two prior months lowered the net gain to 115,000. As can be seen in **Chart 7**, the trend in the 12-month rate of growth in payroll employment has slowed gradually from the cyclical peak of 2.27 percent in February 2015 to 1.45 percent in August 2017. Monthly payroll employment growth averaged 226,000 in 2015, 187,000 in 2016 and 175,625 over the first eight months of 2017.



Household employment growth has been decelerating averaging 209,200 in 2015, 173,400 in 2016, and 166,000 over the first eight months of 2017. Household employment has grown at a slower annual rate of 1.18 percent over the past 12 months compared to payroll employment growth of 1.45 percent.

Growth in total hours worked by all employees had been slowing as well, but growth has accelerated over the past few months as the average length of the workweek expanded. The 12-month moving average length of the work week for all employees has shortened from 34.53 hours at the beginning of 2016 to 34.37 hours in March, but has edged up to 34.40 in August. The recent acceleration in the average length of the workweek and strong household employment growth has boosted the 12-month growth rate in total hours worked by all employees was 1.90 percent over the past 12 months. Growth had been slowing until recently. The growth rate was 1.24 percent in 2016, 1.94 percent in 2015 and 3.42 percent in 2014.

**Chart 7** shows the three measures of employment growth — payroll employment, household employment, and total hours worked. Probably the most important thing to notice in **Chart 7** is the choppy downward trend in employment growth. This is indicative of a maturing labor market in which growth is

slowing to long-term full-employment potential.

## 2. Employment Participation

Employment participation had been declining until about a year ago, reflecting demographic shifts and an increase in discouraged workers exiting the labor force due to poor job prospects during and following the Great Recession. The downward trend in participation driven by changing demographics should continue to reduce participation by about 0.20 percent annually over the next ten years. Because discouraged workers are not counted in the labor force there has been debate about their numbers and whether they would reenter the labor force once the labor market tightened. The increase in the participation rate from 62.39 percent in September 2015 to 62.88 percent in August 2017 is suggestive evidence that many discouraged workers have reentered the labor market in the last few months as jobs have become more abundant. If that were not the case, the participation ratio should have fallen to about 62.02. This is a swing of approximately 1.43 million workers many of whom were probably discouraged but have now reentered the labor.

## 3. Measures of Unemployment Reflect a Labor Market That Is Above Full-Employment

As can be seen in **Chart 8**, the U-3 unemployment rate has fallen to 4.44 percent and has now fallen below the minimum level reached prior to the Great Recession. The August U-3 unemployment rate was considerably below **CBO's** full employment (NAIRU) estimate of 4.74 percent.

The U-6 measure of unemployment, which adds those working part time who would prefer full-time employment and those marginally attached to the labor force to the U-3 measure, has fallen to 8.60 percent and is approximately 0.4 percent above the pre-Great Recession low reached in early 2007. The U-6 measure of unemployment fell 130 basis points over the past 20 months compared to a decline of 58 basis points in the U-3 measure, which underscores an improving labor market that is now above full employment.

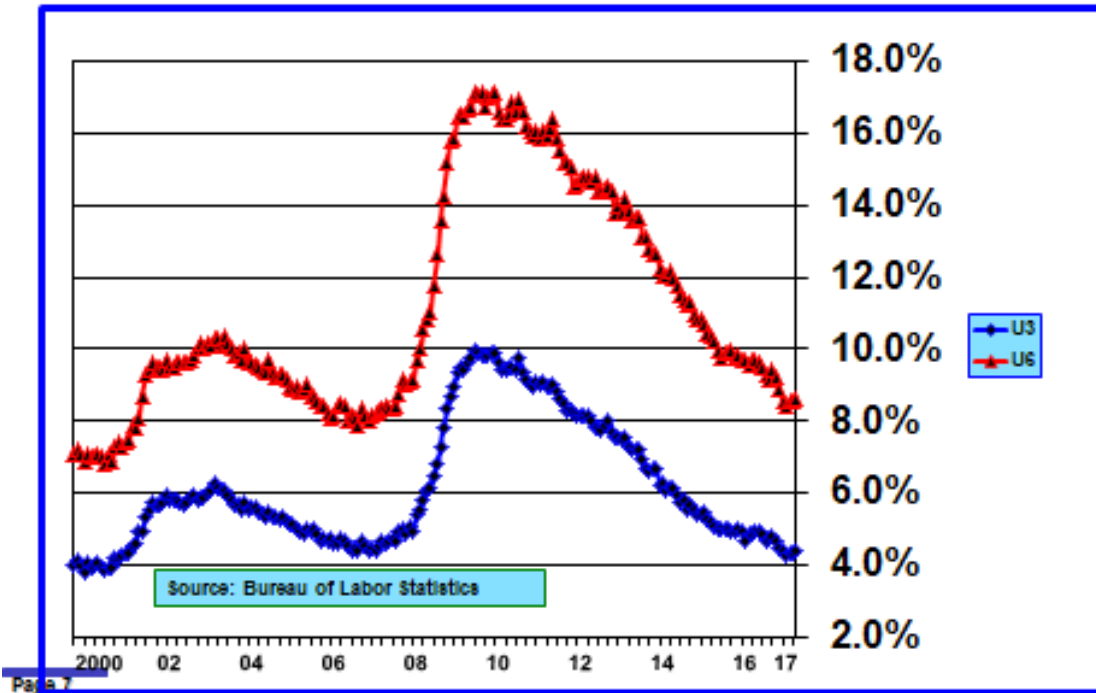
Long-term and short-term unemployment rates are also indicators of labor market tightness and are shown in **Chart 9**. The short-term unemployment rate has now penetrated the minimum level reached prior to the Great Recession. The long-term unemployment rate has declined from over 4 percent in the aftermath of the Great Recession to 1.08 percent in August. It is still about 0.30 percent above the minimum level reached in 2006 just prior to the onset of the Great Recession.

## 4. Forecasts of the U-3 Unemployment Rate

Forecasters expect the labor market to continue to tighten. The current U-3 unemployment rate is 30 basis points below **CBO's** full-employment estimate of the non-accelerating inflation rate of unemployment (NAIRU).

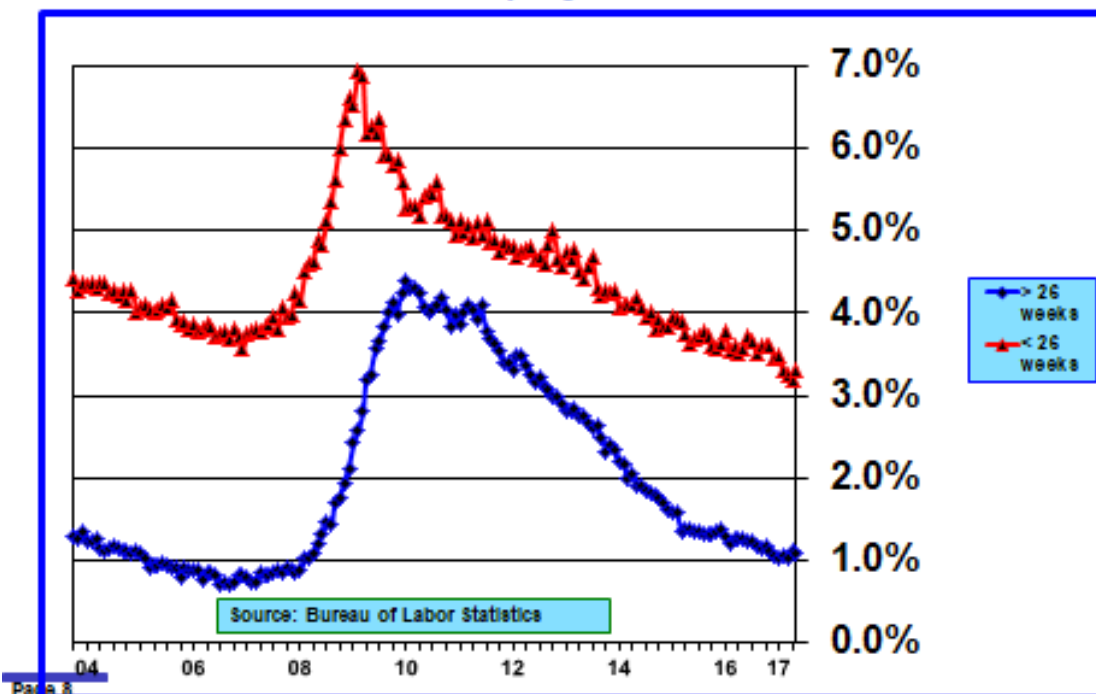
As the term NAIRU implies, when unemployment falls below this level for any length of time not only do wages increase but inflation increases as well. For that reason, the **FOMC** is now crafting monetary policy to maintain full employment but limit the potential for tight labor markets to foster inflation. The traditional monetary policy tool involves raising interest rates. Recent indications of stronger economic

**CHART 8 – U-3 and U-6 Unemployment Rates**



Page 7

**CHART 9 – LT (>26 weeks) and ST (<26 weeks) Unemployment Rates**

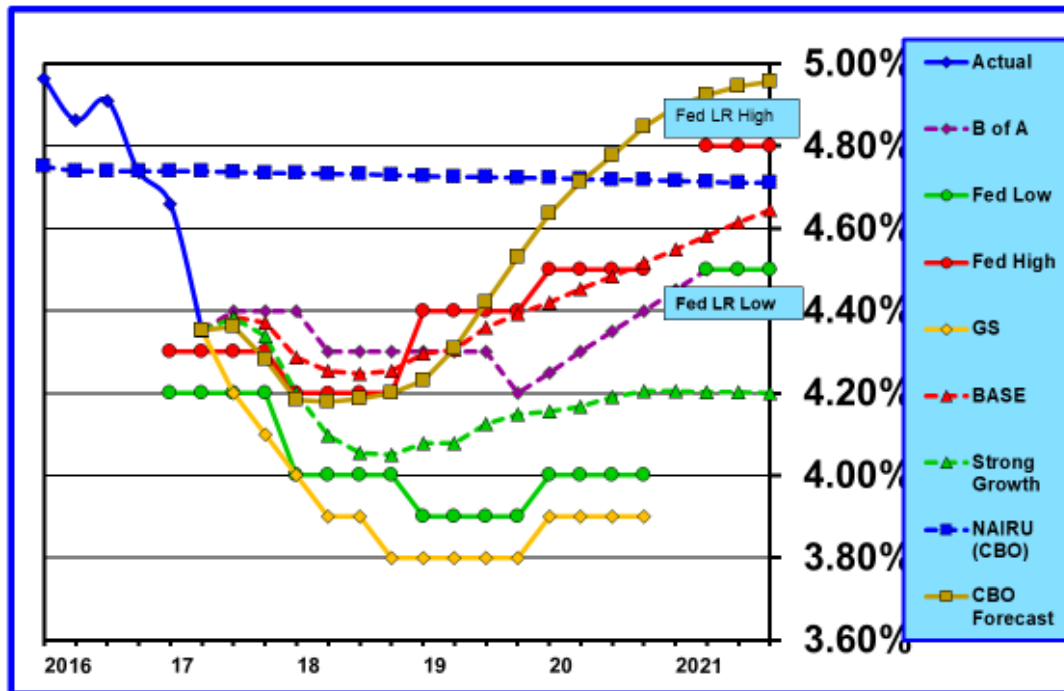


Page 8

growth both domestically and globally have emboldened the **FOMC** to “normalize” monetary policy more rapidly. However, the recent decline in inflation may delay implementation of tighter policy.

**Chart 10** shows U-3 unemployment rate forecasts for **B of A**, **GS**, **FOMC** high and low range, and my “**BASE**” and “**Strong Growth**” scenarios. **CBO’s** estimate of **NAIRU** is also shown in **Chart 10**. Reflecting the recent more rapid decline in the unemployment rate than expected, **B of A**, **GS** and the **FOMC** have all lowered their unemployment rate forecasts.

**CHART 10 – NAIRU and Unemployment Rate Forecasts**  
(quarterly average)



Page 9

Most forecasts project the unemployment rate to stay below **NAIRU** over the next three years. **GS** and **B of A** are the most optimistic and anticipate that the unemployment rate will fall to 3.8 to 4.2 percent by the end of 2018. The unemployment rate falls to 4.25 percent in my “**BASE**” scenario and to 4.05 percent in my “**Strong Growth**” scenario.

During 2019 and 2020 various forecasts diverge considerably. **GS** is the most optimistic. Its forecast unemployment rate forecast remains anchored at 3.8 percent. **B of A** on the other hand expects the unemployment rate to rise to 4.4 percent by the end of 2020. **CBO** is even more pessimistic and expects the unemployment rate to reach 4.85 percent by the end of 2020.

The **FOMC’s** and my unemployment rate forecasts are similar to **B of A’s** forecasts during 2019. My “**BASE**” scenario rises to 4.52 percent and my “**Strong Growth**” scenario edges up to 4.20 percent by the end of 2020.

After 2019 most forecasts, with the exceptions of **GS’s**, including the **FOMC’s** long-run projected range, move upwards gradually toward **CBO’s** **NAIRU**. **CBO** also expects the unemployment rate to

begin rising in 2019 and its forecast exceeds its estimate of NAIRU by the end of 2020.

Increasingly, it appears that structural changes in the labor market may have lowered NAIRU to a greater extent than indicated by **CBO's** estimates. The implication of a lower NAIRU is straightforward — the labor market is not quite as tight as believed. To the extent that this turns out to be the case there will be less upward pressure on inflation and the **FOMC** could slow the rate at which the federal funds rate is normalized. While financial markets seem inclined toward this view, the **FOMC** remains on a course to raise the federal funds rate much more than financial markets currently expect.

## 5. As the Labor Market Has Tightened, Wage Growth Has Accelerated Less Than Expected

Now that the labor market is above full employment, theory and past experience indicate that growth in wages should be accelerating. That is what is supposed to happen when excess supply disappears and demand is increasing. The data indicate this is occurring but to a more limited extent than past experience implies.

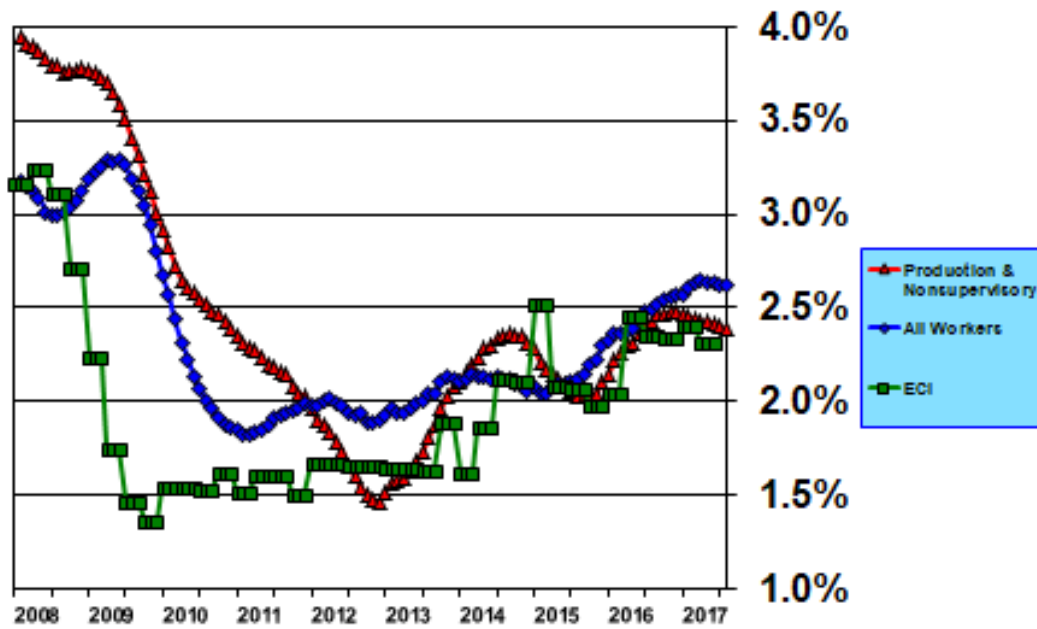
Historically, there has been considerable inertia in wage adjustments which has resulted in a slow rise in average wages even after the labor market has reached or exceeded full employment. Inertia may be greater in this cycle than previously for a number of reasons. First, collective bargaining power provided by unions on the behalf of labor continues to decline as a catalyst for higher wages. Second, because wage increases might not have slowed as much as they could have during the extended period of labor market slack, there is less need to increase wages as much now that the labor market has tightened. Third, lingering employee long-term job insecurity may be dampening demands for higher wages. Responses to a University of Michigan survey question addressing concerns about layoff risk over the next five years remain elevated. Fourth, falling inflation expectations may also be a factor. Fifth, retirement of high-wage baby boomers and replacement with low-wage new entrants may be depressing the average level of wage rates, which would moderate the average rate of wage increases. On the other hand, however, some of the historical inertia appears to have been offset as many states and local governments have raised minimum wage floors over the past two years.

Interestingly, the University of Michigan survey indicates that the share of workers who have not received a pay increase over the previous 12 months has been edging up and remains above the highest level that occurred following the dot.com bust in 2001.

As can be seen in **Chart 11**, increases in wage growth are following the traditional upward cyclical trend as the labor market tightens. But those increases are not as great as historical experience indicates should be occurring. Consequently, forecasts of wage rate increases, which have largely based upon historical relationships, have been consistently higher than have actually materialized.

There are three primary broad-based measures of labor compensation that provide information about compensation trends. All are compiled by the Bureau of Labor Statistics (**BLS**). One is released monthly as part of the monthly labor situation report and includes both hourly and weekly wage rates for all employees and separately for production and nonsupervisory workers, but includes no information about benefits which comprise approximately 30 percent of total compensation. A second measure, the employment cost index (ECI), is released quarterly and consists of wages and salaries, benefits, and total compensation

**CHART 11 – Hourly Wage Rate Growth – ECI, All Workers and Production and Nonsupervisory Workers**  
(annual year over year and 12-month moving average rates of change)



Source: Bureau of Labor Statistics

Page 10

indices (see **Chart 11**). A third measure is also released quarterly as part of BLS's report on output, total hours worked, and productivity.

**Chart 11** shows the rate of growth in hourly wages for all workers, production and nonsupervisory workers, and ECI (total wages and salaries). All three sets of measures in **Chart 11** track each other closely over time. All three measures had been rising gradually, but growth has stalled over the past few months, even as the unemployment rate fell below NAIRU.

Although these measures are highly correlated over time, because compilation methodologies differ for each set of measures percentage changes over fixed time periods will not always be in sync. Currently, all three sets of measures are exhibiting a similar level and trend. Average hourly wages (12-month moving average) of all employees have risen 2.62 percent annually over the past 12 months compared to 2.50 percent a year ago. Increases in average hourly wages (12-month moving average) of production and nonsupervisory workers have been stagnant, rising 2.39 percent annually in August compared to 2.43 percent a year ago. ECI growth in wages and salaries has fallen from 2.45 percent in the second quarter of 2016 to 2.31 percent in the second quarter of 2017.

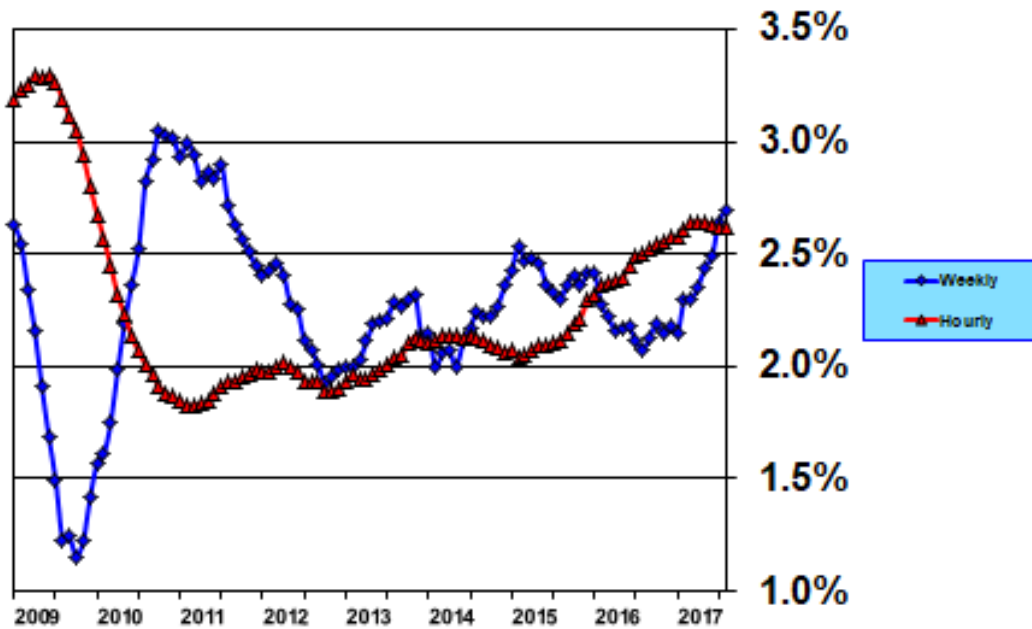
To a certain extent, focusing only on hourly wages is a bit misleading. Growth in average weekly earnings for all employees, which factors in the length of the workweek and thus incorporates changes in the mix of full and part-time employees, has been a little faster than growth in hourly wages, rising from 2.08 percent in August 2016 to 2.69 percent in August 2017 (see **Chart 12**), which is now similar to the 2.62 percent rate of increase in hourly wages. This outcome reflects a modest slowing in the average length of the workweek from 34.44 hours in August 2016 to 34.40 hours in August 2017. In fact, the average length



of the workweek has edged up very slightly since the start of 2017, which could be due to stabilization in the proportions of part-time and full-time workers. Until recently, the proportion of part-time workers had been increasing.

**CHART 12 – Hourly & Weekly Wage Rate Growth – All Workers**

(annual year over year and 12-month moving average rates of change)



Source: Bureau of Labor Statistics

Page 11

**Chart 13** shows my projections for wage growth for production and nonsupervisory workers over the next ten years and **CBO's**, **GS's** and **B of A's** projections for growth in the wages and salaries component of ECI for all workers.

**CBO**, **GS** and **B of A** forecast wage rate growth only for ECI. Although the methodologies for constructing these different wage data series differ, the directionality of all is highly correlated over time, even if the levels aren't precisely the same at every point in time. **GS's** ECI wage growth forecast rises to 3.5 percent by 2018 and remains at that level thereafter. **B of A's** ECI forecast rises to 3.3 percent in 2019 but then recedes to 3.0 percent. **CBO's** ECI forecast rises to 3.4 percent in 2019 but then slows to 3.1 percent by 2021.

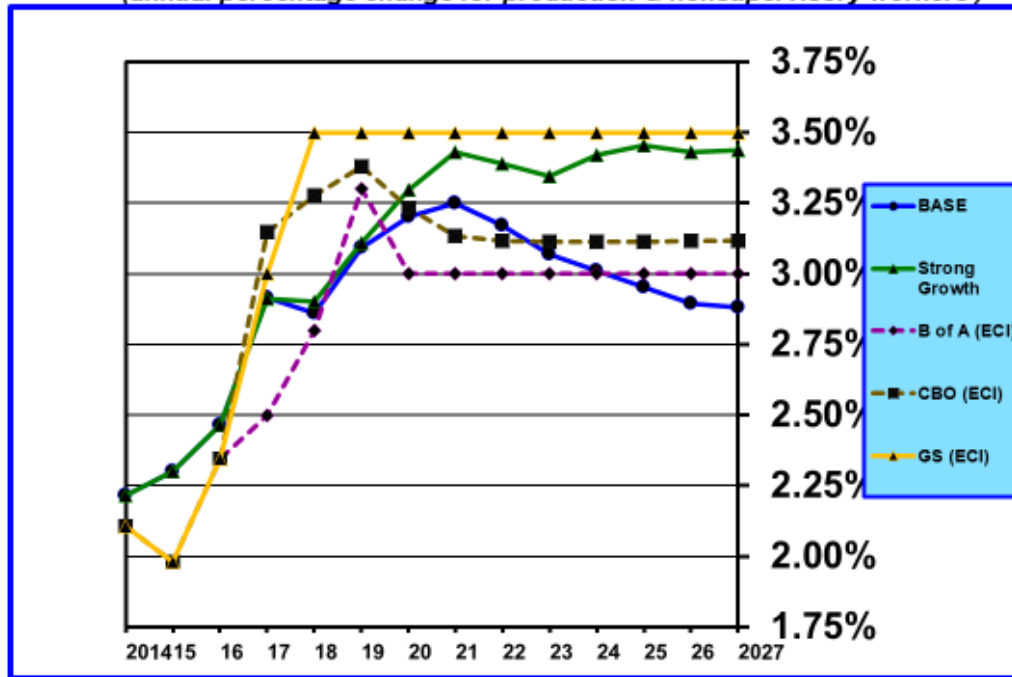
Forecast wage growth for production and nonsupervisory workers rises at about the same rate as **CBO's** and **GS's** projections in my "**BASE**" and "**Strong Growth**" scenarios, reaching 3.09-3.11 percent in 2019. Thereafter wage growth in my "**BASE**" scenario tracks **CBO's** projections closely and is not much different from **B of A's** projections. Wages continue to rise gradually in my "**Strong Growth**" scenario to 3.44 percent by 2027, reflecting the impacts of faster employment growth and lower short-term and long-term unemployment rates.

**GS's** wage tracker registered 2.2 percent in August 2017, about 130 basis points short of its long-run expected 3.50 percent annual rate of increase. **GS's** 3.50 percent level assumes a 3.8 percent unemployment



### CHART 13 – Hourly Wage Rate Forecasts

(annual percentage change for production & nonsupervisory workers)



Page 12

rate, which is well below NAIRU, 2.0 percent inflation, and 1.25 percent annual productivity increases (nonfarm productivity increases would be higher as the measure of productivity **GS** cites does not cover the entire economy).

In **GS's** view the recent weakness in wage growth results from inflation and productivity below expected long-run values. In other words, the historical forces determining wage rate growth have not changed. The upward adjustment in wage rate growth will be consistent with historical precedent and levels of the key determinants — inflation, productivity, and labor market slack. **GS** corroborates its view by demonstrating that low unemployment metropolitan statistical areas have experienced faster wage growth acceleration in recent months than high unemployment areas.

While **GS** is sticking to its guns, others are less certain that wage rate growth will accelerate nearly as much.

### 6. Factors Affecting Wage Rate Growth

Models for forecasting nominal wage growth typically include inflation, productivity, and the unemployment rate as variables. Over time, to preserve real purchasing power, nominal wages should rise and fall in tandem with the rate of inflation. Productivity is included as a variable because labor should receive a portion of productivity gains in the form of higher nominal wage increases. The inclusion of the unemployment rate is simply a way of measuring the effect of the gap between the supply of labor and the demand for labor

on nominal wage rates.

However, in my view the U-3 unemployment rate is an oversimplification of the complexity of labor market dynamics that influence nominal wage rates. Accordingly, I include four labor market variables in my model of nominal wage rate growth in place of the U-3 unemployment rate. These measures do a better job of teasing out oscillations in nominal wage rates over the cycle than using the U-3 rate alone.

Two of the four employment measures involve splitting the U-3 rate into two components: the short-term unemployment rate, defined as those unemployed for 26 weeks or less; and the long-term unemployment rate, defined as those unemployed for more than 26 weeks. The sum of these two variables equals the U-3 unemployment rate. However, it turns out that the coefficients of these two variables and the lag times are very different. The impact of the short-term unemployment rate is about twice as great as the impact of the long-term unemployment rate. The average lagged impact of the short-term unemployment rate on the nominal wage rate is 16.5 months while the average lagged impact of the long-term unemployment rate is 44.9 months. This means that a high short-term unemployment rate will have a relatively quick and substantial negative impact on the nominal wage rate, while a high long-term unemployment rate, which occurred and persisted following the Great Recession, will slow down acceleration in nominal wage rates during the expansion phase of the next cycle. This explains in part why nominal wages have been so slow to respond to a tightening labor market recently.

The third measure is the unemployment gap which is the difference between **CBO's** estimate of NAIRU and the U-3 unemployment rate. To a certain extent this measure contains information similar to the short-term and long-term unemployment rates, but because NAIRU is not a constant level over time, it picks up the impact of employment market slack that is the absolute levels of the short-term and long-term unemployment rates do not pick up. The coefficient of the unemployment gap measure is negative and about the same level as the coefficient of the long-term unemployment rate. The average lagged impact on the nominal wage rate is 15.7 months.

The fourth labor variable is the growth rate in total hours worked. This variable is a proxy for the strength of economic growth over the cycle and over time. It is positively correlated with nominal wage rate growth — the faster hours worked rises, the faster nominal wage rates rise. Its average lagged impact is 22.8 months. Because this variable primarily captures the cyclical effect of labor growth, it needs to be interpreted in conjunction with the short-term and long-term unemployment rates. But there is also a secular trend element embedded in this variable. Thus, as labor growth slows in coming years, there will be less upside pressure on wage rates. Some might argue that this is counter-intuitive because slower labor growth could increase the scarcity value of a smaller labor pool. Although the model does not address this possibility directly, the inclusion of both the short-term and long-term unemployment rates should control for labor scarcity.

In summary, my model of nominal wage rates includes core PCE inflation, productivity and four measures of employment.

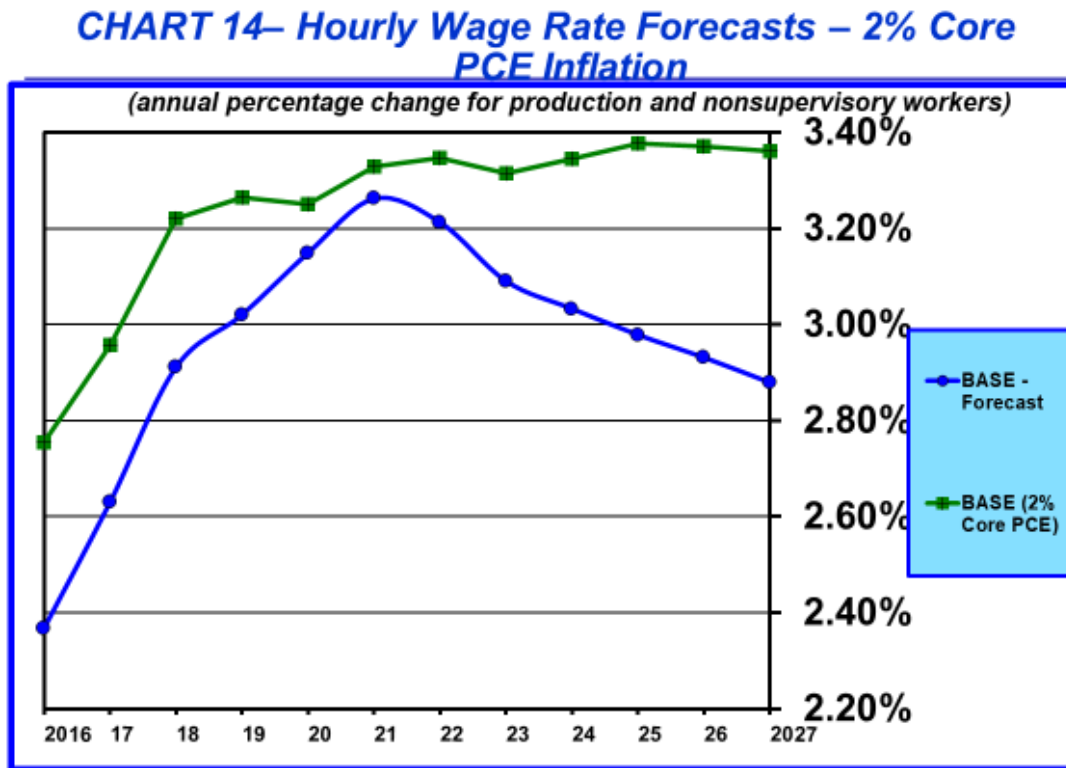
A 1 percent increase in **core PCE inflation** raises the rate of growth in nominal wages by 79 basis points. About half of the lagged adjustment occurs between months 4 and 12 and the remainder occurs between months 13 and 36. Thus, wages respond relatively quickly to changes in inflation. In addition, it is possible that a feedback loop will kick in such that an increase in wages will lead to a further increase in inflation. This is a cost-push feedback loop which can become embedded in automatic cost-

of-living contractual price wage adjustments. In recent years such automatic increases have become less prevalent. **GS** suggests that inflation expectations have become more important.<sup>3</sup> The anchoring of inflation expectations has been accompanied by a decrease in the volatility of changes in wage rates and may have increased the lag between tighter labor market conditions and greater increases in wage rates.

A 1 percent increase in **nonfarm productivity** raises the rate of growth in nominal wages by 29 basis points. This is a rather small impact, which implies that labor does not benefit much from improvements in productivity. About 24 percent of what impact there is occurs with a 13 to 18-month lag with the remainder not kicking in until after 48 months have elapsed.

### 7. Impact of 2 Percent Inflation on Nominal Wage Growth Rate

**Chart 14** shows the two nominal wage rate growth curves — one for my forecasts of the core PCE inflation rate and an alternative one in which core PCE inflation is assumed to be constant at the **FOMC’s** target of 2.0 percent.



Page 13

Because my forecast of core PCE inflation averages less than 2.0 percent, my forecasts for nominal wage growth rate average 30 basis points less in the “**BASE**” scenario — about an average annual rate of increase of 3.05 percent between 2021 and 2027 compared to 3.35 percent if inflation averages 2.0 percent.

<sup>3</sup>Sven Jeri Stehn. “The Missing Reflation,” Global Economics Analysts, Goldman Sachs Economics Research, June 16, 2017.

Both alternatives fall between **B of A's** long-term 3.0 percent rate of increase and **GS's** 3.50 percent rate of increase.

## IV. Inflation

Most **FOMC** members remain confident that both core and total PCE inflation will return to the 2.0 percent target level by 2018 or 2019. In 2013 and 2014 **FOMC** members were premature in their expectation that inflation would rise quickly toward the target of 2.0 percent and were forced repeatedly to extend the time frame for achievement of the 2.0 percent target. Over the past two years as PCE inflation has risen slowly, **FOMC** projections have been stable.

When core PCE inflation was 1.87 percent in 2016 and appeared to be well on the way to reaching 2.0 percent, **FOMC** members were confident that the target of 2.0 percent would be reached in the next two years. However, core inflation has declined steadily since February and stood at 1.41 percent in July and appears headed to 1.30 percent in August. Initially, **FOMC** members dismissed the pullback in inflation to transitory factors, but the persistent decline over six months has led some members to worry about the possibility that inflation expectations have become unanchored to the downside.

Core PCE inflation was 1.41 percent in July and has risen 16 basis points from its recent low of 1.25 percent in July 2015 and appears headed down to 1.30 percent in August.

Total PCE inflation, which had been depressed by the plunge in oil prices and lower import prices in late 2015, rebounded to 2.18 percent in February, up from the 0.19 percent rate of increase that prevailed in September 2015. But total PCE inflation has declined since then and was 1.40 percent in July.

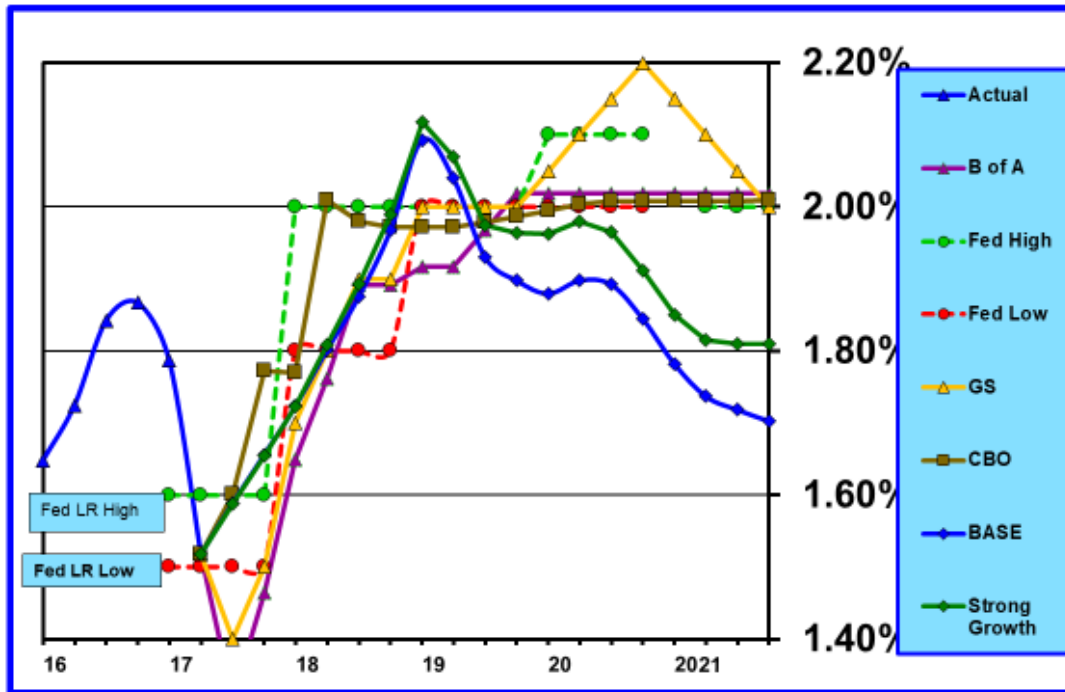
As can be seen in **Table 8** (**Chart 15** shows historical core PCE price index data and data from **Table 8** in graphical form), forecasts of the core PCE inflation index now indicate that inflation will actually fall during 2017. Over the longer run, **B of A** expects core PCE inflation to settle at the **FOMC's** 2.0 percent target. **GS** is forecasting 2.0 percent in 2019 and 2.2 percent in 2020 before dropping back to 2.0 percent in following years. **CBO** projects that 2.0 percent is reached by the end of 2018 and remains at that level thereafter. **FOMC** projections reflect a rise to the 2.0 percent target during 2018 or 2019.

Part of the unexpected recent softness in core PCE inflation is related to quality improvements in cell phones, but other price categories, such as shelter and medical services inflation, have been weaker than expected. **GS** and **B of A** recently reduced their inflation forecasts for 2017 and to a lesser extent for 2018. Their revisions are now about 10 to 25 basis points below my forecasts rather than being about 20 basis points higher in 2017.

As can be seen in **Chart 15**, my econometric model indicates core PCE inflation will closely track the estimates of others through 2020, but softens in 2021. During 2018, and 2019 core PCE inflation in the “**BASE**” and “**Strong Growth**” scenarios is in the vicinity of 2.0 percent but then declines below 2.0 percent in 2020 and continues edging down gradually, reaching 1.41 percent to 1.67 percent by 2027.

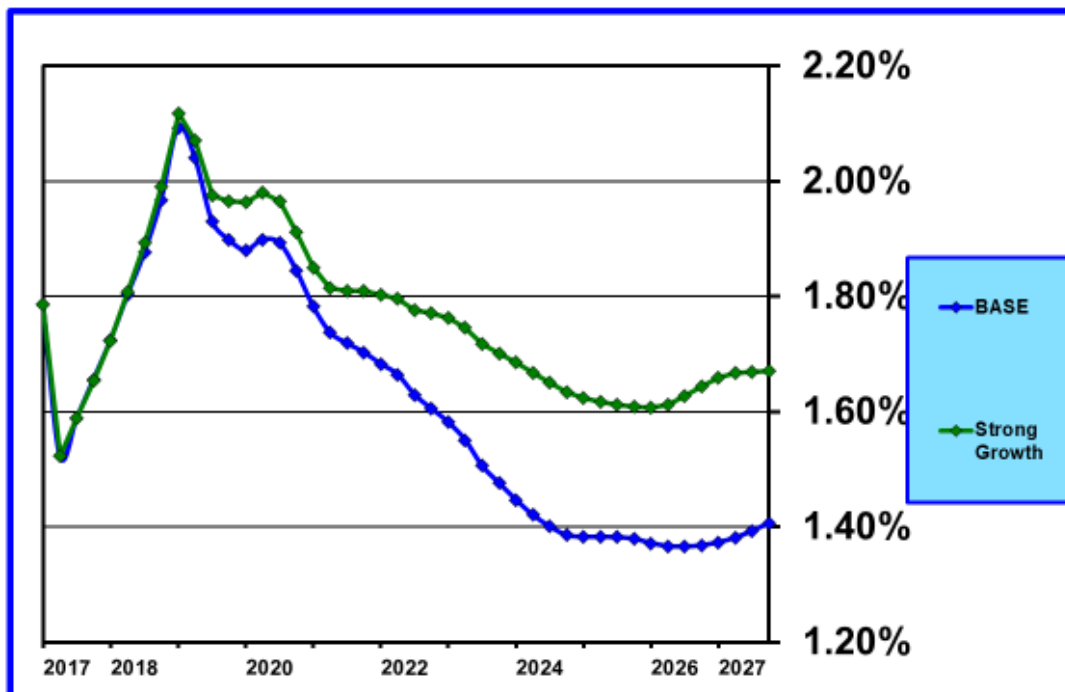
**Chart 16** shows core PCE inflation estimates for my “**BASE**” and “**Strong Growth**” scenarios from 2017 to 2027. What is notable in **Chart 16** is that inflation moves up to the **FOMC's** 2.0 percent target in 2018 and 2019 but falls well below that target after that.

**CHART 15 – Core PCE Inflation**  
(annual percentage rate)



Page 14

**CHART 16 – Core PCE Inflation**  
(annual percentage rate)



Page 15

**Table 8**  
**Core PCE Inflation Forecasts — B of A, GS, Bill’s “BASE”, Bill’s “Strong Growth” and FOMC High and Low**

Core CPE	2013	2014	2015	2016	2017	2018	2019	2020	2021
Actual	1.55	1.48	1.37	1.87					
B of A					1.46	1.89	2.02	2.02	2.02
GS					1.50	1.90	2.00	2.20	2.00
CBO					1.77	1.97	1.99	2.01	1.99
IHS Markit*					2.00	1.60	2.20	2.80	2.60
Economy.com*					2.00	2.10	2.80		
Blue Chip Average*					2.00	2.00	2.30	2.40	2.30
Bill’s BASE					1.66	1.97	1.90	1.84	1.70
Bill’s Strong Growth					1.65	1.99	1.96	1.91	1.81
FOMC — High					1.7	2.0	2.1	2.0	2.0
FOMC — Low					1.6	1.8	2.0		

\*CPI — total index; on average CPI averages about 25 basis points higher than CPE

While one should never discount the possibility of a sea-change in the economic environment in the future that would set inflation on a different course, there is evidence that core PCE inflation will remain modestly below 2.0 percent in coming years, notwithstanding an economy that is operating near full employment and which might benefit from additional fiscal stimulus in the coming year.

## V. Monetary Policy

September’s **FOMC** meeting was viewed by market participants as hawkish, even though the **FOMC** did not change the federal funds rate. As expected the **FOMC** directed the New York Federal Reserve open market desk to begin implementing balance sheet shrinkage in October in accordance with “Normalization Guidelines” the **FOMC** had adopted at its June meeting. Eleven of 16 **FOMC** members indicated that a December federal funds rate increase is likely. The market’s response was to increase the 10-year Treasury note yield 4 basis points to 2.28 percent and raise the probability of a December federal funds rate hike to 67 percent.

Although the market has been somewhat doubtful about the FOMC’s resolve to “normalize” monetary policy, the September FOMC meeting statement and actions were consistent with the roadmap John C. Williams, president of the San Francisco Federal Reserve Bank, laid out several months ago.

In a March speech, Williams said “*With an economy at full employment, inflation nearing the Fed’s 2 percent goal, and the expansion now in its eighth year, the data have spoken and the message is clear: We’ve largely attained the hard-sought recovery we’ve been after for the past nine years. In light of this achievement, we need to shift the conversation from ‘how do we achieve a sustained recovery?’ to ‘how do we sustain the recovery we’ve achieved?’*”<sup>4</sup>

<sup>4</sup>John C. Williams. “From Sustained Recovery to Sustainable Growth: What a Difference Four Years Makes,” Remarks to The Forecasters Club, New York, New York, March 29, 2017.

In a May speech, Williams asserted that “*The U.S. economy has fully recovered from the global financial crisis and the ensuing recession.*”<sup>5</sup> With respect to risk, cited the possibility that the economy might overheat “... *which could undermine the sustainability of the expansion.*” However, an offsetting risk is moving too aggressively. “... *in achieving sustainable growth, it is better to close in on the target carefully and avoid substantial overshooting.*” These are balanced words and Williams emphasizes the importance of “... *gradually raising interest rates to bring monetary policy back to normal . . .*” However, as I comment below, Williams view of “gradual” could result in overshooting, if the market’s view of less monetary policy tightening turns out to be more correct.

Williams, while celebrating the success of monetary policy in restoring aggregate demand, lamented the dismal annual rate of growth in potential real GDP, which he believes to be 1.6 percent. Low prospective employment growth of 0.5 percent annually and anemic productivity of 1.1 percent (the equivalent of approximately 1.4 percent annual rate of increase in nonfarm productivity) are to blame. He asserts that monetary policy cannot influence these supply-side fundamentals. That is a task for fiscal policy. While Williams is optimistic about the economy having reached full employment, he is decidedly among the most pessimistic **FOMC** members when it comes to projecting the trend rate of growth in potential real GDP. His estimate of 1.6 percent is below the lower bound of the **FOMC**’s central tendency range of 1.8 to 2.0 percent.

While **FOMC** members generally agree that monetary policy tightening needs to proceed in the near term, the median expectation about the long-term equilibrium federal funds rate was reduced by about 25 basis points to a range of 2.50 to 3.00 percent. This implies that **FOMC** members believe that only five to six more 25 basis points increases in the federal funds rate will be required to “normalize” monetary policy.

The Federal Reserve’s August Beige Book, which summarizes anecdotal economic information on a regional basis, was a bit stronger than the previous report — five districts upgraded economic activity and two downgraded. The **FOMC** statement explicitly referenced the short-term negative consequences of hurricanes Harvey, Irma, and Maria, but emphasized that these impacts would be transitory and that moderate momentum in economic activity and growth would persist over the longer run.

## 1. Economic Activity

In the September statement, the **FOMC** repeated once again its assessment of overall economic activity, which “... *has been rising moderately so far this year.*” With respect to business investment the **FOMC** said: “... *business fixed has picked up in recent quarters.*” With respect to household spending, the **FOMC** opined that it “... *has been expanding at a moderate rate.*” Overall, the market viewed the **FOMC**’s statement as mildly hawkish and interest rates rose about 5 basis points after the announcement.

**Table 9** shows the **FOMC**’s central tendency projections for real GDP growth for 2017, 2018, 2019 and 2020, as well as the long-term potential real rate of GDP growth. Most forecasters have lowered estimates of 2017 real GDP growth; however, as can be seen in **Table 9**, the **FOMC** has raised its expected range. There are two reasons for this seeming inconsistency. First, the **FOMC** forecasts the growth rate based upon the change in the level of GDP in the fourth quarter of 2016 to the expected level of GDP

---

<sup>5</sup>John C. Williams. “Risk, Resilience and Sustainable Growth: U.S. Monetary Policy in a Post-Recovery Era,” Remarks to the Symposium on Asian Banking and Finance, May 29, 2017.

in the fourth quarter of 2017. Most others calculate the annual growth rate as the change in average GDP over the four quarters of 2017 relative to average GDP for the four quarters in 2016. Averaging over four quarters smooths out anomalous quarterly reports. Because the **FOMC** compares only two quarters rather than comparing the averages of four quarters, its forecasts can be skewed up or down by quirks in data for the fourth quarters of 2016 and 2017. This leads to the second reason why the **FOMC** raised its GDP growth forecast range. In July, the Bureau of Economic Analysis revised GDP data for the past three years. There was a substantial downward adjustment to the fourth quarter 2016 GDP estimate. This reduced the denominator and boosted the reported growth rate. Thus, the **FOMC's** projection convey a false sense of a strengthening economy.

**Table 9**  
**Economic Projections of Real GDP (Q4/Q4) by Federal Reserve Board Members and Federal Reserve Bank Presidents, September 2017**

Real GDP %		Central Tendency						
		2015	2016	2017	2018	2019	2020	Long Run
Q4/Q4	Actual	2.02	1.84					
Y/Y	Actual	2.86	1.49					
2017	Sep			2.2 - 2.5	2.0 - 2.3	1.7 - 2.1	1.6 - 2.0	1.8 - 2.0
	June			2.1 - 2.2	1.8 - 2.2	1.8 - 2.0		1.8 - 2.0
	Mar			2.0 - 2.2	1.8 - 2.3	1.8 - 2.0		1.8 - 2.0
2016	Dec		1.8 - 1.9	1.9 - 2.3	1.8 - 2.2	1.8 - 2.0		1.8 - 2.0
	Sep		1.7 - 1.9	1.9 - 2.2	1.8 - 2.1	1.7 - 2.0		1.7 - 2.0
	June		1.9 - 2.0	1.9 - 2.2	1.8 - 2.1			1.8 - 2.0
	Mar		2.1 - 2.3	2.0 - 2.3	1.8 - 2.1			1.8 - 2.1
2015	Dec	2.1	2.3 - 2.5	2.0 - 2.3	1.8 - 2.2			1.8 - 2.2
	Sep	2.0 - 2.3	2.2 - 2.6	2.0 - 2.4	1.8 - 2.2			1.8 - 2.2
	June	1.8 - 2.0	2.4 - 2.7	2.1 - 2.5				2.0 - 2.3
	Mar	2.3 - 2.7	2.3 - 2.7	2.0 - 2.4				2.0 - 2.3
2014	Dec	2.6 - 3.0	2.5 - 3.0	2.3 - 2.5				2.0 - 2.3
	Sep	2.6 - 3.0	2.6 - 2.9	2.3 - 2.5				2.0 - 2.3
	June	3.0 - 3.2	2.5 - 3.0					2.1 - 2.3
	Mar	3.0 - 3.2	2.5 - 3.0					2.2 — 2.3
2013	Dec	3.0 - 3.4	2.5 - 3.2					2.2 - 2.4
	Sep	3.0 - 3.5	2.5 - 3.3					2.2 - 2.5
	June	2.9 - 3.6						2.3 - 2.5
	Mar	2.9 - 3.7						2.3 - 2.5
2012	Dec	3.0 - 3.7						2.3 - 2.5

## 2. Employment

Most believe the labor market has reached or exceeded full employment. The U-3 unemployment rate in August was 4.4 percent, which was 0.3 percent *below* **CBO's** estimate of NAIRU (non-accelerating inflation rate of unemployment). The **FOMC** noted that "... *the labor market has continued to strengthen ...*" and added that it expects "*labor market conditions will strengthen somewhat further.*" This exact wording



has been repeated in several **FOMC** statements this year.

**FOMC** projections of the U-3 unemployment rate are shown in **Table 10**. The more rapid than expected decline in the U-3 unemployment rate in early 2017 forced **FOMC** members to slash their unemployment rate projections by 0.3 percent in 2017, 2018 and 2019 in June. Importantly, **FOMC** members also reduced the range for the long-term unemployment rate in June, which is presumably the **FOMC**'s version of NAIRU, by 0.2 percent to 4.5 to 4.8 percent. By lowering the long-run range for the unemployment rate, the **FOMC** indicated in June that while the labor market is tight, it is not necessarily overheated to an excessive degree. **FOMC** members made only very modest revisions to their estimates of the unemployment rate in future years in the September update. Of particular note, however, is that the **FOMC** expects the labor market to continue operating above full employment for the next three years.

**Table 10**  
**Economic Projections of Unemployment Rate by Federal Reserve Board Members and Federal Reserve Bank Presidents, September 2017**

Unemp. Rate %	Central Tendency						Longer Run
	2015	2016	2017	2018	2019	2020	
<b>Actual</b>	<b>4.72%</b>	<b>4.72%</b>					
<b>2017 Sep</b>			4.2 - 4.3	4.0 - 4.2	3.9 - 4.4	4.0 - 4.5	4.5 - 4.8
June			4.2 - 4.3	4.0 - 4.3	4.1 - 4.4		4.5 - 4.8
Mar			4.5 - 4.6	4.3 - 4.6	4.3 - 4.7		4.7 - 5.0
<b>2016 Dec</b>		4.7 - 4.8	4.5 - 4.6	4.3 - 4.7	4.3 - 4.8		4.7 - 5.0
Sep		4.7 - 4.9	4.5 - 4.7	4.4 - 4.7	4.4 - 4.8		4.7 - 5.0
June		4.6 - 4.8	4.5 - 4.7	4.4 - 4.8			4.7 - 5.0
Mar		4.6 - 4.8	4.5 - 4.7	4.5 - 5.0			4.7 - 5.0
<b>2015 Dec</b>	5.0	4.6 - 4.8	4.6 - 4.8	4.6 - 5.0			4.8 - 5.0
Sep	5.0 - 5.1	4.7 - 4.9	4.7 - 4.9	4.7 - 5.0			4.9 - 5.2
June	5.2 - 5.3	4.9 - 5.1	4.9 - 5.1				5.0 - 5.2
Mar	5.0 - 5.2	4.9 - 5.1	4.8 - 5.1				5.0 - 5.2
<b>2014 Dec</b>	5.2 - 5.3	5.0 - 5.2	4.9 - 5.3				5.2 - 5.5
Sep	5.4 - 5.6	5.1 - 5.4	4.9 - 5.3				5.2 - 5.5
June	5.4 - 5.7	5.1 - 5.5					5.2 - 5.5
Mar	5.6 - 5.9	5.2 - 5.6					5.2 - 5.6
<b>2013 Dec</b>	5.8 - 6.1	5.3 - 5.8					5.2 - 5.8
Sep	5.9 - 6.2	5.4 - 5.9					5.2 - 5.8
June	5.8 - 6.2						5.2 - 6.0
Mar	6.0 - 6.5						5.2 - 6.0
<b>2012 Dec</b>	6.0 - 6.6						5.2 - 6.0

If the U-3 unemployment rate, which is the simple measure used in the Taylor Rule to assess what the level of the federal funds rate should be, were the only relevant employment policy measure, the **FOMC**'s task to proceed aggressively in normalizing interest rates would be clear. In previous monetary policy tightening cycles, the **FOMC** has always moved more quickly to raise rates when the labor market tightened than it has so far in this cycle.

While the **FOMC** overestimated expected real GDP growth for many years until recently, it simul-

taneously underestimated the decline in the unemployment rate. While these forecasting misses would seem at first blush to be inconsistent, with the benefit of hindsight there have been two drivers. One is that productivity has not recovered to higher levels as expected which explains why real GDP growth has not measured up to expectations. The other is that labor force participation has been much weaker than in previous economic recoveries, resulting in a faster decline in the unemployment rate. Neither of these developments was anticipated. Earlier projections of real GDP growth and the unemployment rate were based on past experience of cyclical recovery patterns which have not repeated as expected.

### 3. Inflation

In its September statement, the **FOMC** factually reported inflation developments: “*On a 12-month basis, overall inflation and the measure excluding food and energy prices have declined this year and are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed on balance.*” In fact, market-based measures of inflation compensation have been declining and survey-based measures are moderately lower than a year.

In the outlook paragraph of the policy statement the **FOMC** opined that: “*Inflation on a 12-month basis is expected to remain somewhat below 2 percent in the near term but to stabilize around the Committee’s 2 percent objective over the medium term. . . . the Committee is monitoring inflation developments closely.*” This wording was exactly the same as it has been in the past several statements. In other words, in spite of the recent decline in inflation, the **FOMC** remains confident that inflation will increase to its target of 2 percent in a reasonable period of time. This could lead to a slower pace in increasing rates. The Committee’s unanimous decision not to raise rates at the September meeting is consistent with that approach.

As can be seen in **Table 11**, the **FOMC** reduced the projected range for inflation in 2017 from 1.6 to 1.7 percent to 1.5 to 1.6 percent. There was also a minor reduction in the top end of the projection range for 2020.

In its recent statements, the **FOMC** has dropped the phrase “stabilize around 2 percent” and replaced it with the terminology “symmetric,” which is intended to convey that its 2.0 percent target is not a ceiling but an average over the cycle. While the term “symmetric” has a certain logic to it, the **FOMC** has not conducted policy in the past on this basis and does not appear inclined to do so currently. Core inflation has remained consistently below 2.0 percent for the past 20 years. Perhaps now that the economy is at full employment inflation will finally rise to 2.0 percent. However, not all of the recent decline in core inflation can be blamed on transitory and technical factors. Prices for goods remain under considerable pressure. My own statistical analysis indicates that inflation is likely to remain below 2.0 percent for an extended period of time (see **Chart 16**).

### 4. Reducing the Size of the Fed’s Balance Sheet

In June, the **FOMC** published updated “Normalization Principles” for reducing the size of the Federal Reserve’s balance sheet. At its September meeting the **FOMC** announced that implementation would begin in October in a manner exactly consistent with the guidelines adopted in June.

**Table 11**  
**Economic Projections of Inflation by Federal Reserve Board Members and Federal Reserve Bank Presidents, September 2017**

Variable		Central Tendency					Long Run	
		2015 0.6	2016 1.6	2017	2018	2019		2020
PCE Inf. %	Sep			1.5 - 1.6	1.8 - 2.0	2.0	2.0 - 2.1	2.0
2017	June			1.6 - 1.7	1.8 - 2.0	2.0 - 2.1		2.0
	Mar			1.8 - 2.0	1.9 — 2.0	2.0 - 2.1		2.0
2016	Dec		1.5	1.7 - 2.0	1.9 - 2.0	2.0 - 2.1		2.0
	Sep		1.2 - 1.4	1.7 - 1.9	1.8 - 2.0	1.9 - 2.0		2.0
	June		1.3 - 1.7	1.7 - 2.0	1.9 - 2.0			2.0
	Mar		1.0 - 1.6	1.7 - 2.0	1.9 - 2.0			2.0
2015	Dec	0.4	1.2 - 1.7	1.8 - 2.0	1.9 - 2.0			2.0
	Sep	0.3 - 0.5	1.5 - 1.8	1.8 - 2.0	2.0			2.0
	June	0.6 - 0.8	1.6 - 1.9	1.9 - 2.0				2.0
	Mar	0.6 - 0.8	1.7 - 1.9	1.9 - 2.0				2.0
2014	Dec	1.0 - 1.6	1.7 - 2.0	1.8 - 2.0				2.0
	Sep	1.6 - 1.9	1.7 - 2.0	1.9 - 2.0				2.0
	June	1.5 - 2.0	1.6 - 2.0					2.0
	Mar	1.5 - 2.0	1.7 - 2.0					2.0
2013	Dec	1.5 - 2.0	1.7 - 2.0					2.0
	Sep	1.6 - 2.0	1.7 - 2.0					2.0
	June	1.6 - 2.0						2.0
	Mar	1.7 - 2.0						2.0
2012	Dec	1.7 - 2.0						2.0
Core PCE Inf. %	Sep	1.4	1.7	1.5 - 1.6	1.8 - 2.0	2.0	2.0 - 2.1	2.0
2017	June			1.6 - 1.7	1.8 - 2.0	2.0 - 2.1		2.0
	Mar			1.8 - 1.9	1.9 - 2.0	2.0 - 2.1		2.0
2016	Dec		1.7 - 1.8	1.8 - 1.9	1.9 - 2.0	2.0		2.0
	Sep		1.6 - 1.8	1.7 - 1.9	1.9 - 2.0	2.0		2.0
	June		1.6 - 1.8	1.7 - 2.0	1.9 - 2.0			2.0
	Mar		1.4 - 1.7	1.7 - 2.0	1.9 - 2.0			2.0
2015	Dec	1.3	1.4 - 1.7	1.7 - 2.0	1.9 - 2.0			2.0
	Sep	1.3 - 1.4	1.5 - 1.8	1.8 - 2.0	1.9 - 2.0			2.0
	June	1.3 - 1.4	1.6 - 1.9	1.9 - 2.0				
	Mar	1.3 - 1.4	1.5 - 1.9	1.8 - 2.0				
2014	Dec	1.5 - 1.8	1.7 - 2.0	1.8 - 2.0				
	Sep	1.6 - 1.9	1.8 - 2.0	1.9 - 2.0				
	June	1.6 - 2.0	1.7 - 2.0					
	Mar	1.7 - 2.0	1.8 - 2.0					
2013	Dec	1.6 - 2.0	1.8 - 2.0					
	Sep	1.7 - 2.0	1.9 - 2.0					
	June	1.7 - 2.0						
	Mar	1.8 - 2.1						
2012	Dec	1.8 - 2.0						

The “Normalization Principles” specify that balance sheet reduction will occur by not replacing all of maturing principal and will not involve outright sales of principal. The initial caps on the amounts of maturing principal that will not be replaced are \$6 billion monthly for Treasuries and \$4 billion monthly for mortgage-backed securities (MBS). These caps will increase quarterly and after 12 months they will reach \$30 billion for Treasuries and \$20 billion for MBS.

There are two views about the impact of balance sheet reductions on interest rates. The market supply view is that rates will go up as the private sector is forced to absorb more Treasuries and MBS. This is the reverse effect of lowering rates which was the intended objective of quantitative easing policy through large scale asset purchases. The other view is that the market will view balance sheet shrinkage as a monetary tightening move with the expected consequence that growth will slow and inflation will fall, which would eventually result in interest rates falling as growth slows. We likely won’t know the tradeoffs between these two views until long after balance sheet shrinkage has ended and economists have had time to conduct sophisticated econometric analyses.

While it’s hard to pin down the ongoing impact of the Fed’s large balance sheet on the economy and the dollar, by some estimates the ten-year Treasury term premium has been depressed by between 50 and 100 basis points. Specifically, the ten-year term premium is 68 basis points below the average level that prevailed between 2005 and 2008; the term premium for mortgage-backed securities is also depressed by 45 basis points currently compared to the earlier period. A word of caution about these comparisons is in order, however. Since the natural rate of interest has declined over the past ten years, a somewhat lower term premium would be a possible related development.

In any event, the argument is that normalization of monetary policy and longer-term interest rates needs to involve shrinking the size of the Fed’s balance sheet. Otherwise, long-term interest rates will remain artificially depressed below the level consistent with a neutral monetary policy.

Federal Reserve research suggests that the depressed ten-year term premium would rise about 15 basis points annually as the Fed’s portfolio of securities ages and average maturities decline and as non-replacement of amortizing and maturing securities occurs. Such a passive policy would take four to five years to eliminate the depressed term premium. It follows that that time frame could be shortened by selling securities prior to maturity. There is no indication that the **FOMC** is thinking about accelerating balance sheet shrinkage through outright sales, but that could change.

In summary, normalizing monetary policy involves both adjusting the federal funds rate and reducing the size of the Fed’s balance sheet. Both will eventually tighten financial conditions, slow economic activity, and reduce inflationary pressures. However, the impacts of the two sets of monetary policy tools operate through different transmission channels and will have differential effects, both in terms of magnitude and timing, on economic activity and inflation. While there is considerable experience with the impacts of tightening monetary policy through the federal funds rate, there is no prior experience with the effects of tightening policy by reducing the size of the Fed’s balance sheet. For that reason, the **FOMC’s** go slow approach is prudent.

## VI. Interest Rates

### 1. Interest Rates — Federal Funds Rate

The **FOMC** raised the federal funds rate 25 basis points at its June meeting to a range of 1.00 to 1.25 percent. The **FOMC**'s projections indicate that there will be one more increase of 25 basis points in 2017, most likely at the December meeting. Market sentiment agrees, but the probability is only slightly greater than 50 percent.

With respect to the issue of additional increases in the federal funds rate in 2018 and subsequent years, there is considerable divergence among the **FOMC**'s own projections, forecasts of analysts and the market forecast embedded in TIPS securities. The expected number and timing of federal funds rate increases made by several analysts, including myself, the **FOMC** and the market is shown in **Table 12**.

**Table 12**

**Number of Federal Funds Rate Increases of 25 Basis Points — FOMC, B of A, GS, Bill's "BASE", Bill's "Strong Growth"**

	2017	2018	2019	2020	2021-27	Total	Long Run
FOMC — median	3	3	2	0.5	0	8.5	2.50-3.00*
B of A	3	3	3	0	0	9	2.75-3.00*
GS	3	4	4	0	0	11	3.25-3.50*
IHS Markit	3	2	3	1	0	9	2.75-3.00
Economy.com	3	3	5	0	0	11	3.25-3.50
Market Forecast	3	1	0	0	0	4	1.50-1.75
Bill's BASE	2	3	4	4	-2	11	3.25-3.75#
Bill's Strong Growth	2	4	4	4	1	18	5.00-5.25#

\*FOMC, B of A and GS rates are equilibrium estimates

#Bill's estimates are forecasts which peak above the likely equilibrium rate

In its September Summary of Economic Projections (SEP), the median **FOMC** member view is three 25 basis point increases in the federal funds rate in 2017 to 1.25 - 1.50 percent, two of which have already occurred; three more in 2018 to 2.00 - 2.25 percent; two more in 2019 to 2.50 - 2.75 percent; and possibly one increase in 2020 to 2.75 — 3.00 percent. The **FOMC**'s central tendency long-term equilibrium level for the federal funds rate is 2.50 to 3.00 percent. In the past the SEP projections have proved to be very unreliable guides to future monetary policy. For example, at the beginning of 2016 the **FOMC** median projected four increases in the federal funds rate during 2016. Only one occurred. While most seem to agree that 2017 will see three increases, which is not a very risky call since two increases have already occurred, there is a wide divergence of opinion about the number of increases in 2018 and later years.

**B of A** and **GS** both expect three increases in 2017 with the remaining increase occurring in December. Over the longer run **GS** expects more tightening than **B of A** and the **FOMC** and a higher equilibrium level of the federal funds rate of 3.25 to 3.50 percent compared to 2.50 to 3.00 percent for the **FOMC** and 2.75 to 3.00 percent for **B of A**.

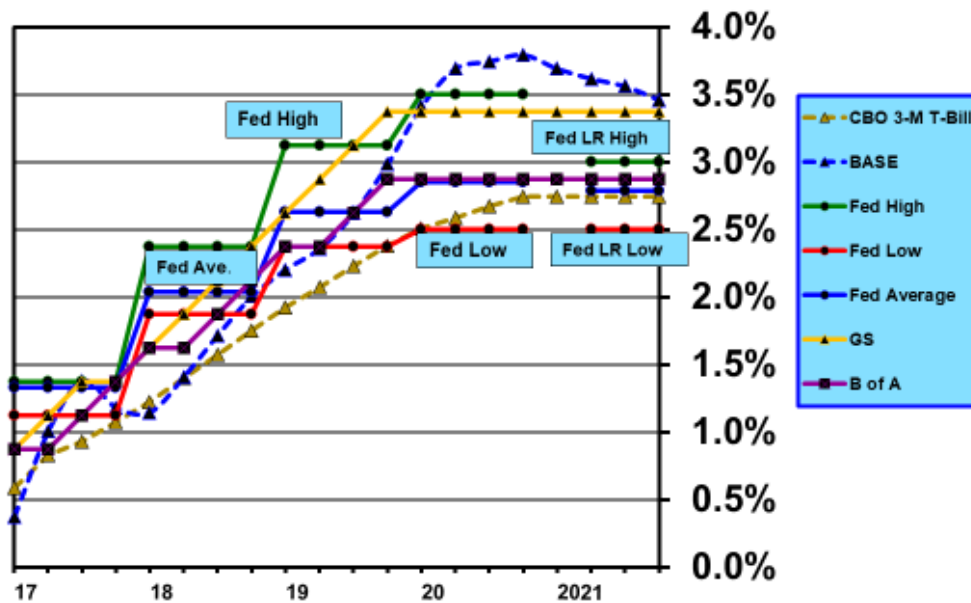
My federal funds rate forecast in my "**BASE**" scenario projects no further increase in 2017, three increases in 2018, followed by four increases in 2019 and four more in 2020. My "**BASE**" case peak rate

reaches 3.75 to 4.00 percent between 2020 and 2025. This is not an equilibrium rate but a forecast that reflects a cyclical peak of an economy operating slightly above full capacity. My estimate of the long-term equilibrium rate is 3.25 to 3.75 percent.

In my “**Strong Growth**” scenario the federal funds rate rises to an even higher cyclical peak of 5.00 to 5.25 percent by 2023. This high projected rate reflects the consequences of a tight monetary policy in an overheated economy — the unemployment rate falls gradually to 3.8 percent in this scenario by 2027, considerably below the NAIRU rate of approximately 4.7 percent. Such a high rate is unlikely to occur because monetary policy tightening will in all likelihood slow economic growth or even result in recession.

**Chart 17** shows the quarterly progression in the federal funds rate from the present through 2021 implied by the **FOMC’s** high, low and average projections. It also shows forecasts for **B of A**, **GS**, and my “**BASE**” scenario. My forecast pathway rises a bit more slowly in 2018 but by 2020 it is higher than **B of A’s** and **GS’s** projections.

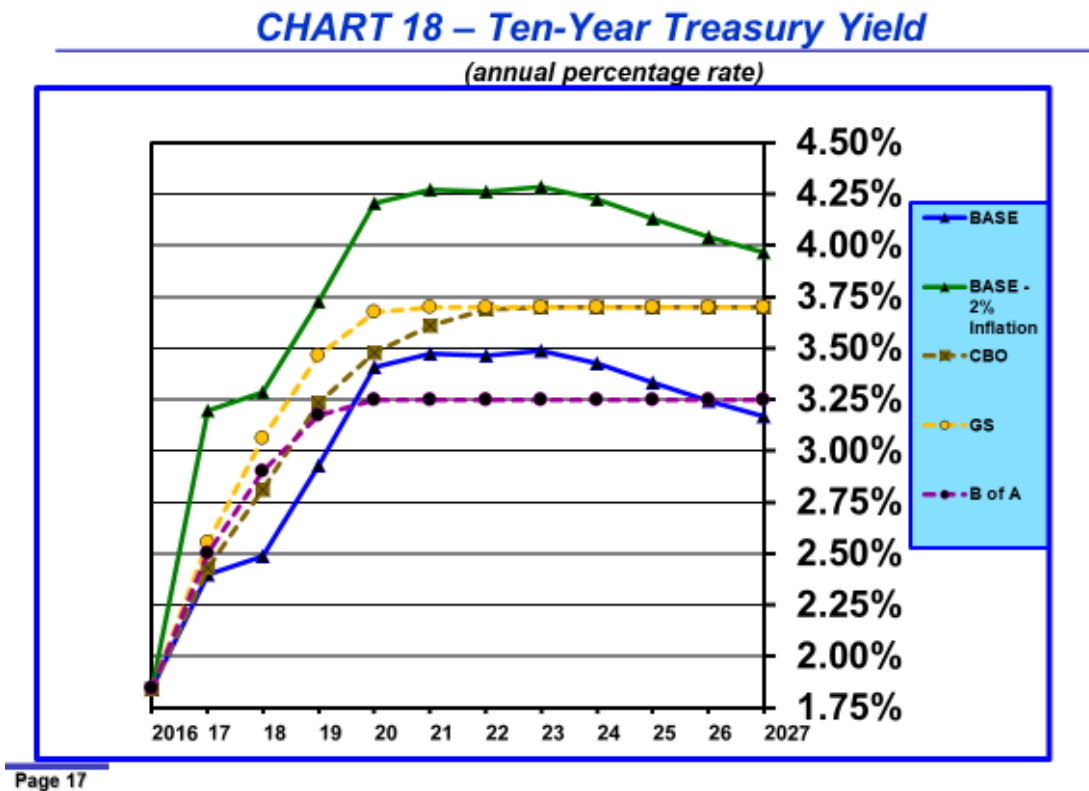
**CHART 17 – Federal Funds Rate Forecasts**



Until December 2016, **FOMC** members had steadily reduced the median estimate of the long-term nominal value of the federal funds rate from 4.25 percent to its current range of 2.50 to 3.00 percent. Based upon my model, my sense is that the **FOMC’s** median projection for the federal funds rate is reasonable with its estimate of long-term real GDP growth of 1.8 to 2.0 percent. My “**BASE**” scenario, assuming 2.0 percent core PCE inflation, indicates that a long-term nominal federal funds rate of about 3.25 to 3.75 percent is a likely level for the long-term neutral federal funds rate, but it could be lower, if productivity remains relatively weak. This also means that the real neutral interest rate, assuming inflation is 2.00 percent, would be 1.25 to 1.75 percent. (See **Table 14.**)

## 2. Interest Rates — 10-Year Treasury Note Yield

**Chart 18** shows forecasts for the 10-year Treasury note yield over the next ten years. Over time analysts have reduced their forecasts for the ten-year yield. Partly this is a mark-to-market exercise driven by the persistent decline in this yield contrary to expected increases. But the adjustments also reflect a growing consensus that the long-run equilibrium real rate of interest has declined. Analysts still expect long-term rates to rise from the current level, but no longer to as high a level.



Assuming an inflation rate of 2.0 percent, my model indicates that the 10-year neutral rate should be between 3.25 percent and 3.75 percent, depending on the level of productivity. (See **Table 14**.) The long-term neutral rate is 3.70 percent for **GS**, 3.25 percent for **B of A** and 3.70 percent for **CBO**. These estimates do not differ materially — all fall within a range of 3.25 percent to 3.75 percent.

My forecasts for the 10-year yield in my “**BASE**” scenario, which are shown in **Chart 18**, are lower than those of other forecasters, except for **B of A**, because my forecasts of inflation are lower than 2.0 percent. The range in my average annual forecasts is 3.00 to 3.40 percent between 2021 and 2027, rather than 3.75 to 4.15 percent that my model says would prevail if inflation were 2.0 percent in the “**BASE**” scenario.

### 3. Real Rate of Interest and Natural Rate of Interest

The **real rate of interest** is the nominal rate of interest minus the rate of inflation. Over the economic cycle both the nominal rate of interest and the reported inflation rate vary. Thus, the real rate of interest also varies over the cycle.

The **natural rate of interest**, sometimes also referred to as the neutral rate of interest or the equilibrium rate of interest, is a specific value of the real rate of interest (nominal rate of interest less the monetary authority's target inflation rate) that occurs when an economy is operating at (not below or above, but at) its full potential. The value of the natural rate depends upon fundamental factors such as the rate of population growth, demographics (e.g., aging), productivity, and inflation expectations. Because these fundamental factors do not necessarily remain constant over time the value of the natural rate can vary.

The natural rate is not directly observable and thus, has to be teased out of messy data.

From a monetary policy perspective, the importance of knowing the value of the natural rate of interest is determining, when the monetary authority's inflation target rate is added, what the nominal value of the short-term interest rate — the federal funds rate — will be when the economy is operating at full capacity.

In the **FOMC's** Summary of Economic Projections (SEP), one of the data points members supply is an estimate of the long-run equilibrium federal funds rate. This is the same as the neutral or equilibrium rate of interest because the accepted assumption is that it is the rate that will prevail when the economy is operating at full capacity. In the September SEP the central tendency range for this rate was 2.50 to 3.00 percent. Given that the **FOMC's** inflation target is 2.0 percent, this means that the consensus of **FOMC** members believes that the neutral rate of interest is in a range of .50 to 1.00 percent.

This all seems to be very tidy. However, there are two big assumptions embedded in the long-run SEP equilibrium value of the federal funds rate. First, and obviously, is that the real rate of interest when the economy is operating at full capacity will be in a range of .50 to 1.00 percent. Second, and less obviously, is that the **FOMC** will be successful in achieving a 2.0 percent stable nominal inflation rate. Most assume that the **FOMC** has the power to engineer this outcome. But, neither assumption is absolutely guaranteed. Both could be wrong.

What evidence exists suggests that both of the **FOMC's** assumptions for the real rate of interest and inflation, when the economy is operating at full capacity, could be too high. Certainly, this is what the market believes currently. The market currently expects at most another 50 basis points increase in the federal funds rate to a range of 1.50 to 1.75 percent. This is 100 basis points lower than what the **FOMC** projects, which is a very large and significant difference. Of course, the market could be wrong and the **FOMC** right; or vice versa, or "truth" could lie somewhere in between.

This is not a trivial issue. If the **FOMC** sticks to its guns and believes it knows best and forges ahead, but the market's assessment is the more correct one, the **FOMC** will commit a serious policy error by over tightening monetary policy and this will surely push the U.S. economy into recession.

There is no clear-cut answer to who is correct or closer to being correct. But, because the consequence of an overaggressive monetary policy — recession — is greater than the consequence of too easy a monetary policy — economic overheating and higher inflation — good risk management principles argue for a more cautious monetary tightening approach than is currently spelled out in the **FOMC's** SEP. If inflation



remains subdued and far short of the 2.0 percent target, expect the **FOMC** in the future to revise down its projections for the federal funds rate, even if the unemployment rate continues to fall.

Now some evidence does exist that sheds a modest amount of light on the two big assumptions about the level of the real rate of interest and the expected long-term level of inflation.

The market's five-year, five-year forward inflation expectations rate was 2.00 percent on September 19. Because the expected inflation rate is derived from TIPS securities which are indexed to the CPI, it is necessary to convert the market's estimate to a PCE basis. Over the last 10 years core CPI has averaged 1.81 percent and core PCE has averaged 1.57 percent, a difference of 24 basis points. This implies that the market's current long-term expected PCE inflation rate is 1.76 percent. Interestingly, this estimate is not much higher than my long-term 1.51 percent core PCE inflation estimate (see **Table 13**). By itself, making a 50 basis points adjustment to the **FOMC's** long-term equilibrium projection would bring the range down to 2.00 to 2.50 percent, which would imply only four to five more 25 basis point increases in the federal funds rate rather than the six to seven additional increases projected by **FOMC** members.

However, with the adjustment for expected inflation, there is still 50 to 75 basis points of difference between the **FOMC** and the market that is unaccounted for. This difference presumably has to do with the value of the expected long-run natural rate of interest. If the market is right, the long-run neutral rate would fall in a range of 0 to 25 basis points.

Jens Christensen and Glenn Rudebusch, both economists at the San Francisco Federal Reserve Bank, recently published a working paper entitled, "New Evidence for a Lower New Normal in Interest Rates."<sup>6</sup> The neutral rate they calculate has fallen more than 200 basis points since the late 1990s and is currently about 25 basis points. The statistical methodology is quite complex but is based on a financial model using market prices of TIPS, which reflect in the authors' words "... *financial market participants' views about the steady state of the economy including the equilibrium interest rate.*"

Others, most notably Thomas Laubach and John C. Williams, currently president of the San Francisco Federal Reserve Bank, have estimated the neutral rate of interest based on a macroeconomic approach that uses data from nominal short-term interest rates, consumer price inflation, and the GDP output gap.<sup>7</sup> The statistical results from this very different analytical methodology closely parallel the decline in the neutral rate of interest over time shown by the financial market model. The macroeconomic model also estimated a neutral rate of approximately 25 basis points in 2016.

So, the fragmentary evidence that is available is more supportive of the market's current view of only two more federal funds rate increases. However, it is possible that as the economy steams ahead at full employment and perhaps overheats that both the long-term inflation rate and the long-term neutral rate of interest will rise. There is evidence in the historical statistical analysis that this has occurred to a limited extent.

And, one additional caveat is in order. The neutral rate assumes that the economy is operating at full capacity. But, if instead the economy is operating above full capacity, which is a definite possibility in coming quarters, then the **FOMC's** policy rate should move to a level above the long-term neutral rate

---

<sup>6</sup>Jens H.E. Christensen and Glenn D. Rudebusch. "New Evidence for a Lower New Normal in Interest Rates," Federal Reserve Bank of San Francisco Economic Letter, 2017-17, June 19, 20117.

<sup>7</sup>Thomas Laubach and John C. Williams. "Measuring the Natural Rate of Interest Redux," *Business Economics*, Vo. 51, No.2, 2016, pp. 57-67.

to contain the risk of an inflationary outbreak. A few **FOMC** members have SEP rate projections that anticipate this kind of outcome. But the bad news from history is that whenever the policy rate moves above the equilibrium rate, recession follows. That is why having a better sense of what the equilibrium rate is from a current perspective is so important. And, from that perspective, the **FOMC** should cool its jets.

#### 4. BASE Scenario Estimates of Nominal and Real Short-Term and Long-Term Federal Funds and 10-Year Treasury Rates

My econometric model provides estimates of values of the short-term (2017) and long-term (2021-27) federal funds rate and the 10-year Treasury rate. These estimates are shown in **Table 13** for various assumed values of inflation, the growth rate in total hours worked and productivity. These estimates are forecasts based upon assumptions about the economy. As such my estimates do not ferret out the natural rate of interest. However, to the extent that my **BASE** scenario is structured to reflect how an economy operating at full capacity might look in the long run, the estimates of inflation and interest rates provide a check on the work of others.

**Table 13**  
**Short-Term and Long-Term Interest Rates for Federal Funds and 10-Year Treasury Rates**  
**(BASE Scenario)**

	Short-Term (2017) Assumptions	Long-Term Assumptions (2021-27)		
Potential Real GDP	1.55%	1.35%	1.78%	1.95%
Inflation (core PCE)	1.51%	2.00%	2.00%	2.00%
Productivity	.66%	.90%	1.40%	1.60%
Labor Force	1.84%	.60%	.60%	.60%
		Nominal Rate		
Federal Funds	.98%	3.29%	3.66%	3.81%
10-Year Treasury	2.21%	3.47%	3.84%	3.98%
		Implied Real Rate		
Federal Funds	-.53%	1.29%	1.66%	1.81%
10-Year Treasury	.70%	1.47%	1.84%	1.98%
		Long-Term Assumptions (2021-27)		
Inflation (core PCE)		1.47%	1.47%	1.47%
Productivity		.90%	1.40%	1.60%
Labor Force		.60%	.60%	.60%
		Nominal Rate		
Federal Funds		2.86%	3.23%	3.38%
10-Year Treasury		2.67%	3.04%	3.18%
		Implied Real Rate		
Federal Funds		1.39%	1.76%	1.91%
10-Year Treasury		1.20%	1.57%	1.71%

My estimates of the long-term federal funds rate are more consistent with the **FOMC**'s SEP projections than with current market expectations. My estimate of the long-run real rate of interest (not necessarily the

natural rate) is in a range of 1.40 to 1.90 percent, depending upon the strength of productivity, compared with the **FOMC's** range of .50 to 1.00 percent for the neutral rate.

In the top panel of **Table 13** it is assumed that growth in total hours worked remains constant at 0.6 percent annually in the long term and that core inflation remains anchored at 2.0 percent and shows the impact on the federal funds and the 10-year Treasury rates for assumed productivity values of 0.9, 1.4, and 1.6 percent. The only change in the bottom panel of **Table 13** is substituting my forecast of core inflation for an assumed target rate of 2.0 percent, which averages 1.47 percent over the 2021-27 period.

## APPENDIX

**Outlook — 2017 and Beyond — Forecast Summary for the U.S. and the Rest of the World, Highlights of Key Issues, and Identification of Risks**

Observations about the 2017 U.S. and global economic outlook and risks to the outlook are listed below. As events unfold during 2017, this will enable the reader to track my analytical prowess. Observations which are on track are denoted by “+”; observations not on track are denoted by “-”; indeterminate observations are denoted by “?” and general observations are denoted by “✓”.

1. **U.S. — September Assessment:** Strong consumer, business, and investor optimism, combined with political uncertainty continue to influence economic activity favorably on balance; early in the year survey data were much stronger than hard economic data reports, but better hard economic data are now being reported; however, recent natural disasters could slow the favorable trend, at least temporarily
  - ✓ **Back-to-Back Hurricanes Harvey and Irma will reduce real GDP significantly in the third and fourth quarters, but should boost real GDP growth in early 2018 as rebuilding occurs**
  - ✓ **Prospects for tax cuts and tax reform are rising once again but are unlikely to take effect until 2018**
  - ✓ **The surge in confidence that followed Trump’s election is being sustained by higher stock prices, strong employment growth, and accelerating global growth**
  - ✓ **The Citi U.S. surprise index remains in negative territory but continues to improve to -21.2 on August 30**
  - ✓ **The index of leading indicators has risen at a 4.1% rate over the past three months**
  - ✓ **The three-month moving average of the Chicago Fed’s national activity index was -.05 in July, which is not significantly different from zero, indicating a stable trend in economic activity — a value above zero indicates accelerating economic activity; a value below zero signals deceleration**
  - **2017 real GDP Y/Y** growth projections range from 2.0% to 2.4%. The FOMC’s central tendency Q4/Q4 projections range from 1.9% to 2.3%. (Q4/Q4 projections are highly dependent upon potential anomalies in Q4 data; therefore, Y/Y estimates, which average all four quarters, usually are more stable estimates.) Risks are tilted to the upside because of fiscal policy activism to cut taxes and increase infrastructure spending.
    - ? *B of A’s has reduced its Q3 forecast growth to 1.7% in response to the negative consequences of Hurricanes Harvey and Irma; GS has lowered its Q3 forecast to 2.0%*
    - ? *GS’s August U.S. Current Activity Indicator (CAI) rose to 3.4% in early September from 3.1% in July; the CAI is a proxy for real GDP growth and reflects what GS thinks GDP growth would be without the impacts of the hurricanes; in early 2017 CAI was high because of strong survey data; the more recent rise in the index has been driven by stronger hard data*
    - + *B of A’s 2017 forecast is 2.19% and GS’s is 2.11%; my “BASE” scenario forecast is 2.00% and my “Strong Growth” scenario is 2.03%*

*+ FOMC boosted its 2017 Q4/Q4 central tendency range in September to 2.2-2.5%, which is a bit of a statistical aberration since the BEA revised down Q4 2016 real GDP*

- **Real GDP output gap** will remain high, but will narrow considerably during 2017 from about 1.2% to 0.5% to 0.8%. (The exact size of the output gap will be revised by CBO, probably in February 2017 and again in August 2017).

*? CBO's estimate of the output gap in the fourth quarter of 2016 decreased from 1.30 percent to 0.45 percent. This improvement was comprised of two components — BEA's revisions to real GDP reduced the gap by 23 basis points; CBO's downward revisions in January and June of estimated potential real GDP reduced the gap by 62 basis points; the revised end of 2017 output gap should be zero or slightly positive*

*+ The second quarter output gap was 0.17%; growth over the remainder of 2017 should reduce the output gap slightly below zero by the end of the year, which means that the economy would be operating above full capacity*

- **Potential structural rate of real GDP growth** has declined significantly in recent years. I expect potential growth to be about 1.3% to 1.4% in 2017. Long-term potential real GDP growth will edge up in coming years to between 1.75% and 2.0%.

*- Based on updated CBO data, I now expect potential GDP growth in 2017 to be approximately 1.55%*

*- Long-term potential real GDP growth has moved higher to a range of 1.9% to 2.2%*

- **Productivity** should rise during 2017 from near zero in 2016 but is still likely to be less than 1.0%, as growth improves and investment increases; it will fall well short of the historical 2.1% average.

*? 2016 productivity was 0.00% Y/Y and .84% Q4/Q4; Y/Y productivity rose to an estimated 0.81% in the second quarter and Q2/Q2 was an estimated 1.35%*

*+ Y/Y productivity growth in 2017 is on a track to rise 1.0% and Q4/Q4 could be .5%*

- **Employment** growth should slow considerably during 2017; now that full employment has been reached actual employment growth should closely track growth in the labor force; payroll growth should average 125,000 to 150,000 per month.

*- Payroll employment growth averaged 175,625 over the first eight months of 2017*

*- Household employment growth averaged 166,000 over the first eight months of 2017*

*+ Labor force growth over the same period averaged 116,375 — eventually payroll and household employment growth will converge to labor force growth*

*+ Evercore ISI temporary and permanent employment surveys remain strong, but have edged down slightly from an average of 60.1 in December to 56.8 in September but remains very strong (a value above 50 is favorable)*

*- The Conference Board's labor market differential was +18.1 in August (the highest level since August 2001 just prior to 9/11) compared to +16.1 in July, +13.6 in June, +11.7 in May, +10.9 in April, +12.8 in March, +7.3 in February and +6.0 in January, indicative of a very strong employment market*

- **Employment participation** will resume a gradual decline during 2017 due to demographically-embedded retirements of baby boomers.

*- Participation grew slightly from 62.67% in December to 62.88% in August*

- **Unemployment rate** should edge down slightly to between 4.3% and 4.5%.
  - + *U3 unemployment rate in July was 4.44%; the unemployment rate is expected to fall further*
- **Hourly wage growth** should edge up slightly during 2017 to a range of 2.7% to 3.1%.
  - ? *Acceleration in wage rate growth has been slower than expected*
  - + *BLS Y/Y hourly wage growth for all employees in August was 2.62%*
  - *The employment cost index grew a disappointing 2.37% in the second quarter*
  - *GS's wage tracker was 2.3% in August, GS still expects wage growth to approach 3.0% by the end of 2017*
  - + *The Atlanta Fed wage tracker was up 3.3% in July, but reflects a slowing in growth from earlier in the year*
  - + *Evercore ISI's composite index of temporary and permanent placement wage pressures were a strong 64.2 in the week ending September 15 compared to 63.7 in December 2016 (a value greater than 50 indicates upward pressure on growth in wages)*
- **Nominal consumer disposable income**, measured on a Y/Y basis should slow as employment growth slows; this will be offset partially by an increase in average hourly wage rates; growth should be in a range of 2.75% to 3.25%.
  - + *As of July nominal consumer income growth over the past 12 months was 2.54%; growth in 2017 appears likely to be in the middle of the forecast range*
- **Nominal consumer spending growth** on the Y/Y basis will rise due in part to upward pressure on inflation in a range of 3.5% to 4.0%.
  - *As of July nominal consumer spending growth over the past 12 months was 4.51%; growth in 2017 appears likely to be above the top end of the forecast range; this strength is not due to inflation, which has declined, but reflects instead strong consumer confidence*
  - ? *University of Michigan Survey of Consumers sentiment index has been relatively stable since reaching a post-presidential election high in January: it was 95.3 in September's preliminary report, 96.8 in August, 93.4 in July, 95.1 in June, 97.1 in May, 98.0 in April, 96.9 in March, 96.3 in February, 98.5 in January and 98.2 in December*
  - ? *Conference Board consumer confidence index has been relatively stable since surging early in the year: it was 122.9 in August, 120.0 in July, 117.3 in June, 117.9 in May and 119.4 in April after surging to 124.9 in March, the highest level since December 2000; this compares to 116.1 in February, 111.8 in January and 113.3 in December; since the election confidence has risen the most for those earning \$35,000 to \$100,000, the only category that has declined is those earning \$15,000 or less*
  - ? *Bloomberg's U.S. Consumer Comfort index dipped to 51.9 on September 15, after peaking at 53.3 on August 26, but still above the 51.3 registered on March 24, which had been the highest level in 16 years*
  - ? *Evercore ISI's index of company surveys ebbed to 52.3 on September 15 from 53.0 on September 8, perhaps related to the consequences of recent hurricanes; the index remains above 50.1 registered on December 30*
  - ? *Growth in August retail sales declined -0.2% because Amazon Prime Day pulled sales forward into July; growth in September sales is likely to be negative because of the hurricanes; July retail sales rose a revised 0.3% (originally reported as 0.6%) and June sales were revised back to a*

*decline of 0.2%, which was the original initial estimate; Amazon Prime Day was a factor in stronger July sales as non-store retailers did particularly well*

*? On line store sales have risen 5% over the past year; department store sales have declined 5% over the past year*

*? Due in part to negative impacts from Hurricane Harvey, auto sales slowed significantly to an annual rate of 16.0 million units in August compared to the recent annual average of about 18 million, a slowing trend, if continued, will depress growth in consumer spending; some improvement in sales is expected over the remainder of the year, but annual sales for 2017 are expected to be -2.3% lower than in 2016*

*? U.S. vehicle production is expected to decline to 11.2 million units in Q3 from 11.7 million in Q2*

- **Household personal saving rate** will decline slightly as growth in spending exceeds growth in disposable income in a range of 5.0% to 5.5%.

*- The saving rate averaged 3.76% over the first seven months of 2017 compared to 3.88% over the past 12 months — the large forecast miss was caused by a substantial downward revision in savings by the Bureau of Economic Analysis in its annual bench market revisions of National Income Accounts*

- **Stock prices**, as measured by the S&P 500 average, should be between 5% higher or 10% lower, on the downside reflecting rising wages, slowing growth in profit margins and rising short-term interest rates and on the upside reflecting growth friendly fiscal policy; there is analysis indicating that U.S. stock prices are overvalued as 2017 commences.

*- The S&P 500 stock index was up 11.7% as of September 21*

- **Manufacturing** will continue to be weak with the PMI index just slightly above or below 50, reflecting the negative consequences of dollar strength.

*- Due to the impacts of Hurricane Harvey, the industrial production index dropped sharply by 0.9% in August to 104.7 from 105.7 in July and 105.3 in June; the index was 103.5 in January; recent manufacturing strength reflects in part stronger global growth and a weakening dollar*

*- 89.5% of manufacturers were somewhat or very positive about business prospects for their companies in the second quarter compared to 93.3% in the first quarter and 56.6% a year ago — the first quarter index was an all-time high for this survey in its 20-year history*

*- The NFIB optimism index skyrocketed to 105.8 in January and held at a high level of 105.3 in February, 104.7 in March, 104.5 in April and May, 103.6 in June, 105.2 in July, and 105.3 in August; these readings are the highest sustained level since 2004; however this high level of optimism has yet to translate into increased capital investment*

*- ISM manufacturing index strengthened to its highest level of the year in August; it was 58.8 in August, 56.3 in July, 57.8 in June, 54.9 in May, 54.8 in April, 57.2 in March, 57.7 in February, 56.0 in January and 54.5 in December (a value above 50 is favorable)*

*- ISM non-manufacturing index has been relatively stable so far in 2017; the index rose to 55.3 in August from 53.9 in July, which was the lowest so far this year: it was 57.4 in June, 56.9 in May, 57.5 in April, 55.2 in March, 57.6 in February, 56.5 in January and 56.6 in December (a value above 50 is favorable)*

*? Also reflecting the theme of strengthening in economic activity, the GS analyst index decisively reversed April's decline to 47.1 by rising to 59.5 in May, 52.9 in June, 55.2 in July and 57.2*

*in August; it was 51.5 in March, 56.7 in February, 58.8 in January and 60.7 in December (a value above 50 is favorable)*

*? S&P earnings growth has been very strong, but National Income accounting data, which adjusts profits for inflation and depreciation, was under downward pressure until a slight increase in the second quarter*

- **Business investment** spending growth should improve and be in a range of 1.0% to 3.0%.

*- Business investment grew at a stronger than expected rate of 6.9% in the first half of 2017 and is expected to rise 4% to 5% for the entire year*

*? Capacity utilization (the U.S. operating rate) improved to 76.7% in July from 75.7% in January, but remains well below the 80.0% level that typically leads to a sustained acceleration in business investment spending*

*? According to the NFIB survey, capital spending has been solid but relatively stable during 2017, "but not enough for a significant improvement in GDP growth or productivity;" however, plans for capital outlays have risen to the highest level since 2006, so there is some room for optimism about future increases in capital spending*

*? The second quarter survey of manufacturers indicated plans to increase capital spending 3.2% over the next year compared to 2.1% in the first quarter survey*

*? EvercoreISI's survey of capital goods has been rising steadily from 44.7 in January to 59.4 in the week ending September 8 (a value above 50 indicates growth in activity)*

*? EvercoreISI's second quarter company inventory survey indicated a significant increase in inventories; auto dealer inventories are very high (+43%); home builder inventories are low (-25%)*

*? C&I lending credit standards have tightened some; C&I lending has weakened steadily over the course of 2017 and growth is now negative; however total bank loans grew at an annual rate of 5.5% over the five-month period of April-August*

*? Commercial real estate credit standards continued to tighten in the second quarter, reflecting regulatory pressures; commercial real estate lending growth is decelerating but is still positive*

- **Residential housing investment** should be about the same in 2017 as it was in 2016 in a range of 3% to 6%; housing starts should rise 2% to 5%.

*? NAHB housing market index has been relatively stable so far in 2017; in the aftermath of the hurricanes, the index dropped to still relatively strong 64 in September; it was 68 in August, 64 in July, 66 in June, 69 in May, 68 in April, 71 in March, 65 in February and 67 in January (a value above 50 is favorable)*

*? Higher mortgage rates depress housing investment; GS estimates that a 100 basis points increase in mortgage rates will decrease the level of residential housing investment by 4-8%*

*+ Annualized housing starts from January through August were 1.8% above the 2016 total, but should be within the forecast range by the end of the year*

*- Housing investment grew at an annual rate of 1.9% in the first half of 2017, and is projected to reach 2.0% to 2.5% for the entire year*

*? Evercore ISI's homebuilders survey has risen from a strong 57.5 in December to an even stronger 58.8 on September 15 (a value above 50 is favorable)*



? Homeownership averaged 63.4% during 2016, the lowest level in 50 years, but rose to 63.9% in the second quarter; GS expects homeownership to stabilize at 65% over the next 3 years, which will boost annual housing starts by about 150,000 to 200,000 cumulatively over the next 3 years and increase growth in housing investment by 1% to 2% annually

? According to the Federal Reserve's senior loan officer Q1 survey, mortgage credit standards tightened slightly; there was no change in Q2

- **Residential housing prices** should rise more slowly in 2017 in a range of 2% to 4% in 2016.
  - ? GS estimates that median housing prices will grow 3-4% more slowly for each 100 basis points increase in mortgage rates
  - The Federal Housing Finance Agency's Housing Purchase Price Index rose 6.2% during 2016 and 6.6% Y/Y in Q2 2017
  - According to the S&P Case-Shiller index, the year over year trend in housing prices was an increase of 5.8% in June, which is well above the rate of increase in nominal incomes and, thus, is not sustainable
  - CoreLogic reported that housing prices are overvalued (more than 10% over sustainable value) in 34% of the U.S.'s 100 largest metropolitan areas and undervalued in 28% (more than 10% under sustainable value); however, overvaluation tends to be concentrated in the larger metropolitan areas (46% of the 50 largest metro markets are overvalued)
- **Trade deficit** should rise in 2017 as the increase in the value of the dollar depresses exports and increases imports.
  - + The trade deficit in July, measured as a 12-month moving average, is expected to be 2.74%, slightly worse than December's 2.67%
- The **dollar's value** on a trade-weighted basis should rise due to stronger economic growth and higher interest rates relative to other developed economies.
  - Trade-weighted dollar was down -7.6% in August from December and is now at its lowest level since January 2015; the dollar has fallen because confidence in Trump economic stimulus has faded, greater than expected strength in European and emerging economic growth, and higher U.S. interest rates relative to interest rates in other developed countries
- **Oil prices** are likely to trade in a narrow band of \$40 to \$55 per barrel because abundant and flexible supply in the U.S. will constrain prices if global demand accelerates.
  - + Oil prices have averaged slightly less than \$50 a barrel so far in 2017 and averaged \$47 in early September; downside risks to prices outweigh upside risks because of rapidly rising U.S. shale oil production, although a curtailment of Venezuela oil exports could lead to a price spike
- **Monetary policy** — the Federal Reserve will raise the federal funds rate one to three times during 2017 in 25 basis point increments.
  - + The FOMC raised the federal funds rate by 25 basis points in March and again in June and reaffirmed its expectation to raise this rate one more time during 2017, probably in December; GS places the probability of a December increase at 75%; following release of the September FOMC meeting statement, the market raised its probability to 67%
  - + The FOMC updated its guidelines for shrinking its balance sheet at the June meeting; at its September meeting the FOMC announced that implementation would begin in October
  - ? Financial conditions have eased so far in 2017 and were 98.92 in September compared to 100.05 in December and have now fallen well below the recent low of 99.57 reached in July 2016

- **Total inflation** measures (CPI and CPE) will be relatively stable in 2017: CPI will rise 2.0% to 2.4% and CPE will rise 1.7% to 2.0%.
  - *Total CPE inflation was up 1.40% in July compared to July 2016; the index, which peaked in February at 2.18%, has fallen as the effects of the rebound from low oil prices experienced in early 2016 dropped out of the index; the index now appears to be headed by year end to a level below the 1.5-1.7% range*
  - *GS's inflation tracker rose to 1.5% in August from 1.4% in July*
  - + *Conference Board 5-10 year CPI inflation expectations fell slightly to 2.4% in April and May from 2.5% in February; CPI inflation expectations for the next year fell from 2.7% in February to 2.5% in April*
  - + *5-year, 5-Year Forward CPI Inflation Expectation rate derived from Treasury Inflation Protected Securities was 2.00% on September 15 compared to 2.08% on December 30, 2016; this translates into an expected long-run PCE inflation rate of approximately 1.75%*
  - + *The August survey of professional forecasters indicated a decline in long-term expected CPE inflation to 2.00% and CPI to 2.25%*
- **Core PCE inflation** will rise slightly in a range of 1.6% to 1.9%, reflecting global disinflationary trends offset somewhat by the closing U.S. employment and output gaps.
  - + *Core CPE inflation was up 1.41% in July compared to July 2016; it now appears that core PCE inflation will be near the bottom end of the forecast range by the end of the year or perhaps slightly below it; B of A's forecast for 2017 is approximately 1.5%*
- The **10-year Treasury rate** is likely to fluctuate in a range between 1.75% and 2.75% in 2017. Faster than expected real GDP and employment growth would push the rate toward the top end of the range; greater than expected declines in inflation and/or heightened financial instability would push the rate toward the bottom end of the range.
  - + *The 10-year Treasury yield was 2.27% on September 21 compared to 2.45% on December 31, 2016*
- **Fiscal policy** will have a positive impact on real GDP growth during both fiscal year and calendar year 2017, raising real GDP growth by 0.2 to 0.3%.
  - ? *Congress is off to a very slow start; no significant legislation has yet been signed into law*
  - ? *President Trump's budget is a political document and is a nonstarter in Congress*
  - *Congress failed to pass health care reform; this complicates prospects for tax reform legislation because the expected fiscal benefits from health care reform will not be available to offset tax cuts*
  - *The odds of significant tax reform have improved in recent days; infrastructure stimulus legislation is uncertain; enactment of legislation, if that occurs, is likely to be delayed until early 2018*
  - + *Congress passed legislation to provide \$15.2 billion in Hurricane Harvey relief aid and combined it with a suspension of the debt ceiling until December 6, thus averting the possibility of a government default for the time being*
  - + *Congress passed a three-month continuing budget resolution, which will extend government spending at fiscal year 2017 levels to December 6, but adoption of a fiscal year 2018 budget resolution will need to occur prior to the expiration of the continuing resolution; thus the possibility of a partial government shutdown has been deferred until December*

*? Congress suspended the federal debt ceiling until December 6, which means that the debt ceiling is unlikely to become binding before March 2018*

- The **deficit** as a percentage of nominal GDP will increase substantially from fiscal year 2016's level of 3.15% to a range of 3.50% to 4.25%. Stronger than expected growth and delayed implementation of tax cuts and infrastructure spending would push the deficit toward the lower end of the range.

*+ Through July 2017 the budget deficit for the prior 12 months is 3.29%*

*+ CBO's revised budget deficit projection for fiscal 2017 is 3.63%; my current estimate is 3.56%*

- **State and Local investment** spending growth should range between 1.0% and 1.5%.

*- State and local spending fell at an annual rate of -0.6% in the first half of 2017; improvement is expected over the remainder of the year, but it is increasingly likely that state and local spending in 2017 will be flat, which will be well short of the 1.0% to 1.5% range*

*? EvercoreISI's survey of state and local tax revenues edged down to 47.0 in August from 48.2 in July (a value of the index below 50 indicates modest deceleration)*

2. **Rest of the World — September Assessment:** Stronger economic activity and improving confidence

- ✓ **GS's global current activity indicator (CAI)** was 4.5% in August, compared to 4.3% in July, 4.6% in May, 4.4% in April, 4.3% in March and 4.1% in February, indicating that global growth remains very strong but acceleration may have passed the peak; global growth will probably exceed the forecast pace of 3.4% for 2017 and the 3.0% actual growth in 2016;
- ✓ **CAI for major advanced economies** has accelerated from 1.5% last summer to 3.1% in August
- ✓ **CAI for emerging markets** rose from 4.3% in January to 4.7% in February, 5.5% in March, 5.6% in April, 6.2% in May, 6.1% in June, 5.4% in July, and 5.7% in August
- ✓ **OECD's global index of leading economic indicators** has been rising slowly over the past year and reached 100.2 in June, compared to 100.2 in June, 99.9 in April and 100.0 in March
- ✓ **The Citi Global Surprise Index** has been rising recently and reached +13.1 on September 4
- ✓ **Annual growth in global trade** was 3.4% in April compared to 6.2% in March, which was the fastest rate since 2011
- ✓ **The JP Morgan Global Manufacturing PMI** increased to 53.1 in August from 52.7 in July, which was the highest level since May 2011
- ✓ **Inflation expectations in Europe and Japan** are increasingly linked to realized inflation rather than to central bank policy rates, which are higher
- **Global growth** is likely to improve to 3.4% in 2017 from 3.0% in 2016. However, due to political instability in Europe and the possible negative impacts of a strong dollar on emerging market economies, risks are tilted to the downside.

- *B of A has increased its 2017 forecast to 3.6%*

- *GS has raised its 2017 forecast to 3.7%*

- *Global growth has accelerated, political instability has been limited, and the dollar has weakened considerably*

? *Global inflation has drifted up slightly due to firming commodities prices; diminishing output gaps should create modest further upside pressure; global inflation is expected to be 2.9% in 2017*

- **European growth** will be positive but will likely fall short of the consensus 1.4% because of potential social and political disruptions, but a decline in the value of the euro would have favorable consequences.

? *Eurozone manufacturing PMI index has improved to its best level of 56.0 since 2010 during the recovery from the Great Recession*

- *B of A has increased its 2017 forecast to 1.9%*

- *GS has raised its 2017 forecast to 2.2%*

- *The euro has strengthened considerably*

- **European inflation** will rise from 2016's 0.2% but will probably fall short of the expected 1.2%.

- *Thanks to rebounding energy prices, the 2017 inflation forecast has been boosted to 1.5% (it was 1.3% in July); core inflation has also edged up and is expected to be 1.2% in 2017*

- **European financial markets** should be relatively stable with periodic episodes of volatility prompted by specific events, such as the French and German elections or a potential banking crisis in Italy

- *No episodes of volatility have occurred*

- **European political dysfunction, populism and nationalism** will continue to worsen gradually. Countries to watch closely include France, Italy, the Netherlands, Greece, Spain, and Portugal. Germany's election will occur toward the end of 2017 and could be significant, depending upon whether political and social turmoil escalates in other parts of Europe earlier in the year.

+ *Dutch elections on March 15 resulted in a smaller than expected gain for the far-right Party for Freedom from 15 to 19 seats out of 150, which eliminated the possibility of a referendum on European Union membership; however, the parliament is more fragmented than ever and will require three or four parties to forge a coalition, which could take several months*

- *Emmanuel Macron, a centrist Europhile, convincingly won the French presidential election and his party captured a majority of seats in the parliament*

? *Germany holds Bundestag elections on September 24; Angela Merkel's party is expected to win the most seats and she will continue as Chancellor for a fourth term*

? *The cyclical economic upturn in Europe has put the damper on the tides of populism*

? *Italy is scheduled to hold elections in 2018; while popular support for the euro is ebbing, Italy's recent return to tepid growth may limit support for Euroskeptic parties*

? *Greece has faded from the news and appears to be complying, albeit grudgingly, with creditor bailout requirements; for now, no new crisis is expected in Greece*

- **U.K. growth** is expected to decline to 0.9% in 2017 compared to 1.8% in 2016 as Brexit consequences begin to develop.

? *The U.K. triggered the two-year withdrawal process from the EU on March 29; EU leaders held a summit in early April to map out the framework for negotiations on Britain's exit from the EU; based on that framework, the European Commission will develop detailed guidelines, which will be submitted to EU member states on the EU Council for approval; negotiations commenced in late June; concerns about the potential consequences of the U.K.'s departure from the EU has ebbed and there is increasing sentiment that the two-year deadline for exit will be extended, perhaps indefinitely*

? *Prime Minister May unexpectedly set early parliamentary elections with the hope of strengthening the Conservative Party's majority; instead Conservatives lost seats, Labour gained and the Scottish National Party lost seats to both Conservatives and Labour; Conservatives formed a minority government, but the likelihood of a "Hard Brexit" has been reduced and the possibility of a referendum and Scottish vote to leave the U.K. has ended, at least for the time being*

- *Expected 2017 GDP growth has been marked up to 1.5% to 1.6%; however, given the U.K.'s impending exit from the European Union, growth is expected to decelerate in future years*

- **China's GDP growth** is expected to be 6.6% but risks are to the downside.

+ *The official 2017 GDP growth target has been cut to 6.5% from 7.0% set in 2016; however, 2017 GDP growth is tracking 6.6% (B of A) and 6.8% (GS)*

- *Growth momentum has been strong but some slowing is expected; however, downside risks of a sharp deterioration in growth are limited*

+ *GS's current activity indicator is edging lower and was 6.5% in August*

? *The yuan was down against the dollar earlier this year, but has strengthened in recent months; foreign reserves have stopped dropping and remain near a hefty total of \$3 trillion*

- **China's leadership** will continue to be slow in implementing **economic reforms** but financial and political stability will be maintained.

? *The 19<sup>th</sup> Party Congress will be held in the fall of 2017; President Xi will receive a second term; however, there is no indication at this time that economic reforms will be a significant agenda matter*

- **Japan's** economic policies will continue to fall short of achieving the 2.0% inflation target; inflation is expected to rise from 0.2% in 2016 to 1.2% in 2017. GDP growth will also continue to fall short of the policy target, but is expected to rise from 1.0% in 2016 to 1.5% in 2017. Population decline and slow implementation of market reforms will continue to weigh heavily on both growth and inflation.

- *Total inflation is expected to be 0.5%, and core inflation is expected to be 0.4%; however, GS's Japan inflation tracker is 1.1%, implying upside pressure on inflation may be building*

- *GDP growth has been marked up to 1.9% by B of A and to 1.5% by GS*

- *GS's current activity indicator was 2.7% in August*

- **India** should continue to experience relatively strong real GDP growth in a range of 7.0% to 8.0% in 2017.

? *State elections early in the year resulted in a major victory for Prime Minister Modi's Janata Party, which will increase Modi's ability to pursue his reform agenda; increasingly it is looking like India can sustain high GDP growth for a number of years, which will offset a probable slowing of growth in China*

- *GDP growth is on track to reach 6.5% to 6.7% in 2017 and was a disappointing 5.7% in Q2, but is expected to accelerate to 7.0 to 8.0% in 2018*

+ *GS's current activity indicator rose sharply early in the year and peaked at nearly 12.0% in May and June but since then has fallen below 6.0%*

- **Emerging market countries** should experience better growth in 2017 than in 2015 and 2016 when falling prices for commodities depressed economic activity in many countries. Growth is expected to improve from 2.6% in 2016 to 3.5% in 2017. However, a major downside risk is a strong dollar, particularly for emerging economies that have large amounts of dollar-denominated debt.

+ *Growth is accelerating; the dollar's decline in value has helped growth accelerate*

+ *GS's current activity index for emerging markets countries rose from 4.3% in January to 4.7% in February, to 5.5% in March, 5.6% in April, 6.1% in May, 5.4% in July, 5.7% in August*

+ *GDP growth is expected to be 5.2% in 2017 and 5.4% in 2018*

- **Brazil, Russia, and Venezuela, in particular**, will continue to struggle with the consequences of the steep decline in the prices of commodities and particularly in the price of oil.

+ *Expected 2017 GDP growth for Brazil is 0.5% to 0.7%; GS's current activity indicator has been positive so far in 2017 and was above 2.0% in August; however, the political situation is deteriorating once again*

- *Economic conditions are improving in Russia; GDP growth is expected to be 2.0% or slightly less in 2017; GS's current activity indicator is hovering close to 4.0%*

+ *Economic and political conditions continue to deteriorate in Venezuela, but regime change does not appear to be imminent*

3. **Risks** — stated in the negative relative to the forecast (+ *risk realized*; - *risk not realized*).

**September Assessment:** No significant positive or negative risks have surfaced so far in 2017; however, Hurricanes Harvey and Irma will probably dampen U.S. economic growth in the third and fourth quarters, but underlying growth momentum remains strong

- **U.S. potential real GDP growth** falls short or exceeds expectations; falling short is the more serious risk

- *Risk not realized; however, updated forecasts for actual real GDP growth have edged toward the lower end of the 2.0-2.4% forecast range*

- **U.S. employment growth** is slower or faster than expected; slower growth is the more serious risk

+ *Through the first 8 months of 2017 employment growth is above the expected level*

- **Employment participation rate** rises rather than remaining stable or falling modestly

+ *The participation rate has risen from 62.67% to 62.88%*

- **U.S. hourly wage rate growth** falls from its 2016 level of 2.6% or rises much more rapidly than expected; falling wage growth is the more serious risk

- *Risk not realized; hourly wage rate growth was 2.62% in August*

- **U.S. Unemployment rate** rises

- *Risk not realized, the rate has fallen more than expected*



- **U.S. productivity** remains below 1%  
*+ Q2 2016 to Q2 2017 productivity increased 1.3%, but the 12-quarter moving average was 0.8%; the full year productivity increase is on track to be approximately 1%*
- **Real U.S. consumer income and spending** increase less or more than expected; less than expected increases are the more serious risks  
*- Consumer income has risen within the expected range*  
*+ Consumer spending growth is slightly above the upper end of the expected range*
- **U.S. stock prices** fall more than or rise more than the expected range of -10% to +5%  
*+ Growth in stock prices is well above the upper end of the expected range*
- **Growth in U.S. residential housing investment and housing starts** are less than or more than expected; below expectations is the more serious risk  
*+ Housing investment growth is on track to be less than expected*
- **U.S. residential housing price increases** are less than expected  
*- Housing prices are rising more than expected and are overvalued by more than 10% in 34% of the U.S.'s 100 largest metropolitan areas*
- **U.S. private business investment** does not improve as much as or more than expected; falling short of expectations is the more serious risk  
*+ Business investment grew much more than expected in the first half of 2017 and is likely to be above the top end of the forecast range by yearend*
- **U.S. manufacturing growth** contracts or expands more than expected; contraction is the more serious risk  
*- Manufacturing surveys are strong*
- **U.S. trade deficit** does not widen as expected  
*- Trade deficit has edged up slightly*
- **Value of the dollar** rises substantially and triggers a global dollar squeeze  
*- Risk not realized, the dollar has declined in value so far in 2017*
- **Oil prices** rise above or fall below the expected range  
*- Risk not realized, price volatility has been modest and prices have remained within the expected range*
- **U.S. monetary policy** tightens more than 75 basis points, spawns financial market uncertainty and contributes to global financial instability  
*- The FOMC has increased the federal funds rate 50 basis points and has indicated that another increase of 25 basis points is likely in December*
- **Financial conditions** tighten and cause financial market volatility  
*- Risk not realized, financial conditions have eased so far in 2017 and are supportive of slightly greater real GDP growth in 2017*
- **U.S. inflation** falls or rises more than expected  
*+ Inflation is weaker than expected and is on a course to be considerably lower than 2016's inflation rate*

- **U.S. interest rates** fall or rise more than expected
  - *Risk not realized; however, long-term rates have fallen modestly since the beginning of the year rather than rising slightly, as expected*
- **U.S. fiscal policy** is more expansionary than expected
  - *Risk not realized; however, the chances that tax reform and infrastructure stimulus will be delayed and smaller are rising*
- **Federal budget deficit** increases more than expected
  - *Risk not realized; according to CBO the deficit is likely to be within the expected range*
- **U.S. state and local spending** does not rise as fast as expected
  - + *Spending is likely to increase much less than expected in 2017*
- **Global GDP growth** does not rise as fast as expected
  - *Risk not realized; growth is accelerating and is expected to be between 3.6% (B of A) and 3.7% (GS) in 2017 and between 3.7% (B of A) and 3.9% (GS) in 2018*
- **Global trade** declines as the U.S. and other countries pursue protectionist policies
  - *Growth in global trade is at the highest level since 2011; other than cancelling TPP, the Trump administration has taken no material actions so far to limit trade*
- **European growth** is considerably less than expected
  - *Risk not realized, growth is accelerating and is expected to reach 1.9% in 2017*
- **ECB's** quantitative easing program is not successful in raising inflation and stimulating the European economy
  - *Risk not realized, Europe's GDP growth is accelerating and inflation has stabilized; inflation is expected to rise to 1.5% in 2017, but the 2.0% target will be very hard to attain — the forecast for 2018 is 1.1%; core inflation is expected to rise to 1.2% in 2017 and 1.3% in 2018*
- **Europe** — financial market turmoil reemerges
  - *Risk not realized; the steadily improving European economy has strengthened the euro and bolstered stock prices*
- **Europe** — political instability and social unrest rises more than expected threatening survival of the Eurozone and the European Union
  - *The Netherlands Party for Freedom, which has an anti-immigration platform and Euroskeptical sympathies, did not do as well as expected in the Dutch elections on March 15*
  - *France elected a moderate centrist, Emmanuel Macron, as president and gave him a parliamentary majority*
  - ? *Germany's parliamentary elections in September are expected to return Angela Merkel as Chancellor*
  - *Populism is receding for the time being as a significant political force as European economies continue to improve*
- **Chinese** leaders have difficulty implementing **economic reforms**
  - ? *The word "difficulty" may be the wrong word choice, as leaders appear to lack resolve to pursue economic reforms*



? *November marks the five-year point in President Xi's term; party officials will meet at the 19<sup>th</sup> Party Congress in November to consider policy and leadership changes*

- **China's growth** slows more than expected
  - *Risk not likely to be realized in 2017, but risks are building for a significant slowdown in future years; second quarter growth was 6.8% and is likely to be 6.6% or greater for all of 2017*
- **Japan** — Abenomics and monetary policy are unsuccessful in raising inflation to the 2 percent target and economic growth continues to be below expectations
  - + *Growth momentum is improving; Japan is expected to report a 2.5% annual rate of growth for the second quarter, which will be the 6<sup>th</sup> consecutive quarter of growth; growth for 2017 is forecast to be 1.9%*
  - *The inflation goal of 2% will not be met, but core inflation has moved up to 0.3% and is expected to be 0.4% for all of 2017*
- **Emerging economies** — a strong dollar leads to serious difficulties especially for countries with large amounts of dollar-denominated debt.
  - *Risk not realized, the dollar's value has declined*
- Severe and, of course, unexpected **natural disasters** occur, which negatively impact global growth
  - + *Hurricane Harvey devastated Houston, the 4<sup>th</sup> largest U.S. city; this disaster along with Hurricane Irma, which wreaked severe damage in Florida, could reduce third quarter U.S. real GDP by 0.8%, according to GS; however, the negative impacts are likely to prove temporary as rebuilding revs up in the first quarter of 2018*
- **New risk** — North Korea's developing nuclear strike capability and potential for pre-emptive military intervention to neutralize that capability
  - + *Risk is simmering after the UN passed new stiff sanctions and North Korea's leader and President Trump traded bellicose comments — "North Korea would be met with fire and fury like the world has never seen."*
  - + *North Korea continues to escalate the situation by testing ICBM missiles, two of the latest of which overflowed Japan's northern most island of Hokkaido, and detonating what it claimed was a hydrogen bomb*

*Bill Longbrake is an Executive in Residence at the Robert H. Smith School of Business at the University of Maryland.*