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The Longbrake Letter*

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I. Slow and Steady Growth Or Imminent Recession?

It is the best of times; it is the worst of times. It is a tale of two economies.

If one only listened to the consensus, one would be optimistic, notwithstanding the ugly US presidential contest, that the US economy is moving forward steadily with strong employment, low inflation, and low interest rates. Even the global economy seems to be perking up.

But, a more critical look at recent data and assessment of years of aggressive and market-intrusive monetary policy, not only in the US but in all major developed economies, leads to a much different and more troublesome outlook.

John C. Williams, president of the San Francisco Federal Reserve Bank, summed up the consensus view of slow and steady growth in a speech he gave to the Cha21, 2016.¹

Although it has been a long, hard road back from the recession, the American economy is in good shape and headed in the right direction. We're essentially at full employment, and inflation is well within sight of and on track to reach our target [2 percent]. Given the progress we have made and signs of continued solid momentum in the economy, and consistent with our agreed-upon monetary policy approach, it makes sense for the Fed to gradually move interest rates toward more normal levels.

But not all agree with this rosy assessment of the outlook. Will Denyer, Tan Kai Xian, and Charles Gave of the much respected proprietary investment research company, GavekalResearch, having examined

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

¹John C. Williams. "Assessing the New Normal(s)," San Francisco Federal Reserve Bank, speech delivered to the Federal Home Loan Bank of San Francisco's 2016 Member Conference, San Francisco, California, October 21, 2016.

recent data reports and assessed the buildup of policy-induced imbalances in financial markets and the US economy, assert that the odds of a US recession in the next 12 months are 50 percent.^{2,3,4,5}

Optimists were heartened by the 2.9 percent growth in real GDP in the third quarter. But, a close examination of the details of the third quarter real GDP report leads to a very different conclusion. The US economy has been steadily losing momentum for the past six quarters and deterioration actually accelerated in the third quarter. Reported third quarter real GDP growth was boosted artificially and temporarily by the quirks of the statistical methodology of annualizing quarterly changes in data and by a one-off increase in agricultural exports to South America and by inventories, which are notoriously very volatile from quarter to quarter but add very little to overall GDP growth over the long run. If these one-time events are ignored, real GDP grew 1.4 percent in the third quarter rather than the reported 2.9 percent.

But, it is the six-quarter steady deceleration in “**Private Domestic**” real GDP growth from 3.7 percent in the second quarter of 2015 to 2.3 percent in the third quarter of 2016 that is more troublesome. The steady deterioration is evident in consumer spending growth, which has fallen over these six quarters from 3.4 percent to 2.6 percent — so much for the much vaunted strong labor market and acceleration in wage growth. In fact, growth in total take-home pay is slowing because the average workweek — the number of hours worked per week — is declining. Business investment has also fallen steadily over the past six quarters from 4.7 percent to -0.3 percent. Some, but not all, of this trend is attributable to the collapse in commodity prices. Together, consumer spending and business investment account for 82 percent of economic activity. Most of the remainder of GDP consists of federal and state and local government spending, which is consistently growing at a sub-trend rate of less than 2.0 percent (1.3 percent in the third quarter of 2016).

In addition, Will Denyer cites an employment statistic in the October National Federation of Independent Business’s monthly report that he claims has had strong predictive power in the past. The data point in question is job openings, which fell from 30 in September to 24 in October, the lowest level in the past 15 months. Denyer suggests that this development could well be an early warning signal that demand for labor is “rolling over.”

In previous letters I have discussed the growing imbalances in the global economic and political fabric. Because there is much at stake the established political and financial elite have an enormous vested interest to maintain stability at all costs. To date they have been successful. That success could be threatened at any moment by a triggering event of some kind or the muddle through approach could persist for a while longer.

I am reminded of the Biblical parable of the house built on sand. It was a fine house and served its occupants well. But its foundation was fragile and thus the house was swept away in a violent storm. At the risk of excessive hyperbole, I wonder whether this kind a fate awaits the existing global economic and political systems. I rather think that is not very likely, but I do think significant change is in the offing.

But, let there be no doubt that events such as the British Brexit vote, the rise of Donald Trump, the erosion of Angela Merkel’s political dominance and the collapse of productivity and decline in real economic

²Tan Kai Xian and Will Denyer. “The Rising Odds of a US Recession,” GavekalResearch, October 12, 2016.

³Charles Gave. “Is the Second Shoe About to Drop?” GavekalResearch, October 20, 2016.

⁴Will Denyer and Tan Kai Xian. “The End of the Goldilocks Scenario?” GavekalResearch, October 26, 2016.

⁵Will Denyer. “On the Brink of Recession,” GavekalResearch, October 31, 2016.

growth, are undermining the foundation of the old order.

II. Real GDP — Deterioration in Growth Continues and is Worrisome

According to the “**Advance Estimate**,” real GDP grew 2.9 percent in the third quarter. This was cause for celebration among economists and politicians following dismal quarterly growth of 1.4, 0.8, and 0.9 percent over the three preceding quarters.

But, there should be no celebration — there should be dismay and concern. The internal details of the “**Advance Estimate**” were ugly. Also, what no one seems to want to recognize, at least not publically, is that real GDP growth momentum has been decelerating for the past six quarters.

1. “Advance Estimate” of Third Quarter GDP

Annualized third quarter real “**Total**” GDP growth in the “**Advance Estimate**” was 2.91 percent (blue line with circles in **Chart 1**). Alternative GDP measures, shown in **Table 1** and **Chart 1**, reveal that economic growth was quite a bit weaker than the topline number suggests.

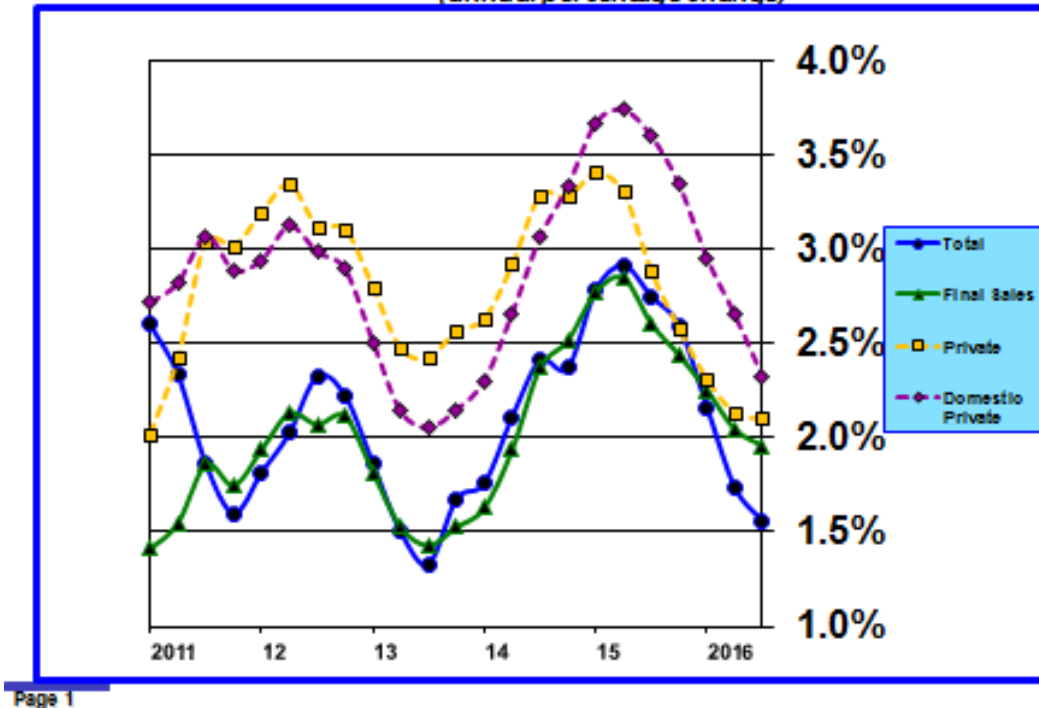
Table 1
Composition of 2016 and 2015 Quarterly GDP Growth

	Third Quarter 2016 Advance Estimate	Third Quarter 2016 Preliminary Estimate	Third Quarter 2016 Final Estimate	Second Quar- ter 2016	First Quar- ter 2016	Fourth Quar- ter 2015
Personal Consumption	1.47%			2.88%	1.11%	1.53%
Private Investment						
Nonresidential	.15%			.12%	-.44%	-.43%
Residential	-.24%			-.31%	.29%	.40%
Inventories	.61%			-1.16%	-.41%	-.36%
Net Exports	.83%			.18%	.01%	-.45%
Exports	1.17%			.21%	-.09%	-.34%
Imports	-.34%			-.03%	.09%	-.11%
Government	.09%			-.30%	.28%	.18%
Total	2.91%			1.41%	.84%	.87%
Final Sales	2.30%			2.57%	1.25%	1.23%
Private	2.21%			2.87%	.97%	1.05%
Private Domestic	1.38%			2.69%	.96%	1.50%

“**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 2.30 percent in the third quarter because inventory restocking added 0.61 percent following

CHART 1 – Real GDP Growth – Alternative Measures

(annual percentage change)



Page 1

on the heels of 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 2.57 percent in the second quarter to 2.30 percent in the third quarter.

"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. Because government activity added 9 basis points to **"Total"** real GDP growth during the third quarter, the decline in annualized **"Private"** GDP growth from 2.87 percent in the second quarter to 2.21 percent in the third quarter was greater than the decline in **"Final Sales."**

"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 has flowed directly from the stronger dollar and is corroborated by the slowdown in industrial production and manufacturing, 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 quarter as net exports inflated **"Total"** GDP by 83 basis points. Netting out the impact of net exports, annualized **"Private Domestic"** GDP plummeted from 2.69 percent in the second quarter

to 1.38 percent in the third quarter.

Thus, when the noise of inventories, government and net exports is swept out of the way, third quarter annualized real GDP is very weak.

There are three important takeaways from **Chart 1**. First, all four measures of real GDP growth peaked in either the first or second quarter of 2015 and have steadily decelerated since then. Second, “**Private**” GDP growth, which omits government spending and inventory accumulation, had been growing more rapidly but has converged with the “**Total**” GDP growth rate in recent quarters. This is due to growth weakening in the private sector rather than strengthening in the government sector. Third, “**Total**” GDP growth has been consistently dragged down by a higher growth rate in net foreign sales. This differential has worsened in the last two years because of strong dollar appreciation that has boosted domestic demand for imports and depressed foreign demand for exports.

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 Compo- nent Weight	Third Quarter 2016	Second Quarter 2016	First Quarter 2016	Fourth Quarter 2015	Third Quarter 2015	Second Quarter 2015
Personal Consumption	69.0%	2.56%	2.70%	2.86%	3.18%	3.42%	3.44%
Private Investment	17.0%						
Nonresidential	13.2%	-.32%	.33%	1.08%	2.07%	3.10%	4.67%
Residential	3.6%	7.68%	10.77%	12.11%	11.70%	9.98%	7.25%
Net Exports	-3.3%	8.16%	17.23%	21.68%	26.83%	26.60%	17.60%
Exports	12.8%	-.55%	-1.14%	-.66%	.11%	1.42%	2.71%
Imports	-16.1%	1.13%	2.21%	3.26%	4.58%	5.48%	5.15%
Government	17.5%	1.28%	1.65%	1.97%	1.79%	1.32%	.78%
Total	100.0%	1.56%	1.74%	2.16%	2.60%	2.75%	2.92%
Final Sales	99.8%	1.96%	2.05%	2.25%	2.44%	2.61%	2.85%
Private	82.3%	2.10%	2.13%	2.31%	2.58%	2.89%	3.31%
Private Domestic	85.7%	2.33%	2.66%	2.96%	3.34%	3.60%	3.74%

Deceleration in economic activity over the past six quarters is evident in all measures of real GDP. The decline in “**Total**” GDP is greater than the decline in “**Final Sales**,” reflecting inventory destocking. 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 1.96 percent in the third quarter may still have room to fall further as the economy approaches full employment.

Growth in personal consumption and nonresidential investment, which collectively contribute 82.2 percent to “**Total**” GDP, has weakened steadily over the past six quarters.

Slowing personal consumption growth seems premature given strong employment gains and small increases in wages in recent quarters, but is not surprising given the downward trend in real disposable income growth from 3.9 percent in the second quarter of 2015 to 2.8 percent in the most recent quarter. In fact, the decline in real personal consumption growth parallels the decrease in real disposable income growth. This means that the much ballyhooed increase in employment in excess of underlying fundamental expansion of the labor force in recent months has not been accompanied by increasing spending growth, which is what should have been expected in a normal cyclical recovery in employment and economic activity. Again, the data paint a troublesome trend.

Weakness in nonresidential investment is particularly worrisome because strong productivity gains in the long run depend on robust investment spending growth. Recent weakness is due in part to the decline in oil prices and the collapse in energy investment, but the declining trend in nonresidential investment is much broader-based than energy.

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 two quarters.

Overall, as the economy verges on full employment, the deceleration in real GDP growth is concerning. This is especially so because of the unparalleled expansionary monetary policy that has propped up asset prices and contributed to a substantial increase in wealth.

Rising wealth boosts personal consumption spending. Over the last 12 months, rising wealth contributed approximately 42 percent of the growth in real consumer spending — 34 percent from rising stock prices and 8 percent from rising home prices in recent years. Obviously, a decline in stock prices would have a negative impact but not an immediate impact because the wealth effect feeds into consumer spending over a considerable period of time. Based upon my econometric model, a 10 percent instantaneous decline in stocks prices that remains in place for the next 24 months would reduce real consumer spending by 23 percent over the next 12 months and an additional 10 percent in the next 12 months — the average decline in consumer spending over two years would be 17 percent. Thus, if real growth in real consumer spending is 2.56 percent, the year-over-year growth rate in the third quarter of 2016, the growth rate over the next 12 months would be 1.98 percent and 2.30 percent over the following 12 months — the average for 24 months would be 2.13 percent.

And, none of this factors in the impact of probable slowing employment growth. Thus, in spite of sunny prognostications by many forecasters, downside risks to real GDP growth in a maturing economy in the face likely monetary policy tightening are much greater than commonly acknowledged.

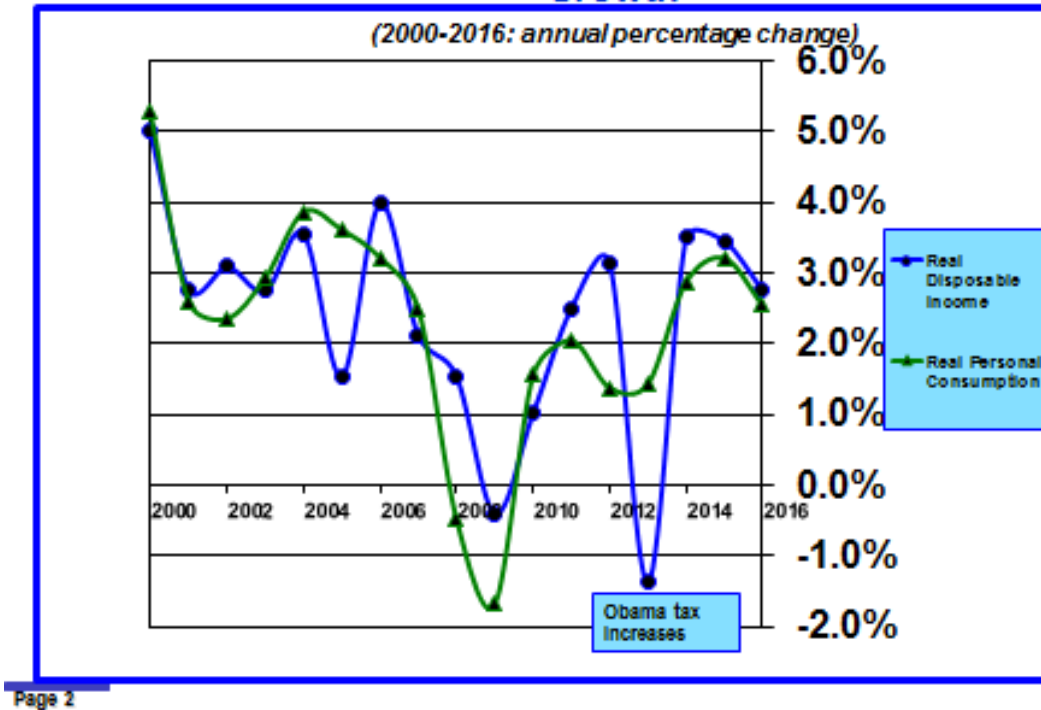
2. Consumption

Personal consumption contributed 1.47 percent to third quarter real GDP growth compared to 2.88 percent in the second quarter. The year-over-year growth rate decelerated from 2.70 to 2.56 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. Slow growth in employment and in wage rates will result in slow growth in disposable income. As can be seen in **Chart 2**, over the last year and a half growth in both real disposable income and personal consumption has slowed slightly. This pattern is reflective of a gradual subsidence in the overall rate of economic growth and mirrors the pattern of slowing real GDP growth shown in **Chart 1**.

CHART 2 – Real Disposable Income and Consumption Growth



Other indicators are sending a similar message of a gradual deceleration in consumer spending growth. Car sales have been softer, although there was a good bounce in September sales. A parallel development is a slowdown in state retail sales tax receipts over the last year, which are sensitive to fluctuations in purchases of durables such as autos.

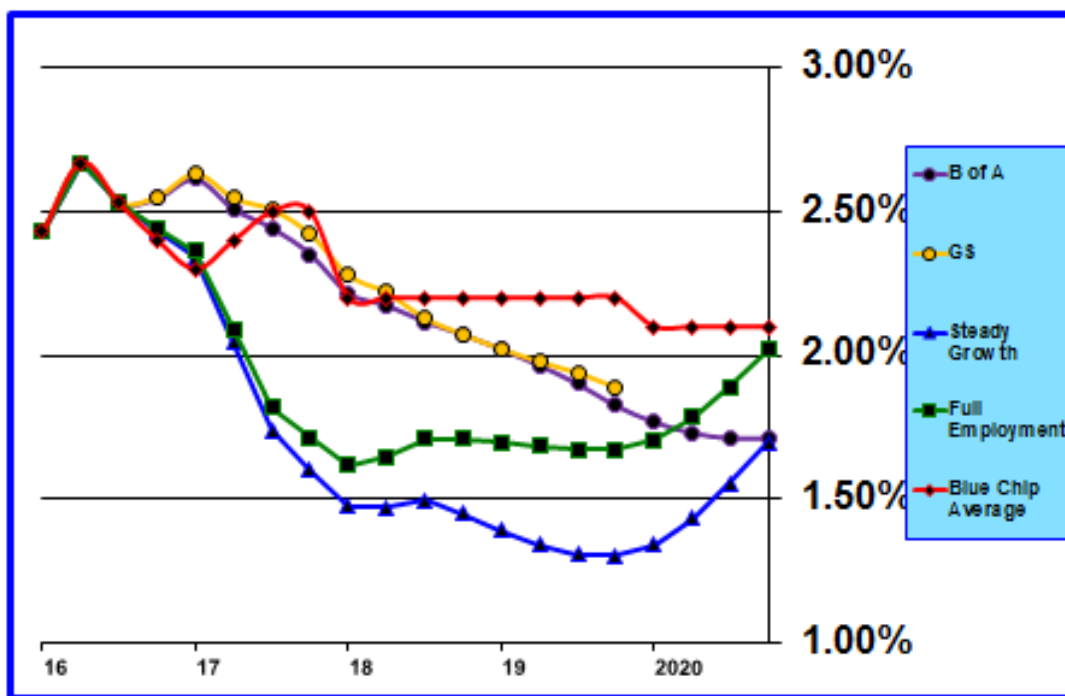
Forecasts of growth in real consumer spending are shown in **Table 3** and **Chart 3**. With nine months of data reported, forecast growth for 2016 has converged to a narrow range of 2.5 to 2.7 percent. Slow third quarter growth argues in favor of the lower end of that range.

However, what is really important to explain in **Table 3** and **Chart 3** is the large divergence in 2017, 2018, and 2019 between consensus forecasts for real consumer spending growth and those that fall out of my “**Slow Growth**” and “**Full Employment**” scenarios. With the exception of Economy.com, which seems perennially overly optimistic, other forecasters expect the real rate of consumer spending growth to moderate in coming years. There is a logical reason for this expectation. Consumer spending growth depends primarily on consumer disposable income growth and the two most important determinants of consumer disposable income growth are growth in total hours worked and growth in hourly wage rates.

Table 3
Real Personal Consumption Growth Rate Forecasts

	2012	2013	2014	2015	2016	2017	2018	2019
Actual	1.38	1.43	2.88	3.21				
B of A					2.54	2.35	2.07	1.82
GS					2.55	2.42	2.07	1.89
Global Insight					2.70	2.50	2.30	2.50
Economy.com					2.70	3.20	3.10	
Blue Chip Average					2.60	2.50	2.20	2.20
Bill's Slow Growth					2.43	1.60	1.45	1.30
Bill's Full Employment					2.44	1.71	1.71	1.67

CHART 3 – Real Consumer Spending Forecasts
(annual rate of change)



Page 3

GS cites several other reasons why consumer spending growth should slow over the next three years. First, growth in capital-related income accounts, which include income from individual proprietorships, rental properties and interest and dividends, have slowed and that is likely to continue because of slow growth in profits and low interest rates. Second, the benefit from the plunge in oil prices has passed. In addition, real disposable income available for spending will be squeezed increasingly by rising rents and medical care premiums. Third, borrowing is likely to become more difficult as financial institutions begin to tighten credit standards, particularly for auto loans and credit card debt. Credit availability for home mortgages never eased much following the housing bubble. Fourth, pent-up demand for consumer durables, such as autos, has largely been satisfied. Indeed, purchases may already be above the long-term trend level

due to easy credit.

My forecasts, shown in the “**Slow Growth**” and “**Full Employment**” scenarios, indicate even greater slowing in consumer spending in the next three years. To a certain extent this is the result of assumptions published by **CBO** in August, which I incorporate into my “**Slow Growth**” scenario. **CBO** projects payroll employment to fall to 10,000 monthly from this year’s monthly average of 178,000 over the next two years. In addition, because the average length of the workweek has been contracting recently, it is quite possible that growth in total hours worked in two years’ time will be zero or negative. Doing the math, either it would take an astronomical acceleration in hourly wage growth or a collapse in the saving rate to forestall a more rapid deceleration in consumption growth.

There is another possibility, of course, and that is that **CBO**’s forecast collapse in employment growth is spurious. The reason my estimate of real consumer spending growth is so slow is because my “**Slow Growth**” scenario is built using many of **CBO**’s basic economic projections. So, if my projections of consumption spending growth appear to be overly pessimistic, it is primarily because I relied on **CBO**’s basic economic assumptions.

Over the longer run growth in real consumer spending follows growth in employment and growth in real wages. Now that the economy is very close to 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.

In summary, because it is likely that employment growth will slow in coming months and because the cyclical components of consumer spending are deteriorating, the contribution of consumer spending to real GDP growth is likely to decline. In combination with weakening growth in trade and investment, this does not bode well for robust real GDP growth in coming quarters.

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.

Nonresidential investment (business) growth was crushed in 2015 by the collapse in oil prices. Energy investment has continued to decline in 2016, but investment is down in other sectors as well. As a result, most forecasters now expect nonresidential investment growth will be less than 1 percent in 2016, followed by a recovery in 2017 and 2018 to a level slightly above average trend growth of 2.35 percent over the last 17 years. Optimism about investment growth, about which I have been consistently skeptical, has faded to a considerable degree. Slower growth in manufacturing is a contributing factor.

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

	2012	2013	2014	2015	2016	2017	2018	Ave. 1947-2016
REAL PRIVATE INVESTMENT								
Actual	9.78	5.02	5.54	3.90				3.71
B of A					0.55	2.14	2.90	
GS					0.53	3.24	4.10	
Bill's Slow Growth					0.32	1.26	2.17	
Bill's Full Employment					0.50	2.31	3.03	
REAL NONRESIDENTIAL INVESTMENT								
Actual	8.98	3.50	6.04	2.07				2.35*
B of A					-0.39	2.19	2.77	
GS					-0.49	2.80	3.48	
REAL RESIDENTIAL INVESTMENT								
Actual	13.51	11.88	3.49	11.70				-0.41*
B of A				4.24	1.94	3.41		
GS					4.49	4.88	6.33	

*Average 1999-2016; real private investment = 1.44% for 1999-2016

B of A has developed a model that explains business investment growth which can be used to produce forecasts. The model is driven by three variables — corporate profits (National Income Accounts data with adjustments), credit conditions (Baa-Aaa corporate bond spread), and policy uncertainty. Based on its model, **B of A** concludes that business investment is similar in this expansion cycle to previous ones. In other words, the shift in the composition of economic activity toward services and software and away from manufacturing and mining (oil exploration) has not had any meaningful impact on business investment activity.

B of A is optimistic about the outlook for business investment to accelerate because it expects those three drivers to improve. Some skepticism is in order. First, credit spreads have improved a bit, but this may be the result of the “search for yield” and thus may prove temporary if interest rates rise. Second, policy uncertainty in the run up to the election has increased. Third, oil prices bounced upward after crashing at the beginning of the year, but appear to have stabilized in the vicinity of \$50 per barrel. New oil and gas rigs have edged up a little, but remain well below the level that prevailed when oil average over \$100 per barrel. Fourth and most importantly, an expected recovery in corporate profits is based on better energy company profits due to higher oil prices in recent months. However, profit pressures appear to be building in other industries because nominal sales growth is weak and wages have begun to edge up a little.

But a more important potential weakness in **B of A**'s business investment model is possible cumulative negative effects over time of low interest rates and depressed innovation, as reflected in a slower rate of new business formation.

GS believes that about 50 percent of the non-energy investment spending slowdown has been caused by the collapse in commodity prices and stronger dollar. If this is true, then stabilization in commodity prices and the dollar should contribute to a recovery in investment spending. **GS** adds that somewhat tighter

credit conditions due to increased uncertainty about the outlook could also be a contributing factor. That seems less likely to abate because the economic cycle looks increasingly mature and regulators have become increasingly nervous about credit quality. Based on its analysis, **GS** expected third quarter nonresidential investment to rise at a 2.5 percent annual rate. It rose less than half that amount. **GS** expects investment spending to rise about 3 percent in 2017. Given the emerging regulatory environment, low operating rate of 75.4 percent and the slowdown in consumer spending on durables, **GS's** outlook for investment spending in both 2017 and 2018 seems optimistic.

I expect annual business investment growth in coming years to average about the same or a little less than the 2.35 percent annual growth rate that has prevailed since 1999. Growth could be slower in the near term as we approach the end of the cycle.

Residential investment growth was very strong in 2015. Growth in 2016 promises to be considerably slower, although still respectable. 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.

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 are running at about a 1.15 million rate in 2016 and are expected to rise only modestly in 2017, still considerably below 1.4 million. Starts fell to an annual rate of 1.047 million in September due to a substantial decline in multi-family starts. This may turn out to be a one-month anomaly, although increased regulatory scrutiny of underwriting standards may be partially responsible.

4. Inventories

Inventories subtracted 1.2 percent from “**Total**” GDP growth in the second quarter and added 0.6 percent in the third quarter. As can be seen in **Table 5**, real inventory accumulation was \$114.4 billion in the first quarter of 2015, \$93.8 billion in the second quarter of 2015, \$70.9 billion in the third quarter of 2015, \$56.9 billion in the fourth quarter of 2015, \$40.7 billion in the first quarter of 2016, actually declined -\$9.5 billion in the second quarter of 2016, and then added \$12.6 billion in the third quarter. Slowing growth in inventory accumulation subtracts from “**Total**” GDP growth — 116 basis points in the second quarter, while expanding growth adds to “**Total**” GDP — 61 basis points in the third quarter.

Inventories generally add between 0.1 and 0.2 percent to annual real GDP growth. Based on the historical record, both Q2 and Q3 inventory data were anomalous. The 1.2 percent decline due to inventory de-accumulation in the second quarter painted a weaker picture and the 0.6 percent increase due to inventory accumulation in the third quarter a stronger picture of “**Total**” GDP growth than long-term trends warrant.

Commentary following the second quarter real GDP report generally concluded that recent inventory destocking has been overdone and that restocking must occur and this will boost “**Total**” GDP growth in coming quarters. This view is not necessarily analytically sound. **B of A** commented:

“The pendulum swung to the extreme and the economy is now left with a dearth of inventory. In prior

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 Q3	12.6					
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

episodes when the change in private inventories has turned negative, there has been a restocking within two quarters.”

Negative inventory accumulation is unusual and generally occurs only during a recession. But, it does not follow necessarily that negative inventory accumulation in a non-recessionary economy automatically results in a “*dearth of inventory.*” It is entirely possible that the overall stock of inventories is still too high. I’ll come back to this observation in a moment.

As can be seen in **Table 5**, initial inventory data are crude estimates and are subject to substantial revision over the next three years. This means that the 12.6 billion inventory third quarter estimate will be revised at least five 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

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.

Year-over-year growth rates give a much better sense of trends but they do not eliminate entirely the potential for oscillations in inventories to skew the observed trend up or down from the underlying unobservable “true” trend. For example, year-over-year growth in “**Total**” GDP peaked at 2.92 percent in the second quarter of 2015 and has since declined to 1.56 percent in the third quarter of 2016. Year-over-year growth in “**Final Sales**” also peaked in the second quarter of 2015 at 2.85 percent but has declined less since then to 1.96 percent in the third quarter of 2016 — a total of 89 basis points versus 136 basis points. Both measures indicate GDP growth is decelerating, but without knowing what the “normal trend” contribution of inventories is to GDP, it is unclear whether the level of GDP and GDP growth are too high, which would be the case if inventories remain above the “normal trend” level, or whether the reverse is the case, which would be the case if inventory liquidation has taken inventories below the “normal trend” level.

So, we still are left with the question of whether underlying GDP growth is 1.96 percent, 1.56 percent, or some other number.

And it’s actually even more complicated. While over an entire cycle inventories grow at approximately the same rate as GDP, inventories increase faster during the expansion phase of the cycle and fall quicker during the contraction phase.

To shed some light on the question of whether inventories are too high or too low requires discerning what the normal trend in inventories is and also determining what phase the inventory cycle is in. Armed with this knowledge we can estimate whether accumulation of inventories over time is above or below trend. That knowledge, in turn, should provide some insight as to whether inventories currently are too high or too low and this analysis will illumine whether the observed growth rate of “**Total**” GDP is too high, too low, or about right relative to the unobserved “true” trend growth rate.

Data for inventories were not reported separately in the National Income Accounts until 1999. From 1999 through the third quarter of 2016 “**Total**” GDP grew at an annual rate of 1.7326 percent and “**Final Sales**” grew at an annual rate of 1.7337 percent. This means that inventories grew only slightly slower than the rest of GDP — approximately 1.2325 percent. A slower growth rate in inventories is reasonable because of steady improvements inventory management.

Without going into the details of the math, inventories should have contributed \$36.3 billion to “**Total**” GDP in the third quarter of 2016. The actual contribution of inventories was \$12.6 billion, which means that inventory accumulation was \$23.7 billion below its trend level in the third quarter. But, by itself, this still does not answer the question of whether the overall stock of inventories was too high or too low in the third quarter.

We can gain a little more insight by looking at the past several quarters. In 12 of the past 14 quarters (the period covered in **Table 5**), inventory accumulation exceeded the trend level. During this 14-quarter period, \$875.6 billion was added to inventories, but a “normal” trend amount would have been only \$497.9 billion, meaning that an excess buildup of \$377.7 billion remains. This probably overstates the excess amount since we are still in the expansion phase of the business cycle when inventories typically accumulate at an above trend rate. But, even so, this rate of inventory accumulation is an average of \$27 billion per quarter, or 74 percent, above the “normal” trend level.

For comparative purposes, a similar 13-quarter cyclical expansionary period occurred from the first quarter of 2004 to the first quarter of 2007. During that period inventory accumulation was \$848.8 billion compared to “normal” trend accumulation of \$412.4 billion, for an excess of \$436.4 billion, or an average excess of approximately \$34 billion quarterly. In this context, recent excess inventory accumulation looks reasonable.

Putting this all together, if you are an optimist, inventory accumulation should return to its trend level of about \$36 billion per quarter. If you are a pessimist, the current expansion is getting a bit long in the tooth, which is to say that GDP growth will decelerate in coming quarters as employment growth and consumer spending slow. If that were to occur, inventory accumulation would probably stay at a below trend level in coming quarters.

B of A observed that the inventory-to-sales ratio is elevated, but the increase in this ratio is dominated by just two sectors — machinery and autos. Generally, an elevated ratio needs to be more broad-based than just two sectors to be a worrisome warning of impending recession.

5. Net Exports

In the “**Advance Estimate**” net exports contributed an outsized 0.83 percent to third quarter real GDP growth (see **Table 1**). This was an anomalous and one-time blip due primarily to a temporary rise in food exports in response to a weak soybean harvest in South America. Growth in exports, which adds to real GDP, was 1.17 percent and growth in imports, which subtracts from real GDP was -0.34 percent. The takeaway is that third quarter real GDP was unrealistically inflated and there is a high probability that the contribution of net exports will be negative in the fourth quarter as this one-time event statistically falls out of the quarterly growth calculation.

Net exports is the difference between exports and imports and when reported as a net number obscures underlying trends in exports and imports. Over the long run, both exports and imports should rise in tandem with overall growth in the economy. But, in the short run growth rates can vary. The biggest factor influencing short-term growth rates is the trade-weighted exchange value of the dollar. When the dollar is rising in value, as it did from April 2011 through January 2016 — a period during which the dollar’s value rose 37.1 percent, exports become less competitive and growth will slow or even turn negative. Correspondingly, imports become less expensive and they grow faster as cheaper imports are substituted for domestically produced goods and services.

This phenomenon can be seen in the year-over-year growth in exports from 10.0 percent in the second quarter of 2011, when the dollar’s value troughed, to -0.6 percent in the third quarter of 2016 (**Table**

2 shows the trends for the last six quarters). The reverse trend did not occur in imports, as would be expected all else equal. Year-over-year growth in imports was 10.8 percent in the second quarter of 2011 to 1.13 percent in the third quarter of 2016. All else was not equal as growth in imports was depressed by the substantial decline in commodity prices. The declining growth rate in imports over the last six quarters can be seen in **Table 2**.

Part of the slowing growth in imports is also due to a world-wide decline in trade. The decline in global trade does not appear to be a temporary phenomenon. The declining trend is traceable at least in part to technological advances and the related shift in economic activity toward knowledge-based services, which generally are located near the point of consumption. The decline in trade is not limited to the U.S.; it is a global phenomenon.

Since the trade-weighted value of the dollar peaked in January, it fell 5.8 percent through April but has since strengthened and was down only 2.6 percent on October 28 from its January high. The good news is that the downward pressure on exports will slowly dissipate over time, provided that the dollar's value remains relatively stable. The bad news is that there is some remaining downward pressure in the short-term due to time lags. The further bad news is that the waning benefit of lower energy prices on imports should slow and probably reverse the trend growth rate in imports. When these two trends are combined they imply that the contribution of net exports to real GDP growth in coming quarters should be slightly negative, which is a far cry from the 0.83 percent contribution of net exports to third quarter real GDP growth.

6. Government Investment

Government investment added 0.09 percent to third quarter real GDP growth. Federal government spending added 0.17 percent and state and local spending deducted 0.08 percent (see **Table 1**).

Government spending ceased to be a negative factor for real GDP growth in 2015 as it had been since 2010. And, while the third quarter “**Advance Estimate**” indicates a small increase in government spending, government spending is only up about 13 basis points over the first nine months of 2016. State and local spending may well be feeling the effects of a slowdown in sales tax revenues.

Table 6 shows recent growth rates in government spending and forecasts for 2016-2019. Going forward, federal spending will not increase much as long as the Budget Control Act remains in effect. However, both Democratic and Republican presidential candidates are talking about increasing federal spending on education and infrastructure. Thus, it is increasingly possible that government spending, at least at the federal level, might grow a little faster in a year or so. That outcome is reflected in the **GS** forecasts for 2018 and 2019.

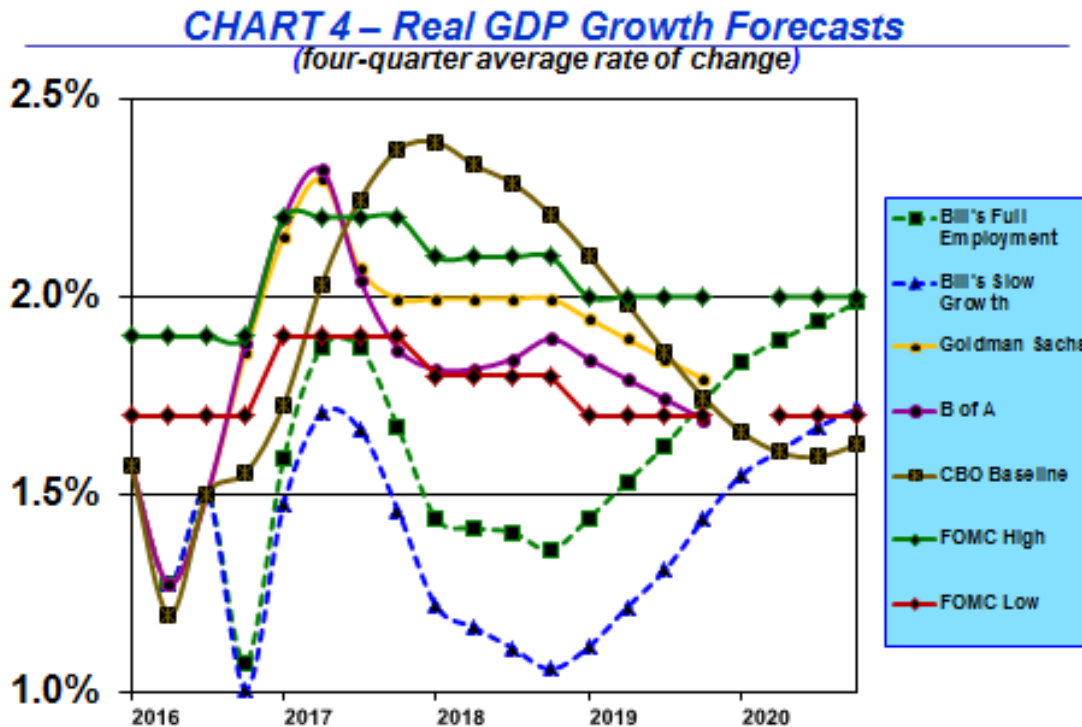
7. Fourth Quarter 2016 and Longer-Term Real GDP Forecasts

B of A is forecasting 2.4 percent fourth quarter growth. **GS** currently is projecting 2.3 percent.

Chart 4 and **Table 7** show quarterly real GDP growth projections from 2016 to 2020. With the exception of **CBO**'s forecast and my forecasts, other forecasts for the next four years are tightly clustered.

Table 6
Forecast Growth Rates of Federal and State and Local Investment Spending

	2012	2013	2014	2015	2016	2017	2018	2019
Federal	-1.86	-5.82	-2.54	0.00				
State and Local	-1.87	-0.81	0.23	2.92				
Total Government	-1.86	-2.86	-0.86	1.79				
GS Federal					0.68	0.38	1.04	1.14
GS State and Local					0.94	1.48	2.49	2.33
GS Total					0.84	1.06	1.93	1.88
B of A Total					0.79	0.34		
Slow Growth					0.83	0.85	1.10	1.03
Full Employment					0.85	1.02	1.31	1.31



Page 4

My “**Slow Growth**” scenario is on the pessimistic end of the spectrum because it is based upon **CBO**’s collapse in employment growth in 2018 and 2019. **CBO**’s forecasts for 2017 and 2018 are at the optimistic end of the range, which is entirely inconsistent with its assumption about slow employment growth during that period of time. All other forecasts fall within the **FOMC**’s high and low estimates throughout the 2017-2019 periods. Besides the low employment growth embedded in my “**Slow Growth**” scenario, real GDP growth in that scenario and also in my “**Full Employment**” 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

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					
B of A				1.56	2.11	1.84	1.77	1.69
GS				1.55	2.13	1.99	1.87	1.75
Global Insight				1.40	2.20	2.20	2.20	2.10
Economy.com				1.60	2.90	2.70		
Blue Chip Average				1.50	2.20	2.10	2.10	2.10
CBO				1.55	2.37	2.21	1.75	1.63
FOMC High*				1.90	2.20	2.10	2.00	
FOMC Low*				1.70	1.90	1.80	1.70	
Bill's Slow Growth				1.56	1.58	1.14	1.27	1.64
Bill's Full Employment				1.56	1.75	1.40	1.58	1.91

*Q4 to Q4 — FOMC year-over-year 2016 equivalent is a range of 1.51 to 1.56 percent, which is in line with other 2016 forecasts

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.

III. U.S. Employment Developments

As the labor market approaches full employment there is increasing evidence that employment growth is slowing. September's payroll employment gains were 156,000, bringing this year's monthly average down to a still above trend level of 178,000. However, as the economy nears full employment, 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. John Williams, president of the San Francisco Federal Reserve Bank in a recent speech pegged the monthly number at 80,000 with a range of 50,000 to 100,000, depending upon potential labor force trends and participation.

Job growth has already begun to slow. Monthly employment growth has averaged 178,000 so far in 2016 compared to 229,000 in 2015 and 251,000 in 2014. Slowing employment growth is reasonable and not worrisome because, while a small amount of slack remains in the labor market, the market is clearly very close to full employment based on many traditional measures.

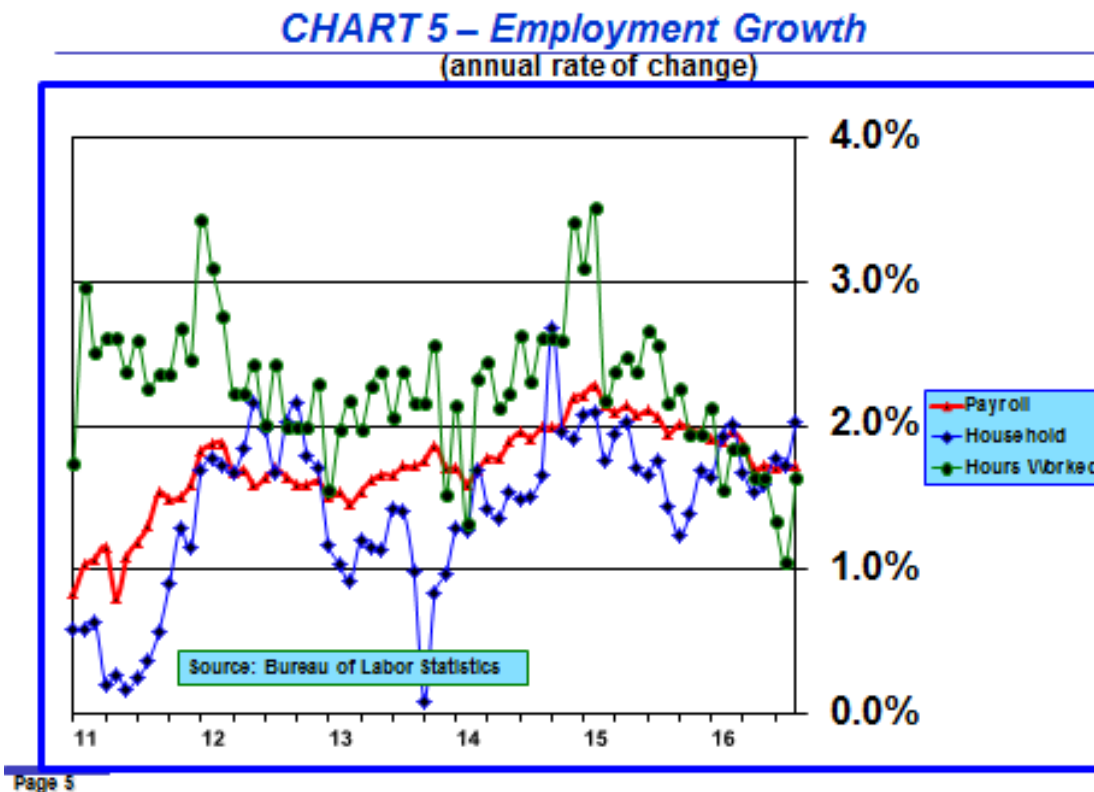
1. Employment Growth

The trend in the 12-month rate of growth in payroll employment is slowing gradually, down to 1.72 percent in September compared to 1.95 percent in 2015 and the peak rate of annual growth of 2.14 percent in March 2015.

Household employment rose 354,000 in September after rising only 97,000 in August. Household employment growth has averaged 227,000 monthly over the first nine months of 2016. Monthly estimates of household employment growth are very volatile so a better sense of trend can be gained by looking at average monthly changes in household employment over longer time periods. Over the past 12 months, monthly household employment growth has averaged 252,000 compared to 204,000 for payroll employment. Household employment has grown 2.03 percent while payroll employment has grown 1.72 percent.

But, growth in total hours worked by all employees has been slowing more rapidly than growth in numbers of employees as the average length of the work week has shortened. The 12-month growth rate in total hours worked by all employees in September was 1.63 percent compared to 2.16 percent a year ago.

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 growth. This is indicative of a maturing labor market that is at or near full employment.

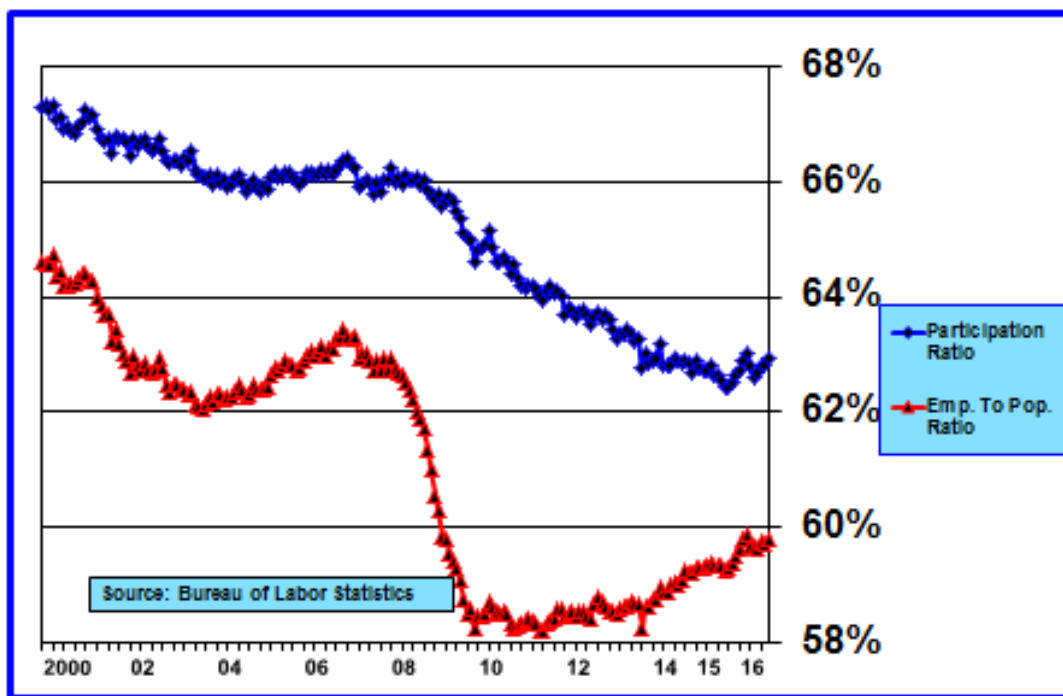


Generally, in the early stages of recovery employers increase the length of the work week of existing workers before hiring new ones resulting in total hours worked growing faster than the other two labor growth measures. This pattern reverses when economic activity weakens — employers cut hours before firing workers. Because monthly employment data are subject to large sampling error, the recent deceleration in total hours worked is only suggestive of the advent of a weakening employment market. Data over the remainder of the year will help establish whether this apparent developing trend is an artifact of data estimation methodology or is signaling the advent of weaker economic activity. The rebound in total hours worked in September underscores the importance of viewing several months' data.

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.

CHART 6 – Labor-Force-Participation and Eligible-Employment-to-Population Ratios (U-3 Measure)



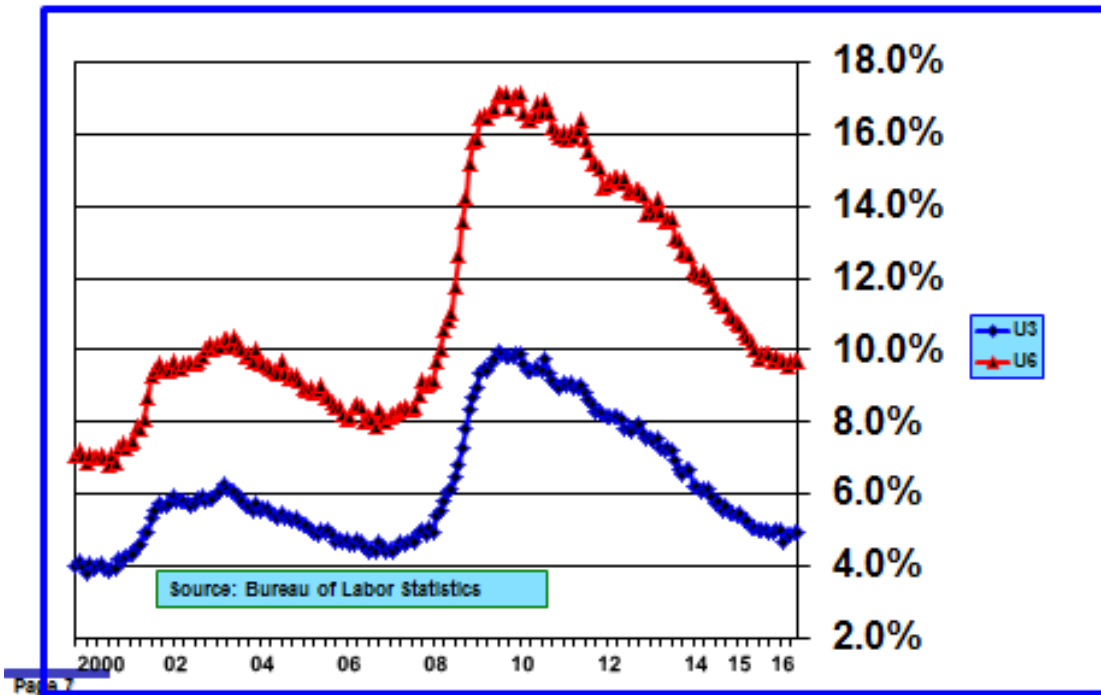
Page 6

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 0.2 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 62.42 percent in September 2015 to 62.93 percent in September 2016 is suggestive evidence that some discouraged workers have reentered the labor market in the last few months.

3. Measures of Unemployment Reflect a Labor Market With a Modest Amount of Slack

As can be seen in **Chart 7**, the U-3 unemployment rate has fallen to 4.96 percent and nearly matches the level attained prior to the Great Recession. The September U-3 unemployment rate was slightly above CBO's recently revised full employment (NAIRU) estimate of 4.74 percent.

CHART 7 – U-3 and U-6 Unemployment Rates



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 9.69 percent but, as can be seen in **Chart 8**, is 0.7 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 has fallen 0.31 percent over the last 12 months compared to a 0.09 percent decline in the U-3 measure, which underscores an improving labor market. Both unemployment measures reflect a tightening labor market with a modest amount of remaining slack.

Long-term and short-term unemployment rates are also indicators of labor market tightness and are shown in **Chart 9**. The short-term unemployment 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 1.23 percent in September. It is still about 0.4 percent above the low level reached in 2006 just prior to the onset of the Great Recession.

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

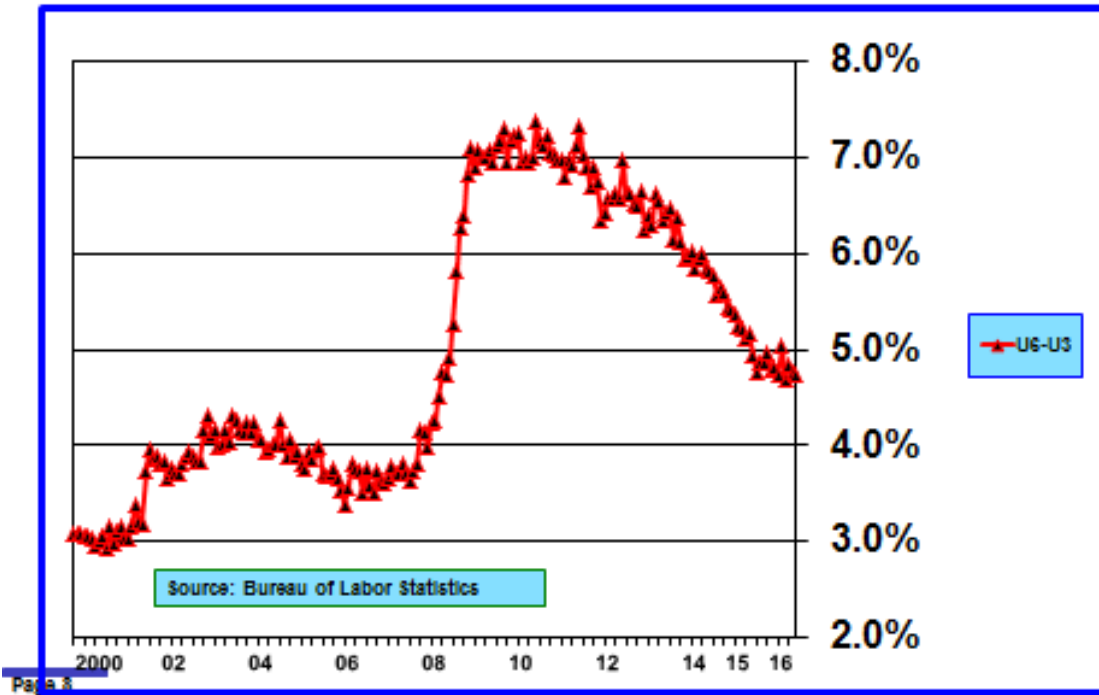
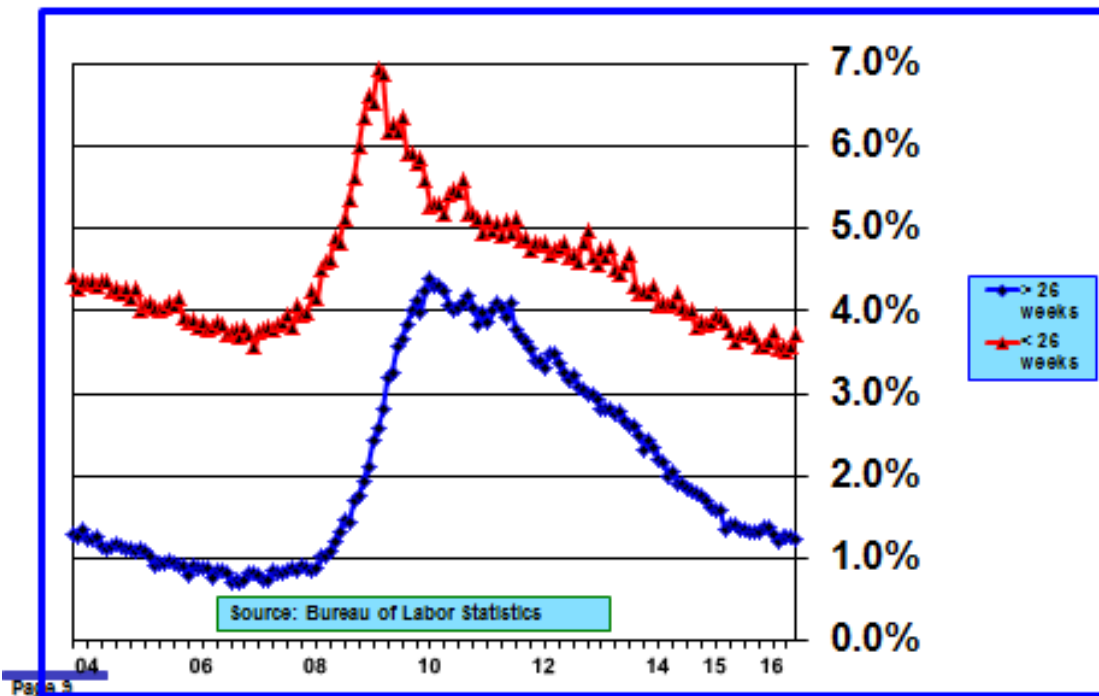


CHART 9 – LT (>26 weeks) and ST (<26 weeks) Unemployment Rates

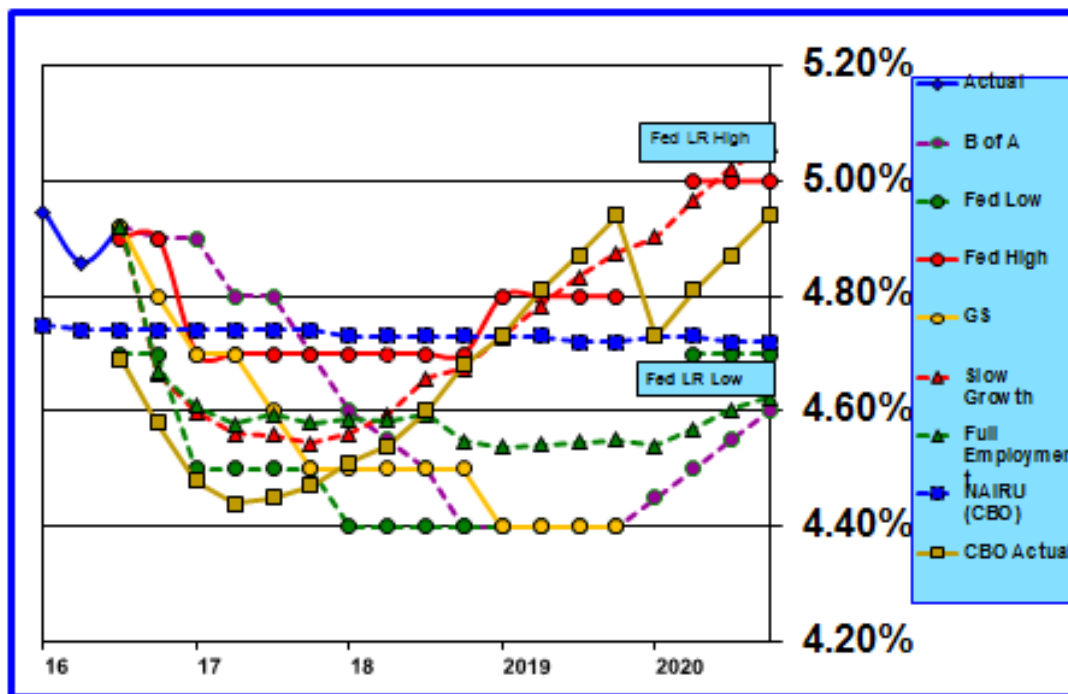


4. Forecasts of the U-3 Unemployment Rate

Forecasters expect the labor market to continue to tighten. The U-3 unemployment rate is only slightly above **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 will drive wages higher. This is also a favorable development because it will increase worker spending power. 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 will worry about tweaking 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 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.

Chart 10 shows U-3 unemployment rate forecasts for **B of A**, **GS**, and **FOMC** high and low range, and my “**Slow Growth**” and “**Full Employment**” scenarios. **CBO's** estimate of NAIRU is also shown in **Chart 10**. (**CBO** lowered its estimate of the NAIRU unemployment rate 10 basis points in its August 2016 revisions of economic assumptions.)

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



Page 10

Most forecasts project that the unemployment rate will fall 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 4.4 percent by 2018. My “**Slow Growth**” scenario tracks 10 to 20 basis points above **CBO's** NAIRU estimate and

the upper end of the **FOMC**'s projection range.

Notice that **CBO**'s estimate of the actual unemployment rate falls faster than **B of A** and **GS** forecasts over the next few quarters, but then reverses course in about a year's time and converges with my "**Slow Growth**" scenario estimate by late 2019.

5. Accelerating Wage Growth Is Finally Discernible

As the labor market approaches 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. But acceleration in wage growth to date, although now visible, has been weaker than experience suggests should be the case.

For quite some time FOMC members have been expecting the rate of growth in wages to pick up and boost inflation. Although slow to develop, evidence is finally emerging that wage growth is accelerating.

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.

a. BLS-Compiled Wage Measures — Employment Situation Report

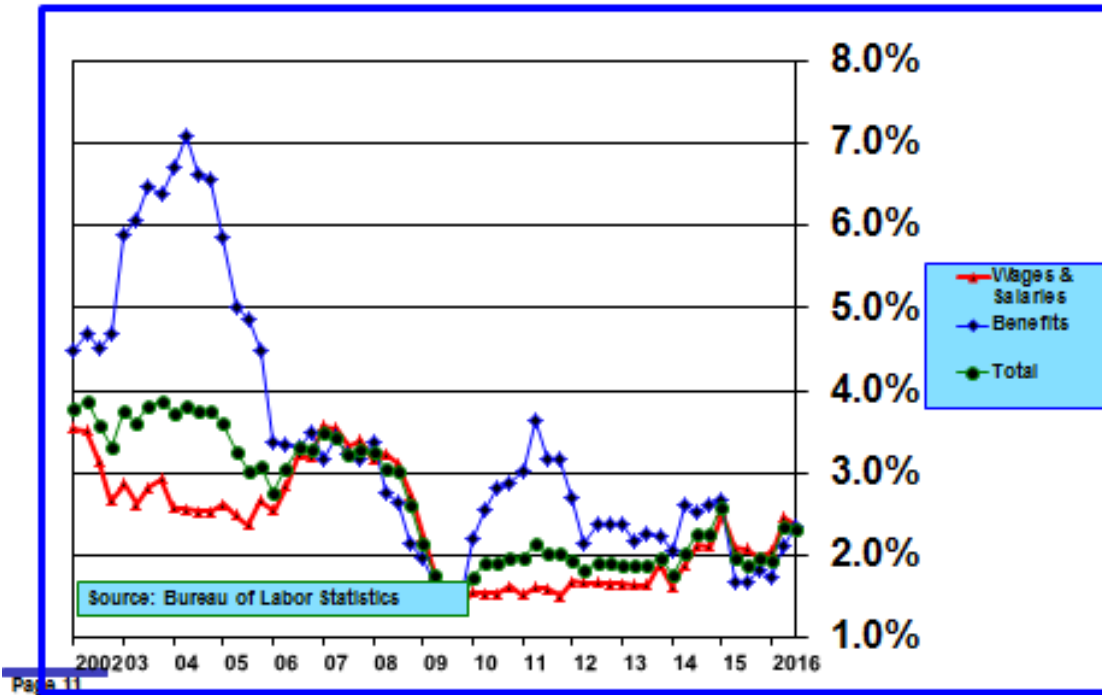
There are three primary broad-based measures of labor compensation that provide information about compensation trends. All are compiled by the Bureau of Labor Statistics (BLS). One is released monthly as part of the monthly labor situation report and includes both hourly and weekly wage rates for all 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.

Looking at **Chart 11**, although there is a slight upward movement in both the wages and salaries and benefits sub-components of ECI, there is really no significant change in the total index over the past five years. Analysts were expecting third quarter ECI data to ratify the slight upward trend in compensation growth reflected in other measures (see **Chart 12**). Instead the year-over-year growth rate in total compensation was unchanged at 2.33 percent compared to 2.34 percent in the second quarter. The salaries and wages sub-component actually declined slightly from 2.45 percent in the second quarter to 2.36 percent in the third 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. Since 2014 all three have moved in a tight band between 2.0 and 2.5 percent.

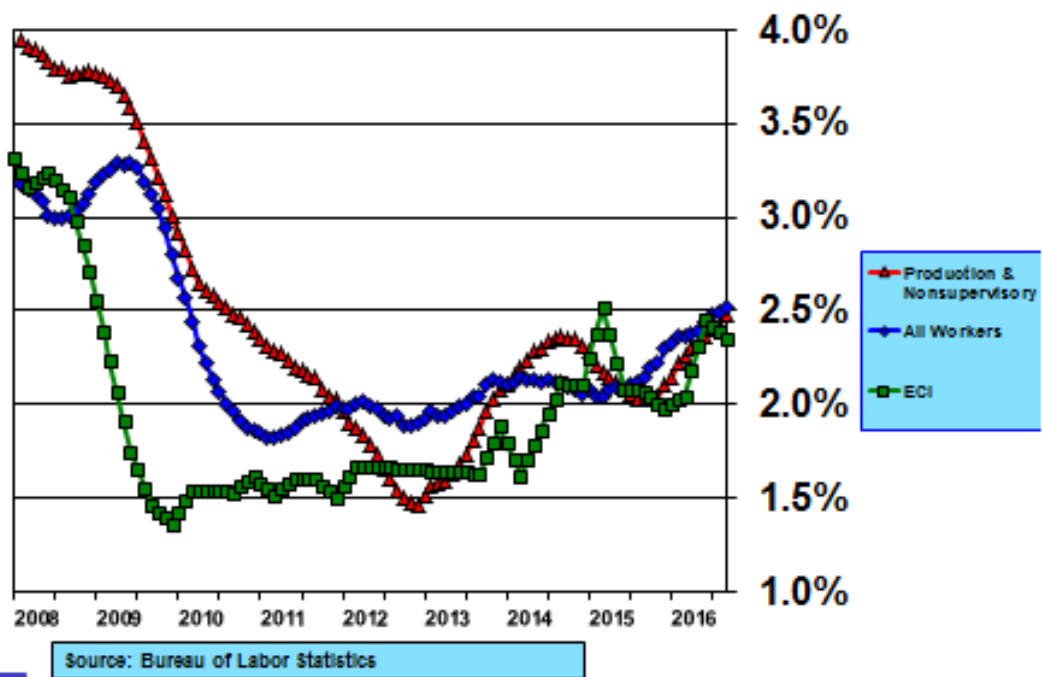
Although these measures are highly correlated over time, because compilation methodologies differ for each set of measures percentage changes over fixed time periods will not necessarily be in sync. This is the

CHART 11 – Employment Cost Index
(annual rate of change)



Page 11

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



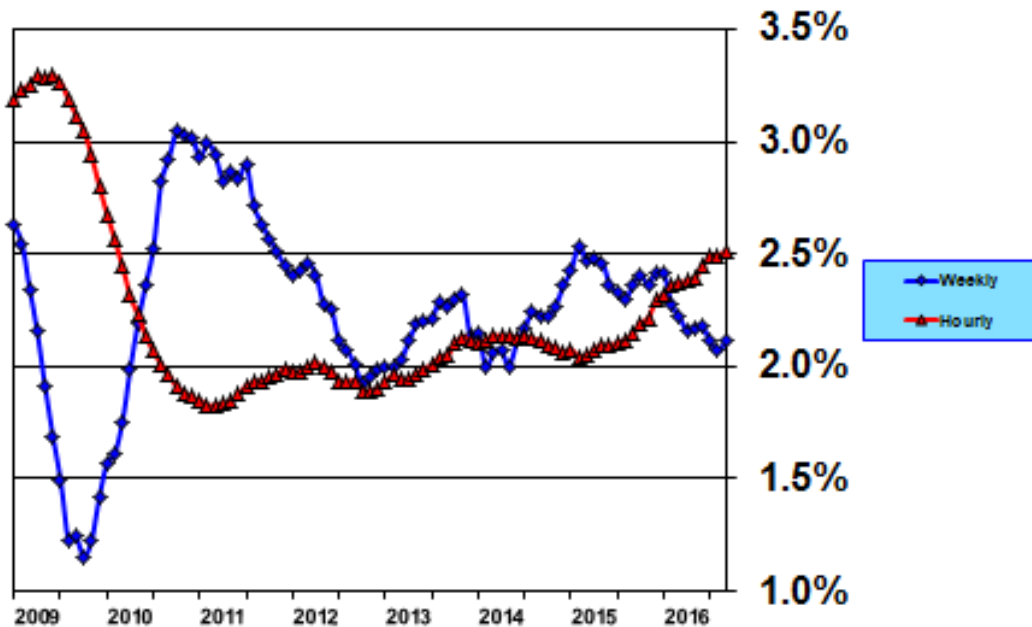
Page 12

case currently. Average hourly wages (12-month moving average) of all employees are rising 2.51 percent annually currently compared to 2.15 percent a year ago. Average hourly wages (12-month moving average) of production and nonsupervisory workers are rising 2.47 percent annually compared to 2.02 percent a year ago. However, growth in ECI is little changed over the past two years and was 2.36 percent in September.

b. Weekly Versus Hourly Wage-Rate Growth

But perhaps 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, growth in weekly wages for all employees has fallen from 2.37 percent a year ago to 2.11 percent in September 2016 (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. Disposable income depends upon growth in total weekly earnings rather than growth in the hourly wage rate. This means that deceleration in the growth rate in average weekly wages will translate into slower growth in disposable income and correspondingly slower growth in consumer spending.

CHART 13 – Hourly & Weekly Wage Rate Growth – All Workers
 (annual year over year and 12-month moving average rates of change)



Source: Bureau of Labor Statistics

Page 13

During the second quarter, the effect of a slowing rate of increase in weekly wages was not evident in consumer spending data. However, weaker than expected growth in retail sales during the third quarter may indicate that weakening growth in weekly wages is beginning to impact consumer spending.

Although nominal consumer spending growth was weak in the first quarter of 2016, increasing just

\$62.3 billion (0.48 percent increase), spending rebounded strongly in the second quarter, rising \$192.6 billion (1.49 percent increase). The second quarter rebound exceeded trend growth by approximately \$68 billion (my statistical analysis indicates that this deviation amounted to a +1.07 standard deviation, a large but not overly significant deviation from trend). We will have to wait for data revisions and consumer spending data in months to come to see whether a slowing in total hours worked will depress consumer spending growth. Weak retail sales during the third quarter suggest that some of the second quarter's overshoot in consumption spending will reverse in the third quarter.

c. Private Sector Wage Tracking Measures

Other measures of wages indicate some upward pressure is developing. For example, **GS's** wage tracker, which is based on four measures of wage rate growth and is intentionally constructed to forecast changes in wage rate growth, has risen to 2.6 percent. **GS** expects wage rates to rise over the next two years to a range of 3.0 percent to 3.5 percent and then stabilize at that level.

Another frequently cited wage tracker is published by the **Atlanta Federal Reserve Bank**. It measures wage increases for workers who have been employed a year or longer. This wage tracker indicated a 3.3 percent annual increase in wages for such workers as of August, down from 3.6 percent in June. It overstates the rate of aggregate wage rate increase because it is a selective measure that leaves out a large share of people who have been in a job for less than a year. Typically, replacement employees start out at lower wage rates than the previous incumbent earned. But, the **Atlanta Federal Reserve Bank** tracker does give a reasonable sense of wage growth momentum in a tight labor market.

d. 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 wage and salary component of ECI for all workers over the same time period. A couple of explanations of details shown in **Chart 14** are in order.

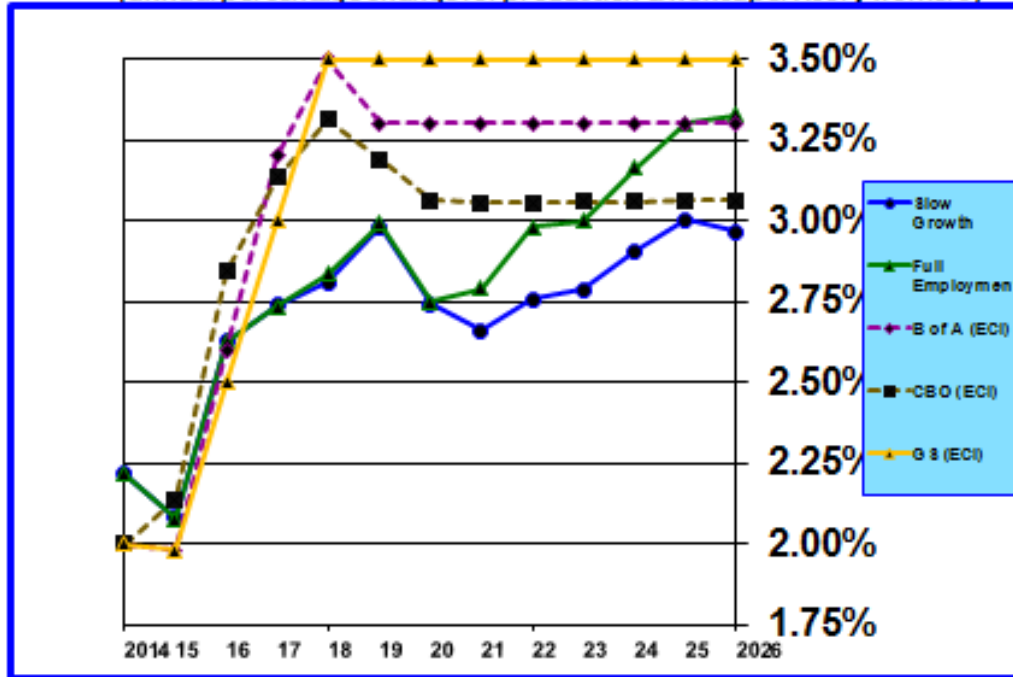
First, the data series for all employees only began in 2006 while the data series for production and nonsupervisory workers goes back to 1964. Thus, the data series for production and nonsupervisory workers contains a lot more historical information which is useful for constructing robust forecasts.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

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. With the exception of **GS's** forecast, wage growth in all other forecasts, including mine, declines about 25 basis points between 2018 and 2020. Mine then edge up after 2021, while the others remained unchanged.

Looking at **Chart 14**, the major takeaway is that my "**Slow Growth**" forecast increases slightly more slowly over the next two years to approximately 3.0 percent, dips to 2.6 percent in 2021 and then rises

CHART 14 – Hourly Wage Rate Forecasts

(annual percentage change for production & nonsupervisory workers)



Page 14

gradually to 3.0 percent by 2025. My “**Full Employment**” scenario diverges from my “**Slow Growth**” scenario in 2020 and eventually rises to 3.3 percent by 2026. Other forecasts range between 3.25 percent and 3.50 percent in over the entire time period from 2018 to 2026.

6. Labor Market Conditions

Labor market conditions, according to the Federal Reserve’s index, declined to -2.2 in September from a revised decline in August of -1.3.

7. Concluding Observations

U.S. employment is nearing full employment. The U-3 unemployment rate of 4.96 percent is about 0.2 percent above **CBO**’s estimate of full employment and the U-6 rate is about 0.6 percent away from full employment.

But, can the labor market remain as strong as it has been in recent months when the pool of skilled eligible workers is shrinking? And, what if erosion of profit margins as wages rise puts pressure on employers to curtail hiring? Is the recent shortening in the length of the workweek a warning signal? And, what if consumer spending continues to slow? Won’t that lead to unwanted inventories and production cutbacks? And, will political uncertainty spawned by the presidential election campaign prompt employers to become

more cautious? What if stock prices decline sharply and financial conditions tighten, perhaps because of an international shock or tighter U.S. monetary policy? That outcome would likely feed employer caution.

There are many risks. The labor market may well continue its forward march, but the balance of risks appears to me to weigh in the direction of slower employment growth in coming months. Also, longer run, the demographics simply do not support the rate of growth in employment that we have experienced in recent times. We may look back at the summer of 2016 and conclude that it marked the apex of good times in the employment market.

IV. U.S. Monetary Policy

Markets have now assigned a 75 to 80 percent probability that the FOMC will increase the federal funds rate range at its December meeting by 25 basis points to 0.500.75 percent. The FOMC is not expected to change policy at its November 1-2 meeting, which occurs less than a week before the presidential election.

In formulating monetary policy, the FOMC primarily examines recent and prospective developments in economic activity, employment, and inflation. It also considers development in global economic activity and financial markets.

1. Economic Activity

In its September statement, the FOMC upgraded its assessment of overall economic activity, noting that the “labor market has continued to strengthen . . . job gains have been solid, on average,” “growth of economic activity has picked up,” “household spending has been growing strongly,” but “fixed business investment has remained soft.”

In the six weeks that have passed since that meeting the market believes that recent data reports validate the FOMC’s September economic activity assessment. Employment markets continue to experience above trend growth. Economic activity, as measured by the “**Advance Estimate**” of third quarter real GDP, appears to have improved, although the topline number, as explained above, greatly overstates the underlying strength of the economy. The fly in the ointment is that household spending softened considerably during the third quarter.

Prior to each FOMC meeting, the 12 regional Federal Reserve Banks prepare the “Beige Book,” which provides anecdotal information about recent economic activity in each region. Economic activity firmed a bit according to the most recent Beige Book. Eight regions reported “modest” or “moderate” activity compared to five in the September Beige Book. The labor market generally was described as “tight,” however employment growth was a little bit slower. Generally, wage growth was “fairly steady at modest levels.” There was little change in price momentum, with inflation generally described as “mild” or “modest.”

2. Employment

Little slack remains in the labor market and compensation has begun to rise, albeit very slowly. If employment were the only policy goal, 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.

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. This is an obvious concern of the three dissenting FOMC members.

It would take an extraordinarily weak November employment report to put a December increase in the federal funds policy range in question.

3. Inflation

There was no change in the FOMC's assessment of inflation in September. The FOMC is not likely to change its inflation assessment at its November meeting and it is doubtful that it will feel a need to do so at its December meeting.

In the September FOMC statement, the Committee acknowledged that inflation remains below its long-term target level, but repeated that this is due, at least in part, to "... *earlier declines in energy prices and in prices of non-energy imports.*" The Committee also reiterated that "market-based" measures of inflation expectations have declined, but "survey-based" measures "*are little changed.*"

In the PCE inflation report for September following the last FOMC meeting, core inflation remained unchanged at 1.7 percent. Most forecasters expect core PCE inflation to fluctuate in a narrow range of 1.6 to 1.8 percent for the next several months. However, downside risks appear to have ebbed and upside risks to have increased because of stabilization in commodity prices and increasing upward price pressures on shelter and medical care expenditures.

4. Running a "High-Pressure Economy"

On October 14, 2016, FOMC and Board of Governors chair Janet Yellen talked about the possibility of "running the economy a little hot" in a speech. The idea is to structure monetary policy in a way that helps repair the damage done to the supply side of the economy by the Great Recession. The supply side of the economy encompasses the labor market and productivity. The health of both establishes the economy's speed limit, namely the potential rate of real GDP growth. The substantial decline in the potential rate of growth in recent years was not expected and has very troublesome long-term consequences if it persists.

Generally, the idea of a high-pressure economy is to use monetary policy to encourage greater business

investment and increased labor force participation. The implication is that the FOMC should delay raising interest rates even when traditional measures indicate that the labor market is near or at full employment. The risk of such a policy, of course, is that inflation might become unanchored. But, if the linkage between tight labor market conditions and inflation has weakened, as some recent research suggests, the risk of running the economy a little hot may not be all that great. Weak acceleration in wage rate growth as the labor market has approached full employment in recent months and well anchored inflation expectations lend further support to the notion of engineering a high-pressure economy.

But, even if the risks of higher inflation are muted, there is still the question of whether keeping interest rates lower for longer will have any real substantive impact on the supply side of the economy. Business investment and productivity have been very weak in spite of interest rates near zero for the past eight years. Theory argues investment should be encouraged when the cost of capital is low relative to the return on investment and the cost of labor is rising. But, the alleged benefits are speculative.

GS opines: “Overall, we see the most convincing case for a high-pressure economy as helping low-wage workers and ensuring that the still-large pool of long-term unemployed eventually find jobs. But recent wage trends and the already-declining rate of labor force exit of the long-term unemployed suggest these goals might be partially achievable without a sharply lower unemployment rate. We view the other potential benefits — substantially raising either the participation rate or productivity growth — as more speculative.”⁶

V. Inflation and Interest Rates

The FOMC remains confident that both core and total PCE inflation will return to the 2.0 percent target level by 2018. Note that the FOMC has repeatedly extended the time frame for achievement of the 2.0 percent target, but has not wavered from its conviction that the target will eventually be achieved.

1. Core Inflation

Core PCE inflation was 1.70 percent in September and has risen 39 basis points from its recent low of 1.31 percent in July 2015. Total PCE inflation, which continues to be depressed by the plunge in oil prices and lower import prices, was 1.25 percent in September, 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 remain below 2.0 percent during 2017, total PCE inflation is expected to rise to slightly more than 2.0 percent.

As can be seen in **Table 8** (**Chart 15** shows historical core PCE price index data and data from **Table 8** in graphical form), forecasts of the core PCE inflation index indicate that inflation will increase modestly during 2016 and 2017. Over the longer run, **B of A** and **GS** expect core PCE inflation to rise gradually, reaching 2.0 percent sometime during 2018. **B of A** expects inflation to rise above the 2.0 percent target to 2.3 percent in 2019, reflecting its belief that the FOMC will intentionally let inflation exceed the 2.0

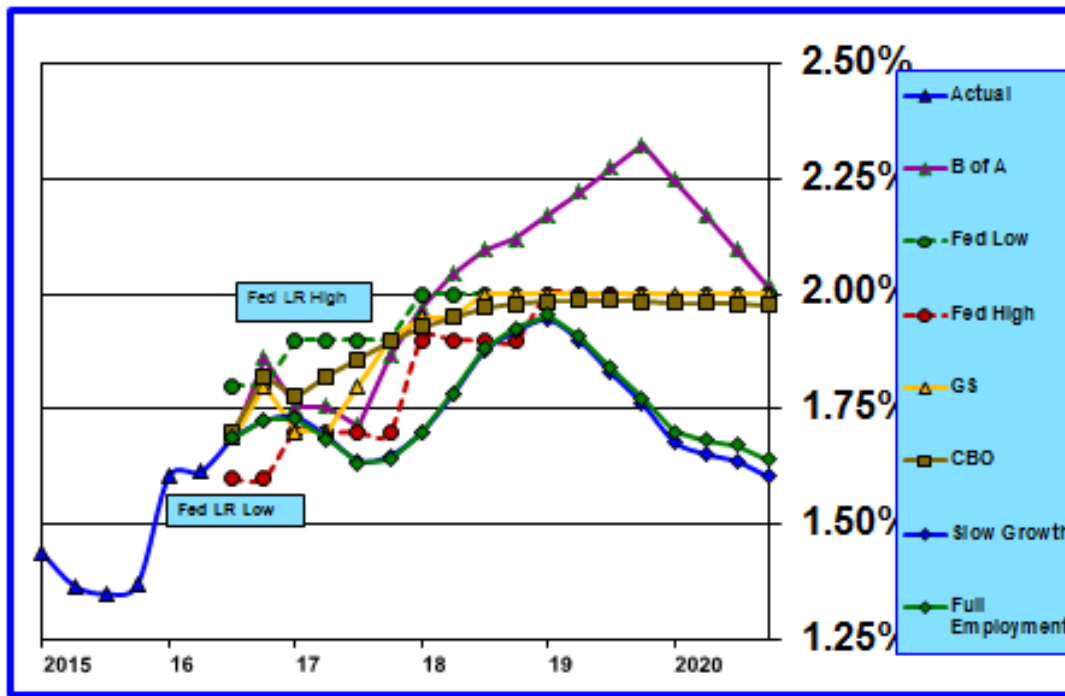
⁶David Mericle and Avisha Thakkar. “What’s the Point of Running a High-Pressure Economy?” Goldman Sachs Economic Research US Daily, October 20, 2016.

percent target by “running the economy a little hot” to assure that real GDP growth is sustained. **B of A** also expects inflation will recede to the 2.0 percent target over the long run. FOMC projections reflect a gradual rise to its 2.0 percent target.

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

Core CPE	2013	2014	2015	2016	2017	2018	2019
Actual	1.55	1.50	1.39				
B of A				1.7	1.9	2.1	2.3
GS				1.7	1.8	2.0	2.0
Bill’s Slow Growth				1.7	1.7	1.9	1.8
Bill’s Full Employment				1.7	1.7	1.9	1.8
FOMC — High				1.8	2.0	2.0	
FOMC — Low				1.6	1.7	1.9	

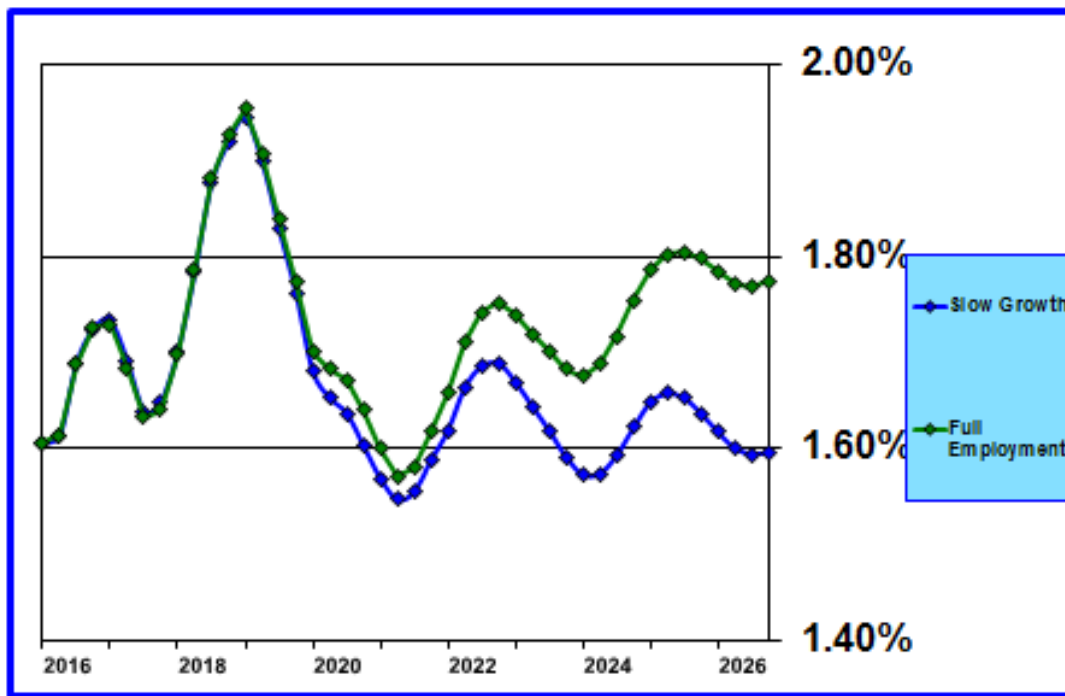
CHART 15 – Core PCE Inflation
(annual percentage rate)



Page 15

In looking at **Chart 16**, my “**Slow Growth**” and “**Full Employment**” forecasts for core PCE inflation also move toward 2.0 percent by 2018. But, as can be seen in **Chart 16**, which shows my “**Slow Growth**” and “**Full Employment**” forecasts through 2026, core PCE inflation does not remain at 2.0 percent as others expect but drifts down to a range of 1.6 to 1.8 percent. The principal culprit is weak productivity and also a modest rise in the employment gap as unemployment edges up in the “**Slow Growth**” scenario.

CHART 16 – Core PCE Inflation
(annual percentage rate)



Page 16

Table 9 shows contributions, based on my econometric model, of various economic variables to forecast core PCE inflation for two periods of time — 2016-2020 and 2021-2026. The starting point is the 1.70 percent rate that prevailed in September. By the end of 2020 core PCE inflation is a few basis points lower in both the “**Full Employment**” and “**Slow Growth**” scenarios, as the positive impacts of tighter labor markets and the passthrough effects of gains in housing prices (proxy for the rent and owners equivalent rent components of the core PCE inflation index) are more than offset by negative impulses from low productivity (depresses the equilibrium real rate of inflation as well as the measured level of inflation) and a very small lagged effect of a stronger dollar (negative impact on U.S. manufacturing and lower import prices).

During the 2021 to 2026 period core inflation is unchanged in the “**Slow Growth**” scenario and moves a few basis points higher in the “**Strong Growth**” scenario. The negative consequences of a weaker dollar are largely a modest increase in the employment gap, lingering low productivity gains, and decelerating housing price increases.

2. Inflation Expectations

Long-term interest rates are lower today than forecasters expected at the beginning of the year. There are several reasons. There were two global financial shocks that drove rates sharply lower. The first occurred in January and early February, but abated quickly once global central banks convinced markets that monetary policy would be accommodative. However, rates remained at a lower level. The second

Table 9
Changes in Core PCE Inflation
(Basis Points)

“Full Employment” Scenario						
	Labor Growth	Labor Gap	Productivity	Dollar	Housing Prices	Total
2016-2020	-3	28	-45	-3	13	-9
2021-2026	1	-10	-14	49	-10	15
2016-2026	-2	18	-59	46	3	6
“Slow Growth” Scenario						
2016-2020	-3	25	-37	-1	4	-13
2021-2026	1	-28	-9	51	-14	0
2016-2026	-3	-4	-46	50	-10	-12

shock occurred in June following the United Kingdom’s vote to leave the European Union. Again rates declined sharply. And again central banks came to the rescue. This shock dissipated even more quickly than the one early in the year, but rates remained lower.

While accommodative monetary policies have diffused market anxieties and kept rates low, investors have become convinced that global growth will be slower and inflation will be lower. This has also contributed to lower interest rates.

At the beginning of the year the 10-year U.S. Treasury note yield was 2.27 percent. On October 31, 2016 it was 1.84 percent (low for the year so far was 1.37 percent on both July 5 and 8). The recent rise in this rate is probably linked to expectations that the Federal Reserve will raise interest rates in December, the European Central Bank might begin to taper quantitative easing after next March, and the Bank of Japan has revised its policy to target a positive long-term yield. Some would also argue that global growth is picking up, although the evidence of that is hardly convincing.

In contrast to the unexpected decline in long-term interest rates, U.S. stock prices after many months of sideways movement broke out to all-time highs after the June Brexit vote (S and P 500 index hit a new all-time peak of 2190.15 on August 15, 2016, compared to the 2015 high of 2130.82 reached on May 21, 2015). In recent days, however, worries about the potential for less stimulative global monetary policies and weaker economic data reports have pushed the S & P 500 average down to 2126.15 as of October 31, 2016, basically continuing the sideways trading pattern that has prevailed over the last year and a half.

The decline in long-term interest rates this year has been validated by a decline in long-term inflation expectations. Forecasts of future inflation embedded in Treasury Inflation Protected Securities (TIPS) have declined during 2016 and are forecasting inflation averaging 1.7 percent over the next five years, which is at odds with the FOMC stated policy objective of 2.0 percent. However, this measure of inflation expectations has increased from a low of 1.4 percent in June. The recent increase is mostly due to a decline in the probability that inflation will fall substantially from recent levels.

Survey-based measures of inflation expectations, such as the University of Michigan’s 5-10 year expected inflation rate, have weakened a little but not to the same extent as market-based measures. This survey measure of long-term inflation expectations fell from an average of 2.9 percent over the past several years to

2.4 percent in October. The survey average has come down largely because the percentage of respondents expecting high inflation has decreased. About 70 percent now expect future inflation to range between 1 and 3 percent compared to approximately 60 percent over the last several years.

Both market and survey measures of inflation expectations reflect a high degree of confidence that the FOMC will be able to achieve its 2.0 percent target. In other words, inflation expectations remain well anchored.

3. Financial Conditions

Maintaining financial stability is a responsibility of the Federal Reserve. In this regard the Federal Reserve was tested repeatedly during the global financial crisis of 2008 and by most accounts responded effectively.

However, prior to the time of the financial crisis, the Federal Reserve regarded its lender of last resort role as just that. It was to respond and stabilize the financial system during times of crisis. Monitoring the fragility of the financial system and formulating monetary policy in an anticipatory manner to assure ongoing financial stability was not regarded as a primary function of monetary policy. That approach has changed in the aftermath of the global financial crisis but it still appears that the macroeconomic goal of maintaining financial system stability remains more one of reaction to developments.

That is not to say that there has been a lack of attention, but the focus has been primarily at the micro level — individual financial institutions — rather than at the macro level. The Dodd Frank Act mandated a comprehensive regulatory regime intended to assure financial strength and prudent management of individual financial institutions. Thus, financial institutions are now subject to more stringent capital and liquidity requirements. Notwithstanding these safeguards, should an individual institution get into serious trouble, the requirement for systemically important financial institutions (SIFIs) to have living wills, is intended to enable regulatory authorities to quickly and surgically resolve failures and contain the potential for systemic contagion.

To my way of thinking, as helpful as establishing rigorous prudential standards might be and preparing for prompt intervention when trouble arises, this micro approach ignores the possibility that macroeconomic policy will drive systemic financial instability rather than the acts of one or more wayward SIFIs. The Federal Reserve needs to monitor macroeconomic developments and the consequences of policy responses not just in terms of their impacts on employment and inflation but also in terms of financial system stability. There is building awareness, I believe, in the importance of this tri-part focus, but considerations of systemic financial stability are not yet robustly built into the monetary policy decision making process.

That brings us to the short-lived global financial panic at the beginning of the year. Measures of financial conditions, which appear to capture well emerging financial system instability, at least in the latter stages of their development, began to escalate during the summer of 2015. Indeed, the FOMC in response delayed the first federal funds rate hike that had widely been expected to occur in September 2015. When a degree of calm returned to markets during the fall, the FOMC proceeded to initiate monetary tightening in the U.S. at its December meeting. Financial conditions began to tighten again and full-scale panic ensued in January. Again, the FOMC responded by pulling back and the crisis passed.

This is not to argue that the FOMC was wrong to begin tightening monetary policy. After all, the labor

market is near full employment and the risk of rising inflation, although not necessarily the reality that inflation will actually increase, exists. The FOMC now finds itself in the difficult position of attempting to satisfy its full employment and price stability mandates without aggravating the financial instability that is inherent in a global financial system that has become dependent upon quantitative easing and abundant liquidity.

Financial conditions tightened briefly in the immediate aftermath of the Brexit vote, but markets were quickly soothed by central banks promise of providing liquidity. Financial conditions quickly resumed an easing trend and stock prices headed higher.

There has been one exception. Short-term dollar funding rates have risen about 30 basis points this year in the absence of any change in the federal funds rate. This development is not transitory for two reasons. First, money market mutual fund reforms in the U.S. requiring redemption at market value rather than at par have shifted the composition of fund portfolios. This has caused a one-time increase in short-term funding rates, but it is a permanent increase. Thus, in the short-run it has the same kind of impact on financial and credit conditions that an increase in the federal funds rate would have. Second, weak earnings, low capitalization, and high levels of problem assets of many European banks, and in particular Deutsche Bank, have also contributed to the increase in short-term funding rates. This negative impact is not likely to abate until European banks are on more solid financial footing. Prospects for that to occur any time soon are not encouraging, although the recent steepening of the yield curve will help profitability a little.

GS calculates and publishes a financial conditions index. Moreover, **GS** has conducted extensive empirical research which demonstrates that tighter financial conditions slow economic growth over the next few quarters. Specifically, **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 past 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. The good news, according to **GS**, is that the easing of financial conditions that has occurred during 2016 should add 0.5 percent to real GDP growth over the next 12 months.

GS recently included a financial conditions variable in its version of the traditional Taylor Rule, which provides guidance for calibrating monetary policy to attain full employment and price stability. **GS** posits that the effects of financial conditions on the policy interest rate are not necessarily independent of the employment and inflation components of the Taylor Rule. In fact, increases in the federal funds rate will tighten financial conditions. **GS** simulated three scenarios.

Because of the interactive effects, **GS** believes that a more gradual rate of monetary policy tightening in the U.S. is prudent policy. In this regard, **GS** has ratified through a model a policy that the FOMC has already embraced. In the first scenario the federal funds rate increases over the next few months by 40 basis points, which is what is already discounted in the market's forward yield curve. Real GDP growth improves by approximately 0.5 percent over the next 12 months but the benefit fades toward the end of 2017. In the second scenario, the federal funds rate rises by 100 basis points by the end of 2017 and there is no net impact on real GDP growth. Note that the FOMC's median projection from its September Summary of Economic Projections is for the federal funds rate to increase 75 basis points by the end of

2017. In the third scenario, financial conditions worsen by more than what can be attributed to a 100 basis point increase in the federal funds rate. In this case, real GDP growth is depressed by about 0.5 percent over the next 12 months.

If GS's analysis is sound, a gradual tightening in monetary policy may maintain a semblance of financial stability for the time being, but such a policy will not directly deal with the sources of financial instability that are already present in the financial system. In that regard, such a policy is palliative, not curative. And, cynics will continue to observe, with merit, that every time that the market has a convulsion, the FOMC pulls back and, perversely, this encourages more risk-taking which worsens, rather than ameliorates, underlying financial market instability.

Volatility has recently fallen to cyclically extremely low levels. 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 prevents markets from managing risk or, worse, encourages excessive risk taking, then history tells us that a Minsky moment will occur, often without much warning.

As I have said before, policymakers can postpone the day of reckoning, perhaps for a very long time. But, if underlying global systemic imbalances are not addressed effectively, the day of reckoning will inevitably eventually occur. And, history tells us that the longer imbalances are allowed to build, the greater will be the pain when pretend and extend policies no longer work.

4. Interest Rates — Federal Funds Rate

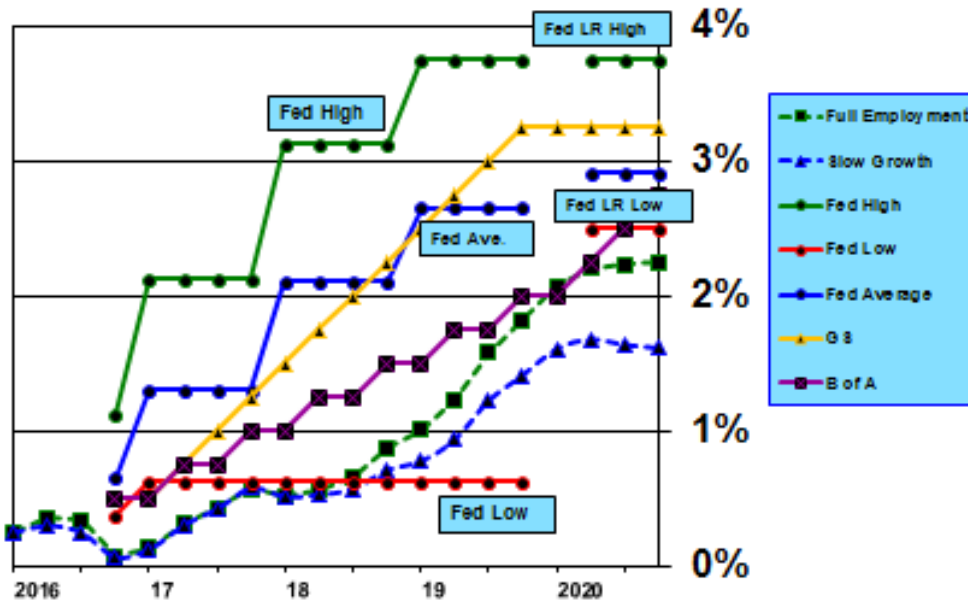
Forecasters expect the FOMC to raise the federal funds rate 25 basis points at its December meeting. Market-based expectations for a rate increase in December are about 75 to 80 percent. In its September Summary of Economic Projections, the median FOMC member view is two additional 25 basis point increases in the federal funds rate in 2017 (1.00-1.25 percent), three more in 2018 (1.75-2.00 percent), three more in 2019 (2.50-2.75 percent), and a long-term equilibrium level of 2.75-3.00 percent.

All forecasters expect the FOMC to raise rates by 25 basis points in December. Both **B of A** and **GS** expect a slightly slower pace of upward adjustments in the federal funds rate — two 25 basis points increases during 2017 and two more in 2018, which would bring the target federal funds rate range to 1.00 percent to 1.25 percent by the end of 2017 and 1.50 percent to 1.75 percent by the end of 2018.

Market expectations for increases in the federal funds rate, which are embedded in futures and the forward yield curve, are for a slower pace of adjustment and a lower equilibrium value than the FOMC median projections and most professional forecasters.

Chart 17 shows the quarterly progression in the federal funds rate from the present through 2020 implied by the FOMC’s projections. It also shows forecasts for **B of A**, **GS**, and my “**Slow Growth**” and “**Full Employment**” scenarios.

CHART 17 – Federal Funds Rate Forecasts



Page 17

My forecasts continue to be outliers relative to other forecasters but track market-based expectations more closely than other forecasts. My forecasts are driven by my expectation that inflation will remain lower for longer than others expect and also by an even smaller expected value for the long-run real rate of interest than the 1.0 percent level now embraced by a majority of FOMC members. My scenarios predict only one to two increases in the federal funds rate during 2017 and 2018.

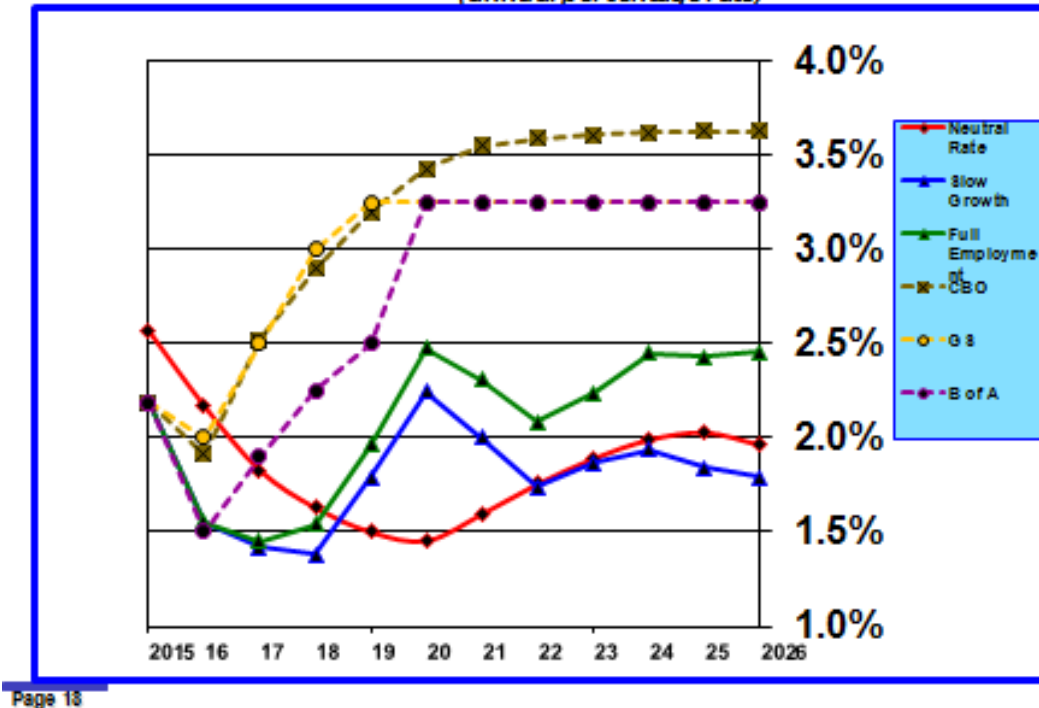
5. Interest Rates — 10-Year Treasury Note Yield

Chart 18 shows forecasts for the 10-year Treasury note yield over the next ten years. Over time analysts have reduced their forecasts for the ten-year yield. Partly this is a mark-to-market exercise driven by the persistent decline in this yield contrary to expected increases. But the adjustments also reflect a growing consensus that the long-run equilibrium real rate of interest has declined. Analysts still expect long-term rates to rise from the current level, but not to as high a level.

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 10** 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.

CHART 18 – Ten-Year Treasury Yield

(annual percentage rate)



Page 18

The top panel of **Table 10** 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 10** is in the assumed annual growth rate in total hours worked, which is raised to 0.8 percent.

Collectively, FOMC members have steadily reduced the median estimate of the long-term nominal value of the federal funds rate from 4.25 percent to 3.00 percent. However, based upon my model, as shown in **Table 10**, my sense is that the FOMC’s median projection for the federal funds rate is still higher than is consistent with its estimate of long-term real GDP growth of 1.7 to 2.0 percent. My model indicates that a long-term nominal federal funds rate of 1.5 to 2.0 percent is a more likely level for the long-term neutral federal funds rate and it could be as low as 1.25 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 slightly negative.

My model indicates that the 10-year neutral rate, which incorporates a term premium of about 110 to 120 basis points (the 40-year average term premium from 1975 to 2016 is 155 basis points, but reflects higher average inflation of 3.36 percent over this period), should be in a range of 2.6 to 3.1 percent. This range is only slightly lower than **GS’s and B of A’s** expected 3.25 percent long-term equilibrium value for the 10-year yield (see **Chart 18**). My estimate of the long-term neutral rate for the 10-year yield is about 2.0 percent and reflects long-term inflation of 1.6 percent rather than 2.0 percent that other forecasters assume.

Table 10

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

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

	Assumptions		
Potential Real GDP	1.40%	1.82%	1.99%
Productivity	.9%	1.4%	1.6%
Labor Force	.6%	.6%	.6%
	Neutral Rate		
Federal Funds	1.28%	1.68%	1.84%
10-Year Treasury	2.46%	2.89%	3.06%

	Assumptions		
Potential Real GDP	1.59%	2.01%	2.17%
Productivity	.9%	1.4%	1.6%
Labor Force	.8%	.8%	.8%
	Neutral Rate		
Federal Funds	1.52%	1.92%	2.08%
10-Year Treasury	2.63%	3.05%	3.22%

GS's and **B of A's** long-run forecasts of the long-term federal funds rate and the 10-year Treasury yield do not reflect the historical level of the term premium. Both expect the long-term 10-year Treasury yield to settle at 3.25 percent. **B of A** expects the long-term federal funds rate to be 2.75 percent, which would mean the term premium is 50 basis points, considerably less than the historical average of 155 basis points and my own estimate of 110 to 120 basis points. The inconsistency is even greater for **GS** which expects the long-term federal funds rate to be 3.25 percent which would mean no term premium would exist. This is not plausible. My own analysis suggests that **GS's** expectations for the long-term federal funds rate is too high by at least 50 basis points and both **B of A's** and **GS's** forecast of the long-term 10-year Treasury yield are too high by about 50 basis points. If these adjustments were made to their forecasts, the term premium would be about 100 basis points.

Over the next four years my model forecasts that the 10-year yield will rise 70 to 94 basis points from its September level of 1.63 (actual — September estimate was 1.58 percent) to 2.28/2.52 percent (see **Table 11**). The favorable effects of slowing labor force growth, *based upon CBO's assumptions*, and improving financial conditions partially offset the negative effects of firming inflation and improving productivity.

After 2020, with slowing employment growth and benign inflation there is little upward pressure on the 10-year yield in the “**Full Employment**” scenario other than potential improvements in productivity. The 10-year yield actually falls quite a bit in the “**Slow Growth**” scenario because of weaker employment growth and lower inflation.

Table 11
Changes in 10-Year Treasury-Note Yield
(Basis Points)

“Full Employment” Scenario							
	Labor Growth	Labor Gap	Productivity	Inflation	Financial Conditions	Other	Total
2016-2020	-96	30	49	193	-67	-15	94
2021-2026	-10	-5	71	-28	-20	-10	-3
2016-2026	-106	24	120	165	-88	-25	91
“Slow Growth” Scenario							
2016-2020	-104	28	37	192	-67	-15	70
2021-2026	-7	-18	55	-47	-20	-10	-46
2016-2026	-110	9	92	145	-88	-25	23

APPENDIX

Outlook — 2016 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 2016 U.S. and global economic outlook and risks to the outlook are listed below.

Financial markets started the year off in ugly fashion with stock prices plunging in all global stock markets, prices of commodities in free fall, and long-term bond yields heading toward zero or below in many global markets. Concerns about slowing global growth and potential recession in the U.S. were amplified by unexpectedly weak data reports during the opening weeks of 2016. Consequently, many forecasters lowered their estimates of economic activity during 2016, but virtually none expected recession.

Market sentiment reversed rather abruptly in late February as it became evident that markets had overreacted and as central banks moved to stabilize markets. Data reports since then have generally been more upbeat, particularly in the U.S. Thus, it was not at all surprising that recession fears faded into the background.

In late June the British vote to leave the European Union reverberated through global financial markets. Although Brexit is likely to result in significant consequences, particularly for the U.K. and E.U. economies, over time, the market quickly determined that interest rates would remain much lower for longer and reverted to “risk-on” dynamics, driving U.S. stock prices to an all-time high and U.S. interest rates to the lowest level in the 240-year history of the nation.

In recent months global growth has ground higher but has been uninspiring. Markets have been stable and volatility has declined. There have been no further significant shock to stir up market anxieties.

Overall, the 2016 U.S. and global growth outlooks are shaping up to be less favorable than when forecasts were prepared in December 2015.

1. **U.S. — October Assessment:** relatively steady growth, but at a low level; consumer spending growth has weakened slightly; presidential election has fostered uncertainty
 - ✓ *The Federal Reserve’s Beige Book report for September 2016 (August 30 — October 7) reflected an economy that is growing slowly with slight improvement in three of twelve districts*
 - ✓ *Labor conditions deteriorated slightly in September*
 - ✓ *Consumer spending has slowed from an above trend pace in the second quarter*
 - ✓ *Manufacturing and services PMIs improved but small business sentiment edged down slightly; manufacturing production rose 0.2% in September after falling 0.5% in August*
- *2016 real GDP Y/Y* growth projections range from 2.3% to 2.5%. The FOMC’s central tendency Q4/Q4 projections range from 2.3% to 2.5%. (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 the substantial federal tax reductions and spending increases Congress enacted at the end of 2015.

- Based upon GDP revisions, Q2 "Final Estimate," and Q3 forecasts, B of A and GS have reduced their estimates of 2016 year-over-year growth to 1.5%; my estimate is now 1.2% (note that my lower estimate results from slowing employment growth and the cumulating effects of recent negative productivity); IMF forecast is 1.6%; the FOMC reduced its 2016 Q4/Q4 projection range from 2.3%2.5% to 1.7%1.9% in September

- The final real GDP estimate for Q2 was revised up to 1.4%, but would have considerably higher without a rare decrease in inventories; Q4 2015 was revised down from 1.4% to 0.9% and Q1 2016 was revised down from 1.1% to 0.8%; as a consequence the year over year growth rate collapsed to 1.3% for the four quarters from Q2 2015 to Q2 2016

? The advance estimate of Q3 real GDP is likely to be about 2.5%, which bring year over year growth up to 1.5%

- **Real GDP output gap** will remain high, but will close rapidly during 2016 from about 2.6% to 2.0%. (CBO revised potential GDP assumptions in January and again in August; these revisions along with BEA's revisions to GDP data in July reduced the beginning of the year output gap from 2.6% to 1.65%; CBO's revised forecast is for the output gap to close to 1.35% during 2016. Other analysts believe the current output gap is smaller than CBO's estimate.)

- OECD's U.S. output gap estimate for the end of 2016 is 1.8% and 1.2% at the end of 2017

- My current estimate of the output gap at the end of 2016 is between 2.2% and 2.3%, reflecting my very weak forecast of annualized real GDP growth during the second half of 2016 of about 0.1% compared to GS and B of A forecasts of approximately 2.5%; it is likely that my forecast is too pessimistic because of how my econometric model incorporates the lagged effects of very low productivity, but there is a reasonable chance the final 2016 gap will fall between CBO's estimate of 1.3% and my estimates

- **Potential structural rate of real GDP growth** has declined significantly in recent years. I expect potential growth to be about 1.4% in 2016. Long-term potential real GDP growth will edge up in coming years to between 1.8% and 2.1%.

+ My current estimate of potential growth in 2016 is 1.5%

- B of A reduced its estimate of long-term potential growth to 1.7%; GS's estimate is 1.75%; JPMorgan's 1.5% long-run estimate is more pessimistic.

+ CBO's updated long-term potential estimate is 1.9%; and the FOMC's central tendency range is 1.7%2.0%

+ My long-term potential estimate is between 1.6% and 2.05%, depending upon employment and productivity growth

- **Productivity** should rise during 2016 as growth improves and investment increases, but should still fall well short of the historical 2.1% average.

- Nonfarm productivity was 0.45% in 2015; the five-year average was 0.45%; my current productivity projection for 2016 is between -0.1% and -0.25%; B of A's is -0.2%

- **Employment** growth should slow considerably during 2016 as full employment is reached and slow growth in the labor force becomes binding; payroll growth should average 130,000 to 165,000 per month.
 - *Payroll employment increased an average of 178,000 per month over the first nine months of 2016*
- **Employment participation** will be relatively stable during 2016 as labor market conditions tighten and discouraged workers find jobs, offsetting the demographically-embedded decline stemming from retirements of baby boomers.
 - + *Participation was 62.93% in September compared to 62.65% in December and up from the recent low of 62.42% in September 2015*
 - ? *GS estimates that the remaining full employment gap is about 0.5% or approximately 800,000 workers, consisting of unemployment (U3 measure of unemployment), underemployment (U6 measure of unemployment), and nonparticipation*
- **Unemployment rate** should edge down to between 4.6% and 4.8%.
 - ? *Unemployment rate was 4.96% in September slightly above the long-term structural rate of 4.74%, according to CBO*
 - ? *Based on the U-3 measure, the economy is very close to full employment*
 - ? *U-6 unemployment rate, which adds marginally attached workers and those working part-time for economic reasons to the number unemployed but looking for work, was 9.69% in September, which is about 0.6% above the historic full-employment level*
- **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 2.2% to 2.5%.
 - *Disposable income growth in August was 3.6% ahead of the year earlier level due to strong employment gains during the last year; growth is projected to fall to 3.25% by the end of 2016 provided that employment growth and total hours worked slow*
- **Nominal consumer spending growth** on the Y/Y basis will be relatively stable in a range of 3.3% to 3.5%.
 - + *Nominal spending growth over the past year as of August was rising at a 3.4% annual pace; I project nominal spending growth in 2016 to be approximately 3.5%*
 - ? *Growth in consumer spending was weaker than expected in the first quarter, but was very strong in the second quarter; retail sales growth weaken during Q3*
 - ? *Consumer sentiment measures have been relatively soft in recent months, oscillating in a narrow range: University of Michigan's index was 87.9 in October compared to 91.2 in September, 89.8 in August, 90.0 in July and 93.5 in June; it was 90.0 a year ago; the Conference Board's measure was 98.6 in October compared to 103.5 in September, 101.8 in August, 96.7 in July, 97.4 in June, 92.4 in May, 94.7 in April, and 96.2 in March; Evercore ISI's weekly company surveys index has been edging down and has fallen from 52.4 to 49.2 since March 2015, but it is up from the recent low of 47.7 in late April*
- **Household personal saving rate** will decline slightly as growth in spending exceeds growth in disposable income.

? In July the Bureau of Economic Analysis revised the saving rate sharply higher for the last several years

- The revised saving rate was 5.84% over the first eight months of 2016 compared to the revised 2015 average rate of 5.80% (prior to revision the 2015 saving rate was 5.12%) (nominal income growth has exceeded spending growth so far in 2016)

- **Stock prices**, as measured by the S&P 500 average, should be between 5% higher or lower, reflecting the slowing growth in profits and rising short-term interest rates.
 - + Stock prices are up 4.0% since the beginning of the year
- **Manufacturing** will continue to be weak with the PMI index just slightly above or below 50.
 - + The PMI manufacturing index was 51.5 in September compared to 49.4 in August, 52.6 in July, 53.2 in June, 51.3 in May, 50.8 in April, 51.8 in March, 49.5 in February, 48.2 in January and 48.0 in December; other manufacturing indices indicate ongoing weakness
 - + The operating rate declined to 75.4% in September, well below the 80% level that historically is indicative of tightness, and implies that capital investment spending will remain weak
 - + The PMI non-manufacturing index rebounded to 57.1 in September after plunging to 51.4 in August from 55.5 in July; it was 56.5 in June, 52.9 in May, 55.7 in April, 54.5 in March 53.4 in February, 53.5 in January, and 55.8 in December; the August reading was the lowest level since February 2010, early in the recovery from the Great Recession; this decline is corroborated by the Markit service PMI, which declined to post-Great Recession low of 50.9 in August
 - + The NFIB optimism index for small businesses fell slightly to 94.1 in September compared to 94.4 in August, 94.6 in July, 94.5 in June, 93.8 in May, 93.6 in April, 92.6 in March, 92.9 in February, 93.9 in January, and 95.2 in December, reflecting stable but moderate growth; however, this index remains below its recent cyclical peak of 100.3 reached in December 2014
 - + GS's business conditions index moved back into expansion territory of 56.5 in September after spending two months in contraction territory at 49.2 in August and 47.1 in July. Monthly index values in 2016 were 55.5 in June, 48.6 in May, 44.9 in April, 46.5 in March, 40.4 in February, 39.9 in January, and 48.6 in December; this indicator has been above 50 only twice in the last 18 months (a value of 50 indicates trend growth; thus, business conditions were below trend for 14 months until June)
- **Business investment** spending growth should edge down slightly and be in a range of 2.0% to 3.5% as employment and consumer spending growth slows.
 - Business investment fell at an annual rate of -1.3% in the first half of 2016, reflecting in part energy investment cutbacks; however, investment in non-energy areas has fallen short of expectations
 - GS expects business investment to rise at a rate of 2.1% in the second half of 2016, but fall -0.4% on a year over year basis during 2016; B of A expects business investment to decline -0.4% in 2016
 - ? An Evercore ISI's Q2 2016 survey indicated that U.S. capital spending plans have moderated during 2016 and global capital spending plans have turned negative for the first time since the survey began in 2010
 - ? Evercore ISI's Q3 2016 survey indicated that inventories have decreased but remain slightly above optimal levels, particularly for industrial companies

? *Average age of U.S. government infrastructure has declined from about 18 years in the 1950s to 27 years in 2014*

- **Residential housing investment** should remain relatively strong in a range of 6% to 8%, but should edge down a bit from 2015's level; housing starts should rise 10% to 15%.
 - *Residential housing investment rose 7.8% in Q1 but fell -7.7% in Q2; growth is currently expected to be 4.2% to 5.0% in 2016*
 - *Over the first nine months of 2016 housing starts are 3.7% above 2015's average, but 4.6% above the first nine months of 2015, which is well below the expected growth*
- **Residential housing prices** should rise more slowly in 2016 in a range of 2% to 4% in 2016.
 - ? *B of A currently is forecasting housing prices to increase 3.6% in 2016 instead of 1.8% it expected at the beginning of the year, but commented that risks are in the direction of an even greater rate of increase; GS expects prices to increase 3.9%*
 - ? *The Federal Housing Finance Agency's purchase only price index rose 5.6% over the 12-month period through June 2016*
 - ? *The Case-Shiller national home price index was up 5.3% over the previous 12 months in August, but B of A expects this measure to decelerate to 3.8% by the end of 2016*
- **Trade deficit** should rise in 2016 as the increase in the value of the dollar continues to depress exports and increase imports. The **dollar's value** on a trade-weighted basis should rise slightly. (*Trade data were revised for the last several years in April 2016, which reduced the size of the deficit, with reductions being greater in more recent months*)
 - *The trade deficit has fallen slightly over the last 12 months from 2.76% to 2.66% in August*
 - *Through September the trade-weighted (major currencies) value of the dollar has fallen -4.3% since December, but has been relatively stable over the past five months*
- **Monetary policy** — the Federal Reserve will raise the federal funds rate two to three times during 2016 in 25 basis point increments.
 - *The FOMC has yet to raise rates in 2016; at the September FOMC meeting 3 of 10 members voted to raise rates; the FOMC signaled in its monetary policy statement that risks to the economic outlook are "roughly balanced," which markets interpreted to mean that rates will be raised 25 basis points in December; the FOMC's "dot plot" substantiates this expectation; B of A expects a 70% probability of one increase by December, and GS has a probability of 65% for an increase by December; my econometric model indicates no additional increases until mid-2017; market participants now expect an increase in December but continue to expect fewer increases in 2017 and 2018 than implied by the FOMC's dot plot*
- **Total inflation** (CPI and CPE) will rebound sharply in 2016 as the depressing effects of 2015's collapse in oil prices passes out of the indices.
 - + *B of A expects CPI to rise from 0.7% in 2015 to 2.4% in 2016 and PCE to rise from 0.6% to 1.4%*
- **Core PCE inflation** will be relatively stable in a range of 1.2% to 1.6%, reflecting global disinflationary trends offset somewhat by the closing U.S. employment and output gaps. Core PCE inflation will remain well below the FOMC's 2% objective at least through 2018 and perhaps much longer.

- Core PCE inflation forecasts have been raised to 1.8%; FOMC's September projection range for 2016 was 1.6%1.8%; my 2016 forecast for core PCE inflation is 1.7%

- The **10-year Treasury rate** is likely to fluctuate in a range between 2.25% and 2.75% in 2016. 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 rate was 1.86% on October 28

- **Fiscal policy** will have a positive impact on real GDP growth during both fiscal year and calendar year 2016, raising real GDP growth by 0.4 to 0.6%. The deficit as a percentage of nominal GDP will increase substantially from fiscal year 2015's level of 2.46% to a range of 3.25% to 3.50%. Stronger than expected growth would push the deficit toward the lower end of the range.

- With GDP revisions, the 2015 calendar year fiscal deficit was 2.62%; both growth and the deficit are rising less rapidly than forecast; the fiscal year 2016 deficit-to-GDP ratio was an estimated 3.15%, slightly better than forecast (the final ratio will change, depending on Q3 nominal GDP)

- **State and Local investment** spending growth should range between 1.5% and 2.0%.

? The Bureau of Economic Analysis revised state and local investment growth much higher in 2015 from 1.36% to 2.92%

- State and local investment spending grew at an annual rate of 0.5% in the first half of 2016, but is expected to increase 0.9% for all of 2016

2. **Rest of the World: October Assessment:** current activity ebbed a bit in August continuing a lackluster trend; over the remainder of the year risks are tilted to the downside

✓ *B of A/Merrill Lynch's GLOBAL cycle indicator declined in August and September but is higher than at the beginning of the year*

✓ *There was deep unease at the recent IMF meetings about the longer-term effects of ultra-low/negative interest rates and weak growth in advanced economies — short-term risks are down but medium-term risks are up*

✓ *The IMF has concluded that political risk in advanced economies has emerged as the biggest threat to the health of the global economy*

- **Global growth** is likely to improve to 3.4% in 2016 from 3.1% in 2015. Risks are tilted to the downside.

- Global 2016 growth forecast has declined to 3.0% (IMF forecast is 3.1%); growth is expected to rise to 3.5% (IMF 3.4%) in 2017

- The global manufacturing index is in a declining trend and at 51.6 in August indicates modest growth

- The OECD leading indicator declined to its lowest level since the Great Recession early in 2016 but improved slightly in July and August

- **European growth** will be positive but will likely fall short of the consensus 1.7% as the benefits of 2015's fall in the value of the euro wane and social and political disruptions occur.

- *European growth forecast has declined to 1.5% in 2016, (IMF forecast is 1.6%); growth is expected to decline to 1.1% in 2017*
- **European inflation** will rise from 2015's 0.1% but will probably fall short of the expected 0.9%.
 - *Final 2015 European inflation was 0.0%; 2016 forecast is 0.2% and 2017 forecast is 1.1%; currently, core inflation is 0.9%*
 - *The ECB is slowly losing its battle to push inflation to 2.0% as reflected in market long-term inflation expectations, which have declined below 1.5%*
- **European financial markets** should be relatively stable with periodic episodes of volatility prompted by specific events.
 - *European stock markets declined broadly in early 2016; bank stocks plunged 45% during the first half of 2016 to a level not experienced in 30 years; however, stock prices rallied vigorously in March as panic subsided and the ECB ramped up monetary easing; nonetheless, bank stocks continue to underperform and underperformance worsened after the Brexit vote, a worrying development*
- **European political dysfunction, populism and nationalism** will continue to worsen gradually. Countries to watch closely include Greece, Spain, Italy and Portugal.
 - + *Political fragmentation is worsening slowly; the immigration crisis is hollowing out centrist political parties*
 - + *Spain's new election was inconclusive but since no party wishes to endure a third election, a weak minority government is likely, but it may have a short tenure*
 - + *Italy's banking crisis is simmering and has the potential to spin out of control; Italy's constitutional referendum is scheduled for December 4 and appears headed for defeat, which could destabilize Italy's government*
 - + *Greece's third bailout is increasingly in jeopardy of failing; however, Greece's parliament has enacted spending cuts and tax increases necessary to meet the requirements for disbursement of funds under the current bailout agreement; eventually debt relief will be necessary according to the IMF — creditors have promised to consider that possibility in 2018 after the French and German elections*
- **U.K. growth** is expected to remain a solid 2.5% in 2016 compared to 2.4% in 2015; some risk to this outlook could evolve from the proposed referendum for the U.K. to leave the European Union.
 - *In the aftermath of the Brexit "Leave" vote, U.K. growth forecast has been reduced to 2.0% in 2016 and 0.9% in 2017 (IMF forecast is 1.8% in 2016 and 1.1% in 2017)*
 - *U.K. consumer confidence plunged following the Brexit "Leave" vote but has recovered; the negative consequences of Brexit will unfold gradually over the next several years*
- **China's GDP growth** will slow below 6.5% and could be as low as 6.0% by the end of 2016 as economic reforms are implemented and the shift to a consumer-focused economy gathers momentum.
 - *China reported year-over-year real GDP growth of 6.7% through the third quarter of 2016 and is unlikely to slow below 6.5% in 2016*

? *China's 2017 GDP growth is forecast to be 6.6% (IMF forecast is 6.6% in 2016 and 6.2% in 2017)*

? *The difference between reported results and forecasts is that policy makers have deliberately taken actions to boost housing construction and public investment, which has resulted in a short-term boost to the economy; however, this force-feeding of economic growth could worsen future economic performance as debt leverage continues to grow faster than economic output*

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

+ *President Xi's anticorruption campaign and centralization of power is smothering the consensus governance approach in place for the last 30 years and may be creating latent political instability*

? *China's mid-term plenum was held in late October; President Xi was declared "the core of the party," a title that previously has been given only to Mao Zedong, Deng Xiaoping, and Jiang Zemin*

- **Japan's** economic policies will continue to fall short of achieving the 2.0% inflation target; inflation is expected to rise from 0.5% in 2015 to 1.0% in 2016. GDP growth will also continue to fall short of the policy target, but should rise from 0.7% in 2015 to 1.2% in 2016. Population decline and slow implementation of market reforms will continue to weigh heavily on both growth and inflation.

- *Japan's economy grew 0.6% in 2015; the 2016 growth forecast has been revised down to 0.6% (IMF July forecast is 0.3%); growth is expected to be 0.9% in 2017*

- *Japanese markets responded very negatively to the Bank of Japan's imposition of negative interest rates early in 2016; the yen has strengthened against the dollar by 14% since the beginning of the year*

- *Inflation is now expected to be -0.2% in 2016 and 1.0% in 2017, well below the Bank of Japan's 2.0% target*

- *Evidence is increasing that Abenomics is failing: only 36% of businesses surveyed by Evercore ISI in the second quarter expect conditions to improve compared to 83% in the first quarter; the yen continues to strengthen, which will depress profits, thus only 36% expect to increase prices compared to 58% in the first quarter*

- *There is increasing skepticism that the Bank of Japan can do much more to boost inflation and economic growth*

- *Abe's political position was strengthened by the outcome of the elections in the Upper House*

- *A substantial fiscal stimulus program has been announced, which includes significant infrastructure spending and Kyushu earthquake recovery spending; though there was talk about helicopter money, the Bank of Japan is legally prohibited from outright "printing" of money and has taken few additional monetary policy easing steps*

- **India** should continue to experience relatively strong real GDP growth in a range of to 6.0% to 7.0% in 2016.

+ *GDP growth is expected to be 7.7%; IMF is forecasting 7.6%*

- **Emerging market countries** should experience better growth in 2016 than in 2015 when falling prices for commodities depressed economic activity in many countries.

- Declines in the prices of commodities and capital outflows depressed growth in most emerging market economies in 2016; however, easier U.S. monetary policy and rebounding prices of commodities averted a potential meltdown

- 2016 GDP forecast has been revised downward from 4.3% to 4.0% and is 2.7% if China is omitted

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

+ Economic and political conditions continue to deteriorate in all three countries; escalation of political tensions and the potential for social disruption is greatest in Venezuela; political stability may be re-emerging in Brazil with the impeachment and removal of President Dilma Rousseff

+ Russia's 2016 GDP forecast has been revised from -1.0% to -0.5%

+ Brazil's 2016 GDP forecast is -3.5%

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

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

+ Forecasts of actual 2016 growth have been reduced; lower than expected productivity, if sustained, will depress potential growth

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

- Employment growth over the first nine months of 2016 has been slightly above the upper end of the expected range

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

+ The participation rate has edged up slightly

- **U.S. hourly wage rate growth** falls from its 2015 level of 2.2% or rises much more rapidly than expected; falling wage growth is the more serious risk

- Risk not realized average hourly wages of all employees have risen slightly from 2.30% in December to 2.51% in September (12-month moving average); however, the rate of increase in weekly average wages has fallen from 2.42% in December to 2.11% in September as the length of the workweek has decreased; other measures of wages indicate a slight acceleration in the growth rate

- **U.S. Unemployment rate** falls less than expected

- Risk not realized, unemployment rate is slightly above the year-end expected range

- **U.S. productivity** remains below 1%

+ Productivity fell at an rate of -0.5% in the first half of 2016 and has fallen -0.5% over the last four quarters; little improvement over the remainder of 2016 seems likely

- **Real U.S. consumer income and spending** increase less or more than expected; less than expected increases are the more serious risks

+ Income is rising faster than forecast and spending is rising about as expected

- **U.S. stock prices** fall more than or rise more than the expected range of -5% to +5%

- Risk not realized; stock prices are up 4.8% year to date

? The Wilshire index of stock prices is 122% of nominal GDP, which is an extremely high level last experienced during the dot.com bubble peak in 2000, suggesting that stock prices are significantly overvalued

- **Growth in U.S. residential housing investment and housing starts** are less than or more than expected; below expectations is the more serious risk
 - + Housing investment growth is slightly below the expected range*
 - + Housing starts are rising much more slowly than expected*
- **U.S. residential housing price increases** are less than expected
 - Risk not realized; prices are rising faster than expected, although the rate of increase is expected to slow during the remainder of the year*
- **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 declined during the first half of 2016 and is expected to be negative for the entire year*
- **Oil price declines** that occurred in 2015 trigger bankruptcies and cause tighter financial conditions with negative implications for economic activity and growth
 - Early in the year it appeared that this risk might be realized; however, the rebound in the price of oil has delayed, perhaps prevented, realization of potential problems*
- **U.S. manufacturing growth** contracts or expands more than expected; contraction is the more serious risk
 - Risk not realized*
- **U.S. trade deficit** does not widen as expected
 - + Deficit has declined slightly*
- **Value of the dollar** rises substantially
 - Risk not realized; value of the dollar has declined slightly since December*
- **U.S. monetary policy** spawns financial market uncertainty and contributes to financial instability
 - Risk was realized briefly at the beginning of the year but has abated due to less aggressive monetary policy and a slightly weaker U.S. dollar; financial conditions tightened only modestly and temporarily following Brexit*
- **U.S. inflation** decelerates, rather than remaining stable or rising as expected
 - Risk not realized; inflation rising a bit more rapidly than expected*
- **U.S. interest rates** fall or rise more than expected
 - + Risk realized; rates have fallen much more than expected*
- **U.S. fiscal policy** is more expansionary than expected
 - Risk not realized — increase in spending about as expected*
- **Federal budget deficit** increases more than expected
 - Risk not realized deficit was slightly below the expected range*

- ***U.S. state and local spending*** does not rise as fast as expected
+ *Spending expected to increase below the bottom end of the forecast range*
- ***Global GDP growth*** does not rise as fast as expected
+ *Risk realized*
- ***European growth*** is considerably less than expected
+ *Risk realized — modest reduction in forecast growth*
- ***ECB's*** quantitative easing program is not successful in raising inflation and stimulating the European economy
+ *Risk realized — inflation forecast is 0.2% for 2016; IMF estimates a 35% probability that Europe is headed to deflation over the longer run*
- ***Europe*** — financial market turmoil reemerges
- *Risk realized temporarily early in the year; ECB's monetary policy has been successful in maintaining financial market stability; bank stocks have performed poorly relative to other industries, reflecting continuing investor concerns about profitability and problem loans; however, bank stock prices have rallied more recently based on speculation that the ECB will moderate its quantitative easing policy in 2017; markets appear to have taken the Brexit "Leave" vote in stride*
- ***Europe*** — political instability and social unrest rises more than expected threatening survival of the Eurozone and the European Union
+ *Risk realized — euro skeptic parties continue to gain ground and are forcing centrist parties to take policy positions that feed centrifugal forces eating away at the cohesion of the European Union*
- ***Chinese*** leaders have difficulty implementing ***economic reforms***
+ *Risk realized — reforms have been delayed in favor of economic stimulus implemented primarily through debt leverage via state-owned banks and the municipal bond market*
- ***China's growth*** slows more than expected
- *Risk not realized — policy makers are pulling out all the stops to hit the target growth rate; this will eventually backfire, but not during 2016*
- ***Japan*** — Abenomics and monetary policy are unsuccessful in raising inflation to the 2 percent target and economic growth continues to be below expectations
+ *Risk realized — yen has strengthened, profits are eroding, wage increases are being scaled back; a new major fiscal stimulus initiative has been announced*
- **New Risk** — ***Political risk is building in Russia as Putin's mandate frays***
- Severe and, of course, unexpected ***natural disasters*** occur, which negatively impact global growth
? *Consequences of Japan's Kyushu earthquake appears to have been confined to Japan*

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