

Longbrake Letter – June 2018¹

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I. Is Today's Euphoria the Precursor of the Next Financial Crisis?

In the *May Longbrake Letter*, I raised this question and discussed developing risks. 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.

Most economies around the world are operating above potential and excess capacity has largely disappeared. Goldman Sachs (**GS**) expects the global economy to grow 4.1 percent in 2018, which is 0.5 percent above potential growth of 3.6 percent. The global economic cycle is mature. In the mature phase of the cycle, when economies are operating above potential, excesses and imbalances build up. We know from history that strong economic momentum, when the economy is operating at or above full capacity, eventually leads to recession and correction of the imbalances that built up during the euphoric period of overly strong growth.

Europe. In the past month, visible signs of stress and actual and potential loss of economic momentum have begun to emerge. Although growth remains above potential in Europe, it is decelerating gradually. The European Central Bank's (**ECB**) monetary policy is likely to contribute to further loss in momentum. The **ECB** will end quantitative easing by the end of the year, although it has promised not to raise interest rates before the summer of 2019. The prospective reduction in liquidity and an ever-widening interest-rate differential with the U.S., as the Federal Open Market Committee (**FOMC**) continues to raise rates, will collectively weigh negatively on European economic growth.

Italy has a new populist, euro-skeptic government. As time passes the economic policies of the new government to increase spending and reduce taxes will challenge European Union (**EU**) fiscal guideposts. As explained in **Section II** of this month's letter, the governance structure of the **EU** is deeply flawed and unless the flaws are eliminated the **EU** cannot survive intact in the long run. What is required for long-run survival is political, economic and fiscal integration of governance systems like those which exist in the United States and which have enabled the U.S. to flourish for nearly 250 years. The **ECB**, under the leadership of Mario Draghi, bought several years of time by keeping interest rates extremely low and purchasing debt of **EU** members. But the **ECB's** monetary policies, along with disruptive

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.

immigration, has contributed to a gradual weakening of the political center in EU member countries and to the rise of nationalism and populism. Those political trends make it more difficult, and probably impossible, to cure the governance flaws which threaten the existence of the EU. The policies of the new Italian government will eventually reintroduce uncertainties about the future of the euro and the EU that have long been kept under wraps. When that occurs, it is bound to have negative consequences for European economic growth.

Since the prospect of a populist government surfaced a few weeks ago, financial markets have been skittish. European bank stocks have performed poorly which is generally a negative indicator of trouble ahead.

In the U.S. the 10-year Treasury yield has fallen 22 basis points since mid-May to 2.9 percent. According to Charles Gave, the current fair value of the 10-year Treasury should be 3.2 percent with an upper limit on the valuation band of 3.9 percent.² Gave believes the reason for the decline in the 10-year yield is a direct consequence of the reemergence of the euro crisis. Long-term rates in Italy have risen to 2.7 percent while long-term German rates are 0.4 percent. The yield differential implies that the market is expecting a 20 percent decline in the Italian currency relative to the German currency. But this is impossible since there is a common currency – the euro. What the market is betting on is that eventually Italy will be forced to abandon the euro and adopt its own currency, with an accompanying devaluation in the exchange rate of 20 percent.

Italian nominal GDP growth is 2.4 percent, which means that Italy is in a “debt trap,” because when the yield on long-term debt exceeds the nominal growth rate in the economy, debt will compound at a faster rate than GDP and the burden of debt will rise relative to GDP. This is another reason that the Italian situation, if sustained, is untenable. The ECB’s quantitative easing bond-purchase program kept Italian interest rates lower and below the debt-trap range. With the ECB moving to end its bond purchase program by the end of 2018, investors see trouble ahead and believe that policies of Italy’s populist government will make a crisis inevitable.

What does all of this have to do with long-term U.S. interest rates? Gave observes that every time in the past 10 years that Italy has fallen into the debt-trap zone, U.S. long-term interest rates have fallen sharply. The recent experience is no exception. What is the connection? According to Gave, *“If the euro were to break apart, the world would face a massive deflationary crisis ... In such a crisis, one would naturally expect the U.S. dollar to go up and U.S. long rates to go down.”*

² Gave, Charles. “Why U.S. Long Rates Aren’t Going Up,” The Daily, GavekalResearch, June 20, 2018 (proprietary research, which is not publicly available)

Emerging Markets. Beyond Europe, there are indications of emerging stress in financial markets in emerging economies with high levels of dollar-denominated debt and negative current account balances – Argentina, Mexico, Brazil, South Africa, and Turkey – stemming from a modestly stronger dollar and higher U.S. interest rates.

Udith Sikand, an analyst with GavekalResearch, opines that “*A strong U.S. dollar, rising interest rates and higher oil prices are a toxic mix for emerging markets.*”³ ⁴ He observes that the currencies of Turkey, Argentina, Indonesia, South Africa, India, and most notably, Brazil, have come under pressure. During May investors withdrew \$12.3 billion from emerging market debt and equity funds, the largest outflow since November 2016. However, currency pressures are not yet intense because in Sikand’s opinion “*... investors are still giving weight to the positive domestic tailwinds which continue to benefit the majority of emerging markets. These include low inflation, relatively strong current account positions, and a reduced dependence on external financing, especially at the sovereign level.*”

Dollar strength is a particularly important ingredient in developing emerging market stress. The trade-weighted dollar exchange rate has risen 1.5 percent since December, but is 5.1 percent above its recent low in February. An appreciating dollar raises the servicing costs of dollar denominated debt, which is estimated to total \$10 trillion on corporate balance sheets in emerging markets. A rising dollar exchange rate prompts emerging market central banks to raise local currency interest rates to limit the inflationary consequences of dollar strength and stanch capital outflows. Monetary tightening in emerging markets in time will have a depressing impact on growth in emerging market economies.

In Sikand’s decision tree, the worst environment is one in which the dollar exchange rate and oil prices are both rising. In recent days, the price of oil has fallen a bit while the exchange value of the dollar continues to rise. If this combination persists, Sikand forecasts that “*... emerging markets will find themselves once again enduring the sort of slow grinding misery that prevailed from 2013-16.*”

In summary, risks are rising in emerging markets but have not reached a dangerous level. This could change, depending upon the course of global monetary tightening, political developments in Italy and Europe, and a substantive, as opposed to rhetorical, international trade war.

Global Trade War. It is a tenet of economic theory, which practically all professionally-trained economists embrace, that trade of goods and services among nations, uninhibited by tariffs or other kinds of restrictions, leads to greater economic output for all. It is the same

³ Sikand, Udith. “The Moment of Truth for Emerging Markets,” The Daily, GavekalResearch, June 11, 2018. (proprietary research, which is not publicly available)

⁴ Sikand, Udith. “A Decision Tree for Emerging Markets,” The Daily, GavekalResearch, May 23, 2018. (proprietary research which is not publicly available)

principle which underpins the EU's commitment to free movement of people among its members.

In theory, free trade and freedom of movement of people is an ideal state at the macro level. Theory ignores the disruptions and dislocations that exist in practice. There are benefits and consequences, but the benefits outweigh the consequences. Therefore, free trade is a good thing and should guide policy.

But, in a social and political context, the consequences are meaningful in human terms. Jobs flow to the regions that can maximize the value of outputs and minimize the costs of inputs. Jobs are lost and jobs are gained. In the aggregate, people are collectively better off. But, individually, the lives of many are disrupted in painful ways. Because this is the case, ordinary citizens have never accepted economists' altruistic arguments in favor of free trade. When economies are performing well and distributional benefits are widespread, concerns about the disruptive consequences of free trade policies tend not to get much traction. However, when economic performance is weak and distribution of economic benefits favors the wealthy, as has generally been the case since the Great Recession, concerns about the consequences of free trade and immigration escalate and become fodder for populist politicians.

President Trump's election owes much to his unapologetic exploitation of the common man's angst about being left behind. Free trade and liberal immigration policies were convenient villains to which to assign blame and marshal support to gain political power.

In a nod to theory, President Trump recently tweeted that free trade is "great" provided that all countries totally eliminate restrictions. But, the reality is that policies in individual countries are often designed to create economic advantage at the expense of other countries. Trump's narrative, which resonates politically, has been that the U.S. has played nice on trade and has not stood up to the self-serving trade policies of other countries, particularly China. The time has long since passed for America to continue its role as the world's free-trade patsy. "Make America Great Again," and "America First," are slogans that convey unequivocally that America intends to stand up to "unfair trade practices" that steal American jobs.

Thus, no one should be surprised that President Trump is using his powers to punish trade abusers. The difficulty, however, is that an all-out trade war will hurt all countries. The U.S. may make its point and win back an advantage, but the costs would be great. Economic theory works in reverse. Impediments to free trade will make all countries worse off.

Up until now there has been much talk and little action. This changed recently with the imposition of tariffs on steel and aluminum products. This was a small step that is more symbolic than substantive. However, the opening battle of what could become a vicious trade war commenced with the U.S. announcement that it is imposing tariffs on \$34 billion of

Chinese imports and could extend tariffs to another \$200 billion or more of Chinese goods. Part of the policy game is intended to induce China to change its self-serving trade policies. But, China is intent on regaining its historical economic and political ascendancy and does not appear to be inclined to give ground. Rather, China seems likely to pursue a tit-for-tat policy, slapping tariffs on American goods. Thus, escalation, rather than negotiation, is a real possibility. Incentive to negotiate appears limited because political agendas stand in the way and because each combatant appears to believe that the other has more to lose. While hotly debated, limited evidence suggests China may have the advantage.

We can hope that the sabre rattling and brinksmanship abates and serious trade negotiations ensue. In the meantime uncertainty has increased and is already having negative impacts on economic activity. This is the proverbial tip of the iceberg. The negative consequences will get a lot worse, if rhetoric turns into substantive action and even more so if escalation follows.

United States. In the case of the U.S., there is no slack in the labor market and the remaining slack in output, estimated by the Congressional Budget Office (CBO) at the end of 2017, probably has vanished. Enormous fiscal stimulus embedded in the “Tax Cuts and Jobs Act,” disaster relief spending, and substantial increases in defense and discretionary spending caps will lift growth substantially above potential in 2018 and probably in 2019 as well. When an economy has no slack, and operates well above its potential, it risks overheating and that triggers upward pressures on prices and accelerates the buildup of imbalances in the economy. We are in the mature phase of the business cycle and the added stimulus will propel the economy higher in coming months, perhaps dangerously so.

In response to overheating in the labor market and economic output exceeding its non-inflationary potential, the Federal Reserve will continue to tighten monetary policy systematically. The Federal Open Market Committee now projects that the federal funds rate will need to rise 50 basis points above its median estimate of the long-term full-employment equilibrium level. Of course, everyone hopes that policymakers will be able to engineer a soft landing, but history is not supportive of such a benign outcome.

Professional Economists. At a recent meeting of the Conference of Business Economists in Washington, DC (I am a member), a large number of members worried that the probability of recession is rising and that 2020 is the most likely time for onset. A bit tongue in cheek, one member boldly predicted that the next recession would begin on June 20, 2020. This approximate timing for the next recession is an emerging consensus among most seasoned economic forecasters. Indeed, some fear that earlier onset is a nontrivial possibility. I would hasten to add, however, that barring some unexpected major geopolitical crisis (perhaps Italy?), optimism and euphoria tend to extend the life of economic expansions for longer than seasoned forecasters customarily expect.

Market Participants. Unlike professional economic forecasters, there is no substantive evidence yet that financial market participants are worried about a recession occurring in the next 12 to 30 months, which may well be good reason for the next recession to be farther away than most forecasters expect.

Desmond Lachman, an economist at the American Enterprise Institute, recently summarized the traditional end-of-cycle arguments for imminent recession.⁵ *“The last thing that a U.S. economy close to full employment and with rising inflation expectations now needs is an expansionary budget policy ... [which] is bound to add considerable pressure on the Federal Reserve to raise interest rates to prevent the U.S. economy from overheating. ... In putting the economy on the path to higher interest rates than the Federal Reserve is currently anticipating, the administration seems to have forgotten the searing 2008-2009 experience of how rising interest rates led to the bursting of the U.S. housing and credit market bubbles. This is all the more to be regretted considering how much more pervasive asset price bubbles and credit risk mispricing are in today’s global economy than they were a decade ago.”*

For good measure, Lachman adds his concern about the potential negative consequences of “beggar-thy-neighbor” trade policies. Earlier this year Lachman flat out predicted that the next recession would begin in early 2019, although he has been silent on this score recently.

Anatole Kaletsky, a generally optimistic equity analyst for Gavekal Dragonomics, recently penned an article, “What – Me Worry?” after attending the Milken Global Conference in Los Angeles.⁶ *“Should we worry that Congress has lifted public spending ceilings at the same time as Trump’s tax cuts are creating trillion dollar deficits in an economy already at full employment? No, said Treasury Secretary Steven Mnuchin, because US growth will accelerate to 3% and automatically eliminate deficits. And anyway, according to several of the other speakers, tax cuts will eventually force cuts in government spending, and Medicare and Social Security to be reformed. ... Will rising bond yields or tightening Federal Reserve policy undermine the economy or Wall Street? Not according to Mnuchin, since interest rates are going up because the economy is doing better – ‘and that is a good thing’. ... I could go on and on ... What are the investment implications of all of this euphoria? Bear markets always begin when the sun is shining. ... when we see economic and policy risks clearly mount, even as optimism soars to euphoric levels, as it has in the American business community since the Trump tax cuts, it is prudent to assume that the upside is limited and look for better investment opportunities elsewhere.”* Kaletsky remains optimistic, but less so about U.S. equity markets.

⁵ Lachman, Desmond. “The Economic Consequences of Donald Trump,” American Enterprise Institute blog post, May 4, 2018.

⁶ Kaletsky, Anatole. “What – Me Worry?” Gavekal Research, Gavekal Dragonomics, May 8, 2018. (This is proprietary research which is not available to the general public.)

Is Another Global Financial Crisis in the Offing? Leading up to the 2008-2009 financial crisis, it was clear to a few that the U.S. real estate market and securities linked to that market were an enormous bubble waiting to burst and wreak havoc on financial markets and the economy. Most, however, were oblivious to the mounting risks. Well, the bust occurred and it was even worse than the prophetic pessimists anticipated.

Looking at the current situation, there does not appear to be a particular economic or financial sector that is as overextended as was the case with real estate in 2005-2008. Furthermore, many take comfort that the Dodd-Frank reforms, which increased capital ratios and liquidity requirements for financial intermediaries, have built in sizable buffers that will prevent the kind of disruptive contagion which punctuated the dark days of the 2008 mayhem that gripped global financial markets. Thus, most, as was the case prior to the 2008-2009 crash, are sanguine about current prospects – they do not see catastrophe ahead. Perhaps the majority is right. But, as Carmen M. Reinhart and Kenneth S. Rogoff discussed in their now famous book, *“This Time is Different: Eight Centuries of Financial Folly,”* (it wasn’t) mega financial crises recur again and again. Humankind seems destined never to learn from the past. Euphoria and greed perpetually overwhelm reason. Few see disaster looming.

So, if financial Armageddon is yet again at hand, what will be the trigger? At first glance, unlike 2008 there is no specific sector of the financial markets or the economy of consequence that appears to be an over-inflated bubble poised to burst. This absence of a highly visible smoking gun has prompted most to buy into the view that the economy will continue to grow steadily and that risks are limited and containable with the help of current regulatory safeguards.

Danielle DiMartino Booth says nonsense to this complacency. There is a smoking gun and it is staring us in the face. It is the monetary policies of global central banks over the past decade.⁷

Following the Great Financial Crisis, global economies were in deep trouble and price deflation threatened to inflict further damage. In response, beginning with the U.S. Federal Reserve and the **FOMC**, but quickly spreading to all the developed countries, central banks aggressively implemented non-traditional monetary tools, primarily large-scale asset purchases (quantitative easing) to depress interest rates. The intent was to stimulate economic activity and lift inflation.

Booth observes, referring to monetary policies in the early 2000s: *“As is always the case when interest rates are suppressed for far too long, nefarious behavior broke out in the credit markets.”* If anything, recent monetary policy not only suppressed interest rates for far

⁷ Booth, Danielle DiMartino. “The Great Contagion,” blog post, May 2, 2018. (This blog post is a summary of much more extensive analysis by Booth which is available on a proprietary basis.)

longer, but quantitative easing injected copious amounts of liquidity into global financial markets. Reflecting this, Booth quoted Peter Boockvar, Chief Investment Officer of Bleakley Advisory Group and editor of The Boock Report: *“Today’s bubble is in central bank balance sheets and the massive monetary inflation that’s created oceans of liquidity.”* Booth goes on to warn that *“The biggest risk to the economy and the financial markets is thus the reversal of these balance sheet builds and the ‘normalizing’ of interest rates.”* She adds that *“[it] is not stock market volatility that will be the primary disruptor, but rather volatility in the credit market.”*

As the **FOMC** raises interest rates and shrinks its balance sheet, the U.S. and global financial systems will be progressively starved of liquidity. Funding of massive federal deficits will exacerbate the liquidity squeeze – supply declines, demand increases, interest rates rise, and growth in the supply of money and credit decelerates to a level lower than growth in nominal GDP (this is already the case).

Why does this matter? **Charles Gave**, in “Why A Curve Inversion Matters,” provides an explanation.⁸ The yield curve Gave focuses on is not the Treasury curve – *“the government can always borrow.”* The relevant yield curve is the one that governs private sector borrowing. Gave’s short-term rate is the prime lending rate charged by U.S. banks and the long-term rate is a long-dated, seasoned industrial bond rated Baa by Moody’s. When the short-term rate exceeds the long-term rate, the economy has always experienced a recession within one year, or *“... a financial accident has afflicted economies which run fixed currency links with the US dollar.”* Currently, the spread between these two rates is zero. That means we are on the cusp. The prime lending rate will rise in lock step with the federal funds rate in coming months. Long-term rates have also been rising, but not as rapidly. But, as liquidity diminishes, the likelihood of yield curve inversion will rise.

Gave’s leading indicator of recession has never been wrong. The reason is straight forward. The long-term rate is a measure of return on capital. This rate mirrors nominal growth in GDP and corporate profits. The short-term rate is indicative of the cost of capital. When the cost of capital rises above the long-term return, firms will find it unprofitable to borrow. Gave paints a grim picture of what follows – financial engineering unravels, zombie companies will fail, capital spending will be reduced, workers will be laid off and the economy will move into recession.

Recession Is Possible in Coming Months, But Timing and Potential Severity Are Uncertain. 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

⁸ Gave, Charles. “Why A Curve Inversion Matters,” The Daily, GavekalResearch, May 1, 2018.

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.

But, developments could follow a different less sanguine path, perhaps one in which inflation rises more rapidly than expected, inflation expectations become unanchored, and interest rates soar, prompting an even tighter monetary policy which brings a quick and premature end to the good times. The steady escalation worldwide in debt leverage, much of which is denominated in dollars, has weakened the resiliency of the global financial system to weather shocks.

II. Italy's New Populist Government Will Renew the European Union's Existential Crisis

Last year the growth of EU economies improved more than expected. Euro area real GDP growth was 2.5 percent in 2017 compared to potential growth of 1.0 percent, according to **GS**. Momentum continued at the beginning of 2018 but is now showing signs of weakening. We may look back on 2017 and conclude that it was the euro area's last hurrah before the flaws of the EU's governance structure reasserted themselves and brought back to the fore the continued existence of the euro and the euro zone.

1. Optimism Fades, Euro-skepticism Dominates Italy's New Populist Government, Is the ECB Out of Bullets?

Despite intractable governance flaws, the EU has survived on borrowed time due to the ECB's creative "do whatever it takes" monetary policy, which kept interest rates artificially low and plied skeptical investors with the promise of unlimited liquidity. But the ECB's has just about exhausted the supply of purchasable assets. In addition, improved European economic performance provides an excuse to curtail quantitative easing, whose viability for much longer was already limited. Monetary policy could not solve the fundamental problems afflicting the European Project. All it could do was to buy time in the hopes that structural governance flaws would be addressed. Unfortunately, the temporary improvement in European economic performance diverted attention from dealing with governance issues and created a false sense that past difficulties had been laid to rest. Time now appears to be running out to fix what is broken. The formation of a populist right-left governing coalition in Italy may hasten the day of reckoning.

2. Consequences of the European Project's Structural Flaws

Fundamental flaws in the governance, economic policies, fiscal policies and monetary policy remain largely unaddressed. As a consequence, it is only a matter of time before the European Project endures a great cataclysm. Because the stakes are so high, ongoing attempts have been and will continue to be made to band-aid the beast just as has been the case since the Great Financial Crisis. This has bought and will continue to buy time, but

without fundamental governance changes, the EU and euro cannot survive indefinitely in their current forms. This is a risk that some see but most believe could never happen.

Actions to bail out member nations in financial distress and establish bailout facilities, coupled with the ECB's policy "to do whatever it takes," in 2014 and 2015 eased financial conditions considerably. Those policies muted the negative economic consequences of the German-inspired policy of sovereign budget austerity which led to restrictive fiscal policies across the EU. But financial and economic austerity hobbled growth, led to higher unemployment and drove down inflation. Those were relatively immediate consequences. Spurred by strong growth in China and a general increase in global economic activity and also by the ECB's aggressive quantitative easing monetary policy, EU member countries are now experiencing good economic growth and declining unemployment. But the political fabric of support for the EU has frayed.

While the initial economic decline has exhausted itself in the European peripheral countries that bore the brunt of austerity, their economies continue to underperform. The social contract in those countries is eroding and with it social stability. Political stability is also ebbing with the hollowing out of centrist parties and the rise of populist and nationalist parties on the left and right. Monetary policy palliatives provided financial stability and helped economic recovery. There is a general sense that the crisis has passed and that all is well. But, the cancer has not been cured and continues to spread. At some juncture a flash point will be reached when the palliatives no longer work. Although the moment of truth is probably not yet at hand, it is getting closer. And, Italy, may be the trigger.

Centrist political parties committed to the European Project still rule the roost in most EU countries, but euro-skeptic parties on both the right and the left are gaining momentum just about everywhere. Inevitably, this puts pressure on ruling parties to avoid losing votes and perhaps power by embracing popular aspects of fringe party policy issues. Thus, the political trend is unambiguously evolving in the direction of nationalism and this will increasingly undermine the glue that holds the EU together. Italy is the first EU member nation with a populist governing coalition that has limited commitment to the long-term success of the European Project.

3. Reasons Why the European Project, As Currently Structured, Is Fatally Flawed

There are many reasons why it is likely that the European Project, as currently designed, will eventually fail. In my opinion the most important reasons are crippling design flaws in the governance structure of the EU and Germany's economic policies.

Incomplete Political and Economic Integration. The U.S. federal/state system and constitution, which have been the foundation of U.S. economic success and ascendancy for over two centuries, rightly provide a model of the governance structures required for a

successful and durable union. The EU has some of the necessary governance structures, but lacks others.

Essential governance components include political union, economic integration, fiscal consolidation and a common currency. The euro area has a common currency, but the remainder of the governance structures, which extend to all EU countries, do not strike the necessary balance for long-term success between central authority and individual country sovereign prerogatives.

For example, all EU member countries must agree to a treaty change before it becomes effective. The U.S. constitution only requires $\frac{3}{4}$ of the states to ratify amendments.

There is no ability for the EU to tax citizens of member countries directly and there is no provision for fiscal transfers from countries with strong economies to countries with weak economies except through onerous bail-out agreements complete with intrusive, and often counterproductive, conditions. Fiscal transfers are essential to address differentials in economic performance. Such transfers occur automatically in the U.S. with virtually no notice.

While there is ample tension between the federal and state governments in the U.S., the ability of the federal government to forge national policies and to enforce them is clear under the U.S. constitution. The EU does have a limited ability to forge common policies and to enforce them. However, the EU's sway does not extend to any significant degree to matters of finance and commerce, which is partly why the financial and economic situations spun out of control in Ireland, Cyprus, and Greece.

The European Project will remain fundamentally flawed until its governance structures are modified to align to a greater extent with those that have made the American union successful. It is not mysterious as to what needs to be done. Doing it, however, given the strong allegiance to individual country sovereignty, has a probability close to zero.

There have been a few somewhat helpful modifications, such as the shared bailout facilities and establishing a banking union. However, the banking union, while providing for common regulation of the largest European Banks, does not incorporate the unified approach to deposit insurance and resolution of all insolvent banks that has worked so well in the United States through the Federal Deposit Insurance Corporation. Indeed, it can be argued that the bail-in approach can amplify a potential financial crisis by prompting the shifting of funds out of a troubled country's banks into banks of a stronger EU member. Because of this threat, the EU and ECB blinked and let Italy bail out its most troubled banks without enforcing the bail-in policy.

Banking Union. One of the features of the EU is free and uninhibited capital flows. This is an essential governance component for successful union, but unfortunately its operation is flawed because of an imperfect a banking union.

An effective banking union has three components. First it has a common set of rules and a single supervisor. Second, it has a universal deposit insurance system. Third, it has a centralized resolution facility to manage failures of individual financial institutions. All three components exist in the U.S. The only component that exists in the EU today is a common set of rules and regulations for the largest banks with the ECB serving as the single regulator. Other rules, for example those governing the granting of credit, are left to the determination of individual countries. This absence of unified rules and oversight contributed to the unsustainable financial imbalances that built up in Ireland, Cyprus, and Greece.

Common supervision of European banks has been limited in two ways by Germany. First, Germany gained acceptance of EU members to limit unified supervision to the 150 largest financial institutions, leaving thousands of smaller banking and financial institutions to be supervised by their home country. Second, more recently Germany convinced EU members that the next time treaty revisions are considered, one of the revisions should be a clear separation of the ECB's monetary and supervisory responsibilities. While such a clarification appears to be reasonable, many view this development as a German tactic for delaying implementation of a more all-encompassing banking union.

Centrally coordinated deposit insurance and resolution remain under discussion. One of the working resolution principles is to "bail in" creditors. This principle, coupled with the free flow of capital among EU members, assures that creditors will flee a troubled bank at the first whiff of trouble, which almost assures a liquidity crisis in the troubled institution.

There is implied deposit insurance for the first €100,000 of bank deposits. This implied guarantee was violated in the initial Cyprus bailout proposal. The subsequent proposal restored the implicit guarantee but also forced conversion of "uninsured" deposits into equity which resulted in an estimated loss of 50 to 60 percent.

Now ponder this. If you can move euros freely to any financial institution in any EU member country and there is doubt that your deposits are guaranteed, why would you keep them in financial institutions that are perceived as weak or that are located in EU countries that are potential candidates for bailouts replete with conditionality. The handling of financial crises in Cyprus and Greece demonstrated the consequences for depositors can be substantial. Those precedents will prompt knowledgeable depositors to move their funds to safer places at the first hint of trouble. This is the stuff of contagion. The best way to prevent the potential for contagion is through a banking union that covers all financial institutions and provides for a unified approach to deposit insurance and resolution.

Inability to Forge a Fiscal Union and Mutualize Sovereign Debt. Losses must eventually be borne by someone. When individual institutions fail, the losses are borne by the creditors. But, because this often triggers panic and a meltdown in the financial system, nations generally step in and bailout creditors. This solution works only as long as the nation itself remains solvent. If the obligations of bailing out creditors become too great as it was in Greece, Ireland, Portugal and Cyprus, either the nation must declare bankruptcy or it must be bailed out by other countries directly or indirectly through the International Monetary Fund or some other mechanism, such as the European Stability Mechanism.

As we know, the solution to date to avert bankruptcy of individual EU members has been to provide bailout loans with conditions that ostensibly are intended to return those nations to solvency over time. These policies appear to have achieved the primary objective, but at considerable cost in lost output and a diminished standard of living for citizens of affected countries. There has also been a political cost because diminished economic opportunity has had social consequences which have strengthened populism, nationalism, and nativism. Political and social trends in the EU are gradually eroding the bonds that have held a flawed EU together.

Issuance of euro bonds, which would mutualize sovereign debt, would spread losses to all EU member countries, which collectively are financially capable of backstopping individual country insolvencies. But this means that strong EU countries would end up paying for the “sins” of weak countries. To date this solution has been unacceptable and is particularly politically toxic in Germany.

Embedded in the ECB’s quantitative easing program is a limited amount of debt mutualization. The program provides for the purchase of sovereign bonds by a country’s national central bank. In addition, the ECB may purchase a limited amount directly for its own account. Since all member countries stand behind the ECB this constitutes a form of debt mutualization. Greece sovereign debt is not eligible to be purchased in the ECB’s quantitative easing program. This enables German politicians to state categorically that German taxpayers are not on the hook for making good on Greek sovereign debt should Greece default. Default of a EU country could be avoided by restructuring existing debt to reduce debt service payments or by extending new loans.

But if the member country lacks the ability to repay its debt under just about any conceivable scenario, such actions would constitute a form of debt mutualization. An alternative to default would be to restructure debt and force immediate realization of losses. This is the approach embedded in the bank bail-in policy. In the case of sovereign debt, it would shift the risk of losses to holders of the debt, such as the ECB, the IMF, European bailout facilities, and private investors. Private investors, of course, would have incentive to get out of their holdings at the first indication of trouble, which could trigger a market panic and escalate the severity and immediacy of the crisis. The ECB’s sovereign debt purchases over

the past several years have diminished contagion risk by reducing substantially the amount of sovereign debt held by private investors.

Cultural and Language Differences and Limitations on Population Mobility. Although the Schengen Agreement among EU members mandates the free movement of people with EU citizenship, cultural and language differences limit population mobility. In the U.S. when a particular geographic area is afflicted by an economic downturn many people leave the area to seek employment opportunities in regions with stronger economies. Language and cultural differences make labor mobility stickier in the EU. As a result, it takes longer for depressed areas to recover.

What mobility does exist primarily involves immigration of people from different cultural and religious backgrounds. In the wake of higher unemployment political opposition to unrestricted movement of people across borders has escalated and nurtured expansion of fringe anti-immigration parties. The principle of free and uninhibited movement of people within the EU was a primary driver of U.K. voters' decision to leave the EU. It was a major issue in bringing a populist government to power in Italy. And, it threatens to bring down Angela Merkel's fragile governing coalition in Germany.

Aging and Declining Population Growth and Low Potential GDP Growth. Most EU countries either have low population growth or negative population growth. The problem is much worse in peripheral countries whose economies have suffered most from austerity. Emigration, particularly of young able-bodied workers, escalated in those countries, particularly in Spain and Greece, during the time when austerity policies depressed economic activity.

Population growth is a critical component of potential GDP growth. When population growth is negligible or negative, potential GDP growth depends entirely on productivity gains. But, productivity growth has collapsed in EU countries since the Great Recession. **GS** estimates that EU potential real GDP growth is a paltry 1.0 percent compared to 1.75 percent in the U.S.

Potential GDP growth is important because the higher it is the easier it is to grow out of a sovereign debt problem.

In addition to the low potential GDP growth posed by limited or negative population growth, an aging population stresses social welfare pension and health systems. EU nations collectively have extensive social safety nets which will require over time an increasing proportion of government expenditures. Either taxes will need to be raised or funds reallocated from other types of expenditures. However, as work forces shrink, tax revenues will also shrink, which would require raising tax rates as an offset. Declining and aging populations inherently create potential budget deficits in nations with extensive social welfare programs. Unfortunately to date, the policy response has been to kick the can down

the road by funding the rising costs of social welfare programs through sovereign debt. This policy buys time, but at the cost of increasing the sovereign-debt-to-GDP ratio, which increases the risk of eventual insolvency and default. This is a problem that is not unique to Europe. The U.S. has been following the same policy and recently escalated the size and timing of the eventual solvency challenge through tax cuts and spending increases funded primarily through the issuance of sovereign debt.

This problem is one that is gathering momentum gradually. While not an immediate consideration in most EU countries or the U.S., it will make policy resolution more difficult as time passes.

High Levels of Sovereign Debt. While sovereign debt is not bad in and of itself, too much of it relative to the size of a nation's economy creates enormous risks. The EU has established a 60 percent target maximum for the sovereign-debt-to-GDP ratio. This appears to be a reasonable upper bound to avoid the potential for insolvency risks to become significant. Unfortunately, most EU members have higher ratios. And, even when they have lower ratios, as was the case for Ireland and Cyprus, the need to backstop the financial system resulted in an immediate and substantial escalation in their debt ratios to levels greatly in excess of 60 percent.

It would seem that the solution to high debt ratios is fiscal austerity and that is the policy that the EU has pursued. But, when economies are already weak, austerity depresses economic activity and results in rising rather than falling debt ratios. The alternative solution of growing out of the problem is limited by population dynamics and poor productivity.

Unfortunately, the more probable solution longer term is restructuring of sovereign debt through bankruptcy or other means. This requires forcing creditors to absorb losses. This is an alternative that has been totally off the table, but eventually may be unavoidable. Since Germany is the largest creditor in the EU, it would be the largest loser.

Write down of sovereign debt either directly or through the issuance of euro bonds appears to be inevitable. Write down occurred in the case of Greece, but in a way that permitted Greece to remain a member of the EU. Private creditors experienced losses but public creditors did not. The consequences for Greece of the bailout solution now in place have been economically disastrous. GDP and the standard of living fell by more than 25 percent.

Ultimately, EU nations with high debt-to-GDP ratios will not be able to work their way out of the problem. Debt restructuring, either voluntarily or involuntarily through default and/or exit from EU membership, can be postponed only so long. The crisis in Greece was defused by loans that enabled Greece to pay its bills. Other than private investors taking a hit, no debt relief was granted. The theory behind the solution was that over time Greece would be able to reduce its debt-to-GDP ratio. But to realize such an outcome, the Greek government must run a "primary" budget surplus, which means tax revenues must persistently exceed

expenditures. But this involves transferring resources from Greek citizens to creditors. This depresses economic activity in Greece, which in turn reduces the amount of tax revenues available to fund debt repayments. When the sovereign-debt-to-GDP ratio is high enough, as it is in Greece, the policy that creditors have pursued by refusing to provide debt principal relief, results in an increasing debt-to-GDP ratio while simultaneously depressing economic growth on an ongoing basis. This is not a viable long-term policy. Greece will eventually need another bail out, which will only delay the inevitable. In the meantime, political support will erode and when the next parliamentary election is held, the submerged crisis might well resurface with a vengeance.

Italy's debt-to-GDP ratio is very high, but not to the same extent as it is in Greece. Nonetheless, EU policies have forced Italy to operate with a primary budget surplus for many years. This has been accompanied by minimal real growth. Thus, it is not at all surprising that the Italian electorate gave a majority of votes in the recent election to two populist parties – one that wants to increase public spending and one that wants to reduce taxes. These two parties have now forged a governing coalition. If the coalition pursues campaign pledges, it will result in direct confrontation with EU fiscal policy guidelines. While the coalition has promised to retain the euro currency, the threat of eventual exit should not be dismissed.

For countries who are not members of a monetary union, the solution to debt problems is straight forward and resolutions have occurred repeatedly throughout history. The over indebted country defaults, restructures its debt and devalues its currency. This relieves it from an unbearable debt servicing burden while simultaneously making its exports more competitive. The result almost always is a renaissance in economic growth. In a monetary union, currency devaluation is not an option, so a country cannot restore competitiveness in this fashion. Default is an option but requires other member countries to embrace this solution. To date, the default solution in the EU has been anathema, particularly in Germany, for political reasons and also for fear that once a precedent has been established many other EU countries will demand similar treatment of their sovereign debt.

4. Germany's Economic Model and Policies

While much of the rest of Europe has struggled economically, Germany has enjoyed low unemployment. Germany's success is rooted in reforms it undertook in the 1990s following the union of East and West Germany, which improved competitiveness tremendously. But, success is also the result of Germany's intentional policy to emphasize manufacturing and exports. Its competitiveness and prowess in manufacturing have resulted in the creation of jobs and large trade surpluses. Germany's economic strategy and success are a cause of economic problems in other members of the euro area.

Germany enacted significant economic reforms between 2003 and 2005 based on Gerhard Schroeder's Agenda 2010. At the time, Germany's economy was sputtering and Germany was sometimes referred to as "the sick man of Europe."

Agenda 2010 entailed large cuts in corporate income tax rates; reductions in public medical insurance, pensions, and unemployment insurance; and significant labor market reforms, which prioritized employment over high wage rates.

Today Germany is an economic powerhouse with low unemployment and reasonable growth. Germany also has transformed its balance of payments from chronic deficits to enormous surpluses, which continue to grow ever larger. This development stemmed directly from the Agenda 2010 reforms which resulted in a substantial competitive advantage for the German economy. This advantage was amplified by its participation in the Eurozone and the shared common currency, particularly because the deutsche mark was undervalued at the time of its conversion into the euro.

Unfortunately, Germany's success has contributed to weakness in some other European countries. Ordinarily, a growing competitive advantage would cause the value of the country's currency to rise and that would increase the price of its exports offsetting the competitive advantage. But this cannot occur when the currency is shared with countries with less competitive economies. Consequently, not only did Germany's competitive advantage result in a trade surplus, the surplus grew larger year by year.

Suffice it to say that because Germany is a net exporter, other euro area countries are forced to be net importers. This shifts jobs from those countries to Germany. Were it not for the common currency, such imbalances would melt away over time through adjustment in currency exchange rates. This is not possible in the euro area. Thus, adjustment can only occur through internal devaluation which entails eliminating competitive disadvantages with Germany by driving down labor costs, among other things. For example, internal devaluation has been forced on Greece. It has worked because wages in Greece fell 25 percent so that Greece's exports became competitive. However, this outcome came at the cost of high unemployment and substantial shrinkage in the size of the Greek economy.

Germany has forced internal devaluation in euro area members by mandating fiscal austerity. This has been enforced directly through bailout agreements but also indirectly through the Fiscal Pact which establishes budget deficit targets with enforcement to be carried out through the European Commission (EC). Unfortunately, as well intentioned and as fiscally prudent as these policies might appear to be, in practice they have been a disaster. That is because fiscal multipliers in weak economies have turned out to be greater than one. What that means is that tax increases and spending cuts intended to reduce the public-debt-to-GDP ratio end up raising it because economic activity falls too much. Unfortunately, Greece has been the poster child for this phenomenon.

One country's trade surplus must be offset by trade deficits in other countries. By running a consistent trade surplus, Germany has transferred production and jobs from trade-deficit countries to Germany. That was good for German growth and German employment but hurt growth and employment in trade-deficit countries.

Germany could have reduced its competitive advantage by using fiscal policy to stimulate consumer spending. This would have resulted in moderate increases in inflation and somewhat higher wage increases, which would have reduced Germany's competitive advantage.

But, until recently Germany did the opposite. Having engaged in belt tightening to become more competitive and then benefiting from those sacrifices, the German public felt that austerity was not just a matter for German workers to endure but that the government should live within its means as well. Thus, political pressure emerged for Germany to have a tight fiscal policy and to balance the budget. This, unfortunately, kept inflation low and, rather than moderating Germany's competitive advantage, the competitiveness gap grew even larger. The current German governing coalition has increased spending somewhat, but a balanced budget remains a firm policy.

In a U.S. Treasury Department report on foreign economic and currency policies, Germany was sharply criticized for its huge balance of payments surplus which the report cited as creating "... a deflationary bias for the euro area, as well as for the world economy." President Trump has been extremely critical of Germany's trade surplus with the U.S.

It has been German policy to demand that members of the Eurozone reduce budget deficits. In Germany austerity policy works because of its export-based economic model and its competitive advantage. However, in less competitive countries austerity depresses economic activity.

Germany could transfer some of its accumulated wealth to other Eurozone countries through fiscal transfers or by agreeing to replace sovereign country debt with Eurobonds. But Germany has adamantly opposed such proposals. That is because it would be politically suicidal to pursue such a policy in light of passionate public opinion opposition. Indeed, the political rise of the Alternative for Germany party has benefited from such sentiment.

Unfortunately, rebalancing of the Eurozone economies cannot occur until Germany adjusts its economic model. Except for President Trump, few are openly talking about the need for Germany to do so. To the contrary, Germany has been applauded for its economic success and other countries are encouraged to follow the German model to achieve economic success. But this is not possible for every country because the sum of all countries' trade surpluses and deficits must be zero. Thus, as long as Germany continues to pursue its economic policies, and there is limited pressure for them to do otherwise, the integrity of the

EU will continue to erode slowly – the weak will continue to stagnate and suffer high unemployment. No amount of austerity will change this outcome.

This leaves countries with weak economies in a hopeless situation. Unrelenting pain and absence of hope are a toxic combination politically. The political process has unfolded slowly, but the consequences are now visible and the trend is troublesome. In democracies, political parties that do not deliver prosperity lose elections. It starts first with erosion of the political power of centrist parties that support the European Project. It continues in time to the election of parties that focus on national priorities and resist the dictates of the EC, the ECB, and the IMF – formerly referred to as the “troika,” now referred to as the euro group. This is exactly the scenario that has unfolded in Italy.

What we have learned is that the promise of liquidity by the ECB has taken investor risk off the table. This means that financial markets have not been the catalyst for forcing rebalancing. Rebalancing will eventually occur, but it may take a very long time to unfold. The catalyst most likely will be slowly escalating social unrest in economies with high unemployment rates and the gravitation over time of voters to political parties on the right and the left that do not have a stake in the preservation of the EU.

5. Where Are the EU and Euro Area headed?

When I review the fundamental flaws inherent in the EU and euro area governance structures and consider demographic trends and political constraints, I am hard pressed to see an outcome that preserves the EU and euro area in their current forms. But European political elites are committed to the European Project and will continue to struggle to preserve it. This means that the unraveling process is likely to be an extended affair. However, deterioration is proceeding and damage is accumulating. Social unrest is building and legitimacy of the ruling political elite is slowly eroding. In short, the crisis is far from over. Indeed, more and worse episodes are ahead. The new populist government in Italy might precipitate the next chapter in the on-going saga of periodic euro-area crises.

The disparities in economic performance among the EU member countries are substantial. For long-term survival of the EU, such disparities must diminish. That requires creating governance and fiscal structures that provide for greater integration. It also would require the strongest economy – Germany – to modify its current export-driven economic model. While there has been a lot of talk about what is needed, little of substance has taken place and there is little reason to expect further action of consequence to occur, at least not until a real existential crisis erupts. The weakening of centrist parties that support the European Project virtually assures that policies necessary to assure long-term survival of the EU will never occur.

So, if you thought all is well in Europe and things are getting better, that is hardly the case in several key countries. The fundamental problems that are tearing the EU apart have not been

addressed. Unlimited liquidity from the ECB has defused financial risks and engineered improved economic momentum. This has bought time and held things together for a while longer, but it is not a lasting solution. Indeed, as Charles Gave of GaveKal Dragonomics has opined, there are many parallels to what the ECB is currently doing through its quantitative easing program and the South Seas bubble. And, we know from history that the South Seas bubble eventually burst and exacted a terrible toll.

III. Components of U.S. Real GDP

First quarter real GDP growth was 2.2 percent, disappointingly weak after fourth quarter growth of 2.9 percent. The principal culprit was weak consumer spending. However, this development appears to have more to do with quarterly statistical noise than a harbinger of an emerging weakening trend in economic growth. This interpretation is reinforced by the delay in tax refunds and the fact that tax cuts had not yet begun to show up in paychecks in a significant way. The market not only took the report in stride, it was pleased that reported growth exceeded the consensus forecast. Optimism was not dented and attention remains focused on the expected positive impact of substantial fiscal stimulus on economic activity in coming quarters. GDP growth forecasts for the second quarter are close to 4 percent, which would more than make up for the weak first quarter. Forecasters have raised estimates for all of 2018 since the start of the year.

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. “Preliminary Estimate” of First Quarter GDP

The “**Preliminary Estimate**” of first quarter GDP growth decreased 15 basis points from the “**Advance Estimate**” to 2.2 percent. However, this revision actually reflected an improvement in underlying economic strength, as a decline in the contributions of inventories and net exports was partially offset by an increase in business investment. This can be seen in the improvement in “**Private Domestic**” real GDP from 1.49 percent to 1.76 percent.

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

Reported quarterly “**Total GDP**” growth tends to be 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 2.17 percent in the first quarter “**Preliminary Estimate**,” the slowest rate since the first quarter of 2017. Weak first quarter growth has been a recurring phenomenon in recent years, suggesting perhaps a downward bias in first quarter seasonal adjustment factors.

Growth in “**Total GDP**” tends to be volatile from quarter to quarter, which makes this measure 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 2.04 percent in the first quarter, which was much weaker than the 3.40 percent growth rate in the fourth quarter.

Table 1
Composition of 2018 and 2017 Quarterly GDP Growth

	First Quarter 2018 Advance Estimate	First Quarter 2018 Preliminary Estimate	First Quarter 2018 Final Estimate	Fourth Quarter 2017	Third Quarter 2017	Second Quarter 2017	First Quarter 2017
Personal Consumption	.73%	.71%		2.75%	1.49%	2.24%	1.32%
Private Investment							
Nonresidential	.76%	1.13%		.84%	.58%	.82%	.86%
Residential	.00%	-.08%		.46%	-.18%	-.30%	.41%
Inventories	.43%	.13%		-.53%	.79%	.12%	-1.46%
Net Exports	.20%	.08%		-1.16%	.36%	.21%	.22%
Government	.20%	.20%		.51%	.12%	-.03%	-.11%
Total	2.32%	2.17%		2.87%	3.16%	3.06%	1.24%
Final Sales	1.89%	2.04%		3.40%	2.37%	2.94%	2.70%
Private	1.69%	1.84%		2.89%	2.25%	2.97%	2.81%
Private Domestic	1.49%	1.76%		4.05%	1.89%	2.76%	2.59%

“**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.

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.

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.

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

Annualized quarterly data are often misleading about the underlying trends in economic growth. **Table 2** and **Chart 1** show four-quarter moving averages of growth rates for GDP components as well as the four alternative measures of real GDP. This smooths out quarterly aberrations in the data and gives a clearer picture of the health and direction of the economy.

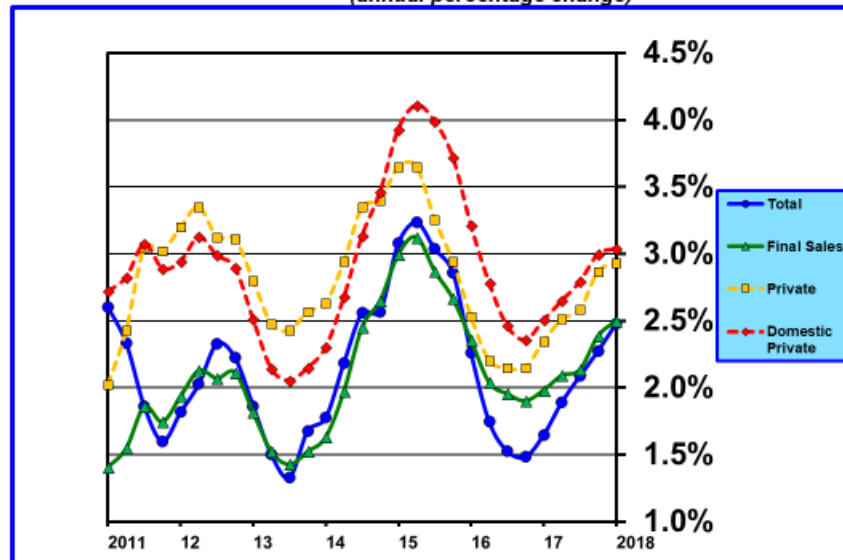
Growth in “**Private Domestic**” GDP has been consistently greater than growth in “**Total GDP**” for several years. This has also been the case for “**Private**” GDP since the second quarter of 2011. Since the fourth quarter of 2014, growth in “**Domestic Private**” GDP has been stronger than growth in “**Private**” GDP. This means that trade has had an unfavorable impact on GDP growth over the past three years.

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

	GDP Com- ponent Weigh t	First Quarte r 2018	Fourth Quarte r 2017	Third Quarte r 2017	Second Quarte r 2017	First Quarte r 2017	Fourth Quarte r 2016	Third Quarte r 2016
Personal Consumption	69.51 %	2.69%	2.75%	2.75%	2.80%	2.81%	2.73%	2.78%
Private Investment	17.39 %							
Nonresidenti al	13.64 %	5.53%	4.69%	3.28%	1.94%	.57%	-.59%	-.67%
Residential	3.47%	1.11%	1.77%	1.76%	2.09%	3.34%	5.48%	7.41%
Inventories	.13%	-15.2%	-54.5%	-21.9%	-59.8%	-69.7%	-66.8%	-66.3%
Net Exports	-3.65%	5.58%	6.06%	7.83%	5.98%	6.33%	7.51%	10.59%
Exports	12.86 %	3.65%	3.36%	2.27%	1.97%	.76%	-.33%	-.93%
Imports	- 16.51 %	4.07%	3.95%	3.45%	2.83%	1.92%	1.27%	1.32%
Government	16.91 %	.45%	.11%	.03%	.13%	.28%	0.75%	1.05%
Total	100.0 %	2.48%	2.27%	2.09%	1.89%	1.65%	1.49%	1.53%
Final Sales	99.87 %	2.50%	2.39%	2.14%	2.09%	1.98%	1.90%	1.96%
Private	82.95 %	2.93%	2.87%	2.58%	2.51%	2.35%	2.15%	2.15%
Private Domestic	86.60 %	3.04%	3.00%	2.79%	2.65%	2.50%	2.36%	2.46%

CHART 1 – Real GDP Growth – Alternative Measures

(annual percentage change)



Page 0

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 20 basis points in the first quarter and 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**.”

3. Consumption and Disposable Income

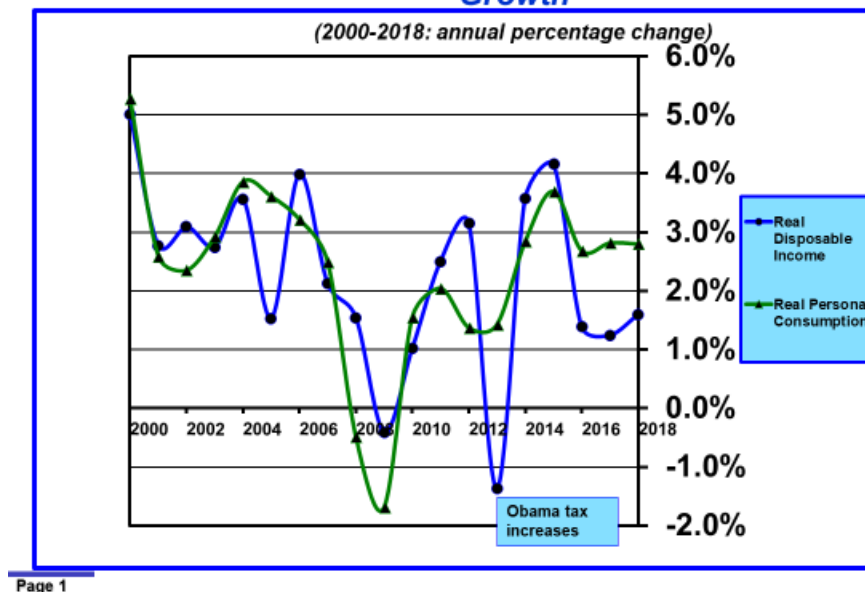
Personal consumption contributed 0.71 percent to first quarter real GDP growth compared to 2.75 percent in the fourth quarter. However, the four-quarter trend in consumer spending edged down only slightly from 2.75 percent to 2.69 percent, which underscores the limitations of relying on annualized quarterly 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 has been lackluster.

Chart 2 shows annual rates of growth in real disposable income and real consumer spending from 2000 through the first 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. However, it is unclear why growth in disposable income faltered in 2016 and 2017 while consumption growth remained relatively strong.

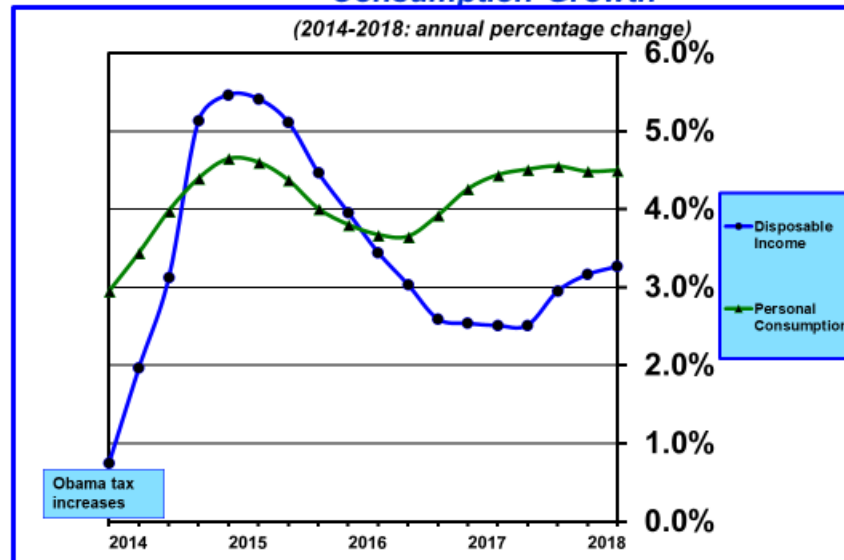
CHART 2 – Real Disposable Income and Consumption Growth



Page 1

Chart 3 shows the 4-quarter moving average growth rates in nominal disposable income and consumption from 2014 through the first quarter of 2018. As is evident in **Chart 3**, nominal disposable income growth rose 2.95 percent in the fourth quarter, 3.16 percent in the first quarter and 3.27 percent over the 12 months from April 2017 to April 2018. This improving trend will continue in 2018 and will benefit from strong gains in employment, rising wage rates and tax cuts and should close the gap between growth in disposable income and consumption.

CHART 3 – Nominal Disposable Income and Consumption Growth



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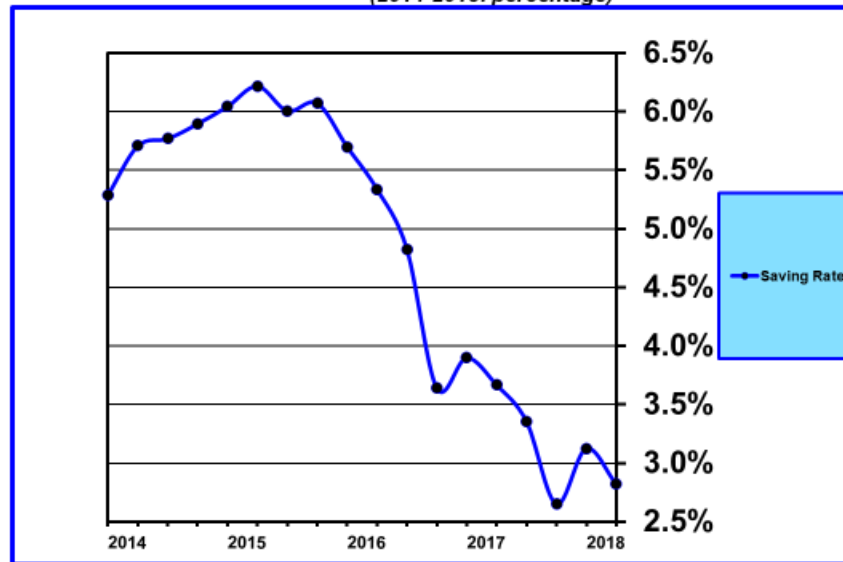
Growth in consumption is typically less volatile than growth in disposable income. Consumer saving serves as the buffer (see **Chart 4**). When growth in disposable income is weak, the saving rate declines as consumers dip into savings and increase borrowing to sustain consumption. This phenomenon is 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**, so far as the reported data are concerned, consumer spending has been supported by a collapse in the saving rate from 6.1 percent during 2015 to 3.4 percent in 2017. Continuing the downward trend, the saving rate in the first quarter of 2018 was 3.1 percent and 2.8 percent in April.

Since the election of President Trump, consumer and business confidence has surged to the highest levels in 20 years. Over the same time, consumption growth has accelerated but income growth didn't follow suit until the last two quarters. Income growth needs to continue accelerating until it matches consumption growth. If it does not, either the saving rate will continue to fall or growth in spending will slow – neither alternative is desirable. However, tax cuts, relatively strong employment growth in the next few months and acceleration in wage growth are likely to boost income growth and stabilize the saving rate without depressing spending growth.

CHART 4 – Saving Rate

(2014-2018: percentage)



Page 3

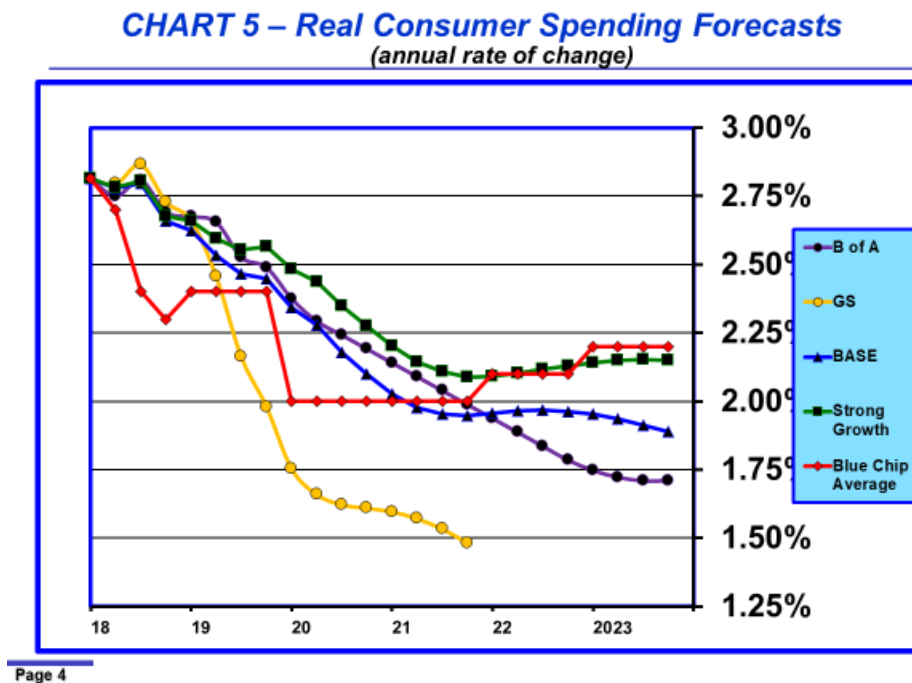
However, beyond the next few quarters, the outlook for consumer spending growth is not a happy one. Forecasts of growth in real consumer spending over the next several years are shown in **Table 3** and **Chart 5**. Real consumer spending increased 2.69 percent in 2016 and 2.82 percent in 2017. These are not the final numbers as several more revisions will occur over the next few years.

Table 3
Real Personal Consumption Growth Rate Forecasts

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actual	3.70	2.69	2.82						
B of A				2.69	2.49	2.19	1.99	1.79	1.71
GS				2.73	1.98	1.61	1.48		
IHS Markit				2.40	2.40	2.40	2.30	2.10	2.10
Economy.com				2.50	2.30	0.90			
Blue Chip				2.60	2.40	2.00	2.00	2.10	2.20
Bill's BASE				2.66	2.45	2.10	1.95	1.96	1.89
Bill's Strong Growth				2.68	2.57	2.28	2.09	2.13	2.15

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 2019. **GS**’s below consensus forecast of consumer spending growth in 2020 and 2021 is consistent with its below consensus projection of real GDP growth.

4. Business Investment

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

Table 4 shows growth rates for real private investment and separately for two of its three principal components – nonresidential (business) and residential investment. Residential

investment is 20 percent of total investment, nonresidential investment is 77 percent, and growth in inventories accounts for approximately 3 percent.

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 negative -0.59 percent in 2016.

Nonresidential investment came out of deep slumber in 2017, rising at an annual rate of 4.69 percent. A recovery in energy investment accounted for much of this surge. Capital investment growth in sectors other than energy and oil has improved slightly but only to about the underlying long-term trend rate of 2.70 percent. Considering the acceleration in global growth and the tightening U.S. labor market, the improvement in growth in investment spending in 2017 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 4

Real Private Investment (Residential and Nonresidential) Growth Rate Forecasts

	2015	2016	2017	2018	2019	2020	2021	2022	Ave. 1947- 2018
REAL PRIVATE INVESTMENT									
Actual	3.83	0.63	4.08						3.76**
B of A				5.83	4.97	4.05	3.60	3.19	
GS				5.27	3.32	2.79	2.43		
Bill's BASE				5.67	4.70	2.20	0.86	1.41	
Bill's Strong Growth				6.07	5.20	2.33	1.26	1.87	
REAL NONRESIDENTIAL (BUSINESS) INVESTMENT									
Actual	2.34	-0.59	4.69						2.70*
B of A				6.82	5.42	4.29	3.74	3.22	
GS				6.03	3.48	3.03	2.46		
REAL RESIDENTIAL INVESTMENT									
Actual	10.23	5.48	1.77						-0.18*
B of A				2.00	3.16	3.07	3.03	3.03	
GS				2.33	2.67	1.83	2.33		

*Average 1999-2018

**Real private investment = 1.79% for 1999-2018

Indeed, right on schedule first quarter business investment grew at an annualized rate of 9.2 percent. **GS** and **B of A** have raised their full-year forecasts for 2018 to a range of 6.0 to 6.8 percent.

Forecasters expect **real private investment** growth will be well above the 1.79 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 May. **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 and this may again prove to be the case with **B of A's** and **GS's** above trend capital spending forecasts for 2018 and particularly for **B of A's** continued above trend forecasts. However, several features of tax reform are intended to boost business investment, so the optimistic forecasts might come to pass this time. First quarter results suggests that forecasts might be exceeded in 2018.

Following 2018 and over the next several years **GS** expects **business investment** to slow gradually to the long-term trend growth of 2.70 percent that has prevailed over the last 20 years, while **B of A** expects growth to be above trend for 2018-2022.

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 accelerate, credit conditions to remain 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's data on capacity utilization indicate that firms are still operating at less than full capacity. This could weaken the incentive to invest.

Housing – Real residential investment growth has been weak in recent quarters despite lean housing inventories, rising prices, and relatively strong demand. First quarter annualized growth was negative -2.0 percent, which followed weak growth of 1.77 percent in 2017. This ongoing 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. Forecasts generally reflect this scenario, although trend growth is expected to exceed, but only very slightly (**GS** and **B of A**), that of overall real GDP growth in 2019, 2020, and 2021.

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 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 five months of 2018 housing starts averaged 1.32 million, which was an increase of 9.8 percent from the first five 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.

Housing prices continue to move higher and were up 6.5 percent (S&P CoreLogic Case-Shiller National Home Price Index) in March 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. These increases are well above the 3.3 percent growth in aggregate nominal disposable income and 2.4 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 increase in mortgage rates will simply make matters worse.

In summary, residential investment growth, which rose only 1.8 percent in 2017, will continue to be weak in coming quarters because of continuing tight credit standards, higher housing prices and the potential for somewhat higher mortgage interest rates. Both **B of A's** 2.0 percent and **GS's** 2.6 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.

5. Change in Inventories

Contributions to quarterly real GDP growth are highly volatile and frequently subject to large adjustments. Inventories added 0.13 percent to “**Total GDP**” growth in the first quarter, subtracted 0.53 in the fourth quarter, added 0.79 percent in the third quarter, subtracted 1.46 percent in the first quarter of 2017 and added 1.06 percent in the fourth quarter of 2016 (see **Table 1**). Because quarterly changes in inventories are very volatile, 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 0.44 percent to real “**Total GDP**” growth over the last four quarters.

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 about 12 basis points to real GDP growth. Accumulation in the first quarter was \$20.2 billion, which was below the long-term trend level of \$38.7 billion.

As can be seen in **Table 5**, initial inventory data are rough estimates and are subject to substantial revision over the next three years. The \$20.2 billion inventory accumulation in the first quarter “**Final Estimate**” will be revised four more times in the next three years.

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

There are two ways to gain a better sense of the underlying trend in real GDP growth. One way is to omit highly volatile data, especially data that are subject to substantial subsequent adjustment. That is why many analysts report the growth rate in “**Final Sales**,” which omits inventory data, as I do in **Tables 1** and **2**.

Another method that helps give a better sense of the underlying trend in real GDP growth is to focus on year-over-year growth rates, which are calculated by dividing the average of the most recent four quarters by the average of the preceding four quarters. The result of that calculation methodology can be seen in **Table 1** 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.

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

	Advance Estimate	Preliminary Estimate	Final Estimate	First Annual Revision	Second Annual Revision	Third Annual Revision
2018 Q1	33.1	20.2				
2017 Q4	9.2	8.0	15.6			
2017 Q3	35.8	39.0	38.5			
2017 Q2	-.3	1.8	5.5			
2017 Q1	10.3	4.3	2.6	1.2		
2016 Q4	48.7	46.2	49.6	63.1		
2016 Q3	12.6	7.6	7.1	17.0		
2016 Q2	-8.1	-12.4	-9.5	12.2		
2016 Q1	60.9	69.6	68.3	40.7	40.6	
2015 Q4	68.6	81.7	78.3	56.9	68.2	
2015 Q3	56.8	90.2	85.5	70.9	96.2	
2015 Q2	110.0	121.1	113.5	93.8	105.6	
2015 Q1	110.3	95.0	99.5	112.8	114.4	132.2
2014 Q4	113.1	88.4	80.0	78.2	76.9	76.9
2014 Q3	62.8	79.1	82.2	79.9	66.8	85.6
2014 Q2	93.4	83.9	84.8	77.1	55.2	69.9
2014 Q1	87.4	49.0	45.9	35.2	36.9	38.7
2013 Q4	127.2	117.4	111.7	81.8	87.2	103.6
2013 Q3	86.0	116.5	115.7	95.6	93.6	109.0
2013 Q2	56.7	62.6	56.6	43.4	39.6	52.6

6. Government Investment

Government investment added a barely discernible 0.11 percent to real GDP growth in 2017 (see **Tables 1** and **6**). Federal government spending rose at an annual rate of 0.16 percent and state and local spending rose 0.08 percent.

Annualized first quarter 2018 government spending growth was a little stronger 0.20 percent. That means there is a lot of catch up required in the remaining three quarters of 2018 to reach **GS's** forecast of 2.0 percent growth and **B of A's** 1.9 percent forecast. Both expect federal government spending to be very strong in the remainder of the year.

Table 6 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 1.6 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**, it appears that my estimate of 1.6 percent growth in 2019 might be too conservative.

Table 6

Federal and State and Local Investment Spending Growth Rates

	2015	2016	2017	2018	2019	2020	2021	2022
Federal	-0.08	0.05	0.16					
State and Local	2.31	1.18	0.08					
Total Government	1.39	0.75	0.11					
GS Federal				3.71	7.05	3.69	0.97	
GS State and Local				0.97	0.79	0.12	0.04	
GS Total				2.03	3.24	1.57	0.42	
B of A Total				1.92	2.32			
BASE				1.48	1.63	1.29	1.00	0.88
Strong Employment				1.48	1.63	1.30	1.39	1.41

7. Net Exports

In the “**Preliminary Estimate**” for the first quarter of 2018 net exports added 0.08 percent to first quarter real GDP (see **Table 1**). The four-quarter moving average in **Table 2** 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 1** 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 2.66 percent of nominal GDP to 2.84 percent in April 2018. The shares of both imports and exports, which are offsetting components of GDP, have increased over the past 16 months. Exports of goods have increased from 7.86 percent to 8.20 percent of GDP and imports of goods have risen from 11.91 percent to 12.45 percent of GDP.

These trends should continue as long as the dollar remains weak and consumer spending remains robust. Exports will also continue to do well because of the weak dollar and strong global demand. However, the increase in the dollar amount of imports will continue to overwhelm the increase in the dollar amount of exports which will drive the trade deficit higher. Consequently, I expect the trade deficit in goods and service will rise substantially during the remainder of 2018.

Trade trends could be impacted negatively if a serious trade war breaks out. The Trump administration wants to reduce the trade deficit and has proposed tariffs on steel and aluminum imports and threatened to impose tariffs on other imported goods. So far this has been more bark than bite, but the possibility of significant tariffs should not be dismissed. If this were to come to pass, tariffs would reduce imports but through retaliatory tariffs, exports would also shrink. 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, although the market is oscillating between fear that a trade war will erupt and the hope that rhetoric will not lead to consequential tariffs and substantial decreases in trade.

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. The consumer saving rate is declining and business cash flows customarily are negative in the mature phase of the economic cycle. 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 followed several quarters later by an increase in the trade deficit.

First, Second Quarter and Full-Year 2018 GDP Forecasts

B of A's current first quarter “**Final**” real GDP forecast is 2.5 percent, unchanged from the “**Preliminary**” estimate. **B of A's** second quarter real GDP forecast is 3.8 percent and **GS's** is 4.0 percent, a strong increase from the first quarter's seasonally depressed 2.2 percent. For the full year, **B of A** has raised its forecast to 3.0 percent and **GS** expects growth to be a very strong 2.9 percent.

8. 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 7** 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, GS, and B of A**). Except for **GS** and the **FOMC**, both of whose projections are at the low end of the range, forecasts for 2019 are tightly clustered.

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 7

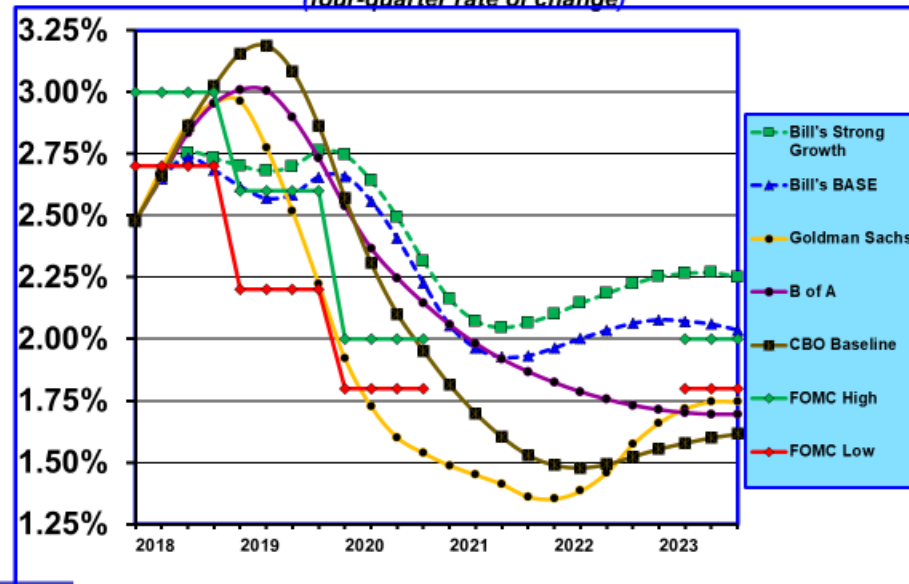
Real GDP Growth Forecasts

(year-over-year average)

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actual	2.86	1.49	2.27						
B of A				2.95	2.73	2.15	1.87	1.73	1.70
GS				2.96	2.22	1.54	1.36	1.57	1.75
IHS Markit				2.80	2.80	1.90	1.70	1.60	1.70
Economy.com				3.00	2.60	0.80			
Blue Chip Average				2.80	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				2.68	2.66	2.23	1.93	2.06	2.04
Bill's Strong Growth				2.73	2.76	2.32	2.07	2.22	2.25

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

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



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.

IV. U.S. Employment Developments

Payroll employment growth has averaged 207,400 monthly over the first five 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, if discouraged workers are still returning to the labor force. Consequently, the labor market continues to tighten. The unemployment rate fell to a new cyclical low of 3.75 percent in May and is now 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.

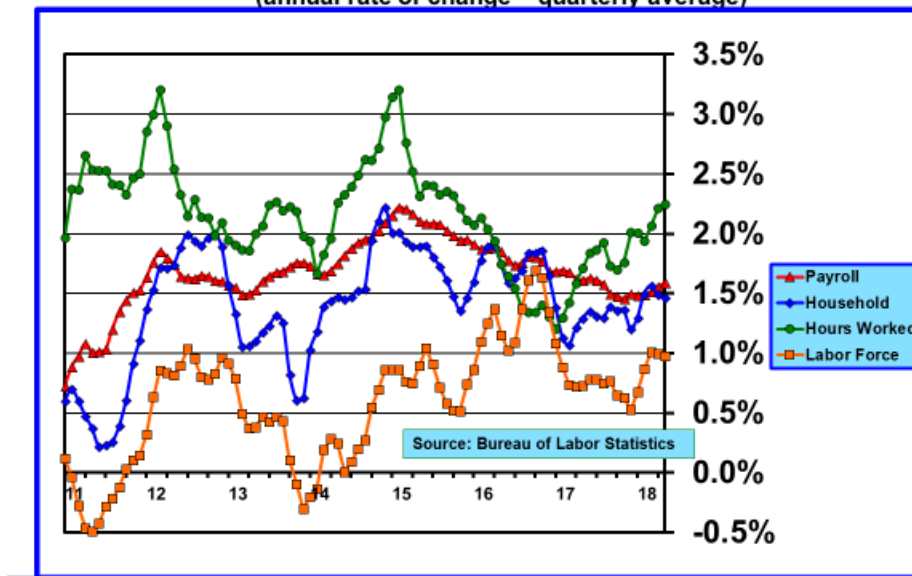
However, disappointing to some and somewhat perplexing, considering strong payroll employment growth and low unemployment, is the failure of wages to show much upward momentum.

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.

CHART 7 – Employment Growth

(annual rate of change – quarterly average)



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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 May 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 1.46 percent in May. 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 2.25 percent in May. Growth is higher for this measure because the length of the workweek has risen from 34.38 hours to 34.44 hours. This is also indicative of a very tight labor market.

Growth in the eligible labor force in May was 0.98 percent, considerably below actual employment gains, which is why the unemployment rate continues to fall.

2. Employment Participation

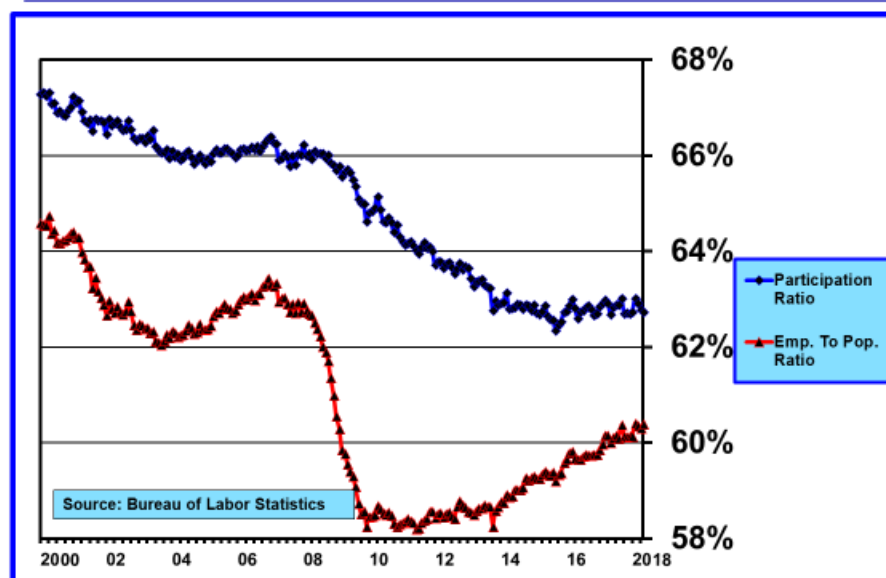
Employment participation had been declining until about a year ago, reflecting changes in demographics and an increase in discouraged workers exiting the labor force due to poor job

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.

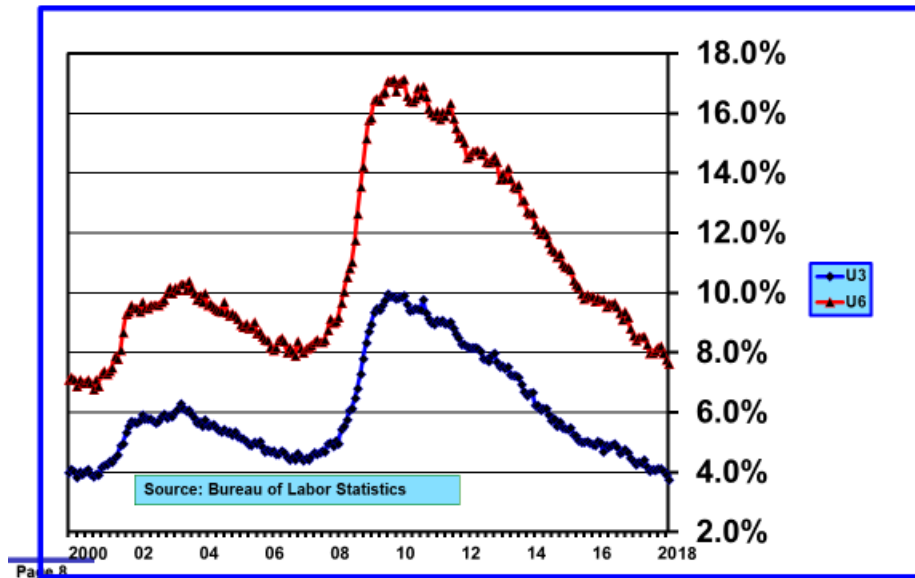
Because discouraged workers are not counted in the labor force there has been debate about their numbers and whether they would reenter the labor force once the labor market tightened. As can be seen in **Chart 8**, the increase in the participation rate from 62.35 percent in September 2015 to 62.74 percent in May 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 61.94. This is a swing of approximately 1.33 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. Measures of Unemployment Reflect a Labor Market That Is Above Full-Employment

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

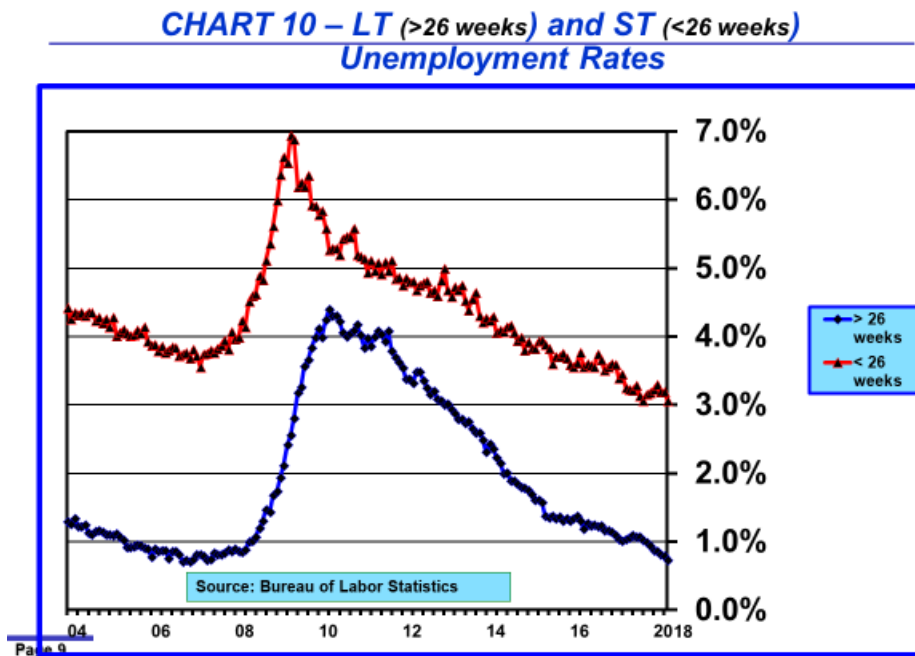


As can be seen in **Chart 9**, the U-3 unemployment rate has fallen to 3.75 percent and is now below the minimum levels reached prior to the Great Recession and the low of 3.88 percent reached in October 2000 just prior to the 2001 recession. In fact, May's unemployment rate is the lowest since December 1969. The May 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 7.65 percent in May, and is now 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 6.8 percent. The U-6 measure of unemployment has fallen 221 basis points since the end of 2015 compared to a decline of 124 basis points in the U-3 measure, which underscores an improving labor market that now increasingly exceeds full employment.

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 3.07 percent in May and is well below the minimum level of 3.78 percent reached prior to the Great Recession and 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 0.74 percent in May 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, the measure historically has fallen even more during tight labor markets. The low was 0.42 percent in November 2000.



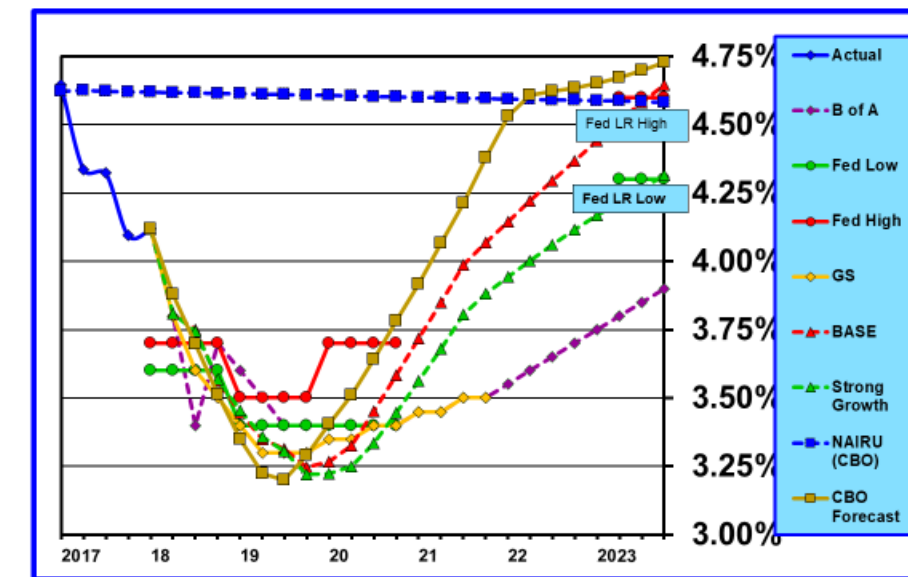
4. Forecasts of the U-3 Unemployment Rate

Forecasters expect the labor market to continue to tighten. The current U-3 unemployment rate is 86 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 more rapidly.

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**.

CHART 11 – NAIRU and Unemployment Rate Forecasts
(quarterly average)



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Most forecasters project the unemployment rate will continue to fall until mid to late 2019 to approximately 3.25 percent. After that most forecasters also expect the unemployment rate to rise slowly but to 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, which is consistent with the emerging consensus view.

My unemployment rate forecast in the “**BASE**” scenario bottoms at 3.22 percent in the fourth quarter of 2019 and the first quarter of 2020. 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.⁹ Seventh, low productivity gains in recent years may also be a factor in retarding wage rate acceleration.

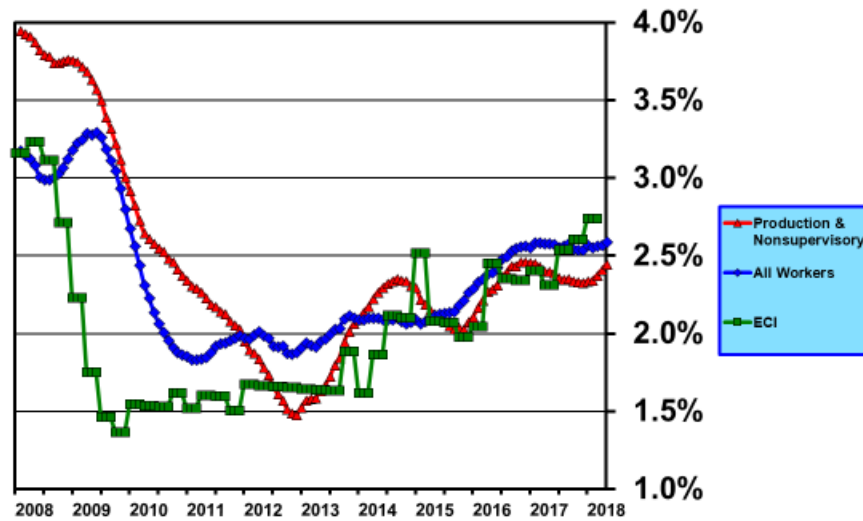
As can be seen in **Chart 12**, increases in wage growth are following the traditional upward cyclical trend as the labor market tightens. But those increases are not as great as historical experience indicates should be occurring. Consequently, forecasts of wage rate increases, which have been based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

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.

⁹ 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.

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



Source: Bureau of Labor Statistics

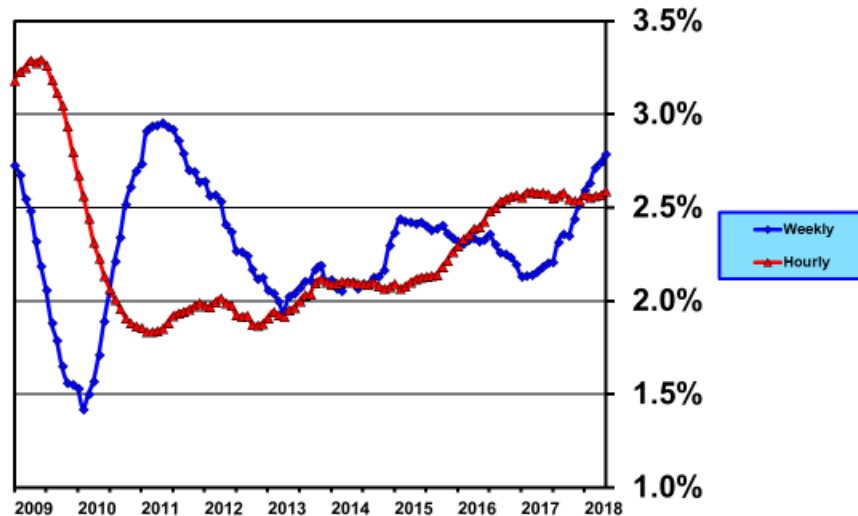
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Although these measures are highly correlated over time, because compilation methodologies differ for each set percentage changes over fixed time periods will not always be in sync. Currently, all three sets are exhibiting a similar level and trend. Increases in average hourly wages (12-month moving average) of all employees have been stable, rising 2.59 percent annually over the past 12 months compared to 2.58 percent a year ago. Increases in average hourly wages (12-month moving average) of production and nonsupervisory workers have also been relatively stable, rising 2.45 percent annually in May compared to 2.40 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 2.41 percent in the first quarter of 2017 (4-quarter moving average) to 2.74 percent in the first 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 2.19 percent in May 2017 to 2.79 percent in May 2018 (see **Chart 13**). This outcome reflects primarily an increase in the average length of the work week from 34.38 hours in May 2017 to 34.44 hours in May 2018.

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

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



Source: Bureau of Labor Statistics

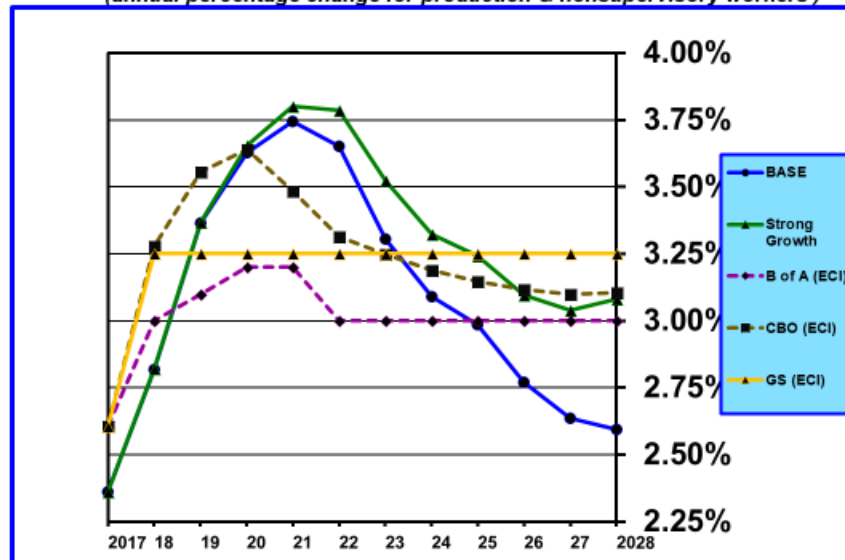
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Chart 14 shows **CBO's**, **GS's** and **B of A's** projections for growth in the wages and salaries component of ECI for all workers and my projections for wage growth for production and nonsupervisory workers over the next ten years.

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.

CHART 14 – Hourly Wage Rate Forecasts

(annual percentage change for production & nonsupervisory workers)



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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, not exceeding 3.0 percent until 2019. Thereafter, however, wage growth in my “**BASE**” scenario peaks at 3.7 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.

GS’s wage tracker registered 2.6 percent in May, about 50 basis points short of **GS’s** long-run expected 3.0 – 3.25 percent annual rate of increase. **GS** assumes the unemployment rate bottoms at 3.25 percent by the end of 2019, which is well below NAIRU, 2.0 percent inflation, and 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).

In **GS’s** view the recent weakness in wage growth results from inflation and productivity below expected long-run values. In other words, the historical forces determining wage rate growth have not changed. The upward adjustment in wage rate growth will be consistent

with historical precedent and levels of the key determinants – inflation, productivity, and labor market slack.

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 9 months. A one percentage point increase in core PCE inflation lifts nominal wage rate growth by 73 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 33 basis points but this takes an average of 4 years to occur.

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 10 months the model has overestimated the rate of increase in the nominal wage rate. The forecast error has been increasing and has averaged 2.3 standard deviations over the past six months. 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.

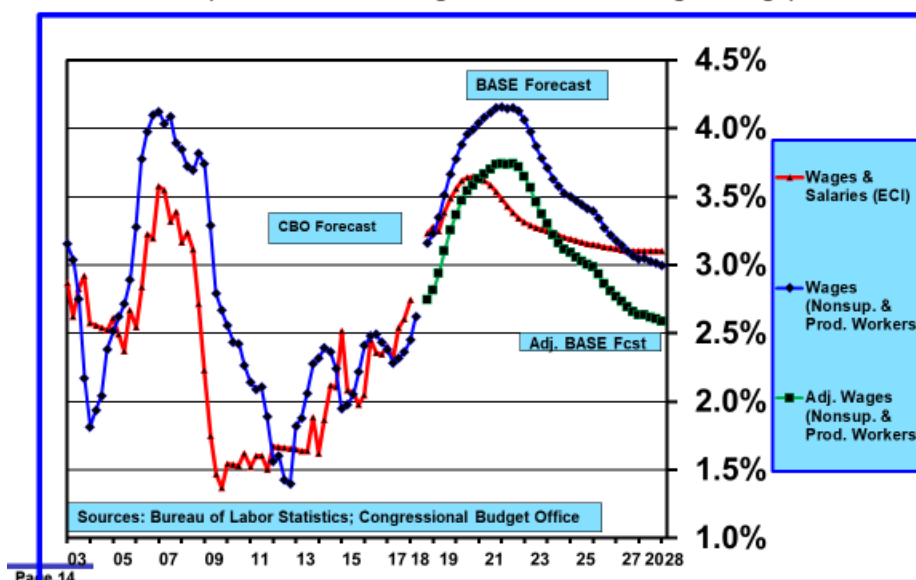
Chart 15 shows that the wage rate for nonsupervisory and production workers and the rate of growth in salaries and wages reported by the **BLS** in the employee cost index (ECI) data respond to the strength of the labor market over the cycle in a similar pattern.

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 moving in a range of 2.3 to 2.6 percent over the past two years. ECI appears to have broken out of that range in the first quarter of 2018, rising 2.74 percent. Hourly wage growth for nonsupervisory and production workers may be catching up – the three-month moving average in May was 2.67 percent above the three-month moving average in May 2017.

Assuming that wage growth accelerates in coming months, it is unlikely to rise to 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 approximately 40 basis points lower than it would be if the historical relationship held fully.

CHART 15 – ECI & Nonsupervisory & Production Worker Wages

(annual rate of change – 4-Quarter Moving Average)



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. Members of the National Federation of Independent Businesses (NFIB) reported in the May member survey that compensation increases were the highest ever in the 45-year history of the survey; concerns about labor quality were the second highest ever recorded; reports of price increases and plans to raise prices were the highest since 2008; and views about expanding their businesses were the highest ever recorded. This sounds like an inflationary boom to me. 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.

V. Monetary Policy

Members of the Federal Open Market Committee (**FOMC**) have gone to considerable lengths in recent years to communicate as clearly and transparently as possible their assessment of the economy and what they collectively believe is an appropriate monetary policy to meet the twin objectives of full employment and moderate inflation.

1. Monetary Policy Making Process

FOMC members gather in Washington, DC eight times a year. At the end of each meeting the **FOMC** releases a statement that contains an assessment of economic activity, employment and inflation and commentary about risks to the outlook. The statement concludes with a summary about the course of monetary policy and specific actions the **FOMC** has decided to implement. For several years at the second meeting during a quarter, members update their economic projections and the chairman holds a press conference. Beginning in 2019 the chairman will hold a press conference after every scheduled **FOMC** meeting. The intent has been to provide greater transparency about the conduct of monetary policy. The press conference provides the chairman the opportunity to explain reasons for any policy changes. As a result, the markets have been rarely surprised in recent years. This has contributed to a lessening of market volatility.

However, 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 and a lower terminal value 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, by June 2018, following the June **FOMC** meeting, the market raised its forecast for the terminal federal funds rate to 2.75 percent. **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 has come close to agreeing with the **FOMC**.

The market expects three and a half more increases in the federal funds rate to 2.75 percent. The median number of remaining increases forecast by **FOMC** members 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 9** and **Chart 18**). The market's view has increased by 75 basis points since late last year to 2.75 percent; however, every other forecaster expects the **FOMC** to

increase the federal funds rate considerably above 2.75 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 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 covered the period from mid-April through May 21st. Overall, economic activity is stable, with one district upgrading its assessment and one district downgrading. Ten of the 12 district banks reported “modest” or “moderate” economic activity, which means trend real GDP growth about 2 percent. Consumption was a little weaker while manufacturing was stronger. Concerns were voiced about trade policy, rising interest rates and higher commodity prices.

Labor markets are considered to be tight, but there is little evidence that wages are accelerating – wage growth was modest in most districts, which means that some pressures exist but there is no acceleration. 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 moderate but with pressure on material and input costs. The recent increase in commodity and materials prices was noted, particularly steel prices due to tariffs. Transportation are rising, due to increasing fuel prices and a shortage of truck drivers. Building costs are increasing due both to rising commodity costs and a shortage of construction workers. Businesses expect further price increases in steel and building materials.

3. Economic Activity

June's FOMC statement was rewritten and shortened significantly.

Table 8

**Economic Projections of Real GDP (Q4/Q4) by Federal Reserve Board Members
and Federal Reserve Bank Presidents, June 2018**

Real GDP %		Central Tendency						
		2015	2016	2017	2018	2019	2020	Long Run
<i>Q4/Q4</i>	<i>Actual</i>	<i>2.02</i>	<i>1.84</i>	<i>2.58</i>				
<i>Y/Y</i>	<i>Actual</i>	<i>2.86</i>	<i>1.49</i>	<i>2.27</i>				
<i>2018</i>	<i>June</i>				<i>2.7 - 3.0</i>	<i>2.2 - 2.6</i>	<i>1.8 - 2.0</i>	<i>1.8 - 2.0</i>
	Mar				2.6 - 3.0	2.2 - 2.6	1.8 - 2.1	1.8 - 2.0
2017	Dec			2.4 - 2.5	2.2 - 2.6	1.9 - 2.3	1.7 - 2.0	1.8 - 1.9
	Sep			2.2 - 2.5	1.8 - 2.2	1.7 - 2.1	1.6 - 2.0	1.8 - 2.0
	June			2.1 - 2.2	1.8 - 2.2	1.8 - 2.0		1.8 - 2.0
	Mar			2.0 - 2.2	1.8 - 2.3	1.8 - 2.0		1.8 - 2.0
2016	Dec		1.8 - 1.9	1.9 - 2.3	1.8 - 2.2	1.8 - 2.0		1.8 - 2.0
	Sep		1.7 - 1.9	1.9 - 2.2	1.8 - 2.1	1.7 - 2.0		1.7 - 2.0
	June		1.9 - 2.0	1.9 - 2.2	1.8 - 2.1			1.8 - 2.0
	Mar		2.1 - 2.3	2.0 - 2.3	1.8 - 2.1			1.8 - 2.1
2015	Dec	2.1	2.3 - 2.5	2.0 - 2.3	1.8 - 2.2			1.8 - 2.2
	Sep	2.0 - 2.3	2.2 - 2.6	2.0 - 2.4	1.8 - 2.2			1.8 - 2.2
	June	1.8 - 2.0	2.4 - 2.7	2.1 - 2.5				2.0 - 2.3
	Mar	2.3 - 2.7	2.3 - 2.7	2.0 - 2.4	0			2.0 - 2.3
2014	Dec	2.6 - 3.0	2.5 - 3.0	2.3 - 2.5				2.0 - 2.3
	Sep	2.6 - 3.0	2.6 - 2.9	2.3 - 2.5				2.0 - 2.3
	June	3.0 - 3.2	2.5 - 3.0					2.1 - 2.3
	Mar	3.0 - 3.2	2.5 - 3.0					2.2 – 2.3
2013	Dec	3.0 - 3.4	2.5 - 3.2					2.2 - 2.4
	Sep	3.0 - 3.5	2.5 - 3.3					2.2 - 2.5
	June	2.9 - 3.6						2.3 - 2.5
	Mar	2.9 - 3.7						2.3 - 2.5
2012	Dec	3.0 - 3.7						2.3 - 2.5

Economic activity was upgraded to “solid” in the June statement from “moderate” in the May statement. Consumer spending strengthened. Business investment continued to grow strongly.

With respect to real GDP growth projections, the bottom end of the 2018 range was raised from 2.6 to 2.7 percent and the top end of the 2020 range was lowered from 2.1 to 2.0 percent. See **Table 8**. The projection of long-run growth remained unchanged in a range of 1.8 to 2.0 percent.

4. Employment

Most believe the labor market has exceeded the non-accelerating inflation rate of full employment (NAIRU). The U-3 unemployment rate in May was 3.75 percent, which was 0.87 percent *below* CBO's estimate of NAIRU. The FOMC noted that "... *the labor market has continued to strengthen ... and the unemployment rate has declined.*" The June statement repeated the assessment added in May that "*Job gains have been strong, on average, in recent months*"

While the bottom end of the range for unemployment projections were not changed, the top end was lowered in each of the three years – 2018, 2019, and 2020. See **Table 9**. Importantly, FOMC members also lowered the top end of the long-run range, which serves as a proxy for the neutral rate of unemployment, from 4.7 to 4.6 percent. The tightening of the long-run range, in effect, reduced the mid-point from 4.5 percent to 4.45 percent, which can be interpreted as FOMC members' consensus estimate of NAIRU.

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

Table 9

**Economic Projections of Unemployment Rate by Federal Reserve Board Members
and Federal Reserve Bank Presidents, June 2018**

Unemp. Rate %	Central Tendency						
	2015	2016	2017	2018	2019	2020	Longer Run
Actual	5.00	4.70	4.15				
2018 June				3.6 - 3.7	3.4 - 3.5	3.5 - 3.7	4.3 - 4.6
Mar				3.6 - 3.8	3.4 - 3.7	3.5 - 3.8	4.3 - 4.7
2017 Dec			4.1	3.7 - 4.0	3.6 - 4.0	3.6 - 4.2	4.4 - 4.7
Sep			4.2 - 4.3	4.0 - 4.2	4.0 - 4.4	4.0 - 4.5	4.5 - 4.8
June			4.2 - 4.3	4.0 - 4.3	4.1 - 4.4		4.5 - 4.8
Mar			4.5 - 4.6	4.3 - 4.6	4.3 - 4.7		4.7 - 5.0
2016 Dec		4.7 - 4.8	4.5 - 4.6	4.3 - 4.7	4.3 - 4.8		4.7 - 5.0
Sep		4.7 - 4.9	4.5 - 4.7	4.4 - 4.7	4.4 - 4.8		4.7 - 5.0
June		4.6 - 4.8	4.5 - 4.7	4.4 - 4.8			4.7 - 5.0
Mar		4.6 - 4.8	4.5 - 4.7	4.5 - 5.0			4.7 - 5.0
2015 Dec	5.0	4.6 - 4.8	4.6 - 4.8	4.6 - 5.0			4.8 - 5.0
Sep	5.0 - 5.1	4.7 - 4.9	4.7 - 4.9	4.7 - 5.0			4.9 - 5.2
June	5.2 - 5.3	4.9 - 5.1	4.9 - 5.1				5.0 - 5.2
Mar	5.0 - 5.2	4.9 - 5.1	4.8 - 5.1				5.0 - 5.2
2014 Dec	5.2 - 5.3	5.0 - 5.2	4.9 - 5.3				5.2 - 5.5
Sep	5.4 - 5.6	5.1 - 5.4	4.9 - 5.3				5.2 - 5.5
June	5.4 - 5.7	5.1 - 5.5					5.2 - 5.5
Mar	5.6 - 5.9	5.2 - 5.6					5.2 - 5.6
2013 Dec	5.8 - 6.1	5.3 - 5.8					5.2 - 5.8
Sep	5.9 - 6.2	5.4 - 5.9					5.2 - 5.8
June	5.8 - 6.2						5.2 - 6.0
Mar	6.0 - 6.5						5.2 - 6.0
2012 Dec	6.0 - 6.6						5.2 - 6.0

5. Inflation

In its June statement, the **FOMC** repeated assessment of inflation, which it upgraded in May: “On a 12-month basis, both overall inflation and inflation for items other than food and energy have moved close to 2 percent” for the wording in the March statement “continued to run below 2 percent.” It simplified the inflation expectations comment by dropping the separate reference to market-based measures: “Indicators of longer-term inflation expectations are little changed, on balance.”

Table 10

Economic Projections of Inflation by Federal Reserve Board Members and Federal Reserve Bank Presidents, June 2018

Variable		Central Tendency					
		2015 <i>0.53</i>	2016 <i>1.77</i>	2017 <i>1.70</i>	2018	2019	2020 Long Run
PCE Inf. %	<i>June</i>				<i>2.0 - 2.1</i>	<i>2.0 - 2.2</i>	<i>2.1 - 2.2</i> <i>2.0</i>
	Mar				1.8 - 2.0	2.0 - 2.2	2.1 - 2.2 2.0
2017	Dec			1.6 - 1.7	1.7 - 1.9	2.0	2.0 - 2.1 2.0
	Sep			1.5 - 1.6	1.8 - 2.0	2.0	2.0 - 2.1 2.0
	June			1.6 - 1.7	1.8 - 2.0	2.0 - 2.1	2.0
	Mar			1.8 - 2.0	1.9 - 2.0	2.0 - 2.1	2.0
2016	Dec		1.5	1.7 - 2.0	1.9 - 2.0	2.0 - 2.1	2.0
	Sep		1.2 - 1.4	1.7 - 1.9	1.8 - 2.0	1.9 - 2.0	2.0
	June		1.3 - 1.7	1.7 - 2.0	1.9 - 2.0		2.0
	Mar		1.0 - 1.6	1.7 - 2.0	1.9 - 2.0		2.0
2015	Dec	0.4	1.2 - 1.7	1.8 - 2.0	1.9 - 2.0		2.0
	Sep	0.3 - 0.5	1.5 - 1.8	1.8 - 2.0	2.0		2.0
	June	0.6 - 0.8	1.6 - 1.9	1.9 - 2.0			2.0
	Mar	0.6 - 0.8	1.7 - 1.9	1.9 - 2.0			2.0
2014	Dec	1.0 - 1.6	1.7 - 2.0	1.8 - 2.0			2.0
	Sep	1.6 - 1.9	1.7 - 2.0	1.9 - 2.0			2.0
	June	1.5 - 2.0	1.6 - 2.0				2.0
	Mar	1.5 - 2.0	1.7 - 2.0				2.0
2013	Dec	1.5 - 2.0	1.7 - 2.0				2.0
	Sep	1.6 - 2.0	1.7 - 2.0				2.0
	June	1.6 - 2.0					2.0
	Mar	1.7 - 2.0					2.0
2012	Dec	1.7 - 2.0					2.0
Core PCE Inf. %	<i>June</i>	<i>1.37</i>	<i>1.87</i>	<i>1.52</i>	<i>1.9 - 2.0</i>	<i>2.0 - 2.2</i>	<i>2.1 - 2.2</i> <i>2.0</i>
	Mar				1.8 - 2.0	2.0 - 2.1	2.0 - 2.1
2017	Dec			1.5	1.7 - 1.9	2.0	2.0 - 2.1 2.0
	Sep			1.5 - 1.6	1.8 - 2.0	2.0	2.0 - 2.1 2.0
	June			1.6 - 1.7	1.8 - 2.0	2.0 - 2.1	2.0
	Mar			1.8 - 1.9	1.9 - 2.0	2.0 - 2.1	2.0
2016	Dec		1.7 - 1.8	1.8 - 1.9	1.9 - 2.0	2.0	2.0
	Sep		1.6 - 1.8	1.7 - 1.9	1.9 - 2.0	2.0	2.0
	June		1.6 - 1.8	1.7 - 2.0	1.9 - 2.0		2.0

	Mar		1.4 - 1.7	1.7 - 2.0	1.9 - 2.0			2.0
2015	Dec	1.3	1.4 - 1.7	1.7 - 2.0	1.9 - 2.0			2.0
	Sep	1.3 - 1.4	1.5 - 1.8	1.8 - 2.0	1.9 - 2.0			2.0
	June	1.3 - 1.4	1.6 - 1.9	1.9 - 2.0				
	Mar	1.3 - 1.4	1.5 - 1.9	1.8 - 2.0				
2014	Dec	1.5 - 1.8	1.7 - 2.0	1.8 - 2.0				
	Sep	1.6 - 1.9	1.8 - 2.0	1.9 - 2.0				
	June	1.6 - 2.0	1.7 - 2.0					
	Mar	1.7 - 2.0	1.8 - 2.0					
2013	Dec	1.6 - 2.0	1.8 - 2.0					
	Sep	1.7 - 2.0	1.9 - 2.0					
	June	1.7 - 2.0						
	Mar	1.8 - 2.1						
2012	Dec	1.8 - 2.0						

In the outlook paragraph of the policy statement the **FOMC** dropped all of the forward-looking inflation language and stated simply that policy will be consistent with “... *Inflation near the Committee’s symmetric 2 percent objective over the medium term.*”

FOMC members raised inflation projections for 2018 slightly, recognizing in particular the impact of higher energy prices on total inflation, but made no changes for other years. It would seem that the **FOMC** has become comfortable that inflation has reached an acceptable level and is likely to remain near that level going forward.

However, history casts doubt on the **FOMC’s** ability to maintain inflation in a narrow symmetric band around its 2 percent objective. PCE core inflation has averaged 1.7 percent for the past 20 years. During those 20 years, this measure was only 2.0 percent or greater 22 percent of the time. The longest stretch of time above 2.0 percent occurred from 2004 to 2008, which led up to and into the Great Recession. During that time the highest monthly inflation rate was 2.45 percent. Now that the economy is at full employment inflation will probably rise above 2.0 percent and this would be consistent with the waning months of the previous cycle. Whether the **FOMC** can achieve its symmetric 2.0 percent objective on an average basis over the entirety of the economic cycle remains to be seen. The historical record is not encouraging.

6. **FOMC Statement – Assessment of Risks**

FOMC members concluded that “*Risks to the economic outlook appear roughly balanced.*” This assessment was unchanged from the May statement.

7. **FOMC Statement – Monetary Policy**

As has been its recent pattern, the **FOMC** raised the federal funds rate at the second meeting of the quarter and observed that “[t]he stance of monetary policy remains accommodative ...” “*In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic condition relative to its maximum employment objective and its symmetric 2 percent inflation objective.*” Again, the language of the policy paragraph was simplified, but the message remains clear – the FOMC will continue to raise rates based upon the actual and expected performance of the economy and inflation.

8. Press Conferences

Chairman Powell announced that beginning in January 2019, there will be a press conference following every **FOMC** meeting rather than the current practice of holding quarterly conferences in sync with the quarterly update of the summary of economic projections (SEP). The practice of updating SEP quarterly will not change.

9. Interest Rate on Excess Reserves (IOER)

In a separate action, the interest rate payable on excess reserves was raised by 20 basis points to 1.95 percent. The increase was smaller than the increase in the federal funds rate range and is intended to make sure that trading in federal funds remains in the 1.75 to 2.00 percent range. In the press conference, Chairman Powell noted that the smaller adjustment in the rate of interest on excess reserves “... *was a minor technical adjustment that had no bearing on the appropriate path of the federal funds rate or financial conditions more generally.*” The implication is that the Fed may adjust the IOER rate in the future independently of changes in the federal funds rate to ensure that federal funds trade within the policy range.

10. Balance Sheet Reduction – “Quantitative Tightening”

As has been the case now for several **FOMC** meetings, there was no mention in the policy statement about the balance sheet normalization program, which was commenced in October 2017 and which is scheduled to accelerate in July. Apparently, the **FOMC** regards this as old news and perhaps the lack of mention has been intentional to keep market participants focused on adjustments in the federal funds rate. The market has not focused on the possible longer run implications of balance sheet shrinkage. Perhaps this is because the shrinkage was limited initially, but the monthly shrinkage in the size of the Federal Reserve’s balance sheet is steadily increasing. Let there be no doubt that liquidity is already being impacted in a meaningful way. Federal tax cuts and spending increases have increased Treasury’s borrowing requirements and it will get no help from the Federal Reserve.

Already measures of the supply of money and credit indicate that growth is slowing and “quantitative tightening” and increases in the federal funds rate will only serve to depress growth further. Annual M2 money supply growth has slowed to less than 4 percent for the

first time since the days of the Great Recession. Importantly, M2 growth is about a percentage point slower than growth in nominal GDP. This is an end-of-cycle phenomenon that indicates shrinking liquidity, which historically has been a precursor of slower economic growth or recession.

Another indicator of decreasing liquidity is the narrowing of the yield spread between the 10-year and 2-year Treasury securities from 125 basis points at the beginning of 2017 to an average of 46 basis points in May 2018 and 41 basis points in early June. The deceleration in growth of money and credit is consistent with a maturing economic cycle but has not yet reached the red zone which in previous cycles has sent a reliable signal of heightened recession risk.

Worries about the potential consequences of the developing liquidity-straining collision between increased Treasury issuance and faster Fed balance sheet reduction are beginning to be voiced. A concern, as articulated by Bank of India governor Urjit Patel in a *Financial Times* op-ed article, is demand for U.S. dollar denominated debt relative to supply will force up dollar-based interest rates, leading to two negative effects – restricted access and higher cost. This will pose particularly troublesome challenges for emerging markets economies with heavy dependence on dollar-denominated debt and deficit trade balances.

If a dollar-liquidity squeeze does develop, the FOMC could relieve pressure by slowing the pace of balance sheet normalization. It was already taken pre-emptive steps quietly to manage dollar liquidity by renewing dollar swap lines to central banks in Europe, the UK, Switzerland, Japan, and Canada. These swap lines are priced slightly above market, so are unlikely to be tapped unless some kind of dollar funding crisis develops.

VI. Inflation

Core PCE inflation edged down to 1.80 percent in April from 1.83 percent in March. Core PCE inflation has now returned to almost the same level it was in February 2017 – 1.86 percent prior to last year’s transitory decline, primarily due to reductions in wireless pricing. Looked at in this way, core inflation has been stable and has yet to be impacted by strong economic growth and a tight labor market.

FOMC members and other forecasters, including myself, are confident that both core and total PCE inflation will return to the 2.0 percent target level by the end of 2018. This conviction has been bolstered by the realities of an extremely tight labor market and substantial fiscal stimulus that will flood the economy over the next several months.

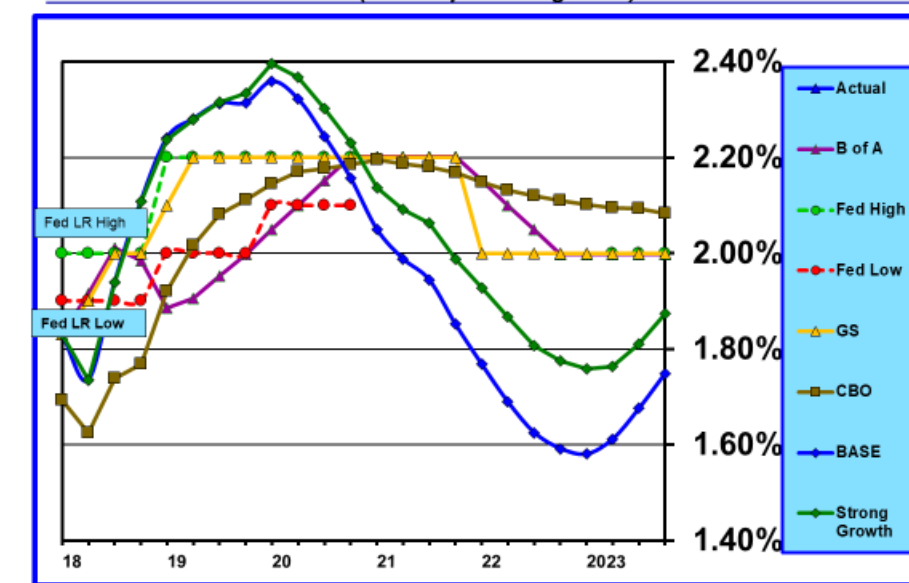
Table 11

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

Core CPE	2015	2016	2017	2018	2019	2020	2021	2022	2023
Actual	1.37	1.87	1.52						
B of A				1.98	2.00	2.20	2.20	2.00	2.00
GS				2.00	2.20	2.20	2.20	2.00	2.00
CBO				1.77	2.11	2.18	2.17	2.11	2.08
IHS Markit*				2.50	1.80	2.50	2.30	2.30	2.30
Economy.com*				2.80	2.50	2.40			
Blue Chip Average*				2.50	2.20	2.30	2.30	2.30	2.30
Bill’s BASE				2.11	2.32	2.16	1.86	1.60	1.75
Bill’s Strong Growth				2.11	2.33	2.23	1.99	1.77	1.87
FOMC – High				2.0	2.2	2.2			2.0
FOMC – Low				1.8	2.0	2.1			

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

CHART 16 – Core PCE Inflation
(annual percentage rate)

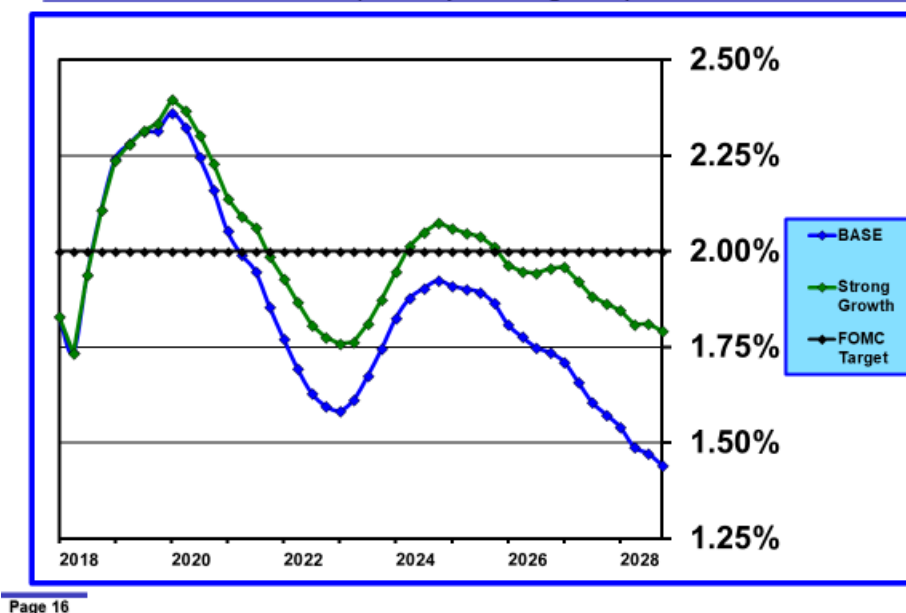


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As can be seen in **Table 11** (**Chart 16** shows historical core PCE price index data and data from **Table 11** in graphical form), forecasters, except **CBO**, expect the core PCE inflation index to be near 2.0 percent by the end of 2018. Over 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.

As can be seen in **Chart 16**, my econometric model indicates core PCE inflation will rise a little 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 2.2 to 2.3 percent. After that, however, my inflation forecasts fall in a choppy fashion, eventually reaching 1.5 to 1.8 percent by 2028 (see **Chart 17**). **Chart 17** shows core PCE inflation estimates for my “**BASE**” and “**Strong Growth**” scenarios from 2018 to 2028.

CHART 17 – Core PCE Inflation
(annual percentage rate)



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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 1.70 percent from 1995 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.

VII. 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. **Table 12** 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 12** for comparative purposes.

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 12**.

Table 12
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	3	4	2	-1	8	3.25-3.50
Economy.com	3.5	4.5	1	0	9	3.50-3.75
Market Forecast	3.5	2	0	0	5.5	2.75
Bill's BASE	4.5	7.5	0	-7	5	2.50-2.75#
Bill's Strong Growth	4.5	7.5	1	-6	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

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 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 SEP projections have proved to be unreliable guides to future monetary policy. For example, at the beginning of 2016 the **FOMC** median projected four increases in the federal funds rate during 2016. Only one occurred. 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** 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**.

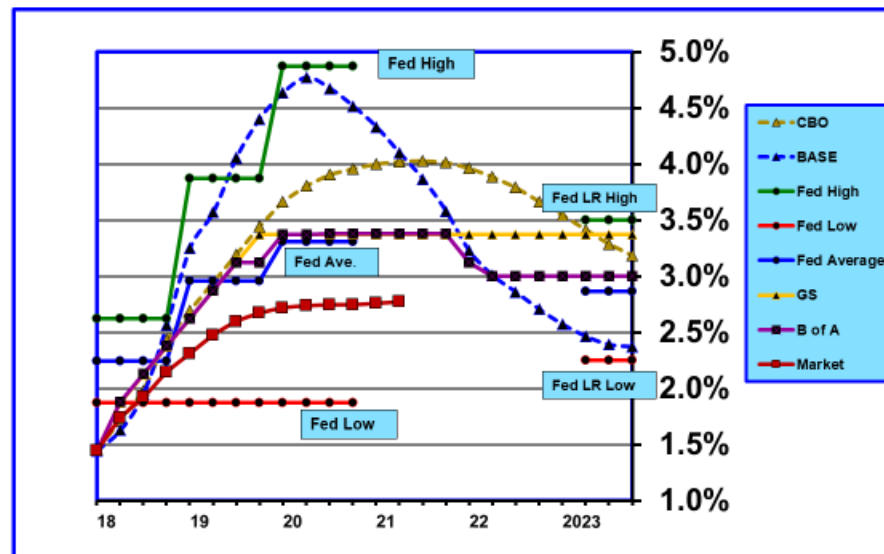
My federal funds rate forecast in my “**BASE**” scenario (4.5 percent NAIRU) projects that the **FOMC** will be forced to increase the federal funds rate 200 basis points in 2019 to 4.25 to 4.50 percent. That trajectory tracks the high end of the **FOMC's** projection range. This larger than consensus 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 4.00 to 4.50 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 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.

CHART 18 – Federal Funds Rate Forecasts



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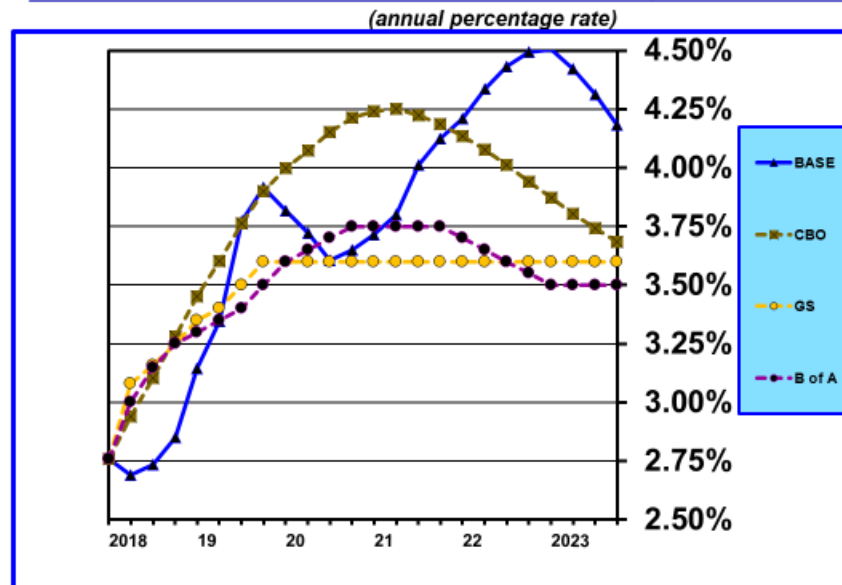
Over the past several years, **FOMC** members have steadily reduced the median estimate of the long-term equilibrium level of the federal funds rate from 4.25 percent to 2.75; the central tendency range is currently 2.75 - 3.00 percent. Based upon my model, my sense is that the **FOMC**’s median projection for the federal funds rate is reasonable 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 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.

CHART 19 – Ten-Year Treasury Yield



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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 3.60 percent and 4.35 percent, averaging 4.00 percent between 2023 and 2028. The long-term equilibrium rate is 3.60 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 as average of approximately 1.7 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 20**, 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 4.50 percent at the end of 2022, and then commence a gradual decline to 3.25 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 4.50 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.