CHAPTER 2: MACROECONOMIC OUTLOOK

- The *Report* provides a thorough assessment of the state of the economy and an analysis of the Administration's projected growth effects.
- The Administration anticipates three percent average annual growth for the next ten years with its agenda implemented, compared to a much more subdued 2.2 without its reforms.
- This *Response* chapter reviews alternative explanations to the common narratives about the slow economic recovery, and provides an encouraging assessment of America's short- and long-terms economic growth prospects.

OVERVIEW

From 2008-2016, inflation adjusted (real) GDP growth averaged only 1.3 percent compared to 2.9 percent from 1990-2007. The inflation rate slowed to a 1.5 percent average from 2008-2016, down from 2.3 percent from 1990-2007.[75] Slow growth and unusually low inflation have been described as the "new normal."

Supporters of this view argue that lower productivity growth and labor force participation rates are inevitable, and they believe tax and regulatory policies cannot improve the slump. Further, many of them point to a low headline unemployment rate and an output gap some estimate has closed to assert that the recently enacted *Tax Cut and Jobs Act* (TCJA) could cause the economy to "overheat" by overstimulating demand.

Conversely, the Majority members of the Committee contend that government policies artificially constrained economic potential after the 2008-2009 recession, and concur with CEA's

endorsement of "an agenda for returning the American economy to its full growth potential."[76]

The first section of this chapter explores factors that constrained the demand side of the economy, and the second section examines factors that constrained the supply side. The former discusses unusually low inflation rates and the latter below-average economic growth rates—suggesting that the U.S. economy has room to grow faster. The next section assesses recent economic developments, and the outlook for 2018 and beyond. The final section contains a summary, conclusions, and recommendations for policymakers going forward.

Because monetary policy plays an important role in affecting the economic outlook, the Committee holds an annual hearing with the Federal Reserve Chair. Therefore, the *Response* discusses monetary policy issues at greater length than the *Report.* The *Response* does not opine on the efficacy of the Fed's two percent inflation target but offers some alternative views for why inflation has chronically fallen short of the target and how this might affect the economic outlook.

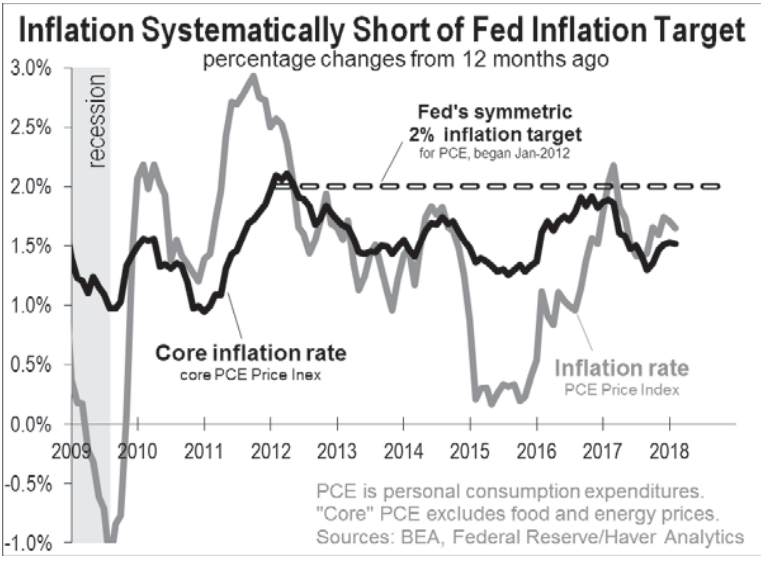
DEMAND-SIDE CONSTRAINTS

Since 2008, inflation has consistently undershot the Fed's two percent symmetric inflation target as Figure 2-1 shows. "Symmetric" signifies that two percent is an average and not a ceiling; thus the Fed will tolerate inflation above and below its two percent target. In what follows, it is important to distinguish between the Fed's inflation target and its Federal (fed) funds rate target. Changing the latter (an instrument) is a means to achieving the former (an objective).

As the *Report* notes, "Inflation is below or barely at target levels in most advanced economies, despite a decade's worth of accommodative, unconventional monetary policy measures."[77]

The *Report*[78] and Federal Reserve officials[79] find low inflation rates "puzzling," especially given the low unemployment rates. The "Phillips Curve" theory of price inflation posits that low unemployment rates drive up wages, which leads firms to raise prices to offset rising costs. The Committee Majority explores alternative explanations for below-target inflation. Notably, monetary policy may not have been as "accommodative" as commonly perceived.

Figure 2-1



Credit Policy, Not Monetary Policy

"Monetary policy easing" is conventionally characterized by Fed reductions in its interest rate target implemented by the purchase of short-term Treasury securities with newly-created bank reserves, colloquially known as "printing money." If banks lend more funds to consumers and businesses as a result, this will stimulate nominal spending (i.e., "aggregate demand"),[80] which can increase employment, output, and inflation in the short run, but only drives inflation higher in the long run.

While such an operation leaves the market and entities such as Government-sponsored entities (GSEs) (e.g., Fannie Mae and Freddie Mac) to determine where credit should be allocated, unconventional "credit easing policies" channel credit toward particular market segments and place financial assets other than the traditional short-term Treasury bills on the Fed's balance sheet.

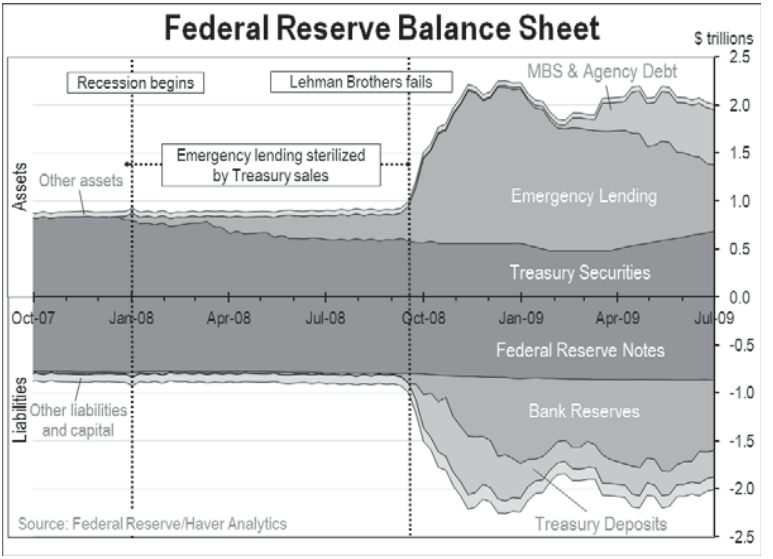
In September 2007, subprime mortgage market stress and concern over its implications for the economy compelled the Fed to lower its target for the fed funds rate—the short-term interest rate at which banks and a few other financial institutions lend funds overnight—from 5.25 percent to 4.75 percent.[81] The Fed further lowered its fed funds rate target at varying intervals and degrees until settling at two percent on April 30, 2008, where it remained until October 8, 2008. The Fed also embarked on "credit easing policy" when it introduced an emergency lending facility[82] designed to support private financial intermediation (i.e., borrowing and lending). Federal Reserve Bank of Richmond senior economist Robert Hetzel succinctly described the unusual credit policy:

> *Policies to stimulate aggregate demand by augmenting financial intermediation provided an extraordinary experiment with credit policy as opposed to monetary policy.*[83]

The Fed bought financial instruments from particular credit markets segments to direct liquidity toward them, which had the effect of injecting reserves into the banking system. This action alone would incidentally ease monetary conditions, but the Fed then sold Treasury securities from its portfolio to withdraw those reserves from the banking system (called "sterilization"), thereby restricting nominal spending growth. Figure 2-2 shows that before 2008, the Fed's balance sheet consisted predominantly of Treasury securities (generally of shorter maturities) and Federal Reserve

Notes (i.e., paper money), and that bank reserves were a miniscule part of the Fed's liabilities.

Figure 2-2



As Figure 2-2 shows, during the first three quarters of 2008 the composition of Fed assets changed such that emergency lending grew, while holdings of Treasury securities shrank, leaving the size of the Fed's balance sheet nearly unchanged.

Furthermore, despite the low level of the Fed's fed funds rate target, monetary policy arguably remained relatively tight, as monetary economist Scott Sumner notes in the context of a 2003 Ben Bernanke speech:

> *Bernanke (2003) was also skeptical of the claim that low interest rates represent easy money:*
>
> > *[Bernanke:] As emphasized by [Milton] Friedman… nominal interest rates are not good indicators of the stance of monetary policy…The real short-term interest rate…*

> *is also imperfect…Ultimately, it appears, one can check to see if an economy has a stable monetary background only by looking at macroeconomic indicators such as nominal GDP growth and inflation.*
>
> *Ironically, by this criterion, monetary policy during the 2008-13 was the tightest since Herbert Hoover was President.*[84]

A Subtle Change to Fed Policy Implementation

During the week of September 15, 2008, investment bank Lehman Brothers failed, followed by a subsequent run on money market mutual funds.[85] The Fed's emergency lending spiked with a corresponding injection of reserves (Figure 2-3), for which the Fed was unwilling to sell more of its Treasury security portfolio to sterilize.

At the Fed's behest, the Treasury Department sold "special treasury bills" to the public and deposited the proceeds with the Fed.[86] As purchase of the treasury bills would require buyers to transfer funds from their banks to the Treasury Department, this drained reserves from the banking system. The Treasury Department, by depositing the proceeds with the Fed, was effectively removing dollars from circulation, sterilizing the Fed's burgeoning emergency lending programs and helping to keep the fed funds rate from trading below the Fed's target. The Fed was attempting to keep interest rates from falling out of greater concern for inflation rising than for the deteriorating economic outlook.[87]

Despite these efforts the fed funds rate still fell below the Fed's target. The Treasury Department, approaching the debt ceiling, grew reluctant to increase its deposits with the Fed. This prompted the Fed to ask Congress for authority[88] to pay interest on excess

reserves (IOER)[89] to incentivize banks to deposit reserves at the Fed and prevent the fed funds rate from falling below the Fed's target (see Appendix 2-1 for the original impetus behind IOER).

As then Federal Reserve Chairman Ben Bernanke wrote in his memoirs:

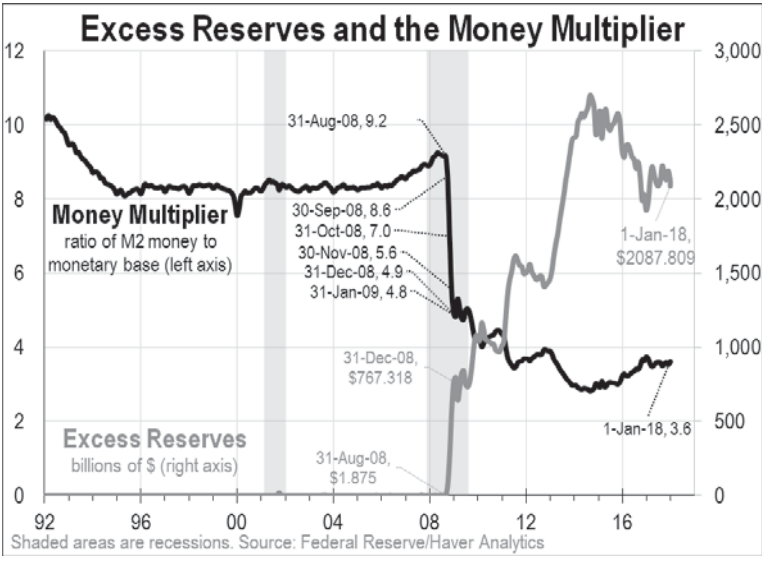
> *When banks have lots of reserves, they have less need to borrow from each other, which pushes down the interest rate on that borrowing—the federal funds rate.*
>
> *Until this point we had been selling Treasury securities we owned to offset the effect of our [emergency] lending on reserves (the process called sterilization). But as our lending increased, that stopgap response would at some point no longer be possible because we would run out of Treasuries to sell. At that point, without legislative action, we would be forced to either limit the size of our interventions… or lose the ability to control the federal funds rate, the main instrument of monetary policy… [By] setting the interest rate we paid on reserves high enough, we could prevent the federal funds rate from falling too low, no matter how much [emergency] lending we did.*[90]

Thus, by paying IOER at rates above the fed funds rate, the Federal Reserve could expand its balance sheet size to ease credit conditions for selected market segments. At the same time, it could keep broader monetary conditions from easing by encouraging banks to hold newly created funds as excess reserves through the payment of IOER.

Why Emergency Lending Programs and "Quantitative Easing" Were Not Inflationary

To help overcome the recession and the ensuing weak recovery, the Fed undertook three large-scale asset purchase (LSAP) programs, more commonly known as "quantitative easing" or "QE," between November 2008 and October 2014, which involved the Fed purchasing longer-term Treasury securities and GSE-issued mortgage-backed securities (MBS) rather than its normal purchases of short-term Treasury securities.[91] This led to a substantial increases in bank reserves, which is shown in Figure 2-3, along with the "money multiplier." The latter measures how increases in reserves and currency by the Fed multiply into broader forms of money (e.g., checking and savings accounts), which propel nominal spending.

Figure 2-3

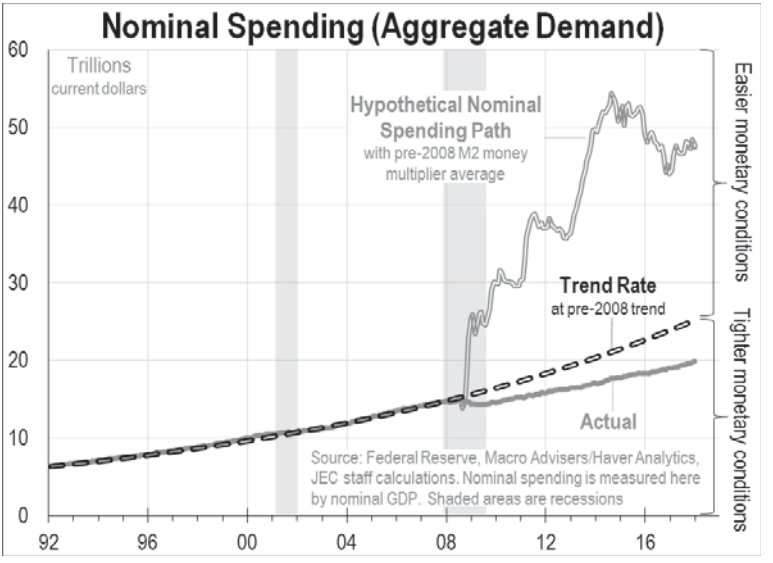


Had the money multiplier remained equal to its pre-recession level, then given the Fed's increases in reserves from its LSAPs, nominal spending would have been nearly $50 trillion at the end

of 2017 instead of just under $20 trillion, and most certainly would have been inflationary. However, LSAPs did not even result in nominal spending returning to its pre-2008 trend, as shown in Figure 2-4.

Given that inflation remained below the Fed's two percent inflation target, monetary conditions have been relatively tight compared to the period preceding the 2008-2009 recession when measured by outcomes rather than instruments (the low fed funds rate target and an enlarged balance sheet).

Figure 2-4



The Fed was clear from the outset that it would undo its LSAPs eventually[92] (i.e., remove from circulation the money it created in the future). The temporary nature of the policy discouraged banks from issuing more long-term loans. Alternatively, as economist Tim Duy pointed out during the inception of the Fed's first LSAP program:

> *Pay close attention to Bernanke's insistence that the Fed's liquidity programs are intended to be unwound. If policymakers truly intend a policy of quantitative easing to boost inflation expectations, these are exactly the wrong words to say. Any successful policy of quantitative easing would depend upon a credible commitment to a permanent increase in the money supply. Bernanke is making the opposite commitment—a commitment to contract the money supply in the future.*[93]

Sumner (2010),[94] Beckworth (2017),[95] and Krugman (2018)[96] observe similar issues.

Furthermore as Sumner (2010),[97] Feldstein (2013),[98] Beckworth (2017),[99] Selgin (2017),[100] and Ireland (2018)[101] note, payment of IOER at rates competitive with market rates led banks to hoard the reserve, which contributed at least partially to the collapse of the money multiplier (Figure 2-3).

Regarding IOER, former Federal Reserve Vice Chairman Alan Blinder advised in 2012:

> *I've been urging on the Fed for more than two years: Lower the interest rate paid on excess reserves. The basic idea is simple. If the Fed reduces the reward for holding excess reserves, banks will hold less of them—which means they will have to find something else to do with the money, such as lending it out or putting it in the capital markets.*[102]

He later observed in 2013:

> *If the Fed charged banks rather than paid them, wouldn't bankers shun excess reserves? Yes, and that's precisely the point. Excess reserves sitting idle in banks' accounts at the Fed do nothing to boost the economy. We want banks to use the money.*[103]

In the same article, he elaborated:

> *The financial crisis short-circuited this process. As greed gave way to fear, bankers decided to store trillions of dollars safely at the Fed rather than lend them out. High-powered money [reserves and currency] became powerless money.*
>
> *The Fed compounded the problem in October 2008 by starting to pay interest on reserves. And these days, the 25-basis-point IOER looks pretty good compared with most short-term money rates. If banks were charged rather than paid 25 basis points, they would find holding excess reserves a lot less attractive. As some of this excess central-bank money became 'high-powered' [i.e., propelled nominal spending growth through the money multiplier] again, the Fed would want less of it. So its balance sheet could shrink.*

The payment of IOER and the transitory nature of LSAPs acting to neutralize the monetary policy transmission mechanism explains, at least partially, the consistent undershooting of the Fed's two percent inflation target. The Fed was effectively pushing the gas pedal and the brake pedal at the same time.

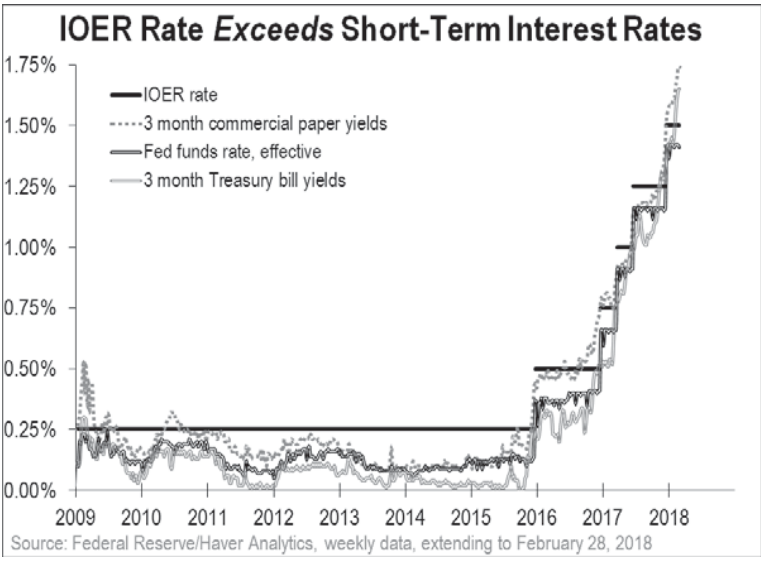
Legislative Issues Related to IOER

The law specifies that IOER be paid at "rates *not* to exceed the general level of short-term interest rates."[104] However, from 2009-2017, the IOER rate exceeded the effective fed funds rate 100 percent of the time, the yield on the 3-month Treasury bills 97.2 percent of the time, and the yield on 3-month nonfinancial commercial paper 82.1 percent of the time (Figure 2-5). The Fed is including its own discount rate (the primary credit rate) in the general level of short-term interest rates to demonstrate compliance with the law.[105]

In connection to IOER, Representative Jeb Hensarling, Chairman of the House Financial Services Committee, stated:

> *[It] is critical that the Fed stays in their lane. Interest on reserves – especially excess reserves – is not only fueling a much more improvisational monetary policy, but it has fueled a distortionary balance sheet that has clearly allowed the Fed into credit allocation policy where it does not have business.*
>
> *Credit policies are the purview of Congress, not the Fed. When Congress granted the Fed the power to pay interest on reserves, it was never contemplated or articulated that IOER might be used to supplant FOMC. If the Fed continues to do so, I fear its independence could be eroded.*[106]

Figure 2-5



Views Cautioning on Use of Unconventional Monetary Tools

Noting that the large quantity of reserves produced by the Fed contributed to the fed funds rate trading at or below the IOER rate, John Taylor of Stanford University's Hoover Institution said:

> *[W]e would be better off with a corridor or band with a lower interest rate on deposits [IOER] at the bottom of the band, a higher interest rate on borrowing from the Fed [the discount rate] at the top of the band, and most important, a market-determined interest rate above the floor and below the ceiling… We want to create a connect, not a disconnect, between the interest rate that the Fed sets and the amount of reserves or the amount of money that's in the system. Because the Fed is responsible for the reserves and money, that connection is important. Without that connection,*

> *you raise the chances of the Fed being a multipurpose institution.*[107]

The preceding observations and alternative views merit consideration. In particular, Hetzel (2009) states:

> *Restrictive monetary policy rather than the deleveraging in financial markets that had begun in August 2007 offers a more direct explanation of the intensification of the recession that began in the summer of 2008.*[108]

Furthermore, the Fed's new operating procedures (a large balance sheet and IOER) may not be conducive to maintaining full employment and price stability, as Taylor (2009) noted:

> *[P]aying interest on excess reserves gives the Fed an additional tool. However, this tool enables the Fed to be more like a discretionary multipurpose institution rather than the rule-like limited purpose institution that has delivered good policy in the past and that can deliver good policy in the future.*[109]

Also, future Fed policy may be constrained in some ways by past policy actions, which may not be conducive toward maintaining full employment and price stability. As Bill Nelson, former deputy director of the Federal Reserve Board's Division of Monetary Affairs and an attendee of FOMC meetings, noted of the Fed's internal debate over its third LSAP program:

> *It is worth keeping in mind that the Fed didn't make an explicit decision to keep its balance sheet so large for so long because doing so would support efficient monetary policy [e.g., the one that maintains full employment and price stability].*

> *Instead, the Fed fell into its current situation because the original plan to drain excess reserves and sell assets became untenable once people realised selling such a large portfolio so quickly would generate large losses.*[110]

SUPPLY-SIDE CONSTRAINTS

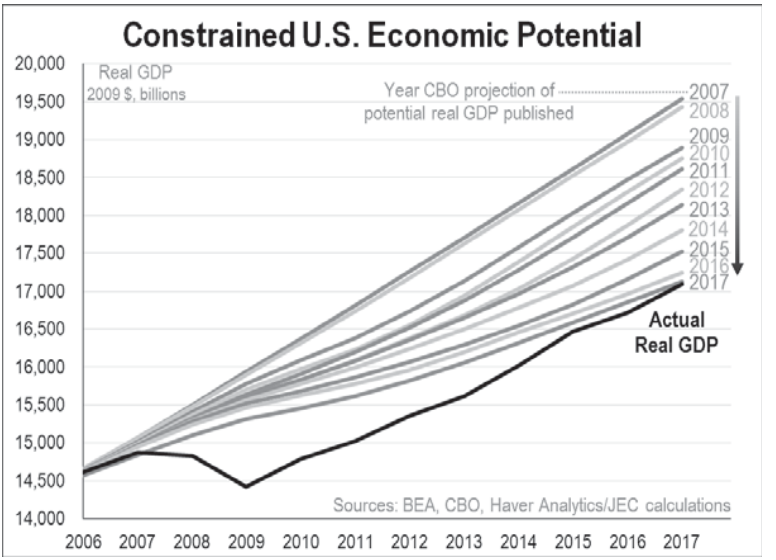
Reasons for the U.S. Economy's Sluggish Growth

Larry Summers, former National Economic Council Chairman during the Obama Administration, succinctly described the economy's performance since the 2008-2009 recession:

> *[E]ssentially all of the convergence between the economy's level of output and its potential has been achieved not through the economy's growth, but through downward revisions in its potential.*[111]

Figure 2-6 shows how real GDP has performed relative to projections of potential real GDP over time. In August 2007, CBO projected that potential real GDP—the maximum sustainable level of output an economy can produce—would be nearly $2.6 trillion more than it actually was by 2017's end.

Figure 2-6



The severity of the 2008-2009 recession has been offered as an excuse for the U.S. economy's failure to recover. However, as Chapter 1 of this *Response* and the *Report* points out, this claim does not square with experience.[112]

Research by Nobel laureate economist Milton Friedman concluded that the more severe an economic contraction was, the sharper the recovery would be (Friedman 1988).[113] Economists Robert Barro and Tao Jin examined 185 distinct macroeconomic crises (including ones associated with severe financial crises, such as during the Great Depression).[114] Barro succinctly summarized their findings in a 2016 *Wall Street Journal* op-ed:

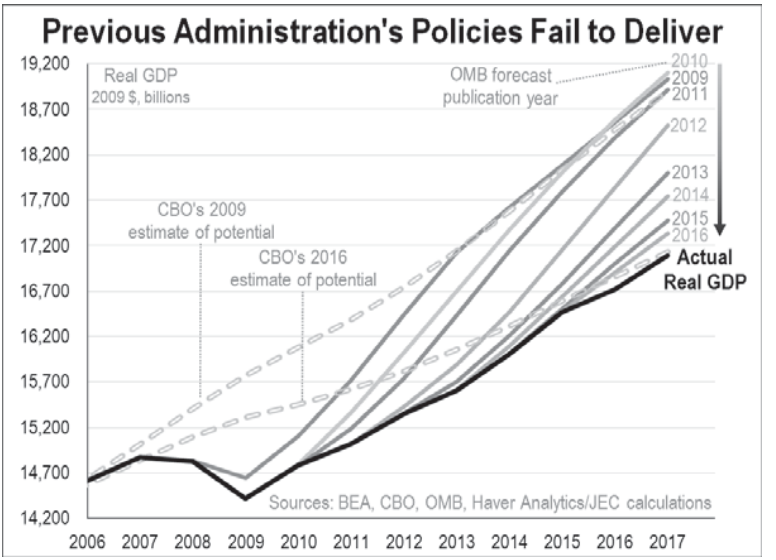
> *On average, during a recovery, an economy recoups about half the GDP lost during the downturn. The recovery is typically quick, with an average duration around two years. For example, a 4% decline in per capita GDP during a contraction predicts subsequent recovery of 2%,*

> *implying 1% per year higher growth than normal during the recovery. Hence, the growth rate of U.S. per capita GDP from 2009 to 2011 should have been around 3% per year, rather than the 1.5% that materialized.*
>
> *Arguing that the recovery has been weak because the downturn was severe or coincided with a major financial crisis conflicts with the evidence, which shows that a larger decline predicts a stronger recovery. Moreover, many of the biggest downturns featured financial crises. For example, the U.S. per capita GDP growth rate from 1933-40 was 6.5% per year, the highest of any peacetime interval of several years, despite the 1937 recession. This strong recovery followed the cumulative decline in the level of per capita GDP by around 29% from 1929-33 during the Great Depression.*[115]

In the post-World War II era, the second most severe U.S. recession was the double-dip recession of 1980 and 1981-82, in which the unemployment rate reached a record high of 10.8 percent. The Reagan Administration's response was to streamline regulation, reform the tax code, and advocate sound monetary policy. In the four quarters after the recession's trough in the fourth quarter of 1982, real GDP growth registered annualized growth rates of 5.3, 9.4, 8.1, and 8.5 percent.[116]

President Obama's Office of Management and Budget (OMB) initially also expected a strong recovery from the recession (Figure 2-7), consistent with the empirical research cited above. But a robust recovery never materialized, and its expectations were gradually revised downward.

Figure 2-7



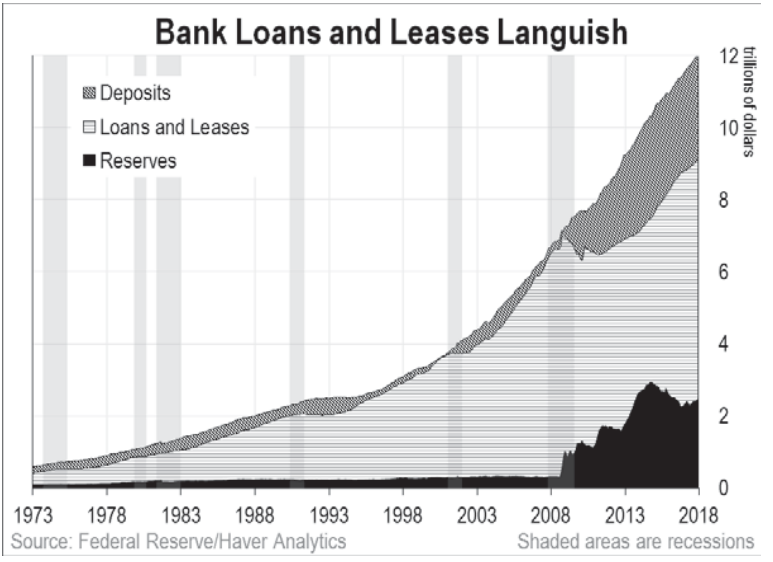
The subsequent sections show that abrupt breaks from trend occurred in key determinants of economic growth such as labor force participation rates, capital investment, and labor productivity. This suggest a failure of policy to promote recovery.

"Quantitative Easing" Increased the Government's Footprint in Capital Allocation

Prior to 2008, nearly every dollar of deposits translated into a dollar of private bank loans and leases. Although lending did rebound in 2008's aftermath, a sizeable portion of bank deposits remained in reserve at the Fed as shown in Figure 2-8. As these reserves emerged from the large-scale Fed purchases of Treasury securities and GSE-issued MBS, the Fed became responsible for allocating a more sizeable portion of private savings (as measured by deposits banks accepted from their customers). Private banks have an incentive to allocate savings to their most productive uses. The shift in responsibility for this allocation toward the less

efficient Government sector may have led to reduced economic potential[117] as well as financial imbalances (i.e. asset price bubbles).[118]

Figure 2-8



Workforce Participation Adversely Affecting Employment

CBO's January 2007 projection of potential real GDP for 2007-2017 had accounted for the aging of the population. CBO reported that the average growth rate of the potential labor force would slow from its 2002-2006 average of 1.1 percent growth per year to 0.8 percent for 2007-2012 and 0.5 percent for 2013-2017.[119] Thus, an aging population does not explain CBO's continual downward adjustment of potential GDP since that was foreseeable in 2007.

Figure 2-9 illustrates that the decline in labor force participation rates was substantially more than what the Bureau of Labor Statistics (BLS) had anticipated.[120] Furthermore, a notable decline occurred among the prime working-age population (those ages 25 to 54).

Figure 2-9

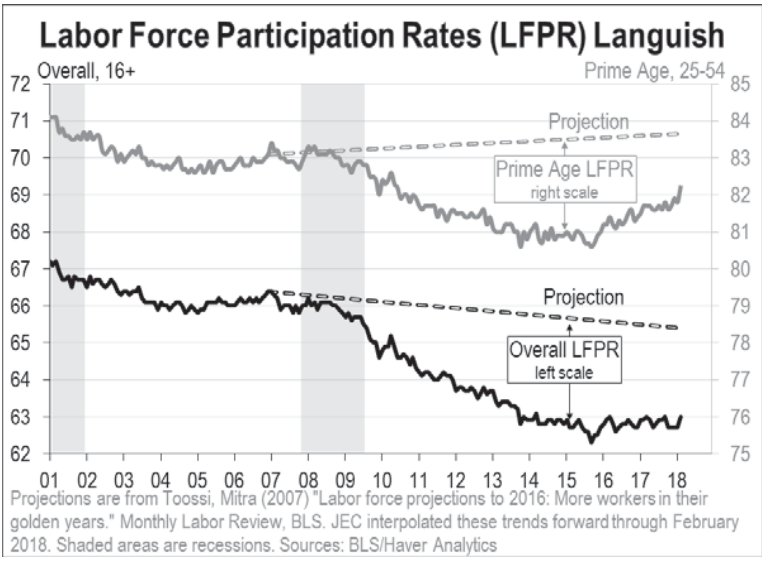
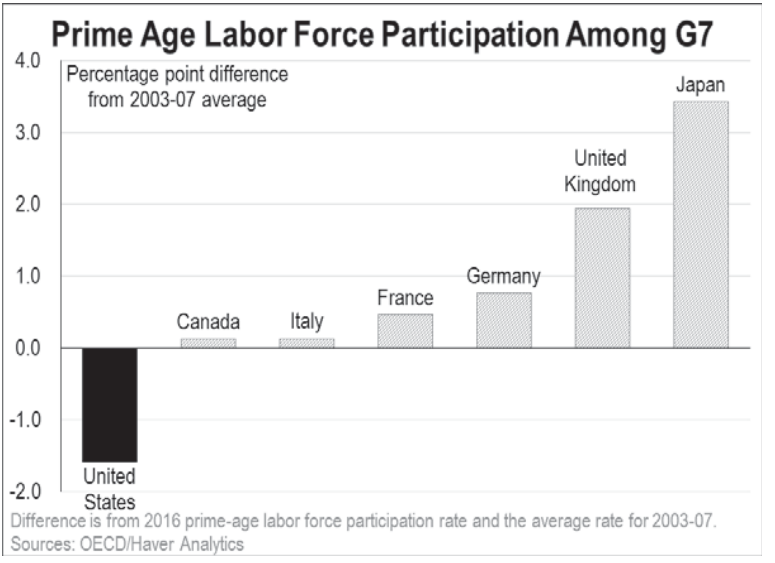


Figure 2-10

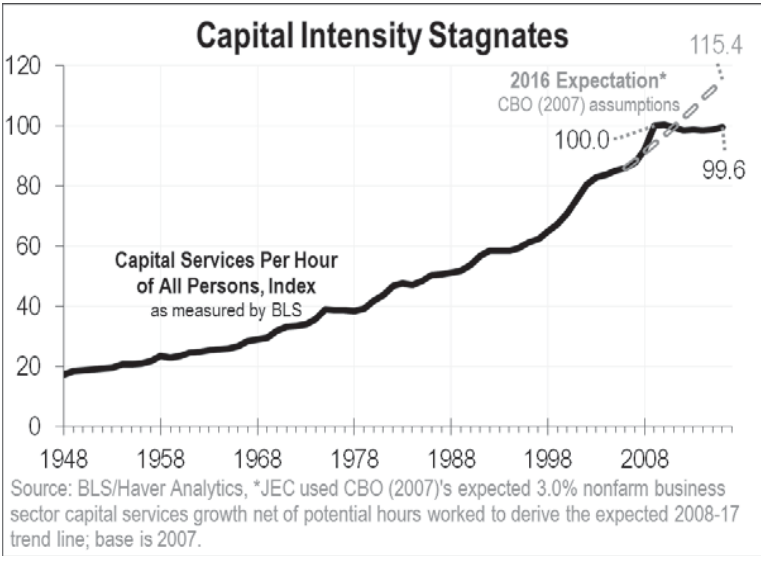


Additionally, the United States was alone in experiencing a decline in prime-age labor force participation rates among the G7 member nations, as Figure 2-10 shows.

Capital Investment Stagnation and the Decline of the Natural Rate of Interest

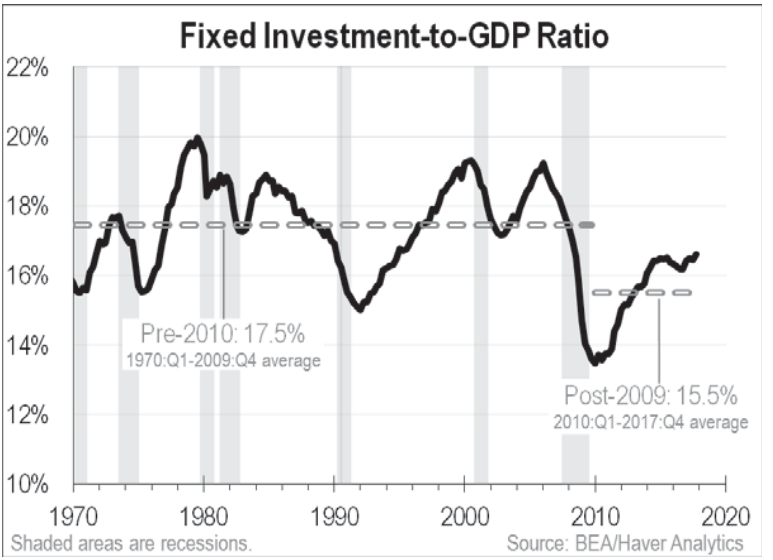
Capital intensity, also known as "capital deepening," measures the quantity of tools, equipment, and machinery available per hour of labor worked. As of 2016, it was over 15 percent lower than what CBO had projected in 2007 (Figure 2-11). It also indicates that workers have slightly less capital at their disposal in 2017 than they did in 2009. Capital deepening has been the worst in the series' history, which extends back to 1948.

Figure 2-11



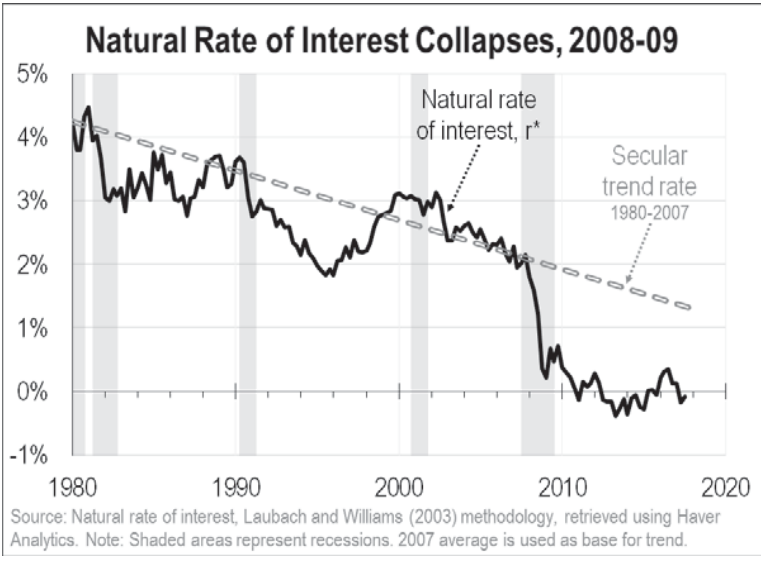
The reduction of capital intensity corresponds with a sharp decline in business capital investment in proportion to GDP after the 2008-2009 recession. Figure 2-12 shows private-sector fixed investment ("fixed" investment excludes changes in business inventories).

Figure 2-12



The reduction in business investment contributed to a reduced "demand for loanable funds" to finance capital accumulation, and a lower natural rate of interest (i.e., the rate consistent with a closed output gap, full employment, and stable prices). A frequently cited methodology for estimating the natural rate of interest by Laubach and Williams (2003)[121] shows a downward trend for some time, which has been interpreted as secular stagnation, beginning to set in well before the recession. However, a sharp break occurred during the 2008-2009 recession as Figure 2-13 illustrates, and its failure to revert to trend implies a cause other than long-developing "secular stagnation."

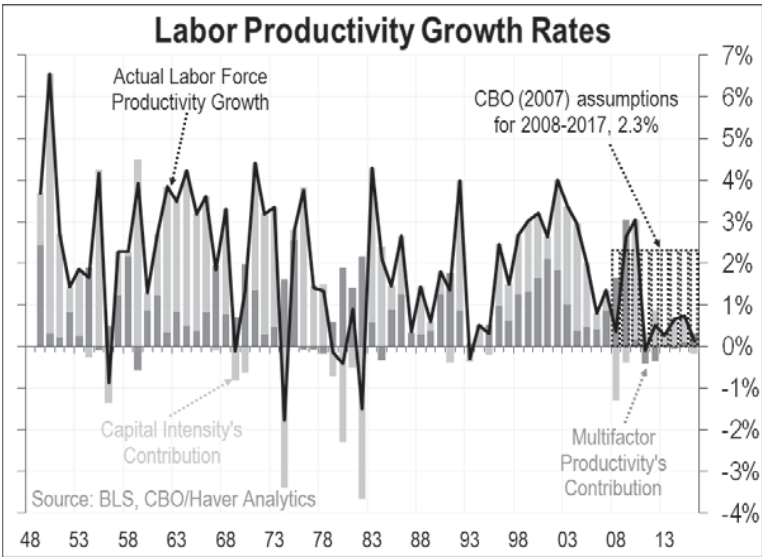
Figure 2-13



Meager Productivity Growth

Between 1994-2004 labor productivity growth averaged 2.6 percent per year. From 2005-2008 its average fell to 1.3 percent and remained low. The slowdown in labor productivity since 2004 might suggest that a "new normal" had begun years before the 2008-2009 recession (Figure 2-14).

Figure 2-14



However, research by Guvenen et al (2017)[122] finds profit shifting by firms—a consequence of the U.S. business tax system becoming increasingly less competitive internationally as discussed in Chapter 3—caused measurement issues for labor productivity growth. Adjusting for the mismeasurement, they find that labor productivity growth averaged 2.7, 1.6, and 1.3 percent in the 1994-2004, 2005-2008, and 2009-2017 periods, compared with unadjusted values of 2.6, 1.3, and 1.3 percent, respectively (top three rows of Table 2-1).

Accounting for the mismeasurement reveals a break in the average between the 2005-2008 and 2009-2017 periods. Furthermore, when the volatile values during the recession from 2008 to 2010 are excluded, an even sharper break in labor productivity growth appears, namely from an unadjusted 0.8 between 2005-2008 and 2009-2017 to an adjusted 1.1 percentage point decline (bottom three rows of Table 2-1). Such an abrupt break suggests policy

choices after the 2008-2009 recession kept the U.S. economy from recovering its full potential.

Table 2-1

	A	B	C	D	E
1	Period	1994-2004	2005-2008	2009-2017	Break between C and D
2	As Reported	2.6%	1.3%	1.3%	-0.1%
3	**Adjusted**	**2.7%**	**1.6%**	**1.3%**	**-0.3%**
4	Period	1994-2004 (ex. 2001, 2002)	2005-2008 (ex. 2008)	2009-2017 (ex. 2009, 2010)	Break between C and D
5	As Reported	2.5%	1.5%	0.7%	-0.8%
6	**Adjusted**	**2.6%**	**1.8%**	**0.7%**	**-1.1%**

Figures may not sum due to rounding.

Figure 2-15

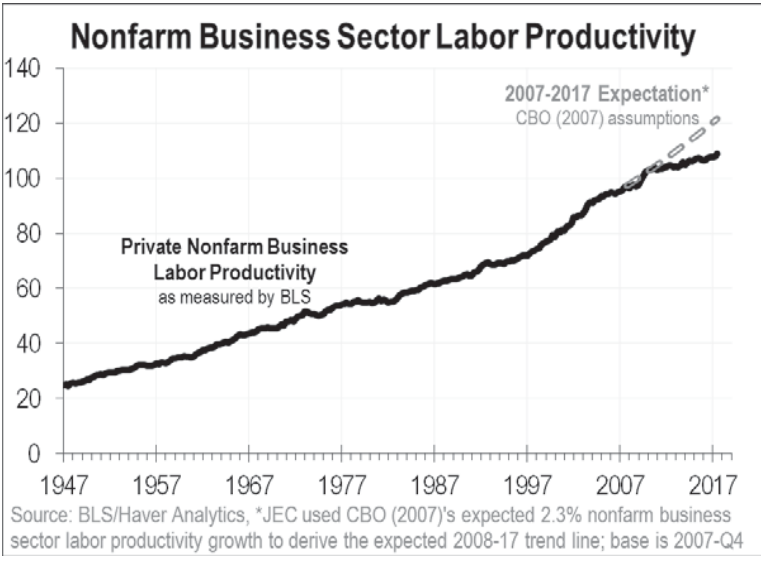


Figure 2-15 illustrates that that an abrupt break occurred in labor productivity growth after the 2008-2009 recession, leading to a nearly 15 percent shortfall below the 2007 CBO projections for 2017. As in the case of the aforementioned break in the natural rate of interest, the break in the productivity trend was not reversed.

Significance of Supply-Side Constraints

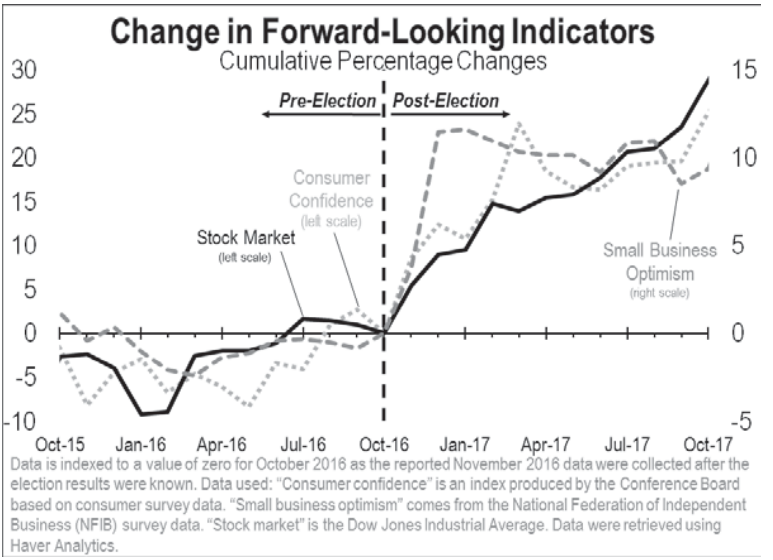
A low headline unemployment rate and closed output gap based on CBO's most recent estimate of potential GDP tell us little about the effects on economic performance of tax and regulatory reform. Subpar performance of the proximate determinants of economic growth—employment, capital, and productivity growth—suggests that the economy has substantial untapped potential. Given better policies, accelerating economic growth in the near term and a higher long-term growth rate seem entirely possible.

THE ECONOMIC OUTLOOK

Forward-Looking Indicators Improve

The economic outlook improved immediately after the last election as shown by the forward-looking indicators in Figure 2-16, which were little changed over the 12 months before the election.[123] Over the 12 months that followed the election, the stock market's value increased nearly 30 percent, consumer sentiment by 25 percent, and small business sentiment by 10 percent.

Figure 2-16



The marked upswing of forward-looking indicators reflects the expectation that removing growth-constraining policies can help recover the U.S. economy's lost potential.

Real Economic Indicators Improve

There was notable improvement in real GDP growth in 2017 compared to 2016, as growth in each quarter exceeded its corresponding quarter from the previous year (Figure 2-17). An important contributor to the acceleration in real GDP growth was private-sector non-residential fixed investment, which measures business spending on structures, equipment, and intellectual property (software, research and development, and entertainment, literary and artistic originals) (Figure 2-18).

Figure 2-17

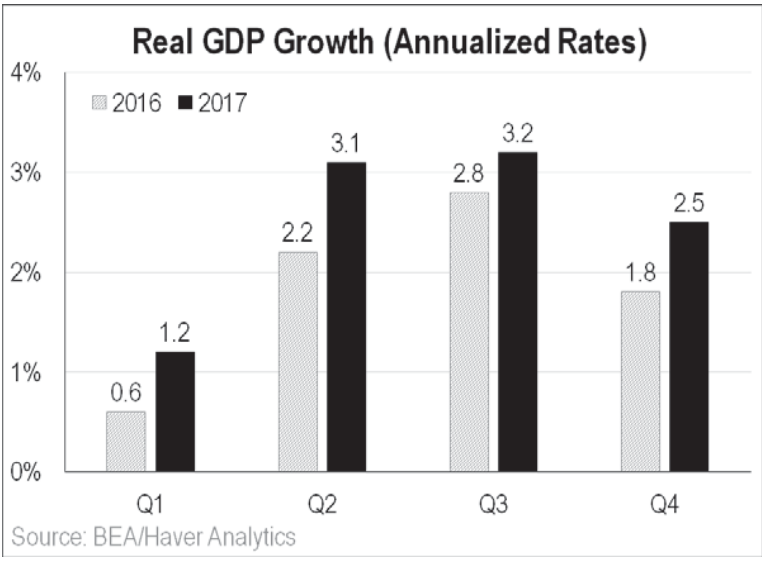
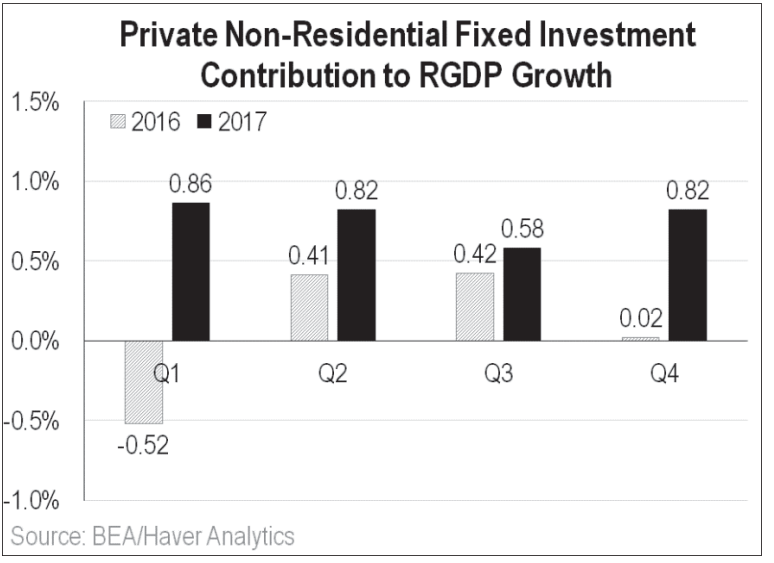


Figure 2-18



Industrial production, which is a comprehensive measure of the production of tangible goods in the United States, also expanded

robustly in 2017 (Figure 2-19). In addition, the industrial capacity utilization rate has trended upward. In December 2017, it registered 77.7 percent, the highest since March 2015, yet still below the pre-recovery average of 81.4 percent—further evidence that the U.S. economy is not operating at its full potential.

Figure 2-19

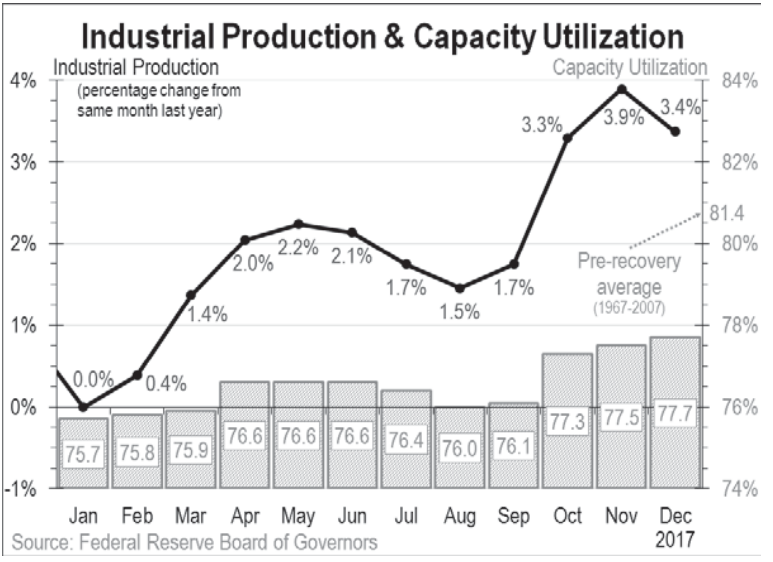
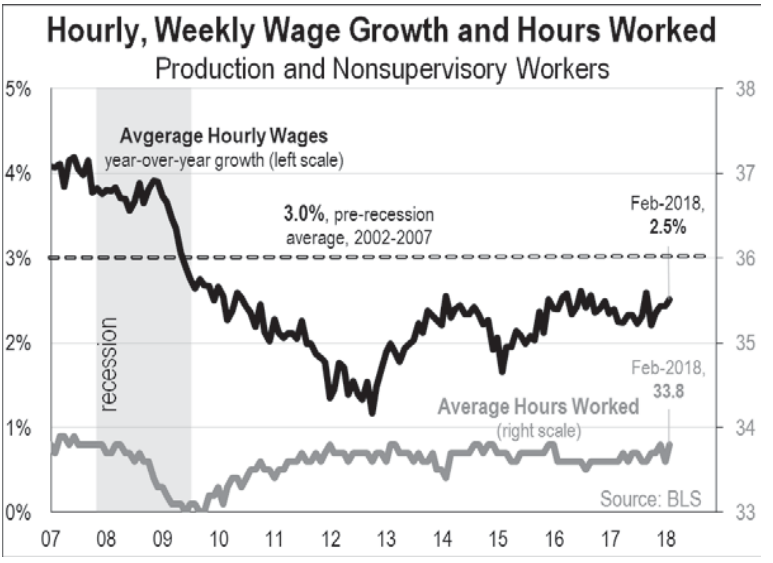


Figure 2-20

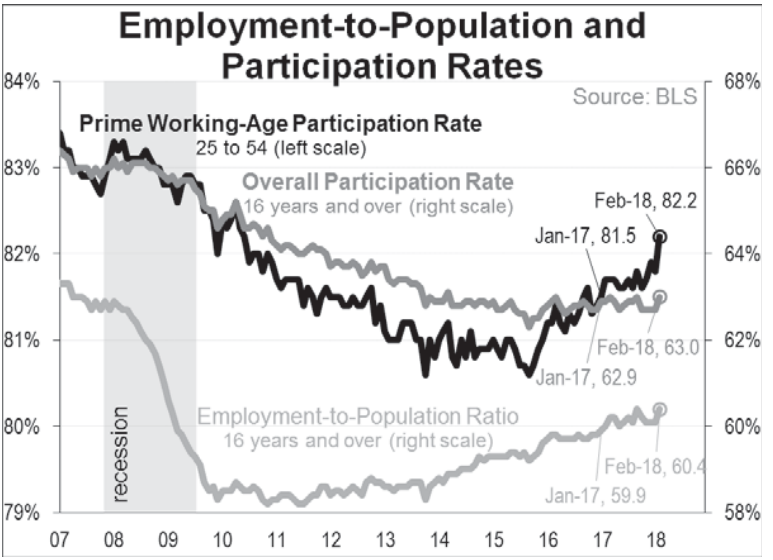
Since January 2017, the headline unemployment rate (U-3) fell 0.7 percentage point to 4.1 percent in February 2018. More notable was the faster decline in the "real" unemployment rate of 1.2 percentage points over the same period (Figure 2-20). This measure also includes those who searched for work in the past twelve months, and those among the employed who can only find part-time work for economic reasons. Its sharp decline suggests that those more adversely affected by the economy's slow growth were able to find better employment opportunities given an improved economic environment.

Figure 2-21



Despite notable improvements and a low headline unemployment rate, labor market slack remains. Private-sector job creation, averaging 180,000 per month in 2017, continues to exceed what is necessary to accommodate the population's growth rate. Annual hourly wage growth for production and nonsupervisory workers is only averaging 2.2 percent in the current expansion, compared with 3 percent in previous expansions (Figure 2-21). Furthermore, although the employment-to-population ratio, overall labor force participation rate, and the prime-age labor force participation rate have trended upward, they remain considerably lower than their pre-recession rates (Figure 2-22).

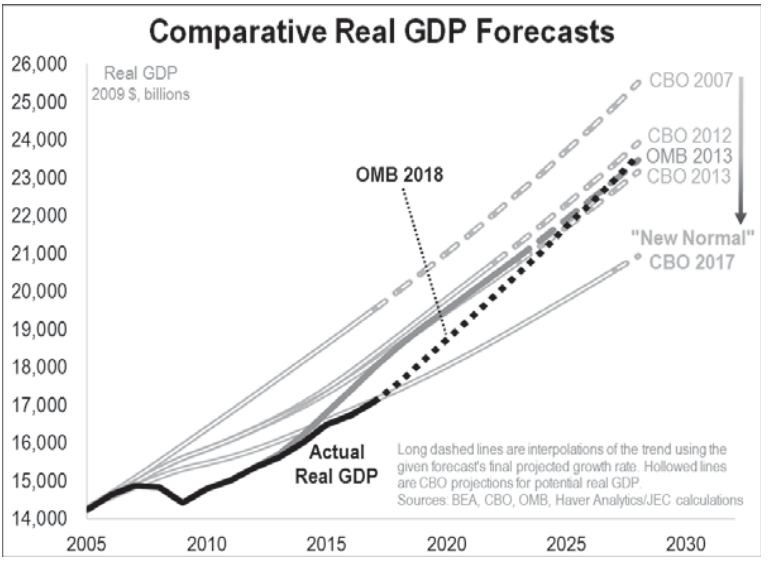
Figure 2-22



The Outlook under Ideal Conditions

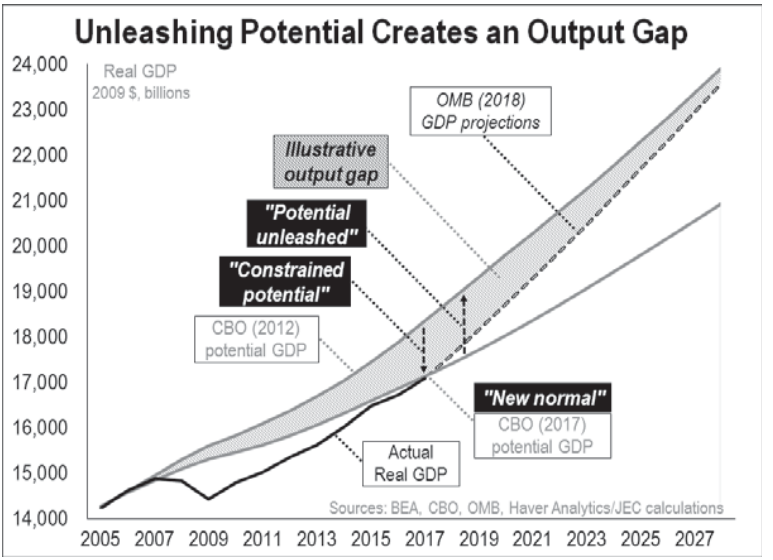
The level of real GDP, which would be realized from the Trump Administration's forecast of 3.0 percent average growth over 2018-2028, matches what the previous Administration's OMB had projected as recently as 2013. Moreover, it is very close to CBO's 2012 estimate of potential real GDP for 2028 (Figure 2-23).

Figure 2-23



Tax and regulatory reforms are intended to help unleash the U.S. economy's full potential. Figure 2-24 uses CBO's 2012 estimates for potential GDP to illustrate that an output gap would open, allowing economic growth to accelerate as policy constraints on capital and employment are lifted.

Figure 2-24



It is difficult to ascertain the U.S. economy's true potential after it was constrained for so long, Table 2-2 illustrates average annual real GDP growth rates that would be necessary to catchup to the different CBO projections for potential real GDP by a given year.[124] For example, column D, row 8 indicates the economy would need to grow at an average rate of 3.4 percent per year to catch up to CBO's 2012 projection for potential real GDP by 2025.

Table 2-2

		CBO's potential GDP estimates, by year of publication								
	Column	A	B	C	D	E	F	G	H	I
Row	**Year**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
1	2018	13.0%	12.2%	11.5%	10.1%	8.8%	6.5%	4.9%	2.8%	1.9%
2	2019	7.5%	7.1%	6.8%	6.3%	5.5%	4.4%	3.6%	2.4%	1.8%
3	2020	5.7%	5.5%	5.3%	5.0%	4.4%	3.7%	3.1%	2.3%	1.8%
4	2021	4.8%	4.7%	4.6%	4.4%	3.9%	3.3%	2.9%	2.2%	1.8%
5	2022	4.3%	4.2%	4.1%	4.0%	3.5%	3.1%	2.7%	2.2%	1.8%
6	2023	3.9%	3.8%	3.8%	3.7%	3.3%	2.9%	2.6%	2.2%	1.8%
7	2024	3.7%	3.6%	3.6%	3.5%	3.1%	2.8%	2.6%	2.2%	1.8%
8	2025	3.5%	3.4%	3.4%	3.4%	3.0%	2.7%	2.5%	2.1%	1.9%
9	2026	3.3%	3.3%	3.3%	3.3%	2.9%	2.6%	2.5%	2.1%	1.9%
10	2027	3.2%	3.2%	3.2%	3.2%	2.9%	2.5%	2.4%	2.1%	1.9%
11	2028	3.1%	3.1%	3.1%	3.1%	2.8%	2.5%	2.4%	2.1%	1.9%

The economy's potential is partly determined by factors over which the government has little influence such as population growth and age composition. The *Report* recognizes the effect of an aging population,[125] for example, which is among the long-term factors that supporters of the previous Administration often cite as a reason for the slow recovery. As the economy returns to a higher output level, economic growth will moderate, but if policymakers continue to pursue productivity-enhancing policies with regard to taxes, regulation, education, infrastructure, trade, and health outlined in the successive chapters of this *Response*, the longer-run average annual growth can be better than CBO's most recent projection of 1.9 percent.

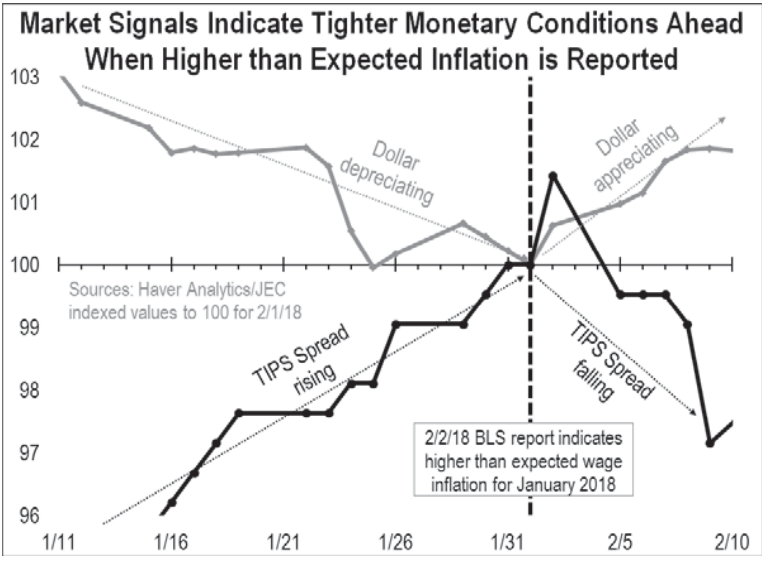
Potential Risks to the Outlook

MONETARY POLICY RISKS. Tax reform, such as TCJA, and an improved economic outlook, raise the value of capital and workers, which in the longer run, will lead to increases in capital and employment that then lead to increased production, which puts downward pressure on inflation rates.[126] To finance additional capital investments business must seek more credit. This puts

upward pressure on interest rates, which may incidentally affect the demand side of the economy.

In particular, higher market interest rates—relative to the Fed's IOER rate (or a given expected path for the Fed's IOER rate)—encourage banks to increase lending using their abundant supply of excess reserves; this also encourages the non-banking public to spend cash balances at a faster rate. Thus, price inflation can accelerate somewhat in the near term before capital and employment attain their new, higher steady states and increased production then puts downward pressure on inflation. The risk is that the Fed misinterprets a transitory acceleration in inflation rates as the economy "overheating" and tightens monetary policy too quickly.

Figure 2-25

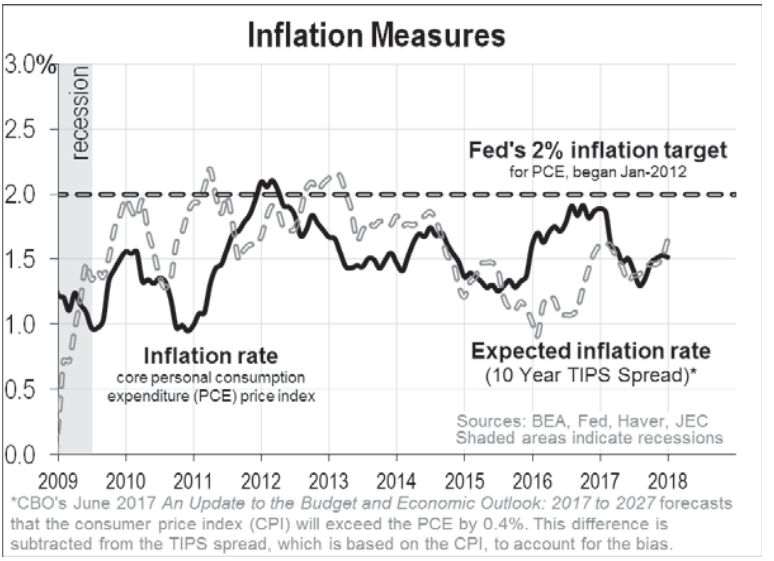


For example, on February 2, BLS reported an acceleration in wage growth, which could portend inflationary pressures.[127] Market turbulence in February followed, which does not appear to have arisen because the economy was "overheating" but out of fear the

Fed might think so and tighten monetary policy too quickly. As evidence, in the wake of the aforementioned BLS report, the TIPS spread, which is a market-based measure of the average expected inflation rate over the next ten years, fell and the U.S. dollar appreciated (Figure 2-26). (The "TIPS spread" is the difference in yields between 10-year Treasury Notes and 10-year Treasury Inflation Protected Securities; TIPS compensate holders for inflation.) Both a lower TIPS spread and appreciating dollar signal tighter monetary conditions ahead rather than an overheating economy.

The risk that the Fed will tighten too much should be low as forward-looking market-based measures of inflation expectations do not indicate inflation will rise to the Fed's two percent target in the next 10 years. Furthermore, the Fed's representation of the two percent inflation target as "symmetric"—an average rather than a ceiling—should afford it room to avoid tightening monetary policy prematurely. Inflation has consistently undershot the Fed's two percent symmetric inflation target since its inception in 2012 (Figure 2-26), meaning that inflation somewhat above two percent could be tolerated for a time.

Figure 2-26



ASSET PRICE BUBBLE RISKS. Prominent economists, including Martin Feldstein,[128] have expressed concern that near-zero interest rates have inflated some asset prices, and they warn that the longer the Fed waits to normalize interest rates, the greater the risk of a price collapse. Indeed, many corporations that can issue bonds at low interest rates or obtain bank credit at low rates have taken on debt to buy back their own stock.

To the extent current assets are overpriced, pro-growth policies can help. The fundamental value of a firm is the present value of its expected future cash flows. As tax and regulatory relief improve future earnings potential, the expected return on new and existing projects rises and the present value of an enterprise increases. Given a currently underutilized workforce, accelerated economic growth to underpin or raise asset valuations seems possible. The sustained rise in stock indices since the last election suggests improving investor confidence.

INTERNATIONAL FINANCIAL RISKS. The Committee Majority is concerned about financial vulnerabilities abroad, as is the CEA.[129] In particular, a foreign financial crisis can increase the demand for safe assets, which includes the U.S. dollar. Monetary economist Lars Christensen lays out the type of scenario that occurred in 2011 during the Fed's second QE program:

> *…[I]imagine that a sovereign default in a euro zone country shocks investors, who run for cover and starts buying 'safe assets'. Among other things that would be the U.S. dollar. [If the Fed takes no reaction to the increased demand for dollars] the Fed is effective allowing external financial shocks to become a tightening of U.S. monetary conditions [which reduces U.S. aggregate demand]. The consequence every time that this is happening is not only a negative shock to U.S. economic activity, but also increased financial distress.*[130]

In addition to the factors outlined in the section discussing demand-side constraints above, this may have further dampened the effectiveness of QE. As Hetzel (2012) noted:

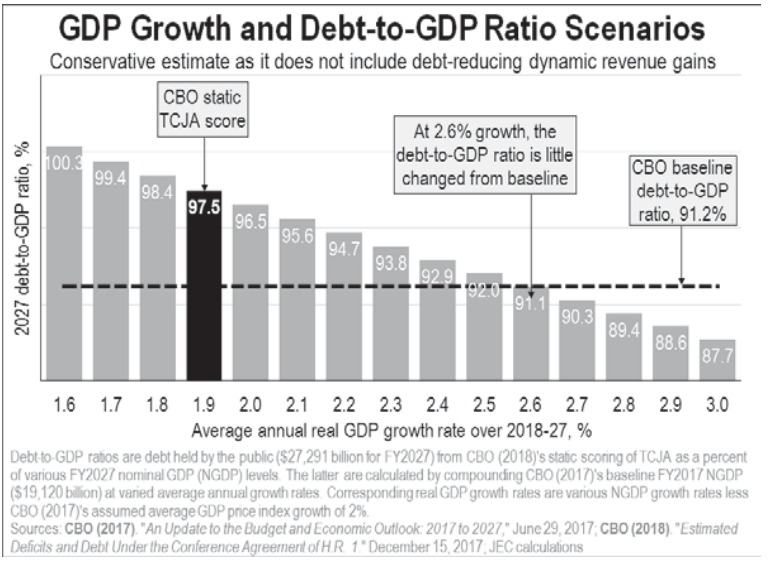
> *…QE2 had produced an increase in Fed securities holdings of $416 billion. However, European banks increased their holdings of dollar excess reserves by more than that amount. They had good reason to accumulate excess reserves in 2011. First, the possibility was real that the troubled peripheral countries in Europe like Greece would at least partially default on their external debt and impose losses on the European banks holding that debt. Second, the European Banking Authority was under pressure to make national regulatory*

> *authorities subject to their banks to rigorous 'stress tests.'*[131]

INTERNATIONAL TRADE ISSUES. Presently, the Trump Administration is renegotiating the terms of the North American Free Trade Agreement (NAFTA), and attempting to change the international terms of trade. Retaliatory trade barriers could disrupt global supply chains, leading to a downturn in economic activity. The stock market declined on the early March 2018 news that the Trump Administration would impose tariffs on imported steel and aluminum.

FEDERAL DEBT. Static scoring of TCJA—which does not allow for GDP to rise as a result of tax cuts and therefore ignoring federal revenue gains from GDP growth—suggests the debt-to-GDP ratio will increase to 97.5 percent from a baseline of 91.2 percent in 2027.[132] But TCJA makes the tax code more efficient and will enhance the economy's ability to grow. Figure 2-27 shows how the debt-to-GDP ratio might change under different real GDP growth rates. If the U.S. economy grows faster than CBO's most recent projected baseline of 1.9 percent, the debt-to-GDP ratio will decline. If it grows at a still-modest 2.6 percent, the debt-to-GDP ratio will remain unchanged without even including the additional tax revenue gained from faster GDP growth.

Figure 2-27



In addition to tax reform, the Administration is implementing other pro-growth reforms—such as reducing regulatory burdens—which OMB projects will result in 3.0 percent average annual GDP growth over the next 10 years. With 3 percent annual growth, the debt-to-GDP ratio would fall to 87.7 percent (again, not including additional Federal tax revenue from faster growth).

The risk to the economy does not derive from passage of the tax legislation as some critics claim. On the contrary, TCJA mitigates the risk with its pro-growth effects. CBO's March 2017 *Long-Term Budget Outlook*[133], which is based on the laws in effect at the time, projected that the Federal debt is on an unsustainable trajectory, wherein the debt-to-GDP ratio rises indefinitely. Tax, regulatory, and other reforms that improve the economy's productive potential will improve, not worsen the situation, but ultimately entitlement reform is necessary to reverse the unsustainable trajectory.

CONCLUSIONS

There is an alternative explanation for the slow recovery following the 2008-2009 recession, which differs from the common view that a financial crisis and adverse long-term trends—an aging population, low labor force participation, and low productivity growth—are to blame and that the Obama Administration and the Federal Reserve did all they could to lift the economy; the former with an enormous debt-financed fiscal stimulus package, and the latter with ultra-low interest rates and quantitative easing.

The alternative explanation is that the previous Administration's spending, tax, and regulatory policies progressively constrained the economy's productive potential, while the Fed held back bank lending by paying interest on excess reserves, directing capital to inefficient uses through quantitative easing.[134]

This chapter explores the economy's performance from the 2008-2009 recession to the present, in the context of both supply and demand. The Committee Majority concurs with the *Report's* findings that supply-side determinants of real economic growth—labor, capital, and productivity—were artificially constrained by government policies that hindered Americans from realizing their full potential. Thus, the Committee Majority endorses policies that will unleash the U.S. economy's full potential. Subsequent chapters in the *Response* offer further recommendations to this end.

This chapter also offers an alternative view of factors that constrained the demand side of the economy (i.e., the Federal Reserve's payment of interest on excess reserves at rates competitive with market rates), and its credit policies, which include quantitative easing. This alternative view helps to explain the "puzzle" of persistent below-target inflation. It suggests that

monetary policy was not as "easy" during the 2008-2009 recession and its aftermath as commonly perceived.

Payment of IOER and the slow unwinding of quantitative easing programs raise complications for the demand side of the economy, especially as the Fed remains "puzzled" by low inflation and still does not appear to connect it to the IOER rate. There is some risk that the Fed—out of fear the economy may be "overheating" and inflation may suddenly accelerate—could tighten monetary policy at too fast a pace.

As time passes, it is important that the study of economic policies during and after the 2008 recession continue. The common narrative of events deserves greater scrutiny, and it should not simply become the "received wisdom" that automatically and unquestioningly informs future policy.

Recommendations

- The closing of the output gap from the 2008-2009 recession, relative to estimates of potential GDP under the constraints of past policies, should not be considered a truly complete recovery. With the continuation of better policies, the economy has room to grow faster.
- Unconventional monetary policy has not been fully unwound, and it bears continued scrutiny. It is important to establish clear goals with respect to the future use of interest on excess reserves and the size of the Fed's balance sheet.
- While America's tax regime after TCJA is now more internationally competitive, reform of the country's regulatory regime, health care system, education system, infrastructure, and cybersecurity must remain top priorities. Positioning these systems so the economy can

grow faster again will help with many of the country's derivative social problems.

APPENDIX 2-1: PRE-2008 IMPETUS FOR IOER

A provision of the *Financial Regulation Relief Act of 2006* authorized the Federal Reserve to begin paying banks interest on their required reserves (IORR) and excess reserves (IOER) in 2011.[135] (Because IORR does not have as significant ramifications as IOER, this chapter focuses on the latter.) The impetus was largely technical; it would enable the Fed to modernize its antiquated required-reserve regime and reduce the magnitude of Fed interventions through open market operations (buying and selling of short-term Treasury securities to alter the supply of bank reserves) that were needed to achieve its target for the fed funds rate.

The IOER rate would create a floor for the fed funds rate,[136] as it would motivate banks to hold excess reserves, rather than lend them to other banks at a lower fed funds rate, thus helping to limit the amount of reserves the Fed has to drain through open market operations to lift the fed funds rate toward its target. The Fed's discount rate—the rate at which banks can borrow reserves directly from the Fed rather than borrow the excess reserves of other banks at the fed funds rate—would serve as a ceiling.[137]

Within this "corridor" of administratively determined rates, market forces as well as the typical (but reduced) Fed open market operations would determine the fed funds rate. By raising or lowering the fed funds rate in this "corridor system" relative to the natural rate of interest—the market rate of interest consistent with price stability and full-employment, the Fed could ease or tighten monetary policy in a way that is consistent with its more reliable and effective pre-2008 operating procedures.

472c-9e5b-f19fe4b67c24/2-28-final-2017-joint-economic-report-w-minority-views.pdf

[65] "Our Greedy Colleges," *The New York Times,* February 18, 1987. http://www.nytimes.com/1987/02/18/opinion/our-greedy-colleges.html

[66] JER 2017, pp. 111-113.

[67] Ambrose, Brent et al., "The Impact of Student Loan Debt on Small Business Formation," Federal Reserve Bank of Philadelphia Working Papers, July 2015. https://www.philadelphiafed.org/-/media/research-and-data/publications/working-papers/2015/wp15-26.pdf

[68] Case, Anne and Angus Deaton, "Mortality and morbidity in the 21st century," Brookings Papers on Economic Activity, 2017. https://www.brookings.edu/bpea-articles/mortality-and-morbidity-in-the-21st-century/

[69] "Hiring Hurdle: Finding Workers Who Can Pass a Drug Test," *New York Times*, May 17, 2016. https://www.nytimes.com/2016/05/18/business/hiring-hurdle-finding-workers-who-can-pass-a-drug-test.html?_r=0

[70] Griswold, Daniel, "The Dynamic Gains From Free Digital Trade," Testimony before the Joint Economic Committee, September 12, 2017. https://www.jec.senate.gov/public/index.cfm/2017/9/jec-to-hold-hearing-on-dynamic-gains-from-free-digital-trade

[71] Mulligan, Casey B., "The Redistribution Recession," Oxford University Press, pp. 5-8, 2012.

[72] Furchtgott-Roth, Diana, "A Record Six Million U.S. Job Vacancies: Reasons and Remedies," Testimony before the Joint Economic Committee, July 12, 2017. https://www.jec.senate.gov/public/index.cfm/2017/7/a-record-six-million-u-s-job-vacancies-reasons-and-remedies

[73] Kane, Timothy, "The Decline in Economic Opportunity in the United States: Causes and Consequences," Testimony before the Joint Economic Committee, April 5, 2017. https://www.jec.senate.gov/public/index.cfm/hearings-calendar?ID=77BCA30A-C2A5-40C5-8CAF-6C61F821842E

[74] Lazear, Edward, "The Decline in Economic Opportunity in the United States: Causes and Consequences," Testimony before the Joint Economic Committee, April 5, 2017. https://www.jec.senate.gov/public/index.cfm/hearings-calendar?ID=77BCA30A-C2A5-40C5-8CAF-6C61F821842E

[75] The inflation rate is measured by the GDP deflator. 1990 was selected as the start year to analyze these averages as inflation had been trending downward as a result of the Great Inflation of the 1970s and the Volcker Fed's efforts to diffuse it. After 1990, the inflation rate stabilized around 2 percent.

[76] ERP 2018, pp. 20.

[77] ERP 2018, pp. 432.

[78] ERP 2018, pp. 422.

[79] "Monetary Policy Report," Board of Governors of the Federal Reserve System, February 23, 2018, p. 14,

https://www.federalreserve.gov/monetarypolicy/files/20180223_mprfullreport.pdf

[80] "Nominal" means unadjusted for inflation. "Aggregate demand" means total spending in the economy.

[81] *"Economic growth was moderate during the first half of the year, but the tightening of credit conditions has the potential to intensify the housing correction and to restrain economic growth more generally. Today's action is intended to help forestall some of the adverse effects on the broader economy that might otherwise arise from the disruptions in financial markets and to promote moderate growth over time."* "FOMC Statement," Board of Governors of the Federal Reserve System, September 18, 2007, https://www.federalreserve.gov/newsevents/pressreleases/monetary20070918a.htm

[82] The first such facility was the Term Auction Facility (TAF), in which the Federal Reserve, *"…auctioned term funds to depository institutions. All depository institutions that were eligible to borrow under the primary credit program were eligible to participate in TAF auctions. All advances were fully collateralized. Each TAF auction was for a fixed amount, with the rate determined by the auction process (subject to a minimum bid rate). Bids were submitted by phone through local Reserve Banks. The final Term Auction Facility auction was conducted on March 8, 2010."* "Term Auction Facility," Board of Governors of the Federal Reserve System, November 24, 2015 (last update), https://www.federalreserve.gov/monetarypolicy/taf.htm, For other such facilities refer to: "Expired Policy Tools," Board of Governors of the Federal Reserve System, November 24, 2015 (last update), https://www.federalreserve.gov/monetarypolicy/expiredtools.htm

[83] Hetzel, Robert L, "The Great Recession," *Cambridge University Press*, New York, NY, 2012, p. 282.

[84] Sumner, Scott, "Monetary policy rules in light of the great recession," Journal of Macroeconomics, Elsevier, vol. 54(PA), p. 94. See also: Bernanke, Ben S, "Speech Given at the Federal Reserve Bank of Dallas Conference on the Legacy of Milton and Rose Friedman's *Free to Choose*," The Federal Reserve Board, October 23, 2003. https://www.federalreserve.gov/boardDocs/Speeches/2003/20031024/default.htm

[85] For a more complete history of the Federal Reserve's emergency lending, commercial and shadow banking and analysis of the factors in the 2008 Financial Crisis, see the Joint Economic Committee paper, "Lender of Last Resort in the Modern Financial System: Development of the Federal Reserve's Policy," Joint Economic Committee, November 29, 2012, https://www.jec.senate.gov/public/_cache/files/8b7982e8-5ac5-4ec7-8944-0b5584f71d5d/20121129-jec-lolr-analysis.pdf.pdf

[86] This was known as the Treasury's Supplementary Financing Program. See: "Treasury Announces Supplementary Financing Program," U.S. Department of the Treasury press release HP-1144, September 9, 2008,

https://www.treasury.gov/press-center/press-releases/Pages/hp1144.aspx. Ben Bernanke's 2009 description of the program: *"…the Treasury issues special Treasury bills and places the proceeds in the Treasury supplementary financing account at the Federal Reserve. The net effect of these operations is to drain reserve balances from depository institutions,"*Bernanke, Ben S, "The Federal Reserve Balance Sheet," Board of Governors of the Federal Reserve System, April 3, 2009, https://www.federalreserve.gov/newsevents/speech/bernanke20090403a.htm

[87] *"Inflation has been high, spurred by the earlier increases in the prices of energy and some other commodities. The Committee expects inflation to moderate later this year and next year, but the inflation outlook remains highly uncertain.*
"The downside risks to growth and the upside risks to inflation are both of significant concern to the Committee. The Committee will monitor economic and financial developments carefully and will act as needed to promote sustainable economic growth and price stability."
"FOMC Statement," Board of Governors of the Federal Reserve System, September 16, 2008. https://www.federalreserve.gov/newsevents/pressreleases/monetary20080916a.htm. For additional evidence refer to: Hetzel, Robert L, "The Great Recession," *Cambridge University Press*, New York, NY, 2012, pp. 217-223.

[88] This was written into the Emergency Economic Stabilization Act of 2008 (the same legislation that created the Troubled Asset Relief Program (TARP), which bailed out the banks. It authorized the Fed to pay interest on reserves, of which there are two classes: required and excess. The IORR rate is the payment banks receive for *required* reserve holdings (excluding vault cash held to satisfy reserve requirements). The IOER rate is the payment banks receive for depositing funds in *excess* of their required reserves. As the latter is far more consequential, IORR is not discussed in this chapter.

[89] The Federal Reserve's rationale was that *"The payment of interest on excess reserve balances will give the Federal Reserve greater scope to use its lending programs to address conditions in credit markets while also maintaining the federal funds rate close to the target established by the Federal Open Market Committee."*
"Board announces that it will begin to pay interest on depository institutions' required and excess reserve balances." Board of Governors of the Federal Reserve System, October 6, 2008, https://www.federalreserve.gov/newsevents/pressreleases/monetary20081006a.htm

[90] Bernanke, Ben S, *The Courage to Act*, W.W. Norton, New York, NY, 2015, pp. 325–6.

[91] Pure usage (as opposed to the general usage) of the term "quantitative easing" refers to an increase in the supply of reserves intended to ease monetary conditions. In contrast, the incidentally created reserves from the Fed's LSAP programs were largely sterilized as the Fed was focusing on directing liquidity toward particular market segments (i.e., long-term Treasury

securities and residential MBS), which constitutes a credit easing policy (also Ben Bernanke's term, see next footnote) rather than a monetary easing policy.
[92] *In pursuing our strategy, which I have called 'credit easing,' we have also taken care to design our programs so that they can be unwound as markets and the economy revive."* Bernanke, Ben S, "The Federal Reserve Balance Sheet," Board of Governors of the Federal Reserve System, April 3, 2009, https://www.federalreserve.gov/newsevents/speech/bernanke20090403a.htm. Note: Bernanke's identification of QE1 as "credit easing" implies that the intent to sterilize the expansion using IOER.
[93] Duy, Tim. "Johnson and Kwak vs. Bernanke," Tim Duy's Fed Watch, April 3, 2009, http://economistsview.typepad.com/timduy/2009/04/johnson-and-kwak-vs-bernanke.html
[94] *"If the monetary injections are expected to be temporary, the inflationary effect is far smaller. The Japanese central bank did lots of QE in 2003, but pulled much of the money out in 2006 when deflation ended. It worked in preventing high inflation, indeed it may have worked too well."* Sumner, Scott. "Open Letter to Conservatives on Monetary Policy," The American Catholic, November 16, 2010, http://the-american-catholic.com/2010/11/16/open-letter-to-conservatives-on-monetary-policy/
[95] *"…[If] the monetary base is increased in the current period but is expected to be fully offset in some future period there will be zero change in the price level."* Beckworth, David, "Permanent versus Temporary Monetary Base Injections: Implications for Past and Future Fed Policy," *Journal of Macroeconomics,* Vol. 54, Part A, December 2017, p. 113.
[96] *"But a monetary expansion the private sector expected to be temporary, to be wound down after the crisis had passed, would do nothing at all: the extra monetary base would just sit there."* Krugman, Paul, "It's Baaack, Twenty Years Later, February 2018, p. 5, https://www.gc.cuny.edu/CUNY_GC/media/LISCenter/pkrugman/Its-baaack.pdf
[97] *"If the Fed pays interest on reserves, then the quantity theory of money (more money means more inflation) doesn't necessarily hold. They recently started paying interest on reserves, and that's one reason why the big injections from 2008 didn't have an inflationary impact. The Fed can adjust the rate as necessary, and indeed in my view a lower IOR [interest on reserves] would be more effective than QE2."* Sumner, Scott, "Open Letter to Conservatives on Monetary Policy," The American Catholic, November 16, 2010, http://the-american-catholic.com/2010/11/16/open-letter-to-conservatives-on-monetary-policy/
[98] *"The link between Fed bond purchases and the subsequent growth of the money stock changed after 2008, because the Fed began to pay interest on excess reserves. The interest rate on these totally safe and liquid deposits induced the banks to maintain excess reserves at the Fed instead of lending and creating deposits to absorb the increased reserves, as they would have done before 2008."* Feldstein, Martin, "Why is US Inflation So Low?" Project

Syndicate, June 28, 2013, p. 2.
http://www.nber.org/feldstein/projectsyndicatejune2013.pdf
[99] "…[*The] large expansion of the monetary base has to be temporary otherwise the price level would have jumped several hundred percent already…Ostensibly for this reason the Fed has been very clear that it plans to eventually reduce its balance sheet. In the meantime, the Fed is using IOER to manage its balance sheet in a manner that effectively sterilizes the above-trend growth in the monetary base. The use of the IOER reinforces the Fed's goals that the excess reserves are to be ultimately temporary."* Beckworth, David, "Permanent versus Temporary Monetary Base Injections: Implications for Past and Future Fed Policy," *Journal of Macroeconomics,* Vol. 54, Part A, December 2017, p. 114.
[100] Selgin, George, "Testimony Before the U.S. House of Representatives Committee on Financial Services Monetary Policy and Trade Subcommittee Hearing on "Monetary Policy v. Fiscal Policy: Risks to Price Stability and the Economy." July 20, 2017, p. 36,
https://financialservices.house.gov/uploadedfiles/hhrg-115-ba19-wstate-gselgin-20170720.pdf
[101] *"First, paying interest on reserves made monetary policy tighter than it would otherwise have been, as measured either by the higher federal funds rate or the lower equilibrium price level implied by the shifting but still intersecting demand and supply curves for reserves. Ex ante, the use of interest on reserves to minimize the effects of emergency lending on the price level seemed prudent. Ex post, however, it turned out to be a mistake: as Hetzel (2012) points out, monetary policy ought to have been substantially more accommodative than it was throughout 2008, considering the severe deflationary recession that followed."* Ireland, Peter N, "Interest on Reserves: History and Rationale, Complications and Risks," Boston College and Shadow Open Market Committee, February 2018, p. 3,
http://irelandp.com/papers/somc201803.pdf
[102] Blinder, Alan, "How Ben Bernanke Can Get Banks Lending Again," *The Wall Street Journal*, July 22, 2012,
https://www.wsj.com/articles/SB10000872396390444873204577537212738938798
[103] Blinder, Alan, "The Fed Plan to Revive High-Powered Money," *The Wall Street Journal*, December 10, 2013.
https://www.wsj.com/articles/the-fed-plan-to-revive-highpowered-money-1386718437
[104] "Financial Services Regulatory Relief Act," Public Law 109-351, October 13, 2006, p. 4, https://www.congress.gov/109/plaws/publ351/PLAW-109publ351.pdf
[105] "Rules and Regulations," *Federal Register*, Vol. 80, No. 119, June 22, 2015, Refer to subsection 204.10 (3), p. 35,567,
https://www.gpo.gov/fdsys/pkg/FR-2015-06-22/pdf/2015-15238.pdf. Note: it is not feasible to set the primary credit rate below the IOER rate as banks could borrow from the Fed at a lower rate and earn a higher rate of return by

depositing the borrowings with the Fed. Thus, the Fed's balance sheet would grow infinitely. By citing the primary credit rate as a relevant short-term interest rate, the Fed remains in de facto compliance with the law.

[106] Hensarling, Jeb, "Hensarling Welcomes Powell for First Monetary Policy Hearing," House Financial Services press release, February 27, 2018, https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=403092

[107] Taylor, John B, "Alternatives for Reserve Balances and the Fed's Balance Sheet in the Future," *Hoover Institution Press,* Stanford, CA, 2018, p. 24, https://web.stanford.edu/~johntayl/2018_pdfs/Alternatives_for_Reserve_Balances_and_the_Fed's_Balance_Sheet_in_the_Future.pdf

[108] Hetzel, Robert L, "Monetary Policy in the 2008-2009 Recession," *Economic Quarterly*—Vol. 95, No. 2, Spring 2009, p. 216, https://www.richmondfed.org/~/media/richmondfedorg/publications/research/economic_quarterly/2009/spring/pdf/hetzel2.pdf

[109] Taylor, John B, "Interest on Reserves and the Fed's Balance Sheet," *Cato Journal*, Vol. 36, No. 3, Fall 2016, p. 719, https://web.stanford.edu/~johntayl/2016_pdfs/Interest_on_Reserves_and_the_Feds_Balance_Sheet_Cato-Fall2016.pdf

[110] Nelson, Bill, "A former Fed insider explains the internal debate over QE3," *Financial Times Alphaville*, February 16, 2018, https://ftalphaville.ft.com/2018/02/16/2198845/guest-post-a-former-fed-insider-explains-the-internal-debate-over-qe3/

[111] Summers, Lawrence H, "U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound, " *Business Economics*, Vol. 49, No. 2, February 24, 2014, p. 66, http://larrysummers.com/wp-content/uploads/2014/06/NABE-speech-Lawrence-H.-Summers1.pdf

[112] ERP 2018, p. 17 and p. 388.

[113] Friedman, Milton, "The 'Plucking Model' of Business Cycle Fluctuations Revisited," The Hoover Institution, Stanford University, December 1988, p. 2.

[114] Barro, Robert J. and Tao Jin, "Rare Events and Long-Run Risks," *NBER Working Paper*, No. 21871, January 2016, http://www.nber.org/papers/w21871

[115] Barro, Robert J, "The Reasons Behind the Obama Non-Recovery," *The Wall Street Journal*, September 20, 2016, https://www.wsj.com/articles/the-reasons-behind-the-obama-non-recovery-1474412963

[116] In contrast, the Obama Administration's *2017 Economic Report of the President* lauded the "forceful response of the Federal Government (p. 28)" for the "remarkable recovery (p. 21)." *Economic Report of the President 2017*, Council of Economic Advisers, January 2017, https://obamawhitehouse.archives.gov/administration/eop/cea/economic-report-of-the-President/2017

[117] Selgin, George, "Testimony Before the U.S. House of Representatives Committee on Financial Services Monetary Policy and Trade Subcommittee Hearing on "Monetary Policy v. Fiscal Policy: Risks to Price Stability and the

Economy," July 20, 2017, p. 46, https://financialservices.house.gov/uploadedfiles/hhrg-115-ba19-wstate-gselgin-20170720.pdf

[118] Feldstein, Martin, "Stocks are Headed for a Fall," *The Wall Street Journal,* January 17, 2018. https://www.wsj.com/articles/stocks-are-headed-for-a-fall-1516145624

[119] "The Budget and Economic Outlook: Fiscal Years 2008 to 2017: January 2007," Congressional Budget Office, January 24, 2007, Table 2-2, p. 41, https://www.cbo.gov/sites/default/files/110th-congress-2007-2008/reports/01-24-budgetoutlook.pdf

[120] The BLS series ended in 2016. JEC linearly interpolated it forward to February 2018. The projections come from:
Toossi, Mitra. "Labor force projections to 2016: more workers in the golden years," *Monthly Labor Review*, Bureau of Labor Statistics, November 2007, https://stats.bls.gov/opub/mlr/2007/11/art3full.pdf

[121] Laubach, Thomas, and John C. Williams, "Measuring the Natural Rate of Interest," *Review of Economics and Statistics*, 85(4), November 2003, pp. 1063–70.

[122] Guvenen, F., R. Mataloni, D. Rassier, and K. Ruhl, "Offshore Profit Shifting and Domestic Productivity Measurement," *NBER Working Paper*, No. 23324, April 2017, http://www.nber.org/papers/w23324

[123] Economic theory suggests that all available information is taken into account when financial instruments are valued. The day before the November 2016 election, prediction markets (exchanges for financial instruments of which the value depends on some outcome being realized, such as election results) estimated that the pre-2017 political and economic status quo would be largely maintained (For example, on November 7, 2016, prediction markets had implied presidential candidate Hillary Clinton had an 82 percent chance of winning the election (see: https://www.predictit.org/Market/1234/Who-will-win-the-2016-US-presidential-election) and the current Majority had a 59 percent chance of losing that position in the Senate (see: https://www.predictit.org/Contract/571/Will-Republicans-maintain-a-Senate-majority-after-the-next-election#data). The election results seem to have surprised financial markets, providing a clear indicator that a change in the political status quo had a substantive impact on the economic outlook.

[124] When the forecast period ended before 2018, the Majority staff used the final forecast growth rate to interpolate the implied level of potential real GDP for 2028.

[125] ERP 2018, p. 446.

[126] As the proportion of goods and services produced rises relative to money, this pushes inflation rates down.

[127] Specifically, the average hourly earnings for all employees on private nonfarm payrolls registered a gain of 2.9 percent as reported in the February 2, 2018 release of the BLS January Employment Situation report, https://www.bls.gov/news.release/archives/empsit_02022018.htm

[128] Feldstein, Martin, "Stocks are Headed for a Fall," *The Wall Street Journal,* January 17, 2018, https://www.wsj.com/articles/stocks-are-headed-for-a-fall-1516145624
[129] ERP 2018, pp. 437-9.
[130] Christensen, Lars, "Fed NGDP targeting would greatly increase global financial stability," *The Market Monetarist*, March 19, 2013, https://marketmonetarist.com/2013/03/19/fed-ngdp-targeting-would-greatly-increase-global-financial-stability/
[131] Hetzel, Robert L, "The Great Recession," *Cambridge University Press*, New York, NY, 2012, p. 279.
[132] Hall, Keith, "Estimated Deficits and Debt Under the Conference Agreement of H.R. 1, a Bill to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018, as filed by the Conferees to H.R. 1 on December 15, 2017," Congressional Budget Office, January 2, 2018, https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/53437-wydenltr.pdf
[133] "The 2017 Long-Term Budget Outlook," Congressional Budget Office, March 30, 2017, https://www.cbo.gov/publication/52480
[134] Dodd-Frank also held back lending by smaller banks.
[135] The rationale behind the five year lag to the effective date for interest on reserves to begin is described by then Federal Reserve Chairman Ben Bernanke, during an FOMC meeting: *"Because of budget-scoring rules, the provisions of this act will not take place until October 2011."* Meeting of the Federal Open Market Committee October 24-25, 2006, The Board of Governors of the Federal Reserve System, October 24-25, 2006, p. 3. https://www.federalreserve.gov/monetarypolicy/files/FOMC20061025meeting.pdf
[136] Then Federal Reserve vice chair, Donald Kohn, in a Congressional Hearing when the topic was first discussed in 2005, noted that: *"Having the authority to pay interest on excess reserves also could help mitigate potential volatility in overnight interest rates. If the Federal Reserve was authorized to pay interest on excess reserves, and did so, the rate paid would act as a minimum for overnight interest rates, because banks would not generally lend to other banks at a lower rate than they could earn by keeping their excess funds at a Reserve Bank."* Kohn, Donald. "Regulatory Relief," Testimony before the Subcommittee on Financial Institutions and Consumer Credit, Committee on Financial Services, U.S. House of Representatives, June 9, 2005.
[137] Under this arrangement, the fed funds rate should not rise above the discount rate because it would be less expensive for banks to borrow reserves directly from the Fed's discount window.
[138] JER 2017, Chapter 8.
[139] "The Startup Slump: Can Tax Reform Help Revive American Entrepreneurship?" Joint Economic Committee, October 3, 2017. https://www.jec.senate.gov/public/index.cfm/hearings-calendar?ID=D47F4892-7AAF-47CA-AC0E-6ECFB04A5B96