Our Perspectives:
Commentary on the economy & regulatory policies affecting financial companies

Barnett Sivon & Natter P.C.
ATTORNEYS at LAW
WASHINGTON, DC

# The Longbrake Letter*

Bill Longbrake

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## I. Optimism Reigns But the Expected Acceleration in Growth Is Hard to Discern

Financial markets just about everywhere began the year doing well as a wave of consumer and business confidence burgeoned in the aftermath of Donald Trump's election and as it became clear that global growth was accelerating. Optimism still prevails, but doubts are beginning to surface. Hard economic data has been o.k., but has yet to indicate convincingly that growth is accelerating, particularly in the U.S.

Although markets were surprised by the Federal Open Market Committee's (**FOMC**) decision to raise the federal funds rate in March rather than later in the year and were also surprised at the inability of the Trump administration to get the House of Representatives to pass health care legislation to repeal and replace the Affordable Care Act, the markets have shaken both of these events off. The only visible consequence is that the stock market has stopped rising.

So, optimism and hope continue to reign, in spite of numerous risks that are discussed in this month's letter.

The U.S. economy's expansion is nearly eight years old and is clearly in its mature phase. There is not abundant evidence of imbalances, so the likelihood of recession is fairly low. However, monetary policy is tightening and expected fiscal policy stimulus may be delayed in the U.S. or even fail to materialize because of political turmoil in the White House and the Congress. Add to this the possibility that potential real GDP growth is lower than the now almost universally accepted meager level of 1.7 to 2.0 percent and the stage is set for possible disappointing growth and too much monetary policy tightening, even though the **FOMC** is committed to a policy of gradual tightening.

Europe's economy is performing the best it has in several years. The economy is benefiting at last from

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years of monetary stimulus and a very favorable exchange rate. Political uncertainty, however, remains the potential spoiler. The Danish elections witnessed a further hollowing out of the political center but resulted in only a very limited, and less than expected, increase in the position of the far right anti-immigration Euroskeptic party.

France's presidential and parliamentary elections will occur over the next two months. Markets expect a status quo outcome with a centrist president and parliament. Those who understand details of French politics are not quite as sanguine as markets are. Any significant deviation from the expected outcome will likely have a negative impact on European financial markets.

China's economy has good momentum at the moment and risks in India appear to have diminished with Prime Minister Modi's Janata party faring extremely well in recent state elections.

All-in-all markets appear to be positioned for good news, not for bad news. While the odds of significant bad news actually occurring are not extraordinarily high, when markets are positioned for perfection the risks of disappointment go up.

We may continue to muddle through as we have for the past several years – lackluster growth, but no cataclysmic events. Let us hope so. There is little substantive evidence that growth will improve and political uncertainty is worrying.

## II. Components of U.S. Real GDP

According to the Bureau of Economic Analysis' "**Final Estimate**," real GDP grew 2.1 percent in the fourth quarter.

While the recent trend in growth over the past several quarters had been one of gradual deterioration in growth, this downward pattern appears to be stabilizing and there are signs that this recent trend might even reverse in coming quarters if the burst in optimism following Donald Trump's election as president translates into stronger economic activity. Thus, the relevant question for 2017 is whether policies of the Trump Administration and the newly emergent spirit of optimism combine to reverse the recent trend.

As we approach the end of the first quarter, data and commentary are mixed. Survey measures remain optimistic. However, a CNBC report on March 14 summarized commentary made by Bill Dunkelberg, the National Federation of Independent Businesses (NFIB), interpreting NFIB's continued high level of optimism in March: "*Main Street's sunny outlook is holding up post election, but positive feelings on the economy have yet to translate into real growth in sales or hiring for America's small businesses.*"

Expectations remain upbeat that stronger growth in Europe, China and elsewhere around the globe, along with business-friendly policies in the U.S., will boost U.S. growth substantially in coming quarters. **GS**'s most recent global current activity indicator (CAI), which is a surrogate for real GDP growth, was 4.1 percent. This exceeds the 2017 global real GDP growth forecast of 3.5 percent. **GS**'s emerging markets CAI increased from 4.3 percent in January to 4.7 percent in February. On balance these favorable global trends imply more upside than downside potential for U.S. real GDP growth during 2017.

Any real U.S. GDP growth in the first quarter greater than 0.8 percent will raise U.S. year-over-year

growth. Thus, if **B of A**'s 1.9 percent growth estimate is on the mark, year-over-year real GDP growth will rise from 1.62 percent to 1.78 percent. **GS**'s 1.8 percent first quarter real GDP forecast would raise year-over-year growth to 1.77 percent.

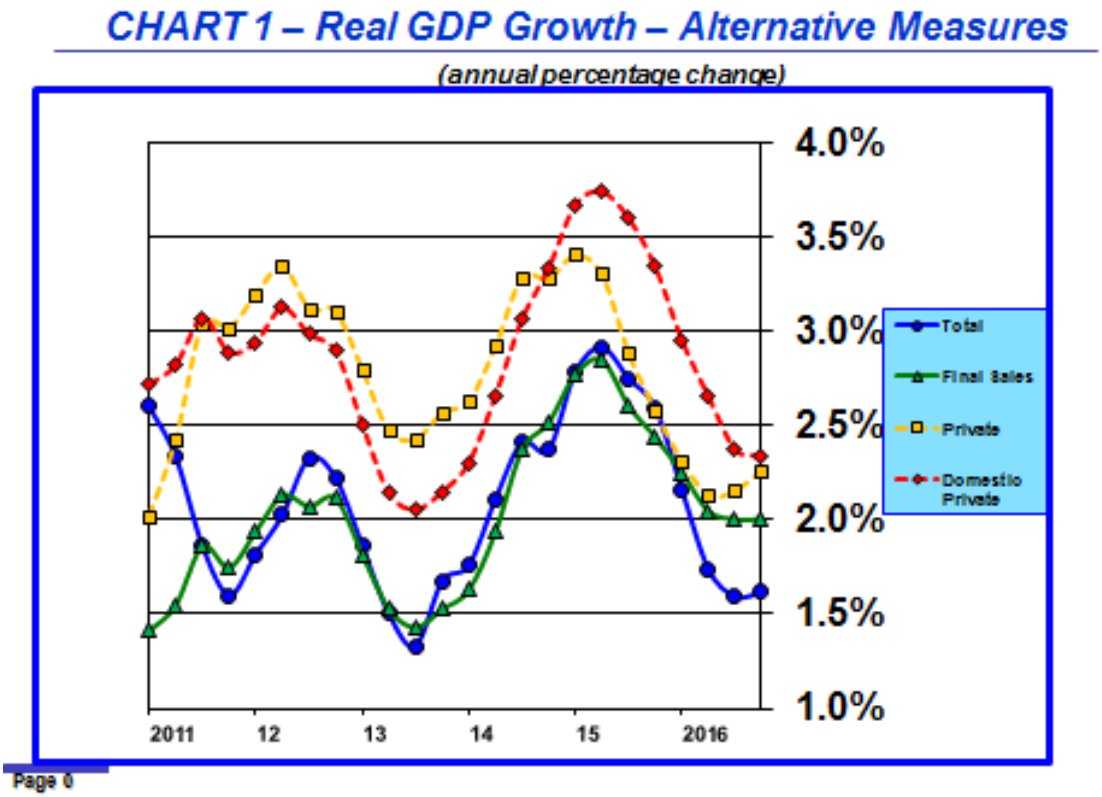
## 1. "Final Estimate" of Fourth Quarter GDP

Annualized fourth quarter real "**Total**" GDP growth in the "**Final Estimate**" was 2.08 percent (blue line with circles in **Chart 1**). Alternative GDP measures, shown in **Table 1** and **Chart 1**, reveal that economic growth was skewed by large anomalous changes in inventories and net exports. In particular, the outsized change in net exports added 0.85 percent to real growth in the third quarter but subtracted 1.82 percent in the fourth quarter – a total swing of 2.67 percent – making all fourth quarter GDP growth measures, with the exception of "**Private Domestic**," virtually meaningless

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

| | Fourth Quarter 2016 Advance Estimate | Fourth Quarter 2016 Preliminary Estimate | Fourth Quarter 2016 Final Estimate | Third Quarter 2016 | Second Quarter 2016 | First Quarter 2016 |
|---|---|---|---|---|---|---|
| Personal Consumption | 1.70% | 2.05% | 2.40% | 2.03% | 2.88% | 1.11% |
| Private Investment | | | | | | |
| Nonresidential | .30% | .17% | .11% | .18% | .12% | -.44% |
| Residential | .37% | .35% | .35% | -.16% | -.31% | .29% |
| Inventories | 1.00% | 0.94% | 1.01% | .49% | -1.16% | -.41% |
| Net Exports | -1.70% | -1.70% | -1.82% | .85% | .18% | .01% |
| Exports | -.53% | -.50% | -.55% | 1.16% | .21% | -.09% |
| Imports | -1.17% | -1.20% | -1.27% | -.31% | -.03% | .09% |
| Government | .21% | .06% | .03% | .14% | -.30% | .28% |
| Total | **1.88%** | **1.87%** | **2.08%** | **3.53%** | **1.41%** | **.84%** |
| Final Sales | **.88%** | **.93%** | **1.07%** | **3.04%** | **2.57%** | **1.25%** |
| Private | **.67%** | **.87%** | **1.04%** | **2.90%** | **2.87%** | **.97%** |
| Private Domestic | **2.37%** | **2.57%** | **2.86%** | **2.05%** | **2.69%** | **.96%** |

"**Final Sales**" omits inventory changes which tend to be volatile over the cycle, rising when the economy slows and falling when the economy accelerates (green line with triangles in **Chart 1**). This measure of real GDP was 1.07 percent in the fourth quarter because inventory restocking added 1.01 percent following the second quarter's rare outright decline in inventories which subtracted 1.16 percent from second quarter




real GDP growth. Netting out inventories, growth in "**Final Sales**" slowed from 3.04 percent in the third quarter to 1.07 percent in the fourth quarter. As mentioned in the previous paragraph, because of the extreme volatility of contributions of net exports to growth in both the third and fourth quarter, the comparison of third and fourth quarter growth rates for "**Final Sales**" is of little value.

"**Private**" GDP is a measure of non-governmental economic activity. It omits both inventory changes and government investment spending (yellow dotted line with squares in **Chart 1**). 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. Growth in "**Private**" GDP was greater than growth in "**Total**" GDP during 2011, 2012, 2013 and 2014, a period when fiscal policy was contractionary. Since 2015, with the exception of the second quarter of 2016, fiscal policy has been mildly supportive of "**Total**" real GDP growth. Government activity added 3 basis points to "**Total**" real GDP growth during the fourth quarter. "**Private**" GDP growth was 1.04 percent in the fourth quarter and 2.90 percent in the third quarter. Again, the quarterly comparison is not meaningful because of the volatility in net exports.

"**Private Domestic**" GDP is a measure of domestic non-governmental economic activity. It omits inventory changes, government investment spending and net exports (red dotted line with diamonds in **Chart 1**). Since mid-2014 net exports have depressed "**Total**" real GDP growth. That development flowed directly from the stronger dollar and was corroborated by the slowdown in industrial production and manufacturing during much of 2016, which are more directly linked to international trade than other sectors of the economy. Like inventories, net exports typically are highly volatile on a quarterly basis. This was particularly the case in the third and fourth quarters as net exports inflated "**Total**" GDP by 85 basis

points in the third quarter and subtracted 182 basis points in the fourth quarter. Netting out the impact of net exports, annualized "**Private Domestic**" GDP declined from 2.69 percent in the second quarter to 2.05 percent in the third quarter and rose to 2.86 percent in the fourth quarter.

***Thus, when the noise of inventories, government and net exports is swept out of the way, fourth quarter annualized real GDP was higher than the same measure in the third quarter, only slightly lower than "Private Domestic" real GDP growth in the second quarter, and 78 basis points better than the topline measure of "Total" GDP growth.***

**Table 2** provides numeric year-over-year data (four-quarter rolling average) for the four measures of GDP shown in **Chart 1**. **Table 2** also includes year-over-year data showing the year-over-year growth rates for key components of real GDP – personal consumption, nonresidential investment, residential investment, net exports, and government.

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

| | GDP Component Weight | Fourth Quarter 2016 | Third Quarter 2016 | Second Quarter 2016 | First Quarter 2016 | Fourth Quarter 2015 | Third Quarter 2015 |
|---|---|---|---|---|---|---|---|
| Personal Consumption | 69.1% | 2.74% | 2.61% | 2.70% | 2.86% | 3.18% | 3.42% |
| Private Investment | 17.0% | | | | | | |
| Nonresiden-tial | 13.2% | -.53% | -.30% | .33% | 1.08% | 2.07% | 3.10% |
| Residential | 3.6% | 4.86% | 7.83% | 10.77% | 12.11% | 11.70% | 9.98% |
| Net Exports | -3.4% | 4.27% | 8.13% | 17.23% | 21.68% | 26.83% | 26.60% |
| Exports | 12.8% | .36% | -.56% | -1.14% | -.66% | .11% | 1.42% |
| Imports | -16.2% | 1.15% | 1.12% | 2.21% | 3.26% | 4.58% | 5.48% |
| Government | 17.5% | 0.81% | 1.30% | 1.65% | 1.97% | 1.79% | 1.32% |
| Total | **100.0%** | **1.62%** | **1.59%** | **1.74%** | **2.16%** | **2.60%** | **2.75%** |
| Final Sales | **99.9%** | **2.00%** | **2.00%** | **2.05%** | **2.25%** | **2.44%** | **2.61%** |
| Private | **82.4%** | **2.26%** | **2.16%** | **2.13%** | **2.31%** | **2.58%** | **2.89%** |
| Private Domestic | **85.8%** | **2.34%** | **2.38%** | **2.66%** | **2.96%** | **3.34%** | **3.60%** |

Economic activity decelerated from the third quarter of 2015 through the third quarter of 2016 but appears to have stabilized in the fourth quarter of 2016. The decline in "**Total**" GDP was greater than the decline in "**Final Sales**," reflecting slow growth in inventories. And, if most analysts are on the mark in expecting long-run potential real GDP to increase annually in a range of 1.7 to 2.0 percent, the "**Final Sales**" year-over-year growth rate of 2.00 percent in the fourth quarter may could fall further now that the economy is close to full employment.

Growth in nonresidential investment and residential investment, which collectively contribute 17.0 percent to "**Total**" GDP, has weakened over the past six quarters. Personal consumption growth has

weakened also, although recent strong employment gains and rising wages appear to have stabilized personal consumption growth in the vicinity of 2.7 percent.

Weakness in nonresidential investment is particularly worrisome because strong productivity gains in the long run depend on robust investment spending growth. Recent weakness was due in part to the decline in oil prices and the collapse in energy investment, but the declining trend in nonresidential investment has been much broader-based than energy. With the recent surge in business optimism there is reason for optimism that business investment will pick up. However, the NFIB survey, while indicating a surge in small business optimism, does not reflect any significant change in plans to increase investment. In addition, capacity utilization is quite low, which does not bode well for robust investment activity.

Residential investment growth has been a bright spot, but accounts for only 3.6 percent of "**Total**" GDP. And, growth in this component of GDP has slowed over the last four quarters.

Overall, as the economy verges on full employment, the deceleration in real GDP appears to be ratifying forecasts of meager potential growth in the range of 1.7 to 2.0 percent. Given the cyclical upswing in global growth and the prospect of growth friendly fiscal and regulatory policies of the Trump administration, it is possible that the U.S. economy will experience its own cyclical upswing in growth in coming quarters. However, the longer term risk of slower growth in the range of 1.7 to 2.0 percent remains in place because of slowing labor force growth and lackluster productivity.

## 2. Consumption

Personal consumption contributed 2.40 percent to fourth quarter real GDP growth compared to 2.03 percent in the third quarter. The year-over-year growth rate rose slightly from 2.61 percent to 2.74 percent, but is little different from the second quarter growth rate of 2.70 percent.

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

Forecasts of growth in real consumer spending are shown in **Table 3** and **Chart 2.** Real consumer spending increased 2.74 percent in 2016. This is not the final number as several more revisions will occur over the next few years.

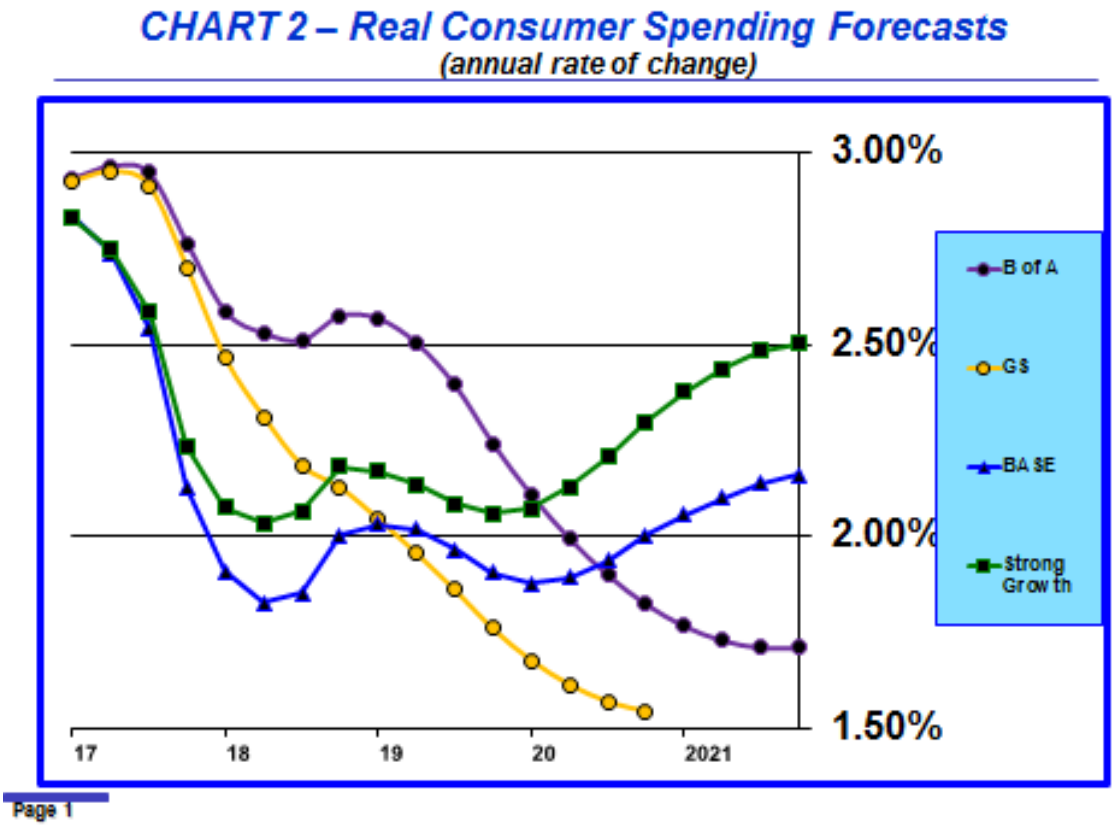
Over the longer run growth in real consumer spending generally should follow growth in employment and growth in real wages (disposable income). Now that the economy is very close to or at full employment, employment growth is set to slow to match underlying demographic dynamics. This is why all forecasters expect real consumer spending growth to slow in coming years.

This is the general pattern apparent in the data in **Table 3** and **Chart 2.** Growth in wages (disposable income) might moderate the forecast decline in consumer spending growth, but only if the growth rate in real wages (disposable income) increases. That would require productivity to improve from its recent very low level. That would be a welcome result, but is not at all assured.

Although all forecasters agree that consumer spending growth will slow, there are considerable differ-

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

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|
| Actual | 1.43 | 2.88 | 3.21 | 2.74 | | | | | |
| B of A | | | | | 2.76 | 2.58 | 2.24 | 1.82 | 1.71 |
| GS | | | | | 2.70 | 2.13 | 1.76 | 1.55 | |
| Global Insight | | | | | 2.80 | 3.20 | 2.90 | 2.40 | 2.30 |
| Economy.com | | | | | 3.20 | 3.20 | 2.10 | | |
| Blue Chip | | | | | 2.70 | 2.50 | 2.20 | 2.20 | 2.10 |
| Bill's BASE | | | | | 2.13 | 2.00 | 1.91 | 2.00 | 2.16 |
| Bill's Strong Growth | | | | | 2.24 | 2.18 | 2.06 | 2.30 | 2.50 |




ences in opinions about growth in 2017 and 2018. My forecasts, shown in the "**BASE**" and "**Strong Employment**" scenarios, are decidedly at the pessimistic end of the range in 2017 but gravitate toward the optimistic end of the range by 2021.The considerable divergence in forecasts for the next two years reflect different assumptions about employment and wage growth and the possible effects of fiscal stimulus. Over the longer run, most analysts' forecast converge based upon shared expectations that employment growth will slow and wage growth will stabilize.

### 3. 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 generally 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. 1947-2016 |
|---|---|---|---|---|---|---|---|---|---|
| REAL PRIVATE INVESTMENT | | | | | | | | | |
| Actual | 5.02 | 5.54 | 3.90 | 0.57 | | | | | **3.73** |
| B of A | | | | | 3.23 | 5.08 | 4.60 | 3.41 | |
| GS | | | | | 3.46 | 4.15 | 3.66 | 3.13 | |
| Bill's BASE | | | | | 1.72 | 2.17 | 2.27 | 2.20 | |
| Bill's Strong Growth | | | | | 2.35 | 3.03 | 3.03 | 3.03 | |
| REAL NONRESIDENTIAL INVESTMENT | | | | | | | | | |
| Actual | 3.50 | 6.04 | 2.07 | -0.53 | | | | | **2.33*** |
| B of A | | | | | 3.08 | 4.98 | 4.56 | 3.41 | |
| GS | | | | | 3.04 | 3.55 | 3.10 | 2.70 | |
| REAL RESIDENTIAL INVESTMENT | | | | | | | | | |
| Actual | 11.88 | 3.49 | 11.70 | 4.86 | | | | | **-0.25*** |
| B of A | | | | | 3.80 | 5.42 | 4.75 | 3.41 | |
| GS | | | | | 5.03 | 6.33 | 5.65 | 4.58 | |

*Average 1999-2016; real private investment = 1.54% for 1999-2016

**Nonresidential investment (business)** growth was crushed in 2015 and 2016 by the collapse in oil prices. But investment was down in other sectors as well. As a result, investment growth was negative -0.53 percent in 2016. Forecasters generally expect investment growth to be quite strong over the next several years to a level well above the average trend growth of 2.33 percent that has prevailed over the last 18 years. In recent weeks, forecaster optimism about investment growth has been rekindled and forecasts have been raised. I have been consistently skeptical in the past about what I felt were overly optimistic forecasts and that skepticism has been merited. I find little reason to jump on the bandwagon now. I continue to expect that investment growth will remain near the average of the past 18 years, even if Congress enacts public infrastructure investment stimulus legislation.

**B of A** is especially optimistic about the outlook for business investment to accelerate in 2017 and particularly 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, because firms are operating at less than full capacity, the incentive to invest is dampened.

**GS** believes that about 50 percent of the non-energy investment spending slowdown was caused by the collapse in commodity prices and stronger dollar. If this was true, then stabilization in commodity prices and the dollar should contribute to a recovery in investment spending. **GS**'s forecast rebound in investment spending in 2017, 2018 and 2019 reflects this expectation.

**Residential investment** growth was very strong in 2015. Growth in 2016 slowed considerably but remained well above the long-term trend. Housing inventories are lean and demand is relatively strong, resulting in upward pressure on housing prices. However, outsized housing price increases will eventually dampen single-family residential demand and inventories should improve with the consequence that residential investment growth should slow in coming years. Generally, forecasts reflect this scenario, although trend growth is expected to exceed 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. However, starts were 1.18 million in 2016, up 6.1 percent from 1.11 million in 2015. Starts are expected to rise only modestly in 2017 and will still be below 1.4 million.

Housing starts were 1.29 million in February 2017, which was 6.2 percent above the pace of February 2016.

## 4. Inventories

Inventories added 1.01 percent to "**Total**" GDP growth in the fourth quarter after adding 0.49 percent in the third quarter and subtracting 1.16 percent in the second quarter. 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 was actually negative in the second quarter of 2016. Based on the $49.6 billion increase in inventories in the fourth quarter of 2016, it appears that the inventory correction may have run its course for the time being.

Inventories generally add between 0.1 and 0.2 percent to annual real GDP growth. Based on the historical record, inventory accumulation in both the second, third and fourth quarters of 2016 was anomalous. The 1.16 percent decline due to inventory de-accumulation in the second quarter painted a weaker picture and the 0.49 percent increase in the third quarter and the 1.01 increase in the fourth quarter painted a stronger picture of "**Total**" GDP growth than long-term trends warrant.

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 $49.6 billion inventory accumulation fourth quarter "**Final**" estimate will be revised three 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 |
|---|---|---|---|---|---|---|
| 2016 Q4 | 48.7 | 46.2 | 49.6 | | | |
| 2016 Q3 | 12.6 | 7.6 | 7.1 | | | |
| 2016 Q2 | -8.1 | -12.4 | -9.5 | | | |
| 2016 Q1 | 60.9 | 69.6 | 68.3 | 40.7 | | |
| 2015 Q4 | 68.6 | 81.7 | 78.3 | 56.9 | | |
| 2015 Q3 | 56.8 | 90.2 | 85.5 | 70.9 | | |
| 2015 Q2 | 110.0 | 121.1 | 113.5 | 93.8 | | |
| 2015 Q1 | 110.3 | 95.0 | 99.5 | 112.8 | 114.4 | |
| 2014 Q4 | 113.1 | 88.4 | 80.0 | 78.2 | 76.9 | |
| 2014 Q3 | 62.8 | 79.1 | 82.2 | 79.9 | 66.8 | |
| 2014 Q2 | 93.4 | 83.9 | 84.8 | 77.1 | 55.2 | |
| 2014 Q1 | 87.4 | 49.0 | 45.9 | 35.2 | 36.9 | 31.7 |
| 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 is shown in **Table 2** and **Chart 1**. 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.

## 5. Net Exports

In the "**Final Estimate**" net exports subtracted an outsized 1.82 percent from fourth quarter real GDP growth (see **Table 1**). This decrease was extremely unusual and partly reflected a reversal of a huge increase in the third quarter due primarily to a temporary rise in food exports in response to a weak soybean harvest in South America. Growth in exports added 1.16 percent to third quarter real GDP and subtracted -0.55 percent in the fourth quarter. However, the large decrease in net exports in the fourth quarter was also driven by a large increase in imports, which subtracted -1.27 percent from real GDP. Acceleration in imports may be linked to the slight decline in the dollar's value that prevailed for much of 2016 prior to the presidential election.

## 6. Government Investment

Government investment added 0.03 percent to fourth quarter real GDP growth. Federal government spending subtracted -.08 percent and state and local spending added 0.11 percent (**see Table 1**).

Government spending ceased to be a negative factor for real GDP growth in 2015 as it had been since 2010. However, government investment contributed a very modest 0.32 percent to GDP growth in 2015 and 0.14 percent in 2016. **Table 6** shows recent growth rates in government spending and forecasts for 2017-2020.

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

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Federal | -5.82 | -2.54 | 0.00 | 0.59 | | | | |
| State and Local | -0.81 | 0.23 | 2.92 | 0.94 | | | | |
| Total Government | -2.86 | -0.86 | 1.79 | 0.81 | | | | |
| GS Federal | | | | | 0.58 | 1.35 | 1.22 | 1.04 |
| GS State and Local | | | | | 1.10 | 2.49 | 2.33 | 2.09 |
| GS Total | | | | | 0.90 | 2.05 | 1.91 | 1.69 |
| B of A Total | | | | | 0.13 | 0.81 | | |
| BASE | | | | | 1.05 | 3.56 | 2.22 | 0.75 |
| Strong Employment | | | | | 1.05 | 3.56 | 2.22 | 0.75 |

Federal government spending growth is likely to increase in coming quarters based upon proposals made during the presidential campaign. Specifics about the timing and magnitude of additional federal government spending remain to be determined by Congress. The spending growth estimates in **Table 6** for the "**BASE**" and "**Strong Growth**" scenarios reflect a front-loading of a $450 billion ten-year infrastructure investment program assumed to begin in late 2017. However, a specific proposal does not yet exist and increasingly it looks like legislation may not be enacted in time for infrastructure spending to begin by late 2017. I assume that infrastructure spending reaches a peak level in 2018 which boosts government investment growth. Thereafter, however, while infrastructure spending remains elevated, annual percentage increases decline and actually fall below the long-run trend level.

Other forecasters have not yet adjusted their estimates of federal government investment spending growth for prospective congressional legislation to boost infrastructure spending. This is not unreasonable given uncertainty about whether Congress will enact legislation and, if it does, how it might be designed and funded.

## 7. Fourth Quarter 2016 and Longer-Term Real GDP Forecasts

The "**Final Estimate**" for fourth quarter real GDP was 2.1 percent.

**Chart 3** shows quarterly real GDP growth projections from the fourth quarter of 2016 to the fourth quarter of 2020. **Table 7** includes annual real GDP growth and forecasts for 2013 to 2020. Generally, forecasts are tightly clustered, although my "**BASE**" and "**Strong Growth**" forecasts are at the lower

end of the range during 2017 and 2018, but then move to the higher end of the range in 2019 and 2020.

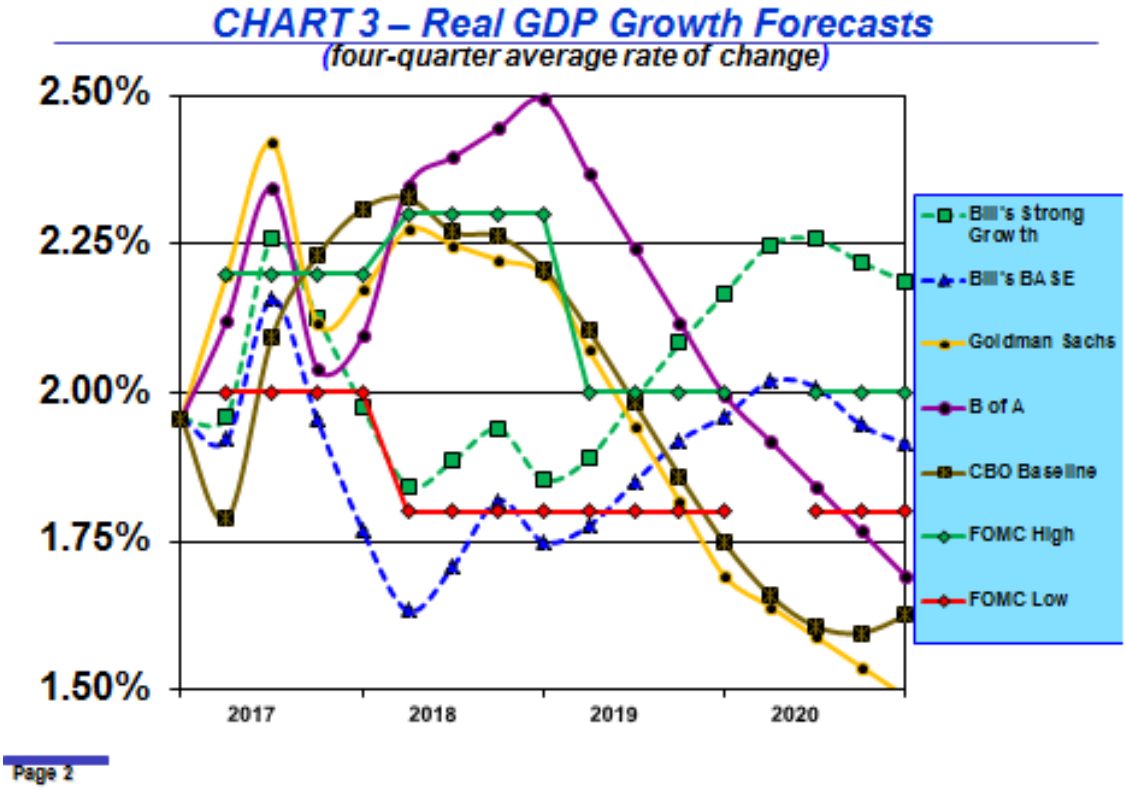



**Table 7**
**Real GDP Growth Forecasts**
(***year-over-year average***)

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Actual | 1.68 | 2.37 | 2.60 | 1.62 | | | | |
| B of A | | | | | 2.15 | 2.42 | 2.18 | 1.80 |
| GS | | | | | 2.23 | 2.24 | 1.88 | 1.56 |
| GLOBAL Insight | | | | | 2.30 | 2.70 | 2.30 | 2.10 |
| Economy.com | | | | | 2.60 | 2.90 | 2.20 | |
| Blue Chip | | | | | 2.30 | 2.40 | 2.10 | 2.10 |
| CBO | | | | | 2.28 | 2.01 | 1.71 | 1.54 |
| FOMC High* | | | | | 2.20 | 2.30 | 2.00 | |
| FOMC Low* | | | | | 1.80 | 1.80 | 1.80 | |
| Bill's BASE | | | | | 2.02 | 1.73 | 1.88 | 1.97 |
| Bill's Strong Growth | | | | | 2.11 | 1.88 | 2.03 | 2.23 |

*Q4 to Q4 – FOMC year-over-year 2017 equivalent is a range of approximately 2.00 to 2.20 percent, which is in line with other 2017 forecasts

My "**BASE**" scenario is on the lower end of the spectrum in 2017 and 2018 because of lower assumed employment and productivity growth. **CBO**'s forecasts, based upon its January update, are now generally

similar to other forecasts in 2017 but are somewhat more pessimistic in 2018, 2019 and 2020. With the exception of 2018, all forecasts fall within the **FOMC**'s high and low estimates during the 2017-2019 periods. Besides the low employment growth embedded in my "**BASE**" scenario, real GDP growth in that scenario and also in my "**Strong Growth**" scenario is depressed by the assumption of continued depressed productivity gains relative to the forecasts of other analysts. While my assumptions may prove to be overly pessimistic, I would suggest to you that the risks are skewed to the downside, and by that I mean that real GDP is more likely to come in under rather than over the forecasts of others in the next few years, especially in 2018.

## III. Productivity and the Long-Term Potential Rate of Growth in Real GDP

To remind readers, the long-run real growth speed limit of the economy is determined by the rate of growth in the labor force and productivity.

**Chart 4** shows historical rates of increase in productivity and projections for my "**BASE**" and "**Strong Growth**" scenarios.

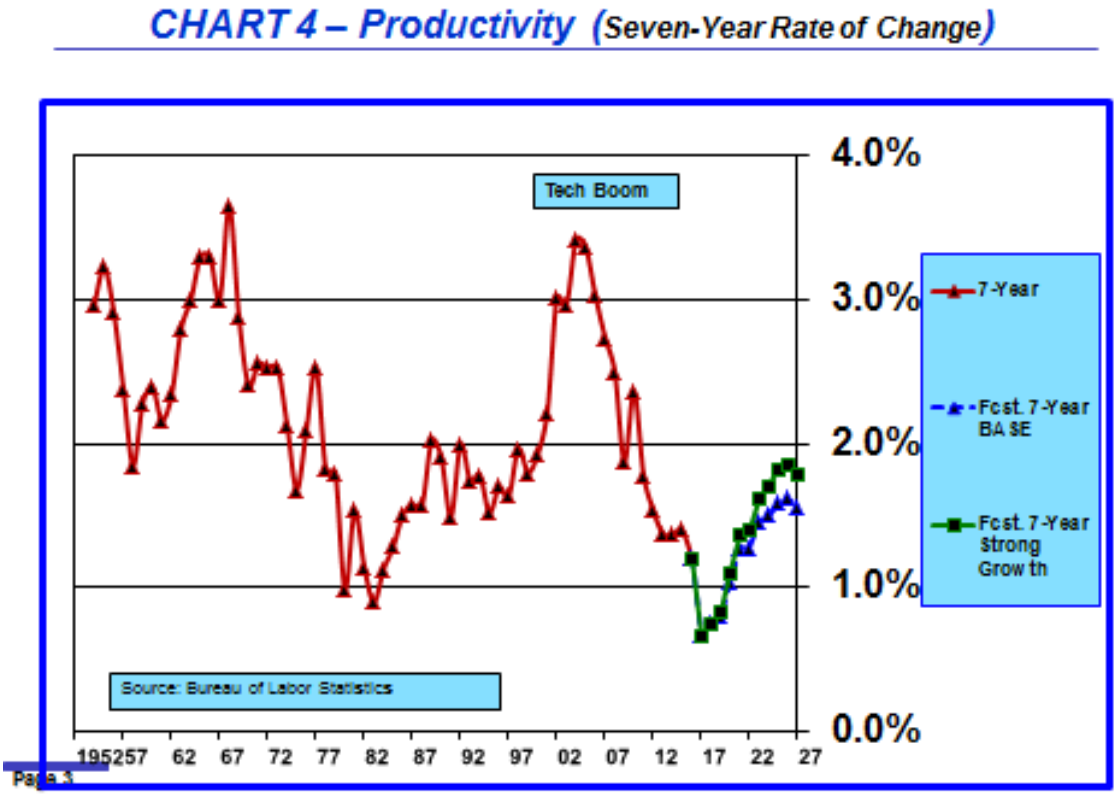



**Table 8** shows the 1973-2004, 2004-16 historical measured average annual potential rates of real GDP growth and various forecasters' estimates of the future long-term potential rate of growth of real GDP. The approximate equation to determine the potential long-term real GDP growth rate is: stable long-term

rate of growth in total hours worked plus .79 times the long-term stable rate of increase in productivity.

**Table 8**

**Long-Term Potential Real GDP Growth and Impact of Changes in Labor Force Growth and Productivity on the Long-Term Natural Rate of Interest and Growth in Nominal Wages**

***(annual percentage rates)***

| | Labor Force Growth* | Nonfarm Productivity | Potential Real GDP | Natural Rate | Nominal Wages |
|---|---|---|---|---|---|
| **HISTORICAL AVERAGES** | | | | | |
| 1973-2004 | 1.36 | 1.89 | 2.86 | 0.00 | 0.00 |
| 2004-2016 | 0.60 | 1.25 | 1.59 | -1.18 | -0.51 |
| **FORECASTS** | | | | | |
| B of A | | | 1.70 | | |
| GS | 0.56# | 1.50 | 1.75 | -1.06 | -0.50 |
| CBO | 0.49 | 1.77 | 1.89 | -0.95 | -0.51 |
| FOMC High* | | | 2.00 | | |
| FOMC Low* | | | 1.80 | | |
| Bill's BASE | 0.65 | 1.53 | 1.87 | -0.95 | -0.45 |
| Bill's Strong Growth | 0.72 | 1.76 | 2.10 | -0.73 | -0.38 |
| Bill's Low Productivity | 0.61 | 1.31 | 1.66 | -1.13 | -0.50 |
| **SCENARIOS** | | | | | |
| Implied Productivity #1 | 0.50 | 1.52 | 1.70 | -1.15 | -0.54 |
| Implied Productivity #2 | 0.55 | 1.46 | 1.70 | -1.06 | -0.51 |
| Implied Productivity #3 | 0.50 | 1.90 | 2.00 | -0.90 | -0.49 |
| Implied Productivity #4 | 0.55 | 1.84 | 2.00 | -0.80 | -0.46 |
| Pessimistic Scenario #1 1973-2004 | 0.50 | 1.89 | 2.10 | -0.86 | -0.49 |
| Pessimistic Scenario #2 2004-2016 | 0.50 | 1.25 | 1.48 | -1.28 | -0.57 |
| Pessimistic Scenario #3 Recent 7 Years | 0.50 | 0.72 | 1.07 | -1.63 | -0.63 |

*Growth in total hours worked; #estimated

## 1. Forecasts

Demographic trends define a tight forecaster band of long-term growth in total hours worked. **CBO**'s projection of the annual growth rate in total hours worked of 0.49 percent is the lowest. Embedded in **CBO**'s estimate are a gradual decline in the employment participation rate and a very modest decline in average hours worked per employee, probably the result of a slight increase in the proportion of part-time

workers.

There is more variation in forecaster expectations for the long-term stable rate of increase in productivity. Productivity increased 1.25 percent annually over the past 12.5 years. However, in the aftermath of the Great Recession, productivity has only increased 0.72 percent annually over the past 7 years.

## 2. Scenarios

Estimates made by various forecasters of the long-term potential rate of growth in real GDP cluster between 1.70 and 2.00 percent. Because stable long-term labor force growth probably ranges between only 0.50 and 0.55 percent, almost all the variation in the estimates of the long-term potential rate of growth of real GDP depend upon assumptions about productivity increases. As can be seen in **Table 8**, if potential real GDP is 1.70 percent, the implied annual productivity increase is between 1.46 and 1.52 percent (Implied Productivity #2 and Implied Productivity #1, respectively). If potential real GDP is 2.00 percent, the implied annual productivity increase is between 1.84 and 1.90 percent (Implied Productivity #4 and Implied Productivity #3, respectively).

But, if productivity increases only 1.25 percent annually, the average from 2004 to 2016 (Pessimistic Scenario #1), or the more dismal recent seven year average of 0.72 percent (Pessimistic Scenario #2), potential long-term real GDP growth will collapse to 1.48 percent and 1.07 percent, respectively. This would be a very dismal outcome with severe negative implications for the economy and, perhaps for political and social stability as well.

## 3. Productivity Debate

Analysts expect, or perhaps the more appropriate word is "hope," that productivity will rebound from its recent dismal 0.72 percent annual rate of increase to at least 1.50 to 1.75 percent. There isn't much hard evidence, however, to back up this hope.

Persistent low productivity gains in recent years are not unique to the U.S. It is a shared phenomenon affecting all developed economies. While it is tempting to blame this development on consequences of the Great Recession, arguments have been made that the weakness in productivity is not transitory but rather reflects a secular slowdown in innovation and capital investment.

**GS** continues to argue that part of the decline in productivity is due to measurement error, which it estimates accounts for 0.25 to 0.50 percent or about half of the shortfall from 1.50 to 1.75 percent. Other analysts, while acknowledging that productivity is hard to measure and is probably misstated, argue that there is no evidence that measurement error has been materially greater in recent years. They do not find **GS**'s arguments persuasive. It should be noted that if **GS**'s view about measurement error is valid, then inflation is overestimated.

If measurement error is dismissed as explaining part of the decline in productivity, GS argues that there are two other cyclically-based effects that explain much of the decrease. The implication is that cyclically-based effects will eventually reverse and productivity will rebound to a much higher and persistent level.

First, **GS** argues that slower growth in capital services per hour worked has had an important negative impact of productivity. This is linked to weakness in capital spending. The cyclical argument is that capital spending will rebound as the economy operates at full capacity over time. I would categorize this as a "hope" argument. Measures of capacity utilization remain elevated even though full employment appears to have been reached or nearly reached. There are countervailing arguments having to do with structural changes in the economy toward less-productivity prone services, diminished innovation, as well as significant declines in housing and government investment.

Second, **GS** examines components of its proprietary current activity indicator that historically have been correlated with changes in productivity. It finds that growth in output-related components has accelerated and this development should lead to increased productivity over time. This is a novel analysis and may turn out to have merit, but it is untested; in other words, correlation does not necessarily imply causality.

It is very obvious from the scenarios in **Table 8** that persistent weakness in productivity would depress potential real GDP to a considerably greater extent than forecasters currently expect. Such an outcome would depress interest rates and growth in wages and would exact downward pressure on inflation.

## 4. Implications for Real Rate of Interest and Monetary Policy

Changes in both the rate of growth in total hours worked and productivity affect the long-term natural real rate of interest. Increases in both cause increases in the natural rate and vice versa. The long-term natural real rate of interest is not directly observable. However, it is possible to derive from my econometric model changes in the natural rate caused by changes in the rate of growth in total hours worked and changes in the level of productivity.

Changes in the long-term natural real rate of interest in **Table 8** are benchmarked to the historical average for 1973-2004.

It is evident by simply comparing the historical average for 2004-2016 with the historical average for 1973-2004 that the long-term natural real rate of interest declined 118 basis points between the two periods. If the unobservable value of the long-term natural rate of interest was 2.00 percent in the 1973-2004 period, this would mean that the long-term natural real rate declined to 0.92 percent in the more recent period. Furthermore, slack in the economy depresses the natural rate in the short run below its long-run equilibrium value. This is consistent with FOMC Chair Janet's Yellen's estimate that the natural rate of interest is currently not materially different from zero.

Should potential real GDP growth stabilize in the long-run in a range of 1.7 to 2.0 percent, implying annual productivity increases between 1.5 and 1.9 percent, the long-term natural real rate of interest would remain 90 to 115 basis points below the average level that prevailed from 1974 to 2004.

But, if productivity fails to rebound and stabilizes between 1.25 and 0.72 percent, the long-term natural real rate of interest would be 10 to 45 basis points lower, or approximately 128 to 163 basis points below the 1973-2004 average.

### 5. Implications for Nominal Wage Growth

Changes in both the rate of growth in total hours worked and productivity affect the long-term equilibrium nominal rate of increase in wages. Increases in both cause increases in nominal wage rate growth and vice versa. It is possible to derive from my econometric model changes in the equilibrium growth rate in nominal wages caused by changes in the rate of growth in total hours worked and changes in the level of productivity.

Changes in the equilibrium rate of growth in nominal wages in **Table 8** are benchmarked to the historical average for 1973-2004. It is evident by simply comparing the historical average for 2004-2016 with the historical average for 1973-2004 that the equilibrium growth rate in nominal wages declined 51 basis points between the two periods. The impact of changes in total hours worked is much greater than the impact of changes in productivity. This relationship is evident in the scenarios – large decreases in productivity have a small downside impact on the growth rate in nominal wages.

## IV. U.S. Employment Developments

February's payroll employment report was exceptionally strong in all respects. Considering that the U.S. is at full employment, the unexpectedly strong report appears to have been the catalyst for the Federal Open Market Committee (FOMC) to accelerate the timing of tightening monetary policy. The market, guided by "open mouth" guidance from FOMC members raised the probability of an increase in the federal funds rate on March 15 from 30 percent to 100 percent in a few days time.

Payroll employment gains of the magnitude reported in January and February are unlikely to persist much longer. It is inevitable that monthly payroll growth will converge to the underlying natural rate of growth in the labor force, which currently is in a range of 70,000 to 80,000 monthly. However, 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.

There appears to be a link between the surge in business optimism that began in November and the recent robust growth in employment. If optimism translates into increased activity, about which there is some debate, then employment growth in coming months is likely to continue to be above the natural rate. This is the scenario that most forecasters now expect. The risk is that the recent employment strength will prove to be a short-term and unsustainable cyclical spike for a couple of reasons. First, Congress may be slow to enact tax reform and fiscal stimulus legislation and what Congress enacts might turn out to be less simulative than expected. Second, the FOMC's newly found ardor to forestall an inflationary outbreak may turn out to be too much too soon and have the effect of crushing the acceleration in employment and economic growth.

### 1. Employment Growth

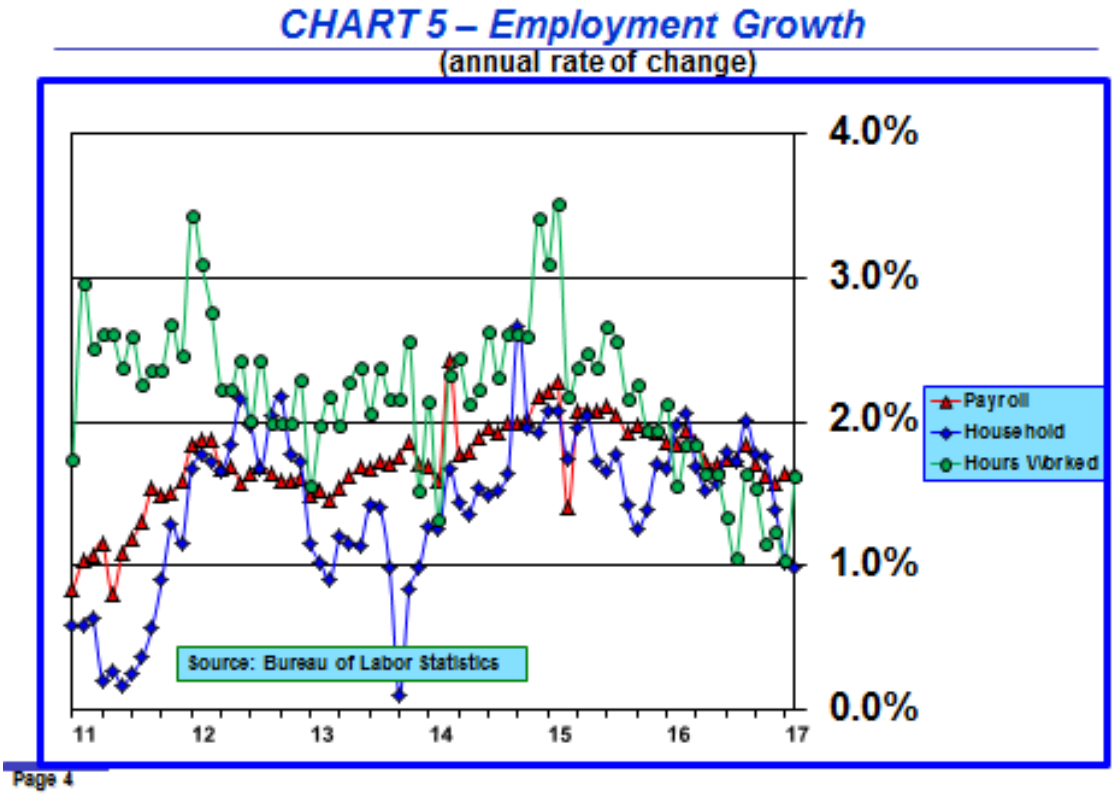
The trend in the 12-month rate of growth in payroll employment has slowed gradually from the cyclical peak of 2.27 percent in February 2015 to 1.64 percent in February 2017. Payroll employment growth

averaged 226,000 in 2015, 187,000 in 2016 and 236,500 over the first two months of 2017.

Household employment growth averaged 209,200 in 2015, 173,400 in 2016, and 208,500 over the first two months of 2017. Household employment has grown at a much slower annual rate of 0.98 percent over the past 12 months compared to payroll employment growth of 1.64 percent.

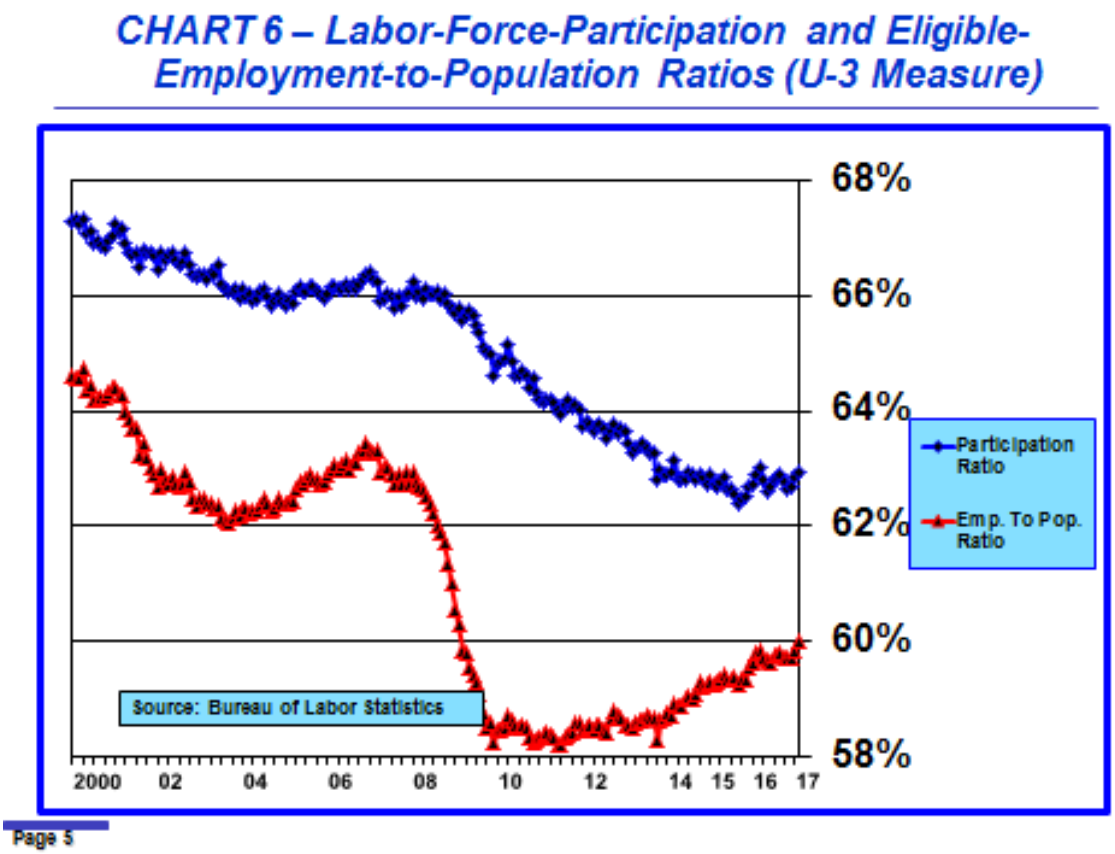
Growth in total hours worked by all employees has been slowing as well. The average length of the work week shortened during 2016 from 34.5 hours to 34.3 hours. The 12-month growth rate in total hours worked by all employees was 1.62 percent over the past 12 months, compared to 1.24 percent in 2016, 1.94 percent in 2015 and 3.42 percent in 2014.

**Chart 5** shows the three measures of employment growth – payroll employment, household employment, and total hours worked. Probably the most important thing to notice in **Chart 5** is the choppy downward trend in employment growth. This is indicative of a maturing labor market.




## 2. Employment Participation

**Chart 6** shows the labor force participation rate and the eligible-employment-to-population ratio. The denominators of both measures are the total number of people eligible to work (the employment population). The numerator of the eligible-employment-to-population ratio is the total number of people employed and unemployed who wish to be in the labor force. The numerator of the participation ratio only counts those who are employed.

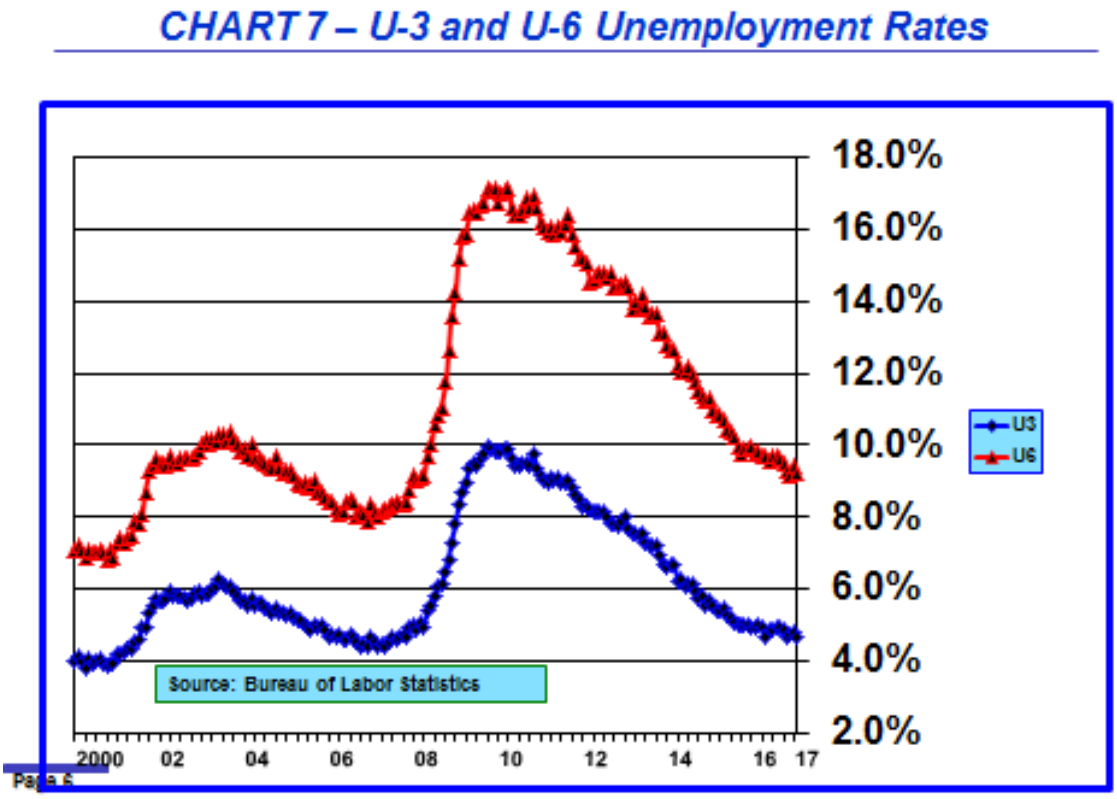



The eligible-employment-to-population ratio plunged during the Great Recession and then stabilized for several years before beginning to rise in 2014. However, the participation rate continued a steady decline until about a year ago. The downward trend in the participation ratio in recent years has been driven by changing demographics which should continue to reduce participation by about 0.15 percent annually over the next ten years. However, the decline in the participation ratio during and immediately following the Great Recession was exacerbated by the exit of discouraged workers from the labor force. Because discouraged workers are not counted in the labor force there has been considerable 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 62.95 percent in February 2017 is suggestive evidence that some discouraged workers have reentered the labor market in the last few months. If that were not the case, the participation ratio should have fallen to about 62.17. This is a swing of approximately 1.25 million workers many of whom were probably discouraged but have now reentered the labor force as the labor market tightened and jobs became easier to find.

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

As can be seen in **Chart 7**, the U-3 unemployment rate has fallen to 4.70 percent and nearly matches the level attained prior to the Great Recession. The February U-3 unemployment rate was slightly 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



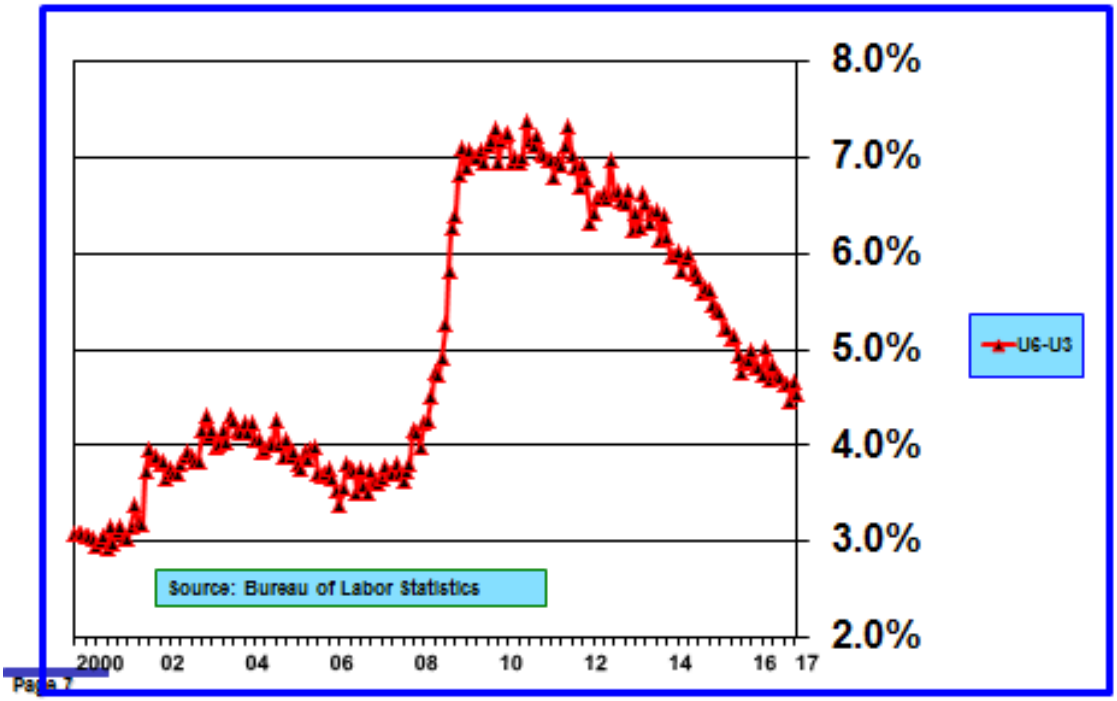

employment and those marginally attached to the labor force to the U-3 measure, has fallen to 9.24 percent but, as can be seen in **Chart 8**, is about 0.5 percentage points above the 2005 pre-Great Recession difference between the U-3 and U-6 unemployment measures when the labor market was at full employment. The U-6 measure of unemployment fell 66 basis points over the past 14 months compared to a decline of 32 basis points in the U-3 measure, which underscores an improving labor market that is near or at 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 returned to the low level that prevailed prior to the Great Recession. The long-term unemployment rate has declined from over 4 percent in the aftermath of the Great Recession to 1.12 percent in February. It is still about 0.3 percent above the low level reached in 2006 just prior to the onset of the Great Recession.

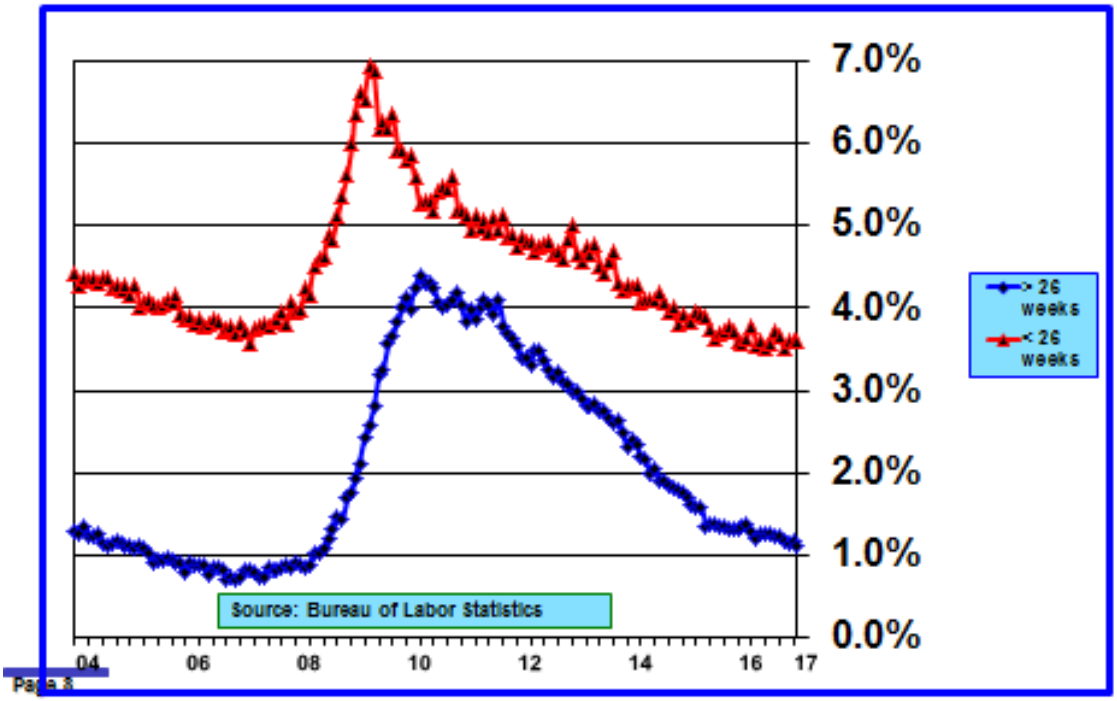
### 4. Forecasts of the U-3 Unemployment Rate

Forecasters expect the labor market to continue to tighten. The current U-3 unemployment rate matches **CBO**'s full-employment estimate of the non-accelerating inflation rate of unemployment (NAIRU). While this is certainly welcome news after seven years of high unemployment, further declines in unemployment will result in a tight labor market. Scarcity of workers typically drives wages higher. This is also a favorable development because it will increase worker spending power.

## CHART 8 – U-6 Minus U-3 Unemployment Rates

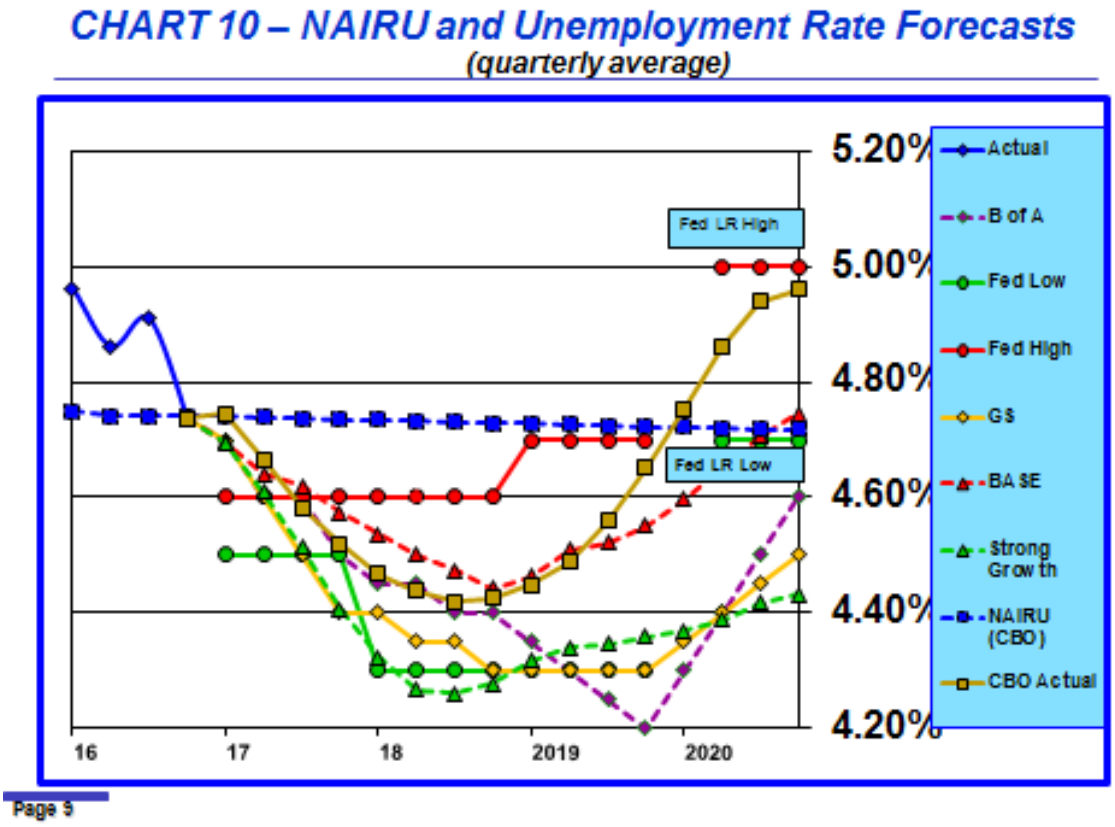



## CHART 9 – LT (>26 weeks) and ST (<26 weeks) Unemployment Rates



But, 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 worrying about formulating 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. While this worry is a prominent topic for FOMC members, offsetting worries up to now about tepid growth in real GDP and fragility of international financial markets have resulted in the FOMC adopting a cautious, go slow approach to increasing interest rates. Recent indications of stronger economic growth both domestically and globally have emboldened the FOMC to normalize monetary policy more rapidly. However, a gradual, albeit perhaps a somewhat more rapid normalization process seems likely.

**Chart 10** shows U-3 unemployment rate forecasts for **B of A**, **GS**, **and FOMC** high and low range, and my "**BASE**" and "**Strong Growth**" scenarios. **CBO**'s estimate of NAIRU is also shown in **Chart 10**.




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 between 4.3 percent and 4.4 percent by 2018. The unemployment rate falls to 4.4 percent in my **"BASE"** scenario by 2018, while it falls to 4.3 percent in the "**Strong Growth**" scenario.

**B of A**'s forecast unemployment rate falls further to 4.2 percent in 2019; **GS**'s forecast remains flat at 4.3 percent and my "**Strong Growth**' scenario edges up to 4.35 percent.

After 2019 all forecasts, including the FOMC's long-run projected range, move upwards gradually toward **CBO**'s estimate of NAIRU. **CBO** expects the unemployment rate to begin rising in 2019 and by

2020 its forecast exceeds NAIRU.

Forecast for B of A, GS and my "**Strong Growth**" scenario are close to the low end of the FOMC's forecast range during 2017, 2018 and 2019. My "**BASE**" scenario is consistent with **CBO**'s projections and both fall about midway between the FOMC's high and low projections.

## 5. Wage Growth Is Accelerating As the Labor Market Tightens

Now that the labor market has reached 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. And the data indicate this is occurring. However, acceleration in wage growth to date has been weaker than experience suggests should be the case.

Growth in wages is an important measure of labor market strength. An increasing rate of growth is evidence of a strengthening labor market in which labor, particularly in scarcer job categories, is gaining more bargaining power.

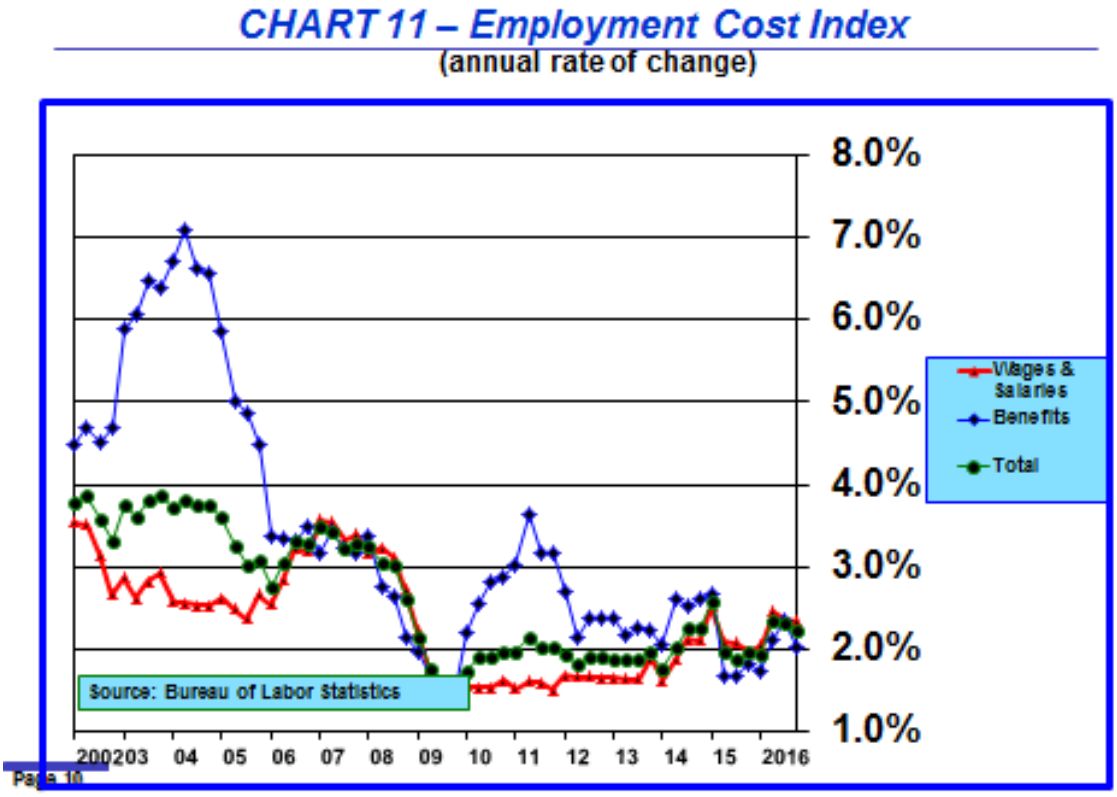
However, there is considerable inertia in wage adjustments which results in a slow rise in average wages even after the labor market has reached or exceeded full employment. Inertia may be greater in this cycle for a number of reasons. First, collective bargaining power provided by unions on the behalf 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 a faster rate now that the labor market has tightened. However, some of this inertia has been offset as many states and local governments have raised minimum wage floors over the past two years.

Forecasts of wage rate increases generally have been too high on balance. There are several different wage measures, which are discussed below. Some reflect little upward movement; others indicate that wage growth is gradually accelerating.

### a. BLS-Compiled Wage Measures

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

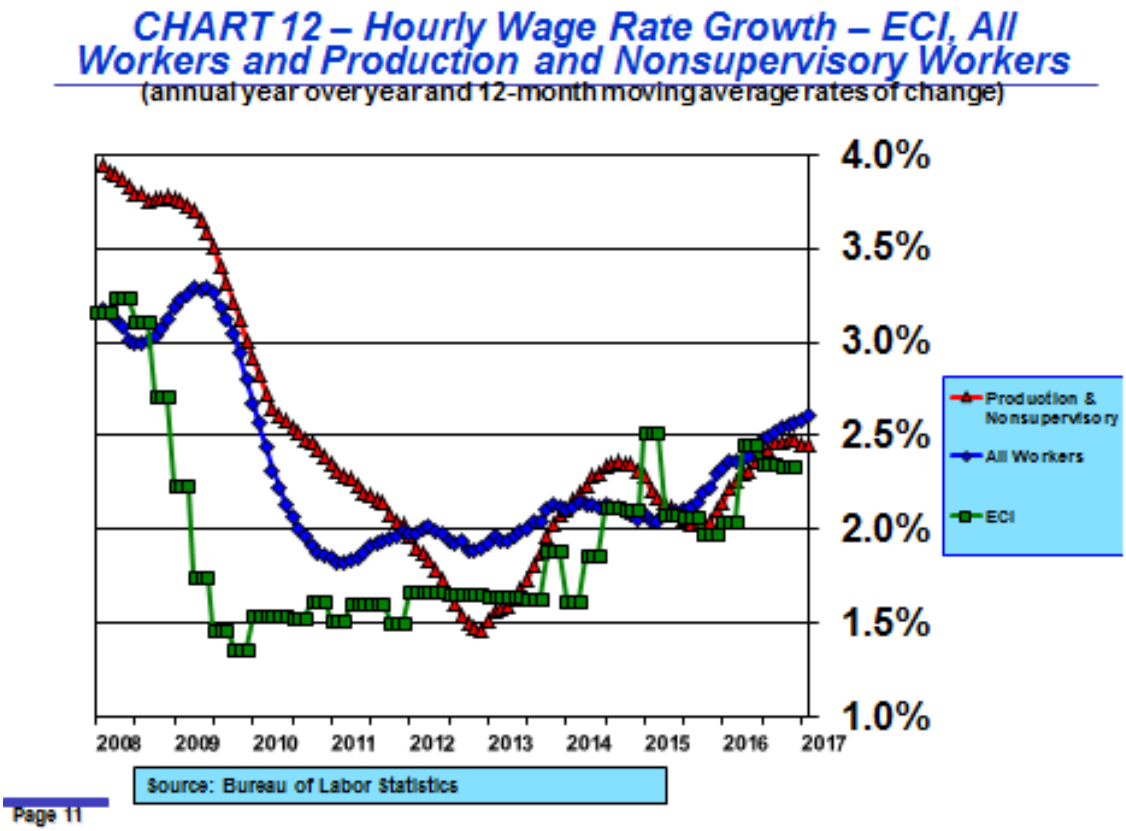
**Chart 11** reveals that there has been very little acceleration in total compensation over the past six years. Total compensation was growing at a rate of about 2.0 percent in 2011 and 2.25 percent in 2016. Growth in wages and salaries has moved up from about 1.6 percent in 2011 to 2.35 percent in 2016. But, much of the acceleration in wages and salaries has been offset by slowing growth in benefits, which declined from about 3.0 percent in 2011 to 2.0 percent in 2016.




Analysts were expecting third and fourth quarter ECI data to ratify the upward trend in compensation growth reflected in other measures (see **Chart 11**). Instead the year-over-year growth rate in total compensation was unchanged in the third quarter at 2.33 percent compared to 2.34 percent in the second quarter and actually declined to 2.24 percent in the fourth quarter. The salaries and wages sub-component declined slightly from 2.45 percent in the second quarter to 2.36 percent in the third quarter and 2.34 percent in the fourth quarter.

**Chart 12** shows the rate of growth in hourly wages for all workers, production and nonsupervisory workers, as well as the ECI (total wages and salaries). All three sets of measures in **Chart 12** track each other closely over time. All three measures have been rising gradually over the past five quarters.

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 necessarily be in sync. This is the case currently. Average hourly wages (12-month moving average) of all employees are rising 2.61 percent annually over the past 12 months compared to 2.36 percent a year ago. Average hourly wages (12-month moving average) of production and nonsupervisory workers are rising 2.45 percent annually compared to 2.22 percent a year ago. ECI total compensation growth has risen from 1.95 percent in the fourth quarter of 2015 to 2.24 percent in the fourth quarter of 2016.




### b. Weekly Versus Hourly Wage-Rate Growth

To a certain extent, focusing only on hourly wages is a bit misleading. If one looks at growth in average weekly earnings, which factors in the length of the workweek and thus incorporates changes in the mix of full and part-time employees, rather than the hourly wage rate, there has been little growth in weekly wages for all employees, rising from 2.28 percent in February 2016 to 2.35 percent in February 2017 (see **Chart 13**). This outcome reflects a modestly shorter average number of hours worked per week, which could be due to a greater proportion of part-time workers as well as fewer hours for other employees, offset by growth in the hourly wage rate.

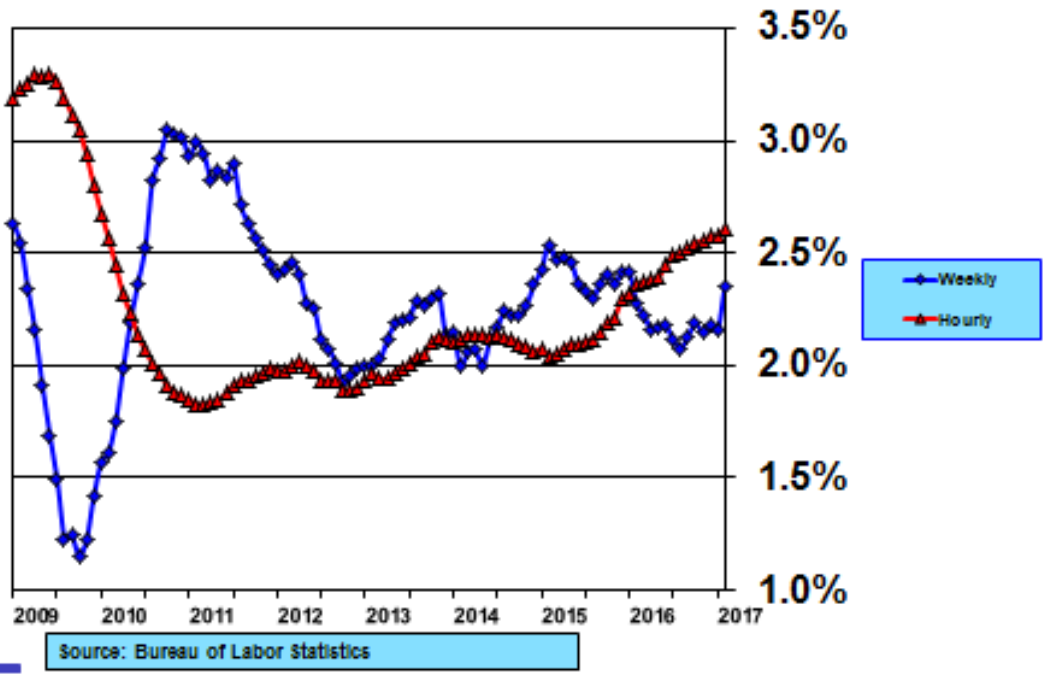
### c. Hourly Wage Forecasts

**Chart 14** 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.

Two comments about the details shown in **Chart 14** are in order. First, the data series for all employees only began in 2006 while the data series for production and nonsupervisory workers goes back to 1964. Thus, the data series for production and nonsupervisory workers contains a lot more historical information which is useful for constructing robust forecasts. In the long run growth rates in wages for all employees and for production and nonsupervisory workers are highly correlated (see **Chart 12**).

## CHART 13 – Hourly & Weekly Wage Rate Growth – All Workers

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

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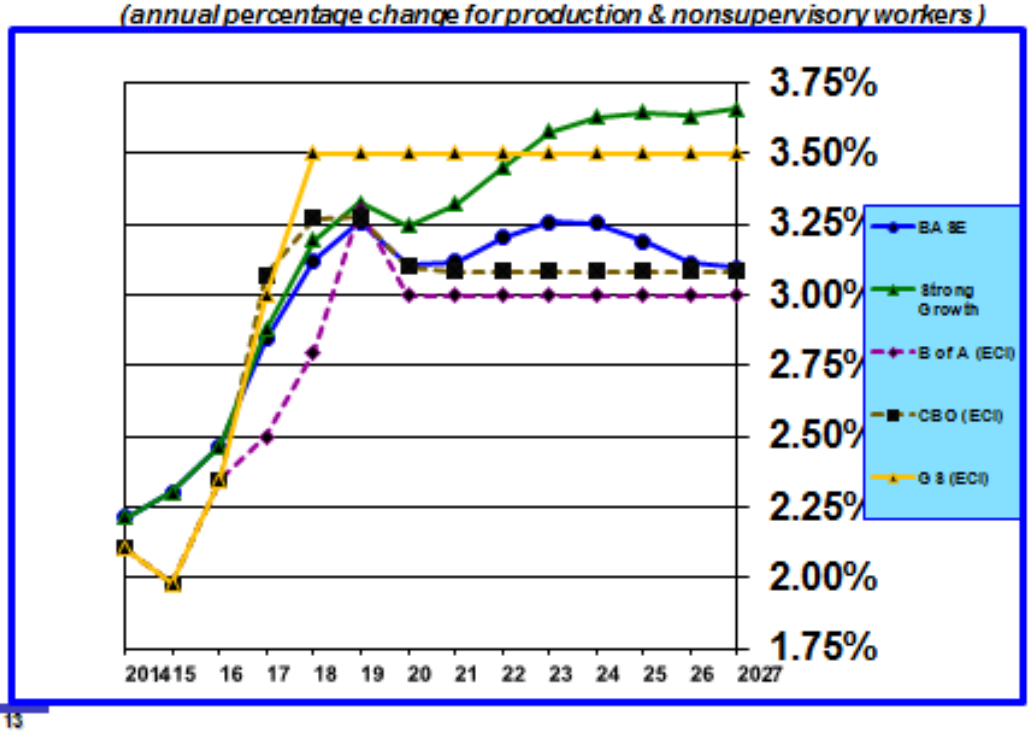
## CHART 14 – Hourly Wage Rate Forecasts

*(annual percentage change for production & nonsupervisory workers)*

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Second, **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 also rises to 3.3 percent in 2019 but then recedes to 3.0 percent. **CBO**'s ECI forecast rises to 3.3 percent in 2018 but then slows to 3.1 percent by 2020.

Wage growth for production and nonsupervisory workers rises at about the same rate as **CBO**'s and **GS**'s projection in my "**BASE**" and "**Strong Growth**" scenarios, reaching 3.25-3.30 percent in 2019. Thereafter wage growth in my "**BASE**" scenario is stable and 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 approximately 3.65 percent by 2027, reflecting the impacts of faster employment growth and lower short-term and long-term unemployment rates.

## 6. Factors Affecting Wage Rate Growth

Wage growth has been slower to recover than employment. Forecasters have repeatedly been forced to push forecast wage increases forward in time. As can be seen in **Chart 14**, this may still be a forecasting problem. My scenario forecasts, and now that of **B of A** as well, project a slower ramp up in wage rate growth than the consensus as reflected in the projections of **GS** and **CBO**.

**B of A** cites four reasons that wage growth has lagged in the current labor market recovery.

1. **Nominal Wage Rate Rigidity.** The argument is that wages are sticky and did not fall as much as they should have when unemployment was high. Thus, as in the early stages of labor market recovery pressures to raise wages were minimal.
2. **The "Silver Tsunami.** Because of the aging of the Baby Boom generation a greater proportion of the work force consisted of highly paid older workers who are now retiring. Their replacements were younger, lower paid workers.
3. **Industrial Composition.** A very large portion of the 16 million new jobs created since the labor market bottomed in December 2009 has been in service sectors with low wages. This compositional effect has dragged down the average wage rate for all workers.
4. **Characteristics of the Employed vs Non-employed.** Employed workers receive more job offers at better wages and higher benefits than unemployed workers. Research indicates that starting wages for those who have been unemployed are 30 percent lower than those who are employed and are simply changing jobs. This matters because of the much larger number of long-term unemployed persons following the Great Recession.

To these reasons, **GS** adds another. Job recovery has been slower in rural areas and so, too, has been wage growth. Geographic mobility has declined, which in the past was a means of redistributing workers from excess supply regions to excess demand locales.

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 three labor market variables in my model of nominal wage rate growth in place of the U-3 unemployment rate. Two involve different ways of measuring the supply and demand relationships. The two 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 three 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 third 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.

**Table 9** shows the coefficients and average lags in number of months for the variables which explain variations in the rate of nominal wage rate growth for production and nonsupervisory employees.

**Table 9**
**Coefficients and Average Lags (in months) for Variables That Explain Variations in the Rate of Nominal Wage Rate Growth for Production and Nonsupervisory Employees and Forecasts for 2017 and 2021-27**

| Variable | Coefficient | Lag (months) | 2017 Forecast | 2021-27 PCE Inf. | 2017 PCE Inflation = 2.0% | 2021-27 PCE Inflation = 2.0% |
|---|---|---|---|---|---|---|
| Constant | .067 | | 6.69% | 6.69% | | |
| Inflation | .416 | 8.6 | .68% | .67% | .83% | .83% |
| Productivity | .124 | 56.4 | .05% | .17% | | |
| Short-Term Unemp. Rate | -1.208 | 36.1 | -5.00% | -4.39% | | |
| Long-Term Unemp. Rate | -.286 | 58.6 | -.93% | -.31% | | |
| Employment Growth Rate | .563 | 18.6 | 1.23% | .35% | | |
| TOTAL | | | 2.71% | 3.18% | 2.86% | 3.33% |

**PCE Core Inflation** – A 1 percent increase in core PCE inflation raises the rate of growth in nominal wages by 41.6 basis points. 64.4 percent of the lagged adjustment occurs between months 4 and 12 and the remainder occurs between months 13 and 18. It is important to understand that wages respond with a lag to changes in inflation. Changes in wages do not have any influence on changes in inflation.

**Productivity** – A 1 percent increase in nonfarm business productivity raises the rate of growth in nominal wages by 12.4 basis points. This is a rather small impact, which implies that labor does not benefit much from improvements in productivity. What impact there is does not occur until after 48 months have elapsed.

**Short-Term Unemployment Rate** – A 1 percent increase in the short-term unemployment rate decreases the rate of growth in nominal wages by 120.8 basis points. This is a rather substantial impact

but it does not occur immediately. There is no impact for 24 months; the entire impact occurs between months 25-48.

**Long-Term Unemployment Rate** – A 1 percent increase in the long-term unemployment rate decreases the rate of growth in nominal wages by 28.6 basis points. This is a relatively small impact which does not impact wage growth for 48 months. The entire impact occurs between months 49 and 72.

It is natural to expect the lagged impact on wages to take longer for long-term unemployment than for short-term unemployment. During a recession it takes a while for long-term unemployment to develop and build. Importantly, however, following the Great Recession, long-term unemployment rose to a very high level and persisted for a long time. When the labor market is at full employment, the long-term unemployment rate is less than 1 percent (it averaged about 0.8 percent in 2006 and 2007). Following the Great Recession, the long-term unemployment rate peaked over 4.0 percent in late 2010, fully 18 months after the end of the recession. The short-term unemployment rate peaked in mid-2009 coincident with the end of the Great Recession and had declined by nearly 2 percentage points by the time the long-term unemployment rate peaked. In the two years following its peak the long-term unemployment declined only to 3.0 percent. Since 2013 the long-term rate has continued to fall gradually and is currently approximately 1.1 percent, which is about 0.3 percent above the 2006-2007 level (see **Chart 9**).

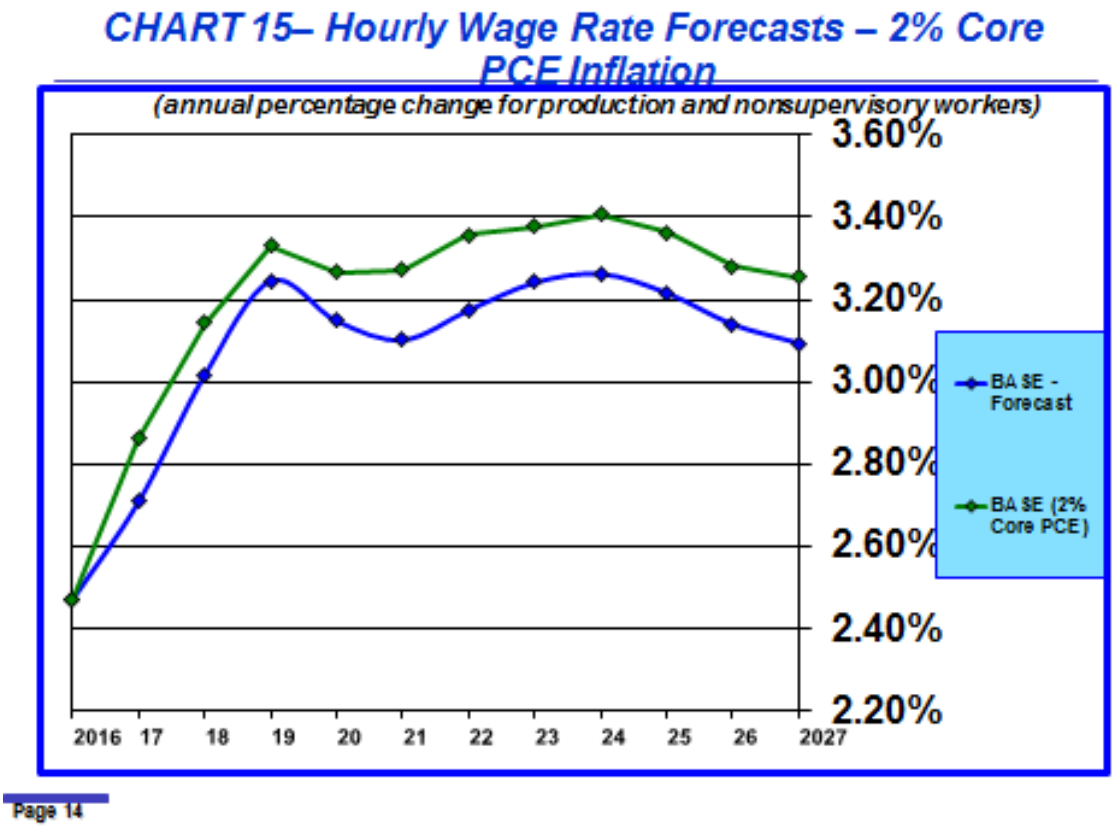
**Growth Rate in Total Hours Worked** – The effect of this variable on the rate of growth in nominal wages is nonlinear. This means that the effect of a 1 percent change in the rate of growth in total hours worked on wage growth will vary with the starting point for the growth rate in total hours worked. On average a 1 percent change in the growth rate of total hours worked raises the rate of growth in nominal wages by 56.3 basis points. The impact is spread out over time: 41.4 percent occurs in the first year, 32.4 percent occurs in the second year, 11.6 percent occurs in the third year, and 14.5 percent occurs in the fourth through sixth years. The nonlinear effect manifests itself in an escalating impact of wage growth as employment growth rises and a diminishing impact as employment growth falls. For example, a 1 percent increase in the rate of growth in total hours worked from1 percent to 2 percent results in an increase in wage growth of 63.0 basis points. However, a fall in the growth rate of total hours worked from -1 percent to -2 percent decreases wage growth by only 36.1 basis points. This confirms that wage growth is sticky in a soft labor market.

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.

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

**Chart 15** shows the two nominal wage rate growth curves – one for my 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.

Because my forecast of core PCE inflation averages less than 2.0 percent, my forecasts for nominal




wage growth rate average 15 basis points less in the "**BASE**" scenario – about and average annual rate of increase of 3.18 percent between 2021 and 2027 compared to 3.33 percent if inflation averages 2.0 percent. Both alternatives fall between **B of A**'s long-term 3.0 percent rate of increase and **GS**'s 3.5 percent rate of increase.

## 8. How Tight is the U.S. Labor Market?

Based upon historical patterns and **CBO** analysis, it appears that the U.S. labor market effectively has reached full employment. The U-3 unemployment rate was 4.71 percent in February and **CBO**'s full employment rate was 4.74 percent. Two recent San Francisco Federal Reserve Economic Letters explore nuances of the labor market to examine whether the simple U-3 unemployment measure indeed is signaling that full employment has been reached. One study corroborates the message the U-3 unemployment rate is sending; the other does not.

In the Letter that corroborates the view that the labor market is at full employment, Marianna Kudlyak explains an alternative measure of unemployment, the Non-Employment Index (NEI), and compares oscillations in this measure over the cycle with the U-3 rate.[1] The U-3 unemployment rate is defined as the ratio of those who are unemployed but are seeking work to the sum of these same people plus those who are working.

[1]Marianna Kudlyak. "Measuring Labor Utilization: The Non-Employment Index," FRBSF Economic Letter 2017-08, March 27, 2017.

There are seven categories of people who are eligible to work but who are not working and are not looking for work. Each month some people from each of these seven groups find employment even though they were supposedly not looking for work. However, the proportion of those in each category that becomes employed differs considerably. For example, those who have been unemployed for less than 27 weeks have a 13 to 14.5 percent probability of being employment in the next month, while those who are retired or disabled have less than a 2 percent probability of being employed in the next month. The Non-Employment Index aggregates the nine categories of people not working (the two additional categories are those officially counted as unemployed split into those who have been unemployed less than 27 weeks and those who have been unemployed for a longer time) and weights the components by the probability that those in each category will be employed in the next month.

NEI in February was 8.2 percent compared to 4.7 percent for the U-3 measure. NEI has been relatively stable at this level for the past year. NEI fell to 8.4 percent in 2005 and bottomed out at 7.9 in March 2007 prior to the Great Recession. Kudlyak concludes that the U-3 and NEI measures of labor underutilization are both signaling a labor market close to the levels experienced at the peak of the labor market just prior to the Great Recession.

The methodology and conclusion of a study conducted by Regis Barnichon and Geert Mesters are very different.[2] Rather than calculating an alternative measure, Barnichon and Mesters adjust the U-3 unemployment rate for two sets of changes in the demographic composition of the labor force that influence the calculation of the U-3 unemployment rate. These changes in demographic dynamics can result in a value of U-3 at one point in time which indicates full employment while the same value of U-3 at another point in time can indicate slack remains in the labor market.

Barnichon and Mesters methodology adjusts the U-3 measure for changes in the demographic composition of the labor force over time so that the resulting values are more reliable measures of labor market tightness. The first set of adjustments involves different labor market cohorts. For example, the unemployment rate for young people is always higher than that for older, more experienced workers. Thus, if the size of the young worker cohort shrinks relative to the size of other cohorts, this compositional change will reduce the measured U-3 unemployment rate but this not indicative of a tighter labor market. Demographic compositional changes of this sort are referred to as "shift-share" and are adjusted by holding shares of each labor cohort constant over time.

However, there is a second set of demographic compositional effects that need to be adjusted which the shift-share method does not deal with. The second set involves systematic compositional trends in a particular labor cohort. For example, over time more and more young people The shift-share adjustment process, by holding shares of cohorts constant over time does not correct for such trends. Barnichon and Mesters methodology adjust for both sets of demographic compositional dynamics. While they do not mention **CBO**'s methodology in determining the non-accelerating inflation rate of unemployment (NAIRU), it seems implicit to me that **CBO** adjusts for the first set of demographic compositional dynamics but not for the second.

Both sets of demographic compositional adjustments result in an adjusted U-3 unemployment rate of 5.2 percent in February compared to the reported level of 4.7 percent. Based on the cyclical behavior of their adjusted U-3 rate over time, Barnichon and Geert Mesters conclude that there is still 0.3 to 0.4

[2]Regis Barnichon and Geert Mesters. "How Tight Is the U.S. Labor Market?" FRBSF Economic Letter 2017-07, March 20, 2017

percent slack in the labor market currently.

### 9. Concluding Observations

Based upon a variety of measures, most believe the U.S. labor market is very near full employment. The U-3 unemployment rate of 4.71 percent compared to **CBO**'s 4.74 percent estimate of full employment and the U-6 rate is about 0.6 percent away from full employment. However, based on the work of Barnichon and Mesters the labor market might not be as tight as traditional measures imply.

Nonetheless, if the labor market isn't at full employment, it still is very close. The questions that need to be pondered include whether the labor market can remain as strong as it has been in recent months when the pool of skilled eligible workers is shrinking? What if business optimism in the Trump administration's ability to cut taxes and regulations fades? What if erosion of profit margins as wages rise puts pressure on employers to reduce expenses by curtailing hiring? Is the slight shortening in the length of the workweek that has occurred over the past year a warning signal? And, what if consumer spending slows? Would that lead to unwanted inventories and production cutbacks? What if stock prices decline sharply due to some unexpected shock or simply a loss of confidence in accelerating growth? What if financial conditions tighten, perhaps because of an international shock or tighter U.S. monetary policy? Such an outcome would likely feed employer caution.

As you can see, there are many downside risks. But at the moment a great deal of optimism continues to prevail, which implies that the labor market is likely to continue its forward march. Optimism continues to hold up well in the wake of ongoing uncertainties constantly emanating from a frenetic Trump administration and seems, for the time being, to have weathered the ignominious demise of Republican health care legislation to repeal and replace the Affordable Care Act.

But, in the longer run demographic trends simply do not support the rate of growth in employment that we have experienced in recent times. CBO in its January forecast update reduced expected population growth. And most of the growth that is expected comes from immigration. The Trump Administration's immigration policies are a significant threat to population and employment growth. As a reminder, slowing employment growth will reduce potential real GDP growth.

## V. Monetary Policy

John C. Williams, president of the San Francisco Federal Reserve Bank, said in a recent speech said "*With an economy at full employment, inflation nearing the Fed's 2 percent goal, and the expansion now in its eight 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?**'*"[3] It should be noted that Williams is more optimistic that the economy has reached full employment than some of his economists.

[3] 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.

Williams, while celebrating the success of monetary policy in restoring aggregate demand, laments 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.

Donald Trump's election and his proposed tax reform, infrastructure and regulatory simplification policies buoyed markets and prompted soaring consumer and business optimism. However, fiscal policy changes usually take a long time to pass Congress. There are further implementation delays. And, following implementation it takes time for the fiscal policy changes to impact real economic activity. This is especially true for infrastructure spending. However, if "animal spirits" are kindled in anticipation of policy changes, business decisions can impact economic activity well before changes in fiscal policy become effective. The ongoing rise in both consumer and business confidence and optimism to multi-decade highs is supportive evidence that anticipatory decision making may occur. However, the case for "animal spirits" is not yet a strong one. Although the Trump market rally continues and apparently has weathered the demise of Republican health care legislation, professional investors remain guarded in their outlook. Many business people, while more hopeful, continue to be in a wait and see stance, as reflected by NFIB's and Evercore ISI's company surveys.

The Federal Reserve's Beige Book, which summarizes anecdotal economic information on a regional basis, has changed little in tone and is consistent with slow, plodding growth and little upward pressure on inflation.

## 1. Economic Activity

In the March statement, the **FOMC** upgraded very modestly its assessment of overall economic activity. With respect to business investment the **FOMC** said: "... *business investment appears to have firmed somewhat*" compared to its February assessment that "... *business fixed investment has remained soft.*" There was no substantive change to the **FOMC**'s favorable assessment of consumer spending. In light of the **FOMC**'s decision to raise the federal funds rate, this extremely limited upgrading of economic activity was interpreted as "dovish." Prior to the meeting and perhaps given the backdrop of a strong stock market and high levels of consumer and business optimism the market had been expecting a stronger assessment of economic activity, which would have supported an emerging belief that the **FOMC** would accelerate the pace of monetary tightening. The **FOMC** did not ratify this expectation and further cemented a dovish interpretation by failing to include any significant upgrades to its projections for future increases in the federal funds rate. In effect, the **FOMC** was able to tighten policy without creating an overreaction in the market. Its ongoing message of gradual tightening that is data dependent remains solidly in place.

**Table 10** shows the **FOMC**'s central tendency projections for real GDP growth for 2017, 2018, and 2019, as well as the long-term potential real rate of GDP growth. The range in GDP growth projections for 2017 was tightened on both ends and the top end of 2018's range was raised. What stands out in **Table 10** is the steady decline in projected long-run growth; however, **FOMC** projections have stabilized in the

last year in an anemic range of 1.8 to 2.0 percent.

**Table 10**
**Economic Projections of Real GDP By Federal Reserve Board Members and Federal Reserve Bank Presidents, March 2017**

| Real GDP % | | Central Tendency | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Long Run |
| Actual | | 2.47 | 1.98 | 1.60 | | | | |
| 2017 | 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 | 2.3 - 2.4 | 2.6 - 3.0 | 2.5 - 3.0 | 2.3 - 2.5 | | | 2.0 - 2.3 |
| | Sep | 2.0 - 2.2 | 2.6 - 3.0 | 2.6 - 2.9 | 2.3 - 2.5 | | | 2.0 - 2.3 |
| | June | 2.1 - 2.3 | 3.0 - 3.2 | 2.5 - 3.0 | | | | 2.1 - 2.3 |
| | Mar | 2.8 - 3.0 | 3.0 - 3.2 | 2.5 - 3.0 | | | | 2.2 — 2.3 |
| 2013 | Dec | 2.8 - 3.2 | 3.0 - 3.4 | 2.5 - 3.2 | | | | 2.2 - 2.4 |
| | Sep | 2.9 - 3.1 | 3.0 - 3.5 | 2.5 - 3.3 | | | | 2.2 - 2.5 |
| | June | 3.0 - 3.5 | 2.9 - 3.6 | | | | | 2.3 - 2.5 |
| | Mar | 2.9 - 3.4 | 2.9 - 3.7 | | | | | 2.3 - 2.5 |
| 2012 | Dec | 3.0 - 3.5 | 3.0 - 3.7 | | | | | 2.3 - 2.5 |

## 2. Employment

Little slack remains in the labor market and compensation has begun to rise, albeit slowly. The U-3 unemployment rate in February was slightly below **CBO**'s NAIRU (non-accelerating inflation rate of unemployment). The **FOMC**'s assessment of the labor market was positive. While it refrained from commenting about whether the labor market has achieved full employment, it said *"Job gains remained solid and the unemployment rate was little changed in recent months."* This upbeat assessment was identical word-for-word in both the February and March statements.

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 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. Critics contend that by pursuing a gradual tightening approach, the **FOMC** risks inflation overshooting the target of 2.0 percent. Of course, the target is intended to be an average over the cycle, not a ceiling. The fact is that inflation has been below the 2.0 percent target for an extended period of time. Nonetheless, some policymakers worry that if policy response is delayed too long the market consequence might be that inflation expectations become unanchored.

**FOMC** projections of the U-3 unemployment rate are shown in **Table 11.** While the **FOMC** overestimated expected real GDP growth for many years until recently, it simultaneously 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, 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.

**Table 11**
**Economic Projections of Unemployment Rate by Federal Reserve Board Members And Federal Reserve Bank Presidents, March 2017**

| Unemp.Rate % | | Central Tendency | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Longer Run |
| Actual | | 5.58% | 5.02% | 4.72% | | | | |
| 2017 | Mar | | | | 4.5 - 4.6 | 4.3 - 4.6 | 4.3 - 4.7 | 4.7 - 5.0 |
| 2016 | Dec | | | 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 |
| 2015 | Dec | | 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 |
| 2014 | Dec | 5.8 | 5.2 - 5.3 | 5.0 - 5.2 | 4.9 - 5.3 | | | 5.2 - 5.5 |
| | Sep | 5.9 - 6.0 | 5.4 - 5.6 | 5.1 - 5.4 | 4.9 - 5.3 | | | 5.2 - 5.5 |
| | June | 6.0 - 6.1 | 5.4 - 5.7 | 5.1 - 5.5 | | | | 5.2 - 5.5 |
| | Mar | 6.1 - 6.3 | 5.6 - 5.9 | 5.2 - 5.6 | | | | 5.2 - 5.6 |
| 2013 | Dec | 6.3 - 6.6 | 5.8 - 6.1 | 5.3 - 5.8 | | | | 5.2 - 5.8 |
| | Sep | 6.4 - 6.8 | 5.9 - 6.2 | 5.4 - 5.9 | | | | 5.2 - 5.8 |
| | June | 6.5 - 6.8 | 5.8 - 6.2 | | | | | 5.2 - 6.0 |
| | Mar | 6.7 - 7.0 | 6.0 - 6.5 | | | | | 5.2 - 6.0 |
| 2012 | Dec | 6.8 - 7.3 | 6.0 - 6.6 | | | | | 5.2 - 6.0 |

### 3. Inflation

In its March statement, the **FOMC** upgraded its inflation assessment while continuing to acknowledge that although inflation is moving closer to the 2 percent longer-run objective, it is not quite there yet. Specifically, the **FOMC** changed the words in the February statement from "*is still below*" to "*moving close to*" the Committee's 2 percent longer-run objective. There was no change in the language about inflation expectations – "*market-based measures of inflation compensation remain low*" and "*survey-based measures of longer-term inflation expectations are little changed, on balance.*" However, the University of Michigan survey of long-run inflation expectations declined to 2.2 percent in March, an all-time low for this survey, compared to 2.5 percent in the January survey.

As can be seen in **Table 12**, there was a slight upgrading of the **FOMC**'s inflation projections in 2017, but no change in 2018 and 2019. The FOMC expects "*inflation will stabilize around 2 percent over the medium term.*" This is the first time the word "stabilize" has been included in the statement. It should be interpreted to mean that inflation might rise above the 2 percent objective for a period of time, but in the longer-run the 2 percent objective is an average target and not a ceiling.

### 4. Unwinding the Fed's Bloated Balance Sheet

Now that the **FOMC** has begun the process of normalizing monetary policy by gradually increasing the federal funds rate to the level consistent with full employment, 2 percent inflation, and a natural rate of interest somewhere in a range of zero to one percent, it is natural to consider whether the Fed's bloated balance sheet should be shrunk to a more normal size.

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 is 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 should 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.

**FOMC** consideration of the Fed's balance sheet strategy is likely to occur later this year. At this time balance sheet management principles the **FOMC** adopted in 2014 still guide policy. Those principles stated that the first step in normalization would simply be to begin phasing out reinvestments of maturing securities or possibly to end reinvestments altogether. In the short-run this would have a very minor impact on the overall size of the balance sheet and also a minor impact on long-term interest rates. The more significant policy decisions are when to initiate sales of securities, the amount of such sales, and the progression of sales over time. It seems likely that the **FOMC** may ultimately adopt a policy that mirrors the extended period of tapering the size of purchases. This would involve indicating details of the amounts to be sold and the timeframe over which sales would occur. It might also include details about which maturities would be sold in what order.

As to the timing to initiate balance sheet normalization, the implicit policy rule appears that this will occur once the **FOMC** believes that the probability of being forced to reduce the federal funds rate to the zero boundary in the event of renewed economic weakness or recession has declined to a very low level. The New York Federal Reserve Bank's primary dealer survey indicates a median expectation that

**Table 12**
**Economic Projections of Inflation By Federal Reserve Board Members And Federal Reserve Bank Presidents, March 2017**

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

the **FOMC** would discontinue reinvestments once the federal funds rate rises to a range of 1.25 to 1.50 percent, which is two more increases. That range is nearly identical to the hypothetical range cited by **FOMC** Vice Chair William Dudley in June 2015. Two additional increases in the federal funds rate are

likely to occur by December and could occur as early as September, if employment growth continues to be strong and inflation continues to edge closer to the **FOMC**'s 2 percent target.

Acceleration of balance sheet shrinkage would require outright sales of securities. There is reason to expect that the **FOMC** will not provide explicit guidance about sales until it has had time to assess the market response to the first passive phase of not replacing amortizations and maturities. This might be coincident with a federal funds rate of 1.75 to 2.0 percent or somewhat higher.

Reducing the size of the Fed's balance sheet would have both favorable and unfavorable effects on the economy, although on balance the net effect should be to tighten financial conditions and slow real GDP growth. There is considerable debate about the particularities of the impacts. Thus, a go slow approach by the **FOMC** seems more likely than not.

On the unfavorable side, reduction of the Fed's balance sheet, by raising longer-term interest rates would adversely affect housing and consumer purchases of durables, such as cars. However, on the favorable side, if balance sheet reductions were accompanied by more gradual increases in the federal funds rate, the dollar's value might weaken and that would stimulate exports and manufacturing. This trade-off between two monetary policy tightening tools would occur because the dollar's value is far more sensitive to changes in short-term rates than it is to changes in long-term rates.

In summary, normalizing monetary policy involves both adjusting the federal funds rate and reducing the size of the Fed's balance sheet. Both will 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 alone, the **FOMC** is likely to proceed with balance sheet normalization very cautiously.

## 5. Is the FOMC Behind the Curve?

Based upon an uncritical application of the Taylor Rule, which assumes that the neutral real rate of interest is 2.0 percent, the current federal funds rate is about 3 percentage points too low. Even if the neutral rate is zero, as suggested by FOMC Chair Janet Yellen, the federal funds rate is still 1 percentage point below what the Taylor Rule prescribes, assuming that inflation is at 2.0 percent. Simplistically, this suggests that the FOMC is "behind the curve" and risks letting the economy overheat and unleashing upside pressures on inflation.

As is often the case, there are two sets of arguments which lead to different conclusions, which mean that risks are two-sided. The consensus view is that the economy is at full employment and is expanding at a rate slightly above potential. History indicates that when such conditions prevail inflation moves higher. It is a simple matter of demand exceeding supply which results in an increase in the price level to clear the market. For the consensus to be vindicated in its view, the assumption that the economy is at full employment must be validated as must its belief that growth will exceed potential in coming months. While both necessary conditions seem to be intuitively plausible, intuition is not a reliable substitute for rigorous proof.

On the other side of the debate, it is argued that premature tightening of monetary policy could flip the economy into recession rather than cooling a nonexistent overheating potential. Neel Kashkari, president of the Minneapolis Federal Reserve Bank, cast a lone dissenting vote at the March **FOMC** meeting, arguing that the 2 percent inflation target has not been achieved, the labor market is not yet at full employment and financial market assumptions about fiscal stimulus policies are premature.

As noted in my commentary on employment, economic research conducted by San Francisco Federal Reserve Bank economists indicates that the labor market is not yet at full employment as traditional measures imply. As discussed below, while most believe inflation will continue to rise, albeit gradually, toward the **FOMC**'s 2 percent target, this expectation is not necessarily validated by rigorous analysis. My econometric model, while corroborating that core PCE inflation has moved close to 2.0 percent, does not indicate that inflation is likely to reach or exceed that level even if the unemployment rate falls further. Finally, my model indicates that the federal funds rate is already above the predicted level, suggesting that the **FOMC** might actually be "ahead of the curve."

Financial markets are solidly in the consensus camp. Since the election of Donald Trump, volatility has fallen to cyclically extremely low levels in financial markets. This is true for both interest rates and exchange rates. One is reminded that the last time interest-rate volatility was low was in 2006 and 2007 in the waning days of the Great Moderation just prior to the financial crisis and onset of the Great Recession. And, the last time currency exchange rate volatility was low was in 1986 and 1987, just prior to the stock market's decline of 22 percent in a single day. Markets can be lulled into complacency by soothing words and friendly policy intervention. Low volatility actually encourages risk taking and the deployment of leverage to arbitrage narrow spreads. But, the mispricing of risk sets the stage for a potentially violent correction when the market loses confidence in policymakers' ability to deliver. This is not to say that such a correction is inevitable or even imminent. It is merely an historical observation that low volatility is an artifact of aggressive policy management. And, if that policy management discourages markets from managing risk or, worse, encourages excessive risk taking, then history tells us that a Minsky moment will occur, often without much warning.

The euphoria that has gripped global markets since the election of Donald Trump has upped the ante on risk taking and reinforced uncritical complacency.

Profit growth is cited as support for the consensus view. But, as Will Denyer opines, "*Inflation has a way of makin things look better than they really are.*"[4] When profits are adjusted for recent increases in total inflation, the trend is flat rather than increasing. Denyer explains that "... *conventional accounting does not adjust for the rising cost of replacing capital, such as depreciating assets and inventories. Inflation pushes up revenues, while depreciation and the cost of goods sold are deducted based on historical costs.*" Denyer notes that these adjustments are made to the Flow of Funds data and that data indicate that real profits fell in 2015 and were flat in 2016. The consequence is that the real rate of return on capital has been declining while the cost of capital, courtesy of monetary tightening, has been rising. The spread between the return on capital and the cost of capital is a very reliable indicator of the health of the economy. Obviously, a narrowing spread is not favorable. When the spread is viewed over time, low levels always occur during times of recession. That point has not yet been reached, or as Denyer puts it, the spread is "*not yet flashing red*" but it is "*glowing a very dark orange.*" The conclusion is unambiguous. If optimism does not translate into higher sustainable growth soon and the FOMC continues to tighten

[4] Will Denyer. "The Profit Illusion," GavekalResearch, The Daily, March 21, 2017.

monetary policy, the risks of recession will grow apace.

## VI. Inflation and Interest Rates

As can be seen in **Table 12**, the FOMC remains 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. With core PCE inflation of 1.74 percent in 2016, FOMC members are confident that the target of 2.0 percent will be reached in the next two years.

### 1. Core Inflation

Core PCE inflation was 1.74 percent in January and has risen 43 basis points from its recent low of 1.31 percent in July 2015. Total PCE inflation, which had been depressed by the plunge in oil prices and lower import prices in late 2015, rebounded to 1.89 percent in January, up from the 0.23 percent rate of increase that prevailed at the end of 2015. Now that commodity prices have stabilized, total CPE inflation will continue to rise in coming months, as the early 2016 declines in prices of commodities drop out of the year-over-year annual rate of change. While core PCE is anticipated to edge up toward 2.0 percent during 2017, total PCE inflation is expected to rise temporarily to about 2.3 percent in March and then recede to near 2.0 percent by the end of the year.

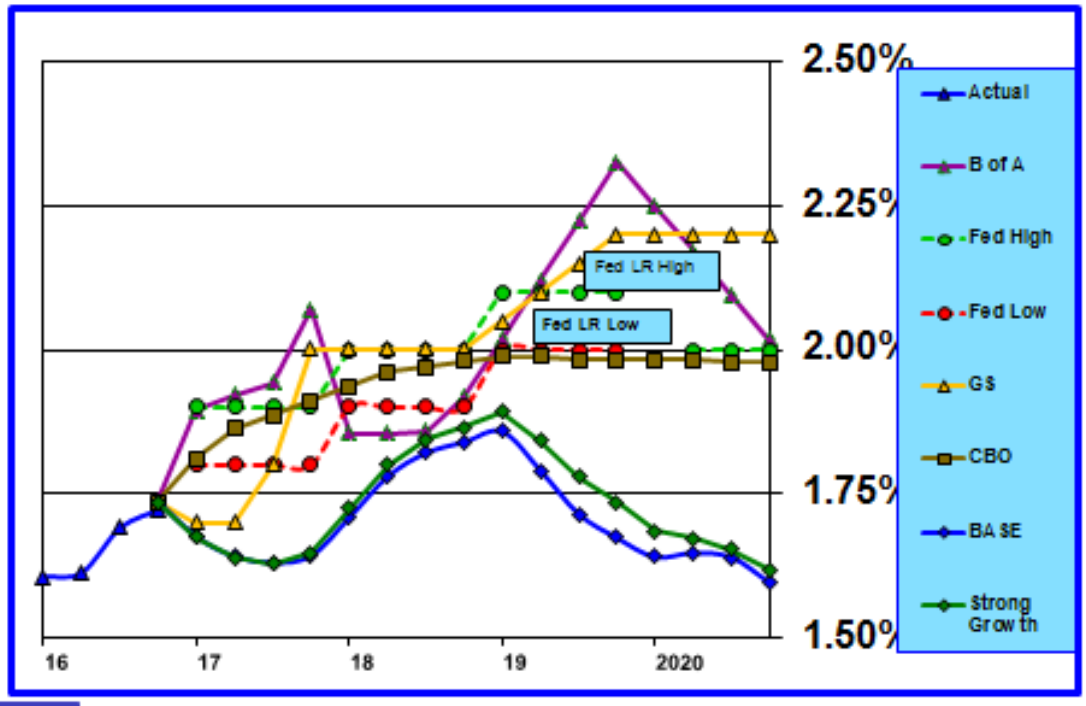
As can be seen in **Table 13** (**Chart 16** shows historical core PCE price index data and data from **Table 13** in graphical form), forecasts of the core PCE inflation index indicate that inflation will increase about 30 basis points during 2017. Over the longer run, **B of A** and **GS** expect core PCE inflation to break above 2.0 percent during 2019, and then edge back toward 2.0 percent after that. **B of A** expects inflation to reach 2.3 percent in 2019 and **GS** is forecasting 2.2 percent in 2019. FOMC projections reflect a gradual rise to its 2.0 percent target during 2018.

In looking at **Chart 17**, my "**BASE**" and "**Strong Growth**" forecasts for core PCE inflation move toward 2.0 percent by 2019. But, as can be seen in **Chart 17**, core PCE inflation does not remain near 2.0 percent as others expect but drifts down to about 1.6 percent. The principal culprit is weak productivity and also a modest rise in the employment gap as unemployment begins to edge up beginning in 2019 in the "**BASE**" scenario.

Core PCE inflation forecasts for my "**BASE**" and "**Strong Growth**" scenarios are not materially different. All are a bit lower than the forecasts of **B of A**, **GS** and the FOMC. While one should never discount the possibility of a sea-change in the economic environment in the future that would set inflation of a different course, the preponderance of the evidence indicates 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 could benefit from additional fiscal stimulus by the end of the year.

While nearly everyone believes inflation is heading higher, my model does not corroborate this expec-

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

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## CHART 17 – Core PCE Inflation
(annual percentage rate)

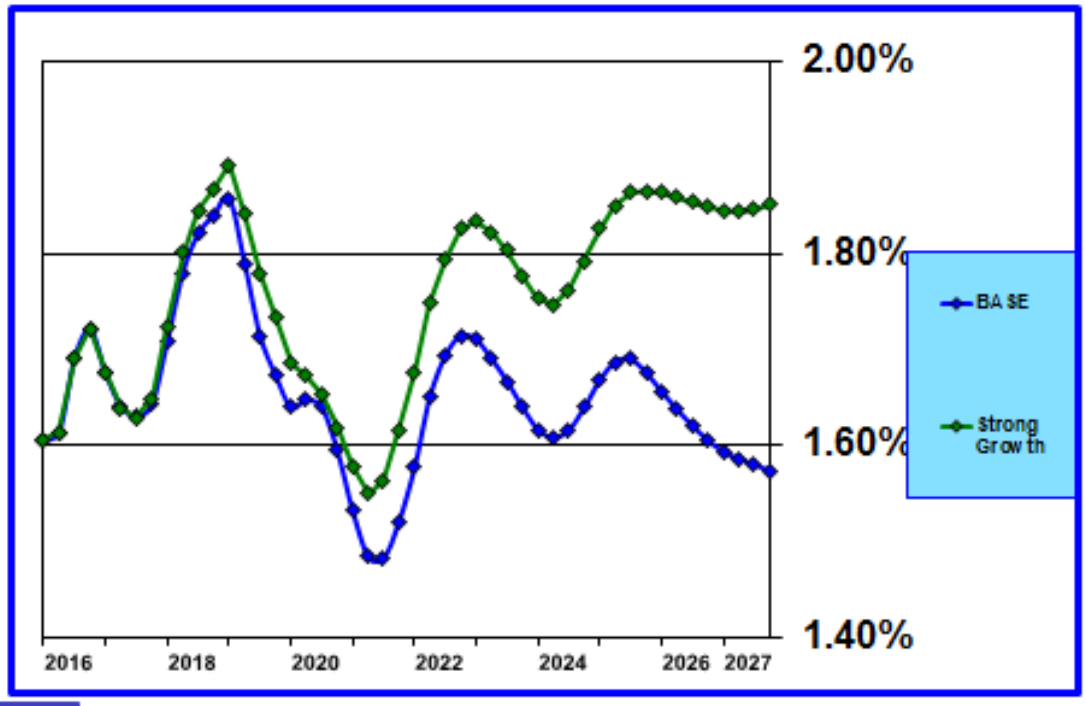


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**Table 13**
**Core PCE Inflation Forecasts – B of A, GS, Bill's "BASE", Bill's "Strong Growth" and FOMC High and Low**

| Core CPE | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Actual | 1.55 | 1.50 | 1.39 | 1.74 | | | | |
| B of A | | | | | 2.09 | 1.92 | 2.32 | 2.02 |
| GS | | | | | 2.00 | 2.00 | 2.20 | 2.20 |
| GLOBAL Insight* | | | | | 2.40 | 1.90 | 2.40 | 2.70 |
| Economy.com* | | | | | 2.80 | 2.70 | 3.10 | |
| Blue Chip* | | | | | 2.50 | 2.30 | 2.30 | |
| Bill's BASE | | | | | 1.67 | 1.85 | 1.66 | 1.57 |
| Bill's Strong Growth | | | | | 1.68 | 1.88 | 1.72 | 1.60 |
| FOMC — High | | | | | 1.9 | 2.0 | 2.0 | |
| FOMC — Low | | | | | 1.8 | 1.9 | 2.0 | |

*Total CPI

tation. Tan Kai Xian cited three reasons why inflation might not head higher as most expect.[5]

First, energy prices have been stable for over a year and have recently fallen a tad. The pro-energy policies of the Trump administration are likely to favor increases in supply relative to demand which would keep a lid on prices. Indeed, the risks of lower energy prices in coming months are greater than the risks of higher prices.

Second, growth in consumer, real estate and business lending has slowed as financial institutions have tightened underwriting. Auto lending has slowed to an annualized rate of 0.9 percent over the last three months and credit card lending to an annual rate of 3.6 percent over the past 12 months. Business lending has stalled, but might recover if business optimism leads to capital investment and inventory building in anticipation of improved sales. Commercial real estate lending has slowed largely in response to increased regulatory scrutiny and tighter underwriting standards. Slower credit growth will take pressure off of inflation.

Third, inflation expectations rose sharply following last year's presidential election because of President Trump's tax reform and infrastructure proposals. Congress has been distracted by investigations and the health care debacle and has yet to move forward on tax and infrastructure legislation. Moreover, President Trump has now declared war on the Freedom Caucus which is composed of approximately 30 House of Representatives Republicans, whose votes are necessary to pass any legislation, assuming Democrats vote against as a bloc. At the best economic stimulus legislation and its implementation have been delayed; at worst, the Republicans will be unable to enact anything of consequence without working with Democrats. Moreover, the demise of health care legislation makes the job of passing tax reform harder because it was anticipated that the health care legislation would help pay for the costs of tax reform. And, in addition, the border adjustment tax, which also would provide revenues to finance tax cuts and increases in spending, is extremely controversial and passage is far from assured. Sum all of this up and the risks of longer than expected delays in enacting and implementing tax reform and infrastructure stimulus seem all but assured and no substantive action at all cannot be ruled out.

[5]Tan Kia Xian. "US Inflation: The End of the Affair," GavekalResearch, The Daily, February 13, 2017.

Tan Kai Xian concludes that the more likely pathway for CPI inflation "... *to tail off through the spring and flatten out at about 2% in the summer months.*" PCE inflation of about 1.6 percent, which is generally what my "**BASE**" scenario is forecasting, is consistent with 2.0 percent CPI inflation.

## 2. Inflation Expectations

According to the University of Michigan monthly Surveys of Consumers, expectations for long-term inflation (5-10 years) was a historic low of 2.2 percent in March, down from 2.5 percent in January. This survey measure has been trending down gradually. A year ago long-term inflation expectations were 2.7 percent. One-year inflation expectations declined to 2.4 percent in March from 2.7 percent in February.

Predictably, now that the labor market has reached full employment, concerns about the possibility of higher inflation have grown as have worries that the FOMC may be getting behind the curve and needs to raise the federal funds rate more rapidly to prevent an outbreak of higher inflation.

## 3. Financial Conditions

**GS** calculates and publishes a financial conditions index, **GSFCI**. **GS** has conducted extensive empirical research which demonstrates that financial conditions impact economic growth. Tighter financial conditions lead to slower growth. Tighter financial conditions can occur through intentional tightening of monetary policy by the **FOMC**. But, tighter financial conditions can also occur during episodes of financial market instability and panic.

**GSFCI** is a strong predictor of interest rates with an average lag of about 18 to 29 months with the longest lag occurring for short-term rates and the shortest lag for long-term rates. A sustained increase of 0.25 in **GSFCI** is associated with an increase in the federal funds of 50 basis points and the 10-year Treasury yield of 35 basis points.

**GS**'s research indicates that the tightening in financial conditions that began in mid-2014 and continued to early 2016, reduced real GDP growth by 1.0 percent over the following year. That intuitively makes sense because tighter financial conditions reflect elevated perceptions of risks and cause market participants to act with a greater degree of caution. Riskier loans are not made and more speculative investments are deferred or avoided altogether.

Financial conditions eased about 0.50 during 2016 after the February peak and should add about 0.5 percent to real GDP growth during 2017.

Since the beginning of 2017, financial conditions have declined another 0.40. This nearly offsets the tightening impact of the December and March increases in the federal funds rate. If this easing in financial conditions persists or deepens, the **FOMC** is at risk of falling behind the curve, which means that the economy could overheat and place upside pressure on inflation.

## 4. Interest Rates – Federal Funds Rate

The FOMC surprised markets by raising the federal funds rate 25 basis points at its March meeting, although members did a good job of foreshadowing the likely increase a few days before the meeting..

Going forward the debate now revolves around how rapidly the FOMC will raise rates. The expected number of federal funds rate increases is shown in **Table 14**.

**Table 14**
**Number of Federal Funds Rate Increases of 25 Basis Points – FOMC, B of A, GS, Bill's "BASE", Bill's "Strong Growth"**

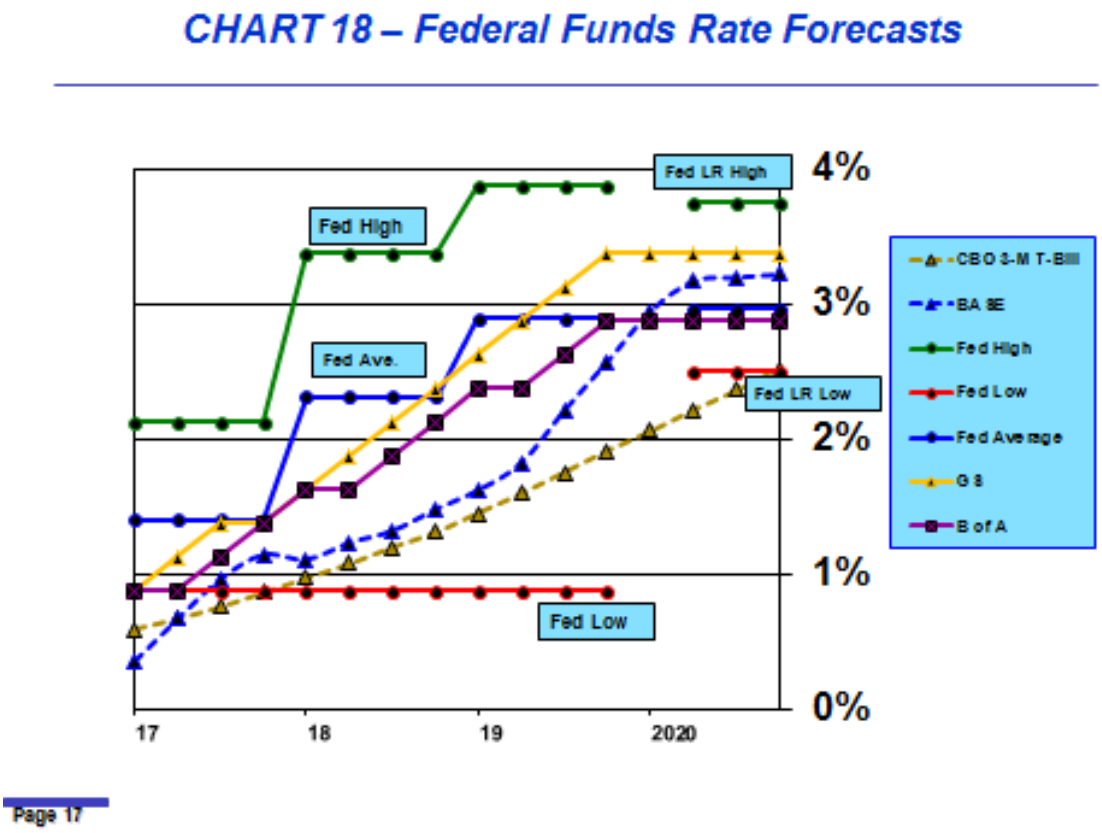
| | 2017 | 2018 | 2019 | 2020 | Total to Equilibrium | Equilibrium Rate |
|---|---|---|---|---|---|---|
| FOMC - median | 3 | 3 | 3 | 0 | 9 | 2.75-3.00 |
| B of A | 3 | 3 | 3 | 0 | 9 | 2.75-3.00 |
| GS | 3+ | 4 | 4 | 0 | 11 | 3.25-3.50 |
| Bill's BASE | 2 | 2 | 4 | 2 | 10 | 3.00-3.25 |
| Bill's Strong Growth | 3 | 2 | 4 | 3 | 15 | 4.25-4.50 |

In its March Summary of Economic Projections (SEP), the median FOMC member view is three 25 basis point increases in the federal funds rate in 2017 (1.25-1.50 percent), three more in 2018 (2.00-2.25 percent), three more in 2019 (2.75-3.00 percent), and a long-term equilibrium level of 2.75 to 3.00 percent. In the past the SEP projections have proved to be very unreliable guides to future monetary policy. For example, a year ago the FOMC median projected four increases in the federal funds rate. Only one occurred. The question now is whether, with the economy at full employment and fiscal stimulus in the wings, the FOMC's projected three rate increases in 2017 might turn out to be an underestimate.

**B of A** now expects three increases in 2017 with the two remaining increases occurring in September and December. **GS** is firmly in the three-rate increases camp and expects the remaining two increases to occur in June and September. Also, **GS** expects a faster pace of tightening than **B of A** and a higher equilibrium level of the federal funds rate of 3.25 to 3.50 percent compared to 2.75 to 3.00 percent for the FOMC and 2.75 to 3.00 percent for **B of A**.

My updated federal funds rate forecast in my "**BASE**" scenario projects on additional rate increase in 2017, two additional increases in 2018, followed by four increases in 2019 and two more in 2020. My "**BASE**" case equilibrium rate settles at 3.00 to 3.25 percent, slightly above **B of A**'s and the FOMC's projections. However, the federal funds rate in my "**Strong Growth**" scenario continues to rise to 4.25 to 4.50 percent. Actually, this is not an equilibrium rate but reflects the consequences of a tight monetary policy in an overheated economy – the unemployment rate falls gradually to 4.0 percent in this scenario by 2027, considerably below the NAIRU rate of approximately 4.7 percent.

**Chart 18** shows the quarterly progression in the federal funds rate from the present through 2020 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 but by 2020 lands between **B of A**'s and **GS**'s projections.




## 5. Interest Rates – 10-Year Treasury Note Yield

My estimates of values of the long-term neutral federal funds rate and the long-term equilibrium 10-year Treasury rate are shown in **Table 15** for various assumed values of the growth rate in total hours worked and productivity, along with the long-term potential real GDP growth rate implied by these assumed values.

The top panel of **Table 15** holds growth in total hours worked constant at 0.6 percent annually and shows the impact on neutral federal funds and the equilibrium 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 15** is in the assumed annual growth rate in total hours worked, which is raised to 0.8 percent.

Until the 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 2.875 percent – the median value rose to 3.00 percent in December and remained at that level in March. Based upon my model, as shown in **Table 15**, 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 3.50 percent is a likely level for the long-term neutral federal funds rate, but it could be lower at 3.25 percent, if productivity remains at the dismal level of 0.9 percent that it has averaged over the last ten years. This also means that the real neutral interest rate, assuming inflation is 2.00 percent, would be 1.25 to 1.50 percent.

**Table 15**
**Long-Term Potential Real Rate of GDP Growth for Various Assumed Values of Growth in Total Hours Worked and Productivity and Corresponding Nominal Long-Term Natural (Neutral) Interest Rates for Federal Funds and 10-Year Treasury Rates (BASE Scenario)**

(***assumes nominal rate of inflation = 2.0% and economy is at full employment***)

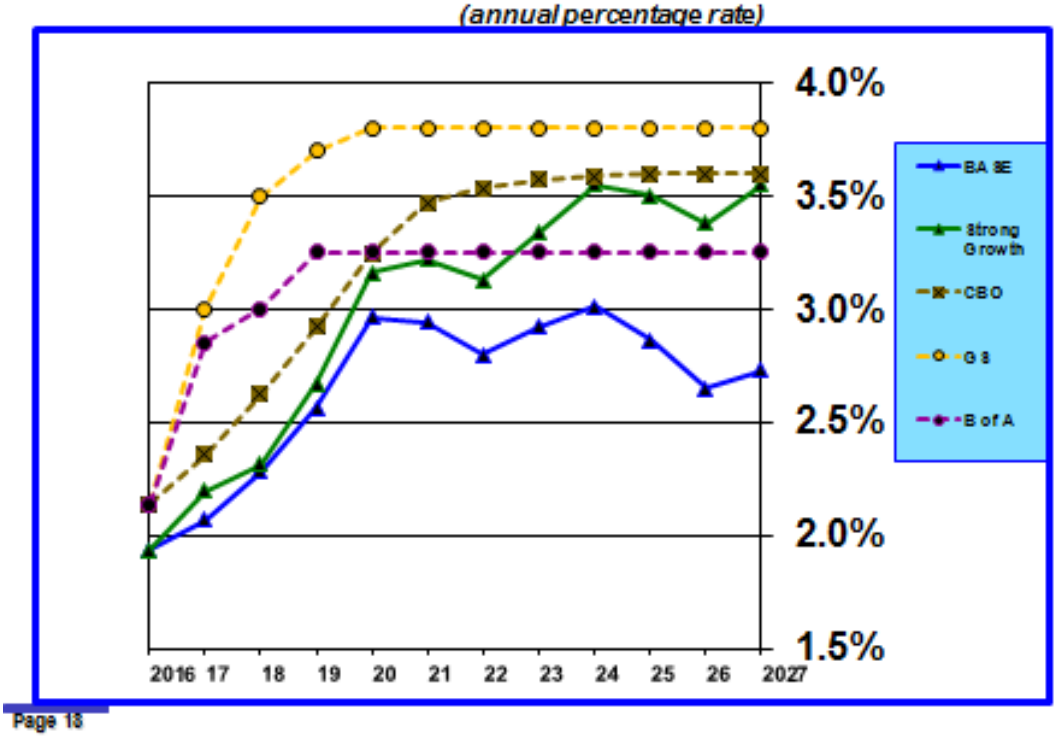
| | Assumptions | | |
|---|---|---|---|
| Potential Real GDP | 1.31% | 1.71% | 1.86% |
| Productivity | .9% | 1.4% | 1.6% |
| Labor Force | .6% | .6% | .6% |
| | Neutral Nominal Rate | | |
| Federal Funds | 3.21% | 3.54% | 3.67% |
| 10-Year Treasury | 3.16% | 3.49% | 3.62% |
| | Assumptions | | |
| Potential Real GDP | 1.51% | 1.91% | 2.06% |
| Productivity | .9% | 1.4% | 1.6% |
| Labor Force | .8% | .8% | .8% |
| | Neutral Nominal Rate | | |
| Federal Funds | 3.44% | 3.77% | 3.90% |
| 10-Year Treasury | 3.36% | 3.69% | 3.82% |

Assuming an inflation rate of 2.0 percent, my model indicates that the 10-year neutral rate should be about 3.50 percent. The long-term neutral rate is 3.80 percent for **GS**, 3.25 percent for **B of A** and 3.60 percent for **CBO**. These estimates do not differ materially – all fall within a range of 3.25 percent to 3.80 percent.

However, my forecasts for the 10-year yield in my "**BASE**" and "**Strong Growth**" scenarios, which are shown in **Chart 19**, are lower because my forecasts of inflation are lower than 2.0 percent. The range in my actual forecasts is 2.75 percent to 3.50 percent, rather than 3.50 percent that my model says would prevail if inflation were 2.0 percent in the "**BASE**" scenario.

## CHART 19 – Ten-Year Treasury Yield

*(annual percentage rate)*



## 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.** — **March Assessment**: Strengthening growth; surging consumer, business, and investor optimism; increased political uncertainty stemming from new U.S. president and Republican-controlled Congress; survey data have been much stronger than hard economic data reports, but better economic data is expected to follow improved optimism

   ✓ **Citi U.S. Surprise Index continues to accelerate to 55.2 on March 21 compared to 39.1 for the 13-week trailing average (index = 0 when positive and negative surprises are balanced), reflecting favorable economic momentum, at least in the near term; however, the survey's positive momentum has been dominated by surveys more than hard economic data**

   ✓ **There is some evidence that economic data are strengthening; the Chicago Federal Reserve's National Activity Index rose to 0.34 in February following two years of sub-trend performance (a positive value means economic activity is above trend)**

   ✓ **However, the defeat of the Republican health care legislation and increased uncertainties about tax reform legislation might dampened the positive market sentiment that has prevailed since Donald Trump's election; the Markit U.S. Manufacturing index receded in March to its lowest level since last October**

   - ***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 Q1 forecast is 1.5% - its current tracking estimate is 1.9%*

     *? GS's Q1 forecast is 1.8%; GS's March U.S. Current Activity Indicator is a very strong 4.1%, but much of the strength is due to strong survey data*

     *? The Atlanta Fed's Q1 GDPNow forecast, which relies more on hard economic data, is 0.9%*

     *+ B of A's 2017 forecast is 2.1% and GS's is 2.2%; my "BASE" scenario forecast is 2.0% and my "Strong Growth" scenario is 2.1%; FOMC tightened its 2017 Q4/Q4 central tendency range in March to 2.0-2.2%*

   - ***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 in its January update reduced the size of the 2016 Q4 output gap from 1.2% to 0.9%; the revised end of 2017 output gap should be in a range of 0.5% to 0.7%*

- ***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 1.5%*

  *- Long-term potential real GDP growth has moved higher to a range of 1.9% to 2.15%*

- ***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 0.2% Y/Y and 1.0% Q4/Q4; Y/Y productivity growth in 2017 could be as high as 1.2%*

- ***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 a very strong 236,500 over the first two months of 2017*

  *- Household employment growth averaged a very strong 208,500 over the first two months of 2017*

  *? Evercore ISI temporary and permanent employment surveys remain strong, but have edged down from an average of 60.1 in December to 57.5 in March (a value above 50 is favorable)*

  *? The Conference Board's labor market differential was +5.9 in February compared to +6.0 in January, indicative of a strong employment market*

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

  *- Participation grew from 62.67% in December to 62.95% in January*

- ***Unemployment rate*** should edge down slightly to between 4.3% and 4.5%.

  *? U3 unemployment rate in February was 4.71%*

- ***Wage growth*** should edge up slightly during 2017 to a range of 2.7% to 3.1%.

  *? BLS Y/Y wage growth for all employees in February was 2.61%*

  *? Atlanta Fed wage tracker declined from 3.8% in December to 3.2% in March*

- ***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 January nominal consumer income growth over the past 12 months was 3.9%; while it's too early to be sure, growth in 2017 now appears likely to be at or above the top end 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 January nominal consumer spending growth over the past 12 months was 3.9%; however, growth in 2017 now appears likely to be at or above the top end of the forecast range*

*? University of Michigan Survey of Consumers sentiment index rose to 97.6 in March compared to 96.3 in February, but below the 98.5 registered in January and 98.2 in December ; improved confidence since the election is solely the result of those identifying themselves as Republicans, confidence among Democrats has declined sharply*

*? Conference Board consumer confidence index surged to 125.6 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 rose to 51.3 on March 24, the highest level in 16 years*

*? Evercore ISI's index of company surveys was 52.1 on March 24 compared to 50.1 on December 30*

*? Retail sales growth was relatively weak during January and February but might have been held down by delays in tax refunds; spending declined for lower income households, but increased for higher income households*

- ***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 was 5.55% in January and has averaged 5.81% over the past 12 months*

- ***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 4.7% as of March 24 as the Trump rally continues*

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

  *- Manufacturing production has expanded over the past four months, reflecting higher commodities prices and an acceleration in global growth*

  *- The NFIB optimism index skyrocketed to 105.8 in January and held at a high level of 105.9 in February and 105.3 in March; these readings are the highest sustained level since 2004; however this high level of optimism has yet to translate into increased hiring and capital investment*

  *- ISM manufacturing index rose to a high 57.7 in February compared to 56.0 in January and 54.5 in December (a value above 50 is favorable)*

  *- ISM non-manufacturing index rose to 57.6 in February from 56.5 in January and 56.6 in December (a value above 50 is favorable)*

  *? GS analyst index fell further in February to 56.7 from 58.8 in January and 60.7 in December (a value above 50 is favorable)*

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

  *? Small business plans to increase capital spending rose along with the increase in optimism in January but declined in February and March; plans have been relatively stable for the past 12 months*

  *? Durable goods orders have increased 5.1% over the past 12 months and dura goods shipments are up 2.7%*

*? EvercoreISI's survey of capital goods survey finally broke above 50 with a value of 50.3 in the week ending March 24 (a value above 50 indicates growth in activity)*

*? C&I lending standard have tightened some; C&I lending has declined at an annual rate of -1.1% since November*

*? Reflecting regulatory pressures, commercial real estate lending is slowing but is still rising at a favorable 6.6% annual rate*

- ***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 declined from 67 in January to 65 in February (a value above 50 is favorable)*

  *? Higher mortgage rates will 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 in February were 8.0% above the 2016 total*

  *? Evercore/ISI's homebuilders survey has risen from a strong 57.5 in December to an even stronger 64.5 on March 21 (a value above 50 is favorable)*

  *? Homeownership averaged 63.4% during 2016, the lowest level in 50 years*

- ***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 Board's Housing Purchase Price Index rose 6.2% during 2016*

- ***Trade deficit*** should rise in 2017 as the increase in the value of the dollar depresses exports and increases imports.

  *? The trade deficit in January, measured as a 12-month moving average, was 2.65%, which was unchanged from December*

- 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 -1.5% in February from December*

- ***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 averaged about $53 a barrel in January and February; however oil prices are averaging about $50 a barrel in March, reflecting the overhang of substantial inventory; downside risks to prices outweigh upside risks because of a record net long speculative positions which are betting on higher prices and rapidly rising U.S. shale production*

- ***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 on March 15 and reaffirmed its expectation to raise this rate two more times during 2017; B of A expects two additional increases in September and December; GS expects two additional increases in June and September*

  *? Financial conditions eased a little in January and February, then tightened briefly in early March when FOMC signaled a likely interest rate increase at the March FOMC meeting, but financial conditions resumed easing in the immediate aftermath of the meeting; commercial real estate lending standards are tightening*

- ***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 in 2016 was 1.57%*

  *? Total CPE inflation was up 1.89% in January compared to January 2016; however, because the depressing effects of low oil prices experienced in early 2016 will fall out of the index in coming months, total CPE inflation is expected to rise well above 2.0% in coming months before falling back to the 1.7-2.0% range by the end of the year*

  *? 5-10 year inflation expectations fell to a historic low of 2.2% in March from 2.5% in February; inflation expectations for the next year fell from 2.7% in February to 2.4% in March*

- ***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 in 2016 was 1.71%*

  *+ Core CPE inflation was up 1.74% in January compared to January 2016*

- 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 2.40% on March 24 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 and currently is preoccupied with presidential nominations*

  *- The failure of the House of Representatives to pass health care legislation complicates consideration of tax reform legislation*

  *- Odds of significant new fiscal stimulus in 2017, both tax reform and infrastructure spending, are declining*

- 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 February 2017 the budget deficit for the prior 12 months is 3.06%*

  *- CBO's revised budget deficit projection for fiscal 2017 is 3.10%; my current estimate is 3.26%, which assumes Congress cuts taxes and increases infrastructure spending*

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

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

   ✓ **Citi global surprise index is up sharply so far in 2017 reaching 42.6 on March 21 (index = 0 when positive and negative surprises are balanced)**

   ✓ **GS's global current activity indicator was 4.1 in February, indicating that global growth is accelerating above the forecast pace of 3.4% for 2017 and the 3.0% actual growth in 2016; the pace of growth for major advanced economies has accelerated from 1.5% last summer to 3.2% in February; the indicator rose from 4.3% in January to 4.7% in February for emerging markets countries**

✓ **J.P Morgan Global Manufacturing PMI for February was the strongest since May 2011; this is corroborated by Markit's Eurozone Manufacturing PMI which is at its strongest level since April 2011**

- ***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.

  *- Global growth forecast has been revised upward to 3.5%*

  *? Global inflation has drifted up due to firming commodities prices; diminishing output gaps should create modest further upside pressure*

- ***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*

  *- European growth forecast has been revised upward to 1.5%*

- ***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 inflation forecast has been boosted to 1.7%*

- ***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.

- ***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*

  *? France's Marine Le Pen of the right wing National Front Party is leading the April 23 presidential election polls with 27%, with the next two candidates commanding 20% each; however, she is likely to lose the second round of voting on May 7; historically, the centrist parties engineer the outcome of the parliamentary elections, which follow the presidential election on June 11 and 18, to shut out candidates of extreme left and right parties – that might not happen this time, thus it is possible that the right will lose the presidential election but win the parliamentary election, producing a stalemate and probable political crisis – Le Pen has promised a referendum on European Union membership*

  *? Germany holds bundestag elections on September 24; while it is assumed that Angela Merkel will prevail, the tides of populism and nationalism and the outcome of the French election could undermine her support; a grand coalition government remains the likely outcome, but could be led by the SPD (Social Democratic) party rather than Merkel's CDU (Christian Democratic Union) party*

*? Italy is not scheduled to hold elections until 2018, however an evolving rift in former prime minister Renzi's party could accelerate elections to this year; popular support for the euro is ebbing*

*? While Greece has faded from the news and appears to be complying, albeit grudgingly, with creditor bailout requirements, the real test will come during the summer when Greece is required to make payments for which bailout funds might be insufficient*

*? The U.K. triggered the two-year withdrawal process from the EU on March 29; EU leaders scheduled 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*

- ***U.K. growth*** is expected to decline to 0.9% in 2017 compared to 2.0% in 2016 as Brexit consequences begin to develop.

  *? Parliament is scheduled to initiate the two-year time frame for U.K. withdrawal from the European Union on March 29; increasingly a "Hard Brexit" outcome appears likely*

  *- Expected 2017 GDP growth has been marked up to 1.4%*

- ***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% in 2016*

  *? The yuan is down 4.4% against the dollar over the last 12 months; however, foreign reserves have dropped below a still very hefty $3 trillion*

  *+ Growth momentum is strong and downside risks have diminished*

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

  *? The 19 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.

  *- Expected 2017 inflation has been marked up to 1.3%*

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

  *? Recent state elections 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*

- ***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 slight decline in value has diminished potential risks to growth*

*? GS's current activity index for emerging markets countries rose from 4.3% in January to 4.7% in February as manufacturing accelerated*

- ***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 1.0%*

  *? Economic conditions continue to deteriorate in Venezuela, but regime change does not appear to be in the offing*

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

   **March Assessment**: No significant positive or negative risks have surfaced so far in 2017

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

     *- Risk not realized*

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

     *+ Through the first 2 months of 2017, employment growth is substantially above the expected level*

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

     *+ The participation rate has risen over the first 2 months of 2017*

   - ***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*

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

     *- Risk not realized*

   - ***U.S. productivity*** remains below 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 faster than expected*

     *- Consumer spending growth is at 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 at 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 starts are above the expected range*

   - ***U.S. residential housing price increases*** are less than expected

     *- Early indications are that housing prices are rising more than expected*

- ***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 appeared to be weaker than expected in January and February; however, the Q1 GDP report will provide clarity*

- ***U.S. manufacturing growth*** contracts or expands more than expected; contraction is the more serious risk

  *+ Manufacturing surveys are stronger than expected*

- ***U.S. trade deficit*** does not widen as expected

  *? One month of data indicates that the trade deficit is stable*

- ***Value of the dollar*** rises substantially and triggers a global dollar squeeze

  *- Risk not realized, the dollar has declined slightly in value so far in 2017*

- ***Oil prices*** rise above or fall below the expected range

  *- Risk not realized*

- ***U.S. monetary policy*** tightens more than 75 basis points, spawns financial market uncertainty and contributes to global financial instability

  *- Risk not realized*

- ***Financial conditions*** tighten and cause financial market volatility

  *- Risk not realized, financial conditions have eased slightly so far in 2017 and are supportive of modestly greater real GDP growth in 2017*

- ***U.S. inflation*** falls or rises more than expected

  *- Risk not realized*

- ***U.S. interest rates*** fall or rise more than expected

  *- Risk not realized*

- ***U.S. fiscal policy*** is more expansionary than expected

  *- Risk not realized; however, the chances that tax reform and infrastructure stimulus will be delayed are rising*

- ***Federal budget deficit*** increases more than expected

  *- Risk not realized; according to CBO the deficit is likely to be a little smaller in 2017*

- ***U.S. state and local spending*** does not rise as fast as expected

- ***Global GDP growth*** does not rise as fast as expected

  *- Risk not realized; growth appears to be accelerating*

- ***Global trade*** declines as the U.S. and other countries pursue protectionist policies

  *- Risk not realized; other than cancelling TPP, the Trump administration has taken no action so far to limit trade*

- ***European growth*** is considerably less than expected

  *- Risk not realized*

- ***ECB's*** quantitative easing program is not successful in raising inflation and stimulating the European economy

*- Risk not realized*

- ***Europe*** – financial market turmoil reemerges

  *- Risk not realized*

- ***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 Euroskeptic sympathies, did not do as well as expected in the Dutch elections on March 15*

- ***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*

- ***China's growth*** slows more than expected

  *- Risk not likely to be realized*

- ***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; the inflation goal of 2% will not be met*

- ***Emerging economies*** – a strong dollar leads to serious difficulties especially for countries with large amounts of dollar-denominated debt.

  *- Risk not realized*

- Severe and, of course, unexpected ***natural disasters*** occur, which negatively impact global growth

- ***New risk*** – North Korea's developing nuclear strike capability and potential for pre-emptive military intervention to neutralize that capability

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