I. Status of U.S. Recession Watch

In January I placed the U.S. economy on recession watch. The recession watch continues. However, significant easing of U.S. monetary policy and rebounding consumer, business, and investor sentiment have reduced the immanency of recession.

A “recession watch” is not a forecast that recession is imminent. It may or may not be. It is like a tornado watch. Conditions are developing that could lead to recession in the next few months, but those conditions could evolve in ways that keep the U.S. economy on firm footing for a long time to come.

What economists refer to as “tail risk,” which involves large deviations from generally anticipated outcomes, was unusually high as 2019 commenced. While the consensus does not expect recession to occur during 2019, “tail risk” is significant and the probability of recession occurring in the U.S., and some other countries, is rising. It is the timing of onset that is uncertain.

While the U.S. economy put together the best three consecutive growth quarters of the current economic expansion in the second, third and fourth quarters of 2018, Europe and China have clearly lost momentum and growth in many countries, although still strong and above long-run potential, is decelerating.

Investor pessimism skyrocketed in the fourth quarter of 2018 and wave after wave of selling took U.S. stock indices down nearly 20 percent, which traditionally is the demarcation point for a bear market. But, incoming economic data didn’t validate the gloomy mood. All it took to dispel much of the gloom were soothing words from the Federal Reserve, indicating an intention to ease monetary policy, and an extraordinarily strong December employment report. The S&P 500 stock average rebounded sharply and by March 21st was only 2.6 percent below its all-time high reached on September 20, 2018.

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What we know from experience is that forecasting a recession’s onset is notoriously difficult. The fact is that we are usually well into recession before the consensus acknowledges it. What we do know from history is that when risks are unusually high, the economy is especially vulnerable to unexpected shocks. Consumer, business and investor sentiment can plunge quickly and propel the economy into a downward spiral. Trying to forecast the pivotal shock and perhaps more importantly, its timing, is a crap shoot. The best policy is to be prepared for difficult times while hoping for benign outcomes.

History tells us that good times do not last forever. When the economy is operating at full capacity, bottlenecks begin to emerge, and they slow momentum and drive up inflation. Optimism can overwhelm prudence and foster speculative excesses.

As we learned in the 1970s, when the economy is stretched to the limit, if policy does not dampen enthusiasm, inflation can spin out of control. The Federal Reserve learned this lesson and ever since then has conducted monetary policy to dampen demand and contain inflationary pressures, whenever the economy is operating near full capacity, by raising interest rates.

However, while history is a guide, it is not an infallible one. Structural changes in the economy can change relationships among economic variables. The present cycle could be a case in point. The labor market has been operating above full capacity for several months and GDP is now above its full employment potential level. But wage growth has increased much less than historical patterns indicate should have happened, inflation has barely budged, and interest rates not only are very low, but long-term rates have been falling recently. This is not what history tells us should occur at this point in the cycle.

Perhaps the most logical explanation for the more muted response of wages, inflation and interest rates in this cycle is that inflation expectations have become firmly anchored. This implies that even as demand exceeds supply, which normally would lead to upside pressures on wages, inflation, and interest rates, the expectation that policy will quickly be adjusted to stanch these pressures inhibits price increases.

There are other changes in the current cycle whose impacts on wages, prices, and interest rates are less clear. These include the impact of the Federal Reserve’s large balance sheet, declining population growth and aging demographics, and depressed productivity. These structural changes are linked with lower real rates of interest, which means that nominal interest rates are lower for a given rate of inflation. It could well be that lower real rates of interest also contribute to reduced upside
pressures on wages and inflation when the economy is operating above its full potential level.

What we know with certainty is that economic growth will slow in the U.S. in coming months from its recent above-potential pace. What we don’t know is whether slower growth will morph into recession. Forecasters almost universally assume that policymakers will be able to engineer the proverbial soft landing and avoid recession. History isn’t particularly supportive of this sanguine view. A more typical evolution is that policy errors, lagged responses, unanticipated shocks, and abrupt shifts in sentiment from optimism to pessimism combine to turn gradual deceleration into decline.

Hard to tame excesses can develop in the real economy and financial markets. They can be fostered and nurtured by policy decisions. And they can be amplified by the interaction of policy and sentiment.

Excesses develop from phenomena that are standard parts of an economic and political system, but which have migrated to extremes relative to their normal relationships to other components. For example, during the housing bubble which preceded the Great Recession, home prices soared to levels that could not be supported by incomes and thus were destined to fall. However, soaring house prices were enabled by easy access to cheap credit and imprudent underwriting standards that relied on inflated homes values rather than the ability of borrowers to service mortgages from income. This excessive reliance on debt leverage based on inflated and unsustainable housing valuations was amplified through the creation of debt derivatives, the inevitable search by investors for high yields, and investor sentiment which misunderstood and underestimated the risks inherent in the rapid run up in housing prices. Moreover, the consequences of debt leverage excesses were amplified by policy errors that permitted financial institutions to operate with inadequate levels of loss absorbing capital.

Of course, it is always easy after the fact to dissect the causes of a debacle, but it is hard to discern them and assess the extent of imbalances before the fact. Lack of critical assessment and the preponderance of optimism typically cloud clear vision about risks. Such sentiment can amplify the extent of excesses and inflate a bubble to a much greater extent.

For the most part, blatant excesses of the sort that preceded the Great Recession and contributed to its virulence are not visible today. It should be noted that
Desmond Lachman of the American Enterprise Institute disagrees. He cites the risks posed by the escalation in the global debt to GDP ratio from 220 percent prior to the global financial crisis of 2008 and the current ratio of 250 percent. "An important reason to be more concerned about high debt levels today than we might have been in 2008 is that the mispricing of global debt in the current economic cycle has become much more pervasive. ... The US [and other countries] is less well-equipped now than it was in 2008 to fight the next recession."

Notwithstanding Lachman’s global debt concern, the apparent absence of blatant excesses does not mean there are no risks. To the contrary there are several that bear watching. Individually today’s risks don’t appear to pose extreme danger to the U.S. economy. But, a combination of risks and interconnected responses that correction of excesses could unleash, while difficult to foresee, could lead to recession and more difficult economic times than forecasters expect.

II. Phenomena That Lead to Recessions

There was a time during the 1990s, when economists believed their knowledge of how the economy works and how policy tools can be applied to adjust economic activity, that the business cycle had been tamed. This phenomenon was referred to as the Great Moderation. Both the mild recession of 2001 but decidedly the Great Recession of 2008-2009 buried this overly simplistic notion. So much so, in fact, that many market participants today are skittish about the likelihood of recession just around the corner, even though economic activity in the U.S. is very strong.

While it is easy to point out all the things that could go wrong in the economy and cause recession, it is much harder to make a solid case that recession is inevitable and describe the pathway that will lead to one. In the next section of this month’s letter, I describe several aspects of the economy which pose risks. And, I argue that many of those risks are elevated. But other than stating the obvious that some time in the future recession will occur, I am hard pressed to make a case that recession will occur with certainty in the next few months. Easier monetary policy and rebounding consumer, business, and investor sentiment over the last two months appear to have bought additional time.

Goldman Sachs (GS) recently studied the causes of recession in the U.S. economy over the past 100 years and, based upon this analysis, concluded that one is not

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imminent.\textsuperscript{2} However, \textbf{GS} acknowledged that its recession model indicates recession risk is rising in developed economies.

Consensus forecasts put current recession risk within the next 12 months at 25 percent, which, according to \textbf{GS}, is at the top of the historical range. Alternative models, which rely on financial markets measures, placed the probability at 50 percent in January. But these alternative models are very sensitive to short-run developments in financial markets. Improving conditions in financial markets since January driven down recession probability estimates in these alternative models.

\textbf{GS} found that there have been five major drivers of U.S. recessions:

- Industrial shocks and inventory imbalances
- Oil shocks
- Inflationary overheating and tight monetary policy
- Market financial imbalances and asset price crashes, and
- Fiscal tightening

\textbf{GS} believes that the first three recession causes have diminished in importance and potential impact as the U.S. economy has evolved and restructured over time.

Manufacturing\textsuperscript{3}’s contribution to GDP has diminished steadily as services have become an ever-increasing portion of economic activity. Services typically are less sensitive to economic cycles. Disruptive labor strikes have not occurred in several decades. In addition, technological innovations have made it much easier to control inventories. That said, however, the inventory cycle is not completely dead as illustrated by the burst in inventory accumulation in the third and fourth quarters caused at least in part by businesses trying to beat price increases stemming from the imposition of tariffs on Chinese imports. Nonetheless, these structural changes have greatly diminished the likelihood that industrial shocks and inventory imbalances will be the primary drivers of a future recession.

Oil prices still gyrate and still contribute to large fluctuations in the investment cycle. However, overall, energy efficiency has improved and this has diminished the proportion of business and consumer spending devoted to energy. In addition, shale oil and gas technology has reduced U.S. dependence on energy imports and decreased considerably the potential of politically motivated international energy

shocks. GS believes that a shock in oil prices today would have only 10 percent as
great an impact as a similar shock 15 years ago.\(^3\)

In the past, when the economy was operating at or above full capacity and labor
markets were tight, price inflation and wages rose and led the FOMC to raise
interest rates and tighten monetary policy with the intent to moderate price
pressures. Unfortunately, the historical record indicates that tight monetary policy
has often been a recession catalyst. What appears to be different now is that prices
and wages have not responded to nearly the same extent to tightening economic
capacity and labor markets as they did in the past. Wages are rising, but my analysis
indicates that recent hourly wage growth should be about 0.7 percent higher based
upon historical relationships. The market seems to have figured this out quite some
time ago and for well over a year has forecast a much smaller increase in the federal
funds rate than the experts on the FOMC. However, thanks to market volatility in the
fourth quarter, FOMC members now appear to understand the inflation threat is
subdued and the need to raise interest rates, therefore, has diminished. This was
confirmed by the dot plot in the March FOMC meeting, which revealed that the
median expectation shifted from two rate increases in 2019 to none. GS agrees with
this revised outlook. B of A has reduced its expectation to just one rate increase in
the fourth quarter.

But, it is incomplete to focus only on the role of monetary policy in setting interest
rates. Since the Great Financial Crisis, the FOMC has used the Fed’s balance sheet
as an instrument of policy. Quantitative easing – large scale asset purchases –
depressed long-term interest rates, but also kept financial markets highly liquid. By
decreasing the size of the Fed’s balance sheet through sales of securities, the
FOMC is reducing market liquidity at the same time as federal deficit spending is
also diminishing market liquidity. This development is without precedent, so the past
doesn’t provide guidance. It could turn out to be a consequential recession risk.

Belatedly the FOMC has recognized that this risk is more consequential than it
thought and announced at its March meeting that sales will be tapered, then ended,
by September.

This brings me to the fourth recession cause – market financial imbalances and
asset price crashes. Unequivocally, this has been the primary cause of the last two
recessions. GS believes this recession cause is less consequential today because of
regulatory reforms implemented after the Great Financial Crisis and by private sector
restraint. I am considerably less sanguine. For example, in December credit spreads

blew out on high yield debt securities and new issuance almost came to a standstill. Banks stepped in and filled the lending gap. For the moment, the crisis has passed and credit spreads have narrowed. But this isn’t exactly a compelling development in support of GS’s argument of better regulation and private sector restraint. This kind of faith in the efficacy of policy actions preceded the two previous recessions and obviously, with the benefit of hindsight, was misplaced. Think about the risks posed by collateralized loan obligations (CLOs), dollar-denominated debt in emerging economies, administered interest rates that have been kept low for years, and the explosion of debt-to-GDP ratios in almost every country around the globe. All of these are surely imbalances. The question is whether any one or combination of them is sufficiently great to trigger recession.

Fiscal policy contraction historically occurred as a part of post-war demobilization. This has not contributed to a U.S. recession since 1953 (Korean Conflict) and to a lesser extent 1969 (Vietnam War).

However, fiscal risks are of a different sort in today’s economy. Political risk, which is an outcome of intensifying partisan conflicts, has risen steadily in recent years. The recent partial federal government shutdown was indicative of elevated political risk.

An emerging fiscal risk is government deficit financing. Risk grows as the ratio of government debt to GDP rises. In the short run, governments can boost economic growth through deficit spending, but when such a policy is carried to an extreme it can depress growth and catalyze financial crisis when investors are no longer willing to finance further increases in government debt. There is debate about what ratio of government debt to GDP constitutes a tipping point. The European Union has a policy limiting the ratio to 60 percent, but Italy is close to 130 percent and to date has evaded financial crisis. Ultimately, the tipping point depends upon investor confidence. What we do know with certainty is that an increasing debt-to-GDP ratio raises risk and slows growth. That means the U.S. and many other countries are headed in the wrong direction, but the climactic moment, when everything falls apart, could be many, many years in the future. In the meantime, if recession occurs for some other reason, burgeoning debt-to-GDP ratios will constrict governments’ abilities to use fiscal policy to soften the consequences of recession.

Based upon its historical analysis of recession causes, GS concludes that a soft landing is more probable than most believe in coming years than recession.

III. Developing Risks

With these observations in mind, let’s take a deeper look at some the obvious risks that exist in the U.S. and global economies and financial markets.
1. **The U.S. Economy Is Operating Above Full Capacity**

Based upon Congressional Budget Office (CBO) analysis, the U.S. economy entered 2019 operating 0.32 percent above capacity on a four-quarter moving average basis. This is expected to grow to approximately 0.9 percent to 1.0 percent by the end of the year. In the past the economy has rarely operated at full capacity for very long before recession occurred. Soft landings don’t usually occur.

*Economic expansions don’t die of old age, they die when the economy operates above capacity and overheats.*

*Forecasts of first quarter 2019 real GDP growth are below full-employment potential and vary between about 0.5 and 1.5 percent, but could be weaker, depending upon inventory accumulation. However, analysts generally expect U.S. growth to reaccelerate during the year, reflecting accommodative U.S. monetary policy and a reacceleration in China’s growth following the recent growth slowdown. This risk remains, but policy actions, improving financial markets and confidence have lessened this risk in the near term.*

2. **Quantitative Easing and Excessive U.S. Corporate Debt**

Two policy initiatives were adopted in reaction to the Great Recession. These policies were intended to pull the economy out of its near-depression state and prevent reoccurrence of the financial mischief that catalyzed the Great Financial Crisis. One involved radical restructuring of monetary policy, which came to be known as quantitative easing. The other was new regulatory requirements for financial services intermediaries, which were embedded in the Dodd-Frank Act. These regulatory requirements were intended to prevent recurrence of the behaviors that led to the Great Recession and contributed to its severity. These two sets of policies have shaped U.S. financial markets over the past ten years. Both were apparently successful in their intended objectives, but each has led to behaviors that have created new risks which could contribute to the onset of the next recession, and possibly to its severity as well.

Monetary policy innovations and behavioral responses are examined in this section. Dodd-Frank Act regulatory policies and their consequences are explored in the next section.

*Monetary policy* went far beyond the traditional strategy of lowering short-term rates. Quantitative easing, involving the purchase of U.S. Treasury securities and mortgage-backed securities issued by government sponsored enterprises, was added to the monetary policy tool kit. This policy intentionally injected copious amounts of liquidity into the financial system and depressed long-term interest rates.
Because quantitative easing endured for several years, two effects evolved which helped boost economic growth, but which simultaneously sowed the seeds of future problems.

First, market participants came to rely on abundant liquidity and low and sustained long-term interest rates. This had the direct effect of inflating asset values and creating a wealth effect that helped stimulate economic growth. The stock market was the most visible beneficiary of this policy, but all other long-term asset classes also benefited. Inflation in asset values enabled lending at apparently conservative loan-to-value ratios. But, debt service coverage ratios based upon cash flows remained the same. With abundant liquidity and the mirage of conservative lending terms, competition drove credit spreads down. Loans appeared to have low risk but weren’t very profitable. In fact, if the artificially inflated asset values returned to levels dictated by market interest rates rather than depressed rates manipulated by the Federal Reserve, in the longer run such loans would be even less profitable because of inadequate create spreads. The Federal Reserve’s recent decision to stop raising interest rates means that tight credit spreads, which do not adequately price for risk of default, will continue.

This is a longer-term risk, which has gotten renewed life following 2018’s market correction and the easing of monetary policy.

But, tight credit spreads are not the only problem with commercial and industrial loans and commercial real estate loans. Other underwriting terms have been loosened steadily and is continuing according to the most recent Federal Reserve Senior Loan Officers survey. According to Moody’s Analytics, the composite underwriting score for commercial and industrial loans deteriorated from 2.5 in 2007 prior to the Great Recession to 4.0 in 2017. Scores for every underwriting term — financial covenants, subordination limitations, additional debt issuance, asset sales and mandatory prepaids, and voting and assignments, have weakened in favor of borrowers. Many of these loans have found their way into the collateralized loan obligation market, which has nearly doubled in size since 2013 to $550 billion. Over the same period leveraged loans have ballooned from $800 billion to $1.4 trillion.

GS opines: Overheating in corporate credit markets poses several macroeconomic risks. First, high leverage makes firms more vulnerable to rising interest rates. Second, low profit spreads have historically led to reversals with a credit crunch sometimes causing a broader growth slowdown. Third, rapid deterioration in risky
pockets of corporate credit markets can trigger broader financial market disruptions and tighten standards on less risky lending.\(^4\)

**There has been no change in corporate credit risks, which remain moderate with the exception of collateralized loan obligations.**

Currently, risks are moderate because the rate of return on invested capital exceeds the cost of borrowing. Higher interest rates, which appear to be less likely in the near term, would raise the cost of borrowing and slowing economic activity would depress the rate of return. Historically, when the spread between the return on investment and the cost of capital approaches zero, recession has ensued. According to Gavekal Research, this point would have been reached with two to four more increases of 25 basis points in the federal funds rate, depending upon what would happen to the rate of return on invested capital.\(^5\) But this is not likely to occur because the Federal Reserve has indicated that no further increases in interest rates are likely during 2019.

### 3. **Dodd-Frank Act and Regulatory Requirements for Financial Services Intermediaries**

The **Dodd-Frank Act** changed regulatory requirements for financial services intermediaries in several ways. It increased capital and liquidity requirements for regulated financial services institutions. In the interests of protecting consumers from unscrupulous lending practices, it also imposed stricter requirements on consumer and residential lending. The intent on the one hand was to force regulated financial institutions to have greater reserves to withstand credit losses and liquidity crises. On the other hand, the intent was to protect consumers from predatory lending.

There have been several consequences.

First, tighter residential loan underwriting standards and the costs of consumer compliance have limited the availability of home construction and home mortgage credit and contributed to a housing shortage and an escalation in housing prices that has exceeded increases in household incomes. I estimate that national housing prices, after falling 8.0 percent below trend in the first quarter of 2012 in the aftermath of the Great Recession, were 13.1 percent above trend in the fourth quarter of 2018. While this is well short of the housing bubble peak of 34.9 percent above trend in the first quarter of 2006, it is indicative of the increased unaffordability of housing, which will only get worse if interest rates rise further.

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\(^5\) Denyer, Will. "GE is More Fish Than Fowl," The Daily, Gavekal Research, November 16, 2018/
Second, the number of market makers has declined substantially and many assert that liquidity is now less assured should a financial markets crisis erupt. The worry is that in the event of a financial markets crisis, scarcity of liquidity providers could make it difficult to contain potential contagion.

Third, higher capital requirements for financial intermediaries discourages risk taking in providing credit. This, of course, was intended. However, it has shifted credit lending to less regulated intermediaries such as the providers of leveraged loans (see discussion below). Reduced risk taking, coupled with low interest rates, might also have contributed to disappointing productivity gains.

Fourth, while little noted, implementation of liquidity requirements at the end of 2018 for 29 global systemically important banks (GSIBs) contributed significantly to the financial panic that culminated on Christmas Eve. Implementation of the requirement resulted in withdrawing prodigious amounts of liquidity from the market at the same time that the FOMC’s monetary policy to continue increasing interest rates and shrinking the Federal Reserve’s balance sheet was extracting liquidity from the financial system. The GSIB rule resulted in these 29 mega financial institutions shrinking their balance sheets and converting assets to cash thus starving markets of liquidity at a time when it was desperately needed.

*The threat posed by the GSIB rule to the financial system has passed and the FOMC has learned a hard lesson about the interaction of macro prudential rules intended to reduce risk and monetary policy tools aimed at preventing an overheating economy from igniting inflation. In short, policies intended to reduce systemic risks posed by individual financial institutions can result in macro risks. What remains untested yet are the limitations the Dodd-Frank Act imposed on the Federal Reserve to serve as a lender of last resort in an all-out financial crisis.*

4. **Leveraged Loans and Collateralized Loan Obligations (CLOs)**

Leveraged loans have grown to $1.13 trillion and account for 12 percent of outstanding corporate debt. Of that amount, approximately $600 billion are packaged in CLOs. Carmen Reinhart asserts that CLOs *“share many similarities with the now notorious mortgage-backed securities of the pre-subprime-crisis era.”*

Leveraged loans are borrowings by low-credit-rated companies, generally secured by a portion of the company’s assets and paying a floating rate of interest. CLOs are

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a structured security, which means there are multiple credit tranches, which are collateralized by a pool of leveraged loans.

Growth in CLOs has been propelled by investors’ desire for high yielding variable rate securities. As always happens when demand exceeds supply, credit spreads are very tight and not reflective of likely long-term defaults and probable losses. Also, underwriting standards have deteriorated, and covenants are generally lax.

As long as corporate earnings remain robust, leveraged loans should perform satisfactorily. This implies that CLOs will not likely be a primary cause of recession but could greatly amplify a recession once it is underway. These securities will be very vulnerable to a slowdown in sales revenues that impairs earnings and debt servicing capacity.

Take note of Carmen Reinhart’s comparison of CLOs to subprime residential mortgage securities and their companion, collateralized debt obligations (CDOs). As the risks of CDOs became increasingly apparent during 2006 and 2007, most, including chairman of the Federal Reserve System, Ben Bernanke, dismissed the importance of the risks posed by these securities because they were a small portion of the securities market. This turned out to be a horribly complacent and terribly incorrect assessment. We know how it turned out. Subprime residential mortgage securities and CDOs were the tip of an iceberg. The cold hard reality as it turned out was that over-leverage and credit laxity permeated large parts of the securities markets and contagion resulted in unanticipated extensive financial carnage. Can history repeat itself? Students of the market with the history of the Great Financial Crisis in mind say “No,” but it’s difficult to know for sure all the linkages in an opaque market until after the fact. What we know with certainty is that low interest rates have driven financial engineering and a substantial increase in corporate debt. We know that CLOs are the latest hot investment, which is attractive to retail investors through ETFs.

During December’s stock market swoon, the market for leveraged loans and collateralized debt obligations evaporated overnight. Credit spreads blew out, but this didn’t matter a whole lot because investors were unwilling to finance new obligations at any price. Contagion did not develop, however, because the tempest passed quickly thanks to soothing words from Federal Reserve Chair, Jerome Powell, and the FOMC’s decision in January to ease monetary policy by taking interest rate increases off the table and tapering and ending shrinkage of the Federal Reserve’s balance sheet by September. These actions were sufficient to assuage investor anxiety. The leveraged loan market returned to business as usual and credit spreads contracted.
This is a longer-term risk, which has gotten renewed life following 2018’s market correction. Going forward, the danger is that the imbalances in corporate leveraged debt and collateralized debt obligation continue to build.

5. U.S. Trade Policy

According to economic theory, tariffs have negative consequences for economic growth and employment. Tariffs raise the cost of goods to consumers which depresses demand. This leads to lower production. A recent International Monetary Study confirms theory. The study examined 151 countries covering the period 1963 to 2014. The study found that tariffs reduce economic output, productivity and employment, but do not change the trade deficit. Impacts were greater for developed economies and economies that were expanding. Specifically, the authors found that an aggregate increase in tariffs of 3.6 percent reduced GDP by 0.4 percent and decreased productivity improvement by 0.9 percent after five years. These results were statistically significant.

If the U.S. responds to tariffs in the same way, the trade deficit is unlikely to decline, but there will be negative consequences over time for GDP and employment. Since the political focus has been on reducing the trade deficit, if it does not decline as the IMF study indicates, this is likely to have negative political repercussions.

In the short run the U.S.–China trade deficit has increased, aided in part by a 10 percent depreciation in the Chinese currency relative to the dollar. The increase in the trade deficit was also spurred by stockpiling to beat the increase in tariffs on imports from China to 25 percent on January 1, 2019, now delayed through March. This phenomenon was evident particularly in third quarter GDP data. Inventory accumulation skyrocketed but this was almost entirely offset by a decrease in net exports (imports greater than exports). Inventory accumulation was also well above normal in the fourth quarter. Anticipatory actions of this sort boost U.S. growth and employment in the short run, but this will reverse after the tariffs take effect. The implication is that U.S. growth will slow in early 2019 as excess inventories are run off and perhaps to a greater extent than most forecasters expect.

The jury is still out, but unofficial commentary suggests that the U.S. and China will back away from full-scale trade war; the Trump Administration has been noticeably silent about auto tariffs and not released the Commerce Department’s report. This risk remains, but appears to be less consequential.

6. Monetary Policy

As discussed in the section above concerning risks stemming from quantitative easing and corporate debt leverage, the normalization of interest rates could have
greater negative impacts on economic activity in coming months than in past monetary policy tightening episodes because long-term rates have been artificially depressed for a long time. In turn, valuations have been artificially elevated. The adjustment process in valuations could turn out to be more disruptive than in past tightening cycles and could spur unexpected bankruptcies for those who have relied too heavily on debt leverage.

Past recessions have usually occurred when the FOMC raised the federal funds rate well above the long-term equilibrium value. Lag times between adjustments in the policy rate and the impact on economic activity can be as long as 18 months. Monetary policy works through tightening financial conditions, but economic momentum can delay the transmission of higher rates to tighter financial conditions for an extended period. For this reason, the FOMC historically has raised the federal funds rate by too much. Or, another way of looking at it, because of concern for losing control of inflation and inflation expectations, the FOMC has had a bias historically to increase the federal funds rate more than a retrospective view indicated was probably necessary.

But, it is incomplete to focus only on the role of monetary policy in setting interest rates. Since the Great Financial Crisis, the FOMC has used the Fed's balance sheet as an instrument of policy. Quantitative easing—large scale asset purchases—depressed long-term interest rates, but also kept financial markets highly liquid. By decreasing the size of the Fed's balance sheet through sales of securities, the FOMC is reducing market liquidity at the same time as federal deficit spending is also diminishing market liquidity. This development is without precedent, so the past doesn't provide guidance.

**FOMC policy changed abruptly in the wake of the near panic in financial markets in the fourth quarter of 2018. The change in policy was ratified at the March FOMC meeting when the median of participants agreed that interest rates should not rise further in 2019 and the shrinkage of the Federal Reserve's balance sheet should end by September. In addition, FOMC policy review could result in a revised inflation target to assure that inflation averages 2% over the entire cycle – this would result in keeping rates low until inflation rises convincingly above 2%. This risk has diminished.**

7. **Tightening Financial Conditions**

One of the more important advances in economic forecasting in recent years has been an improved understanding of the importance of financial conditions in guiding developments in the real economy. Prior to the Great Recession economic forecasting models focused primarily on real economic activity, monetary policy and
fiscal policy, but did not include to any great extent the interaction of financial markets and the real economy. Consequently, the enormous financial risks that built up in the economy prior to 2008, which were recognized by a few seasoned analysts, were not captured in econometric models. Thus, many were surprised by the severity of the Great Financial Crisis who should not have been.

In recent years measures of financial conditions have been constructed and their relationship with and impact on real economic activity has been tested. The measure I follow closely is the Goldman Sachs Financial Conditions Index (GSFCI). This measure is a weighted composite of credit spreads, exchange rates, market price movements and other indicators of financial market conditions. Through its research GS has been able to determine how a persistent change in financial conditions is likely to impact economic activity.

GSFCI is pegged to a neutral level of 100. However, since 2010 it has averaged 99.5. At the beginning of 2018, the January 2018 GSFCI hit a recent low of 98.29. By December GSFCI had risen to 100.12. As market volatility has eased early in the new year GSFCI has retreated to 99.5.

In late December, following the surge in tightening financial conditions, GS concluded the “tightening has only moderately reduced the median growth outcome for 2019…But, GS added a caution. Financial tightening has considerably increased downside tail risk.” For now, the easing of financial conditions during the first quarter has reduced this tail risk.

Tighter financial conditions do the work of slowing the economy that the FOMC’s interest-rate policy is intended to accomplish, but the time lags are much shorter. GS, which had been forecasting four 25 basis point increases in the federal funds rate in 2019 reduced this number to two in December and recently eliminated increases altogether in 2019. This is belated acknowledgement that historical patterns no longer serve as a reliable guide to monetary policy in the current cycle.

GS’s research indicates that 100 basis points tightening in financial conditions, which is what occurred during the fourth quarter, if persistent, would reduce the median estimate of real GDP growth over the next four quarters by 0.7 percent. However, tail risk of GDP growth falling below zero would rise from 10 percent to 15 percent. However, GS has reduced its 2019 real GDP growth forecast from 2.6 percent made in 2018 to 2.3 percent currently. This seems reasonable, given the improvement in financial conditions during first quarter. However, GS’s 2.3 percent

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2019 growth estimate is the median of a distribution, which means that actual 2019 real GDP growth could be higher or lower than this estimate.

The takeaway from GS’s research is that changes in financial conditions matter. They not only matter but large and persistent changes can alter the outlook for real economic activity quickly and dramatically. With that in mind, maintaining a close watch on GSFCI and also on GS’s CAI (current activity indicator) will be key in monitoring the possibility of recession and timing of onset.

Financial conditions eased in the first quarter but remain tighter than they were prior to 2018 Q4’s financial market correction. The improvement appears to have stalled in March. This risk has diminished in the short run, but could quickly return if U.S. and global economic activity weakens more than expected.

8. Declining Consumer, Business, and Investor Sentiment

Shifts in consumer, business, and investor sentiment rarely are a direct cause of recession. But in tandem with a substantive economic development they can amplify a momentum shift literally overnight. An example was the failure of Lehman Brothers in early October 2008. Recession was already underway; it began in January 2008. But until the failure of Lehman, the recession was developing gradually. The Lehman failure scared the living daylights out of investors. Overnight liquidity dried up, asset prices plunged and panic engulfed employers and consumers. Within days the economy was in freefall.

Another experience of a similar sort in which I was a participant occurred in April 1980 when President Carter decided to implement price controls to corral inflation. The program was confusing to consumers and they reacted by delaying spending. Within days economic activity plummeted and recession ensued.

In both cases it was policy action which triggered a violent and negative shift in sentiment. But the policy actions were responding to substantive imbalances and problems in the economy and financial markets.

Violent shifts in sentiment are rare, but significant shifts occur more frequently. The most recent shift was a rather abrupt change in investor sentiment from risk on to risk off which started in early October. High visibility in financial markets can amplify shifts in sentiment and that is what occurred over the next three months. When stocks tumble, if the tumble is great enough, it can spill over to consumer and business optimism and lead to a slowdown in production, investment, and spending. Recent survey data suggest that this occurred to a certain extent but probably not on the order of magnitude that would lead to a significant slowing in economic
momentum in the U.S. However, most forecasters have trimmed forecast growth a little in 2019.

Investor sentiment has now flipped back to risk on. But, not much has really changed in the economic outlook. Investors over-reacted and this fed on itself for a while. Similarly, there is little reason to be euphoric now. Growth is slowing everywhere in the world to more sustainable levels. Tail risks are higher than normal. Policy shocks and negative surprises could refocus attention on the tail risks later in the year and a shift in sentiment in response could amplify the negative impact on the economy and financial markets.

Consumer and investor sentiment has improved since the beginning of the year; some measures of business confidence have softened. This risk has diminished in the short run, but could worsen quickly, if financial market volatility returns.

9. Escalating Political Uncertainty

In January a Congressional Polarization Index, based upon roll-call votes, reached its highest level since the days of Teddy Roosevelt. A news-based economic policy uncertainty index rose to its highest level since the dark days of the Great Recession.

Policy uncertainty can cause people and businesses to delay making decisions and can depress optimism. Although heightened levels of uncertainty appear to be correlated with slower economic growth, there does not seem to be a direct causal relationship between increased political uncertainty and recession. The relationship that does exist, is linked to specific policy actions, not to uncertainty about what might happen.

While the recent partial federal government shutdown was a specific policy action, its impacts appear to have been transitory and did not trigger a broader reaction.

Political uncertainty in the U.S. has diminished in the short run, but could escalate at any time. Political uncertainty is rising in the U.K. and Europe.

10. Men of the Trees – Men of the Boats

Increasing political uncertainty appears to be more deeply rooted in structural shifts in society than can simply be attributed to the personality of the U.S. president or heightened congressional partisanship.
Charles Gave of Gavekal Research opines colorfully:

... all over the world, you have seen a tension between what I call “the men of the trees” and “the men of the boats.” The joke is something that comes from the French Polynesia, that some men like to stay next to the tree where they were born, and some guys cut the tree and go to see the next island if it is any better. The world has been managed by the men of the boats for the last 30 or 40 years, and it has been managed extremely successfully for the men of the boats, and extremely unsuccessfully for the men of the trees. And the men of the tree are revolting everywhere. Whether you talk Trump or Brexit, tractors, as the populists in Italy, or the yellow jackets in France, it’s exactly the same thing. There is absolutely no difference, it’s all the same problem. And the funny thing is that the men of the boats, the highly intelligent people, are basically talking to the other guys as if they are idiots. They tell them, “Look you’re uneducated,” which is not true, “You don’t know what the real world is all about so shut up and let us manage the world as we have managed it for the last 30 or 40 years: Which is perfectly understandable if you are a man of the boats. So we have a massive problem in the sociological and almost political buildup of our nations all over the West. And I don’t know how it’s going to finish, but it’s certainly not good news.

In Europe the men in the boats are the centrist Europhile politicians and the European Commission technocrats lodged in Brussels. The men of the trees are the working-class populists, both on the left and on the right ends of the political spectrum. It is the spontaneous yellow jacket, anti-Macron movement in France; it is the Five-Star National League populist governing coalition in Italy, it is the nationalist-populist political governments in Hungary and Poland.

In the U.S. it is the anti-immigration, anti-elite coalition that helped elect Donald Trump.

A common denominator of the men of the boats is that of a highly educated elite meritocracy that believes they know best. But the men of the trees see the men of the boats as self-serving, taking care of their interests and stifling the men of the trees. This breeds divisiveness and political fragmentation and could be disruptive to economic activity.

*This is a long-term risk, which is evolving and worsening slowly.*

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11. Brexit and the European Union

U.K. Prime Minister Theresa May and the EU reached agreement on a draft plan for the U.K. to leave the EU, but the U.K. parliament has rejected the proposal resoundingly twice.

The withdrawal agreement covered U.K. payments into the EU budget, the rights of EU citizens living in the U.K. and the northern Ireland border. It provided for a two-year transition period during which the U.K. would continue to be subject to EU market rules but would no longer engage in EU political institutions if the U.K. would be subject to EU rules but would have no role in formulating those rules. Further negotiations were to occur during the transition period which would determine the long-term relationship between the U.K. and the EU.

At the request of Prime Minister Theresa May, the EU has granted an extension to May 22nd provided that the U.K. parliament accept May’s exit plan. If parliament rejects the plan for the third time, the exit date is extended from March 29th to April 12th, which would result in a “no deal” exit. The EU’s conditions do not necessarily constitute a bright line in the sand. The EU could decide to extend the deadline if the U.K. commits to a fundamental rethinking of its long-term relationship with the EU. This could possibly involve holding a new public referendum.

Adverse economic consequences of “no deal” and the U.K.’s disorderly exit from the EU cannot be ruled out.

Populist forces continue to gain ground in the EU. Populations in many EU member countries are not optimistic about the long-term economic outlook. Centrist parties, which have been the mainstay of support for the EU, continue to atrophy. The EU holds parliamentary elections in May and will form a new European Council later in 2019. Depending upon the election outcome, potentially dramatic changes could occur.

Grinding political unraveling of support for the EU and the prospect of more challenging economic times at best heighten uncertainty and at worst could throw the continent into political chaos and economic decline. This is not an outcome that most anticipate but it is one that should not be dismissed out of hand.

*This risk is worsening as March 29th approaches because there is no agreed upon exit plan; uncertainty is depressing U.K. economic activity.*

12. Italy, France and Germany

Another challenge to the integrity of the EU involves the Italian budget. During 2018 two populist parties, one on the right and the other on the left, joined together to form
a coalition government. The coalition reached a compromise budget which would have resulted in an estimated 2.4 percent deficit. While this deficit seems small in relation to deficits nearly twice as large in the U.S., because Italy’s public-debt-to-GDP ratio greatly exceeds EU rules, the proposed budget was rejected by the European Commission (EC). Italy’s government initially held firm and refused to modify its proposed budget. Worried financial markets increased spreads on Italian government debt. Inevitably both sides found a way to kick the can down the road. The Italian government agreed to reduce the budget deficit a little bit and the EC winked at requiring Italy to manage to a primary deficit that would reduce its debt-to-GDP ratio. In the meantime, Italy’s economy continues to stagnate and may be entering recession – real GDP growth was negative in the third and fourth quarters of 2018. Early 2019 data indicate worsening economic conditions. Increasingly, if looks likely that both the budget deficit and the government debt-to-GDP ratio will both go up.

An increasing portion of the Italian electorate is disaffected with EU membership. They see little in the way of benefits. Inflation-adjusted per capita income is the same today as it was 20 years ago and the income gap between Italians and citizens in other EU countries continues to widen. Increasingly, Italians have come to realize that the euro and EU fiscal rules are responsible for Italy’s economic malaise. To regain competitiveness and stimulate economic growth, Italy needs to devalue the currency it doesn’t have because it is locked into the euro. The euro straightjacket and EU deficit and public debt rules force austerity. But austerity has reinforced Italy’s economic decline.

Recent economic data indicate that Italy’s economy is losing momentum rapidly. A recession, which appears to be underway, will reinforce public disaffection with the EU and heighten pressure on the governing coalition to defy the EC. While the recent budget accommodation worked out between the Italian government and the EC defers the unresolved underlying problems to another day, Italy’s economy will continue to perform poorly as long as it remains under the straitjacket of the euro. This is unsustainable in the long run. If confrontation occurs in coming months, it would rekindle the euro crisis of a few years ago and this would probably negatively impact global financial markets.

All is quiet for the moment, but be prepared for Italy’s problems to impact financial markets and EU politics later on during 2019.

In France, President Macron is an unabashed Europhile and has been attempting to strongarm the French economy to implement reforms to unleash economic growth. But as Thomas Friedman recently wrote, “When you simultaneously challenge all these things that anchor people – their sense of home, their job security, their
prospects for growth and the social norms that, for better or worse, defined their
lives – and then amp it all up with social networks, you can get a really ferocious
blowback, as France’s president, Emmanuel Macron, saw across his country.\(^9\) This
phenomenon, Charles Gave has observed, is not unique to France. It is present in
all developed western countries. Friedman went on to say: \textit{Macron, by contrast,
dared to do the right things to unlock growth in France, at the right time, ‘but he did
not understand the difference between being right and doing it right,’} a French
economist, Ludovic Subran, told me.”

\textit{This risk has fallen out of the headlines. But not much has changed. The
Yellow Jackets, albeit in somewhat reduced numbers, continue to
demonstrate. As France’s and Europe’s economies slow, greater political
unrest is sure to surface.}

Then there is Germany, and all is not well there either. Economic growth was
negative in the third quarter of 2018 and zero in the fourth quarter. Industrial
production is contracting at a worrisome pace. One of its largest banks, Deutsche
Bank, is teetering on the edge of failure, and is likely to be bailed out through a
forced merger with Commerz Bank. Centrist political parties are in decline and
Angela Merkel will soon give up the chancellorship to the new leader of the Christian
Democratic Union, Annegret Kramp-Karrenbauer. Germany’s much vaunted
economy is in jeopardy of descending into recession. Its economic growth has been
powered by exports. But as China’s growth slows and the U.S. pursues its trade war
with China, Germany may be an unintended victim.

\textit{This risk is escalating – Germany might be joining Italy in recession; ECB’s
monetary policy has been ineffective in preventing substantial deceleration in
EU economic growth.}

\textbf{13. China}

China’s official GDP growth was 6.6 percent in 2018. The official growth target for
2019 is a range of 6.0 to 6.5 percent. Most forecasters expect growth to be near the
bottom end of the official range. Growth slowed during the second half of 2018 and
to a greater extent than was welcome. In response, Chinese policy makers are
taking steps to stimulate growth. It remains to be seen how effective these measures
will be.

In the longer-term, China’s high growth rate is not sustainable. That is because
population and employment growth are decelerating rapidly and because its

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economy is catching up quickly with developed economies. What that means is that the outsized productivity increases China has experienced will moderate to lower levels prevalent in developed economies. Potential growth depends on the sum of employment growth and the rate of productivity improvement. Eventually this could push growth down to 3 percent or lower. Potential growth in Japan, which has a shrinking population and workforce, is approximately 1 percent.

China has driven high growth though a capital infrastructure intensive policy fueled by construction activity and prodigious amounts of credit. In the short run such a policy mix drives high growth. But the policy ultimately becomes self-limiting for two reasons. First, building infrastructure counts in GDP but once built it must be used to continue generating GDP. Empty buildings do not contribute to GDP. What this means is that China must build a consumer economy to take advantage of newly constructed infrastructure. China is working on this. But growth based upon consumer spending depends upon population growth and increases in household incomes. Policy cannot easily raise consumer spending growth in the way that it can increase investment spending growth. This is because consumer spending depends upon employment growth and productivity improvements which policy can influence but outcomes evolve slowly.

Second, credit creation stimulates spending and can accelerate growth. But, credit obligations ultimately must be serviced, or defaults will ensue. The ability to service debt depends upon incomes. In the long run nominal growth in GDP (spending) and credit need to be approximately the same to maintain economic stability. If credit continually grows faster than spending, as it has in China, the ability to service it will deteriorate over time. Initially in an economy which has underutilized credit, the increased use of credit can trigger significant increases in spending. However, as the use of credit matures, the efficiency of each additional unit of credit in creating more spending declines. China has followed this path rapidly and this has contributed to China’s high growth rate. However, China’s use of credit has matured to the point where its efficiency in creating additional spending has declined precipitously and servicing risks have escalated.

About a year ago China’s leadership became concerned with the proliferation of highly speculative wealth management products and instituted rules to regulate them. Credit growth slowed in 2018 and not surprisingly GDP growth also slowed.

In recent years whenever China’s growth slowed significantly, the leadership responded with monetary and fiscal spending stimulus. In 2009 this intervention was great enough that it fostered a global economic recovery. China has responded similarly to each subsequent slowdown in its economic growth. Global economic
growth, particularly in emerging markets and commodity exporting countries such as Brazil, Australia, and Canada, have benefited.

Today China finds itself once again in a growth slowdown and since July has been actively attempting to stimulate its economy, but with one major exception. To date it hasn’t relaxed its campaign to limit speculative credit products. This time around the Chinese economy didn’t respond materially to the first round of stimulus.

Going forward there are two pathways China can take and two sets of risks that will evolve depending upon which pathway is chosen. China can continue to follow the current policy mix which limits outsized and potentially speculative credit creation. This would result in a slower rate of economic growth over time. The question is whether the leadership can accept such an outcome given their track record of promising high rates of growth.

The alternative pathway is to relax credit restrictions and reopen the credit spigot. This will give a short-term boost to growth, but at the cost of increasing instability in the financial system over the longer run.

Prudence argues for the first pathway, but politics may drive policymakers to pursue the second pathway.

Overlaying this policy choice is the evolving trade war with the U.S. In the short run, it is becoming clearer that China has more to lose from tariffs than the U.S. does. The list of U.S. trade demands to remove tariffs is long and politically unpalatable to the Chinese leadership. As the war continues, economies in both countries will be damaged. But at the moment the playing field is uneven. The U.S. economy is strong, but the Chinese economy is slowing. The negative impact of tariffs will be greater in China in the short run. As the IMF study, discussed in the section on trade above, documents, a continuation of the trade war will have negative effects on growth, employment and productivity, but the adverse effects, particularly in the U.S., will probably not be as great.

*China’s stock markets rose over 20% in the first two months of 2019, reflecting investor optimism that policy will end the growth slowdown. Much of the growth optimism about a better 2019 second half in the U.S. and many global economies hinges on growth reacceleration in China. Current Chinese policies support, but do not guarantee, such an outcome. This is a significant risk and it’s too soon to determine whether Chinese policy actions will be effective.*
14. Commentary

It is practically speaking foolhardy to attempt to predict when recession might occur and, if it occurs, its severity. Events can occur that materially impact outcomes. That said, however, it is possible to know whether risks are building. And that is clearly the case currently as global growth momentum slows. And, it is possible that policymakers will be able to manage the risks discussed above in ways that diffuse them and enable economic activity to return to a trajectory consistent with long-term potential.

But, prudence and good risk management dictate that one should prepare for a messy resolution of many of these risks and this might involve a period of recession.

As to timing, the U.S. economy should experience significant slowing during the first quarter of 2019. The consensus expects the economy to reaccelerate in the second quarter and post above potential growth for all of 2019. Whether and when a recession commences will depend a great deal on Federal Reserve monetary policy, the evolution of financial conditions, and declines in investor, business and consumer optimism. Recent trends have been favorable on balance. Nonetheless, recession risk remains, but the timing probably has been pushed out. And, if we’re really fortunate, the soft landing that most forecasters foresee will be the scenario that ultimately prevails.

IV. Components of U.S. Real GDP

Growth has been well above the full potential level since the second quarter of 2017. Over the past seven quarters, the output gap, as measured by the Congressional Budget Office (CBO), has reversed from a shortfall of 1.03 percent of real GDP to an excess of .32 percent in the fourth quarter of 2018. The full effects of optimism and fiscal stimulus from the Tax Cuts and Jobs Act fully kicked in during the second and third quarters of 2018, which registered 4.2 percent and 3.4 percent growth. Fourth quarter growth slowed a bit to 2.6 percent, still well above potential. At the end of 2018, the U.S. economy was operating above full capacity for the first time since 2007 and poses the possibility that the economy will overheat in coming quarters. This is what most forecasters expect, but since recession risk is rising, this outcome is not assured.

Financial market volatility damaged consumer, business and investor confidence at the end of 2018. Slowing global growth, particularly in China, and the U.S. federal government partial shutdown in early 2019 also dented optimism. These developments elevated the risk of recession. However, a decisive easing in U.S. monetary policy at the January FOMC meeting and hints that shrinkage in the Federal Reserve’s balance sheet will soon be curtailed, lifted the gloom from
financial markets. During February and March consumer, business, and investor confidence recovered partially from the fourth quarter shocks.

First quarter 2019 growth in economic activity promises to be very weak and could even be slightly negative. But most analysts expect growth to strengthen during the remainder of the year and to be above its full employment potential level. While it is hard to argue this consensus outlook, above potential growth when the economy is already operating above full capacity is not sustainable indefinitely. Recession risks may have abated somewhat since the beginning of the year, but the risks to slower than expect growth and possible onset of recession remain high.

1. “Preliminary Estimate” of Fourth Quarter 2018 GDP

The ‘Preliminary Estimate’ of fourth quarter GDP growth was 2.58 percent. Growth in “Private Domestic” GDP, which eliminates inventories, net exports and government spending, was 2.60 percent compared to 2.58 percent in the third quarter (Table 1). However, the four-quarter moving average of ‘Private Domestic’ GDP moved down slightly from 3.29 percent in the third quarter to 3.21 percent in the fourth quarter (Table 2).

Details of the fourth quarter’s ‘Preliminary Estimate’ are shown in Table 1. The bottom four panels of Table 1 show different measures of real GDP growth. These include the traditional ‘Total GDP’ measure, and three alternatives ‘Final Sales’, ‘Private’, and ‘Private Domestic’.

Table 1

Composition of 2018 and 2017 Quarterly GDP Growth

<table>
<thead>
<tr>
<th></th>
<th>Fourth Quarter 2018</th>
<th>Fourth Quarter 2018 Final Estimate</th>
<th>Third Quarter 2018</th>
<th>Second Quarter 2018 Final Estimate</th>
<th>First Quarter 2018</th>
<th>Fourth Quarter 2017</th>
<th>Third Quarter 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Consumption</td>
<td>.92%</td>
<td>2.37%</td>
<td>2.57%</td>
<td>.36%</td>
<td>2.64%</td>
<td>1.52%</td>
<td></td>
</tr>
<tr>
<td>Private Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonresidential</td>
<td>.82%</td>
<td>.35%</td>
<td>1.15%</td>
<td>1.47%</td>
<td>.63%</td>
<td>.45%</td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>-.14%</td>
<td>-.14%</td>
<td>-.05%</td>
<td>-.14%</td>
<td>.41%</td>
<td>-.02%</td>
<td></td>
</tr>
<tr>
<td>Inventories</td>
<td>.13%</td>
<td>2.13%</td>
<td>1.17%</td>
<td>.27%</td>
<td>-.91%</td>
<td>1.04%</td>
<td></td>
</tr>
<tr>
<td>Net Exports</td>
<td>-.22%</td>
<td>-1.99%</td>
<td>1.22%</td>
<td>-.02%</td>
<td>-.89%</td>
<td>.01%</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>.07%</td>
<td>.44%</td>
<td>.43%</td>
<td>.27%</td>
<td>.41%</td>
<td>-.18%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.58%</td>
<td>3.16%</td>
<td>4.15%</td>
<td>2.31%</td>
<td>2.29%</td>
<td>2.82%</td>
<td></td>
</tr>
<tr>
<td>Final Sales</td>
<td>2.45%</td>
<td>1.03%</td>
<td>5.32%</td>
<td>2.04%</td>
<td>3.20%</td>
<td>1.78%</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>2.38%</td>
<td>.59%</td>
<td>4.89%</td>
<td>1.77%</td>
<td>2.79%</td>
<td>1.96%</td>
<td></td>
</tr>
<tr>
<td>Private Domestic</td>
<td>2.60%</td>
<td>2.58%</td>
<td>3.67%</td>
<td>1.79%</td>
<td>3.68%</td>
<td>1.95%</td>
<td></td>
</tr>
</tbody>
</table>
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 2.58 percent in the fourth quarter Preliminary Estimate.

Because growth in Total GDP is volatile from quarter to quarter, this measure is an unreliable indicator of economic strength. Alternative GDP measures strip away the noisier quarterly components and often provide a better sense of economic strength. The Final Sales measure of real GDP removes the contribution of changes in inventories, which is very volatile from quarter to quarter. Final Sales grew a paltry 1.03 percent in the third quarter, following robust 5.32 percent growth in the second quarter. The swing from negative to positive inventory growth between the second and third quarters amounted to 3.29 percent, accounting for most of the quarter-to-quarter difference of 4.29 percent in Final Sales. Inventory accumulation remained abnormally high in the fourth quarter, but the pace of accumulation edged up only a little, which is why its contribution to GDP was slightly positive. It is likely that inventory accumulation will return to more normal levels in 2019 and should this occur, inventory accumulation is likely to subtract a potentially large amount from Total GDP in the first and second quarters of 2019.

Private GDP omits both inventory changes and government investment spending. Growth in government expenditures typically rises during periods of economic weakness or when Congress increases spending, such as is currently the case, and falls during periods of economic strength or when fiscal austerity is the order of the day. “Private” GDP grew 2.38 percent in the fourth quarter compared to a paltry .59 percent in the third quarter. Weak third quarter Private GDP was impacted by strong inventory accumulation.

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 contributes approximately 88 percent to Total GDP. Annualized quarterly growth rates of this measure are generally, but not always, less volatile. This measure grew 2.60 percent in the fourth quarter compared to 2.58 percent in the third quarter.

It should be noted that the surge in inventory growth and the outsized decline in net exports in the third quarter are related and are largely traceable to trade policy. The announcement of tariffs on imported goods, particularly those from China, with delayed effective dates resulted in stockpiling during the third and fourth quarters to beat higher costs.
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 \textit{Private Domestic} GDP has been consistently greater than growth in \textit{Total GDP} for several years. Moreover, this GDP measure had been trending upward steadily, but appears to have peaked in the third quarter of 2018. This has also been the case for \textit{Private} GDP. Since the fourth quarter of 2014, growth in \textit{Private Domestic} GDP has been stronger than growth in \textit{Private} GDP. This means that trade has had an unfavorable impact on GDP growth over the past four years.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Year-Over-Year Growth Rates for Components of Real GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GDP Component Weight</td>
</tr>
<tr>
<td>Personal Consumption</td>
<td>69.41%</td>
</tr>
<tr>
<td>Private Investment</td>
<td>18.24%</td>
</tr>
<tr>
<td>Nonresidential</td>
<td>14.62%</td>
</tr>
<tr>
<td>Residential</td>
<td>3.28%</td>
</tr>
<tr>
<td>Inventories</td>
<td>0.24%</td>
</tr>
<tr>
<td>Net Exports</td>
<td>-4.92%</td>
</tr>
<tr>
<td>Exports</td>
<td>13.71%</td>
</tr>
<tr>
<td>Imports</td>
<td>-18.63%</td>
</tr>
<tr>
<td>Government</td>
<td>17.11%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
</tr>
<tr>
<td>Final Sales</td>
<td>99.76%</td>
</tr>
<tr>
<td>Private</td>
<td>82.65%</td>
</tr>
<tr>
<td>Private Domestic</td>
<td>87.57%</td>
</tr>
</tbody>
</table>
Since 2015 fiscal policy has been mildly supportive of Total GDP growth. Until the second quarter of 2018, government’s contribution to real GDP growth had been small, which reduced the growth rate in Total GDP relative to Private GDP. Government spending boosted Total GDP growth by 27 basis points in the first quarter, 43 basis points in the second quarter, 44 basis points in the third quarter, as the full force of fiscal stimulus kicked in (Table 1). Even though government’s contribution to fourth quarter GDP slide to 7 basis points, the four-quarter rate of growth accelerated from 1.11 percent to 1.51 percent (Table 2). The government’s contribution should increase further in 2019 as federal spending (not including transfer payments which are not counted in the government sector of GDP) ramps up. However, it should be noted that even as government spending growth strengthens, the four-quarter growth rate has moved up only to 1.51 percent (Table 2), which is considerably below the growth rate in the rest of the economy and the long-term potential rate of growth of 1.8 percent to 2.0 percent if government has been and remains a shrinking sector of economic activity.

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. However, two GDP measures (Private and Private Domestic) appear to have rolled over in the fourth quarter. This development is likely to extend to all four GDP measures in the first quarter of 2019. 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 \textit{Total GDP} and \textit{Final Sales}. What this means is that growth in the core of the U.S. has been stronger than reflected in the measure of “Total GDP.”

3. Consumption and Disposable Income

Consumer spending contributed 1.92 percent to fourth quarter real GDP growth compared to 2.37 percent in the third quarter. As can be seen in Table 2, the four-quarter trend in consumer spending’s contribution to GDP growth has been relatively stable over the past several quarters, ranging between 2.48 percent and 2.65 percent, which underscores the limitations of relying solely on annualized quarterly data to discern trends.

In the long run, growth in nominal disposable income and consumer saving/borrowing 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. Strong growth in employment and robust growth in wage rates will result in strong growth in disposable income.

Spending growth also is boosted when an increasing percentage of households expect incomes to rise. In anticipation of income gains, households increase borrowing, which will be reflected in an acceleration in consumer credit growth and a decrease in the saving rate. Prior to the stock market turmoil in the fourth quarter, the Conference Board’s survey of household income expectations had indicated a growing percentage of households had anticipated their incomes would rise. This optimism drove higher growth in spending, as can be seen in Charts 2 and 3.

However, stock market turmoil and the partial government shutdown damaged consumer optimism and impacted the slowdown in consumer spending in the fourth quarter. First quarter 2019’s contribution of consumer spending to GDP growth is likely to be negatively impacted to an even greater extent. Compared to 2018’s 2.64 percent contribution and the fourth quarter’s 1.92 percent annualized contribution, the annualized contribution of consumer spending in the first quarter of 2019 is expected to decelerate to between 0.8 percent (B of A) and 1.1 percent (GS).

Both B of A and GS expect consumer spending to bounce back in the second quarter of 2019. However, after the second quarter both also expect growth in consumer spending to slow as employment growth slows (Table 3).

In recent months employment growth, both in numbers and the increase in the average length of the workweek, has been quite strong. Wage growth has been
improving. Until employment and wage growth slow and optimism for income gains fade, consumer spending growth should remain strong.

Chart 2 shows annual rates of growth in real disposable income and real consumer spending from 2000 through the fourth 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. Over the past two years growth rates in disposable income and consumption have been nearly the same and have been trending upward gradually.

Chart 3 shows the 4-quarter moving average growth rates in nominal disposable income and consumption from 2014 through the fourth quarter of 2018. As can be seen in Chart 3, the four-quarter moving average growth rate in nominal disposable income was 4.41 percent in the fourth quarter of 2017, 4.57 percent in the first quarter, 4.71 percent in the second quarter, 4.83 percent in the third quarter and 4.96 percent in the fourth quarter. Barring a sustained shock to consumer confidence, this improving trend should continue during 2019 and will benefit from further gains in employment and rising wage rates.
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. Nonetheless, a negative shock to consumer confidence, such as occurred in November through January, will lead slow spending, particularly for big ticket purchases, such as cars.

As is evident in Chart 3, consumer spending has been trending higher over the past two years. Growth in nominal disposable income, which faltered in 2015 and early 2016, has recovered nicely in the last few quarters and is now fully supporting the upward trend in consumption growth.

Following the election of President Trump, consumer and business confidence surged to the highest levels in 20 years. Over the same time, consumption and income growth accelerated. Tax cuts, strong employment growth and acceleration in wage growth boosted income growth. Confidence took a hit in recent months and is off the recent multi-decade high. However, in the last few weeks confidence has improved, and though still below the recent peak, remains at a cyclically high level.
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 2.68 percent in 2016, 2.63 percent in 2017 and 2.82 percent in 2018. 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

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Following continued strong growth in 2019, forecasters expect real consumer spending growth to slow 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 currently is boosting consumer spending growth and will continue to do so in 2019.

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 2019 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.

4. Business Investment

Real private investment consists of three principal categories: nonresidential 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.

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

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</table>

*Average 1999-2018
**Real private investment = 2.37% for 1999-2018

**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 a meager 0.48 percent in 2016.

Nonresidential investment came out of deep slumber in 2017, rising at an annual rate of 5.26 percent. A recovery in energy investment accounted for much of this surge. Capital investment growth in sectors other than energy and oil also improved. Considering the acceleration in global growth and the tightening U.S. labor market, the improvement in growth in investment spending in 2017, although strong, was somewhat disappointing. However, this changed in 2018 with the help of sky-high business optimism and tax breaks contained in the Tax Cuts and Jobs Act. Business investment grew 6.96 percent. and momentum should carry over into 2019 due to,
which are intended to stimulate investment. B of A and GS expect business investment growth to be near its recent 20-year average of 3.30 percent over the next several years.

Forecasters expect real private investment growth will be modestly above the 2.37 percent average of the last 20 years in 2019, 2020, 2021, and 2022. Relatively strong growth in 2019 is supported by GS’s capital expenditures tracker, which currently registers approximately 5 percent, which is above the long-term trend level but foreshadows a slower pace of growth in 2019 compared to 2018. GS expects accommodative financial conditions and strong domestic demand, as implied by purchasing manager surveys, to make 2019 a good year.

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

Business activity was extremely strong during 2018 but has weakened slightly in early 2019. There is a plethora of business activity indicators, but there are three which are national in scope. They are the ISM manufacturing index, the ISM non-manufacturing index, and the National Federation of Independent Businesses (NFIB) optimism index.

Values of the two ISM indices above (below) 50 indicate accelerating (decelerating) business activity. The NFIB index is scaled to 100. It is a measure of sentiment rather than a measure of whether business activity is accelerating or decelerating.

Since December 2017, the ISM manufacturing index has been strong. It was 59.3 in December 2017, 54.3 in December 2018, and 54.2 in February 2019. Similarly, the ISM non-manufacturing index has been very strong, rising from 56.0 in December 2017 to 58.0 in December 2018, peaking in September and October at the highest levels reached in the current business cycle. This index was still a robust 59.7 in February 2019.

Immediately following President Trump’s election in November 2016, the NFIB optimism index jumped and has spent most of the time since then at all-time high levels. It reached an all-time high of 108.8 in August 2018, easing since then to a still respectable 101.7 in February 2019.
If one only looked at these three headline indices, it would be straightforward to conclude that business activity has been and continues to be brisk on a sustained basis. However, each of these three indices is backed up by a wealth of additional information, including new orders, production, inventories, employment, wages, and materials costs. These subcomponents can be used to analyze trends in employment, inflation, and economic activity.

By examining trends in new orders, production, inventories and input costs, it is possible to get a sense of where business activity might be headed in coming months. For example, if businesses expect input costs to rise, they might accelerate production and build inventories to get ahead of anticipated higher costs. This boosts supply relative to demand and increases economic output. Because supply increasingly exceeds demand, excessive inventory levels accumulate and this results inevitably in a subsequent correction, which means lower economic activity, to bring supply back into alignment with demand.

During the third and fourth quarters of 2018 two phenomena combined to accelerate business activity. The first was optimism that demand would increase. This showed up in the data when the new orders sub-index exceeded the level of the production sub-index. Such a relationship is usually accompanied by a decline in the inventories sub-index. When this occurs, production activity ramps up to meet the higher level of orders and replenish inventories. Second quarter GDP data indicated that growth in inventories was depressed, as demand exceeded production. This prompted greater production during the third and fourth quarters and replenishment of inventories.

Eventually, production and inventories catch up with demand and business activity slows. Indeed, demand exceeded supply during much of 2018 according to Danielle Booth of Quill Intelligence.\textsuperscript{10} Booth forecast supply-driven catch-up in business activity in the third and fourth quarters, which will exhaust itself by the first quarter of 2019. Third and fourth quarter GDP data confirmed this expectation with inventory accumulation contributing 2.13 percent of the 3.16 percent annualized rate of growth in real GDP in the third quarter and 0.13 percent of the 2.58 percent annualized rate of growth in the fourth quarter. One of the collateral effects of stockpiling is elevated demand for temporary workers, which kept employment growth and hours worked very strong through the end of 2018. However, once catch up is achieved, temporary workers will no longer be needed and employment growth should slump. This could explain, at least in part, the disappointing slump in payroll growth to 20,000 in February 2019.

\textsuperscript{10} Booth, Danielle. “Artificial Supply Boosts Don’t Last,” Quill Intelligence, September 27, 2018 and “The Tail Wagging the U.S. Economy,” Quill Intelligence, October 4, 2018. (proprietary research available to the public at a fee)
While this logic of the cyclical ebb and flow of supply and demand imbalances is quite straightforward, it is not broadly recognized. Thus, the risk is that a sharp slowing in growth in early 2019 will occur. This could adversely affect confidence and reinforce the loss in economic momentum. Coupled with tighter financial conditions, which resulted from stock market weakness at the end of 2018, first quarter 2019 economic growth could be surprisingly weak. Indeed, this is exactly the scenario that appears to be playing out.

Second, tariffs injected a new dimension into the classic boom-bust oscillations of the business demand-supply activity cycle. Businesses, which source materials from China, increased orders to beat the rise in tariffs from 10 percent to 25 percent at the beginning of 2019. Not surprisingly, this had a negative effect on the U.S. trade deficit in December because it accelerated the timing and amount of imports.

However, this effect, in terms of measuring growth in real GDP, was offset by an increase in inventories (see Table 1). This is exactly what third and fourth quarter 2018 data revealed. The trade deficit burgeoned as inventories rose sharply. This process should reverse in the first and second quarters of 2019 as businesses work off excess inventories. In terms of GDP growth, much of the decline in inventory accumulation could be offset by a decrease in imports during the first and second quarters of 2019. But, the potential for weaker employment growth as production decelerates as inventories are worked off, would not be offset.

**Housing – Real residential investment** growth has been weak in recent quarters despite lean housing inventories, rising prices, and relatively strong demand. Growth was negative -0.23 percent in 2018, which followed modest growth of 3.34 percent in 2017. Housing investment growth has been decelerating since 2015. This evolving weakness in housing construction has contributed to a supply shortage and to above trend increases in housing prices, but higher home prices depressed demand with the consequence that housing price increases are decelerating. During the third and fourth quarters of 2018, this negative trend was strengthened by rising long-term interest rates. However, since late 2018, long-term interest rates have fallen and affordability has improved somewhat, lessening the negative impact on housing investment. Both GS (-1.59 percent) and B of A (-1.33 percent) forecast negative housing investment growth in 2019. However, GS is optimistic that housing investment will improve steadily during the year and reach an annualized growth rate of 4.0 percent by the fourth quarter.

Outsized housing price increases, which have exceeded growth in wages and nominal disposable income, have dampened single-family residential demand. Slowing employment and income growth during 2019 could adversely impact
residential investment growth in 2019, but lower interest rates could offset this impact.

Housing starts remain low relative to family formation rates. The long-term trend rate in housing starts should be about 1.4 million (household formation rose at an annual rate of 1.50 million in 2018 if the 20-quarter average number of household formations rose to 1.23 million in the fourth quarter of 2018) based upon growth in household formation and replacement of existing homes. Housing starts were 1.24 million in 2018 and are forecast to rise modestly to

Starts were 1.18 million in 2016, 1.21 million in 2017 and 1.24 million in 2018. Starts are forecast to rise only to 1.26 (B of A) to 1.27 (GS) million in 2019. Thus, housing investment is expected to continue its lackluster performance and to continue to fall short of the trend in new household formation.

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 fully. 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. Currently, labor shortages and higher materials costs are contributing to housing’s malaise.

Housing prices continue to rise faster than gains in disposable income. Prices are forecast to rise 4.4 percent (S&P CoreLogic Case-Shiller National Home Price Index) in 2018; the Federal Housing Finance Agency’s purchase only housing price index was up 5.7 percent in 2018. These increases compare to the 5.0 percent growth in aggregate nominal disposable income and 4.4 percent growth in per capita nominal disposable income during 2018. As 2019 commenced, housing price increases were decelerating and interest rates were lower. Both trends are favorable
for affordability and lend credibility to the forecast that housing investment will improve later on in 2019.

In summary, residential investment growth will continue to be weak in coming quarters because of continuing tight credit standards and high housing prices. Potential deceleration in employment and household income gains in coming months is a downside risk. Both B of A’s forecast decline of -1.3 percent and GS’s decline of -1.6 percent in housing investment growth in 2019 may prove to be optimistic if housing prices don’t decline and employment and income growth weakens.

5. Change in Inventories

Inventory accumulation contributions to quarterly real GDP growth are highly volatile and frequently subject to large adjustments. The average quarterly accumulation rate rose over the past 20 years from approximately $27 billion to $54 billion in the most recent quarter.

Initial inventory data are rough estimates and are subject to substantial revision over the next three years. 2018’s five-year revision resulted in substantial changes to inventory accumulation. The $97.1 billion inventory accumulation in the fourth quarter “Preliminary Estimate” will be revised four more times in the next three years and then again five years from now.

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

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.

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 in the impact of inventories on “Total GDP” growth is very small and the growth trends in “Total GDP” and “Final Sales” are similar.
During the third and fourth quarters of 2018 annualized inventory accumulation averaged $93.4 billion compared to the expected trend level over the same two quarters of $54.1 billion. This implies that a substantial reduction in inventory accumulation should be expected in the first and second quarters of 2019. However, things look a little less grim if one looks at all of 2018 rather than only the third and fourth quarters. Annual inventory accumulation in 2018 was $45.1 billion, which was lower than the 2018 trend level of $53.7 billion. Nevertheless, because it is the annualized change in quarterly inventory accumulation that impacts GDP estimates, any decrease in accumulation from the $97.1 billion recorded in the fourth quarter will negatively impact reported GDP growth. For example, the change in inventory accumulation from $30.3 billion in the first quarter of 2018 to a deaccumulation of -$36.8 billion in the second quarter, subtracted 1.17 percent from the second quarter 2018 estimate of real GDP growth. If inventory accumulation merely returns to trend in the first quarter of 2019, this would subtract about 80 basis points from the estimate of real GDP growth.

6. **Government Investment**

Thanks to federal tax cuts and spending increases, government investment grew 1.53 percent in 2018 (see Table 5). Federal government spending rose at an annual rate of 2.63 percent and state and local spending increased 0.86 percent.

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<td>GS State and Local</td>
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<td>GS Total</td>
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<td>B of A Total</td>
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**Bill’s Scenarios**

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<td>1.31</td>
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Table 5 shows recent growth rates in government spending and forecasts for 2019-2022. **GS** (1.9 percent) and **B of A** (1.8 percent) expect strong growth in government investment spending in 2019. The increase in growth from 2018 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 1.56 percent in 2019 and then slow after 2019, but not to as great an extent as GS is forecasting.

7. Net Exports

In the Preliminary Estimate for the fourth quarter of 2018 net exports subtracted 0.22 percent from fourth quarter real GDP. 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 relative to Private Domestic GDP growth.

Since the end of 2016 the trade deficit in goods and services has risen from 2.65 percent of nominal GDP to 2.97 percent in December 2018. Exports of goods as a share of GDP have risen slightly from 7.82 percent in December 2016 to 8.19 percent in December 2018. Imports of goods have risen from 11.84 percent to 12.56 percent of GDP. Both the negative differential between exports and imports and the greater percentage increase in the share of imports have contributed to a worsening trade deficit. A 3.5 percent decrease in the trade-weighted value of the dollar over this 24-month period contributed to the rising trade deficit by making exports more expensive and imports cheaper.

These trends should continue if the dollar weakens and consumer spending remains robust. Typically, this mix leads to stronger growth in imports and weaker growth in exports and a widening of the trade deficit. Growth in exports peaked in October 2018 and is now declining, reflecting slowing global growth. Growth in imports also peaked in October 2018. The developing deceleration in import growth may reflect the imposition of tariffs. Slowing growth in both exports and imports is moderating the upward pressure on the trade deficit in goods. Given all of these cross-cutting forces, the trade deficit is likely to change only marginally over the course of 2019.

In the longer run, trade trends could be impacted negatively by tariffs. The Trump Administration imposed tariffs on steel and aluminum imports and has implemented substantial tariffs on goods imported from China. Chinese tariffs may be reduced if the U.S. and China reach a trade agreement, something that most expect, but is not yet assured. Realization of threats to impose tariffs on automobiles and other goods is still possible but now seems less likely. Tariffs will reduce imports by shifting some demand to domestically-produced substitutes. Tariffs will also add to inflationary pressures by raising the prices of imported goods. Furthermore, if affected nations
adopt retaliatory tariffs on U.S. exports, as China has done, growth in exports should decline and might even become negative.

It is not clear that an all-out trade war would reduce the size of the U.S. trade deficit. What it would do, however, is to slow global trade and weigh on global economic activity. It is this potential that has worried the stock market from time to time in recent months. While most experts believe tariffs will have negative consequences for growth and inflation over the long run, short-run impacts are unclear. So, while investors are worried, there has not been much market impact.

There is a reason that the current accounts deficit, which includes the trade deficit, might rise over the next few quarters. Increases in the federal deficit must be funded by a combination of greater consumer or business saving or by increases in foreign capital inflows. Business cash flows customarily are negative in the mature phase of the economic cycle. The consumer saving rate has been relatively stable. 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 Òtwin deficits.Ó That term refers to the federal budget deficit and the current accounts deficit, of which the trade deficit is the primary component. While the relationship between the two deficits is not exact, an increase in the size of the federal budget deficit is typically followed several quarters later by an increase in the trade deficit.


B of A’s fourth quarter ÒFinal EstimateÓ real GDP forecast is 2.1 percent and GS’s is 2.3 percent compared the ÒPreliminary EstimateÓ of 2.6 percent. Shortfalls in consumer spending, investment and inventory accumulation are cited as reasons to expected reduce fourth quarter real GDP growth.

Downward revision in fourth quarter 2018 real GDP growth is not expected to change the 2.9 percent 2018 real GDP growth rate.

Both B of A and GS expect growth in the first quarter of 2019 to be a very weak. By and large, in coming data reports have been much weaker than expected. B of A’s most recent forecast update pegs first quarter growth at 1.4 percent. This is relatively bullish compared to GS’s estimate of just 0.4 percent. Both B of A and GS expect growth to reaccelerate during the remainder of 2019 and reach 2.2 percent for the year, which, while slower than 2018’s 2.9 percent pace, still would exceed the full-employment potential growth rate of approximately 1.8 to 2.0 percent.
9. **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 6 includes annual real GDP growth for 2015-18 and forecasts for 2019 to 2023. Forecasts for 2019 range from 2.2 percent (B of A and GS) to 2.8 percent (Economy.com). My scenario forecasts fall in the middle of the range.

All forecasters expect real GDP growth to slow considerably in 2020 after the impact of 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 6

**Real GDP Growth Forecasts**

(year-over-year average)

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<td>Actual</td>
<td>2.88</td>
<td>1.57</td>
<td>2.22</td>
<td>2.88</td>
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<tr>
<td>B of A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.23</td>
<td>1.87</td>
<td>1.79</td>
<td>1.73</td>
<td>1.70</td>
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<tr>
<td>GS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.31</td>
<td>2.10</td>
<td>1.82</td>
<td>1.67</td>
<td>1.69</td>
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<tr>
<td>IHS Markit</td>
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<td>2.00</td>
<td>1.70</td>
<td>1.60</td>
<td>1.40</td>
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<tr>
<td>Economy.com</td>
<td>2.80</td>
<td>0.80</td>
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<tr>
<td>Blue Chip Average</td>
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<td>1.80</td>
<td>1.80</td>
<td>1.90</td>
<td>2.10</td>
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<td>CBO</td>
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<td>2.69</td>
<td>1.89</td>
<td>1.59</td>
<td>1.60</td>
<td>1.68</td>
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<tr>
<td>FOMC High*</td>
<td>2.70</td>
<td>2.10</td>
<td>2.00</td>
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<tr>
<td>FOMC Low*</td>
<td>2.40</td>
<td>1.80</td>
<td>1.60</td>
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**Bill’s Scenarios**

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<td>BASE</td>
<td>2.47</td>
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<td>1.88</td>
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<td>STRONG GROWTH</td>
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<td>1.99</td>
<td>1.98</td>
<td>2.02</td>
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</table>

*Q4 to Q4 is sensitive to specific Q4 values and may diverge from year-over-year trend.
Because fiscal stimulus came at a time when the economy was already operating above full employment, monetary policy will be very challenged to engineer a soft landing. With the FOMC’s monetary policy pivot in January, it is certainly trying to achieve such an outcome. As a result, near-term recession risks have diminished but risks remain high over the next two years. My recession watch continues.

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. At this writing, monetary policy is not overly tight and oil prices are not high.

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 1.7 to 2.0 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 2019 and 2020.
V. U.S. Employment Developments

Payroll employment growth averaged 165,500 monthly in January and February compared to 2018’s monthly average of 223,250. This slowdown may stem from slowing economic activity and labor scarcity. Nonetheless, hiring remains brisk and continues to be above the natural increase in labor supply, which is growing about 100,000 monthly or perhaps as much as 130,000 on a short-run basis, if discouraged workers are returning to the labor force, as seems likely since the participation rate has been stronger than expected. Another indicator is that disability filings have dropped considerably.

Relentlessly, the labor market continues to tighten. The unemployment rate fell to a cyclical low of 3.68 percent in September and was only slightly higher at 3.82 percent in February. The unemployment rate over the past few months has been at the lowest level since December 1969. All agree that the unemployment rate is below the natural rate, which means that the labor market is tight. All also expect the unemployment rate to decline somewhat further in coming months.

1. Employment Growth

Chart 7 shows the four measures of employment growth – payroll employment, household employment, total hours worked, and the eligible labor force. The growth rate in the eligible labor force indicates the expected equilibrium rate of employment growth when the economy is at full employment. When growth in the various measures of employment exceeds growth in the eligible labor force, the unemployment rate declines and the labor market tightens. This is exactly what continues to happen currently.

As can be seen in Chart 7, the trend in the annual rate of quarterly growth in payroll employment slowed gradually from the cyclical peak of 2.27 percent in February 2015 to 1.39 percent in September 2017. However, since then payroll growth has accelerated as the economy picked up momentum. The annual growth rate was 1.91 percent in January but dropped to 1.69 percent in February. January may mark the near-term peak in payroll employment growth.

Household employment growth also had been decelerating gradually, averaging 212,417 in 2015, 176,000 in 2016, 149,000 in 2017, but accelerated to 199,500 in 2018. The annual growth bottomed at 1.20 percent in December 2017 but improved to 1.84 percent in December 2018. The annual household employment growth rate was 1.47 percent in February. 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. This pattern is evident on Chart 7. Also, it is evident in Chart 7 that payroll employment is less volatile than household
employment. That is because payroll employment is revised over time to include more detailed source data, while household employment is based on a one-time sample and is only revised for changes in seasonality patterns.

Growth in total hours worked by all employees had been slowing as well. But, like the other employment measures, growth bottomed in 1.13 percent in the fourth quarter of 2016 and has accelerated since then to 2.42 percent in the third quarter of 2018. This measure slowed to 2.00 percent in February 2019. Growth has been higher for this measure because the length of the workweek has risen from 34.38 hours to 34.48 hours over the past 2 years. This reflects an increase in the proportion of full-time workers relative to part-time workers and increased overtime. Both measures are indicative of a very tight labor market.

Growth in the eligible labor force in February was 1.24 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 0.17 percent annually over the next ten years.
As the labor market continues to tighten, however, it appears that nearly all 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 62.37 percent in September 2015 to 63.15 percent in February 2019 is evidence that most discouraged workers have reentered the labor market in the last three years as jobs became more abundant. If that were not the case, retirements would have driven the participation ratio down to about 61.79. This is a swing of approximately 2.21 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)](chart8)

Growth in the labor force is being amplified currently by people who normally would not be looking for work. Plentiful jobs and the chance to make a little extra money is probably luring some of these non-workers back into the labor force.

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

As can be seen in Chart 9, the U-3 unemployment rate has fallen to 3.82 percent and is now below the minimum levels reached prior to the Great Recession and the
low of 3.88 percent reached in October 2000 just prior to the 2001 recession. In fact, the average unemployment rate over the past ten months was 3.83%, which is the lowest since December 1969. The February U-3 unemployment rate was substantially below CBO’s full employment (NAIRU) estimate of 4.60 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 7.27 percent in February, and is now well below the pre-Great Recession low of 7.92 percent reached in December 2006. This measure is likely to continue falling and in coming months could challenge the October 2000 low of 6.80 percent. The U-6 measure of unemployment has fallen 263 basis points since the end of 2015 compared to a decline of 119 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 3.03 percent in February and is well below the minimum level of 3.78 percent reached prior to the Great Recession and the previous cycle low of 3.41 percent in September 2000. The long-term unemployment rate has declined from over 4 percent in the aftermath of the Great Recession to 0.78 percent in February and is closing in on the low of 0.71 percent reached in October 2006 just prior to the onset of the Great Recession. However, this measure historically has fallen even more during tight labor markets. The recent low was 0.42 percent in November 2000. These comparisons imply that there is still a little bit of room for further above potential growth in employment.

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

Forecasters expect the labor market to continue to tighten. The current U-3 unemployment rate is 78 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. While growth rates in both wages and inflation have edged up a bit, the increases are far smaller than what historical patterns imply should be the case. During 2018 FOMC crafted monetary policy to respond to the historical threat of higher inflation. However, it is increasingly evident that wage and inflation pressures
are considerably less in the current cycle. In the wake of stress in financial markets during the fourth quarter of 2018, the FOMC determined that further increases in interest rates were not necessary immediately to fight the threat of higher inflation. In fact, debate has emerged as to whether inflation is high enough.

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

Most forecasters project the unemployment rate will continue to fall during 2019 and 2020 to between 3.6 percent (GS) and 3.5 percent (B of A). After that most forecasters expect the unemployment rate will rise slowly but will remain below CBO’s NAIRU for an extended period. The FOMC’s projections for the unemployment rate are similar to those of other forecasters, falling to a range of 3.5 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 4.2 percent to 4.5 percent. San Francisco Federal Reserve Bank economists expect the unemployment rate to fall to 3.4 percent by the end of 2019 and then gradually rise to their estimate of the natural rate of 4.6 percent.

My unemployment rate forecast in the “BASE” scenario bottoms at 3.30 percent in the fourth quarter of 2019. This is below projections of B of A, GS and CBO and may result from the fact that I have not adjusted my estimate of unemployment for further gains in the participation rate.
Barring advent of a recession, the unemployment rate is expected to remain below CBO’s February 2019 natural unemployment rate estimates for several years. CBO forecasts that the unemployment rate will bottom at 3.49 percent in fourth 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 2020 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 by the end of 2020 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 before or 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 and another 10 basis points in its January 2019 update, bringing NAIRU down to 4.45 percent by 2029. 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. Although FOMC member projections of long-run NAIRU are not materially different from CBO’s projections, the FOMC now acknowledges that upward pressure on wages and inflation are considerably less than it previously believed and this has contributed to its decision to be patient in adjusting the federal funds rate. It is interesting that the market reached this conclusion more than a year before the FOMC did and it took a market riot in the fourth quarter to drive the point home to FOMC members.

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 4.35 percent and the median estimate from the Survey of Professional Forecasters is 4.50 percent compared to CBO’s February estimate of 4.60 percent. 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

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11 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.
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 – Hourly Wage Rate Growth – ECI, All Workers and Production and Nonsupervisory Workers**

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

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 wage growth in the all workers and production and nonsupervisory workers measures has lagged the ECI measure in recent quarters.

Although these measures are highly correlated over time, because compilation methodologies differ for each set, percentage changes over fixed time periods will not always be in sync. Currently, all three sets are exhibiting a similar level and trend of very gradual increases. Average hourly wages (12-month moving average) of all employees have edged up 2.99 percent annually over the past 12 months compared to 2.56 percent a year ago. Average hourly wages (12-month moving average) of production and nonsupervisory workers have risen a bit more to 3.02 percent annually in February compared to 2.35 percent a year ago. The third measure, ECI, reflects a similar pattern in wage growth, but the acceleration has been modest. ECI growth in wages and salaries accelerated from 2.61 percent in the fourth quarter of 2017 (4-quarter moving average) to 3.00 percent in the fourth 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 2.63 percent in February 2018 to 3.21 percent in February 2019 (see Chart 13). This outcome reflects an increase in the average length of the work week from 34.41 hours in February 2018 to 34.48 hours in February 2019.

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 2019 and remains at that level thereafter. However, it should be noted that GS’s wage tracker, which is a leading indicator of wage growth, is currently 3.4 percent. 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 3.66 percent by the end of 2020 but then gradually slows to 3.06 percent over the next several years.
Forecast wage growth for production and nonsupervisory workers in my "BASE" and "Strong Growth" scenarios track CBO's projections relatively closely in 2019 and 2020. My wage growth projections anticipate a short-lived spike in wage growth from 2019 to 2023; CBO projects a smaller spike from 2019 to 2021; B of A's and GS's projections include no spike and indicate that wage growth should flatten out soon. Wage growth in my "BASE" scenario peaks at 3.8 percent in 2022 and then begins to decelerate. After 2023 my "BASE" scenario 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.

My projected spike in wage growth in 2019 to 2022 probably overstates what will actually happen for a couple of reasons. First, my wage growth forecasts reflect a rapid runup in inflation to a much greater extent than anyone else is forecasting. My inflation forecasts simply reflect the historical pattern of response to a very strong and tight labor market, which continues unabated for several years. There is good reason to expect that inertia and structural changes in labor markets will limit upside wage pressures in the current cycle. Second, if inflation pressures do erupt to a greater degree than most expect, the FOMC could tighten monetary policy, but while
this after a few months would slow economic activity and wage and inflation pressures, it would increase the risk of recession.

**GS’s** wage tracker registered 3.4 percent in February, modestly above **GS’s** long-run expected 3.25 percent annual wage growth rate. **GS** assumes the unemployment rate bottoms at 3.6 percent by the end of 2019, which is historically very low compared to **CBO**’s projection of 4.6 percent for NAIRU at the end of 2019.

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

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

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

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

As can be seen in **Chart 14**, analysts, including myself, expect wage growth to accelerate and this acceleration was evident in 2018 and should continue over 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 view that NAIRU is 4.35 percent, the rate of growth in total hours worked, and the square of total hours worked to incorporate a possible nonlinear relationship between nominal wage rate growth and the strength of the labor market. The model also includes the other two standard Phillips Curve variables – nonfarm productivity and core PCE inflation.

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

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

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

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

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

Although my econometric model describes well the historical relationships between nominal wage rate growth and the economic variables in the Phillips Curve, over the past 16 months the model has overestimated the rate of increase in the nominal wage rate by an average of 70 basis points. The forecast error has averaged 4.4 standard deviations. This pattern has 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.
VI. Monetary Policy

Members of the FOMC met on March 19 and 20.

1. Divergent Views About Future Course of Monetary Policy

FOMC members updated economic projections at the March meeting. The March update confirmed expectations that the committee would not raise interest rates at this time, leaving the federal funds policy range between 2.25 and 2.50 percent. However, the FOMC’s rate projections were considered to be a dovish surprise because the median of member projections indicated no increases at all during 2019 and only one in 2020; moreover 7 of the 17 participants expect not to increase rates in 2020. The updated federal funds rate projections were in line with pre-meeting market federal funds futures, but since early March the market has reduced the expected federal funds rate for the end of 2021 from 2.16 percent to 1.76 percent. This means that the market currently expects two and a half rate cuts, rather than one rate increase over the next two years (see Table 11 and Chart 17).

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. This is especially apparent with the decisive easing of monetary policy since the FOMC’s December meeting. But, even as the FOMC has moved its rate projections in the direction of the market, the market’s expectations have ratcheted down.

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

2. Beige Book – Assessment of the Economy

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

According to the Federal Reserve’s March Beige Book, economic activity slowed a bit to a slight to moderate pace; somewhat worse than the January report; optimism generally
prevailed, but trade policy and the global slowdown were concerns; scarcity of skilled labor and upside pressure on input costs continued to be concerns, but wage pressures remained moderate.

Overall, ten banks of twelve banks reported slight to moderate growth. Philadelphia and St. Louis indicated flat growth.

Consumer spending was adversely impacted by severe winter weather, more expensive credit, and the partial government shutdown.

Manufacturing strengthened slightly, but concerns were voiced about weakening global demand, higher input costs, scarcity of skilled labor, and tariffs.

Employment grew ŕmodestlyûor ŕmoderatelyûin most districts. Labor markets are tight with widespread shortages, particularly in high-skill jobs, but increasingly in low-skill jobs. Shortages are slowing hiring. Wage growth was ŕmoderateûin most districts, which means that some pressures exist. Half the districts indicated that there is rising pressure for higher non-wage forms of compensation.

Price inflation was generally characterized as ŕmodestûor ŕmoderate.ûHigher input prices are putting some upside pressure on overall inflation, but the impact is limited by the difficulty companies are having on passing on cost increases. Tariffs are contributing to upside price pressures.

3. Economic Activity

In the March 20, 2019 FOMC statement, the committee downgraded its assessment of economic activity slightly, noting ŕthat the labor market remains strong but that economic activity has slowed from its solid rate in the fourth quarter.ûThe assessment of consumer and business spending was cautionary: ŕRecent indicators point to slower growth of household spending and business fixed investment in the first quarter.û

At the March FOMC meeting projections of real GDP growth were updated (see Table 7). Projected GDP growth was downgraded in 2019, but upgraded in 2021 from the December projections. FOMC members continue to expect long-term potential real GDP growth to be in a range of 1.8 to 2.0 percent.
Table 7
Economic Projections of Real GDP (Q4/Q4) by Federal Reserve Board
Members and Federal Reserve Bank Presidents, March 2019

<table>
<thead>
<tr>
<th>Real GDP %</th>
<th>Central Tendency</th>
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<td>Q4/Q4</td>
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<tr>
<td>Actual</td>
<td>1.88</td>
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<tr>
<td>Y/Y</td>
<td>1.57</td>
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<tr>
<td>2019</td>
<td>1.9 - 2.2</td>
</tr>
<tr>
<td>Mar</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>3.0 - 3.1</td>
</tr>
<tr>
<td>Dec</td>
<td>3.0 - 3.2</td>
</tr>
<tr>
<td>Sep</td>
<td>2.7 - 3.0</td>
</tr>
<tr>
<td>June</td>
<td>2.6 - 3.0</td>
</tr>
<tr>
<td>Mar</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>2.4 - 2.5</td>
</tr>
<tr>
<td>Dec</td>
<td>2.2 - 2.5</td>
</tr>
<tr>
<td>Sep</td>
<td>2.1 - 2.2</td>
</tr>
<tr>
<td>June</td>
<td>2.0 - 2.2</td>
</tr>
<tr>
<td>Mar</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>1.8 - 1.9</td>
</tr>
<tr>
<td>Dec</td>
<td>1.7 - 1.9</td>
</tr>
<tr>
<td>Sep</td>
<td>1.9 - 2.0</td>
</tr>
<tr>
<td>June</td>
<td>2.1 - 2.3</td>
</tr>
<tr>
<td>Mar</td>
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<tr>
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<td>2.3 - 2.5</td>
</tr>
<tr>
<td>Dec</td>
<td>2.2 - 2.6</td>
</tr>
<tr>
<td>Sep</td>
<td>2.4 - 2.7</td>
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<tr>
<td>June</td>
<td>2.3 - 2.7</td>
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<tr>
<td>Mar</td>
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<td>2.5 - 3.0</td>
</tr>
<tr>
<td>Dec</td>
<td>2.6 - 2.9</td>
</tr>
<tr>
<td>Sep</td>
<td>2.5 - 3.0</td>
</tr>
<tr>
<td>June</td>
<td>2.5 - 3.0</td>
</tr>
<tr>
<td>Mar</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>2.5 - 3.2</td>
</tr>
<tr>
<td>Dec</td>
<td>2.5 - 3.3</td>
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</table>

4. **Employment**

Most believe the labor market has exceeded the non-accelerating inflation rate of full employment (NAIRU). The U-3 unemployment rate in February was 3.82 percent, which was 0.78 percent below CBO’s estimate of NAIRU. The FOMC noted that "Payroll employment was little changed in February, but job gains have been solid, on average, in recent months, and the unemployment rate has remained low."
Table 8 shows FOMC unemployment rate projections. Participants increased their projections of the unemployment rate in 2019, 2020, and 2021 by about 0.1 percent compared to December’s projections. This might reflect stronger than expected employment participation. Members lowered their estimate of the long-run natural rate of unemployment to a range of 4.1 percent to 4.5 percent. The midpoint of this range, 4.3 percent, is below CBO’s 4.46 percent natural rate of unemployment by the end of 2029.
5. **Inflation**

In its March assessment of inflation, the **FOMC** noted that total inflation and market-based measures of inflation expectations were low: “On a 12-month basis, overall inflation has declined, largely as a result of lower energy prices; inflation for items other than food and energy remains near 2 percent.” The inflation expectations comment emphasized that “market-based measures of inflation compensation have remained low in recent months, and survey-based measures of longer-term inflation expectations are little changed.” The significance of these statements is that even though the labor market is very tight and economic activity is strong, the absence of upside pressures on inflation gives the **FOMC** room to be patient.

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

### Table 9

**Economic Projections of Inflation by Federal Reserve Board Members and Federal Reserve Bank Presidents, March 2019**

<table>
<thead>
<tr>
<th>PCE Inflation</th>
<th>Central Tendency</th>
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<tr>
<td></td>
<td>2016 1.75</td>
</tr>
<tr>
<td>PCE Total</td>
<td>Mar</td>
</tr>
<tr>
<td>2018 Dec</td>
<td>1.8 - 1.9</td>
</tr>
<tr>
<td>Sep</td>
<td>2.0 - 2.1</td>
</tr>
<tr>
<td>June</td>
<td>1.8 - 2.0</td>
</tr>
<tr>
<td>Mar</td>
<td>1.8 - 2.0</td>
</tr>
<tr>
<td>2017 Dec</td>
<td>1.6 - 1.7</td>
</tr>
<tr>
<td>Sep</td>
<td>1.5 - 1.6</td>
</tr>
<tr>
<td>June</td>
<td>1.6 - 1.7</td>
</tr>
<tr>
<td>Mar</td>
<td>1.8 - 2.0</td>
</tr>
<tr>
<td>2016 Dec</td>
<td>1.5</td>
</tr>
<tr>
<td>Sep</td>
<td>1.2 - 1.4</td>
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<tr>
<td>June</td>
<td>1.3 - 1.7</td>
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<tr>
<td>Mar</td>
<td>1.0 - 1.6</td>
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<tr>
<td>2015 Dec</td>
<td>1.2 - 1.7</td>
</tr>
<tr>
<td>Sep</td>
<td>1.5 - 1.8</td>
</tr>
<tr>
<td>June</td>
<td>1.6 - 1.9</td>
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<tr>
<td>Mar</td>
<td>1.7 - 1.9</td>
</tr>
<tr>
<td>2014 Dec</td>
<td>1.7 - 2.0</td>
</tr>
<tr>
<td>Sep</td>
<td>1.7 - 2.0</td>
</tr>
<tr>
<td>June</td>
<td>1.6 - 2.0</td>
</tr>
<tr>
<td>Mar</td>
<td>1.7 - 2.0</td>
</tr>
</tbody>
</table>
Table 9 shows FOMC projections for total and core PCE inflation. Members lowered the projected inflation range for 2019 by 0.1 percent. There were no changes in the projections for 2020 and 2021. Members expect inflation to deviate very little from the 2.0 percent long-term inflation target over the next three years.

6. Monetary Policy Statement

There were no changes in the FOMC’s March policy statement. It kept the range for the federal funds rate of 2.25 to 2.50 percent unchanged and reaffirmed its commitment to patience: "The Committee continues to view sustained expansion in economic activity, strong labor market conditions, and inflation near the Committee’s symmetric 2 percent objective as the most likely outcomes. In light of global and financial developments and muted inflation pressures, the Committee will be patient as it determines what future adjustments to the target range for the federal funds rate may be appropriate to support these outcomes."
7. **Balance Sheet Policy**

In effect, acknowledging the impact of its balance sheet management policy on market liquidity, the FOMC announced several changes at its March meeting, which are intended to provide greater certainty and lessen market liquidity pressures.

- Beginning in May, monthly sale of Treasury securities from the Federal Reserve’s portfolio will be reduced from $30 billion to $15 billion;
- Sales of Treasury securities will cease altogether in October;
- Tapering and then ending sales of Treasury securities is expected to reduce the Federal Reserve’s balance sheet by $43 billion to $3.76 trillion;
- Monthly principal redemptions in the Federal Reserve’s mortgage-backed securities portfolio will be reinvested in Treasury securities with a maturity structure comparable to that of outstanding Treasury debt;
- If monthly redemptions of mortgage-back securities exceed $20 billion, which is unlikely but possible if prepayments jump, the excess over this cap would be reinvested in mortgage-back securities rather than Treasury securities;
- When tapering is concluding in September, $1.22 trillion of the Federal Reserve’s balance sheet will be in bank reserves; as time passes, this amount will shrink.

These changes lessen the impact of the management of the Federal Reserve’s balance sheet on tightening market liquidity, but because bank reserves will decline over time a constant balance sheet will tighten market liquidity gradually.

8. **FOMC’s Examination of its Monetary Policy Framework**

In January the FOMC announced it is reviewing its monetary policy framework. This will be a subject of research and discussion over the next few meetings.

In particular, focus of this review will be on how to achieve the FOMC’s symmetric 2 percent inflation target, which is meant to be an average of 2 percent over the entire economic cycle. Monetary policy as currently structured has not been able to achieve this goal. Inflation has averaged approximately 1.70 percent over the cycle and inflation expectations currently about the same level.

Policy restructuring is likely to involve letting the economy run hot for longer before raising interest rates. The challenge for the FOMC will be to convince markets that when inflation rises above 2 percent during the hot phase of the cycle, it will be able to manage monetary policy to keep inflation from accelerating beyond a modest overshoot of the 2 percent symmetric objective. The goal will be to firmly anchor inflation expectations at 2 percent. This might be accomplished by adopting a simple rule that places a band around inflation of 1.5 to 2.5 percent. If inflation is anticipated
to exceed the top end of the band, the FOMC would be expected to tighten monetary policy aggressively and, correspondingly, if inflation falls below 1.5 percent, the FOMC would be expected to ease policy aggressively.

There is broad agreement among analysts that now is the best time to implement a policy shift while the economy is strong, but inflation remains well behaved.

In recent days market chatter has emerged that perhaps the FOMC will need to reduce the target federal funds rate range in the near future because inflation remains slightly below the 2 percent objection and upside pressures are limited. The federal funds futures rate for 2021 has declined 40 basis points to 1.76 percent. Generally, this kind of decline would be interpreted as signaling much slower growth and an impending need for the FOMC to cut rates to stimulate growth. However, it is also possible, given the developing discussion about the structure of monetary policy, that the market is signaling that the FOMC will need to cut rates to achieve its symmetric goal of 2 percent inflation.

It will be interesting to watch how the FOMC’s monetary policy structure review evolves.

9. Recession Predictive Power of the Yield Curve Slope

Historically, an inversion of the yield curve involving short-term interest rates moving above long-term interest rates has been a fairly reliable indicator signaling recession will commence in a few months. The yield curve has inverted prior to every recession; however, the inversion of the yield curve has not always been followed by recession.

On March 22nd, one measure of the yield curve spread, the 3-month ‒ 10-year Treasury spread (-2 basis points), was negative for the first time since 2008. However, another measure, the 2-year ‒ 10-year Treasury spread (+13 basis points), remained modestly positive. With the recent flattening of the yield curve, given the historical record, it is unsurprising that concern and commentary about imminent recession risks has been raised in many quarters.

Arguments have been voiced for why this time is different and why the flattening of the yield curve is unlikely to be a reliable indicator of a coming recession. The difficulty with economic forecasting is that the structure of the economy changes and the relationships among economic variables evolve over time, making historical patterns potentially unreliable. What this means is that the slope of the yield curve could still be a reliable predictor of recessions or it might not be. We won’t know for sure until after the fact.
There have been two threads to the recent debate. One thread involves which measure of yield curve slope is the best predictor of recession. The other thread deals with other factors that have impacted long-term interest rates, including the impact of monetary policy on the term premium and the decline in the long-term natural rate of interest. The thrust of the second thread is that the nominal long-term interest rate has been depressed abnormally and this alters the reliability of the yield curve slope measure as a predictor of recessions.

**Measurement.** Most have traditionally monitored the yield spread between the 10-year and 2-year Treasury notes. However, in a recent study, economists at the Federal Reserve Bank of San Francisco found that the best yield-curve predictor of recession is the spread between the 10-year Treasury note and the 3-month Treasury bill. The authors conclude that “… the recent evolutions of the yield curve suggests that recession risk might be rising, but the flattening yield curve provides no sign of an impending recession.” Bauer and Mertens offer two explanations in support of their conclusion: First, the evidence suggests that recession predictions based on the yield curve require an inversion; no matter which term spread is used to measure its shape, the yield curve is not yet inverted. Second, the most reliable summary measure of the shape of the yield curve, the ten-year – three-month spread, is nearly 1 percentage point away from an inversion. The recent low in this spread was 72 basis points on November 16th.

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

In summary, there are two key takeaways from the San Francisco Federal Reserve Bank study. First, a narrowing of the spread between the ten-year Treasury note and the 3-month bill rate increases recession risk, but a narrowing spread is not a reliable predictor of recession. Second, only an outright inversion of the yield spread is a reliable predictor of recession. It is this research finding which spoked financial markets on March 22nd when this yield curve spread inverted.

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In my econometric model, a +100 basis points 10-year ‒ 2-year yield spread increases real GDP growth by 12.1 basis points and a -100 basis points spread decreases real GDP growth by -8.8 basis points, with an average lag of 6 quarters. While this relationship is statistically significant, the negative impact on GDP of a declining yield curve spread is not particularly meaningful. In my interest-rate forecasts the 10-year ‒ 2-year spread does not invert and gradually grows more positive during 2019 and 2020. So, perhaps, as many argue, the recent modest inversion of the yield curve is a false recession signal.

**Factors Which Have Depressed Long-Term Interest Rates.** One theory is that quantitative easing in Japan and Europe has contributed to reducing the term premium on long-term interest rates below their natural level. The rationale is that in global financial markets investors will seek the highest risk-adjusted yield. If a yield of equivalent maturity and risk is lower in one country because of monetary policy, investors will move money to another country not similarly affected. This arbitrage activity will lower rates in the country not impacted or less impacted by monetary policy. For example, yields on 10-year German bunds are near zero, but U.S. 10-year Treasury yields are approximately 2.5 percent. If this argument has substance, then the yield on U.S. Treasuries would be higher than 2.5 percent absent the incentive to arbitrage German bunds and U.S. Treasuries.

Another theory is the flight to quality argument. Global concerns, particularly the economic slowdown in Europe and existential risks to the EU posed by Italy, have prompted investors to shift to safe assets, namely U.S. Treasury securities. This theory is supported by the observation that the flattening yield curve is due in part to long-term rates falling. Typically, curve inversions occur because short-term rates are rising faster than long-term rates. In fact, 10-year Treasury yields fell from 3.23 percent in early October to 2.44 percent on March 22nd, and the 10-year ‒ 2-year spread fell from 35 basis points to 13 basis points during that interval.

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

Will Denyer of GavekalResearch argues that “What really causes recession is interest rates being too high compared to the economy-wide return on invested capital. Specifically, when the cost of capital rises above the expected marginal rate of return on capital, recession soon follows.”\(^\text{13}\) For the time being the spread between the return on invested capital and the cost of capital remains firmly in positive territory. Denyer concludes that the yield curve, measured in this way, is not

yet signaling recession. Or, put differently, the Treasury yield curve spread is not the right one to watch in terms of recession risk.

Then there is the theory that the secular decline in the term premium has muddied the signaling power of the yield-curve spread. The decline in the term premium is linked to the secular decline in the neutral long-term rate of interest. Thus, it is argued, what matters is whether the current real rate of interest is below the neutral rate of interest. While the neutral real rate of interest is hard to measure, various estimates indicate that it is very low but rising as the U.S. economy strengthens. Correspondingly, now that the U.S. economy is slowing, the current real rate of interest may be declining. To the extent this is the case, it means that the FOMC should not raise the federal funds rate further. Indeed, the next rate move might be a decrease, which is what federal funds futures are signaling, regardless of the nominal measure of the yield-curve spread. This is a technical argument, which may or may not have merit. But, the research of Bauer and Mertens indicates that this technical explanation really doesn’t matter because the nominal 10-year ï 3-month Treasury spread historically has been the best and most reliable predictor of recession, but only once that spread becomes negative. Now that this spread has turned negative, perhaps the moment of truth has arrived.

**Recession Timing.** In summary, the collective weight of these theories and various yield curve measures suggest that recession risks are probably rising, but the advent of recession is far from certain. Perhaps easier monetary policy has arrived just in time to engineer a soft landing and extend the current economic expansion for several more quarters.

**VII. Inflation**

Historical PCE and core PCE data were revised by the Bureau of Economic Analysis in July 2018. The revised data are shown in Table 10A. The Bureau of Labor Statistics prepares and reports CPI data. These data have not been revised and are shown in Table 10B. Over the past 20 years, core CPI has averaged 30 basis points higher than core PCE. The FOMC’s 2.0 percent inflation target is linked to PCE. Thus, the equivalent CPI target is 2.3 percent.

Core PCE inflation was 1.94 percent in December (release of January’s inflation measure has been delayed by the partial government shutdown). Since this measure approximately equals the FOMC’s target, but the economy is operating above full potential and still has a great deal of forward momentum, the questions now are ones of how far above the 2.0 percent target actual inflation will go and how will the FOMC respond.
As can be seen in Table 10A (Chart 15 shows historical core PCE price index data and data from Table 10A in graphical form), forecasters, except CBO, expect the core PCE inflation index to be close to 2.0 percent at the end of 2019 with forecasts ranging between 1.9 and 2.1 percent. Over the longer run, most, including FOMC members, expect core PCE inflation to rise modestly above 2.0 percent but then settle back to that level as economic growth slows and the unemployment rate edges up.

Table 10A

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

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<thead>
<tr>
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<td>BASE</td>
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Table 10B

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

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<td>2.30</td>
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<td>2.40</td>
</tr>
<tr>
<td>Economy.com*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.10</td>
<td>2.20</td>
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<tr>
<td>Blue Chip Average*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.90</td>
<td>2.20</td>
<td>2.20</td>
<td>2.20</td>
<td>2.30</td>
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</tbody>
</table>

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

My econometric model indicates core PCE inflation will rise more than the estimates of others in 2019 and early 2020, but my estimates begin to soften in late 2020 and
fall below other forecasts in the years following 2020 (Chart 15). During 2019 the core PCE inflation forecast in the BASE scenario rises to 2.59 percent in September 2019. After that, however, my inflation forecasts fall in a choppy fashion, eventually reaching 2.19 percent by the end of 2020. Chart 16 shows core PCE inflation estimates for my BASE and Strong Growth scenarios from 2018 to 2028.

Core PCE projections shown in Charts 15 and 16 for 2019 and 2020 for my “BASE” scenario are those of B of A and not those of my econometric model. It is my sense that my inflation estimates in 2019 and 2020, which are based upon historical relationships, are too pessimistic because they do not accommodate the anchoring of inflation expectations which has occurred in recent years. What is of greater interest, perhaps, is that my estimates of inflation in years following 2021 fall well below the 2.0 percent level. This result is driven by slowing employment growth and a rising unemployment rate. The takeaway is that the FOMC will have a harder time than it currently expects in keeping inflation close to its 2 percent target.
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 above full employment. Core PCE inflation averaged 1.70 percent from 1998 to the present. It has only risen above that level during the mature phase of the cycle. There is little historical support for the view that inflation will remain at 2.0 percent when the economy slows. 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, weak productivity, and slowing population growth. When the economy cools, these trends will reassert themselves.

If the FOMC is really serious about structuring monetary policy to achieve an average inflation rate of 2.0 percent over the entire economic cycle, it has some heavy lifting to do. In the current cycle, which is mature, the core PCE inflation rate has yet to move convincingly above 2.0 percent. If the current cycle extends, the labor market tightens further, and economic activity continues to expand at a rate in excess of its full-employment potential, and, if the FOMC refrains from raising the federal funds rate, it might be successful in pushing up inflation expectations so that a 2.0 percent inflation average over the cycle is realized. Currently, the market for Treasury Inflation Protected Securities (TIPS) is projecting a long-term core PCE inflation rate of 1.70 percent (CPI equals 2.00 percent).
VIII. 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 December meeting to a range of 2.25 to 2.50 percent, but did not raise this rate further at its March meeting. Table 11 shows the forecast pathways for the federal funds rate expected by various analysts over the next several years. The FOMC’s median pathway and the market’s forward yield curve implied pathway are also shown in Table 11 for comparative purposes.

<table>
<thead>
<tr>
<th>Number of Federal Funds Rate Increases of 25 Basis Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOMC – median</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>B of A</td>
</tr>
<tr>
<td>GS</td>
</tr>
<tr>
<td>CBO</td>
</tr>
<tr>
<td>IHS Markit</td>
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<tr>
<td>Economy.com</td>
</tr>
<tr>
<td>Market Forecast</td>
</tr>
<tr>
<td>Bill’s BASE</td>
</tr>
<tr>
<td>Bill’s Strong Growth</td>
</tr>
</tbody>
</table>

*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 March Summary of Economic Projections (SEP), the median FOMC members’ view was one increase in the federal funds rate to 2.50 - 2.75 percent and that would not occur until sometime during 2020. Prior to the end of 2018, FOMC members projected that the equilibrium federal funds rate would be in a range of 3.00 - 3.25 percent. At that time, although the market disagreed, I felt this was reasonable because the strength of the labor market and the threat of higher inflation. Also, historically the real rate of interest has averaged about 1.50 percent over the cycle. Adding the real rate to the target rate of inflation of 2.00 percent implied that the equilibrium federal funds rate should be 3.50 percent.
Two things have become clearer in the past few months that prompted the FOMC to lower its equilibrium federal funds rate to 2.75 percent and eliminate rate increases from its 2019 projection. First, there is no evidence that inflation pressures are growing, even though the labor market has tightened further. Indeed, recent data suggest that there is a bit of downside risk to measured inflation during 2019. Second, the real rate of interest does not appear to be rising as the economy and the labor market strengthen. In fact, it seems to be stuck in a range of 0.50 – 0.75 percent, which translates into a nominal equilibrium federal funds rate of 2.50 – 2.75 percent. And, as the economy slows, there is downside risk to the real rate and, therefore, downside risk to the equilibrium federal funds rate. That seems to be the market’s conclusion and may explain the recent modest inversion in the yield curve. Importantly, such an outcome could occur without a recession.

Market participants collectively apparently reached this conclusion during 2018 and after the September FOMC meeting anxieties rose that tightening monetary policy would drive the U.S. economy into recession. Anxieties drove a nearly 20 percent decline in S&P 500 stock prices during the fourth quarter of 2018, culminating on Christmas Eve. This, of course, got the FOMC’s attention and prompted its pivot and monetary policy reset.

Financial conditions, which tightened significantly at the end of 2018, have eased since then and the threat of imminent recession has receded, although a higher than normal risk of recession in the next 18 months remains. Bond market participants, however, continue to believe that monetary policy may still be too tight. Federal funds rate futures agree that there will be no further increase in the federal funds rate during 2019 but project two 25 basis point rate declines by the end of 2020 in contrast to the FOMC’s one increase. In addition, the Treasury yield curve continues to flatten. The 10-year Treasury note – 3-month Treasury bill spread, which was 24 basis points on December 31, 2018 has fallen since then to -3 basis points on March 25, 2019. Research conducted by economists at the San Francisco Federal Reserve Bank, concluded that the risk of recession increases substantially when this yield spread turns negative. What the bond market is saying is that in spite of the FOMC’s pivot in monetary policy, it is likely that economic activity and GDP growth will slow significantly over the remainder of 2019, and to a much greater degree than embedded in consensus expectations and FOMC projections, and the risk of recession in 2020 is rising.

The average of 17 FOMC members’ projections for the end of 2019 fell 36 basis points from 2.85 percent in December to 2.49 percent in March, which is within but at the top end of the current policy range of 2.25 to 2.50 percent, validating the median expectation that there will be no further rate increases during 2019.
By the end of 2020, the median projection of the federal funds rate is 2.625 percent, down 50 basis points from December. The average moved down 40 basis points from 3.07 to 2.67 percent. By the end of 2021, the median projection of the federal funds rate is unchanged at 2.625 percent, indicating no rate increases during 2021, but the average creeps up 7 basis points to 2.74 percent.

With respect to the FOMC’s projection of the long-run equilibrium (natural rate) federal funds rate, the March median projection was 2.75 percent, which was the same as the December projection; however, the average fell four basis points from 2.84 percent to 2.80 percent; the central tendency range remained between 2.50 percent to 3.50 percent.

In the past, the FOMC’s Summary of Economic Projections has proved to be an unreliable guide to future monetary policy. For example, at the beginning of 2016 the FOMC median projected four increases in the federal funds rate during 2016. Only one occurred. The FOMC did deliver on the four projected rate increases during 2018. Going forward the question is whether the FOMC’s projection of no rate increases in 2019 and one rate increase in 2021 will turn out to be what occurs. The market is betting that rates will fall rather than increase over the next two years.

During 2018 there was a large divergence of opinion between professional forecasters and the market about the future course of the federal funds rate. GS and B of A expected four increases in 2019 compared to the FOMC’s three. GS and the FOMC now agree there will be no increases during 2019. B of A has also joined the crowd forecasting one more rate increase, but it expects that increase to occur in the fourth quarter of 2019. GS and B of A have also reduced their estimates of the long-term equilibrium level of the federal funds rate to 2.75 to 3.00 percent compared to 2.75 percent for the FOMC.

My federal funds rate forecast in my BASE scenario (assuming 4.35 percent NAIRU unemployment rate) projects that the federal funds rate will rise 125 basis points in 2019 to a range of 3.50 to 3.75 percent. That trajectory is considerably above that of all other forecasters, including the FOMC’s high end of the central tendency range. This larger than consensus increase is driven by my econometric model’s much higher forecast of inflation during 2019 which, in turn is caused by an exceptionally tight labor market. My model’s forecast also reflects the historical tendency of the FOMC to tighten policy more than a retrospective view indicates was probably necessary. Because inflation expectations are well anchored and because the FOMC has come around to the view that it does not need to tighten policy further, even though the economy is operating above its full potential level, it is unlikely that my model’s forecast will come to pass. So, my model’s projected path
for the federal funds rate indicates what might have been likely to happen had structural changes not occurred.

Just because my model’s forecasts of the federal funds rate are out of sync with the likely path in the near term does not imply that my model’s forecasts of the federal funds rate in future years are meaningless. The model indicates that the federal funds rate will drop sharply after 2020, as employment growth slows (50 percent) and inflationary pressures (50 percent) ebb, to about 2.25 percent by the end of 2022. This is below most analysts and FOMC projections but is still 50 basis points the market’s expectations embedded in federal funds futures.

**Chart 17 – Federal Funds Rate Forecasts**

![Chart 17](image)

Chart 17 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 iBASE scenario and the market forecast embedded in federal funds futures.

Over the past several years, FOMC members steadily reduced the median estimate of the long-term equilibrium level of the federal funds rate from 4.25 percent to 2.75. The central tendency range is currently 2.50 - 3.50 percent. Based upon my model, my sense is that the FOMC’s median projection for the federal funds long-term equilibrium rate is reasonable and consistent with its estimate of long-term real GDP growth of 1.8 to 2.0 percent, assuming that the real rate of interest, when the economy is at full employment and NAIRU is zero, is approximately .75 percent. In my iBASE scenario, the equilibrium level of the federal funds rate is 50 basis points
lower in a range of 2.00 to 2.25 percent, primarily because my econometric model projects inflation to be below 2.0 percent in the long run.

2. **Interest Rates – 10-Year Treasury Note Yield**

**Chart 18** shows forecasts for the 10-year Treasury note yield from 2018 to 2026. Over time analysts have reduced their forecasts for the ten-year yield. Partly this has been a mark-to-market exercise driven by the failure of this rate to rise much as economic activity accelerated. But the adjustments also have 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 as in the past when inflation was near 2.0 percent.

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 approximately 3.25 percent in the long run. But, this estimate does not take into account the likelihood that the long-term real rate of interest has declined. Other forecasters have made this adjustment. The long-term equilibrium rate is 2.80 percent for **GS** and 3.00 percent for **B of A**. However, **CBO**’s long-term projection is 3.75 percent and, similar to my model’s projections, does not appear to adjust for a persistent reduction in the real rate and in the term premium. If **CBO**’s outlook is wrong, this would have favorable implications for the long-term federal budget deficit, as interest payments would be considerably less than what is embedded in **CBO**’s current forecast.
My forecast for the 10-year yield in my BASE scenario, which is shown in Chart 18, rises in tandem with CBO’s projections over the next three years. But, GS and B of A expect only small increases from the recent level.

CBO’s forecast is interesting in that it rises faster and much farther than other forecasts. CBO’s estimate peaks at 3.75 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 CBO’s projections of short-term and long-term rates fall considerably.