Few policies in recent memory have generated as much debate, and as much controversy, as quantitative easing by the Federal Reserve. Despite the public focus, however, quantitative easing remains largely misunderstood. Mistakenly viewed as a simple euphemism for “money printing,” the effects of quantitative easing are often overstated in both directions (positive and negative). In this paper we discuss the actual mechanics behind quantitative easing, its intended benefits and potential side effects, assess its effectiveness thus far, and look forward to its eventual unwind.

A BRIEF HISTORY OF QUANTITATIVE EASING

The series of asset purchase programs initiated by the Federal Reserve in 2009, now referred to as quantitative easing, or “QE,” was actually the second time that U.S. monetary authorities employed this form of stimulus. According to the Federal Reserve Bank of St. Louis, “During 1932, with congressional support, the Fed purchased approximately $1 billion in Treasury securities…Quantitative easing continued during 1933-36.”¹

Quantitative easing was not used in practice again by a major central bank until the Bank of Japan in 2001. Still reeling from the bursting of their asset bubble over a decade earlier, the Bank of Japan had continually cut interest rates in an effort to jumpstart their economy. By 1999, short-term interest rates finally reached zero, but still had not achieved the desired effect. Having exhausted traditional monetary policy, the Bank of Japan began searching for more unconventional ways to stimulate the economy. With short-term interest rates already at zero, the focus shifted to lowering long-term interest rates, which typically have a greater impact on economic activity. To do so, the Bank of Japan began buying longer-dated government bonds to push their prices up and their yields down, in a process dubbed “quantitative easing.”

Quantitative easing (“QE”) found its way back to the United States during the depths of the Global Financial Crisis. Initially viewed purely as a temporary crisis response tool, the first round of easing (which was later named QE1) began in November 2008. The Federal Reserve began buying $600 billion of mortgage backed securities (MBS) and agency debt, which was then expanded three months later to include an additional $750 billion of MBS and $300 billion of Treasury securities. In addition to purchasing distressed assets from banks, the Federal Reserve also made direct loans to banks and corporations that were far outside the scope of their normal operations.

In the subsequent months, the financial crisis began to calm, but the economy was still very slow to recover. The Fed began to contemplate using quantitative easing as not just a tool to combat acute financial distress, but as an extension of traditional monetary policy. The second round of easing, QE2, began in November 2010 with the Fed’s announcement that they would buy $600 billion of longer-dated Treasuries, at a rate of $75 billion per month. That program concluded in June 2011. Just three months later, in September 2011, the Fed began a new program which was dubbed “Operation Twist.” This was a plan to purchase $400 billion of bonds with maturities of 6 to 30 years and to sell bonds with maturities less than 3 years. While fundamentally different from quantitative easing in that the Fed was balancing each of its purchases with offsetting sales, the end goal (lowering long-term interest rates) was consistent with the prior rounds of stimulus.

Finally, in September 2012, the Federal Reserve announced a third round of quantitative easing (QE3). This new round of stimulus provided for an open-ended commitment to purchase $40 billion of agency mortgage-backed securities per month until the labor market improved "substantially." This program was then extended three months later in December 2012, with the added commitment to purchase $45 billion of longer-term Treasury securities.

As a result of this ongoing series of quantitative easing, the Federal Reserve now holds $2 trillion of Treasury securities, and $1.3 trillion of agency and mortgage-backed

The Mechanics of Quantitative Easing

Quantitative easing is often referred to as “money printing,” but for a variety of reasons this is an inaccurate and misleading description. QE is the process by which the Federal Reserve buys bonds from banks in exchange for cash. This cash accumulates on bank balance sheets in what are known as “excess reserves.” This cash has the potential to significantly impact the supply of money in the economy through the fractional reserve lending of banks, but as will be discussed later, this only occurs when banks decide to lend the cash into the real economy.

In removing bonds from bank balance sheets and replacing them with cash, the Fed is trying to encourage lending. The excess reserves (i.e., cash) that banks receive as a result of QE earn an annual interest rate of just 25 basis points (0.25%). The hope is that banks will be dissatisfied with this extremely low yield, and instead look to lend that money out into the real economy in search of a higher rate of return.

In addition to incentivizing lending (i.e., loan supply), quantitative easing also seeks to promote borrowing (i.e., loan demand). By purchasing longer-dated Treasuries, the Fed is creating a new source of demand for these bonds, thereby pushing their prices up and their yields down. Lower yields on Treasuries generally translate into lower interest rates on private sector loans, making them more affordable to potential borrowers.

A third intended benefit of QE works through the so-called “portfolio rebalancing” channel. By forcing down the yield, and thus the expected return, on “safe” assets such as Treasuries, the Federal Reserve is incentivizing investors to shift their portfolios towards riskier assets. This new flow of money into riskier assets (e.g., stocks) may then create a “wealth effect” whereby increases in the stock market make people feel wealthier, resulting in more spending and ultimately greater economic activity.

Lastly, a potential benefit of quantitative easing is that it lends credibility to the Fed’s promise to keep interest rates at zero for an extended period of time. Due to the mechanics of raising the federal funds rate, the Fed would likely need to drain excess reserves from the system (i.e., reverse quantitative easing) before raising interest rates. Understanding that this intermediate step must happen first, borrowers and lenders may be able to operate with a higher degree of certainty around near-term interest rates.

The Potential Side Effects

While QE may work through a variety of channels, its goal is to increase aggregate demand

1 “Horseshift! (With Reference to Gordian Knots),” Remarks before the National Association of State Retirement Administrators, Richard W. Fisher, President and CEO, Federal Reserve Bank of Dallas.
in the economy through increased borrowing and spending. This goal is consistent with the Fed’s mandate to provide countercyclical stimulus to the economy. While this stimulus can be helpful when the economy is operating below full employment, it creates potential side effects and risks.

One potential side effect of quantitative easing is that it stimulates risk-taking behavior. This manifests itself in a number of different ways. While the intention of QE is to increase borrowing to stimulate investment and spending in the real economy, the proceeds of that borrowing can just as easily be used to speculate in the capital markets. In other words, in a still sluggish economy providing insufficient profitable investment opportunities, the “cheap financing” provided by the Fed may be more likely to find its way into capital markets, bidding up asset prices beyond where they would be under normal market conditions. Heightened prices can lead to the misallocation of resources, speculative bubbles and, eventually, catastrophic financial collapses.

Another potentially damaging side effect of quantitative easing is its impact on savers. Lowering the interest rate borrowers are required to pay also lowers the interest rate savers are able to earn. Thus, in forcing down interest rates, quantitative easing effectively acts as a wealth transfer from savers to borrowers. This dynamic is particularly damaging for retirees, or anyone living on a fixed income. They are either forced to cope with a significant decline in the return on their savings, or take more financial risk at a time in their lives where it may not be prudent to do so.

Future inflation represents another potential risk of quantitative easing. In forcing down interest rates to stimulate bank lending, the Fed risks going too far and igniting inflationary pressures through another credit boom. While there is little evidence of inflation thus far, history has proven that inflation is very difficult to tame once it starts.

**HAS QUANTITATIVE EASING WORKED?**

If the goals of quantitative easing were to stimulate bank lending and overall economic activity, the results thus far are mixed. QE1 appears to have played a significant role in the sharp recovery following the Global Financial Crisis, but there were a number of other unprecedented policy actions during that time (e.g., fiscal stimulus, regulatory changes), which make isolating QE’s true impact very difficult. Subsequent rounds of QE appear to be suffering diminishing returns, at least when measured through the real economy. As shown in the chart below, despite the Fed’s ongoing stimulus, U.S. nominal GDP growth over the past year was the slowest ever recorded outside of a recession.

Through its recent comments, the Fed has directly tied the need for ongoing monetary stimulus to the unemployment rate; which makes the labor market a reasonable yardstick for measuring the effects of QE. While the official unemployment rate has fallen substantially from its peak of 10.2% in October 2009 to 7.3% in September 2013, there are a number of reasons why the “official” unemployment rate may not provide a comprehensive picture of the health of the labor market. For one, the official unemployment rate measures the number of unemployed people as a percentage of the “labor force.” To be counted as part of the labor force, one must be actively seeking a job. As a result, anyone who has become discouraged and stopped actively looking for work is no longer considered unemployed. One way to normalize for this factor is to simply look at the employment-to-population ratio, which is the ratio of people with a job to the total number of eligible workers (anyone over 16 years

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1 Source: BoFA Merrill Lynch Global Research, BEA
old). In this light, the employment picture has not improved significantly since the start of QE.

At best, an analysis of the effects of QE on the real economy is inconclusive. Of course, what makes this analysis more difficult is that it is impossible to prove a counterfactual. Critics point out that despite an unprecedented amount of monetary stimulus, this has been the slowest economic recovery in U.S. history. But no one knows what the economic recovery would have looked like without QE or some of the other measures taken by the Fed. Perhaps it would have been much worse.

Nonetheless, multiple rounds of massive monetary stimulus have failed to produce a robust recovery in the real economy.

**Why Hasn’t QE Worked in Practice?**

The breakdown in QE has come in the transmission mechanism from banks to the real economy. While central bank bond purchases have successfully built up record excess reserves in the banking system (i.e., growth in the “monetary base”), too little of this money has found its way out into the real economy through the traditional borrowing/lending channels (i.e., growth in the “money supply”).

The distinction between “monetary base” and “money supply” is critical. Growth in the monetary base (i.e., growth in banks’ excess reserves) has no direct impact on the real economy. Not until banks lend these funds into the real economy that they begin to have an impact that is either good (e.g., growth) or bad (e.g., inflation). Traditional economic theory assumes a relatively stable relationship between growth in the monetary base and growth in the money supply, otherwise known as the “money multiplier.” The money multiplier theory assumes that banks will always

How successful has QE been in pushing down long-term interest rates? While rates have trended down since the start of the quantitative easing, it is interesting to note that during the periods where the Fed has been actively purchasing Treasury bonds, rates have tended to rise rather than fall. And during the periods between QE cycles, rates have tended to fall, rather than rise. Much of this dynamic is likely driven by market expectations (i.e., the market front-running an expected change in Fed policy), but it nonetheless makes it more difficult to isolate the true impact of QE on long-term rates.
lend out a certain percentage of their excess reserves; therefore, if the amount of excess reserves is increased, the amount of loans to the real economy should naturally follow.

This theory has broken down since the Global Financial Crisis. As seen in the chart below, massive increases in the monetary base across the U.S., U.K. and the Eurozone, failed to increase bank lending to the private sector.

Exhibit 1. Massive Quantitative Easing Failed to Increase Credit to Private Sector

This is largely due to the ongoing deleveraging of households. The combination of an unprecedented accumulation of debt in the prior cycle, and the subsequent bursting of the housing market bubble, left many households with no choice but to pay down debt rather than increase borrowing. Furthermore, the same chain of events created a dearth of credit-worthy borrowers to whom banks are willing to lend. Thus, despite the Fed’s best efforts, the fallout from the Global Financial Crisis led to a stubbornly low level of private sector credit growth.

While the traditional lending channel of Fed policy has broken down, the impact of any “wealth effect” appears modest. Mr. Bernanke has clearly stated, on a number of occasions, his belief in the wealth effect. The wealth effect is generally defined as an increase (decrease) in spending due to an increase (decrease) in perceived wealth. While there are a number of variables that can influence one’s perception of their own wealth, Mr. Bernanke has tended to focus on the stock market. In an OpEd piece in The Washington Post at the onset of QE2, Mr. Bernanke wrote that “higher stock prices will boost consumer wealth and help increase confidence, which can also spur spending.”

But is this really true? Does the level of the stock market really have an impact on consumer spending? The academic research on this topic is mixed, with most formal studies concluding that while there is some correlation between asset values such as the housing/stock markets and consumer spending, growth in disposable income is far more important. Unfortunately, growth in real disposable income has proven harder to generate than stock market gains. As shown in the following chart, real disposable income is roughly equal to its level five years ago, despite the stock market having doubled since the end of the crisis.

1 Source: Nomura Research Institute
HAVE THERE BEEN SIDE EFFECTS?

The most widely cited potential side effect of quantitative easing is inflation. Historically, an increase in the monetary base, and consequently the money supply, usually led to an increase in inflation. Yet despite the dramatic rise in the monetary base and unprecedented build up of excess reserves in the banking system, inflation has remained subdued. At a current year-over-year rate of just 1.7%, Core CPI remains below the Fed’s stated target as well as its long-term average.

U.S. equity markets have also experienced a dramatic increase since the start of QE and have been highly correlated with the Fed’s balance sheet expansion. While correlation does not imply causation, and the recent stock market rally has come on the back of the U.S. economy exceeding many expectations, there are some warning signs. One example is margin debt, which hit an all-time high earlier this
Quantitative Easing has been successful in artificially suppressing interest rates, then won’t rates begin to rise when the program is scaled back? And more importantly, can anyone afford for interest rates to go up?

The Bank for International Settlements (BIS) recently examined this very question in their most recent annual report. They estimated that a 300 basis point rise in Treasury yields across the term structure (i.e., across all maturities) would result in a loss of over $1 trillion (roughly 8% of US GDP).1 A 300 basis point “stress test” may sound excessive on the surface, but only in the context of today’s abnormally low interest rates. Over the past 25 years, the average yield on the 10 Year US Treasury bond has been 5.25%, which is roughly 350 basis points over the low for yields in early May. In other words, simply moving back towards a “normal” interest rate environment could be devastating given the size of our nation’s debt.

Furthermore, the above analysis does not include the collateral damage likely to occur in other markets as a direct result of a significant rise in Treasury rates. For example, mortgage rates would also be expected to rise, jeopardizing the recent housing recovery that is so critical to the overall health of the U.S. economy. Rising interest rates may also have a negative impact on the domestic stock market that is central to the Fed’s “wealth effect” thesis. The unfortunate reality of today’s circumstances is that the economy can’t afford higher interest rates. So it seems logical that the Federal Reserve will then look to keep interest rates suppressed for a very long time. But can they actually do this?

Quantitative Easing

debt is roughly $16.7 trillion. Net of intragovernmental holdings (Social Security, Medicare, etc.), that number is roughly $12 trillion. The Fed currently holds a little over $2 trillion of Treasuries on its balance sheet. Thus, there are roughly $10 trillion of Treasury securities outstanding that have not been purchased by the Fed. While the $45 billion of Treasuries per month that the Fed is currently purchasing is a very big number in absolute terms, and big relative to the “flow” of current supply; it is actually a very small number relative to the existing “stock” of government debt. How small? The “flow” of $45 billion per month equates to only 0.45% of the “stock” of outstanding government debt not held by the Fed. Thus, if a critical mass of existing Treasury holders decided to liquidate U.S. government bonds (for whatever reason), there appears to be little the Fed could do to stop this from resulting in rising long-term interest rates, at least under current policies.

The Exit Plan

So what will the Fed do? If the recent past is any indication, they have a daunting task in front of them. In recent months, the Federal Reserve has begun discussing plans for their eventual exit from quantitative easing (commonly referred to as “tapering”). To the surprise of many, the slight hint of the future removal of quantitative easing sent shockwaves around the world. Ten-year Treasury yields rose from a low of 1.63% in early May to 2.66% by late June.

Rising Treasury rates negatively impacted financial assets of all types, from all over the
world. Investors who had been “pushed” out of the safety of Treasury bonds and into riskier assets such as high yield, emerging markets debt and equities, began to take cover. And this came from the hint that maybe the Fed would begin to taper asset purchases later this year. If simply talking about tapering caused a global sell-off in capital markets, what will happen if and when the Fed actually begins the process?

The Fed has taken great pains to distinguish between slowing asset purchases (i.e., tapering) and raising interest rates. They have committed to keeping the Fed Funds rate at zero (i.e., not raising short-term interest rates) through at least early 2015. But if the whole intention behind quantitative easing was to lower long-term interest rates, then why wouldn’t they rise once the asset purchase program was pulled back? As seen in the chart below, nearly all of the incremental demand for longer-dated Treasuries has come from the Fed in recent years. If and when the Fed tapers, will there be an offsetting increase in demand from other market participants to relieve upward pressure on rates?

If long-term interest rates continue to rise, what will be the effect on other asset classes? While a number of asset classes have seemingly benefited from quantitative easing (notably high yield and emerging markets debt), nowhere is the impact more apparent than in the US equity market. As seen in the chart above, the correlation between the S&P 500 and the Fed’s various stimulus policies is impossible to ignore. This has been a somewhat curious correlation. As discussed earlier, there is no transmission mechanism for quantitative easing to directly impact the stock market. No new money is being created by the Fed swapping cash for Treasury bonds. If the mechanics of QE don’t directly lead to a rise in the stock market, then why has this happened?

There are a number of possible reasons. As the yields on Treasuries and other fixed income securities have come down, so has their expected future return relative to equities. As a result, investors set on achieving predetermined return targets have needed to take on more risk. There is also the potential impact of the so-called “Fed Put” or “Bernanke Put,” i.e., the belief that the Fed will do everything in

1 Source: BofAML

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their power to support the stock market and eliminate the potential for any substantial declines. Lastly, the possibility exists that a portion of the stock market rise is a direct result of a general misunderstanding of what quantitative easing really is. If enough people believe that quantitative easing is simply “money printing” that makes the stock market go up, then there is the potential for a self-fulfilling prophecy. In short, given that there is no direct transmission mechanism from QE to the stock market, the recent rise is likely due in large part to positive market sentiment. While the Fed will likely choose to taper QE gradually, a shift in market sentiment may be more sudden.

**Looking Ahead**

The Fed has stated that if the economy continues to progress according to their expectations, they will begin to taper asset purchases later this year. As discussed throughout this paper, quantitative easing has had a very limited impact on the real economy. Therefore, its removal should have similarly limited implications. The capital markets, however, are an entirely different story. And it all starts with Treasury rates. While a slight tapering of QE in itself should not have a significant impact on Treasury yields, a shift in market sentiment certainly could. A material rise in Treasury yields could have severely negative effects on everything from government budgets to mortgage rates. As shown earlier, quantitative easing has provoked much more of a “risk on” mindset from the market than its true function should warrant. Therefore, its removal, even if gradual, has the potential to swing market sentiment too far in the opposite direction.

A large mitigating factor to any medium-term risk from the effects of tapering is that with inflation still very much under control, the Federal Reserve would likely respond with increased stimulus to any material slowdown in the domestic economic recovery. In other words, reducing stimulus now does not preclude increasing it again at some point in the future. But all of this serves to highlight the point that we are very much in uncharted territory. There is no historical precedent for this. All of us, the Federal Reserve included, are learning as we go. In response to the Global Financial Crisis, the Federal Reserve and other global central banks have pushed the limits of monetary stimulus. In many ways, implementing stimulus is the easy part. Removing it will likely prove far more difficult. There is no existing roadmap for what comes next, but there will likely be bumps along the way.

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**Dr. Bernanke Explains Quantitative Easing**

If we feed the banks enough dollars, something good is bound to come out at the other end eventually...

— Eric G. Lewis © 2008