

# ENDERS GAME

## THE STORY OF THE LAST AND NEXT DOLLAR CRISIS

Understanding the fundamental impacts of quantitative easing and the Fed's psychology (including its limitations, deficiencies and inconsistencies) serves as a guide to what the Fed's next moves will be and what the impact will be on financial markets. A black swan event is difficult to predict but often rationalized in hindsight as being more predictable than it actually was. Subprime was so obvious in hindsight. Not dissimilarly, the Fed digitally created \$3.6 trillion dollars, which increased the dollar value of financial assets and allowed for a significant expansion of the U.S. credit system (25% net increase from pre-crisis to today). It will seem obvious in hindsight that when the Fed begins to remove that \$3.6 trillion of "temporary" accommodation, the value of financial assets will fall (reverse order of operations) and the instability of the credit system will reappear, far quicker than the market expects. The risk is misunderstood and mispriced.

The following pages explain these risks and why the market believes this time is different. The analysis begins with a more in-depth review of relevant historical periods, beginning with the period known as the Great Moderation, continuing with an assessment of the current economic landscape and concluding with a recommendation of how best to protect wealth.

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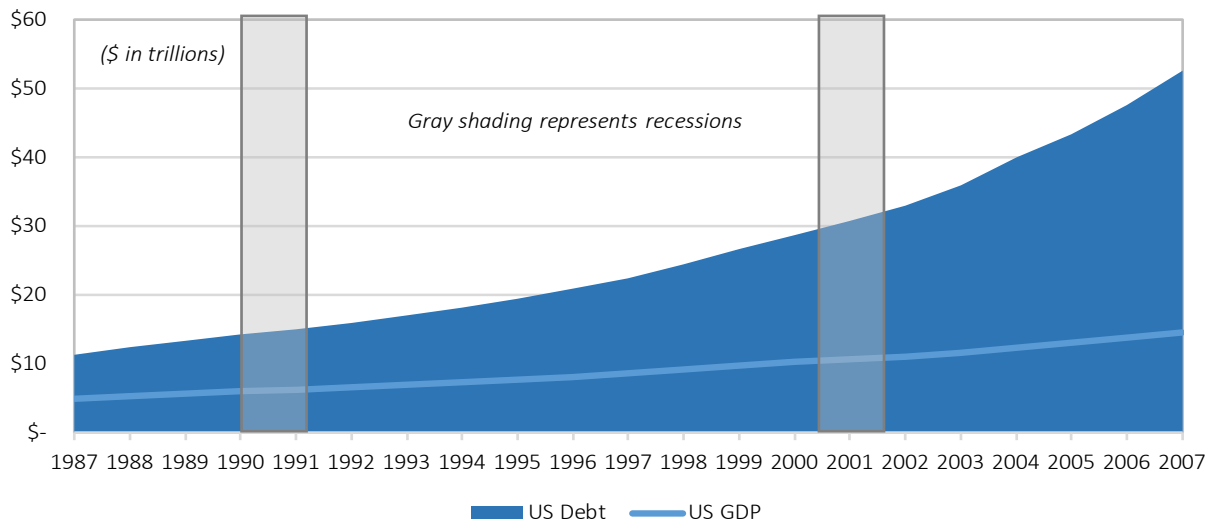
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## THE LEAD UP TO THE GREAT FINANCIAL CRISIS OF 2008

In the two decades leading up to the Great Financial Crisis, total debt in the United States nearly quintupled, increasing from \$11.2 trillion in 1987 to \$52.5 trillion in 2007. Over the same period, nominal GDP significantly lagged the massive credit expansion (despite still tripling), resulting in system-wide debt to GDP increasing from 230% in 1987 to 360% in 2007.

**FIGURE 1.** U.S. System Wide Debt (Shaded Area) vs. Nominal GDP (Line) – 1987-2007

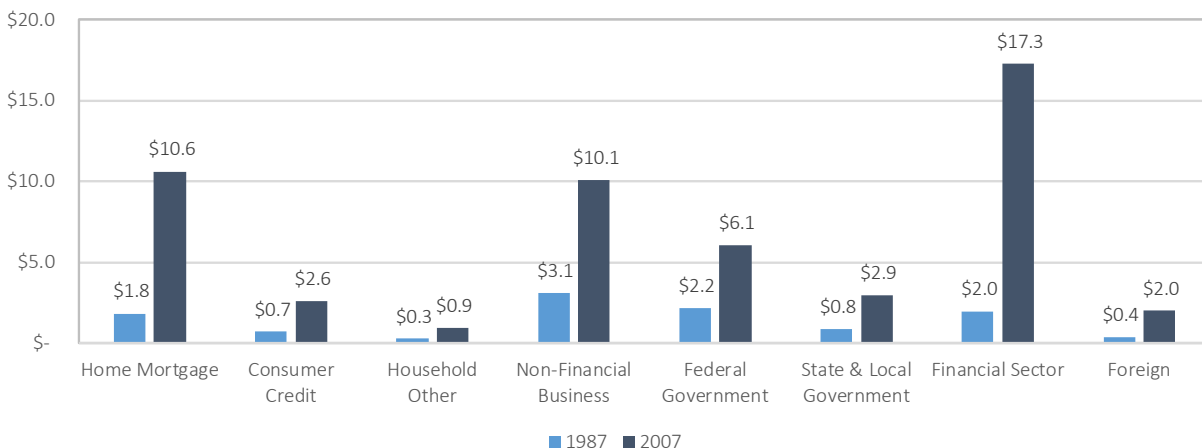
U.S. Dollars in Trillions, Source: Federal Reserve data



While the credit expansion was broad-based, it was primarily fueled by households (specifically home mortgages) and the financial sector. Debt for these segments outpaced the overall average with household home mortgages and financial sector debt increasing by factors of 5.8x and 8.8x from 1987 to 2007, respectively, compared to the net increase system-wide of 4.7x.

**FIGURE 2.** Debt by Economic Sector: Home Mortgage & Financial Sector Debt Outpace, 1987 vs. 2007

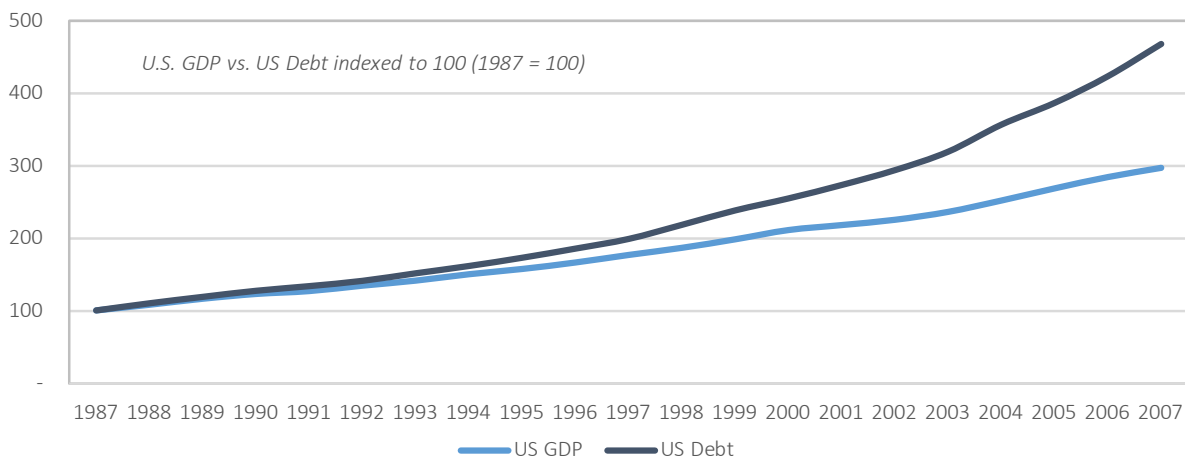
U.S. Dollars in Trillions, Source: Federal Reserve data



Despite recessions in the early 1990s and the early 2000s, the credit-fueled expansion persisted without any net deleveraging. During this period, the credit creation was largely non-productive, on average, with less than 20% being driven by the non-financial business sector. Diminishing returns were evident as each dollar of credit expansion resulted in a fraction of GDP growth (credit growth outpacing GDP growth).

**FIGURE 3. Diminishing Returns: Growth in Debt (Dark Blue) Outpaces GDP (Light Blue)**

Values Indexed to 100, 1987 = 100, Source: Federal Reserve data

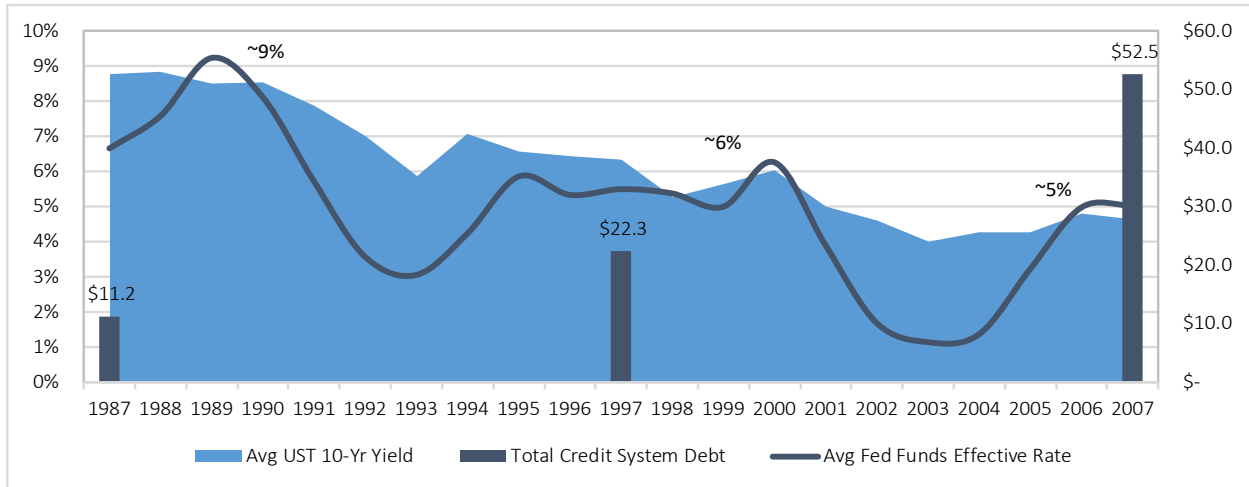


As recessionary business cycles hit the economy, the Fed aggressively lowered interest rates; since the mid-1980s, the Fed has had one policy response: lower interest rates to spur demand. Rather than allowing the credit system to naturally restructure, the Fed has consistently created an environment in which more credit could be created so that the level of existing debt could be sustained. Despite the fact that the credit which the Fed was fueling was producing diminishing returns, the Fed’s answer was more (not less) of the same. In each recession between 1987 and 2007, the Fed aggressively reduced short-term policy rates, from 9% to 3% in 1991 and from 6% to 1% in 2001. With each passing cycle, interest rates (Fed funds) never reached the levels prior to the previous lowering cycle. **Because the credit system was now larger and more demand had been pulled forward, a higher maintenance burden could not be sustained.**

Each time the Fed lowered short-term interest rates to stimulate the economy, it effected this policy by increasing the amount of bank reserves (cash) in the system. Increase supply and price should come down; in this case, the Fed increased the supply of dollars and the price of dollars (borrowing rates) came down. The mechanism by which the Fed increased the supply of dollars was, primarily, to purchase U.S. government securities (treasuries). With more liquidity (dollar supply) and tepid economic growth, U.S. treasuries (the global risk-free benchmark) became more attractive on a risk-adjusted basis, driving longer-duration yields lower. Because risk assets are all, to varying degrees, priced off of risk-free rates and because there was an ever-increasing supply of dollars provided by the Fed, the cost of credit was made cheaper across the board, inducing the credit fueled expansion to continue in a broad-based manner.

**FIGURE 4. Volatility Suppression: Lower Interest Rates, More and More Debt**

Interest Rates (Percent, Left-Axis), System-wide Debt (\$ in trillions, Right-Axis), Source: Federal Reserve data

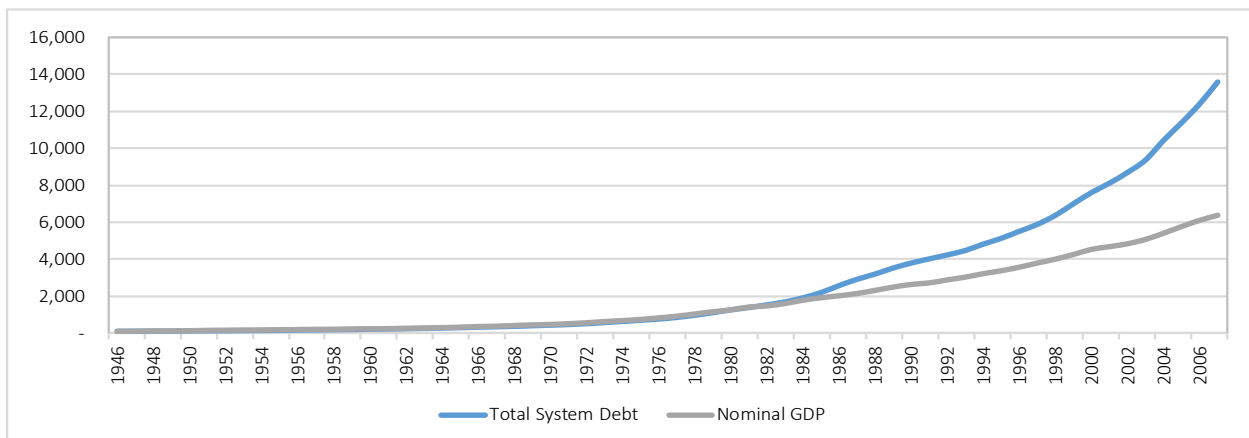


The new Fed regime in the 1980s had determined that its price stability mandate was a directive to reverse business cycles, or at least the boom and busts of those cycles. In order to do so, the Fed had one tool: supply more dollars to reduce interest rates to induce credit expansion. Despite the intermittent recessions, nominal GDP did not decline in any individual year during this period on an annual basis, largely a function of the Fed’s quick and aggressive responses to lower interest rates.

While prior to 2008 nominal GDP in the U.S. had not declined on a year-over-year basis since 1947 (a period that spanned over 60 years), the period from the mid-1980s to 2007 was different because of the rate at which credit growth outpaced GDP growth. During the significant expansionary period from the 1950s to the 1980s, GDP and credit grew at comparable rates. Something changed in the 1980s and it was largely a function of a shifting Fed doctrine as well as a departure from sound monetary policy. U.S. system-wide debt to GDP remained relatively stable at approximately 1.5x (or 150%) from the mid-1940s to the mid-1980s. During the 1980s, a housing and financial sector fueled credit expansion began a period of two decades which saw system wide debt to GDP increase to nearly 3.5x GDP (or 350%).

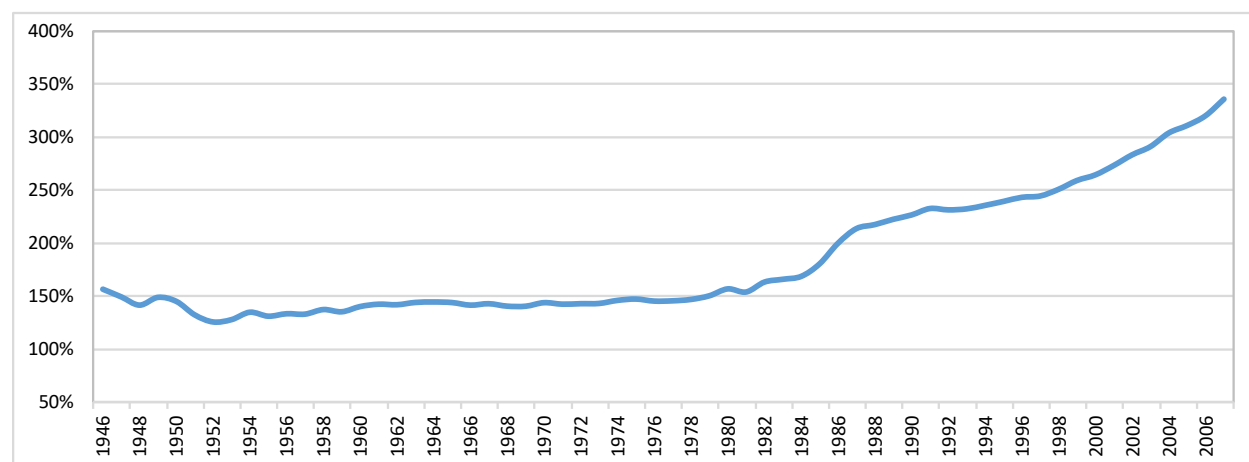
**FIGURE 5. Something Changed in the Mid-1980s: Productive or Non-Productive Credit Expansion?**

U.S. System-Wide Debt (Blue Line) vs. U.S. Nominal GDP (Gray Line) Indexed to 1946 = 100, Source: Federal Reserve



**FIGURE 6.** System-wide Debt to GDP Increases from 1.5x in 1980 to Nearly 3.5x in 2007

Source: Federal Reserve data



Over the past several decades, individual companies and industries have restructured; many companies and even industries have gone away completely as new industries and new companies have emerged. However, the economy as a whole has never been allowed to restructure following periods when the credit system has expanded too quickly. By not allowing smaller, system-wide restructurings, the Fed promoted imbalances, wittingly or unwittingly. Over time, these imbalances grew, on net, and the credit system became even more unsustainable as the underlying economic engine broke down, masked by deficit financed tax cuts, an artificial housing boom and a Fed willing to spike the punch bowl. By 2007, after two recessions and two recoveries, interest rates were 50% lower than 20 years earlier. Because credit growth had significantly outpaced GDP growth, **the only practical way to sustain inflated credit levels was to artificially suppress interest rates; the consequential bi-product of artificially low interest rates: credit-fueled asset bubbles.**

Despite creating an unsustainable environment, the Fed's monetary policy during this period is often credited for sustaining lower volatility. Because of both low inflation volatility and low volatility in output that was experienced, the period came to be known as the Great Moderation. In reality, the Great Moderation was really just the Great Suppression. Central bankers suppressed volatility by progressively lowering interest rates and going back to the well time after time. The Fed believed that more "effective" monetary policy meant creating an environment of lower volatility which supported healthy economic expansion.

Ironically, the Fed's policy to suppress volatility through lower and lower interest rates actually contributed significantly to future volatility, leading directly to the Great Financial Crisis, a period of violent volatility. Unfortunately, most economists and central bankers do not accept this reality and are still blind to the causal link between the Great Suppression of the false moderation and the great volatility of the 2008 crisis. The following excerpt from a representative of the Federal Reserve Bank of Kansas City describes how the period from the mid-1980s to 2007 is viewed in most mainstream circles.

## **FIGURE 7.** *The Great Moderation or the Great Suppression: View from the Kansas City Fed*

Source: Federal Reserve Bank of Kansas City, Craig S. Haikkio (Senior VP, Economic Polity), Link Below

*The Great Moderation from the mid-1980s to 2007 was a welcome period of relative calm after the volatility of the Great Inflation.<sup>1</sup> Under the chairmanships of Volcker (ending in 1987), Greenspan (1987-2006) and Bernanke (starting in 2006), inflation was low and relatively stable, while the period contained the longest economic expansion since World War II. Looking back, economists may differ on what roles were played by the different factors in contributing to the Great Moderation, but one thing is sure: **Better monetary policy was key.** Unfortunately, the financial crisis of 2007-08 and the ensuing Great Recession broke the calm of the Great Moderation. An important question for Federal Reserve policymakers—and for other policymakers in the United States and worldwide—is whether the disruption beginning in 2007 was a temporary blip or reflects a shift to a more volatile economy going forward. The significant decline in macroeconomic volatility that began in the mid-1980s and came to be known as the Great Moderation has been documented by many, including Stock and Watson (2003), Bernanke (2004), and Clark (2009). ([TheGreatModeration](#)).*

The prevailing economic debate regarding this period is not whether the Great Moderation caused the Great Financial Crisis; instead, the debate is whether the Great Financial Crisis marked the ending of the Great Moderation. While central bankers and economists debate to what degree “better monetary policy” deserved credit for the period of sustained lower volatility prior to the crisis, the debate should be whether this policy contributed to the violent volatility and instability experienced during the crisis. In 2004, prior to becoming the Fed Chairman and prior to the crisis, Ben Bernanke argued that improved monetary policy deserved more credit than it had received.

## **FIGURE 8.** *Bernanke on the Great Moderation: Thank the Federal Reserve*

Source: Remarks by Governor Ben Bernanke, Speech at meetings of Eastern Economics Association, February 2004

*“Whether the dominant cause of the Great Moderation is structural change, improved monetary policy, or simply good luck is an important question about which no consensus has yet formed. **I have argued today that improved monetary policy has likely made an important contribution not only to the reduced volatility of inflation (which is not particularly controversial) but to the reduced volatility of output as well.** Moreover, because a change in the monetary policy regime has pervasive effects, I have suggested that some of the effects of improved monetary policies may have been misidentified as exogenous changes in economic structure or in the distribution of economic shocks. This conclusion on my part makes me optimistic for the future, because I am confident that monetary policymakers will not forget the lessons of the 1970s. **I have put my case for better monetary policy rather forcefully today, because I think it likely that the policy explanation for the Great Moderation deserves more credit than it has received in the literature.**”*

At the time, Bernanke was without the benefit of hindsight; however, it remains telling that the future Fed Chairman thought that the Fed was creating an environment of financial stability when in fact the opposite was true. In the midst of the crisis, the Fed responded with more of the same policy (lower rates), further establishing that the Fed did not recognize that it was that very same failed policy of the Great Moderation which had contributed to the instability in the financial system leading up to the crisis.

Nassim Nicholas Taleb, author of *the Black Swan* (2007), and Mark Blyth argue that suppressing volatility makes the world less predictable and less safe in an essay comparing the circumstances of the financial crisis to the Arab Spring (the Black Swan of Cairo, 2010). Whether financial or political, modern social systems are increasingly complex and interconnected; such systems are made inherently less stable and more fragile by inhibiting fluctuations, according to Taleb and Blyth. While central bankers should have

debated to what extent **suppressed volatility increased instability and future volatility** prior to charting the unprecedented course of quantitative easing, that debate has been left to contrarians, the market and the future of the American economy.

**FIGURE 9. *The Black Swan of Cairo: Suppressing Volatility Increases Risk, No Stability Without Volatility***

Source: Taleb & Blythe, *Foreign Affairs*, May/June 2011 Issue

**Complex systems that have artificially suppressed volatility tend to become extremely fragile, while at the same time exhibiting no visible risks.** In fact, they tend to be too calm and exhibit minimal variability as silent risks accumulate beneath the surface. Although the stated intention of political leaders and economic policymakers is to stabilize the system by inhibiting fluctuations, the result tends to be the opposite. These artificially constrained systems become prone to "Black Swans"—that is, they become extremely vulnerable to large-scale events that lie far from the statistical norm and were largely unpredictable to a given set of observers. **Such environments eventually experience massive blowups, catching everyone off-guard and undoing years of stability** or, in some cases, ending up far worse than they were in their initial volatile state. Indeed, the longer it takes for the blowup to occur, the worse the resulting harm in both economic and political systems. [...]

**Variation is information. When there is no variation, there is no information [...]** As Jean-Jacques Rousseau put it, "A little bit of agitation gives motivation to the soul, and what really makes the species prosper is not peace so much as freedom." With freedom comes some unpredictable fluctuation. This is one of life's packages: **there is no freedom without noise—and no stability without volatility.** (*Foreign Affairs*, May/June 2011 Issue)

There is a credible case to be made, upon review of history, that the Fed created instability by suppressing volatility. In an effort to smooth out the boom and bust of economic cycles, the Fed stimulated artificial demand by lowering interest rates. On the margin, this demand came initially from sources sensitive to interest rates: long-term capital-intensive projects and durable goods (housing, plants, autos, etc.). As a function of this, future demand was pulled forward, naturally creating excess supply in many cases or driving consumption that could otherwise not be afforded, both limiting future capital investment and future consumer expenditures. Rather than allow excess supply to broadly be restructured and for bad debts to be written-off, the Fed continued to reduce interest-rates further and further at the slightest sign of economic slowdown, perpetuating similar cycles.

Just prior to the onset of the financial crisis, total debt outstanding in the U.S. credit system had grown to \$53 trillion (system wide, including public + private sector). At the time, the banking system and its \$53 trillion in debt liabilities were supported by only \$350 billion of bank liquidity (a ratio of approximately 150:1, debt-to-cash system-wide excluding derivatives). The unstable and fragile nature of this system was supported by overnight and short-term funding markets. Each day, every dollar available was wrung out of the financial system to provide liquidity where funding was needed most. During periods of calm in the markets, market participants maintain a high willingness to lend in overnight and short-term markets as most do not need (or demand) 100% of cash holdings on any given day and short-term risk is limited. In short-term funding markets, lenders are typically banks or other financial institutions that hold excess cash balances; cash holdings of banks largely represent consumer and business deposits (i.e. banks are lending customer deposits overnight or on a short-term basis). This system works until a very small percentage of counterparties default on short-term funding or until a very small percentage of

lenders stop providing liquidity to overnight and short-term markets because of fears of broad-based insolvency.

It is because of the structure of the financial system that the subprime crisis was the match that lit the fire and not the fire itself. The fire was a massively levered financial system with too much debt funded by too few dollars. Each dollar had been levered and lent 150 times over. When credit begins to contract, heightened value is placed on liquidity and the demand for dollars increases. Consumers spend less and save more. Businesses cut costs and reduce investments. The velocity of money slows and slowing velocity is problematic for a highly levered credit system which is dependent on money flowing freely and quickly through the financial system. It becomes evident that there will never be enough dollars to repay all the dollar denominated debt which exists. The downward cycle is both vicious and procyclical as defaults lead to more defaults and credit contraction leads to more credit contraction. Because the deleveraging event is sudden and largely uncontrollable, unemployment rises sharply which further fuels the procyclicality of the fire. This is the Armageddon scenario which the Fed faced in 2008.

## THE GREAT FINANCIAL CRISIS aka THE DOLLAR CRISIS

The troubling part is that at the onset of the crisis, throughout the term of the crisis and ever since, the Fed has shown time and again that it does not fully understand the problems or the implications of its policy responses. Importantly, this is not an expression of an opinion; it is a fact that is proven out by a review of history and the test of time. Despite not fully understanding the consequences, the Fed pursued the extreme measures of reducing short-term target rates to 0% for seven years and creating \$3.6 trillion dollars, quintupling the size of its balance sheet and increasing bank liquidity by nearly 10x. The extreme policy response did not happen all at once and along the way, there was evidence that it was not working.

Despite recognition that its policy prescription was both unprecedented and experimental, and with empirical evidence that aggressive monetary easing measures were not working, the Fed's response was to do more of the same: print more money, buy more mortgaged backed securities (propping up the housing market) and buy more treasuries (distorting every risk asset in the world). In doing so, the Fed not only pursued policy which it did not and could not fully understand; it also created an environment in which an unstable \$53 trillion credit system could expand by 25%.

Despite the credit crisis, the credit system (excluding derivatives) has since ballooned to \$66 trillion in outstanding debt as of the end of 2016 – \$13 trillion larger than it was pre-crisis. In the decade since the crisis, more debt was created than existed prior to 1987 (\$11 trillion), a scenario and an equation that is simply not possible without the intervention of the Fed. **The Fed pursued these policies because it has no other tool.** Printing money, primarily through the creation of bank reserves, is all the Fed can do to stop a panic or to stem a system-wide procyclical credit contraction. The Fed may use opaque and veiled terms like federal funds target rate, open market operations, interest on overnight excess reserves, large scale asset purchases, reverse repo and quantitative easing. But, in reality, the only way the Fed achieves its policy objective of easing monetary conditions is by increasing the money supply. The Fed's tools are deficient and its knowledge and understanding of the implications are both limited and wanting.



Understanding the implications of the Fed's current policy decisions and the psychology of its governing body related to future decisions is critical in navigating the unintended consequences that lie ahead.

While there is 30 years of history from which to choose, understanding the Fed's deficiency over the course of the past decade beginning at the onset of the crisis, before most everyone even knew a crisis was imminent, best illuminates the path forward. In February 2007, subprime had become a concern and the S&P 500 index dropped 5%. In the subsequent March 2007 Fed meeting, Chairman Bernanke was admittedly puzzled by the link between subprime and the stock market.

**FIGURE 10.** *Puzzled: Estimated Subprime Loss of \$50 Billion Would Lead to a \$10 Trillion Market Sell-Off*

Source: Federal Reserve Transcripts, March 2007 meeting of Board of Governors

*CHAIRMAN BERNANKE. I had been puzzled about the quantitative relationship between the subprime problems and the stock market. I think that the actual money at risk is on the order of \$50 billion from defaults on subprimes, which is very small compared with the capitalization of the stock market. It looks as though a lot of the problem is coming from bad underwriting as opposed to some fundamentals in the economy. So I guess I'm a bit puzzled about whether it's a signal about fundamentals or how it's linked to the stock market.*

The Fed did not (and still does not) regulate individual derivative markets but it did regulate the financial institutions which dealt in derivatives. Despite overseeing these institutions and the risks to which their balance sheets were exposed, Bernanke had no reliable measure of the derivatives linked to subprime, and at the onset of the crisis, he continually failed to recognize that the crisis was one of liquidity; over time, he failed to understand the extent of the liquidity crisis. This failure was a function of a wholesale misunderstanding of why a credit system with \$53 trillion in debt (excluding derivatives) supported by only \$350 billion in liquidity was unstable and why it was susceptible to a bank run at the strike of any match (whether subprime or otherwise).

After famously saying that problems in the subprime market seemed likely to be contained in March 2007, more cracks in the facade appeared over the summer and fall of 2007. Bernanke's misunderstanding of both the potential systemic risk and the poor liquidity profile of the financial markets were highlighted in 2008 as market turmoil accelerated. The Fed Chairman failed to identify the then present dollar crisis in the lead up and in the midst of the turmoil.

**FIGURE 11.** *Bernanke Misses the Systemic Risk and the Extent of the Liquidity Crisis in 2008*

Source: Fed Chairman, comments from various meetings, speeches and press conferences, January - July 2008

*"The Federal Reserve is not currently forecasting a recession." – January 10, 2008*

*"[The U.S. economy] has a strong labor force, excellent productivity and technology, and a **deep and liquid financial market** that is in the process of repairing itself." – January 18, 2008*

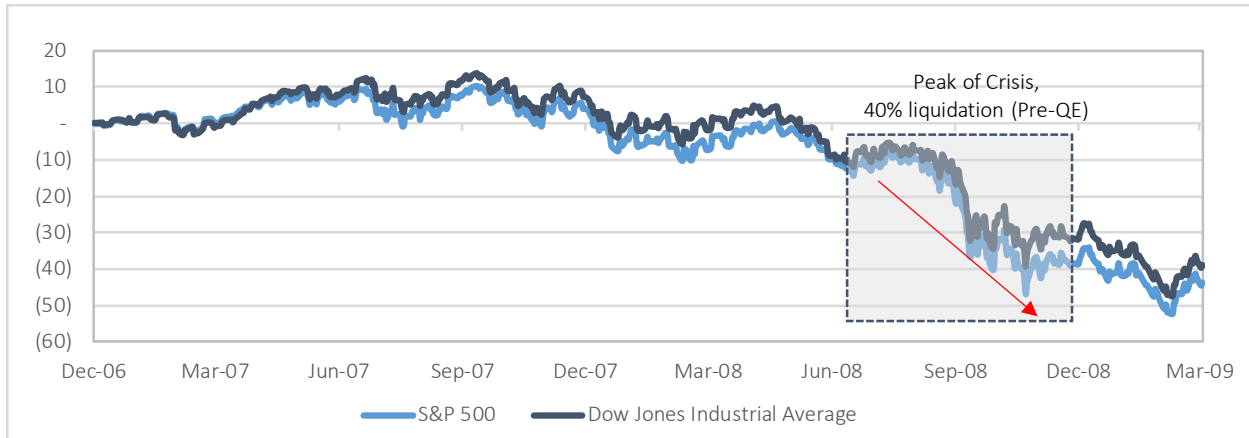
*"The risk that the economy has entered a substantial downturn appears to have diminished over the past month or so." – June 9, 2008*

*"The **GSEs are adequately capitalized**. They are in no danger of failing." – July 20, 2008*

From peak to trough, the U.S. stock market lost \$10 trillion in value, corporate bonds were sold, gold was sold, foreign currency was sold. As the following charts show, **everything was a source of funding for dollars** because everyone was short dollars and there was a global shortage.

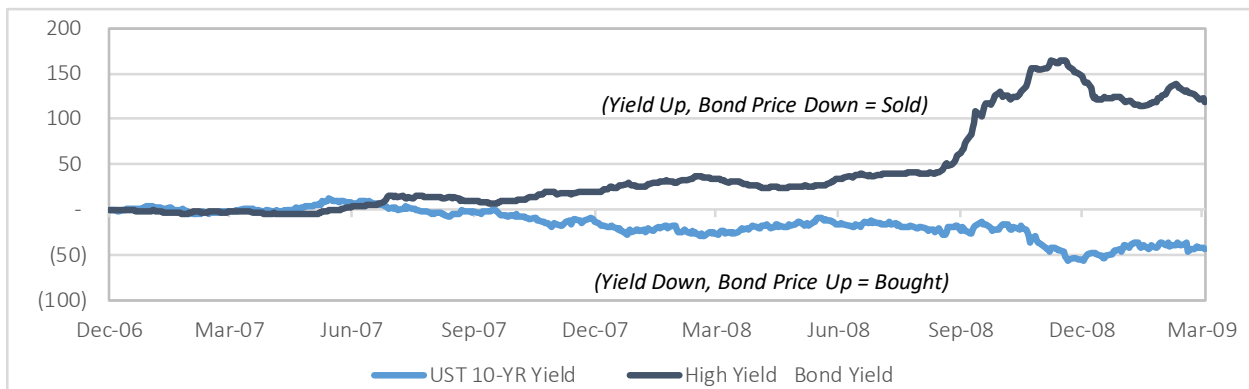
**FIGURE 12. Equities Sold: The Stock Market Lost \$10 Trillion in Value from Peak to Trough**

Source: Bloomberg, S&P 500 (Light Blue), Dow Jones Industrial Average (Dark Blue), Indexed Price Chart (0 = 2006)



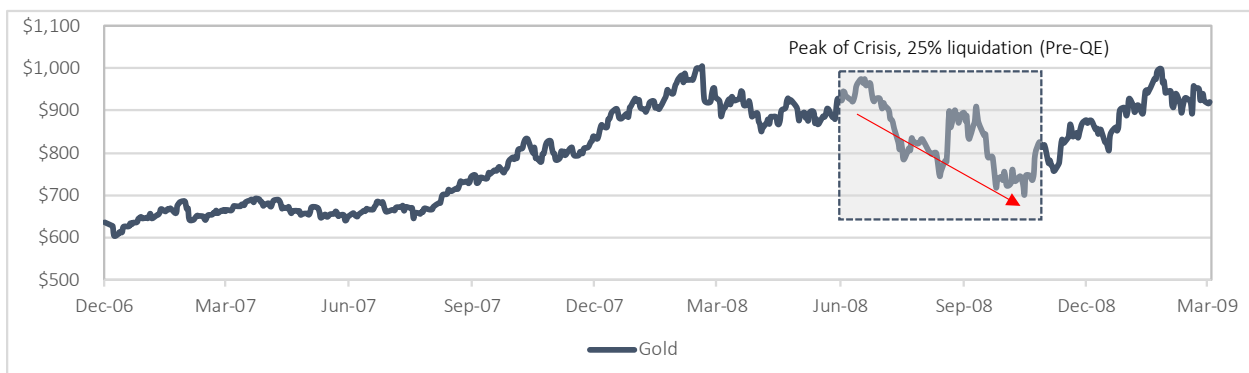
**FIGURE 13. High Yield Bonds Sold, Treasuries (Dollars) Bought: Junk Bond Yields More Than Doubled**

Source: JP Morgan, 10-YR Treasury Yield (Light Blue), High Yield Index Yield (Dark Blue), Indexed Yield (0 = 2006)



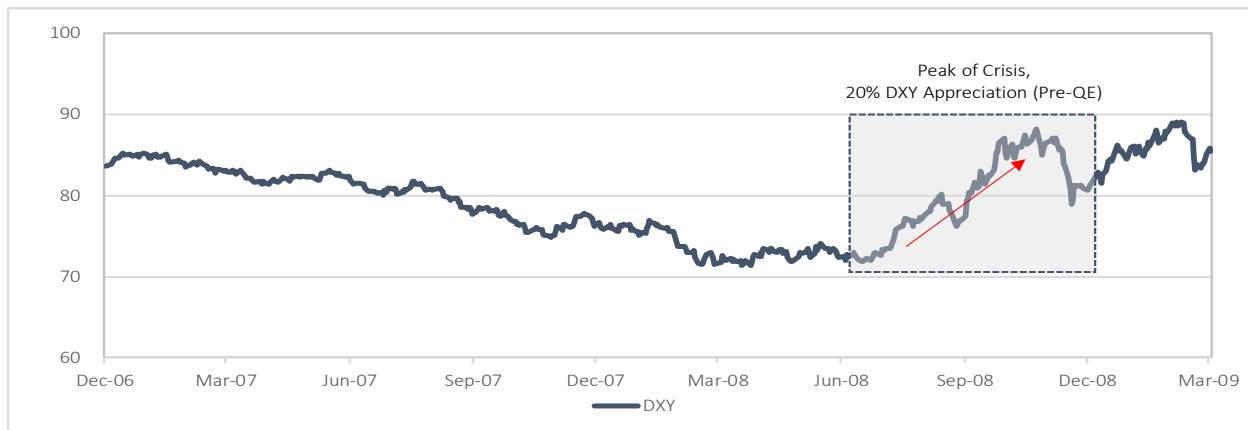
**FIGURE 14. Gold Sold: Historical Flight to Safety Lost Approximately \$1.25 Trillion in Purchasing Power**

Source: Bloomberg, Gold Spot (Dark Blue), Price per Troy Oz (\$), 2006-2009



**FIGURE 15.** Dollar Index Appreciated 20%: FX Sold to Acquire Dollars

Source: Bloomberg, DXY Index (Dark Blue), Nominal Level, 2006-2009



**Everything was sold to acquire dollars in order to fund dollar denominated liabilities.** Estimated subprime mortgage losses amounted to less than half of 1% of the loss in stock market value. It was a dollar crisis that began with subprime. As Nassim Taleb would argue, the system was complex and fragile; attributing the crisis to subprime is similar to blaming an avalanche on the singular disturbance that exposes the fragility of the unstable system.

Bernanke and the Fed fundamentally misunderstood why the system as constructed was experiencing such significant strains in liquidity. What seems obvious in hindsight was not to the Fed, nor was it to the vast majority of all market participants that blindly ignored the risks of a highly levered financial system dependent on wholesale short-term funding. With \$53 trillion in debt and only \$350 billion of liquidity, how could the Fed Chairman view the financial markets as deep, liquid or stable? The Fed believed the \$350 billion in liquidity was sufficient because it was looking at the financial markets through the status quo lens of short-term funding needs and perpetual refinancing and re-leveraging of the debt stock. It had failed to recognize the unsustainable monster that it had created. **Because every dollar that existed in the banking system had been leveraged 150 times to create bank and shadow bank liabilities, it was a mathematical impossibility that all the debts could be repaid** and, the Fed had not seriously considered the possibility or consequence of a system-wide deleveraging event.

The banking system was a massive game of musical chairs and when the music stopped, everyone finally realized that the system was far more than one chair short. Not every dollar of debt is due on a given day, or in the next 30 days or in the next six months or even in a year. Far from it, in fact. However, as market participants figured out the reality of the dollar scarcity, it did not matter when debts were due. Everyone needed to source dollars to pay future maturing debts and to protect against insolvency. At the same time, everyone was fearful of counterparty risk and insolvent borrowers. The consequence was a run on dollars and short-term funding markets stopped functioning. The liquidity which the Fed thought was deep and liquid evaporated because it was always an illusion. Short-term funding is only a reliable source of liquidity when the demand is limited. When a system-wide need arises, short-term funding is never a reliable source of liquidity because there could never be enough and the fear of insolvency is legitimately broad-based. It follows that, any time there is a system wide deleveraging event, a system-wide need for liquidity arises. By the transitive property, there will almost assuredly be a liquidity crisis in response to a system-wide deleveraging event, no matter how deep or liquid the Fed perceives the banking system.

## THE QUANTITATIVE EASING (QE) RESPONSE

The consequences of a system-wide deleveraging event are extremely severe because of the leverage profile of the financial system and the risk of such an event is present today because of the Fed's response to the last crisis. In response to the 2008 crisis, despite being caught by surprise, the Fed recognized that, in order to prevent a massive credit cycle, it needed to take extreme measures to spur "aggregate demand" in order to reverse the contractionary tidal wave. While it had already taken measures to inject term-liquidity into the financial system to address the liquidity crisis, the Fed maintained the misguided view that, to solve the longer-term problem, it just needed to reduce interest rates low enough to restart the economic engine. That meant not just lowering short-term rates; this time, it meant manipulating long-term rates as well and in order to effect this, the Fed pursued large-scale asset purchases (QE).

There is a saying about the definition of insanity. In the Fed's case, it is guided by two principal philosophies that prevent it from changing course. First: the Fed is dominated by monetarists that believe, in response to contractionary periods, the path to full employment is to increase the money supply (printing money) which is aimed at reducing the value of each dollar relative to goods and services with the goal of inducing an increase in dollar spending (aggregate demand). Second: the Fed created the problem through failed policy; if it does nothing, it will become apparent that the emperor has no clothes and it is easier to do something rather than nothing. The insanity is emboldened by the popular delusion that debts will be inflated away (or made to be sustainable) as money is printed when in reality such a policy only serves to create an environment in which more unsustainable debt will be created.

Accordingly, and in response to the 2008 crisis, the Fed did what it had been doing over the past two decades. It just did so on a massive scale. When the United States terminated the convertibility of the U.S. dollar to gold on August 15, 1971, effectively ending the Bretton Woods system, the checks and balances on an otherwise independent Federal Reserve were removed. With it, the door was opened for unfettered, and unchecked, money printing by the Fed. Alexander Hamilton, one of the founding fathers of the national central bank, supported the formation of a common national currency but warned, presciently, of the risks posed if that currency was not backed by physical money, specifically gold.

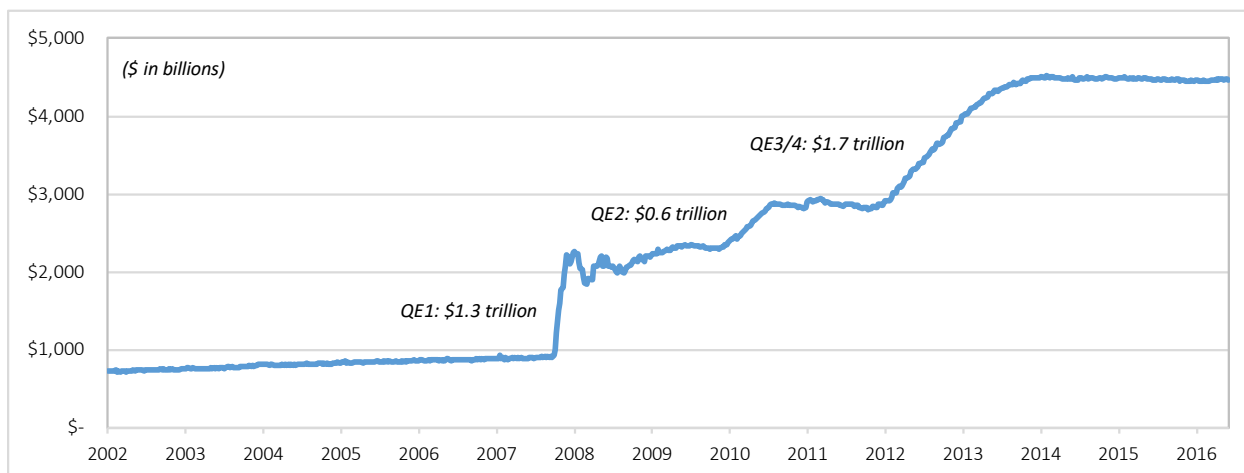
**FIGURE 16.** *Alexander Hamilton Musing on the Federal Government and the Emission of Paper Currency*

Source: Hamilton Writings, 590-591, Hamilton speaking to the House in Congress

*"The emitting of paper money by the authority of Government is wisely prohibited by the individual States, by the national constitution; and the spirit of that prohibition ought not be disregarded by the Government of the United States. Though paper emissions, under a general authority, might have some advantages not applicable, and be free from some disadvantages which are applicable to the like emissions by the States, separately, yet they are of a nature so liable to abuse – and it may even be affirmed, so certain of being abused – that the wisdom of the Government will be shown in never trusting itself with the use of so seducing and dangerous an expedient. In times of tranquility, it might have no ill consequences; it might even be managed in a way to be productive of good; but, in great and trying emergencies, there is almost a moral certainty of its becoming mischievous. The stamping of paper is an operation so much easier than the laying of taxes, that a government, in the practice of paper emissions, would rarely fail, in any such emergency, to indulge itself too far in the employment of that resource, to avoid, as much as possible, one less auspicious to present popularity. If it should not even be carried so far to be rendered an absolute bubble, it would at least be likely to be extended to a degree which would occasion an inflated and artificial state of things, incompatible with the regular and prosperous course of the political economy. – Alexander Hamilton, *The Writings* 590-91.*

While Hamilton could not have envisioned the complexities of the modern financial system or the extent of the Federal Reserve's active role in financial markets, this founding father clearly understood the foundational risk of an unchecked Federal Government and national central bank. The Fed's response to the financial crisis in 2008 was the culmination of a century long deterioration in foundational principles and the ultimate deviation from sound monetary policy. At the height of the liquidity crisis, quantitative easing officially began with the oft-romanticized bank bailout engineered by Ben Bernanke and Hank Paulson in October 2008. Over the course of the subsequent five years, the Federal Reserve would pursue three quantitative easing programs, increasing the Fed's balance sheet from \$900 billion to \$4.5 trillion.

**FIGURE 17.** *Federal Reserve Quantitative Easing Programs Quintuple the Size of the Fed's Balance Sheet*  
Total Assets of the Federal Reserve Banks, U.S. Dollars in Billions, Source: Federal Reserve Data.



The evolution of the Fed's emergency policy makes self-evident just how unprecedented and experimental its actions really were. The Fed cut its target policy rate seven times over the course of 2008, from 4.25% to 0%. It offered up to \$400 billion in term liquidity to banks. As the crisis spread throughout the globe, it expanded existing dollar swap lines to the European Central Bank and the central banks of Switzerland, Japan, Canada, and England. It created new swap lines for the central banks of Australia, Norway, Sweden, Denmark, New Zealand, Brazil, South Korea and Mexico. After allowing Lehman Brothers to fail, it provided a bailout loan to AIG in the amount of \$85 billion and worked with the Federal Government to engineer a \$250 billion bailout of nine Wall Street banks and to implement a \$700 billion troubled asset relief program (TARP). After all the extreme bailout measures coordinated with the Treasury Department and passed by Congress, the economy remained in turmoil and the Fed then decided it appropriate and necessary to pursue the first of three quantitative easing programs.

Through QE1, the Fed committed to buy \$600 billion in mortgage-backed securities (MBS) and to expand its purchases of treasury securities and bank debt. After halting asset purchases in June 2010, the Fed resumed purchases in August 2010 in order to maintain the total size of its balance sheet as loans held by the Fed matured. With the recovery at risk, the Fed subsequently authorized a second QE program to further expand its balance sheet through the purchase of \$600 billion in incremental treasury securities. If the emergency bailout measures and QE1 had been successful in stabilizing markets and the economy, why was a second QE necessary? If the actions taken during the course of 2008 and 2009 established that

the financial system was unstable and unsustainable, the need for QE2 led to questions regarding the efficacy of the Fed's various policy responses.

The operation of increasing the money supply through the creation of bank reserves should have been recognized for what it was, creating an environment incompatible with the regular and prosperous course of the economy (in Hamilton's words). Instead, guided by monetarists, the Fed believed that the most effective way to achieve its policy mandate of full employment was to continue to stimulate aggregate demand through monetary easing and the lowering of interest rates. After approving QE2 in November 2010, Ben Bernanke appeared on 60 Minutes to reassure the nation that the Fed had everything under control and that its latest round of balance sheet expansion was prudent and necessary. In this interview, Bernanke communicated exactly what the Fed was aiming to achieve through QE2: to further lower interest rates. Often mocked, Bernanke also explained that it was a myth that what the Fed was doing amounted to printing money.

**FIGURE 18. Ben Bernanke: The Fed is Not Printing Money Through QE, It Is Lowering Interest Rates**

Source: 60 Minutes Interview, December 2010

*"One myth that's out there is that what we're doing is printing money. We're not printing money. The amount of currency in circulation is not changing. The money supply is not changing in any significant way. What we're doing is lowering interest rates by buying Treasury securities. And by lowering interest rates, we hope to stimulate the economy to grow faster. So, the trick is to find the appropriate moment to begin to unwind this policy. And that's what we're going to do." – Ben Bernanke, 60 Minutes Interview, December 2010*

While nuanced, the Fed was not physically printing money. When Bernanke explained that currency in circulation was not changing, it actually was not. The Fed's balance sheet is comprised of two primary forms of liabilities: currency in circulation and bank reserves. The former is physical currency (paper cash and coin) that exists largely outside the control of the banking system; the latter represents bank claims held by various banking institutions within the Federal Reserve system. The Fed, through QE, was increasing the amount of bank reserves; so long as those reserves were not converted to physical currency, the liquidity created by the Fed would remain in the banking system. While the vast majority of market participants view Bernanke's infamous comments as either intentionally misleading or a flat out lie, what if, however simplistic, the Fed really did not consider what it was doing as printing money?

As Bernanke stated, the Fed's goal was to stimulate the economy by lowering interest rates. With its short-term policy rate already at 0%, the only way to effect such an end was to purchase longer duration securities to influence longer-term interest rates. **The Fed recognized that it was increasing the amount of bank reserves, and as a direct consequence, dollar liquidity in the banking system; however, its goal was to lower interest rates, not provide incremental liquidity.** The liquidity crisis had passed and so had the need for more liquidity (as viewed by the Fed); QE2 was all about interest rate targeting. And, the Fed viewed its measures as temporary. Regardless of how extended a period the Fed's balance sheet would remain at elevated levels, the Fed could drain bank reserves as quickly as it created bank reserves, notably by either allowing securities which it held to mature without reinvesting proceeds

or by actively selling securities in the open market. The same is not true for currency in circulation (physical cash) and likely why the Fed viewed its operations as different, and temporary.

The distinction is nuanced but critical. A goal of interest rate targeting vs. injecting liquidity. The order of operations may be confusingly similar and the lines are certainly blurred; but, it speaks to the psychology of the Fed's decision making: QE2 was about a continuation of the policies of the Great Moderation, signaling that despite the volatile course of 2008 and 2009, the Fed did not see the need to chart a new course. If ever a time for introspection, the years subsequent to the financial crisis should have been it but the Fed was either too blind or too stubborn to recognize the failures of its policy. The deployment of QE2 certified this conclusion and set up the sequence of events that would transpire in 2011, events that would turn out to significantly damage the Fed's credibility.

While 2008 and 2009 are remembered for the height of the crisis, 2011 turned out to be the most critical marker in the last decade for what comes next. During this critical but often overlooked year, the conditions of the real economy deteriorated; the Fed's QE programs were proven to be ineffective; and the instability of the financial system once again became evident. A comprehensive review of the Fed transcripts from 2011 (which were just made available in January 2017) shows that the Fed had a limited understanding of why. After 2011, any baseline assumption that the Fed reasonably understands the implications of its policy decisions on financial markets or the real economy is willingly ignorant of history.

With QE2 underway, the Fed met in January 2011 and the consensus, at the time, was that the economy was improving with the risks to the Fed's economic projections being balanced or to the upside (i.e. downside risk was seen as limited). QE2 was working much to the satisfaction of the Fed. When the Fed next met in March 2011, the members viewed the economy as still improving but at a lower than expected pace. By the subsequent meeting in April, the economic outlook was mixed; there were members concerned about downside risks and others concerned about the inflationary impact of QE. However, the sentiment regarding the economic recovery was positive enough to justify a lengthy debate on how the Fed would sequence the tightening of monetary policy when the appropriate time came. By the June meeting, members took note of recent weakness in the economy as incoming data had almost uniformly disappointed. While most believed a moderate recovery was still underway, sentiment had become notably more pessimistic and the perception of downside risks to the Fed's projections had increased. Despite the deterioration in the economic outlook, the recovery was still intact and the Fed concluded round 2 of QE at the end of June 2011 as planned, halting further expansion of the Fed's balance sheet.

During the short period between the conclusion of QE2 at the end of June and the subsequent Fed meeting in August, financial conditions became significantly more turbulent. During the Summer months, the U.S. economy was slowing and there were increasing concerns about long-term and short-term growth. The Fed recognized that "leverage and debt" were "retarding growth over a longer period" and noted weak consumer spending as a particular concern. At the same time, a confluence of global events further impaired financial conditions: Europe was on the brink of a sovereign debt crisis, Congress struggled to authorize an increase in the debt ceiling and S&P downgraded the U.S. credit rating amidst the budget and debt-ceiling turmoil. Conditions in financial markets had deteriorated so significantly and so quickly that liquidity became an issue.

In just eight short months, the economy went from improving steadily, to moderating, to deteriorating rapidly. What was particularly extraordinary was that this rapid shift in economic conditions occurred as the Fed was actively purchasing \$600 billion in U.S. treasuries through QE2. The extraordinary nature of what occurred and when it occurred was not lost on the Fed. While the liquidity pressures and concerns ultimately subsided without the Fed having to take emergency measures, the issues were severe enough to prompt debate regarding the stability of financial markets and the effectiveness of QE. The head of the Fed's open market operations, on multiple occasions, noted how concerning and unexpected it was that there would be liquidity issues given the Fed had increased bank reserves to \$1.6 trillion through QE1 and QE2. Prior to QE, there were only \$10 billion in bank reserves held with the Fed and the banking system had approximately \$350 billion in total cash. By August 2011, the banking system was supported by \$1.7 trillion in cash, of which \$1.6 trillion in bank reserves were held at the Fed; yet somehow, liquidity issues suddenly became evident. Prior to the crisis, Bernanke mistakenly viewed the financial system as deep and liquid; after QE1 and QE2, the previously misunderstood liquidity problem should have been solved by the Fed's response.

**FIGURE 19. Head of Fed's Open Market Account: Why is Liquidity an Issue with Reserves of \$1.6 trillion**

Source: Federal Reserve Transcript, August 2011, Brian Sack – Head of System Open Market Account (SOMA)

*"MR. SACK. Can I add a comment? In terms of your question about reserves, as I noted in the briefing, we are seeing funding pressures emerge. We are seeing a lot more discussion about the potential need for liquidity facilities. I mentioned in my briefing that the FX swap lines could be used, but we've seen discussions of TAF-type facilities in market write-ups. **So the liquidity pressures are pretty substantial. And I think it's worth pointing out that this is all happening with \$1.6 trillion of reserves in the system.**"*

*"MR. SACK. As I noted on the videoconference, **the spike in short-term funding rates left the Desk on alert to the possibility of having to conduct repurchase agreements to keep the federal funds rate within the FOMC's target range. This was an extraordinary outcome, given that the financial system has about \$1.6 trillion in excess reserves. In the end, we did not conduct any such operations, as the federal funds rate remained within the FOMC's target range.**"*

Once again, the stability of the financial system was called into question, even after extreme measures taken by the Fed. This stress further substantiates two conclusions: 1) the perceived liquidity in the financial markets is and will always be insufficient so long as the leverage profile remains at unsustainable levels (at this point, debt-to-cash was approximately 32:1, \$55 trillion in debt vs. \$1.7 trillion in banking system cash); and 2) the Fed fundamentally struggles with the inherent liquidity risk present in financial markets because it views liquidity through the status quo lens of short-term funding needs.

Not only was the shock severe and sudden enough to raise questions about how short-term liquidity could possibly be an issue; it also led Chairman Bernanke to admit that there was reason to question the efficacy of the Fed's policy. Despite admitting that the Fed could not solve fiscal and structural problems through monetary policy and that the monetary base was not the main problem with the economy, Chairman Bernanke still viewed it as the Fed's responsibility to be "palliative" – to relieve pain without dealing with the cause of the condition. Even when the Fed is introspective and honest concerning its limitations, it finds itself trapped between two bad options: do something or do nothing. What happens when an unstoppable force meets an immovable object? In the case of the Fed, the answer is to stay the course: pursue more and not less. It is partly a function of human nature (survival instincts) and partly a



function of an unchecked and unelected central bank rationalizing irrational decisions. The consequence is short-term stability at the expense of long-term sustainability.

**FIGURE 20. Bernanke at a Crossroads: Monetary Policy is Not the Issue but It Can Still Be the Solution**

Source: Federal Reserve Transcript, August 2011, Ben Bernanke – Fed Chairman

*"CHAIRMAN BERNANKE. I'm perfectly willing to accept the argument that monetary policy is not the main tool, that this is not the main thing wrong with the economy, but it's our duty to do what we can, to be palliative, to help where we can, even if we can't solve fiscal, structural, and other problems."*

At the same meeting, there were at least a few rational participants willing to admit, in an unqualified and unapologetic manner, that the Fed was pursuing extreme and experimental policy without sufficient understanding of the links between the financial sector and the real economy and of the impact of overall deleveraging on the economy.

**FIGURE 21. Fed Economist: Gaps in Understanding Link Between Financial and Real Sector Are Profound**

Source: Federal Reserve Transcript, August 2011, David Wilcox – Fed Economist

*"MR. WILCOX. We've been marching determinedly in a negative direction. John Stevens had a nice exhibit in yesterday's Board briefing that showed just how much we'd taken the forecast down over the course of this year. **Also, I want to just emphasize that I think the gaps in our understanding of the interactions between the financial sector and the real sector are profound**, and they have, over the past few years, deeply affected our ability to anticipate how the real economy would respond, and they are continuing to do so now. This is an ignorance that we share with the entire rest of the profession, and I think one thing that is good to see is the enormous amount of work that's going on at the Board, in the System, and in the profession at large in an attempt to develop a better understanding of the interactions between the real sector and the financial sector, operating in both directions. **But boy, I don't know whether that literature is in its infancy, but I would not put it at any more beyond toddlerhood.** We've got just an enormous amount yet to learn and incorporate in that regard."*

**FIGURE 22. Fed Governor: Limited Understanding of How Overall Deleveraging Impacts the Economy**

Source: Federal Reserve Transcript, August 2011, Richard Fisher – Fed Governor

*"MR. FISHER. In terms of our outlook for the economy. And we're constantly asking ourselves, **what have we been missing, or what did we miss**, and how useful are our various models, depending on their degree of sophistication, in terms of being of assistance to us in trying to get a sense of what's developing in the economy? I wonder if, at some point—we may not do it now, but **it strikes me that one of the issues that I don't think we understand very well—this is my working hypothesis—is how our models are affected by overall deleveraging.** Consumer sector deleveraging, for sure. Certainly a releveraging has taken place in the business sector amongst corporate credits, and, right now, what I expect to be a significant deleveraging is happening in the fiscal sector—that is, with the federal, state, and local governments. This is just really a request that we pursue this a little bit more. I see by your nodding of your head, I think I may be correct. **But I do think it's something that's inhibiting our understanding—a better understanding of this would probably enhance our understanding of what's going on with the economy.**"*

After a long discussion in April 2011 of how the tightening of monetary policy would be sequenced and after the completion of QE2 in June 2011, the market and, importantly, the economy deteriorated to

such an extent that by August 2011 the Fed was discussing liquidity issues and the potential need for more accommodative Fed policy to support the economic recovery. By September of that year, Bernanke was evoking comparisons to 2008 and the Fed determined to execute Operation Twist, an accommodative policy through which the Fed would sell \$400 billion in short duration assets (less than 3 years) to buy longer-dated assets (6 to 30 years) in order to extend the maturity profile of the Fed's balance sheet, intending to have the impact of both lowering longer-term interest rates and to signal to the market that policy would remain accommodative for a longer period of time.

**FIGURE 23. Bernanke Puzzled: 2011 Is Starting to Look a Lot Like 2008**

Source: Federal Reserve Transcript, September 2011, Ben Bernanke – Fed Chairman

*"CHAIRMAN BERNANKE. Financial conditions have continued to be strained—even reminiscent of 2008 in some dimensions. European sovereign debt and banking problems have the potential to worsen significantly, with potentially serious implications for the U.S. financial system and economy."*

*"I think the most important development over the summer is that financial instability looks to be rearing its ugly head once again. We are not yet, of course, at the level of 2008, but some of the same adverse feedback loop between the economy and financial conditions looks to be in operation."*

*"My own assessment is that the instability in financial markets, increase in spreads, decline in stock prices, increased stock volatility—all of those things taken together are at least one important reason why the bounce back in the second half that we were anticipating has been weaker than we had hoped. Not only have financial conditions affected household wealth and the cost of credit by increasing spreads, for example, but they have led to increased risk aversion, both in markets, I think, and in the real economy, and have affected sentiment as well."*

While the conditions in the Fall of 2011 also led to consideration of additional QE, the Fed avoided the temptation of any further balance sheet expansion as it executed its strategy to increase the duration of its portfolio, hoping that this policy would be accommodative enough to stimulate the economy, despite increasing pessimism concerning the recovery.

**FIGURE 24. The Art of the Argument: Bernanke Logic Planting the Seed for QE3**

Source: Federal Reserve Transcript, September 2011, Ben Bernanke – Fed Chairman

*"CHAIRMAN BERNANKE. I don't think it is literally the case that monetary policy is completely ineffective. I think we can see the effects on financial markets, which in turn must be affecting wealth, confidence, and some other determinants of spending and production. To the extent that transmission is weaker, that could be used to argue for more stimulus rather than less stimulus."*

It was not until September 2012 that the Fed decided that a third round of QE was necessary to revive the recovery, through which it approved the purchase of \$40 billion in mortgage-backed securities (per month) for an indefinite period of time. In December 2012, QE3 was expanded to \$85 billion of additional purchases per month (\$40 billion MBS + \$45 billion treasuries), again for an indefinite period of time. The Fed finally began to taper QE3 asset purchases in January 2014; as a consequence, it gradually reduced the amount of securities it purchased each month until incremental purchases were halted completely in October 2014. **From September 2012 to October 2014, the Fed effectively created \$1.7 trillion dollars, increasing its balance sheet by approximately 60% from \$2.8 trillion to \$4.5 trillion.**

QE<sub>3</sub> was not remarkable because of its size. More noteworthy was what the existence of QE<sub>3</sub> said about the Fed's decision-making process, its broad judgment, its temperament, policy inconsistencies and its ability to forecast – both in terms of economic projections and how its policy would affect the real economy. In March 2011, QE<sub>2</sub> was a success in the Fed's mind, with almost unanimous agreement among the Fed's governing body that a moderate recovery was intact and that QE<sub>2</sub>'s accommodation was having the intended effects. By the fall of that year, it became evident that the Fed was wrong; the economic recovery was at risk and the financial markets were once again unstable, reconfirming the Fed's inability to forecast policy impact or economic conditions.

Many members of the Fed's governing body, including Bernanke, admitted that monetary policy was not the main problem ailing the economy and that monetary policy could not solve fiscal and structural problems. And, many of these same members also questioned whether additional asset purchases would have any meaningful impact in reviving the economy. Despite the historical scoreboard, a recognition of its limitations and open concerns of policy efficacy, the Fed decided that it was better to be "palliative" than logical or rational; its decision was guided by fear of the unknown rather than a firm understanding of the implications, only leading to more questions concerning the Fed's judgment.

Not only did the evolution of 2011 reaffirm that the Fed put was alive; the 2011 transcripts proved out the Fed's underlying psychology: something is better than nothing (almost literally Bernanke's words). The Fed certainly recognized that its policy came with uncertainty and that there would likely be unintended consequences. However, beyond a broad fear of inflationary impacts and an admission of uncertainty and unintended consequences, the Fed did not rigorously debate or quantify the range of possible negative outcomes (at least not at the time or in the record). It did not debate the consequences of encouraging a credit system which had expanded at a rate of 200% in excess of GDP to expand by 25%. It failed to identify all of the economic imbalances which its policies would allow to be sustained and likely cause to grow. It never quantified why QE<sub>1</sub> and QE<sub>2</sub> were ineffective; nor has it ever been able to enumerate why QE<sub>3</sub> was different. The principal reason why? Because it does not and cannot know. In its own eyes, it was the Fed or Armageddon, more or nothing. Pursuing more of the same policy without first understanding the reasons for its failures and, consequently, the expectations for its future success, demonstrates the Fed collectively lacks the required discretion and temperament for the job it possesses. Its general disposition has proven inconsistent with that of a board of a multi-billion corporation yet it is authorized, and actually managed, to spend trillions of dollars.

Moreover, the Fed's decision to expand purchases of mortgage-backed securities shined a bright light on the extent of the inconsistencies in its policy. The Fed justified its original expansion into MBS during QE<sub>1</sub> by arguing it was necessary in order to improve market functioning in a critical non-functioning market. Many Fed members expressed concerns during 2011 about the Fed being in the business of credit allocation rather than simply interest rate targeting and argued for a transition as quickly as possible to a balance sheet only comprised of treasuries. With varying degree of concern, most agreed. Without the transcripts yet available for 2012, it is impossible to fully know what changed and the nature of the debate. The minutes from the September 2012 Fed meeting only serve to further highlight the policy inconsistency and the gap between the concerns regarding the Fed holding MBS in 2011 and its decision in 2012 to expand purchases of MBS massively.

Despite longer-term inflation expectations being "stable" and improvement in the labor market, the Fed used the excuse of "medium-term" inflation being below an arbitrary 2% threshold and the "slow pace" in labor market improvement to justify incremental purchases of \$40 billion per month in MBS for an indefinite period of time. This decision led to the aggregate purchase of an incremental \$1.1 trillion in MBS, adding to the \$600 billion purchased through QE1. While it was noted that one voting member (Richmond Fed President Jeffrey Lacker) dissented "because he viewed it as inappropriate for the Committee to choose a particular sector of the economy to support," the committee as a whole never justified why in fact it was appropriate nor did it disclose that the concern was more broad-based.

**FIGURE 25. A Wanting Justification for an Inconsistent Policy Stance Leads to \$1.7 Trillion More QE**

Source: Federal Reserve Minutes, September 2012 Meeting

*"Members generally continued to anticipate that, with **longer-term inflation expectations stable** and given the existing slack in resource utilization, inflation over the medium term would run at or below the Committee's longer-run objective of 2 percent."*

*"In their discussion of monetary policy for the period ahead, members generally expressed concerns about the slow pace of improvement in labor market conditions and all members but one agreed that the outlook for economic activity and inflation called for additional monetary accommodation. Members agreed that such accommodation should be provided through both a strengthening of the forward guidance regarding the federal funds rate **and purchases of additional agency MBS at a pace of \$40 billion per month**. Along with the ongoing purchases of \$45 billion per month of longer-term Treasury securities under the maturity extension program announced in June, these purchases will increase the Committee's holdings of longer-term securities by about \$85 billion each month through the end of the year, and should put downward pressure on longer-term interest rates, support mortgage markets, and help make broader financial conditions more accommodative."*

The Fed ultimately believed that direct purchases of MBS would be more effective in the transmission of its monetary policy. The English version: household wealth is significantly tied to home values, so if the Fed manipulated the housing market to prop up home prices, the perception of household wealth would increase as would consumer confidence which would stimulate credit creation, consumer spending and aggregate demand which is the Fed's religiously held view of how best to achieve full or maximum employment. In its totality, the Fed has manipulated markets that could otherwise not be self-sustained. It has done so with poor judgment, an ill-suited temperament, a flawed decision-making process, inconsistent policies and an inability to accurately forecast or measure the impact of QE.

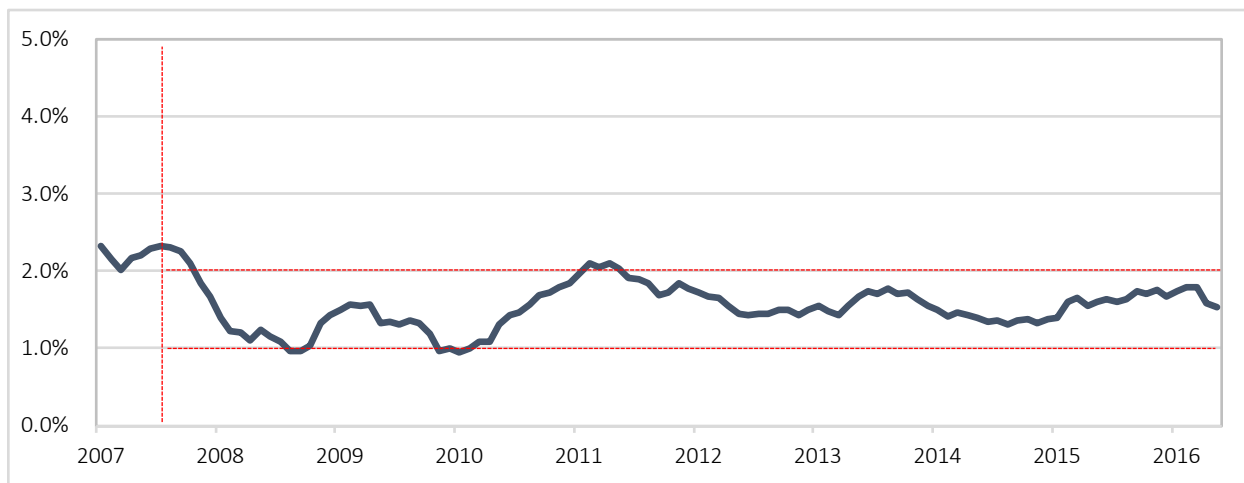
## THE CURRENT UNSUSTAINABLE STATE OF PLAY

Throughout the Fed's extreme policy experiment over the course of the last decade, inflation was the one clear and present danger of which the Fed was constantly conscious. With each additional accommodative policy decision, there were always members of the Fed concerned with impacts on inflation. **How could the Fed lower interest rates to 0% for seven years and print \$3.6 trillion dollars without creating rampant inflation?** Despite all of the Fed's herculean efforts, the Core PCE (personal

consumption expenditures) inflation measure stubbornly stayed in a tight corridor between 1-2%: low inflation volatility, just what the Fed wanted and had intended. Never mind the extreme measures that everyone thought would be more inflationary or why QE had not been.

**FIGURE 26.** *The Great Moderation Returns: Core PCE Goods and Services Y-o-Y Stays in Tight Corridor*

Source: Bureau of Economic Analysis.



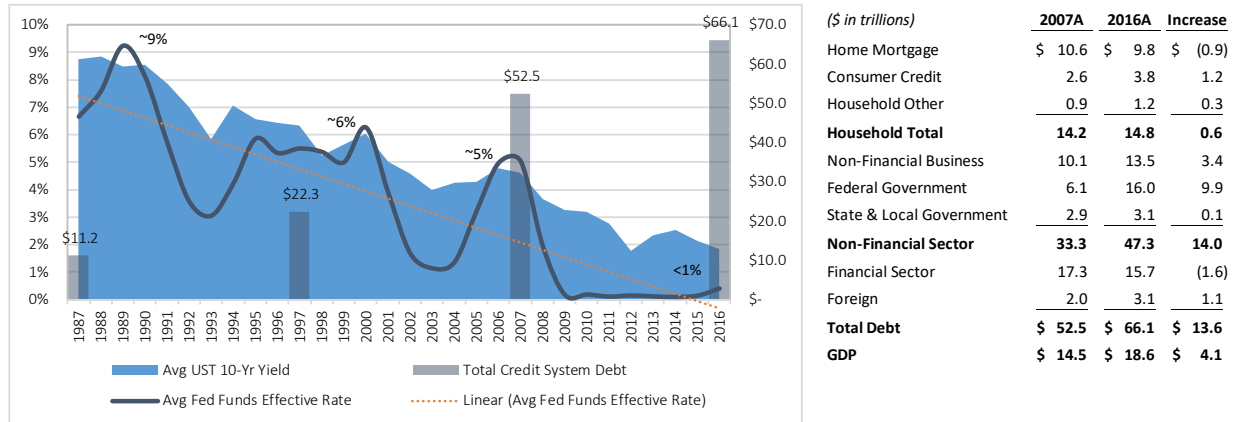
A primary reason why: debt and leverage. While there was an occasional comment about debt levels impeding growth, the Fed and the market never seem to make the direct connection between the credit system leverage and the lack of elevated inflation in response to the Fed's policy decisions. The link between the system leverage and lack of success of Fed policy in driving higher rates of growth was also never directly made. For two decades leading up the 2008 crisis, **the Fed had induced excessive leverage which not only pulled forward a massive amount of future demand but it also caused households, governments and corporations to take on debt that could not be afforded or sustained.**

As the Fed engaged in creating bank reserves to ease financial conditions, its policy was designed to induce the creation of additional credit (debt) and it was successful to the tune of \$13 trillion in incremental net debt issued from 2007 to 2016. Unfortunately, non-productive government debt expansion accounted for over 70% of the net credit created, as domestic private sector demand for credit was predictably weak because households and corporations were already over levered entering the crisis, owing debts that could not be repaid.

The Fed effectively prevented these pre-crisis debts from being restructured through its reflationary policies. In response to the Fed's extreme measures to stimulate credit demand and aggregate demand, the entire domestic private sector only created \$2.4 trillion in net new credit while the public sector allowed government debt to explode by \$10 trillion. The private sector was rational, responding to the reality of the imbalances that existed pre-crisis due to unsustainable debts that never went away while the public sector, with the help of the Fed and money dealers, borrowed to the hilt, something only an irrational economic actor could or would do.

**FIGURE 27. Lower Interest Rates = Expanded Credit System: Government Debt Leads the Way**

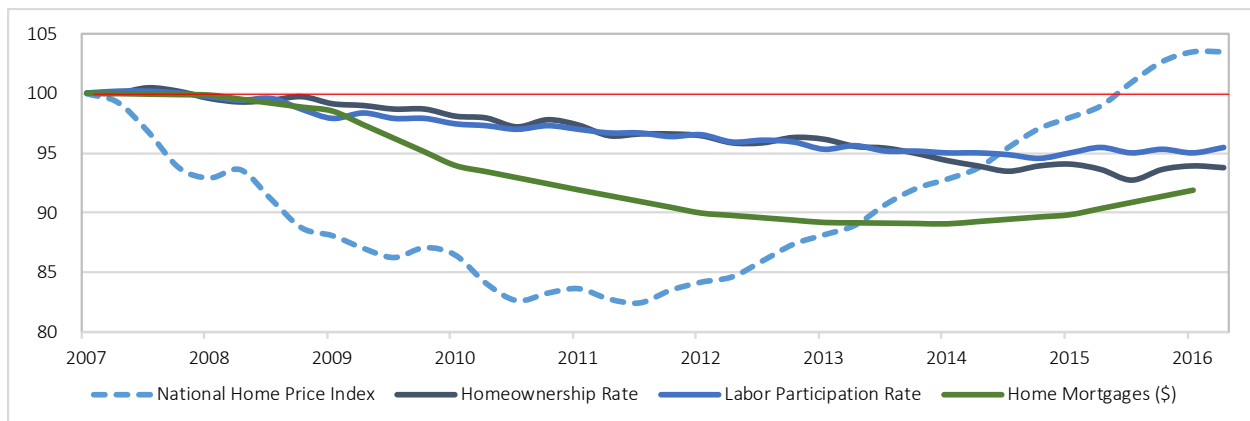
Source: Federal Reserve Data. Total Credit System (Gray Bars, \$ in trillions, right axis), Interest Rates (Left-Axis)



The net unintended consequence of the Fed's policy has been to sustain and exacerbate existing imbalances and to create new imbalances by expanding a credit system that was clearly unstable in 2008. Most notable are the imbalances in the housing market and the labor market. Prior to the onset of the crisis, the home ownership rate according to the U.S. Census Bureau was 69%, compared to 64% in 2017. While the Census estimates that the number of households has increased by six million (from 112 million prior peak to 118 million today), the implied number of households owning homes has declined by over two million (from 77 million prior peak to 75 million today).

Over the same period, household mortgage debt outstanding has actually declined by \$900 billion (from \$10.6 trillion to \$9.8 trillion), while the labor participation rate has declined from 66.2% to 62.9%. Despite these statistics which would seemingly be negative for housing, the FHFA nationwide home price index is approximately 3% above the prior peak. With a housing market in imbalance pre-crisis (a surplus of supply in excess of demand), combined with now lower labor participation rates, lower home ownership rates and lower aggregate funding levels (less mortgage debt), one should expect home prices to be lower, not higher. Without the Fed's purchase and continual reinvestment of \$1.7 trillion in mortgage-backed securities, would this be possible?

**FIGURE 28. Home Price Index vs. Home Ownership Rate, Labor Participation Rate & Mortgage Debt**  
Values Indexed to 2007, Source: Federal Reserve Data.

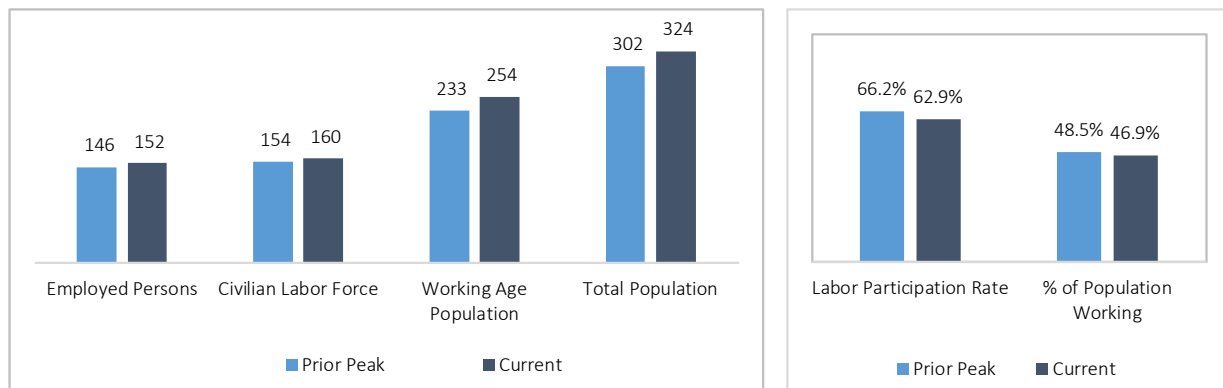


The imbalances are not only evident in the housing market but also in the labor market. Specifically, there is a considerable imbalance between relative prices and relative wages, partly driven by the decline in the labor participation rate. Note that the labor force participation rate is calculated as the civilian labor force (employed + unemployed actively seeking employment) divided by the working age population which is defined as the population 16 years and over, including those entering and in retirement. Despite the decline in the participation rate, the work force has actually grown from pre-crisis levels by 5.7 million (from 154 million pre-crisis to 159.7 million) and the net number of employed persons has also grown by 5.7 million, i.e. net new jobs created.

However, the working age population in the country has grown by over 21 million during the same period (from 233 million to 254 million). While a 3.3% decline may not seem all that significant, if the current labor force participation rate were equal to the pre-crisis level, there would be approximately 8.4 million more workers in the labor force than there are today (i.e. there would be 168.1 million vs where it currently stands at 159.7 million). The crux is that **for nearly every 4-person increase in the working age population, only 1 is working and in aggregate, nearly 8 million more Americans should be working.**

**FIGURE 29.** *The Civilian Labor Force: Participation Rate Has Declined by 3.3%*

Eight Million More Americans Would Be Working If the Labor Participation Rate Were at Prior Peak, Source: BLS.



Making the equation worse is that an aging population, the reason often blamed for the declining participation rate, while certainly an issue is far from the only factor at play. The decline in participation rate is broad-based across demographic groups according to the latest data from the Bureau of Labor Statistics which tracked the changes in participation rate from 2004 to 2014. Over this period, Caucasians, African Americans, Asians and Hispanics all experienced 2%+ declines in labor participation rates. Similarly, within each group, both men and women are participating at lower rates, while men generally suffered steeper declines. Most troublesome however is the breakdown by age group as it is actually younger people (16-24) and the middle-age which makes up the core of the workforce (25-54) which are participating at lower rates while older workers (55+) are actually participating at higher rates. As of 2014, there were actually 2.4 million fewer Americans between the ages of 16-54 in the workforce than a decade prior in 2004. The table below shows the breakdown in participation rates from 2004 to 2014 (note that the labor force participation rate in aggregate as of August 2017 is the same as it was in 2014 - approximately 62.9%).

**FIGURE 30.** *The Lost Decade for the Core Group of Workers: Fewer Workers Aged 16-54*  
2004 vs. 2014, Source: Bureau of Labor Statistics.

Source: U.S. BLS

	Participation Rate			Participating in Labor Force			Working Age Population		
	2004A	2014A	Change	2004A	2014A	Change	2004A	2014A	Change
<b>Age:</b>									
16 to 24	61.1%	55.0%	(6.1%)	22,268	21,295	(973)	36,419	38,712	2,293
25 to 54	82.8%	80.9%	(1.9%)	102,122	100,767	(1,355)	123,410	124,511	1,101
55 and older	36.2%	40.0%	3.8%	23,011	33,860	10,849	63,527	84,724	21,197
<b>Gender:</b>									
Men	73.3%	69.2%	(4.1%)	78,980	82,882	3,902	107,710	119,748	12,038
Women	59.2%	57.0%	(2.2%)	68,421	73,039	4,618	115,647	128,199	12,552
<b>Race:</b>									
White	66.3%	63.1%	(3.2%)	121,086	123,327	2,241	182,643	195,498	12,855
Black	63.8%	61.2%	(2.6%)	16,638	18,873	2,235	26,065	30,843	4,778
Asian	65.9%	63.6%	(2.3%)	6,271	8,760	2,489	9,519	13,785	4,266
All other groups	66.4%	67.6%	1.2%	3,406	4,961	1,555	5,130	7,335	2,205
<b>Total</b>	<b>66.0%</b>	<b>62.9%</b>	<b>(3.1%)</b>	<b>147,401</b>	<b>155,922</b>	<b>8,521</b>	<b>223,357</b>	<b>247,947</b>	<b>24,590</b>

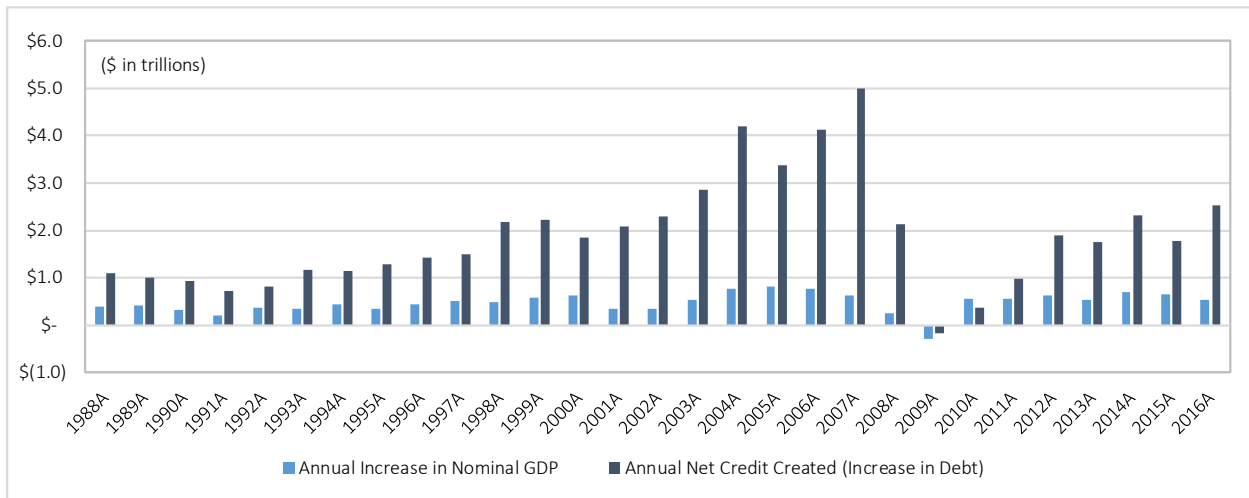
Despite the imbalances evident in the housing market and labor market, the S&P 500 Index and the Dow Jones Industrial Average are both approximately 50% higher than the prior peak in 2007. As is well understood, wealth effects are generally pro-cyclical; higher home values translate to higher household net worth and lower interest rates translate to higher prices for financial assets (stocks and bonds) also driving household net worth higher. Both wealth effects fuel the other, resulting in greater appetite for risk taking. As evidence, household net worth derived from the stock market has risen to \$40 trillion, an increase of \$15 trillion from the prior peak (or 60% above 2007) at the same time when home prices reach all-time highs. On net, household net worth has increased by over \$30 trillion above the prior peak in 2007 according to Fed estimates, all in response to the Fed creating \$3.6 trillion through QE despite declining labor participation rates and stagnant real wages.

Ultimately, price levels (and perceived dollar net worth) are a function of the Fed and can only be sustained temporarily as an already over-extended credit system continues to expand. The Fed intended to reflate assets values and it did, in a big way. Unfortunately, **everywhere the market looks, the Fed has created and caused distortion, albeit unintentionally in an effort to stimulate growth.**

Right or wrong, the Fed has done whatever it takes to fuel credit expansion, without a clear or quantifiable insight into the imbalances created in the housing market, the labor market or financial markets. However, the credit-fueled recovery of the last decade is not fundamentally different than the 20 years leading up to the crisis. The Fed has responded the same way for thirty years. Other than being more material in size and term, the policies of QE are no different than the policies of the Great Moderation. But, **the risks are greater as the Fed has taken us all further out on to the same ledge.**

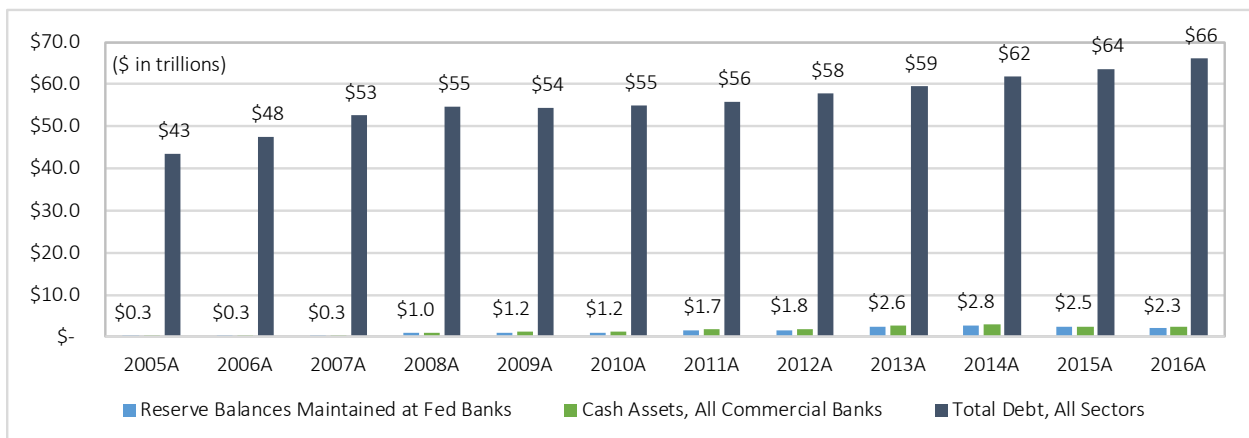


**FIGURE 31. The Last Thirty Years of Fed Policy: Explosion in Debt Outpacing Rate of GDP Growth**  
Annual Increase in System-wide Debt vs. Annual Increase in GDP, Source: Federal Reserve Data.



By 2007, after two decades of the Fed continually making credit cheaper, every dollar that existed within the banking system had been pledged over 150 times (\$53 trillion in debt vs. \$350 billion in banking system cash), excluding the impact of derivatives. Today, as a function of the Fed increasing the amount of bank reserves through QE by nearly \$3 trillion, net system leverage is lower. However, gross leverage is also materially higher for much the same reason, as the Fed’s low interest rate policy drove further credit expansion. After multiple QE programs and shifts in the Fed’s liabilities (as bank reserves have been converted to physical currency outside the control of the banking system), the \$66 trillion in liabilities that exist today are supported by only \$2.3 trillion in banking system cash.

**FIGURE 32. An Over-Levered Banking System: \$30 Dollars of Debt for every \$1 of Bank Liquidity**  
Banking System Cash (Green), Bank Reserves (Light Blue) vs. System-Wide Debt (Blue) Source: Federal Reserve Data.



The total cash that is currently in the banking system is approximately \$2 trillion higher than it was entering the crisis. However, even after the Fed increased the amount of cash in the banking system by

over 6 times (\$350 billion then vs. \$2.3 trillion today), every dollar that exists today in the banking system has still been pledged almost 30 times over. Also as a consequence, **even more demand has been pulled forward over the course of the last decade as more credit was created.** The leverage profile of the credit system and the decades of pulled forward demand **restrict the economy and prevent more robust and productive growth resulting in economic fundamentals diverging from the value of financial assets (stocks and bonds),** a status quo that can only exist under easing financial conditions.

The same leverage dynamics also explain why the Fed's fears of inflation have generally always been a false flag. Inflation is principally a function of the balance, or imbalance, between aggregate supply and aggregate demand and the Fed has distorted both supply and demand for an extended period of time. When aggregate demand is in excess of aggregate supply, inflation follows, whether a function of growth in demand outpacing growth in supply (demand-pull inflation) or a function of a supply shock (cost-push inflation). When aggregate demand falls short of aggregate supply, deflation follows.

The Fed's policy created both inflationary and deflationary pressures as it stimulated expenditures on consumer goods (demand-side) and capital projects (supply-side) by lowering interest rates. Low interest rates tend to drive consumption of goods and capital projects that are sensitive to long-term financing (i.e. long-term supply and demand pulled forward which initially has an inflationary impact). In terms of consumer expenditures, this means the likes of housing and autos. In terms of capital investment, it means expansion of supply chains and output capacity. The broader, second order economics effects then follow from increased first order activity (retail, hospitality, restaurants, etc.).

However, as a consequence, the Fed's policy caused long-term demand to be pulled forward and for supply to be expanded. And, the supply side was not only expanded within the U.S. but also globally. Because the dollar is the primary funding currency of the globe, the Fed's policy of ever cheaper dollar funding, combined with the effects of fiscal policy, helped accelerate the globalization of supply chains, further expanding and diversifying supply. More fragmented and more capacity of global supply chains has created an environment in which broad pressures on price levels quickly become evident as global demand predictably slows after years of having been pulled forward. In aggregate, the Fed has created an environment in which current demand is weak and existing capacity on the supply side is more than sufficient. **The net effect, after the initial pull-forward of demand, is a constant deflationary pressure and the only thing the Fed fears more than inflation is deflation.**

When credit systems expand, i.e. when new credit is created, the impact is inflationary as that demand is pulled forward but the opposite is true when credit systems contract. When incentives on both the supply and demand side are distorted through the Fed's low interest-rate policy, it increases the likelihood that supply and demand fall into a more severe imbalance through misallocations of capital. The Fed fails to recognize the extent to which it has created a massive imbalance in the credit system and corresponding supply and demand structures. The effect is cumulative and with limited understanding of the actual size of the imbalance because it is impossible to quantify, the Fed is currently fearful of the inflationary impacts of its policy when it should be focused on the risks of financial stability.

In 2011, as the Fed was completing QE2, there were signs that the economy was slowing yet many members remained concerned about the second order inflationary effects of creating over \$1 trillion dollars. In an effort to understand history, Fed Governor Tarullo reviewed the transcripts from 2005 and 2008 to understand how the Fed had weighed inflationary pressures at the time and how those considerations informed policy decisions. In review of 2008, Tarullo found that the Fed was downplaying financial risks and playing up inflationary concerns. While Tarullo did not identify the missing link, he did urge the Fed to question its underlying assumptions and its fundamental understanding of what may be driving countervailing pressures.

**FIGURE 33. History Repeats: False Flag of Inflationary Pressures vs. Downplaying Financial Risks**

Source: Federal Reserve Transcripts, August 2011 Meeting, Governor Tarullo.

*"MR. TARULLO. Over the weekend, one of the many things I did instead of hunting for Easter eggs was to go through the transcripts of the FOMC from the middle part of 2005 and from all of 2008, periods during which there had been big run-ups in oil prices and, to some degree, other commodity prices, to see how the FOMC was assessing what was going on and to see whether we can learn anything from that experience [...] But I contrast that with just stating things that might happen, and this is what one learns by going back and looking at the transcripts. Concerns about commodity prices, particularly reports of what businesses are saying—and there was a lot of this in 2005 and 2008—read like this: "Man, we have just shifted. We are now thinking in inflationary terms." And of course, about six months later they weren't. [...] And I guess, Richard, what I'd say is that the 2008 transcripts are probably more a lesson in the need to look at what else is going on. I have to say, I was taken by the relative downplaying of financial risks and the relative playing up of inflationary risks in the middle part of 2008."*

The same concerns Governor Tarullo highlighted regarding the Fed's thinking in 2008 turned out to be true in 2011. In 2011, through the first quarter and into the summer, there were concerns about inflation. By September, Bernanke was evoking 2008. There is a similar dynamic at play today. The Fed held a meeting on February 1, 2017 and Fed Chair Yellen testified to Congress on February 14, 2017. Yellen signaled to the market that a March hike was possible but not probable. Suddenly, during the last week of February, the Fed rushed several governors out to signal to the market that a March rate hike was coming. The probability of a March 15th rate hike was less than 30% during the week subsequent to Yellen's testimony. By the first week of March, the probability of a March 15th rate hike had increased to 90% and the Fed in fact raised 25 bps.

What changed that caused the Fed to suddenly signal a March hike? The minutes from the meeting downplayed inflationary fears but history says the Fed was afraid of being behind the curve, as market expectations for wage inflation had increased significantly. By accelerating rate increases (1 hike in 2015 and 2016 vs. 3 projected for 2017) and by signaling balance sheet reduction in the near term (incremental tightening), the Fed was clearly concerned about the economy overheating, inflationary pressures rising and its credibility deteriorating after eight years of easy money.

As is often the case with the Fed, there was a dissenting voice but the dissent was overruled by the collective. In this case as the minutes from the Fed's March 2017 show, Minneapolis Fed President Neel Kashkari dissented because "recent data had not pointed to further progress on the Committee's dual objectives and thus had not provided a compelling case to firm monetary policy [.]"

Soon after the Fed’s March 2017 meeting, Kashkari took to the internet to further elaborate on his views of the current state of the economy in a blog post specifically aimed at refuting claims made by the CEO of J.P. Morgan, Jamie Dimon, who had argued in a letter to shareholders that bank regulations on capital requirements were excessive and preventing lending that would stimulate economic growth. While not connecting the Fed’s role in pulling forward decades of expenditures, Kashkari rightly pointed to the lack of fundamental demand for new loans in order to undress Dimon’s claims.

**FIGURE 34.** *The Fed vs. Wall Street: Regulatory Constraint or Fundamentals Impeding Growth*

Source: Blog Post by Neel Kashkari, Minneapolis Fed President, April 6, 2017.

*“Mr. Dimon argues that the current capital standards are restraining lending and impairing economic growth, yet he also points out that JPMorgan bought back \$26 billion in stock over the past five years. If JPMorgan really had demand for additional loans from creditworthy borrowers, why did it turn those customers away and instead choose to buy back its stock?”*

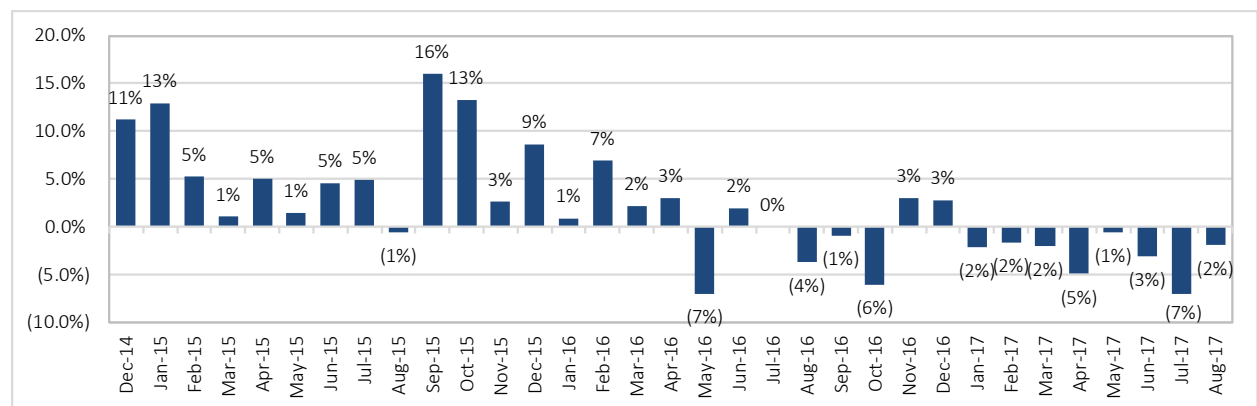
*“The truth is that borrowing costs for homeowners and businesses are near record lows. If loans were scarce, borrowers would be competing for them, driving up costs. That isn’t happening.”*

FUNDAMENTALS ARE JUST BEGINNING TO WEAKEN IN RESPONSE TO FED

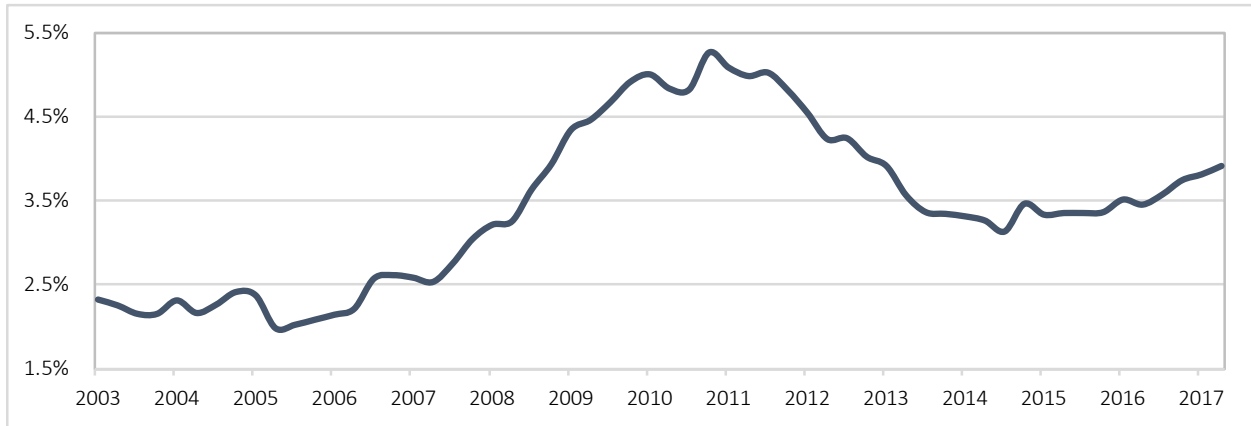
While there is at least one voice within the Fed that has a directional pulse on underlying fundamental issues, the Fed as a whole has fallen victim yet again to false flags of growth. With rate hikes in December 2016 and March 2017, the Fed has signaled economic strength and remained committed to its tightening course. Over that same period of time and in subsequent months, hard economic data weakened as did market expectations of growth. Q1-2017 GDP growth of 1.2% quarter-over-quarter on a seasonally-adjusted basis, indicated a decelerating pace of expansion from the second half of 2016. Unit auto sales data continues to disappoint with each of the first eight months of 2017 down year-over-year. While jobs data remains positive, bank credit expansion continues to slow as interest rates rise, delinquencies on the consumer side begin to increase, specifically driven by poorer performance of auto loans, credit card loans and student debt, and retail struggles with both structural and cyclical issues.

**FIGURE 35.** *Unit Auto Sales Struggling: Y-o-Y Declines in First Eight Months of 2017 (and 11 of Last 13)*

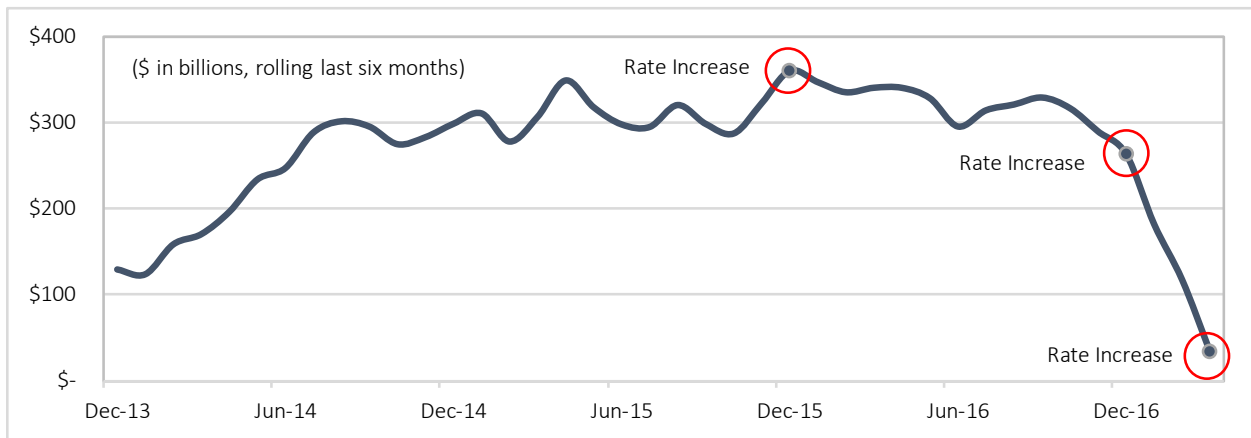
U.S. Monthly Unit Auto Sales, Y-o-Y, Source: Ward’s Auto Data.



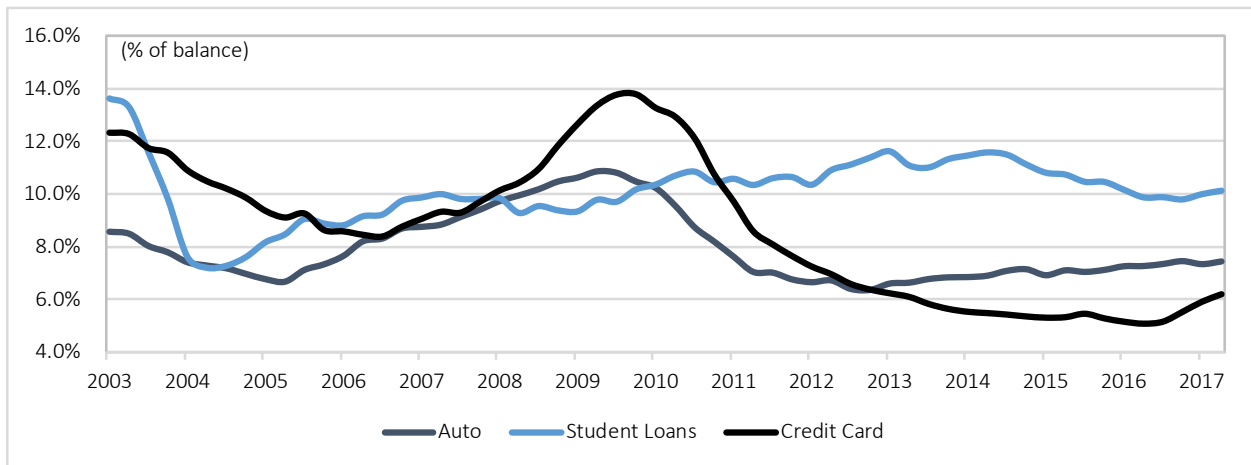
**FIGURE 36. Recent Auto Weakness Related to Increasing Delinquencies & Tightening Auto Credit**  
 Auto Loans 90 Days+ Past Due, % of Balance, Source: New York Fed Data (through Q2 2017 – June Quarter).



**FIGURE 37. Loans and Leases in Bank Credit: Loan Creation Slowing Broadly Across Banks**  
 Net Credit Created on a Rolling Last Six-Month Basis, \$ in Billions, Source: Federal Reserve Data.

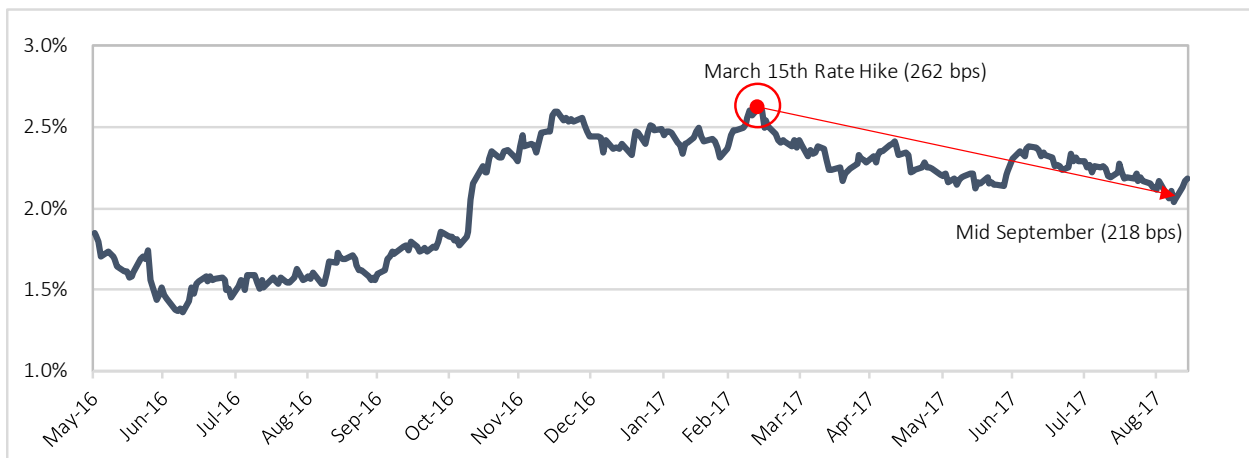


**FIGURE 38. Consumer Credit: Fundamentals Just Beginning to Deteriorate as Delinquencies Start to Rise**  
 Transition into Delinquency: New Delinquencies 30+ Days Past Due (% of Balance), Source: NY Fed Data.

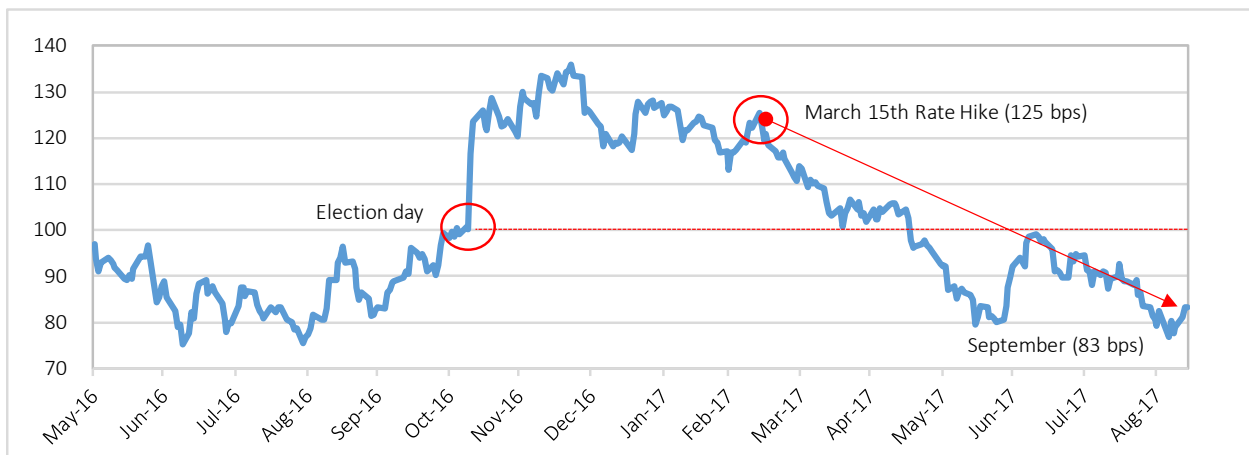


In the 10 weeks subsequent to the March rate hike, the yield on the 10-yr U.S. treasury declined by 40bps from (2.6% to 2.2%) and the spread between 10-yr treasuries and 2-yr treasuries collapsed by 33 bps (from 125 bps to 92 bps), **signaling market fears of broad economic weakness**. Generally, when economic conditions weaken, the treasury yield curve flattens as it has (spreads between long duration bonds and short duration bonds tighten). Historically, during recessions, it is not uncommon for the yield curve to invert (long duration bonds trading at a premium to shorter duration bonds on a yield basis). For example, during a recession, it is not uncommon for the 10-yr treasury to trade at a lower yield than a 2-yr treasury, primarily due to deflationary concerns and more negative longer-term outlooks.

**FIGURE 39.** *Signs the Market is Not Confident: 10 Yr. Treasury Yields Decline Over 40 bps Post Rate Hike*  
Daily Yield on 10-Yr U.S. Treasury, Source: Federal Reserve Data.



**FIGURE 40.** *Signs the Market is Not Confident (Continued): Spread Between 10yr & 2yr Treasury Collapse*  
Spread Between Daily Yield on 10-Yr U.S. Treasury and 2-Yr U.S. Treasury, Source: Federal Reserve Data.



Following the election of Donald Trump, the market began to focus on fiscal reform as an economic stimulant rather than monetary policy for the first time in nearly a decade. Confidence soared and bond

yields rose as investors sold bonds to rotate into the stock market. Distracted by the promise of tax reform, the rolling back of regulation including Dodd-Frank and environmental protections, and the repeal of Obamacare, the market lost focus on the Fed. Unfortunately for the market and the Fed, fiscal reform cannot suddenly make the mountain of debt created by sins of many decades suddenly disappear. Deficit financed tax cuts that do not address entitlements and long-term spending levels would only serve to provide a temporary and muted increase in demand in exchange for even more government debt. Rolling back regulation would be fundamentally positive on the margin going forward but it would not solve for the imbalances that currently exist between relative price levels and relative wage levels. Because of 30 years' worth of flawed policy and the Fed's current stance to tighten monetary conditions, the future economic and market outlook remains all about the Fed.

## WHAT COMES NEXT – REVERSE QE aka FED BALANCE SHEET REDUCTIONS

The Fed unwittingly created a problem and the problem is made worse by continually moving the figurative goal posts closer and then further away. If the Fed fully understood how sensitive economic conditions truly are to interest rates, it would not be signaling incremental rate increases and it certainly would not be discussing shrinking its balance sheet. The shadow banking system (~\$66 trillion assets/liabilities) is levered to the commercial banking system (\$16.2 trillion assets/liabilities) which is levered to the Fed's balance sheet (\$4.5 trillion assets/liabilities). **If the Fed's balance sheet contracts, it will cause all balance sheets levered to it to contract.**

The linkage will not be direct but it will be causal. Should the Fed shrink its balance sheet, bank reserves (i.e. liquidity) will be drained from the system. As a result, there will be fewer dollars that exist within the banking system and each remaining dollar will become more expensive (longer-term rates rise). As more dollars were created, supply increased and the funding costs for dollars (interest rate) declined. If the Fed shrinks its balance sheet, the reverse will be true: supply will decrease and dollar funding costs will rise.

Rising interest rates slow down the propensity to borrow and spend. By raising short term rates, the Fed is effectively incentivizing banks not to create credit on the margin which will have the impact of slowing the velocity of money. Similarly, but differently, as the Fed stops reinvesting its balance sheet, longer term interest rates will rise which will cause corporations, individuals and governments to demand less incremental longer-term credit. Not only will there be less demand for incremental credit as credit becomes more expensive but there will also be fewer dollars to repay existing loans; as a consequence, delinquencies and defaults on existing credit will increase which will cause velocity to slow and GDP to decline more precipitously. As business and consumer confidence turns, savings rates will increase and spending, investment and GDP will decline further. It will be a precipitous negative feedback loop.

Expanding the money supply through QE allowed for a system that was too levered to add trillions of debt and the type of growth it generated was dismal. **Shrinking the money supply will make the original problems all the more evident as it forces the beginning stages of a system-wide**

**deleveraging event.** As discussed previously, a system-wide deleveraging event will almost assuredly lead to a liquidity problem because there are not nearly enough dollars to fund all the liabilities that exist. As the Fed's balance sheet contracts, perceived liquidity in short-term and funding markets will evaporate.

Why does the Fed not see the buzz-saw coming? Mainly because of how it views market liquidity and thus financial stability but also because the Fed views the current state of the economy as stronger than the weakening data would suggest. From a liquidity standpoint, the Fed thinks about the size and composition of its balance sheet largely as if its two main type of liabilities, bank reserves and currency in circulation, are more or less interchangeable when in reality the two are very different. Bank reserves provide the liquidity needed to fund liabilities in the banking system (the \$66 trillion in debt among other obligations). Currency in circulation represents physical cash which is almost entirely outside the control of the banking system. Think cash in your wallet, cash under your mattress, in a safety deposit box, in the black market or sent outside the country. Accordingly, currency in circulation does not provide liquidity to the banking system to fund liabilities. As a consequence, in terms of the stability of the banking system, the amount of bank reserves is far more important than the overall size of the Fed's balance sheet.

When most experts (including current Fed officials, ex-Fed officials and expert macro economists with PhD) evaluate the impact of pending balance sheet reduction, this distinction is not made because the focus is on the expected impact to interest rates and financial markets rather than liquidity and the real economy. Recall that QE<sub>2</sub> and QE<sub>3</sub> were about interest rate targeting to spur demand, not to solve a liquidity problem. In the Fed's mind, the liquidity crisis had passed. Consequently, when the Fed considers unwinding QE, its goal is to increase interest rates to slow growth in the economy and control inflation. It is not focused on draining liquidity. To the Fed, liquidity is excessive if anything. This is the macro reason why the Fed does not expect the balance sheet reduction to have a material impact on the economy; it will simply slow demand.

From a more technical perspective, the standard argument presented for why balance sheet reduction will not have a large impact is two-fold: 1) it will happen gradually, over time and 2) the balance sheet will not be reduced to pre-crisis levels. First, after the Fed always maintained as it pursued QE that it was the stock of debt that it purchased (size of balance sheet) which mattered rather than the flow (actual purchases), now the argument goes that it will not have a significant impact because the rate of reduction (the flow) will be gradual. Second, regarding the future size of the balance sheet, experts (including current Fed officials) have suggested that the Fed balance sheet will only be reduced to ~\$2.5 trillion (a reduction of \$2.0 trillion from its current size at \$4.5 trillion) when it is fully normalized, this compared to the pre-crisis size of \$900 billion.

The primary reason why most experts argue that the balance sheet will not be reduced to its original size: currency in circulation will continue to grow. The following is how Ben Bernanke recently explained it in an op-ed penned in January 2017.



**FIGURE 41. Ben Bernanke Explains How Money Grows on Trees: The Public Just Demands It**

Source: Brookings Op-Ed, January 2017

*"That's a pretty good description of the Fed's balance sheet before the crisis: liabilities were about \$800 billion in currency in circulation, and assets (almost all in Treasuries) were only slightly greater than that. However, today currency in circulation has grown to \$1.5 trillion. **Because of rising nominal GDP, low interest rates, increased foreign demand for dollars and other factors**, Fed staff estimates that, the amount of currency in circulation will grow to \$2.5 trillion or more over the next decade. [7] In short, **growth in the public's demand for currency alone implies that the Fed will need a much larger balance sheet** (in nominal terms) than it did before the crisis."*

*"Taking currency demand into account as well, it's not unreasonable to argue that the optimal size of the Fed's balance is currently greater than \$2.5 trillion and may reach \$4 trillion or more over the next decade. **In a sense, the U.S. economy is "growing into" the Fed's \$4.5 trillion balance sheet, reducing the need for rapid shrinkage** over the next few years."*

And, this is where Bernanke's comment to 60 Minutes in 2010 about QE not increasing the currency in circulation breaks down. Since 2007, over \$715 billion of cash (currency in circulation) has been withdrawn from the banks, on a net basis – withdrawals net of deposits. At the end of 2007, the banks only had \$325 billion of cash in total including reserves held at the Fed. Since the crisis, customers have withdrawn more than twice as much cash that existed pre-crisis; **effectively, there have been over two entire bank runs on the banking system since the crisis. This could not have happened without QE.** How those in Fed circles describe the growth in currency in circulation – "the economy is growing so there is growth in the public's demand for currency so the Fed balance sheet will be larger in the future" – is intellectually dishonest and glosses over the insolvency of the banking system. How could \$715 billion have been withdrawn from banks if banks only had \$325 billion to both finance lending and satisfy withdrawals, rhetorically, emphasis added.

The Treasury may print dollars but the Fed creates them. It does so by first creating a bank reserve. When the public goes to the bank to withdraw cash, that bank reserve is converted to currency in circulation. The Treasury then prints a dollar to supply to the Fed which then can supply it the bank which then supplies it to the public. As a net effect, the conversion of bank reserves into currency in circulation drains liquidity from the banking system; it just does so gradually. However, the current annual average over the past four years is approximately \$90 billion per year, representing 4% of current bank liquidity, whereas before the crisis the average annual rate was less than \$30 billion (so much for the war on cash).

Soon to be added to the reserves already being drained is the full amount by which the Fed plans to reduce its balance sheet. This is because the Fed cannot directly control the public's tendency to demand currency; it can only control the amount of reserves. The consequence is that, if the experts suggest that the Fed's balance sheet will be reduced by \$2 trillion (a reduction of ~45% to the overall balance sheet), this would cause bank reserves to be reduced by approximately 90% and cash liquidity in the banking system to be reduced by over 80%, from \$2.4 trillion to \$400 billion, albeit over a period time. In a recent interview on CNBC, Fed Governor Jerome Powell suggested just that as if it will not present a problem.

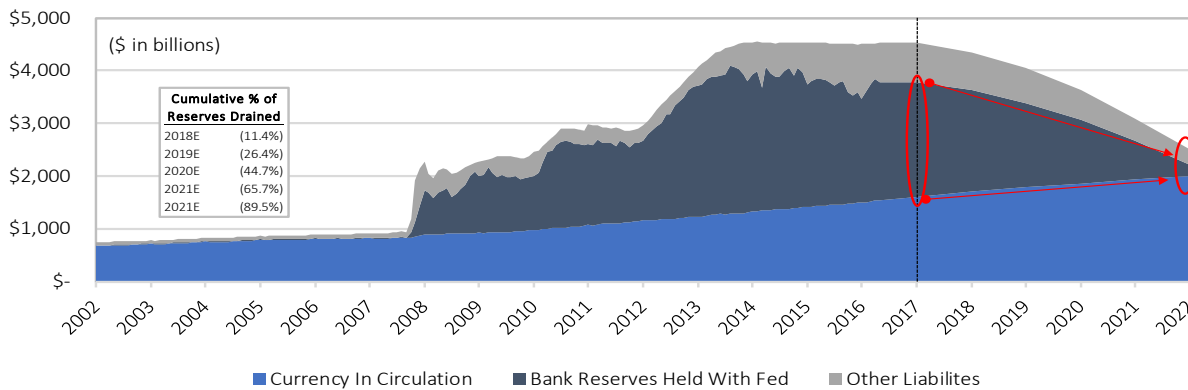
**FIGURE 42. Fed Governor Indicates Bank Reserves Will Return to Fairly Small Number**

Source: Fed Governor Jerome Powell, CNBC Interview with Steve Liesman, June 2017

*"It's hard for me to see the balance sheet getting below \$2.5 trillion, \$2.5 trillion to \$3.0 trillion and that assumes that we normalize the balance sheet over the course of the next 5 years and go back to a fairly small number of reserves."*

**FIGURE 43. Reverse QE: Based on Initial Fed Indications Bank Reserves Will Be Drained by ~90%**

Fed Balance Sheet Liabilities, Source: Federal Reserve Data (Historical Data), Projections Based on Fed Statements.



The problem with this scenario is that the \$66 trillion in debt that exists in the shadow banking system would be supported by only \$400 billion in liquidity. Essentially, each dollar would be levered at approximately 165:1, a leverage ratio even higher than existed pre-crisis. Despite this, the Fed does not forecast there being a problem because the Fed thinks about liquidity in terms of how depositors (mainly corporations and households) demand liquidity on a short-term basis in a status quo environment in which credit is expanding and debts are easily refinanced. In reality, the credit system as a whole will begin to contract once the Fed begins to shrink its balance sheet, not when the balance sheet is fully normalized. It just will not be immediately apparent that the contraction will lead to a system-wide deleveraging event.

In an over-simplified explanation, everyone agrees that QE caused financial assets to go up (significantly) but no one is willing to admit that when QE is unwound, the reverse will be true. **When dollars were created through QE, the dollar value of financial assets increased** because there were more dollars; **when dollars are removed through reverse QE, the dollar value of financial assets will go down** because there will be fewer dollars. Again, an over-simplification of the transmission mechanism. From a practical perspective, most market participants believe that if the Fed were to tighten financial conditions, it would only happen after the Fed was sure the economy had recovered sufficiently; guided by trust in the efficacy of the Fed's policy, most view QE like an antibiotic rather than an addictive drug. Once the economy is healthy, the antibiotic can be removed; if conditions deteriorate, take more of the antibiotic until it works. Unfortunately, because QE induced the creation of trillions more in fixed liability and fixed maturity debts, QE is more like crack than an antibiotic; the more applied to a financial system, the more dependent that system becomes on it and the worse off when it is removed.

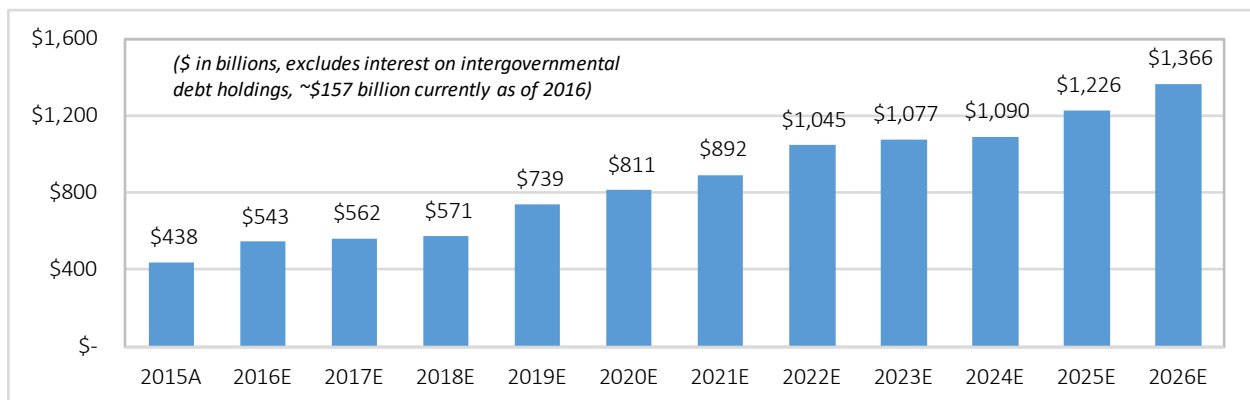
The actual function by which the value of financial assets will be forced lower is through the funding gap that the Fed leaves behind when it stops reinvesting a portion of its securities that mature in the normal course, notably treasuries. Through this transmission mechanism, real interest rates will finally be forced higher; because of the unsustainable leverage in the credit system, the already weakening fundamentals will further deteriorate as interest rates rise and as less market liquidity is available to fund maturing liabilities. There will be a waterfall-like effect as bond investors are compensated in incremental yield for higher quality credit and at each point in the value chain, credit spreads will widen. As investment grade (IG) corporate bondholders and emerging market (EM) sovereign bondholders shift to treasuries, spreads between IG/EM and treasuries will widen. As high yield bondholders shift to IG, spreads between IG and high yield will widen. The ultimate result will be that lower quality credit will continually find a more challenged environment to secure liquidity needed to refinancing maturing obligations.

Because it is a certainty that the Federal Government's deficit will only grow over the next several years, the combined funding gap created by the Fed's gradual balance sheet reduction and the increase in the deficit will need to be funded by resources that are currently devoted elsewhere in the market, notably to finance higher risk sovereigns (EM) and the private sector (IG and high yield).

**FIGURE 44. Maturity Schedule of Treasuries Held by Fed: Currently Reinvesting 100% of Maturities**  
When the Fed Begins to Shrink Balance Sheet, It Will Taper Reinvestments, Not Halt Completely. Source: Fed Data.



**FIGURE 45. Federal Deficit: \$550 Billion Per Year and Growing Due to Increasing Mandatory Spending**  
Source: Congressional Budget Office. Assumes Average Nominal GDP Growth of 4.1%.



The conventional wisdom is that foreign buyers will step in to satisfy a majority of the funding gap. The reality is that foreign buyers have reduced purchases of treasuries materially over the past three years and were actually net sellers of treasuries to the tune of over \$200 billion in 2016. Even if foreign buyers increased purchases, that demand will have to come at the expense of some other financial asset because dollar liquidity as a whole will have been reduced (as a function of the Fed). The impact will be widening spreads between risk assets and risk-free assets and higher nominal interest rates of risk assets (corporate bonds and the discount rate applied to equities).

As yields are pushed higher and as less market liquidity is available to fund maturing liabilities, corporate refinancings will become more difficult, less credit will be extended to consumers, and delinquencies and defaults will rise. Savings will increase as consumers and businesses need to source dollars in order to fund liabilities maturing in the future. Spending will decrease, investment will decrease and corporate profits will suffer. The Fed will reverse course but only after it becomes evident that financial markets and economic activity are deteriorating.

While it is unclear at what point critical mass will set in as the Fed shrinks its balance sheet, the force pulling risk assets down in aggregate will be like gravity, no matter how gradual at first. Because the market is focused on fiscal reform rather than monetary policy and because the markets misunderstand the impact of balance sheet reduction on liquidity and the real economy, risk is broadly mispriced. The Fed will surely step in and reverse course in order to avoid a 2008-like crisis with the highest probability scenario being that the Fed responds with more QE, in an aggressive way and sooner than most think. Similarly, and with a high degree of confidence, it should be expected that the Fed is successful in stabilizing markets before the market reaches a true liquidity crisis (90%+ probability of Fed success). However, the Fed will have to be reactionary to market declines rather than proactively altering course in response to deteriorating fundamentals; if the Fed stops shrinking its balance sheet and returns to easy monetary policy while markets remain at all-time highs, it risks losing credibility when it is most needed.

As a consequence, it will not be sufficient for fundamentals to deteriorate in order for the Fed to reverse course; it will have to have become evident in financial markets (lower equities and higher credit spreads). In a scenario in which the Fed's action forces market deterioration but not to the extent that a full crisis ensues, the equity markets will likely have corrected 10-20% (and the high-yield credit markets 20-30%) before the Fed becomes concerned (depending on how orderly or disorderly the early moves).

There is a saying that markets can remain irrational for longer than you can stay solvent. Because of this, execution is the key to neutralizing the unpredictability of timing and the market. Rather than short equities which may suffer greater losses in the end, shorting credit on a relative value basis is the most effective way to manage risk (both timing and mark-to-market) while also providing asymmetric return; in early 2008, credit spreads widened significantly while equities remained neutral as credit instruments fundamentally remain more closely and sensitively linked to initial moves in interest rates. Furthermore, there is naturally less downside risk and volatility to shorting a bond index that is trading in aggregate above par than there is to shorting the equity market which could easily see prices gains that incrementally diverge from fundamentals for extended periods of time.