SQUIRE PATTON BOGGS

Our Perspectives

Commentary on Economic and Regulatory Policies Affecting Financial Services Companies

The Longbrake Letter[1]

By Bill Longbrake

September, 2018

I. Tenth Anniversary of the Great Financial Crisis – Is a New GFC Near At Hand?

Is a new Great Financial Crisis (GFC) near at hand? In short, the answer is "No."

But, just because I don't expect a financial crisis of the sort that decimated global economies in 2008 to occur any time soon, that view does not extend to the possibility of recession in coming months.

To understand this seeming contradiction, it is important to explain the differences in recessions triggered by financial system meltdowns and recessions spawned by other kinds of economic excesses, such as overproduction relative to demand, or simply an overly tight monetary policy intended to tame inflationary pressures.

As I write this month's letter I am thinking about the failure of Washington Mutual, where I served as Chief Financial Officer until 2002, which occurred on September 25, 2008, a few days after Lehman's collapse. While the American Public is optimistic about the economy these days, and it's hard not to be, they remain deeply suspicious about Wall Street and the financial system. Concern about the possibility of another GFC is broadly shared.

But, today's financial system is very different in many ways from the one that existed prior to 2008 and fostered the GFC. Yet, some similarities remain.

While there were many causes of the GFC, exotic mortgage and derivative instruments, fair value accounting, securities fraud, inadequate capitalization to absorb losses, and lax supervision were among the more important ones. This was a toxic mix that enabled housing prices to inflate far beyond reasonable affordability.

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[1] The information contained in this newsletter does not constitute legal advice. This newsletter is intended for educational and informational purposes only. Bill Longbrake is an Executive in Residence at the Robert H. Smith School of Business, University of Maryland.

It was inevitable that prices would have to come back down and once this began to occur it was also inevitable that the most aggressive and overleveraged institutions would suffer catastrophic losses. And, indeed they did. It was like an avalanche crashing down a mountain side. It started in a small way but picked up momentum and grew larger and larger. What started with a purging of the weakest, spread to stronger institutions as confidence was decimated – Who can you trust? Who's next? Just get out quickly and ask questions later.

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What is different today? Importantly, the Dodd-Frank Act mandated much higher capital ratios and liquidity requirements. It increased the intensity of regulation of the mortgage and securities markets. Today's financial institutions are in a much better position to absorb losses. Underwriting standards remain extraordinarily conservative for home loans. Household debt-to-income ratios are much lower.

However, these safeguards have come with costs. For example, housing supply is too lean with the consequence that once again housing prices are rising much faster than incomes. Debt bubbles have developed in student loans, automobile loans and corporate debt. None of these, however, is of the order of magnitude of the housing debt bubble that precipitated the GFC.

What has not changed? Christopher Whalen argues that three significant issues, which were at the root of the GFC, remain unresolved.[2]

"*First was an odious public policy partnership … to enhance the availability of affordable housing via the use of creative financing techniques*." While technically speaking the fundamentals might not have been resolved, the current reality is that housing is quite unaffordable, and it is almost impossible to engage in creative financing.

"*Second, federal regulators have actively encouraged the rapid growth of over-the-counter derivatives and securities by all types of financial institutions*." This is certainly true and is helping underpin the longest bull market run in stock prices in U.S. history. But, it seems less broadly based than the housing bubble. And, does it involve the extensive fraud which permeated the mortgage and securities markets prior to the GFC? Perhaps … perhaps not.

[2] Whalen, R. Christopher. "Lehman Brothers and the Subprime Crisis Ten Years After," The IRA Bank Book, September 13, 2018.

"*And third, also bearing blame for the subprime crisis is the related embrace by the Securities and Exchange Commission and the Financial Accounting Standards Board of fair value accounting*." Whalen is talking about gain-on-sale accounting which results in capitalizing expected future cash flows and recognizing them immediately as income. This accounting rule encourages origination of long-dated assets, which collateralize asset-backed securities, often in excess of prudent levels. This is not a sizable issue any longer in the mortgage market, but it is still alive and well for student loans, auto loans and credit cards.

Whalen concludes that nothing has changed since 2008 and that just as occurred in the runup to the GFC crisis "… *we have convinced ourselves that everything is just fine*."

But, from my point of view today's market aberrations pale in magnitude compared to those that fostered the GFC. In short, while some of today's financial excesses will be purged during the next recession, a wholesale meltdown of the financial system is probably not likely.

Why is this important? As Kenneth Rogoff and Carmen Reinhart documented in their seminal treatise, "This Time is Different: Eight Centuries of Financial Folly," financial meltdowns destroy an average of 9 percent of real GDP per capita.[3] This is far greater than occurs in recessions that are not accompanied by financial system collapse. In addition, the time for the economy to recover following a financial system implosion is more than twice that following an average recession. The Reinharts opine: *"Financial crises do so much economic damage for a simple reason: they destroy a lot of wealth very fast.*" They explain that the extended length of recovery involves three stages. First, there needs to be acknowledgement that extensive wealth has been destroyed. This usually takes time. For example, U.S. housing prices continued to decline for many months after Lehman's bankruptcy. Second, policymakers need to determine who bears the losses. Often this involves shifting losses to the government. Bank bailouts are examples. In the U.S. this was accomplished through the much-maligned TARP (Troubled Asset Relief Program). The final step, is government actions to revive economic activity. On average governments have spent 25 percent of GDP on stimulating their economies after a financial system collapse. The Reinharts observe that while U.S. policymakers did respond the stimulus programs were inadequate and inefficient. The implication is that this extended recovery time.

[3] Reinhart, Carmen M. and Reinhart, Vincent R. "The Crisis Next Time, What We Should Have Learned From 2008," Foreign Affairs, September 13, 2018.

As to lessons learned, the Reinharts put one succinctly: *"First, authorities must follow the three-step process of dealing with a crisis – admit the losses, decide who should bear them, and fight the ensuing downturn – as quickly as possible. Delay allows problems to fester … increasing the ultimate cost of bailing out the financial system."*

In summary, while the likelihood of a near-term repeat of the GFC seems low, this does not mean that recession risk is also low. What it means is that when recession occurs, the amount of wealth destroyed will be considerably less and the time to recover should be much shorter.

What could trigger a recession in today's economy. In the ***June Longbrake Letter*** I cited a host of risks, including Italy, emerging markets, a global trade war, and excessively strong economic growth in the U.S. corralled by an overly tight monetary policy. I concluded that good times seem likely to prevail during 2018 and perhaps 2019, but in the interests of prudent risk my advice was to prepare for the possibility of recession in 2020 or possibly 2019. Increasingly, however, it looks like strong economic momentum will carry us through 2019 unscathed and perhaps through 2020 as well.

As is always the case, the future trajectory of the economy could change in ways that short-circuit the current good times or extend them. The benign outcome would be one in which fiscal stimulus prompts an investment boom which increases productivity and lifts the potential rate of growth substantially. This would reduce inflationary pressures and generate more tax revenues, which would make the burgeoning federal public debt more manageable. The less sanguine view is that the consequences of a collection of problems, coupled with well-intentioned but misguided policies, erupt sooner than later. In any event, we known from history that recessions inevitably occur when economies become overextended. It will be no different this time. It is only a matter of when, not whether.

II. Components of U.S. Real GDP

Growth in real GDP was 2.3 percent in the fourth quarter of 2017 and 2.3 percent in the first quarter of 2018. Although this seems weak, it was above the full-employment trend level. However, the effects of optimism and fiscal stimulus fully kicked in during the second quarter which registered 4.2 percent growth in the "Preliminary" estimate. Third quarter growth is on track to be between 3.0 and 4.0 percent, well above the potential growth rate. Assuming this occurs and given **CBO's** assumptions about the level of potential real GDP, the U.S. economy will be operating above full capacity for the first time since 2007.

Consumer and business confidence remains at multi-year highs, generating favorable economic momentum, which appears sufficient to guarantee good economic performance for several more quarters. However, there are a few pessimists beginning to surface who are expressing concerns about overheating, upside pressure on inflation, and the potential for tighter monetary policy and higher interest rates. While good times appear to be assured for the next 18 to 24 months because of substantial fiscal stimulus, worries are surfacing about what happens after that. Will growth slow gradually and dampen overheating – the proverbial soft landing? Or, will we face a classic end-of-cycle overshoot that will devolve into recession?

1. Data Revisions – GDP

Every year in conjunction with the release of the "Advance Estimate" of second quarter GDP, the Bureau of Economic Analysis (BEA) revises national income accounts data for the three previous years. However, every fifth year, BEA updates data methodologies and revises data from 1947 to the present.

Most of the changes in this year's 5-year comprehensive update were minor, as shown in **Table 1** and explained below. But there was one very important change involving measurement of income, which is shown in **Table 2,** which increased personal and disposal income and the saving rate by a considerable amount. In short, BEA found missing income almost all income categories.

Table 1 compares growth rates for key components of real GDP before and after the implementation of data revisions for the years 2011 to 2017. Differences also occurred for years prior to 2011, but they were generally smaller in magnitude.

Table 1

Old and Revised Real Growth Rates for Contributions to GDP: 2011 - 2017

		2011	2012	2013	2014	2015	2016	2017
Personal Consumption	Old	1.55%	.99%	1.00%	1.95%	2.47%	1.86%	1.89%
	New	1.29%	1.03%	.99%	1.97%	2.50%	1.85%	1.73%
Nonresidential Investment	Old	.92%	1.15%	.43%	.86%	.30%	-.08%	.58%
	New	1.00%	1.16%	.54%	.90%	.24%	.06%	.68%
Residential Investment	Old	.01%	.38%	.33%	.11%	.34%	.20%	.07%
	New	.00%	.31%	.34%	.12%	.33%	.23%	.13%
Inventories	Old	-.09%	.16%	.19%	-.07%	.23%	-.40%	-.11%
	New	-.05%	.17%	.23%	-.12%	.25%	-.53%	.00%
Net Exports	Old	.01%	.08%	.29%	-.16%	-.73%	-.23%	-.18%
	New	-.01%	.00%	.22%	-.25%	-.78%	-.30%	-.31%
Exports	Old	.87%	.44%	.47%	.58%	.05%	-.04%	.40%

	New	.90%	.46%	.48%	.58%	.08%	-.01%	.36%
Imports	Old	-.86%	-.35%	-.18%	-.74%	-.78%	-.19%	-.58%
	New	-.91%	-.46%	-.26%	-.83%	-.85%	-.28%	-.67%
Government	Old	**-.61%**	**-.36%**	**-.56%**	**-.12%**	**.25%**	**.13%**	**.02%**
	New	**-.66%**	**-.42%**	**-.47%**	**-.18%**	**.33%**	**.25%**	**-.01%**
Federal	Old	-.22%	-.15%	-.46%	-.18%	-.01%	.00%	.01%
	New	-.23%	-.16%	-.44%	-.19%	.00%	.03%	.05%
State & Local	Old	-.38%	-.21%	-.09%	.06%	.26%	.13%	.01%
	New	-.44%	-.26%	-.03%	.02%	.34%	.22%	-.06%
Total GDP	Old	**1.79%**	**2.59%**	**1.68%**	**2.57%**	**2.86%**	**1.48%**	**2.16%**
	New	**1.57%**	**2.31%**	**1.85%**	**2.44%**	**2.87%**	**1.56%**	**2.22%**
Final Sales	Old	**1.87%**	**2.75%**	**1.49%**	**2.64%**	**2.63%**	**1.88%**	**2.27%**
	New	**1.62%**	**2.48%**	**1.62%**	**2.56%**	**2.62%**	**2.09%**	**2.22%**
Private GDP	Old	**2.48%**	**3.11%**	**2.05%**	**2.76%**	**2.38%**	**1.75%**	**2.25%**
	New	**2.28%**	**2.85%**	**2.09%**	**2.74%**	**2.29%**	**1.84%**	**2.23%**
Private Domestic	Old	**2.47%**	**3.03%**	**1.76%**	**2.92%**	**3.11%**	**1.98%**	**2.43%**
	New	**2.29%**	**2.85%**	**1.87%**	**2.99%**	**3.07%**	**2.14%**	**2.54%**

Generally, changes were greater in 2011, 2012, and 2013 than in more recent years.

- **GDP**
  - **Total** – reduced by 20 to 30 basis points in 2011 and 2012; increased 17 basis points in 2013; single digit changes in 2014, 2015, 2016 and 2017
  - **Final Sales** – (eliminates the impact of changes in inventories); pattern of changes was similar to that for "Total" except 2017 where "Final Sales" was reduced by 5 basis points compared to an increase of 6 basis points in "Total"
  - **Private** – (eliminates the impact of changes in inventories and government investment spending); with the exception of 2013 (6 basis points reduction), revised contributions to real GDP from government spending were reduced, which resulted primarily from weaker state and local government spending growth
  - **Private Domestic** – (eliminates the impact of changes in inventories, government investment spending and net exports); with the exceptions of 2012 (22 basis points boost) and 2015 (7 basis points increase), revisions to net exports data reduced "Private Domestic" GDP
- **Consumption** – spending was weaker in 2011 (reduced by 26 basis points) and 2017 (decreased by 16 basis points) but only minor adjustments occurred in other years

- **Business Investment** – except for 2015 (reduced by 6 basis points), growth in business investment spending increased from 1 to 14 basis points in each year
- **Residential Investment** – change were generally small with growth a bit slower in 2011 and 2012 and slightly higher in 2016 and 2017
- **Inventories** – Inventory accumulation was generally greater except in 2014 (reduced by 5 basis points) and 2016 (decreased by 13 basis points)
- **Net Exports** – adjustments to net exports were more negative in every year; this was almost entirely due to increases in imports
- **Government** – changes in government spending were mixed and almost entirely due to adjustments in state and local government spending

2. Data Revisions – Income and Saving

Table 2 shows annual rates of change for personal income, disposable income and outlays before ("Old") and after ("New*) the data revisions. Table 2 also includes nominal income in trillions of dollars before and after the data revisions and the saving rate before and after.

Table 2

Old and Revised Data for Real Growth Rates in Personal Income, Disposable Income, Outlays and the Saving Rate: 2011 - 2017

		2011	2012	2013	2014	2015	2016	2017
Personal Income	Old	4.08%	3.03%	-.18%	3.72%	4.65%	1.21%	1.43%
	New	3.55%	3.16%	-.12%	4.15%	4.59%	1.49%	2.57%
Disposable Income	Old	1.67%	5.05%	-2.85%	4.94%	3.22%	.23%	1.88%
	New	1.56%	4.89%	-2.49%	5.15%	3.11%	1.59%	2.78%
Nom. Dis. Inc. (trillions $)	Old	11.99	13.02	12.58	13.36	13.80	14.04	14.61
	New	12.09	13.09	12.72	13.52	13.94	14.42	15.08
Pct. Increase		.83%	.54%	1.11%	1.20%	1.01%	2.71%	3.22%
Outlays	Old	1.35%	1.27%	1.97%	3.64%	3.02%	2.83%	2.92%
	New	1.09%	1.49%	1.78%	3.91%	3.13%	2.68%	2.83%
Saving Rate	Old	6.02%	7.63%	5.00%	5.67%	6.08%	4.87%	3.39%
	New	7.16%	8.86%	6.41%	7.35%	7.58%	6.69%	6.67%

Nominal disposable income increased by an enormous $470 billion, or 3.22 percent, in 2017. Since there was very little change in outlays, almost all of this increase raised saving. The saving rate rose from 3.39 percent to 6.67 percent. Disposable

income and the saving rate also increased substantially in 2016 and to a lesser extent in prior years.

Because of the substantial additions to income in 2016 and 2017, growth rates in personal income and disposable income in both of those years rose substantially, moderating the slowing growth pattern evident in the unrevised data and eliminating the precipitous decline in the saving rate.

Overall, these data revisions tell a good story which is consistent with strong employment growth and moderate growth in consumer credit.

3. "Preliminary Estimate" of Second Quarter GDP

The "**Preliminary Estimate**" of second quarter GDP growth increased 17 basis points from the "**Advance Estimate**" to 4.2 percent. Growth in **"Private Domestic"** GDP, which eliminates inventories, net exports and government spending, was virtually unchanged at 3.62 percent. Slower growth in personal consumption was more than offset by increases in business investment, exports, and government spending.

Details are shown in **Table 3.** The bottom four panels of **Table 3** show different measures of real GDP growth. These include the traditional "**Total GDP**" measure, and three alternatives – "**Final Sales**," "**Private**," and "**Private Domestic**."

Table 3

Composition of 2018 and 2017 Quarterly GDP Growth

	Second Quarter 2018 Advance Estimate	Second Quarter 2018 Preliminary Estimate	Second Quarter 2018 Final Estimate	First Quarter 2018	Fourth Quarter 2017	Third Quarter 2017	Second Quarter 2017
Personal Consumption	2.69%	2.55%		.36%	2.64%	1.52%	1.95%
Private Investment							
Nonresidential	.98%	1.13%		1.47%	.63%	.45%	.94%
Residential	-.04%	-.06%		-.14%	.41%	-.02%	-.22%
Inventories	-1.00%	-.97%		.27%	-.91%	1.04%	.23%
Net Exports	1.06%	1.17%		-.02%	-.89%	.01%	.08%
Government	.37%	.41%		.27%	.41%	-.18%	.01%
Total	**4.06%**	**4.23%**		**2.31%**	**2.29%**	**2.82%**	**2.99%**
Final Sales	**5.06%**	**5.20%**		**2.04%**	**3.20%**	**1.78%**	**2.76%**
Private	**4.69%**	**4.79%**		**1.77%**	**2.79%**	**1.96%**	**2.75%**
Private Domestic	**3.63%**	**3.62%**		**1.79%**	**3.68%**	**1.95%**	**2.67%**

Reported quarterly "**Total GDP**" growth tends to be highly variable because of volatility in various GDP components, especially inventories, and the methodology of annualizing quarterly growth rates which amplifies the impact of short-term aberrations in the growth of individual GDP components. "**Total GDP**" grew 4.23 percent in the second quarter "**Preliminary Estimate,**" the fastest rate since the third quarter of 2014.

Because growth in "**Total GDP**" is volatile from quarter to quarter, this measure is an unreliable indicator of economic strength. Alternative GDP measures strip away the noisier quarterly components and often provide a better sense of economic strength. The "**Final Sales**" measure of real GDP removes the contribution of changes in inventories, which is very volatile from quarter to quarter. "**Final Sales**" grew a robust 5.20 percent in the second quarter.

"**Private**" GDP omits both inventory changes and government investment spending. Growth in government expenditures typically rises during periods of economic weakness or when Congress increases spending, such as is currently the case, and falls during periods of economic strength or when fiscal austerity is the order of the day. **"Private"** GDP grew 4.79 percent in the second quarter.

In my opinion, "**Private Domestic**" GDP is the best quarterly measure of fundamental economic momentum. It omits inventory changes, government spending and net exports. This measure gives the truest picture of the performance of the core of the U.S. economy, which accounts for approximately 87 percent to "**Total GDP**." Annualized quarterly growth rates of this measure are generally, but not always, less volatile. This measure grew 3.62 percent in the second quarter.

But, while the four alternative measures of real GDP growth provide some context to the factors driving growth, the annualization of quarterly data amplifies statistical errors and timing anomalies, which makes it difficult to discern underlying trends.

4. Growth Rates of Real GDP Components – 4-Quarter Moving Average

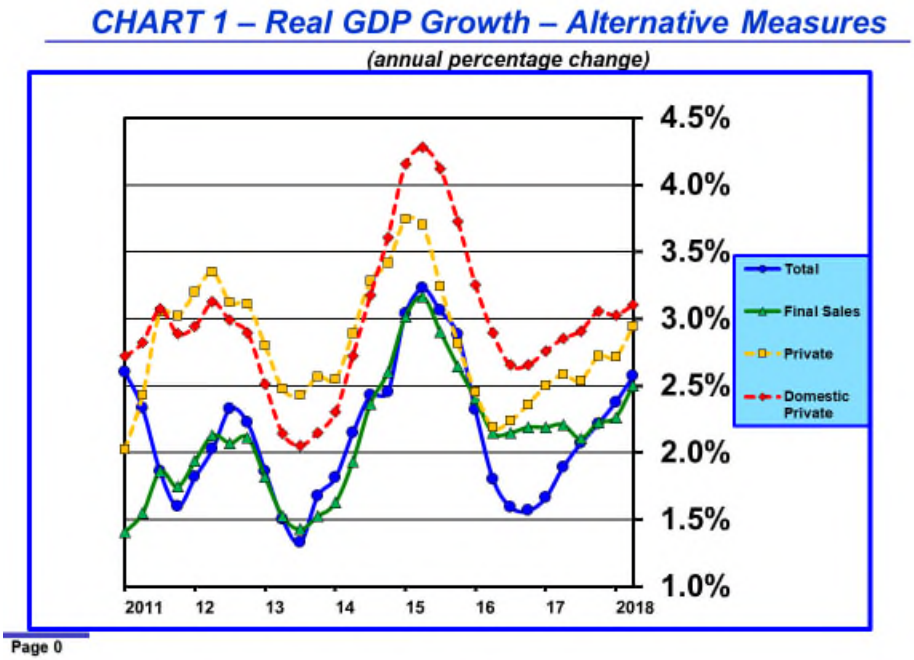
Annualized quarterly data are often misleading about the underlying trends in economic growth. **Table 4** and **Chart 1** show four-quarter moving averages of growth rates for GDP components as well as the four alternative measures of real GDP. This smooths out quarterly aberrations in the data and gives a clearer picture of the health and direction of the economy.

Table 4
Year-Over-Year Growth Rates for Components of Real GDP

	GDP Com-	Second Quarter	First Quarter	Fourth Quarter	Third Quarter	Second Quarter	First Quarter	Fourth Quarter

	ponent Weight	2018	2018	2017	2017	2017	2017	2016
Personal Consumption	69.49%	2.51%	2.48%	2.53%	2.55%	2.63%	2.70%	2.74%
Private Investment	17.94%							
Nonresidential	14.34%	6.28%	5.84%	5.26%	4.14%	3.07%	1.71%	.48%
Residential	3.35%	2.06%	2.42%	3.34%	3.50%	3.75%	4.88%	6.48%
Inventories	.11%	143.2%	203.7%	-3.7%	-17.3%	-87.2%	-89.9%	-81.9%
Net Exports	-4.77%	6.03%	8.68%	9.21%	9.93%	7.94%	7.70%	8.47%
Exports	13.72%	4.19%	3.45%	3.02%	2.05%	1.82%	.83%	-.10%
Imports	-18.49%	4.66%	4.76%	4.56%	3.97%	3.31%	2.47%	1.90%
Government	17.20%	.44%	.14%	-.07%	.12%	.49%	.78%	1.42%
Total	**100.0%**	**2.57%**	**2.38%**	**2.22%**	**2.07%**	**1.87%**	**1.66%**	**1.57%**
Final Sales	**99.89%**	**2.50%**	**2.26%**	**2.22%**	**2.11%**	**2.21%**	**2.19%**	**2.19%**
Private	**82.69%**	**2.94%**	**2.72%**	**2.72%**	**2.54%**	**2.59%**	**2.50%**	**2.36%**
Private Domestic	**87.46%**	**3.11%**	**3.03%**	**3.05%**	**2.91%**	**2.86%**	**2.76%**	**2.66%**

Growth in "**Private Domestic**" GDP has been consistently greater than growth in "**Total GDP**" for several years. Moreover, this GDP measure has been trending upward steadily over the past seven quarters. This has also been the case for "**Private**" GDP. Since the fourth quarter of 2014, growth in "**Domestic Private**" GDP has been stronger than growth in "**Private**" GDP. This means that trade has had an unfavorable impact on GDP growth over the past three and a half years.



Since 2015 fiscal policy has been mildly supportive of "**Total GDP**" growth. In recent quarters government's contribution to real GDP growth has been small, which has reduced the growth rate in "**Total GDP**" relative to "**Private**" GDP. Government spending boosted "**Total GDP**" growth by 27 basis points in the first quarter and 37 basis points in the second quarter. The government's contribution should increase further in 2018 and 2019 as federal spending (not including transfer payments which are not counted in the government sector of GDP) ramps up.

There are some important takeaways from **Chart 1.** First, all four measures of real GDP growth troughed in the fourth quarter of 2016 and have risen gradually since then, reflecting accelerating growth momentum. Second, "**Private**" GDP, which omits government spending and inventory accumulation, and "**Private Domestic**" GDP, which omits government spending, inventory accumulation and net exports, have been growing more rapidly than "**Total GDP**" and "**Final Sales.**" What this means is that growth in the core of the U.S. has been stronger than reflected in the measure of **"Total GDP."**

5. Consumption and Disposable Income

Consumer spending contributed 2.55 percent to second quarter real GDP growth compared to 0.36 percent in the first quarter and 2.64 percent in the fourth quarter. However, the four-quarter trend in consumer spending edged has been relatively stable over the past several quarters, ranging between 2.48 percent and 2.74 percent, which underscores the limitations of relying on annualized quarterly data to discern trends.

In the long run, growth in nominal disposable income and consumer saving preferences determine growth in nominal personal consumption. Growth in nominal disposable income, in turn, depends upon a lot of things but the most important ones are growth in employment and wage rates. Tepid growth in employment and lethargic growth in wage rates will result in slow growth in disposable income. In recent months employment growth has been quite strong, but wage growth, while lackluster, has been improving.

Chart 2 shows annual rates of growth in real disposable income and real consumer spending from 2000 through the second quarter of 2018. The negative impact of the Great Recession on both disposable income and consumption growth is clear in **Chart 2**. So, too, is the temporary depressing effect of the Obama tax increases on disposable income growth in 2012 but not on consumption growth. The mystery of weak growth in disposable income has been solved by data revisions which substantially increased disposable income over the past three years.

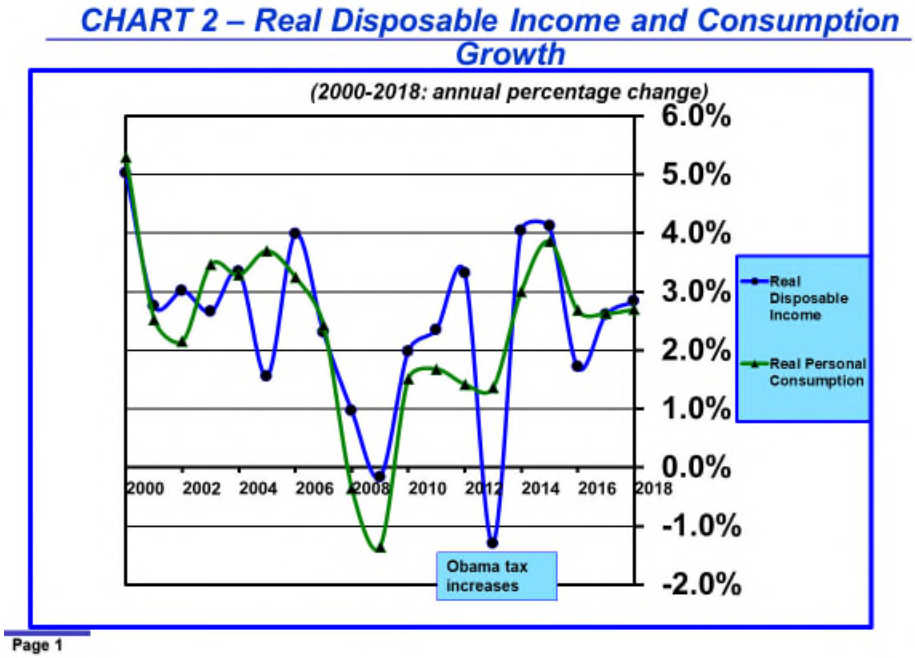
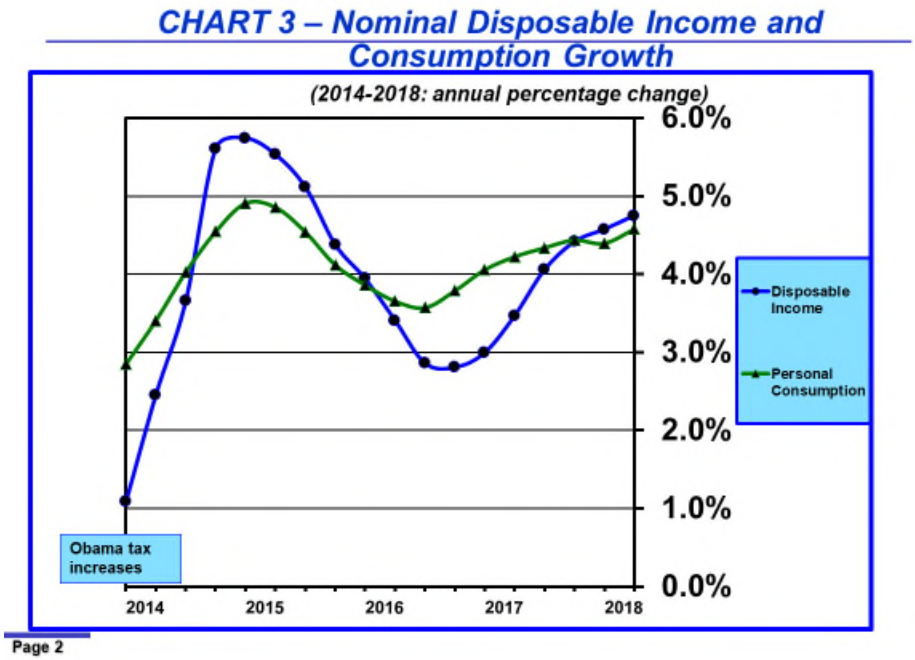


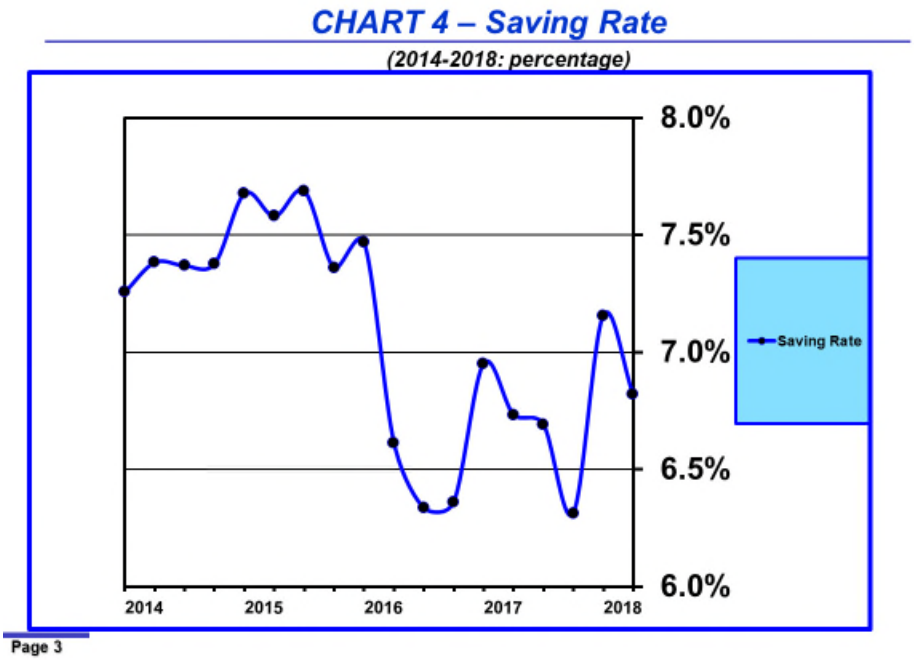
Chart 3 shows the 4-quarter moving average growth rates in nominal disposable income and consumption from 2014 through the second quarter of 2018. As can be seen in **Chart 3**, nominal disposable income growth rose 4.41 percent in the fourth quarter, 4.57 percent in the first quarter,4.75 percent in the second quarter and 4.82 percent over the 12 months from July 2017 to July 2018. This improving trend will continue in 2018 and will benefit from strong gains in employment, rising wage rates and tax cuts.



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

As is evident in **Chart 4**, consumer spending has been trending higher over the ast two years. Growth in nominal disposable income, which faltered in 2015 and early 2016, has recovered nicely in the last few quarters and is now fully supporting the upward trend in consumption.

Since the election of President Trump, consumer and business confidence has surged to the highest levels in 20 years. Over the same time, consumption and income growth have accelerated. Tax cuts, relatively strong employment growth in the next few months and acceleration in wage growth are likely to boost income growth in coming months and will either be spent or saved.



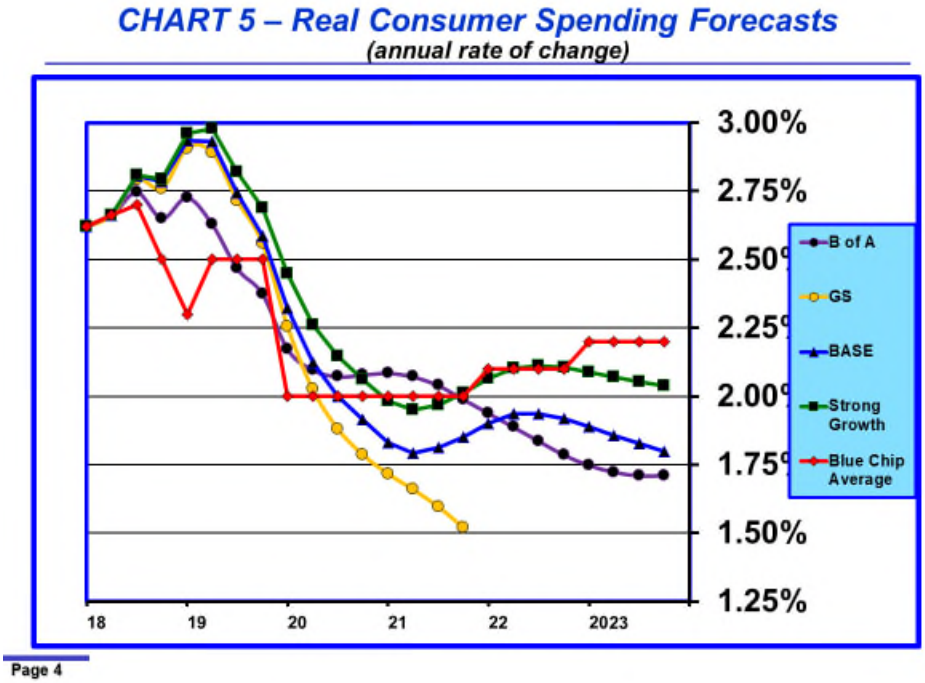
However, beyond the next few quarters, the outlook for consumer spending growth is not a happy one. Forecasts of growth in real consumer spending over the next several years are shown in **Table 5** and **Chart 5.** Real consumer spending increased 2.68 percent in 2016 and 2.63 percent in 2017. These are not the final numbers as several more revisions will occur over the next few years.

Table 5
Real Personal Consumption Growth Rate Forecasts

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actual	3.86	2.68	2.63						
B of A				2.65	2.38	2.08	1.99	1.79	1.71
GS				2.76	2.56	1.79	1.52		
IHS Markit				2.50	2.50	2.30	2.40	2.40	2.20
Economy.com				2.50	2.40	0.90			
Blue Chip				2.60	2.50	2.00	2.00	2.10	2.20
Bill's BASE				**2.78**	**2.59**	**1.91**	**1.85**	**1.92**	**1.80**
Bill's Strong Growth				**2.80**	**2.69**	**2.06**	**2.01**	**2.10**	**2.04**

Following continued strong growth in 2018, forecasters expect real consumer spending growth to slow in coming years because the economy is above full employment and employment growth is set to slow in coming quarters in response to the underlying demographic dynamics of aging and slowing population growth.

Fiscal stimulus will delay development of this trend for at least another year and possibly two.



This slowing pattern in consumer spending growth is apparent in the data in **Table 3** and **Chart 5.** Growth in real wages might moderate the forecast decline in consumer spending growth, but only if the growth rate in real wages increases more than most expect. That would require productivity to improve from its recent very low level, which would be a welcome result, but is not at all assured.

From 2018 to 2021 my "**BASE**" scenario forecast differs little from most others. In 2022 and 2023 my forecasts are a little higher than **B of A's** but a little lower than the **Blue Chip** average. **GS** is clearly much more pessimistic beginning in 2020. **GS's** below consensus forecast of consumer spending growth in 2020 and 2021 is consistent with its below consensus projection of real GDP growth in those years.

6. Business Investment

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

Table 6 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 2016 by the collapse in oil and commodity prices. But business investment was down in other sectors as well. Investment growth was aa meager 0.48 percent in 2016.

Nonresidential investment came out of deep slumber in 2017, rising at an annual rate of 5.26 percent. A recovery in energy investment accounted for much of this surge. Capital investment growth in sectors other than energy and oil also improved. Considering the acceleration in global growth and the tightening U.S. labor market, the improvement in growth in investment spending in 2017, although strong, was somewhat disappointing. However, this is expected to change in 2018 and 2019 due to tax breaks contained in the Tax Cuts and Jobs Act, which are intended to stimulate investment.

Table 6

Real Private Investment (Residential and Nonresidential) Growth Rate Forecasts

	2015	2016	2017	2018	2019	2020	2021	2022	Ave. 1947-2018
REAL PRIVATE INVESTMENT									
Actual	4.61	-1.89	4.82						**3.87****
B of A				5.68	5.28	3.61	3.61	3.19	
GS				5.41	3.68	3.00	2.89		
Bill's BASE				**6.06**	**4.64**	**2.05**	**1.13**	**1.92**	
Bill's Strong Growth				**6.26**	**5.14**	**2.29**	**1.84**	**2.23**	
REAL NONRESIDENTIAL (BUSINESS) INVESTMENT									
Actual	1.80	0.48	5.26						**3.27***
B of A				7.34	4.57	3.74	3.74	3.22	
GS				6.93	4.12	3.37	3.21		
REAL RESIDENTIAL INVESTMENT									
Actual	10.15	6.48	3.34						**-0.09***
B of A				.83	2.61	3.03	3.03	3.03	
GS				-.10	.59	1.64	1.62		

*Average 1999-2018

**Real private investment = 2.20% for 1999-2018

Indeed, right on schedule business investment grew at an annualized rate of 9.8 percent during the first half of 2018. **GS** and **B of A** have raised their full-year forecasts for 2018 to a range of 6.9 to 7.3 percent.

Forecasters expect **real private investment** growth will be well above the2.20 percent average of the last 20 years in 2018, 2019, 2020, and 2021. Strong growth is supported by **GS's** capital expenditures tracker, which has risen in recent months and registered an above trend level of approximately 9.0 percent in August. **GS** expects easy financial conditions and strong domestic demand, as implied by purchasing manager surveys, to make 2018 a very good year. With the passage of tax reform, as the **GS** capital expenditures tracker is signaling, risks are now tilted in the direction of strong business investment growth in 2018 and 2019.

Generally, in recent years, analyst forecasts of growth in business investment have been too optimistic. For the next few months the risk might shift in the other direction – the forecasts may not be high enough. Sky-high business optimism, as reflected in the NFIB survey, tight labor markets, and tax incentives could well drive an investment boom. Several features of tax reform are intended to boost business investment, so the optimistic forecasts might come to pass this time or even prove not to be optimistic enough. Indeed, business investment spending so far in 2018 suggests that forecasts might be exceeded in 2018.

Following 2018 and over the next several years **GS** and B of A expect **business investment** to slow gradually to the long-term trend growth of 3.27 percent that has prevailed over the last 20 years.

B of A and **GS** are optimistic about the outlook for business investment growth to remain at a high level over the next several years because they expect corporate profits to remain strong, credit conditions to be benign and uncertainty to diminish. The benefits of tax reform must now be added to those positive drivers. A potential weakness in **B of A's** business investment model is the possibility of cumulative negative effects over time of low interest rates and depressed innovation, as reflected in a slower rate of new business formation. Also, Federal Reserve capacity utilization data indicate that firms are still operating at less than full capacity. This could weaken the incentive to invest, particularly if business optimism fades.

Housing – Real residential investment growth has been weak in recent quarters despite lean housing inventories, rising prices, and relatively strong demand. Annualized growth was negative -2.6 percent during the first half of 2018, which followed modest growth of 3.34 percent in 2017. Housing investment growth has been decelerating since 2015. This evolving weakness in housing construction has contributed to a supply shortage and to above trend increases in housing prices.

Outsized housing price increases, which are exceeding growth in wages and nominal disposable income, will eventually dampen single-family residential demand and inventories should improve with the consequence that residential investment growth should remain slow. Higher interest rates have contributed to the decline in housing investment growth and higher mortgage rates will dampen housing demand. Forecasts generally reflect this scenario.

Housing starts are still historically low relative to family formation rates. The long-term trend rate in housing starts should be about 1.4 million (household formation rose at annual rates of 1.44 million in the fourth quarter of 2017, 1.06 million in the first quarter of 2018 and 1.67 million in the second quarter) based upon growth in household formation and replacement of existing homes.. But, starts were 1.21 million in 2017, up 2.8 percent from 1.18 million in 2016.

Over the first eight months of 2018 housing starts averaged 1.27 million, which was an increase of 6.3 percent from the first eight months of 2017.

B of A expects housing starts will be 1.27 million in 2018 because of lower than expected activity in multifamily housing construction**. GS's** forecast is similar – 1.27 million in 2018.

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

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

In summary, housing demand is depressed relative to demographics and historical trends in household formation and supply is weak. Overall housing inventory is very lean. In response, average housing prices have been rising faster than growth in nominal incomes. All else equal, this creates a feedback loop which depresses demand. Ordinarily, this would be offset by increased construction. But in the wake of the Great Recession's cataclysmic impact on builders and lenders, increased construction activity has been constrained. Now higher interest rates and labor shortages and higher materials costs are contributing to housing's malaise.

Housing prices continue to rise faster than gains income. Prices were up 6.2 percent (S&P CoreLogic Case-Shiller National Home Price Index) in June over the prior year; the Federal Housing Finance Agency's purchase only housing price index was up 6.9 percent in the first quarter of 2018 compared to the first quarter of 2017 and up 6.5 percent in the second quarter. These increases are well above the 4.8 percent growth in aggregate nominal disposable income and 4.0 percent growth in per capita nominal disposable income over the past 12 months. This differential, along with rising interest rates, is eroding affordability and, thus, is not sustainable over the long run. Any further increases in mortgage rates will simply make matters worse.

In summary, residential investment growth, which rose 3.3 percent in 2017, will continue to be weak in coming quarters because of continuing tight credit standards, higher housing prices and somewhat higher mortgage interest rates. Both **B of A's** 0.8 percent and **GS's** -0.1 percent modest forecasts of housing investment growth in 2018, which have been lowered since the beginning of the year, may yet prove to be optimistic.

7. Change in Inventories

Contributions to quarterly real GDP growth are highly volatile and frequently subject to large adjustments. The volatility and pattern of very large adjustments can be seen in **Table 7**. The five-year comprehensive revision of National Income Accounts data this year added substantially on average to inventory accumulation over the past several years. The average quarterly accumulation rate rose over the past 20 years rose approximately $11 billion to $50 billion in the most recent quarter.

Inventories subtracted 0.97 percent from "**Total GDP**" growth in the second quarter of 2018; added 0.27 percent in the first quarter of 2018; subtracted 0.91 in the fourth quarter of 2017; and added 1.04 percent in the third quarter of 2017 (see **Table 3**). Because quarterly changes in inventories are very volatile and subject to substantial revisions, this skews interpretation of quarterly "**Total GDP**" data. However, a four-quarter moving average eliminates much of the quarterly oscillations and indicates that inventory accumulation has added about 0.11 percent to real "**Total GDP**" growth over the last four quarters, which is close to its long-term contribution.

Inventories generally add between 0.1 and 0.2 percent to annual real GDP growth. The recent four-quarter average is low relative to the historical range, adding 11 basis points to real GDP growth. Accumulation in the first quarter was $30.3 billion, which was below the long-term trend level of $49.3 billion. The change in inventories during the second quarter was -$26.9 billion.

As can be seen in **Table 7,** initial inventory data are rough estimates and are subject to substantial revision over the next three years. This year's five-year revision resulted in further substantial changes to inventory accumulation. The -$26.9 billion inventory deaccumulation in the second quarter "**Preliminary Estimate**" will be revised four more times in the next three years and then again five years from now.

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.

Table 7
Quarterly Real Inventory Data
(*most recent data are in red*)

	Advance Estimate	Pre-liminary Estimate	Final Estimate	First Annual Revision	Second Annual Revision	Third Annual Revision	5-Year Bench-mark
2018 Q2	-27.9	-26.9					
2018 Q1	33.1	20.2	30.3				
2017 Q4	9.2	8.0	15.6	16.1			
2017 Q3	35.8	39.0	38.5	64.4			
2017 Q2	-.3	1.8	5.5	11.9			
2017 Q1	10.3	4.3	2.6	1.2	-2.4		
2016 Q4	48.7	46.2	49.6	63.1	39.1		
2016 Q3	12.6	7.6	7.1	17.0	-14.1		
2016 Q2	-8.1	-12.4	-9.5	12.2	17.8		
2016 Q1	60.9	69.6	68.3	40.7	40.6	50.7	
2015 Q4	68.6	81.7	78.3	56.9	68.2	82.3	
2015 Q3	56.8	90.2	85.5	70.9	96.2	117.6	
2015 Q2	110.0	121.1	113.5	93.8	105.6	149.8	
2015 Q1	110.3	95.0	99.5	112.8	114.4	132.2	166.4
2014 Q4	113.1	88.4	80.0	78.2	76.9	76.9	75.1
2014 Q3	62.8	79.1	82.2	79.9	66.8	85.6	102.8
2014 Q2	93.4	83.9	84.8	77.1	55.2	69.9	103.8
2014 Q1	87.4	49.0	45.9	35.2	36.9	38.7	64.8
2013 Q4	127.2	117.4	111.7	81.8	87.2	103.6	120.0
2013 Q3	86.0	116.5	115.7	95.6	93.6	109.0	147.6
2013 Q2	56.7	62.6	56.6	43.4	39.6	52.6	85.8

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 3** and **4.**

Another method that helps give a better sense of the underlying trend in real GDP growth is to focus on year-over-year growth rates, which are calculated by dividing the average of the most recent four quarters by the average of the preceding four quarters. The result of that calculation methodology can be seen in **Table 3** by comparing the growth rates in "**Total GDP**" and "**Final Sales**." Quarterly data volatility in growth rates largely disappears – the impact of inventories on "**Total GDP**" growth is very small and the growth trends in "**Total GDP**" and "**Final Sales**" are similar.

8. Government Investment

Government investment subtracted a barely discernible -0.06 percent from real GDP growth in 2017 (see **Tables 3** and **8**). Federal government spending rose at an annual rate of 0.72 percent and state and local spending contracted -0.54 percent.

Government investment spending grew at an annual rate of 1.96 percent in the first half of 2018; federal spending was up 3.15 percent, reflecting the initial impact of spending stimulus authorized by Congress early in the year; state and local spending increased 1.21 percent. Since the full impact of federal fiscal stimulus has not yet taken hold, it could turn out that **GS's** full-year growth estimate of 1.80 percent and **B of A's** estimate of 1.74 percent will turn out to be too low.

Table 8

Federal and State and Local Investment Spending Growth Rates

	2015	2016	2017	2018	2019	2020	2021	2022
Federal	-0.01	0.41	0.72					
State and Local	3.02	2.04	-0.54					
Total Government	1.84	1.42	-0.06					
GS Federal				3.54	6.46	3.47	0.94	
GS State and Local				0.72	0.81	0.12	0.04	
GS Total				1.80	3.01	1.47	0.41	
B of A Total				1.74	2.45			
BASE				1.47	1.70	1.29	1.15	1.00
Strong Employment				1.47	1.70	1.30	1.30	1.31

Table 8 shows recent growth rates in government spending and forecasts for 2018-2022. **GS** and **B of A** expect strong growth in government investment spending in 2018 and 2019. The substantial increase in growth is due almost entirely to federal spending. Given customary delays in actual federal spending, I am a bit more cautious and expect growth to be 1.5 percent in 2018 and 1.7 percent in 2019 and

then slow after 2019, but not to as great an extent as **GS** is forecasting. Compared to **GS** and **B of A** and strong growth in the first half of 2018, it appears that my estimates of 1.5 percent growth in 2018 and 1.7 percent in 2019 might be too conservative.

9. Net Exports

In the "**Preliminary Estimate**" for the second quarter of 2018 net exports added 1.17 percent to second quarter real GDP (see **Table 3**). The four-quarter moving average in **Table 4** indicates that growth in net exports has been positive over the past few quarters. But, because the volume of imports greatly exceeds the volume of exports, that is, net exports are negative, positive growth in net exports means that net exports are reducing real "**Total GDP**" growth. This can be seen in **Table 3** by comparing growth rates in "**Private**" and "**Private Domestic**" real GDP.

Since the end of 2016 the trade deficit in goods and services has risen from 2.65 percent of nominal GDP to 2.78 percent in July 2018. The shares of both imports and exports, which are offsetting components of GDP, have increased over the past 19 months. Exports of goods have increased from 7.82 percent to 8.28 percent of GDP and imports of goods have risen from 11.84 percent to 12.52 percent of GDP.

These trends should continue provided the dollar weakens and consumer spending remains robust. Exports should also continue to do well because of strong global demand. However, the dollar has strengthened slightly since the beginning of the year and global growth appears to have peaked. These developments coupled with the Trump Administration's implementation of tariffs could lead to a reversal in these trends in coming months. In any event, the increase in the dollar amount of imports will continue to overwhelm the increase in the dollar amount of exports which should drive the trade deficit higher. Consequently, I expect the trade deficit in goods and services will rise somewhat more during the remainder of 2018.

Trade trends could be impacted negatively by tariffs. The Trump Administration imposed tariffs on steel and aluminum imports and has implemented substantial tariffs on goods imported from China. Threats to impose tariffs on automobiles and other goods now seems unlikely. Tariffs will reduce imports by shifting some demand to domestically-produced substitutes. Tariffs will also add to inflationary pressures. Furthermore, if affected nations adopt retaliatory tariffs on U.S. exports, as China has done, growth in exports should decline and might even become negative. It is not clear that an all-out trade war would reduce the size of the U.S. trade deficit. What it would do, however, is to slow global trade and weigh on global economic activity. It is this potential that has worried the stock market from time to time in recent months. While most experts believe tariffs will have negative

consequences for growth and inflation over the long run, short-run impacts are unclear. So, while investors are worried, there has not been much market impact. This cannot be said about the Chinese stock market, which is a bear market.

There is another reason that the trade deficit is likely to rise over the next few quarters. Increases in the federal deficit must be funded by a combination of greater consumer or business saving or by increases in foreign capital inflows. Business cash flows customarily are negative in the mature phase of the economic cycle. Consumer saving has been relatively strong but is not increasing. This leaves only foreign capital inflows to fund increases in the federal deficit. But foreign countries can obtain additional dollars only if the U.S. imports more than it exports. Perhaps you have heard of the phrase “twin deficits.” That term refers to the federal budget deficit and the current accounts deficit, of which the trade deficit is the primary component. While the relationship between the two deficits is not exact, an increase in the size of the federal budget deficit is typically followed several quarters later by an increase in the trade deficit.

10. Second and Third Quarter and Full-Year 2018 GDP Forecasts

B of A’s current second quarter “**Final**” real GDP forecast is 4.4 percent, an increase of 0.2% from the “**Preliminary**” estimate. **GS** expects no change.

B of A’s third quarter real GDP forecast is 3.7 percent and **GS’s** is 3.3 percent. For the full year, both **B of A** and **GS** expect growth to be a very strong 2.9 percent.

11. Longer-Term Real GDP Forecasts

Chart 6 shows quarterly real GDP growth projections from the first quarter of 2018 to the fourth quarter of 2023. **Table 9** includes annual real GDP growth for 2015-17 and forecasts for 2018 to 2023. Forecasts for 2018 range from 2.7 percent (my “**BASE** and “**STRONG GROWTH**” scenarios) to 3.0 percent (**CBO and Economy.com**). Except for **CBO**, forecasts for 2019 are tightly clustered in a range of 2.4% to 2.7%.

All forecasters expect real GDP growth to slow considerably in 2020 after the impact of the massive federal fiscal stimulus wears off. **Economy.com** is especially pessimistic, perhaps because it believes monetary policy will end up having a dramatic negative impact on growth. Forecasters almost never foresee a recession until it is well underway. And, the **FOMC** has never forecast a recession – it is politically impossible to do so.

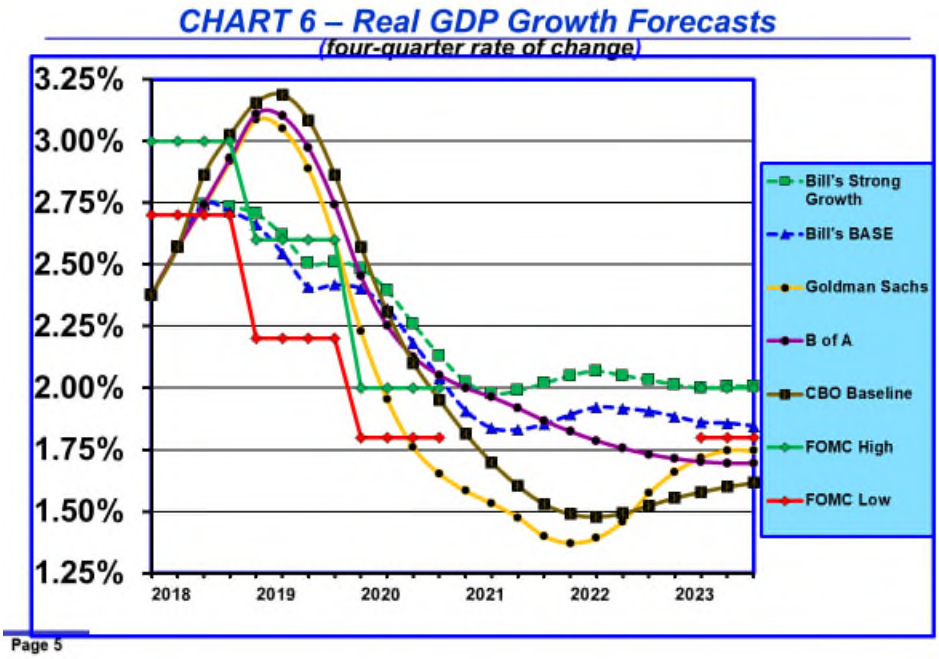
Table 9

Real GDP Growth Forecasts

(year-over-year average)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actual	2.88	1.57	2.22						
B of A				2.93	2.74	2.05	1.87	1.73	1.70
GS				2.92	2.60	1.65	1.40	1.57	1.75
IHS Markit				2.90	2.70	1.90	1.60	1.80	1.70
Economy.com				3.00	2.70	0.90			
Blue Chip Average				2.90	2.60	1.90	1.90	2.10	2.10
CBO				3.03	2.86	1.95	1.53	1.52	1.62
FOMC High*				3.00	2.60	2.10			
FOMC Low*				2.60	2.20	1.80			
Bill's BASE				2.71	2.42	2.04	1.85	1.91	1.85
Bill's Strong Growth				2.73	2.51	2.13	2.02	2.03	2.01

*Q4 to Q4 – sensitive to specific Q4 values and may diverge from year-over-year trend.



However, because fiscal stimulus comes at a time when the economy is already operating above full employment, monetary policy will be very challenged to engineer a soft landing. The risk of recession in 2020 is significant but not certain.

B of A observes that recession risks will increase in 2020 for three reasons: 1) the favorable effects of fiscal stimulus will fade, 2) global economic risks stemming from Brexit, Italian populist economic policies, and Japanese fiscal policy could have negative impacts by late 2019, and 3) the ability of policymakers to mitigate the consequences of economic and financial market shocks will be limited by large debt to GDP ratios, substantial budget deficits and very low interest rates. **B of A** advises watchfulness on two it characterizes as "traditional business cycle killers," tight U.S. monetary policy and high oil prices.

While recession risks are likely to rise by 2020, most forecasters expect real GDP growth to track long-term potential, which most believe is in a range of 1.75 to 2.00 percent. Note that **CBO** forecasts growth in 2021 and 2022 to be below potential, which is an assumption necessary to eliminate the positive output gap that builds up during 2018, 2019, and 2020.

III. U.S. Employment Developments

Payroll employment growth averaged 206,750 monthly over the first eight months of 2018, well above 2017's monthly average of 182,333. Hiring remains brisk and well above the natural increase in labor supply, which is growing about 100,000 monthly or perhaps as much as 130,000 on a short-run basis, if discouraged workers are returning to the labor force, as seems likely since the participation rate has been stronger than expected. Another indicator is that disability filings has dropped considerably.

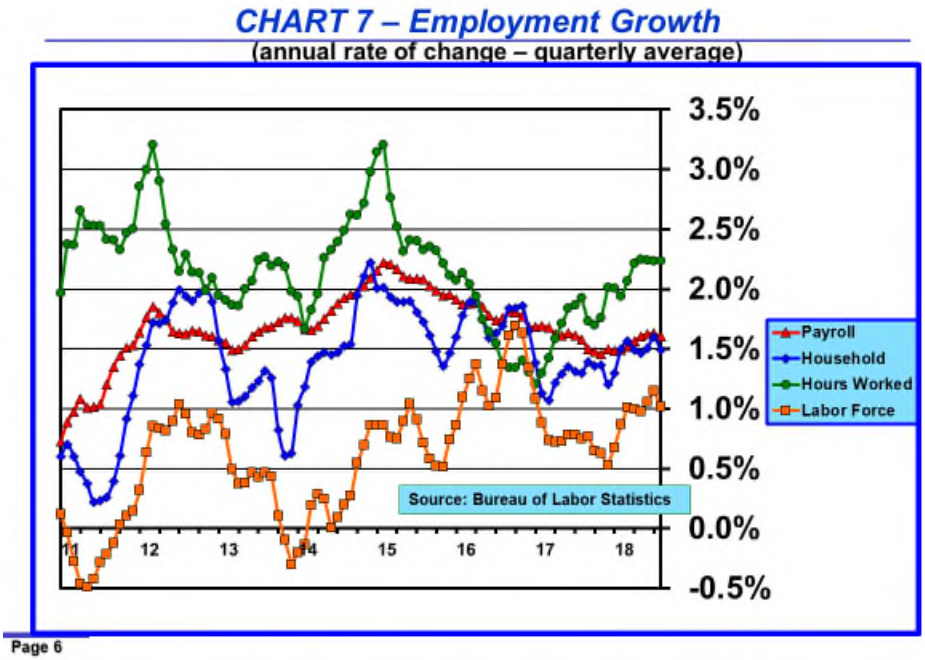
Nevertheless, the labor market continues to tighten. The unemployment rate fell to a new cyclical low of 3.75 percent in May and was 3.85% in August. Unemployment over the past few months has been at the lowest level since December 1969. All agree that the unemployment rate is below the natural rate, which means that the labor market is tight. All also expect the unemployment rate to decline further in coming months as the economy responds to massive fiscal stimulus.

However, disappointing to some and somewhat perplexing, considering strong payroll employment growth and low unemployment, is the failure of wages to show much upward momentum.

1. Employment Growth

Chart 7 shows the four measures of employment growth – payroll employment, household employment, total hours worked, and the eligible labor force. The growth rate in the eligible labor force indicates the expected equilibrium rate of employment growth when the economy is at full employment. When growth in the various measures of employment exceeds growth in the eligible labor force, the

unemployment rate declines and the labor market tightens. This is exactly what continues to happen currently.



As can be seen in **Chart 7**, the trend in the annual rate of quarterly growth in payroll employment slowed gradually from the cyclical peak of 2.27 percent in February 2015 to 1.39 percent in September 2017. However, since then payroll growth has accelerated as the economy picked up momentum. The annual growth rate was 1.59 percent in August and is expected to rise to 1.72 percent by the end of 2018.

Household employment growth also had been decelerating gradually, averaging 211,600 in 2015, 174,800 in 2016, and 148,900 in 2017, but, like payroll employment, growth bottomed at 1.30 percent in August 2017 and has since accelerated to 1.49 percent in August. Payroll and household employment growth generally are similar when averaged over several months but can diverge substantially from month to month, primarily due to sampling error.

Growth in total hours worked by all employees had been slowing as well. But, like the other employment measures, growth bottomed in 1.21 percent in January 2017 and has accelerated since then to 2.23 percent in August. Growth is higher for this measure because the length of the workweek has risen from 34.38 hours to 34.48 hours over the past 12 months. This reflects an increase in the proportion of full-time workers relative to part-time workers and increased overtime, which are also indicative of a very tight labor market.

Growth in the eligible labor force in August was 1.01 percent, considerably below actual employment gains, which is why the unemployment rate continues to fall.

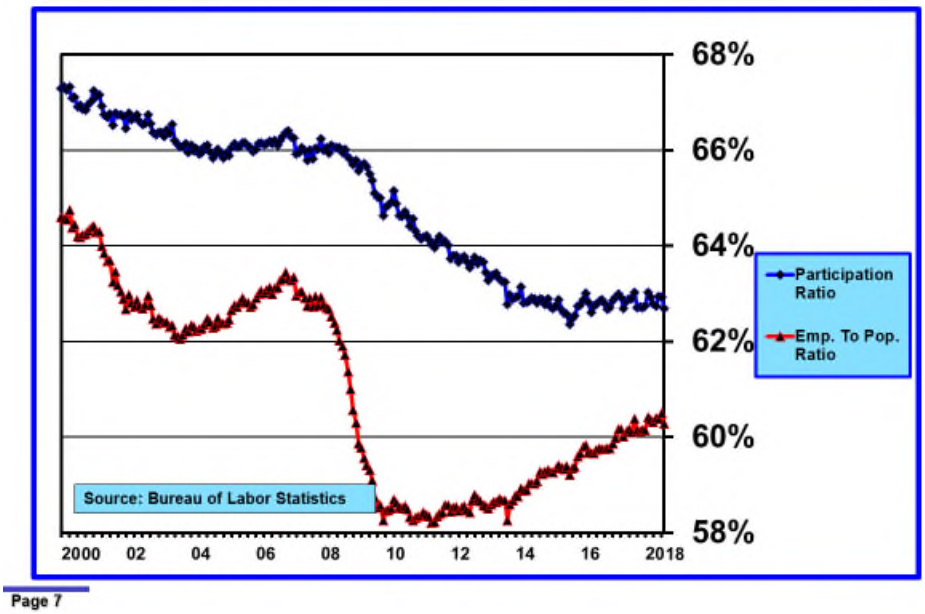
2. Employment Participation

Employment participation had been declining until about a year ago, reflecting changes in demographics and an increase in discouraged workers exiting the labor force due to poor job prospects during and following the Great Recession. Between 50 and 75 percent of the downward trend in participation has been driven by retiring baby boomers and, according to **CBO**, this trend should continue to reduce participation by about 0.16 percent annually over the next ten years.

As the labor market continues to tighten, however, it appears that most of those accounting for the other 25 to 50 percent of the decline in the participation rate since the Great Recession have returned to the labor force.

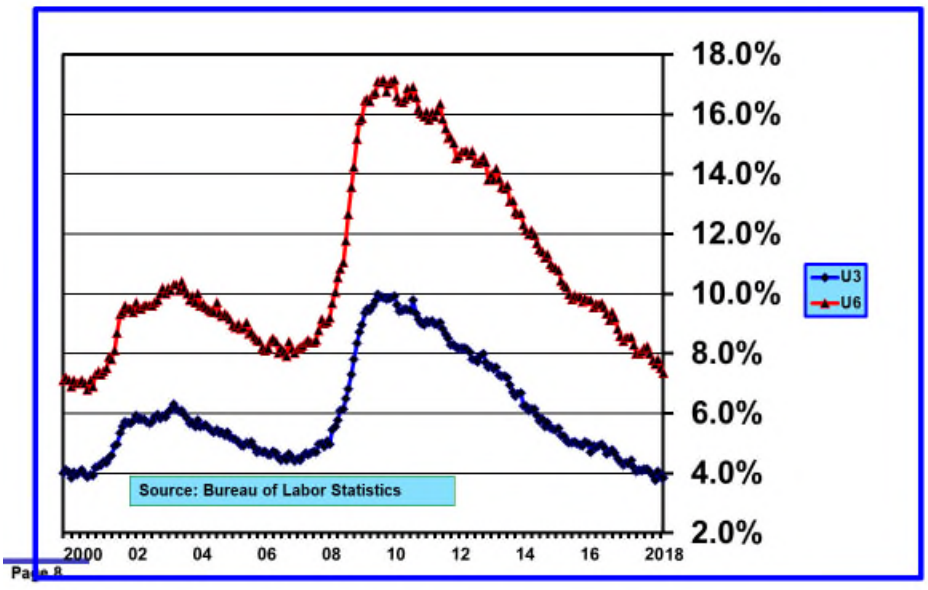
Because discouraged workers are not counted in the labor force there has been debate about their numbers and whether they would reenter the labor force once the labor market tightened. As can be seen in **Chart 8**, the increase in the participation rate from 62.35 percent in September 2015 to 62.69 percent in August 2018 is evidence that most discouraged workers have reentered the labor market in the last couple of years as jobs have become more abundant. If that were not the case, retirements would have driven the participation ratio down to about 61.87. This is a swing of approximately 1.32 million workers many of whom were probably discouraged but have now reentered the labor force.

CHART 8 – Labor-Force-Participation and Eligible-Employment-to-Population Ratios (U-3 Measure)



3. <u>Measures of Unemployment Reflect a Labor Market That Is Above Full-Employment</u>

CHART 9 – U-3 and U-6 Unemployment Rates

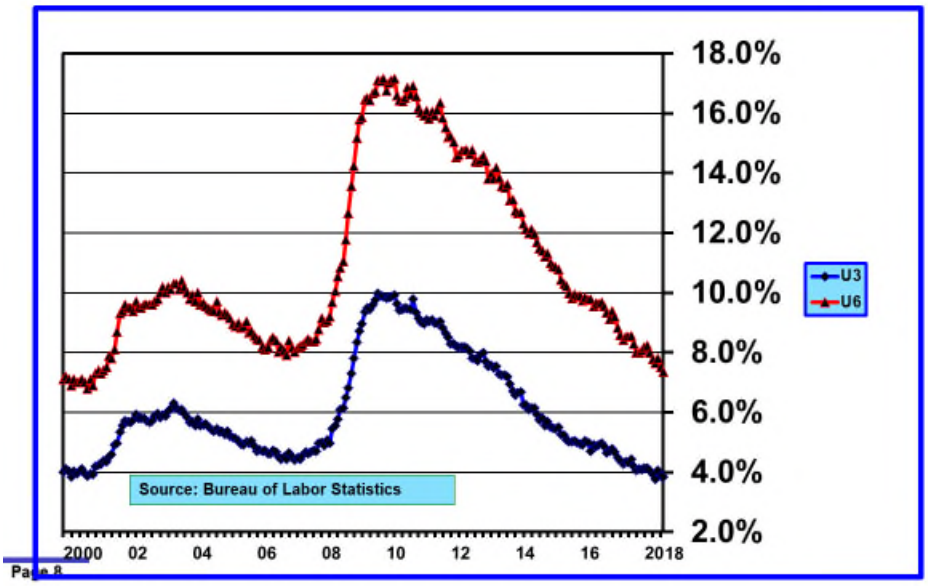


As can be seen in **Chart 9**, the U-3 unemployment rate has fallen to 3.85 percent and is now below the minimum levels reached prior to the Great Recession and the low of 3.88 percent reached in October 2000 just prior to the 2001 recession. In fact,

the average unemployment rate over the past four months was 3.88%, which is the lowest since December 1969. The August U-3 unemployment rate was substantially below **CBO's** full employment (NAIRU) estimate of 4.62 percent.

The U-6 measure of unemployment, which adds those working part time who would prefer full-time employment and those marginally attached to the labor force to the U-3 measure, fell to 7.34 percent in August, and is now well below the pre-Great Recession low of 7.92 percent reached in December 2006. This measure is likely to continue falling and in coming months could challenge the October 2000 low of 6.80 percent. The U-6 measure of unemployment has fallen 252 basis points since the end of 2015 compared to a decline of 114 basis points in the U-3 measure, which underscores an improving labor market that now increasingly exceeds full employment.

CHART 9 – U-3 and U-6 Unemployment Rates



Long-term and short-term unemployment rates are also indicators of labor market tightness and are shown in **Chart 10**. The short-term unemployment rate was 3.00 percent in August and is well below the minimum level of 3.78 percent reached prior to the Great Recession and the previous cycle low of 3.41 percent in September 2000. The long-term unemployment rate has declined from over 4 percent in the aftermath of the Great Recession to 0.82 percent in August and is closing in on the low of 0.71 percent reached in October 2006 just prior to the onset of the Great Recession. However, this measure historically has fallen even more during tight labor markets. The low was 0.42 percent in November 2000. These comparisons

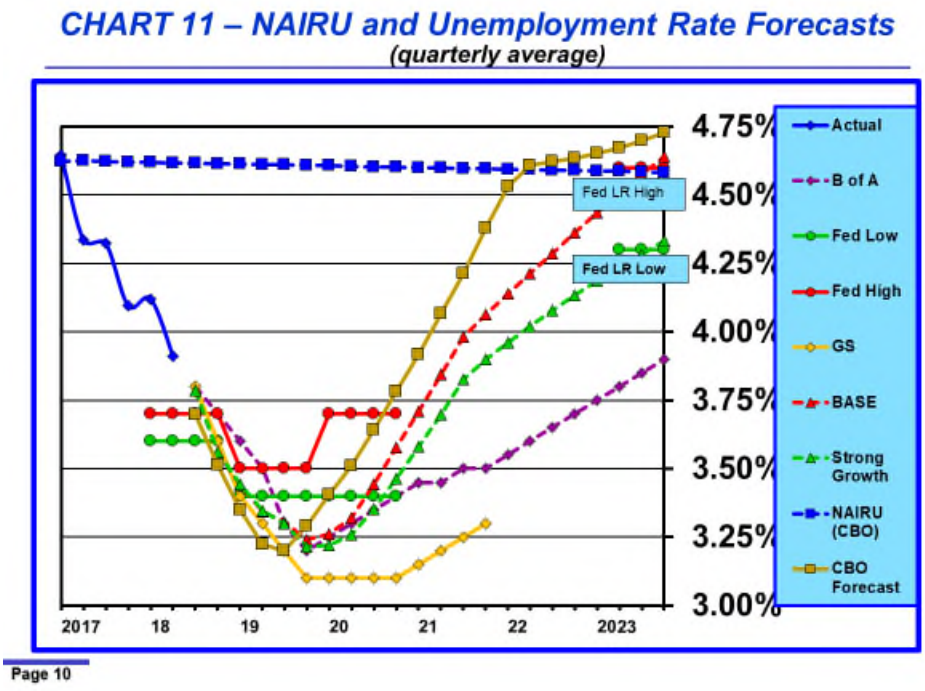
imply that there is still a little bit of room for further above potential growth in employment.

4. Forecasts of the U-3 Unemployment Rate

Forecasters expect the labor market to continue to tighten. The current U-3 unemployment rate is 77 basis points below **CBO's** full-employment estimate of the non-accelerating inflation rate of unemployment (NAIRU).

As the term NAIRU implies, when unemployment falls below this level for any length of time not only is it likely that wages will increase but inflation will probably increase as well. For that reason, the **FOMC** is now crafting monetary policy to maintain full employment but limit the potential for tight labor markets to foster inflation. The traditional monetary policy tool involves raising interest rates. The recent acceleration in economic growth, both domestically and globally, have emboldened the **FOMC** to "normalize" monetary policy through steady increases in the federal funds rate.

Chart 11 shows U-3 unemployment rate forecasts for **B of A**, **GS, CBO**, **FOMC** high and low range, and my "**BASE**" and "**Strong Growth**" scenarios. **CBO's** estimate of NAIRU is also shown in **Chart 11**.



Most forecasters project the unemployment rate will continue to fall until mid to late 2019 to between 3.10 percent (**GS**) and 3.25 percent (**B of A**). After that most forecasters expect the unemployment rate will rise slowly but will remain below

CBO's NAIRU for an extended period. The **FOMC's** projections for the unemployment rate are similar to those of other forecasters, falling to a range of 3.4 percent to 3.7 percent in 2019 and 3.5 percent to 3.8 percent in 2020 and then rising gradually to a long-run stable NAIRU range of 4.3 percent to 4.7 percent. The **FOMC's** projections are somewhat higher than other forecasts, which suggests that **FOMC** members may lower their unemployment rate projections at the next **FOMC** meeting in late September.

My unemployment rate forecast in the **"BASE"** scenario bottoms at 3.24 percent in the fourth quarter of 2019. This is consistent with projections of **B of A**, **GS** and **CBO**.

Barring advent of a recession, the unemployment rate is expected to remain below **CBO's** April 2018 natural unemployment rate estimates for several years. **CBO** forecasts that the unemployment rate will bottom at 3.20 percent in third quarter of 2019 and then rise gradually over the next two years, reaching the neutral rate of unemployment in the second quarter of 2022.

After 2019 most forecasts, including the **FOMC's** long-run projected range, move upwards gradually but, except for **CBO's** forecast, the unemployment rate remains below **CBO's** estimate of NAIRU for several years.

These forecasts, including my own, seem a bit too tidy. Forecasters acknowledge that the labor market cannot remain overheated perpetually and so all expect the unemployment rate to bottom in about 18 months and then gradually return to a less overextended state. The problem with this is that historical experience doesn't substantiate this benign scenario. In the past, whenever the unemployment rate has moved up by approximately 0.3 percent, a recession almost always has ensued and the unemployment rate has risen much more and much faster than these scenarios assume. If there is a reality check, it is most likely to occur sometime during 2020, which just happens to be a presidential election year.

Increasingly, it appears that structural changes in the labor market have lowered NAIRU to a greater extent than indicated by **CBO's** estimates, even though it lowered its estimate of the neutral rate of unemployment by about 12 basis points in its April 2018 update. The implication of a lower NAIRU is straightforward – today's labor market would not be quite as tight as past cyclical experience would imply. To the extent that this turns out to be the case there will be less upward pressure on wages and inflation and the **FOMC** could slow the rate at which the federal funds rate is normalized. While financial markets seem inclined toward this view, the **FOMC** remains on a course to raise the federal funds rate much more than financial markets currently expect.

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

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

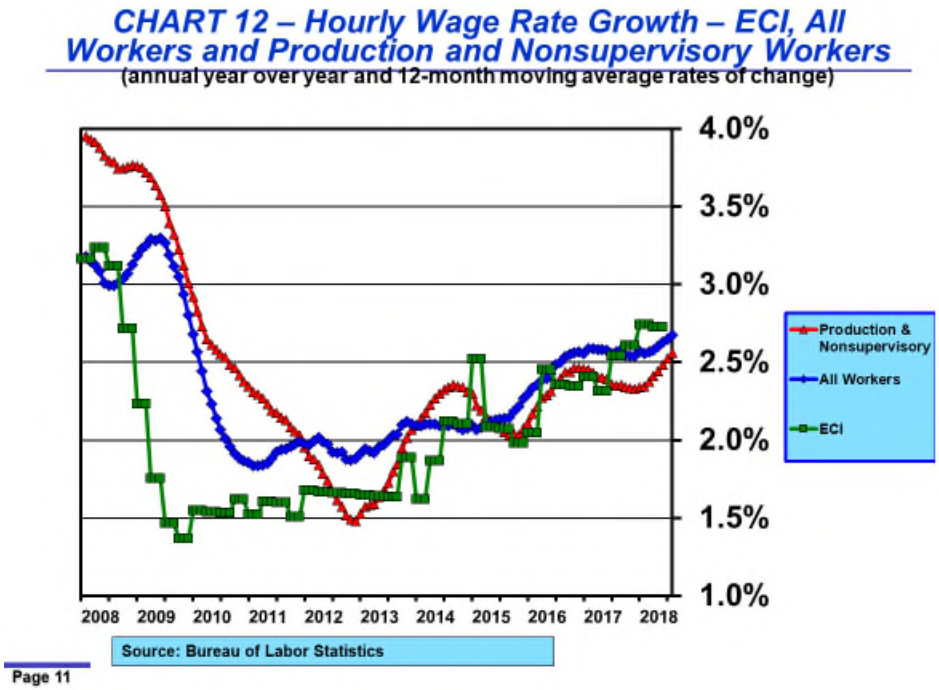
Historically, there has been considerable inertia in wage adjustments which has resulted in a slow rise in average wages even after the labor market has reached or exceeded full employment. Inertia may be greater in this cycle than previously for several reasons. First, collective bargaining power provided by unions on the behalf of labor continues to decline as a catalyst for higher wages. Second, because wage increases might not have slowed as much as they could have during the extended period of labor market slack, there may be less pressure to increase wages as much now that the labor market has tightened. Third, lingering employee long-term job insecurity may be dampening demands for higher wages. Responses to a University of Michigan survey question addressing concerns about layoff risk over the next five years remain elevated. Also, the long-term unemployment rate remains elevated. Fourth, falling inflation expectations may also be a factor. Fifth, retirement of high-wage baby boomers and replacement with low-wage new entrants may be depressing the average level of wage rates, which would moderate the average rate of wage increases. Sixth, there may be more capacity in the labor market than **CBO's** NAIRU unemployment rate implies, if NAIRU has declined. The **FOMC's** Summary of Economic Projections implies a median estimate of NAIRU of 4.5 percent and the median estimate from the Survey of Professional Forecasters is 4.5 percent compared to **CBO's** current estimate of 4.62 percent.[4] Seventh, low productivity gains in recent years may also be a factor in retarding wage rate acceleration.

As can be seen in **Chart 12**, increases in wage growth are following the traditional upward cyclical trend as the labor market tightens. But those increases are not as great as historical experience indicates should be occurring. Consequently, forecasts of wage rate increases, which have been based largely upon historical relationships, have been consistently higher than have materialized.

[4] Regis Barnichon and Christian Matthes. "The Natural Rate of Unemployment over the Past 100 Years," Federal Reserve Bank of San Francisco Economic Letter, 2017-23, August 14, 2017. In this paper, the authors conclude that NAIRU has fluctuated within a tight band of 4.5 percent to 5.5 percent over the past 100 years. The authors' estimate of the current level of NAIRU is close to the lower bound of this range.

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

Chart 12 shows the rate of growth in hourly wages for all workers, production and nonsupervisory workers, and ECI (total wages and salaries). All three sets of measures in **Chart 12** track each other closely over time. All three measures have been rising, but growth in the all workers and production and nonsupervisory workers measures has been extremely limited.



Although these measures are highly correlated over time, because compilation methodologies differ for each set percentage changes over fixed time periods will not always be in sync. Currently, all three sets are exhibiting a similar level and trend of very gradual increases. Average hourly wages (12-month moving average) of all employees have edged up to 2.67 percent annually over the past 12 months compared to 2.57 percent a year ago. Average hourly wages (12-month moving

average) of production and nonsupervisory workers have risen a bit more to 2.56 percent annually in August compared to 2.35 percent a year ago. The third measure, ECI, reflects some acceleration in wage growth, but the acceleration has been modest. ECI growth in wages and salaries accelerated from 2.31 percent in the second quarter of 2017 (4-quarter moving average) to 2.73 percent in the second quarter of 2018.

To a certain extent, focusing only on hourly wages is a bit misleading. Growth in average weekly earnings for all employees, which factors in the length of the workweek and thus incorporates changes in the mix of full and part-time employees, has been accelerating relative to growth in hourly wages, rising from 2.32 percent in August 2017 to 2.95 percent in August 2018 (see **Chart 13**). This outcome reflects primarily an increase in the average length of the work week from 34.38 hours in August 2017 to 34.48 hours in August 2018.

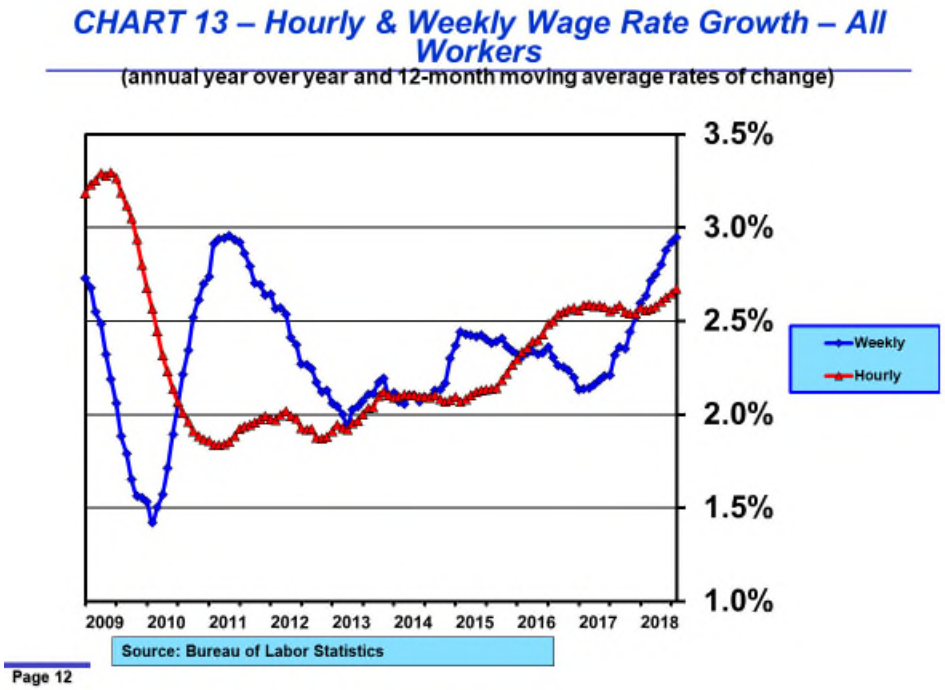
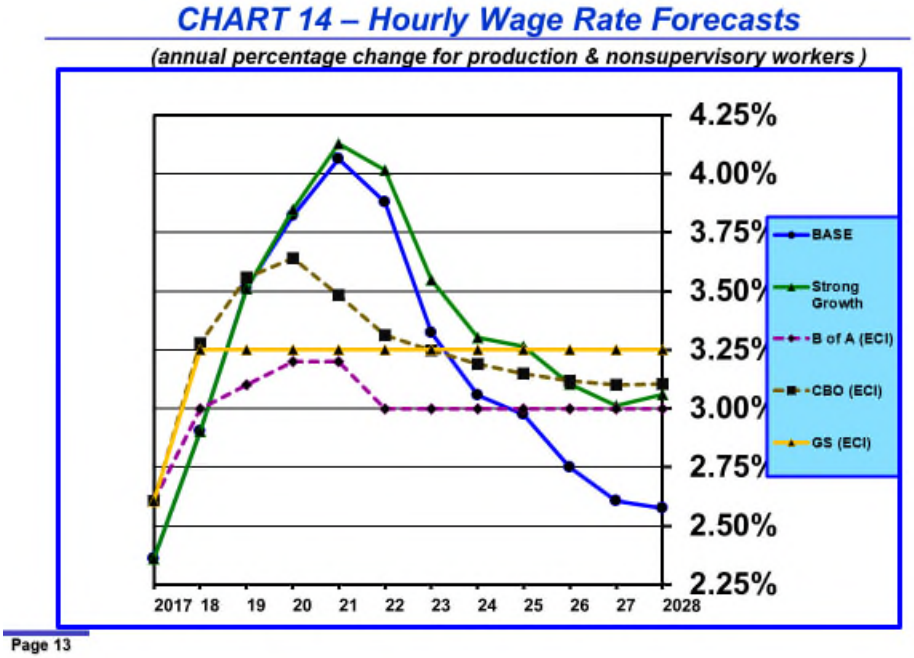


Chart 14 shows **CBO's, GS's** and **B of A's** projections for growth in the wages and salaries component of ECI for all workers and my projections for wage growth for production and nonsupervisory workers over the next ten years.

CBO, GS and **B of A** forecast wage rate growth only for ECI. Although the methodologies for constructing these different wage data series differ, the directionality of all is highly correlated over time, even if the levels aren't precisely the same at every point in time. **GS's** ECI wage growth forecast rises to 3.25 percent by 2018 and remains at that level thereafter. **B of A's** ECI forecast rises to

3.2 percent in 2020 but then recedes to 3.0 percent by 2022. **CBO's** ECI forecast rises to 3.64 percent in 2020 but then slows to 3.1 percent over the next several years.



Forecast wage growth for production and nonsupervisory workers in my "**BASE**" and "**Strong Growth**" scenarios lags **CBO's, B of A's** and **GS's** projections in 2018. Thereafter, however, wage growth in my "**BASE**" scenario peaks at 4.1 percent in 2021 and then begins to decelerate. After 2023 my wage growth estimates are weaker than those of other analysts. That result is driven by a decline in the labor market gap, slowing inflation and lower productivity improvements.

Wage growth in my "**Strong Growth**" scenario follows a similar pattern to that of my "**BASE**" scenario, but at a higher level. The sharp increase in wage growth reflects strengthening wage bargaining power due to the excess of labor demand relative to supply and also to greater increases in inflation.

In all likelihood, my projected spike in wage growth probably overstates what will actually happen for a couple of reasons. First, my wage growth forecasts reflect a rapid runup in inflation to a much greater extent than anyone else is forecasting. My inflation forecasts simply reflect the historical pattern of response to a very strong and tight labor market, which continues unabated for several years. There is good reason to expect that inertia and structural changes in labor markets will limit upside wage pressures in the current cycle. Second, if inflation pressures do erupt to a greater degree than most expect, the **FOMC** would raise interest rates more than

anyone anticipates and that would probably put a quick end to economic buoyancy and precipitate recession. When I introduce a mild recession in 2019, wage growth peaks at 3.3 percent and then declines.

GS's wage tracker registered 2.7 percent in August, about 50 basis points short of **GS's** long-run expected 3.25 percent annual rate of increase. **GS** assumes the unemployment rate bottoms at 3.1 percent by the end of 2019, which is historically low compared to NAIRU of approximately 4.5 percent.

In **GS's** view the recent weakness in wage growth results from inflation and productivity below expected long-run values. In other words, the historical forces determining wage rate growth have not changed. The upward adjustment in wage rate growth will be consistent with historical precedent and levels of the key determinants – 2.0 percent inflation, 1.0 – 1.25 percent annual productivity increases (nonfarm productivity increases would be higher, about 1.4 – 1.8 percent, as the measure of productivity **GS** cites covers the entire economy, while nonfarm productivity covers only about 70 percent of the economy), and labor market slack.

6. Modeling the Relationship Between Labor Market Tightness and Wage Growth

Economic theory posits that when the demand for labor increases relative to the available supply, wage rates should rise more rapidly. This theoretical concept is embedded in the Phillips Curve. The Phillips Curve defines a statistical relationship in which decreases in the unemployment rate, improvements in productivity and increases in inflation should increase nominal wage growth.

In recent months, the labor market has tightened considerably and the unemployment rate is well below **CBO's** estimate of NAIRU. However, increases in wage rates have been muted. This has led to speculation about whether the Phillips Curve is dead.

As can be seen in **Chart 14**, analysts, including myself, expect wage growth to accelerate and this acceleration should occur in the next few quarters. These forecasts are based on a Phillips Curve model of wage rate behavior which by and large fits the historical data well. Historically, the apparent slow response of wage rates to a tightening labor market can be explained by time lags between cause and effect and non-linearities in the relationship between labor market variables and wage growth. This historical pattern has repeated predictably over several past cycles and it is this consistency which has prompted forecasters to expect wage rate growth to accelerate in the current cycle.

My statistical estimation of nominal wage rate growth is based upon the following labor variables: short-term unemployment of less than 26 weeks, long-term unemployment of 26 weeks or more, the gap between the U-3 unemployment rate and **CBO's** NAIRU rate adjusted down in recent months to reflect the consensus view that NAIRU is 4.5 percent, the rate of growth in total hours worked, and the square of total hours worked to incorporate a possible nonlinear relationship between nominal wage rate growth and the strength of the labor market. The model also includes the other two standard Phillips Curve variables – nonfarm productivity and core PCE inflation.

As short-term and long-term unemployment rates rise and labor market slack expands, increases in nominal wage rates decline. The impact of a change in the short-term unemployment rate is greater and affects nominal wage rate growth more quickly than a change in the long-term unemployment rate.

Growth in total hours worked raises the nominal wage rate, but its incremental effect is nonlinear, which means that when the rate of growth in total hours slows, the growth rate in wages declines at a slower rate. The average lag time between cause and effect is about 2 years, which explains in part the apparent slow response of nominal wage rate increases to acceleration in employment growth.

Core PCE inflation impacts the nominal wage rate with an average lag of 11 months. A one percentage point increase in core PCE inflation lifts nominal wage rate growth by 78 basis points. Once the labor market has tightened sufficiently, there is probably a positive feedback loop between the increase in the nominal wage rate and changes in inflation, but the statistical analysis indicates that increases in the wage rate lag and depend on increases in inflation to occur first.

Finally, while productivity does have a positive impact on the nominal wage rate, it is smaller than most believe and takes a long-time to have even this small impact. A one percentage point increase in nonfarm productivity raises the nominal wage rate by 26 basis points but this takes an average of 4 years to occur.

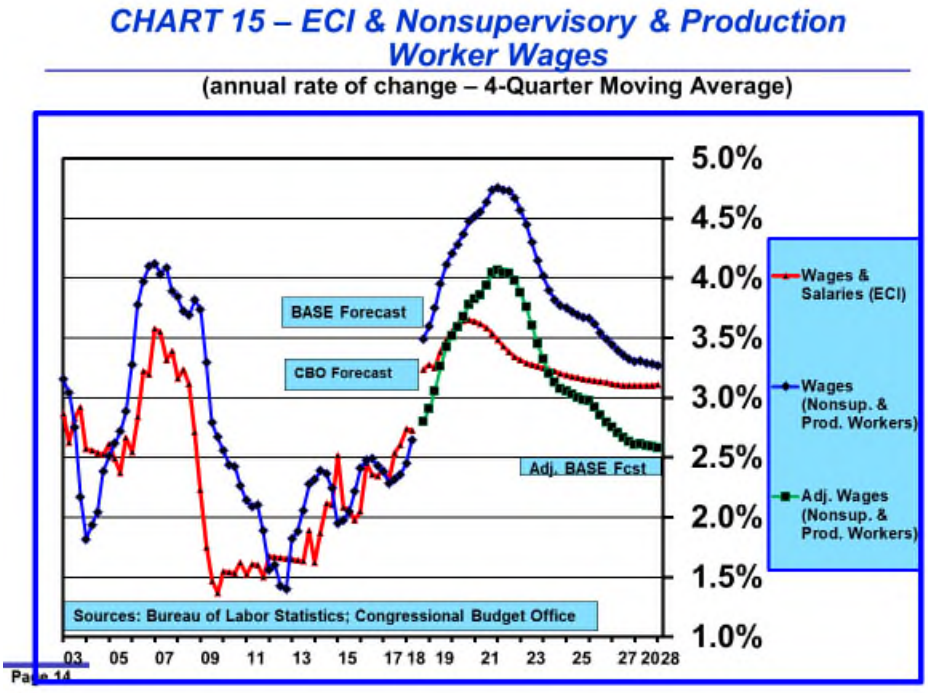
Based upon historical relationships, you can see in **Chart 14** how a very tight labor market sustained over time, as is the case in the "**Strong Growth**" scenario, can result in a much higher rate of increase in the nominal wage rate.

Although my econometric model describes well the historical relationships between nominal wage rate growth and the economic variables in the Phillips Curve, over the past 15 months the model has overestimated the rate of increase in the nominal wage rate by an average of 69 basis points. The forecast error has averaged 4.3 standard deviations. This pattern has now persisted long enough that speculation

that a structural change has occurred in the labor market, which is retarding wage growth acceleration, needs to be taken seriously.

Chart 15 shows that the wage rate for nonsupervisory and production workers and the rate of growth in salaries and wages reported by the **BLS** in the employee cost index (ECI) data respond to the strength of the labor market over the cycle in a similar pattern.

My model's forecast of rising wage rate growth for nonsupervisory and production workers and **CBO's** forecast of rising ECI salaries and wages growth both indicate that wage growth should already be 3.0 percent or greater rather than gradually moving up to 2.7 percent over the past two years. Salaries and wages in ECI rose 2.74 percent in the first quarter of 2018 and 2.73 percent in the second quarter. Hourly wage growth for nonsupervisory and production workers has been accelerating – the six-month rate of increase was 2.71 percent in the second quarter and 2.76 percent in August.



Assuming that wage growth continues to accelerate in coming months, it is unlikely to rise above 4.0 percent, as indicated in **Chart 15**. In **Chart 15**, I show an adjusted wages and salaries wage growth alternative which subtracts the large forecast error of the last several months. In so doing, the assumption is that the Phillips Curve still will guide wage rate growth in coming months, but the level will be at least 70 basis

points lower than the historical relationship implies. And, the forecast shortfall in wage growth could be even greater because of structural changes in the labor market and a more rapid cooling in economic momentum.

If the nominal wage rate does not accelerate in the next few months and close the forecasting error gap, this will provide substantial evidence that a structural change in the historical Phillips Curve has occurred. This is not a trivial matter. If wage rate growth is poised to accelerate, as the model predicts, the FOMC should continue to raise the federal funds rate to contain a buildup in inflationary pressures. However, if wage growth does not accelerate meaningfully, an overly aggressive monetary policy could hasten onset of recession.

7. Businesses, Particularly Small Business, Are Feeling Labor Shortages and Wage Pressures

Perhaps wage acceleration is just around the corner. A net of 35 percent of members of the National Federation of Independent Businesses (NFIB) reported in the May member survey that employee compensation was higher. This level was the highest ever in the 45-year history of the survey. The net percentage declined modestly to 32 percent in July and August.

In addition, 21 percent, an historically high level, reported plans to increase employee compensation. Historically, there has been a strong positive correlation between the NFIB survey's measure of plans to increase compensation and the employment cost index (ECI) with a three-quarter lag. Assuming this relationship prevails, we should expect a large increase in ECI in the fourth quarter of 2018 and the first quarter of 2019.

NFIB members continue to confirm just employment challenges. A record high 38 percent indicated in August that they have at least one unfilled job opening. A record net 26 percent intend to create additional jobs; only 4 percent plan employment reductions. Concerns about labor quality were the highest ever recorded in August with 25 percent citing that difficulty in finding qualified workers was their most important problem. Of those attempting to hire workers, 89 percent said there were few or no qualified applicants.

Favorable views about expanding their businesses were a net 34 percent in August, which equaled the previous record high. This sounds like an inflationary boom to me. But, reflecting the growing reality of the shortage of qualified employees, a smaller percentage said they increased actual employment.

IV. Monetary Policy

Members of the **FOMC** will meet the last week of September shortly after this letter was written. The outcome of the meeting should not come as a surprise. Everyone expects the **FOMC** to raise the range for the federal funds rate by 25 basis points.

1. Divergent Views About Future Course of Monetary Policy

FOMC members will update economic projections at the upcoming meeting. They are likely to affirm the intent of the committee to raise the range for the federal funds rate another 25 basis points in December. This is what the market expects. However, beyond 2018, there is considerable divergence of opinion about the future course of monetary policy. The market expects fewer increases in the federal funds rate than the **FOMC** median projects and some analysts expect more increases.

The market keeps its own counsel and does not blindly accept indications of future policy that are embedded in **FOMC** member economic projections, the **FOMC** statement, the press conference and speeches given by Federal Reserve officials. While the market does not always agree with the **FOMC's** assessment of the economic outlook and the likely course of monetary policy, it has come to trust the **FOMC** to update its views as new real-time information becomes available and not to blindly pursue a rigid policy agenda.

For the past few quarters, the market forecast for the federal funds rate has had a slower upward trend than the projections of all others, including **FOMC** members. In October 2017 the market forecast that the terminal federal funds rate would be 2.00 percent compared to the **FOMC's** and **B of A's** 2.75 to 3.00 percent projections and **GS's** projection of 3.25 to 3.50 percent. However, the market forecast for the terminal federal funds rate has edged up gradually to a range of 2.75 to 3.00 percent, equaling the **FOMC's** projection. In the meantime, **FOMC** members, **B of A** and **GS** have not changed their estimates for the terminal value of the federal funds rate, which means that the market now agrees with the **FOMC**.

But there is still an important difference between the **FOMC** and the market. The **FOMC** median projects the range for the federal funds rate will rise 50 basis points above the long-term terminal neutral value and then subsequently decline to that value. The market expects rates to stop rising once the level of 2.75 to 3.00 percent is reached.

The median number of remaining increases forecast by **FOMC** members, including the September increase, is six, followed later as the economy cools, by two decreases for an equilibrium range of 2.75 percent to 3.00 percent (see **Table 11** and **Chart 18**). The market's view has increased by 75 basis points since late last

year to 2.85 percent by the first quarter of 2020; however, every other forecaster expects the **FOMC** to increase the federal funds rate above 2.85 percent in coming quarters. And, quite a few, like **FOMC** members, expect the federal funds rate to peak above the long-term equilibrium level in the current monetary policy tightening cycle.

Thus, although the market's view is now closer to that of the consensus of analysts and the **FOMC**, it continues to reflect an expectation for a less aggressive monetary tightening policy. There is a possible alternative explanation for the market's view. Perhaps the market foresees that monetary policy tightening will be effective more quickly in slowing the economy and preventing an outbreak in inflation so that the **FOMC** will not feel compelled to continue raising rates. After all, there is little disagreement about the long-term equilibrium level of the federal funds rate.

Whatever the reasons, the disagreement between the market and others about the pathway of rate increases and the level of the long-run equilibrium federal funds rate continues. The eventual outcome will depend upon future developments.

2. Beige Book – Assessment of the Economy

Three weeks prior to each **FOMC** meeting, the Beige Book is published. It summarizes in anecdotal form recent economic activity in each of the 12 Federal Reserve districts. The most recent Beige Book primarily covered the month of August.

Overall, 8 banks reported that economic growth was "modest" or "moderate" and were positive about the near-term outlook. Dallas reported activity was "brisk" and Philadelphia, St. Louis, and Kansan City indicated that activity was slower than average. "Modest" or "moderate" economic activity means trend real GDP growth of about 2 percent.

Consumption grew at a modest pace while manufacturing expanded in 10 of the 12 districts. Concerns were voiced about trade policy and tight labor markets.

Employment grew "modestly" or "moderately," but labor markets are tight with widespread shortages, particularly in high-skill jobs, but increasingly in low-skill jobs. Shortages are beginning to slow hiring. Half of the districts recounted anecdotes about labor shortages constraining economic activity. Wage growth was "modest" or "moderate" in most districts, which means that some pressures exist but there is no acceleration, although several districts mentioned increased wage pressures are emerging, particularly in construction. This is consistent with macro data. Shortages of qualified skilled workers are widespread, but employers are coping with pay increases, overtime, training and automation.

Price inflation was generally characterized as “modest” or “moderate”, but a few districts reported some slowing. There are price pressures in material and input costs, particularly construction materials. Manufacturers in most districts mentioned that tariffs were contributing to price pressures or expressed concern that they would foster future price pressures. There were mixed responses about the ability to pass price increases through to customers.

3. Economic Activity

In the August 1, 2018 FOMC statement, the committee noted “… *that the labor market has continued to strengthen and that economic activity has been rising at a strong rate*.” This was an upgrade from “solid” to “strong.” Similarly, the assessment of consumer and business spending was upgraded: “*Household spending and business fixed investment have grown strongly*.”

4. Employment

Most believe the labor market has exceeded the non-accelerating inflation rate of full employment (NAIRU). The U-3 unemployment rate in August was 3.85 percent, which was 0.77 percent *below* **CBO’s** estimate of NAIRU. The **FOMC** repeated its June assessment of employment, noting that “*Job gains have been strong, on average, in recent months, and the unemployment rate has stayed low.*”

5. Inflation

In its August assessment of inflation, the **FOMC** substituted the words “remain near” for “have moved close to”: “*On a 12-month basis, both overall inflation and inflation for items other than food and energy remain near 2 percent.”* The inflation expectations comment was unchanged: *“Indicators of longer-term inflation expectations are little changed, on balance.”*

Inflation language in the outlook paragraph of the policy statement was not changed: “… *inflation near the Committee’s symmetric 2 percent objective over the medium term*.”

6. August 1, 2018 Meeting Minutes

Minutes of **FOMC** meetings are released three weeks following the meeting. The minutes of the August 1st meeting revealed that **FOMC** members feel the economy has “*considerable momentum*” which warrants continued gradual increases in the federal funds rate. There was increased confidence that inflation will remain near the **FOMC’s** inflation target of 2.0 percent. Concerns about trade policy were discussed. There was a discussion of upside and downside risks to the outlook, but only brief mention about currency stresses in some emerging markets countries.

Some members expressed concern about the flattening of the yield curve as a warning signal, but others discounted the historical yield curve slope as a recession indicator, noting that the term premium is depressed: "… *in such an environment an inversion of the yield curve might not have the significance that the historical record would suggest*."

Some expressed the view that in the "*not too distant future*" it might be appropriate to revise the language in the FOMC statement that describes monetary policy as "*accommodative*."

There was no substantive discussion of balance sheet shrinkage strategy. However, based upon earlier comments, this will probably to a topic for discussion at one of the **FOMC** meetings before the end of the year.

Another topic for future **FOMC** discussion involves alternative monetary policy strategies intended to address the zero federal funds rate lower bound and the operating framework for implementing monetary policy.

7. Chairman Powell's Jackson Hole Speech

Every year the Kansas City Federal Reserve Bank sponsors a monetary policy symposium at Jackson Hole, Wyoming. It has become a tradition for the Federal Reserve chairman to give a speech. This year's speech was titled "Monetary Policy in a Changing Economy." It focused on the role of uncertainty involving the neutral real rate of interest and the natural rate of unemployment in the conduct of monetary policy. His message was that placing excessive weight on estimates of specific values of these variables historically would have led to misguided monetary policy. He also cautioned about placing too much weight on inflation as an indicator of economic overheating and noted that "… *destabilizing excesses appeared mainly in financial markets rather than in inflation*" prior to the two last recessions.

Perhaps the main takeaway was Powell's reiteration that further gradual increases in the federal funds rate would "*likely be appropriate,*" assuming strong employment and income growth continues. He did not express concern about the potential for the economy to overheat. With respect to inflation prospects he said there is "… no clear sign of an acceleration above 2 percent."

Although a gradual pace of monetary policy tightening in the current environment appears to be appropriate, there are two exceptions. The first involves avoiding a financial crisis. The second would be responding to the threat that inflation expectations are becoming unanchored.

8. Federal Reserve Staff Paper

"*Some Implications of Uncertainty and Misperception for Monetary Policy*" was authored by four senior Federal Reserve staffers and presented at the Jackson Hole symposium.

The thrust of the paper argues that the gap between estimates of the natural rate of unemployment, which cannot be measured with precision, and the actual rate of unemployment is an important measure, in spite of the uncertainty of the exact value, in guiding monetary policy. Some have argued that because of the uncertainty of this measure, it should not play a role in monetary policy and the **FOMC** should focus exclusively on inflation and measures of inflation expectations. The authors reject this view and argue that both employment and inflation measures, in spite of measurement uncertainties, are important. In other words, the balanced approach to monetary involving assessing deviations of both employment and inflation from target values, notwithstanding measurement uncertainty, remains appropriate.

9. Recession Predictive Power of the Yield Curve Slope

Historically, an inversion of the yield curve involving short-term interest rates moving above long-term interest rates has been a reliable indicator signaling recession will commence in a few months.

With the recent flattening of the yield curve, given the historical record, it is unsurprising that concern and commentary about imminent recession risks has been raised in many quarters.

But arguments are being voiced for why this time is different and why the flattening of the yield curve is unlikely this time to be a reliable indicator of a coming recession. The difficulty with economic forecasting is that the structure of the economy changes and the relationships among economic variables evolve over time, making reliance on historical patterns potentially unreliable. What this means is that the slope of the yield curve could still be a reliable predictor of recessions or it might not be. We won't know for sure until much later.

There have been two threads to the recent debate. One thread involves which measure of yield curve slope is the best predictor of recession. The other thread deals with other factors that have impacted long-term interest rates, including the impact of monetary policy on the term premium and the decline in the long-term natural rate of interest. The thrust of the second thread is that the nominal long-term interest rate has been depressed abnormally and this alters the reliability of the yield curve slope measure as a predictor of recessions.

Measurement. Most have traditionally monitored the yield spread between the 10-year and 2-year Treasury notes. However, in a recent study, economists at the Federal Reserve Bank of San Francisco found that the best yield-curve predictor of recession is the spread between the 10-year Treasury note and the 3-month Treasury bill.[5] The authors conclude that "*… the recent evolutions of the yield curve suggests that recession risk might be rising*," but "… *the flattening yield curve provides no sign of an impending recession*." Bauer and Mertens offer two explanations in support of their conclusion: "*First, the evidence suggests that recession predictions based on the yield curve require an inversion; no matter which term spread is used to measure its shape, the yield curve is not yet inverted. Second, the most reliable summary measure of the shape of the yield curve, the ten-year – three-month spread, is nearly 1 percentage point away from an inversion*." The recent low in this spread was 73 basis points during late August. Since then this spread has risen to 86 basis points on September 24th.

Bauer and Mertens' research also examined whether the size of the term premium impacts recession prediction accuracy. They concluded that the nominal yield curve spread, unadjusted for changes in the term premium, is the best predictor: *"… we do not find an empirical basis for adjustments based on the term premium, especially in light of uncertainties about the possible effects of quantitative easing*." This is an important empirical finding as it refutes recent arguments in the second thread that the decline in the term premium in recent years makes the yield spread a less reliable predictor of recession.

In summary, there are two key takeaways from the San Francisco Federal Reserve Bank study. First, a narrowing of the spread between the ten-year Treasury note and the 3-month bill rate increases recession risk, but a narrowing spread is not a reliable predictor of recession. Second, only an outright inversion of the yield spread is a reliable predictor of recession.

In my econometric model, a +100 basis point 10-year – 2-year yield spread increases real GDP growth by 11.9 basis points and a -100 basis point spread decreases real GDP growth by -8.6 basis points, with an average lag of nearly 6 quarters. While this relationship is statistically significant, the negative impact on GDP of a declining yield curve spread is not particularly meaningful. In my interest-rate forecasts the 10-year – 2-year spread is not forecast to turn negative until the first quarter of 2019, but then remains negative until the third quarter of 2021.

[5] Bauer, Michael D. and Mertens, Thomas M. "Information in the Yield Curve about Future Recessions," FRNSF Economic Letter 2018-20, August 27, 2018.

Factors Which Have Depressed Long-Term Interest Rates. One theory is that quantitative easing in Japan and Europe has contributed to reducing the term premium on long-term interest rates below their natural level. The rationale is that in global financial markets investors will seek the highest risk-adjusted yield. If a yield of equivalent maturity and risk is lower in one country because of monetary policy, investors will move money to another country not similarly affected. This arbitrage activity will lower rates in the country not impacted or less impacted by monetary policy. For example, yields on 10-year German bunds are slightly above 50 basis points, but U.S. 10-year Treasury yields are approximately 3.0 percent. If this argument has substance, then the yield on U.S. Treasuries would be higher than 3.0 percent absent the incentive to arbitrage German bunds and U.S. Treasuries.

Another theory is the flight to quality argument. Global concerns, particularly the existential risks the new Italian government poses to the European Union, have prompted investors to shift to safe assets, namely U.S. Treasury securities. This theory is supported by the observation that the flattening yield curve is due in part to long-term rates falling. Typically, curve inversions occur because short-term rates are rising faster than long-term rates. In fact, 10-year Treasury yields fell from 3.11 percent on May 17th to 2.82 percent on August 24th, and the 10-year – 2- year spread fell from 54 basis points to 19 basis points during that interval. However, since then 10-year yields have moved back up to 3.08 percent and the yield curve spread has edged up to 25 basis points. This reversal is consistent with the argument that concerns that drove the flight to quality have abated somewhat.

For data junkies, there have been four occasions when the yield curve (10-year – 2-year spread) inverted but recession did not ensue – 1967, 1986, 1995, and 1998.

Will Denyer of GavekalResearch argues that "*What really causes recession is interest rates being too high compared to the economy-wide return on invested capital. Specifically, when the cost of capital rises above the expected marginal rate of return on capital, recession soon follows*." [6] For the time being the spread between the return on invested capital and the cost of capital remains firmly in positive territory. Denyer concludes that the yield curve, measured in this way, is not yet signaling recession. Or, put differently, the Treasury yield curve spread is not the right one to watch in terms of recession risk.

Then there is the theory that the secular decline in the term premium has muddied the signaling power of the yield-curve spread. The decline in the term premium is linked to the secular decline in the neutral long-term rate of interest. Thus, it is

[6] Denyer, Will. "The Meaning of a Flat Yield Curve," The Daily, GavekalResearch, August 17, 2018.

argued, what matters is whether the current real rate of interest is below the neutral rate of interest. While the neutral real rate of interest is hard to measure, various estimates indicate that it is very low but rising as the U.S. economy strengthens. To the extent this is the case, it means that the **FOMC** can raise the federal funds rate further without triggering recession, regardless of the nominal measure of the yield-curve spread. This is a technical argument, which may or may not have merit. But, the research of Bauer and Mertens indicates that this technical explanation really doesn't matter because the nominal 10-year – 3-month Treasury spread historically has been the best and most reliable predictor of recession, but only once that spread becomes negative. On September 24th, that spread was a positive 86 basis points. That implies that the **FOMC** can raise the federal funds rate by another 100 basis points with impunity and perhaps more, if long-term yields rise further, as most expect.

Recession Timing. In summary, the collective weight of these theories and various yield curve measures suggest that recession risks are probably rising, but the advent of recession is far from certain. This could change a year from now as the **FOMC** continues to raise the federal funds rate 25 basis points each quarter. But, even then, history indicates that the onset of recession can take up to two years following the date when curve inversion occurs. This would place the tentative timing of recession in 2020 or 2021.

V. Inflation

Historical PCE and core PCE data were revised by BEA in July. The revised data are shown in **Table 10A**. BLS prepares and reports CPI data. These data were not revised and are shown in **Table 10B**. Over the past 20 years, core CPI has average 30 basis points higher than core PCE. The FOMC's 2.0 percent inflation target is linked to PCE. Thus, the equivalent CPI target is 2.3 percent.

Core PCE inflation was 1.98 percent in July. Since this measure approximately equals the FOMC's target, but the economy is operating above full potential and has a great deal of forward momentum, the questions now are ones of how far above the 2.0 percent target actual inflation will go and how will the **FOMC** respond.

As can be seen in **Table 10A** (**Chart 16** shows historical core PCE price index data and data from **Table 10A** in graphical form), forecasters, except **CBO**, expect the core PCE inflation index to be near 2.0 percent by the end of 2018. Over the longer run, most, including **FOMC** members, expect core PCE inflation to rise modestly above 2.0 percent but then settle back to that level as economic growth slows and the unemployment rate edges up.

Table 10A

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

Core CPE	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actual	1.24	1.83	1.61						
B of A				2.03	2.15	2.20	2.20	2.00	2.00
GS				2.00	2.30	2.20	2.20	2.00	2.00
CBO				1.77	2.11	2.18	2.17	2.11	2.08
Bill's BASE				2.02	2.61	2.46	2.12	1.77	1.80
Bill's Strong Growth				2.02	2.62	2.53	2.24	1.93	1.96
FOMC – High				2.0	2.2	2.2			2.0
FOMC – Low				1.8	2.0	2.1			

Table 10B

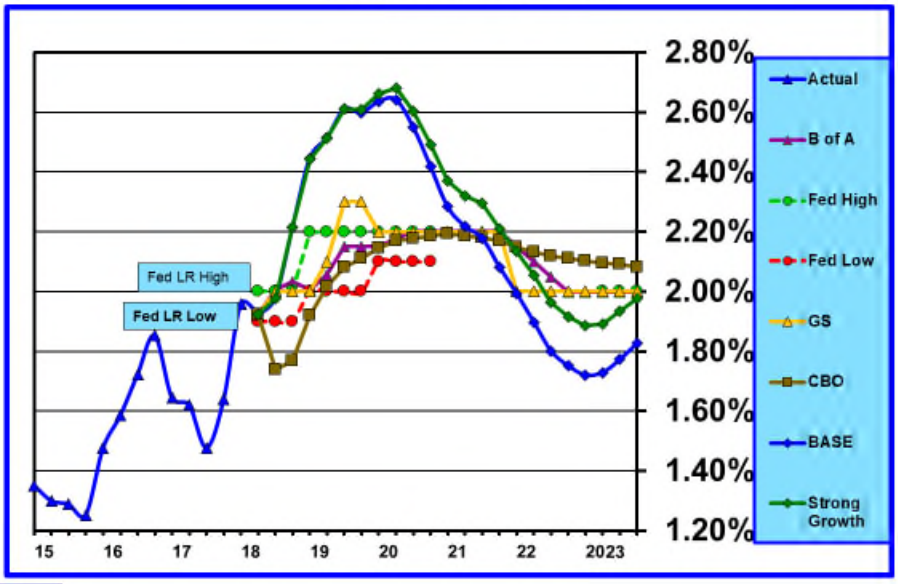
Core CPI Inflation Forecasts – B of A, GS, IHS Markit, Economy.com, Blue Chip Average

Core CPI	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actual	2.12	2.25	1.75						
B of A				2.26	2.48				
GS				2.50	2.40	2.20	2.20		
IHS Markit*				2.60	2.30	2.40	2.20	2.10	2.10
Economy.com*				2.60	2.50	2.30			
Blue Chip Average*				2.50	2.30	2.30	2.30	2.30	2.30

*CPI – total index; over the past 20 years core CPI has averaged 30 basis points higher than core CPE

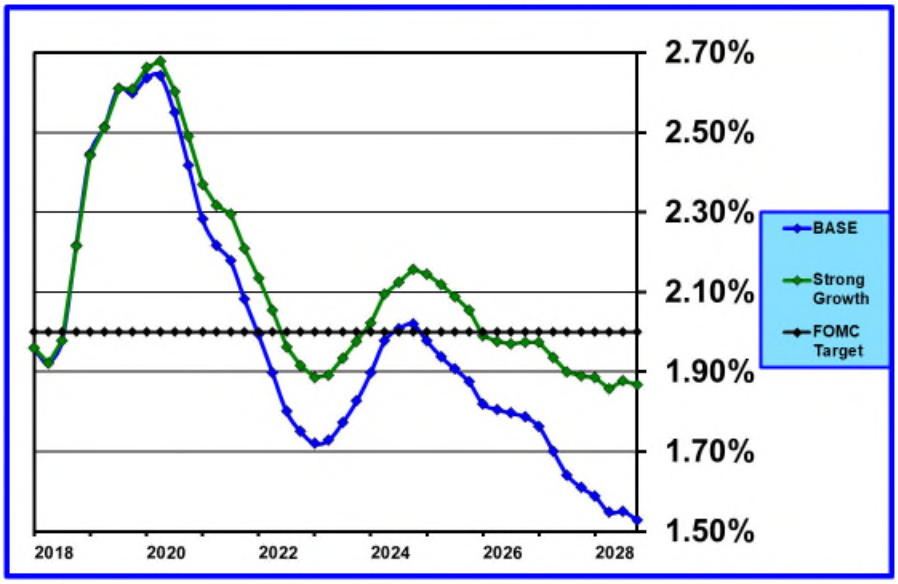
As can be seen in **Chart 16**, my econometric model indicates core PCE inflation will rise more than the estimates of others in 2019 and early 2020, but my estimates begin to soften in late 2020 and fall below other forecasts in the years following 2020. During 2019 and 2020 core PCE inflation forecasts in the "**BASE**" and "**Strong Growth**" scenarios rise to 2.65 to 2.70 percent. After that, however, my inflation forecasts fall in a choppy fashion, eventually reaching 1.5 to 1.9 percent by 2023 (see **Chart 17**). **Chart 17** shows core PCE inflation estimates for my "**BASE**" and "**Strong Growth**" scenarios from 2018 to 2028.

CHART 16 – Core PCE Inflation
(annual percentage rate)



Page 15

CHART 17 – Core PCE Inflation
(annual percentage rate)



Page 16

While one should never discount the possibility of a sea-change in the economic environment in the future that would set inflation on a different course, there are reasons that core PCE inflation could move below 2.0 percent in coming years, notwithstanding an economy that is currently operating at full employment. Core inflation has averaged 1.71 percent from 1998 to the present. It has only risen above

that level during the mature phase of the cycle, which is currently the case. There is little historical support for the view that inflation will remain at 2.0 percent when the economy slows, as it must inevitably, as the **FOMC** tightens monetary policy to a level of the federal funds rate above the long-term equilibrium level. Other secular trends that continue to place downward pressure on inflation, but have been masked by the current strength of the U.S. and global economies, include strong global competition, excess supply, and weak productivity. When the economy cools in response to monetary policy tightening, these trends will reassert themselves.

VI. Interest Rates

Interest-rate forecasts depend upon assumptions about employment growth, labor market tightness, productivity, and inflation. Some or many of these assumptions might prove to be inaccurate. Nonetheless, for a plausible range of assumptions, my econometric model provides a bounded range of interest-rate forecasts.

1. Interest Rates – Federal Funds Rate

The **FOMC** raised the federal funds rate 25 basis points at its June meeting to a range of 1.75 to 2.00 percent and is expected to raise the range to 2.00 to 2.25 percent at its September meeting. **Table 11** shows the forecast pathways for the federal funds rate expected by various analysts over the next several years. The **FOMC's** median pathway and the market's forward yield curve implied pathway are also shown in **Table 11** for comparative purposes.

Table 11

Number of Federal Funds Rate Increases of 25 Basis Points

	2018	2019	2020	2021-28	Total	Long Run
FOMC – median	**4**	**3**	**1**	**-2**	**6**	**2.75-3.00***
B of A	4	3	1	-1.5	6.5	3.00*
GS	4	4	0	0	8	3.25-3.50*
CBO	4	4	2	-3	7	3.00-3.25*
IHS Markit	4	4	1	-1	8	3.25-3.50
Economy.com	4	4	1	0	9	3.50-3.75
Market Forecast	**4**	**2**	**0**	**0**	**6**	**2.75-3.00**
Bill's BASE	**5**	**8**	**1**	**-9**	**5**	**2.50-2.75#**
Bill's Strong Growth	**5**	**8**	**1**	**-7**	**7**	**3.00-3.25#**

*FOMC, B of A, GS and CBO rates are equilibrium estimates
#Bill's estimates are forecasts which peak above the projected equilibrium rate

With respect to the issue of additional increases in the federal funds rate in 2018 and subsequent years, there is considerable divergence among the **FOMC's** own

projections, forecasts of analysts and the market forecast embedded in federal funds futures. The expected number and timing of federal funds rate increases made by several analysts, including myself, the **FOMC** and the market is shown in **Table 11**.

In its June Summary of Economic Projections (SEP), the median **FOMC** members' view was four increases in the federal funds rate during 2018 to 2.25 - 2.50 percent; three increases in 2019 to 3.00 - 3.25 percent; and one in 2020 to 3.25 - 3.50 percent, which would lift the federal funds rate 50 basis points above the **FOMC's** expected long-term equilibrium level of 2.75 – 3.00 percent. This seems like a reasonable response to quell the potential inflationary pressures expected to stem from an economy and labor market operating well above full capacity. However, by overshooting the expected long-term equilibrium rate, the **FOMC** risks triggering a recession.

Although the median number of federal funds rate increases during 2018 moved from three in March to four in June, this change was not as dramatic as media commentary made it out to be. It was already a close call between three and four increases in March and that remains the case in June. The average of the 15 **FOMC** members projections for the end of 2018 rose only 5 basis points from 2.19 percent in March to 2.24 percent in June, while the median rose from 2.125 to 2.375 percent.

Similarly, the median projection of the federal funds rate for the end of 2019 rose from 2.875 percent in March to 3.125 percent in June, but the average only moved up 4 basis points from 2.92 to 2.96 percent.

In the past, the **FOMC's** Summary of Economic Projections has proved to be an unreliable guide to future monetary policy. For example, at the beginning of 2016 the **FOMC** median projected four increases in the federal funds rate during 2016. Only one occurred. With 2018 half over most agree, including myself, that 2018 will see four increases.

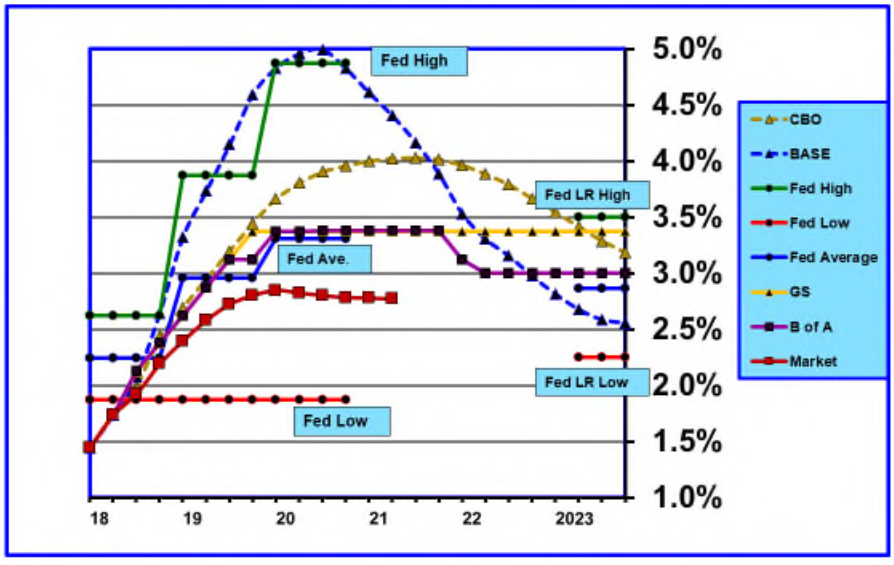
After 2018 there is divergence of opinion about the total number of increases the **FOMC** will implement during the current monetary policy tightening cycle. **GS** expects four increases in 2019 compared to **B of A's** and **FOMC's** three. **GS** believes the balance of risks is tilted in the direction of more rather than fewer increases. **GS** is projecting a higher equilibrium level of the federal funds rate of 3.25 to 3.50 percent compared to 2.75 to 3.00 percent for the **FOMC** and 3.00 percent for **B of A**.

My federal funds rate forecast in my "**BASE**" scenario (assuming 4.5 percent NAIRU) projects that the **FOMC** will be forced to increase the federal funds rate 250 basis points in 2019 and 2020 to 4.75 to 5.00 percent. That trajectory tracks the high end of the **FOMC's** projection range. This larger than consensus increase is driven

by stronger inflation (70 percent) and robust employment growth (30 percent). However, I doubt that my model's forecast will come to pass for two reasons. First, the **FOMC** historically has adjusted rates in measured fashion which has tended to moderate cyclical highs and lows in the federal funds rate – it is an administered rate, not a market rate. Second, it is likely, in my opinion, that the market would react badly to such a rapid run up in the federal funds rate, leading to a significant tightening in financial conditions, followed by rapid softening in economic momentum or even recession.

My model forecasts that the federal funds rate will drop sharply after 2020, as employment growth slows (50 percent) and inflationary pressures (50 percent) ebb. The lower long-term equilibrium rate of 2.50 to 2.75 percent in my long-term "**BASE**" scenario projections is caused by a decline in inflation below the 2.0 percent target, much slower employment growth, and to a lesser extent by weak productivity. As a reminder, the long-term projections of my model depend upon assumptions of what might happen rather than what will happen. What is more important to consider as a real possibility is that the federal funds rate in the short run could peak in a range of 4.50 to 5.00 percent. In that regard my model's forecast is not necessarily totally far-fetched considering that **CBO** is forecasting a peak level of 4.00 percent.

CHART 18 – Federal Funds Rate Forecasts



Page 17

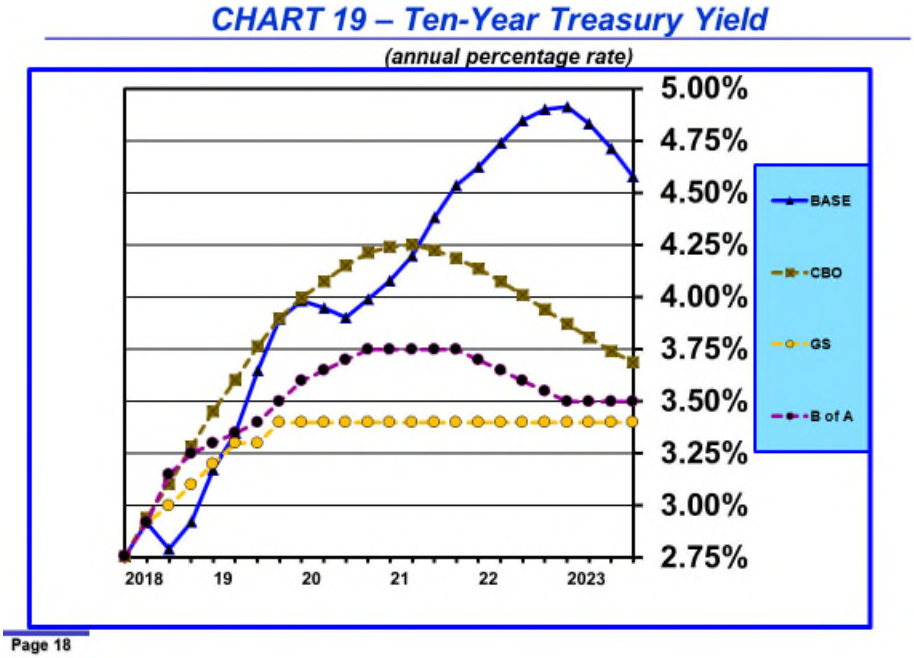
Chart 18 shows the quarterly progression in the federal funds rate from the present through 2023 implied by the **FOMC's** high, low and average projections. It also

shows forecasts for **B of A, GS, CBO,** my "**BASE**" scenario and the **market** forecast embedded in federal funds futures.

Over the past several years, **FOMC** members steadily reduced the median estimate of the long-term equilibrium level of the federal funds rate from 4.25 percent to 2.75; the central tendency range is currently 2.75 - 3.00 percent. Based upon my model**,** my sense is that the **FOMC's** median projection for the federal funds long-term equilibrium rate is reasonable and consistent with its estimate of long-term real GDP growth of 1.8 to 2.0 percent and assuming that the real rate of interest, when the economy is at full employment and NAIRU is zero, is approximately 0.75 percent. In my "**BASE**" scenario, the equilibrium level of the federal funds rate is 25 basis points lower in a range of 2.50 to 2.75 percent, primarily because my econometric model projects inflation to be below 2.0 percent in the long run.

2. Interest Rates – 10-Year Treasury Note Yield

Chart 19 shows forecasts for the 10-year Treasury note yield over the next five years. Over time analysts have reduced their forecasts for the ten-year yield. Partly this was a mark-to-market exercise driven by the persistent decline in this yield until this year. But the adjustments also reflected a growing consensus that the long-run equilibrium real rate of interest has declined considerably from its historical level. Analysts still expect long-term rates to rise, but no longer to as high a level.



Assuming an inflation rate of 2.0 percent and depending upon the level of productivity, my model indicates that the 10-year neutral rate should be between 3.50 percent and 3.75 percent. The long-term equilibrium rate is 3.40 percent for **GS**, 3.50 percent for **B of A** and 3.75 percent for **CBO**. These estimates do not differ materially from my estimated range. However, since my model projects inflation falling in the long run to an average of approximately 1.8 percent between 2023 and 2028, it also projects that the 10-year yield will average about 3.60 percent.

My forecast for the 10-year yield in my "**BASE**" scenario, which is shown in **Chart 19,** initially does not rise as rapidly as **B of A's** and **GS's** forecasts but by late 2021 my forecasts exceed those of **B of A** and **GS.** My forecasts reach a peak of approximately 5.0 percent at the end of 2022, and then commence a gradual decline to 3.5 percent by the end of 2028.

CBO's forecast is interesting in that it rises faster and much farther than other forecasts. **CBO's** estimate peaks at 4.25 percent in 2021, while my forecast peaks about a year later at 4.90 percent.

Although **CBO** does not forecast a recession, it does project a substantial slowing in the economy beginning in 2020. And, as that occurs both short-term and long-term rates fall considerably. It will be hard to avoid a recession if the high rates and flat yield curve that **CBO** forecasts for 2020 occur.