

Quantitative Easing

Summary:

In September 2019, the Federal Reserve (aka “the Fed”) started intervening in the repo market. Alongside its direct participation in the repo market, the Fed also began purchasing at least \$60 billion per month in short-term Treasury bills in an attempt to incentivize banks to increase lending to the repo market. These interventions expanded the Fed’s balance sheet and were accompanied by a significant rally in financial markets, causing market participants to compare these moves to the Fed’s post-financial crisis Quantitative Easing (or “QE”) programs that were instrumental in supporting financial markets from 2008 to 2014. This article outlines the events leading up to the introduction of QE in the US and its implications for the future.

QE has evolved into a key monetary policy solution to facilitate continued lending by the banking system during economic and financial downturns. While QE is a necessary solution to prevent the collapse of the financial system and the resulting pain that people would have to bear in the short-run, it is structured without respect to increasing humanity’s ability to consume and produce products in the future. As a result, it transfers today’s consequences onto future wage earners and taxpayers by reducing future growth potential and increasing the debt burden that must be paid by future generations.

Examining QE helps illustrate several points about the US economy: (1) the health of the banking system may be in jeopardy; (2) the Fed’s intervention is increasingly becoming necessary for the US’s financial plumbing to function; and (3) the resulting impact across the economy is likely to depress real growth in the future. Given that the Fed recently launched a \$700 billion QE program to combat COVID-19 related disruptions in credit markets, it is clear that this tool has become a vital part of the Fed’s monetary policy toolkit. In this context, it is critical to understand the wide-ranging impact that QE has across the economy today and, more importantly, in the future.

What events led to the Financial Crisis and the introduction of Quantitative Easing in the US?

Parsing out the causes of the financial crisis in 2008 is a very complex task – however it is generally recognized that the bubble that developed in the housing market between 2003 and 2007 was a key contributor to the downturn. This article will focus on a few key aspects of the housing bubble: (1) the broad desire for home ownership; (2) the “get rich quick” mindset that drove many people to try to make “low-risk” money in the

housing market; and (3) how the banks worked to facilitate and, more importantly, profit off of the housing boom.

Homeownership has long been an important part of the American Dream – even today, well after the burst of the housing bubble in 2007-2008 and the resulting economic crisis, the vast majority of Americans believe that owning a home is the most important hallmark of achieving the American Dream¹.

Regulations have long targeted increasing home ownership in support of the American Dream, so it makes sense that regulation played an important role in the development of the housing bubble. In 1993, the Clinton administration began a major effort to reform existing legislation to support home ownership. In doing so, they institutionalized a relaxation in lending standards by effectively requiring banks to originate a certain number of loans to lower-income borrowers and use “innovative and flexible” lending practices to meet the needs of low income and nonprime clients².

Around the same time, securitization of mortgages was becoming increasingly popular amongst banks as a way to mitigate asset-liability mismatches arising from the banks having to fund variable-rate deposits with prime fixed-rate mortgages (this issue was a major cause of the Savings and Loan Crisis of the late 1980s). In securitization, banks originate prime mortgage loans, group them and then sell bundles of mortgages to special purpose vehicles (“SPVs”), which are shell companies formed specifically for the purpose of buying mortgages. The SPVs finance the purchase by issuing debt and equity securities, called Mortgage Backed Securities (“MBS”), to investment firms including hedge funds, insurance companies and pension plans. The SPVs’ ongoing interest and principle payments are serviced using the cash flow generated by the mortgages that the SPV³ holds.

Once the securitization process is complete, the bank no longer owns any of the mortgages in the bundle, eliminating the asset-liability mismatch. Securitization also brought ancillary benefits for the banks – for example, once the mortgages are sold, the bank no longer bears any direct risk that the borrowers could default; this risk is spread across the investors who purchased the mortgage-backed securities. This secondary benefit enabled banks to underwrite loans to less credit-worthy clients under the assumption that they would not be ultimately responsible for the increased default risk; this significantly expanded the amount of loans banks could originate.

¹ <https://www.bankrate.com/mortgages/homebuyers-survey-february-2019/>

² https://spectator.org/42211_true-origins-financial-crisis/

³ <http://realestate.wharton.upenn.edu/wp-content/uploads/2017/03/689.pdf>

Securitization has another ancillary benefit for banks – it enables them to reduce the amount of cash that they are required to hold. Before the 2008 crisis, US regulators required banks to hold a cash buffer of 8% of the risk-weighted value of their assets (e.g. the mortgages and other investments they underwrite and hold), to ensure that the bank will be able to survive if some of its risky assets are impaired⁴. Maintaining this cushion is costly for banks – this is cash that could otherwise be put to work by lending it out and earning interest, and instead it is lying fallow. This requirement forcibly depresses banks’ profits and returns in exchange for ensuring the stability and safety of the banks and the financial system. Securitization benefits the banks by allowing them to underwrite loans and profit from the associated fees, then sell the loans to others so that they don’t have to hold the required regulatory capital⁵. As banks discovered that they can earn much higher returns under this model than they would otherwise, they expanded their use of securitization accordingly.

Freed from the burden of having to bear the risks and costs of the loans they originate, and with the implicit approval of the government, lenders began to relax lending standards significantly. Limitations in the amount lent to borrowers increased to 100%+ of the current value of the house (100% Loan-to-value, or LTV), vs. a previously accepted limit of 80% LTV. Documentation requirements were also relaxed, meaning that borrowers no longer needed to provide sufficient evidence of income and financial wherewithal to be able to afford the loan on the house.

Financial innovations from the 1980s and 1990s, known as Adjustable-Rate Mortgages (“ARMs”), significantly reduced borrowers’ mortgage costs in the initial years of homeownership, enabling speculators that otherwise wouldn’t be able to support the mortgage cost associated with a fixed-rate loan to cash in on the boom with short-term buy-and-flip schemes. Indeed, the combination of low up-front costs resulting from banks lending at 100%+ LTV, low mortgage interest expense enabled by ARMs and steadily increasing home prices proved to be a very attractive proposition for many speculators seeking to get rich quickly with minimal risk of loss. Research has shown that real-estate speculators played a critical role in driving growth of mortgage debt amongst the middle-and-high income classes in the US between 2003 and 2007⁶.

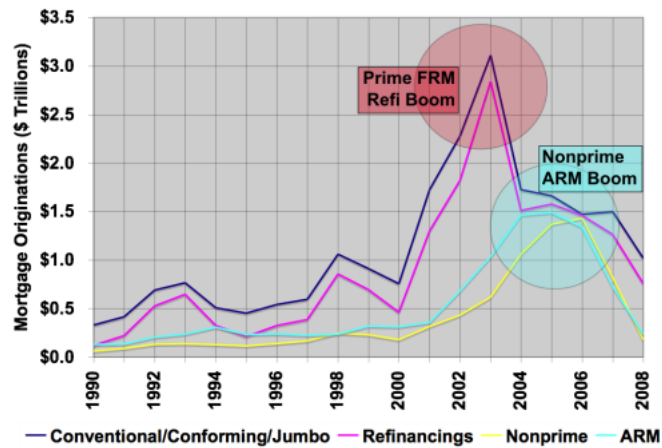
The combination of securitization, reduced lending standards and speculation generated an explosion in non-prime and ARM mortgage issuance between 2003 and 2007, as shown in the chart below⁷:

⁴ https://www.richmondfed.org/-/media/richmondfedorg/publications/research/economic_quarterly/2019/q1/walter.pdf

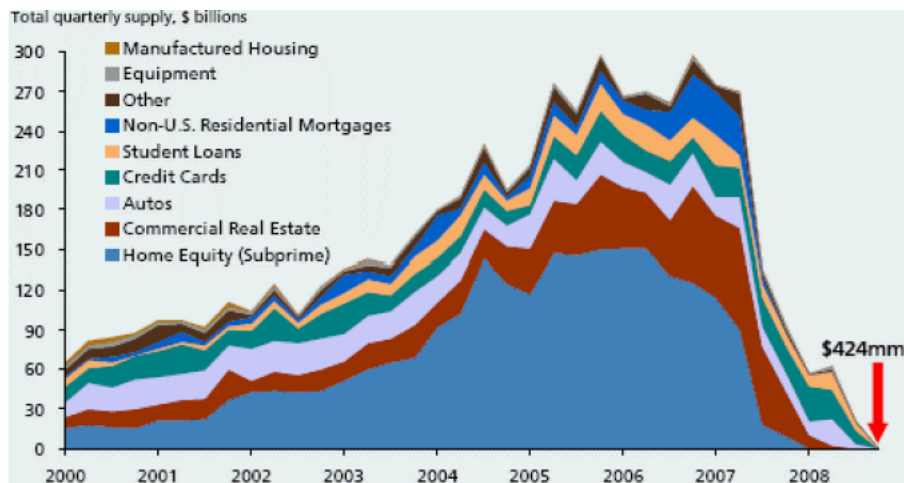
⁵ http://pages.stern.nyu.edu/~sternfin/vacharya/public_html/tail_risk.pdf

⁶ <https://www.nber.org/papers/w23740.pdf>; using credit scores as a proxy for income

⁷ <http://realestate.wharton.upenn.edu/wp-content/uploads/2017/03/689.pdf>



Origination of these relatively low-quality mortgages was facilitated by securitization, as shown in the below chart of Asset-Backed Securities Issuance⁸:



The SPVs issuing MBS were heavily “structured” by splitting up the mortgages they owned into pools that were organized according to the predicted riskiness of the loans – each pool could then be used to back a MBS with a specific risk profile. These MBS could be structured even further by packaging them into new SPVs with other credit securities such as corporate debt and other asset-backed securities to create vehicles known as collateralized debt obligations (“CDOs”), which in turn would issue their own securities (known as asset-backed securities) to investors. The result of all this structuring was an extremely complex set of securities that bankers and investors believed carried low risk. In fact, holders of the least-risky securities issued by SPVs and CDOs often found themselves owning a product that paid a relatively high interest rate despite carrying a AAA rating from the three ratings agencies (Moody’s, S&P and Fitch). This is the same

⁸ <http://icrier.org/pdf/Session%20-%20P%20-%20Viral%20Acharya-2.pdf>

rating that the agencies gave to US Treasury securities at the time, which investors and regulators interpreted to mean that these highly complex products had approximately the same risk of loss as securities issued by the US government.

Sometime between 2003 and 2006, banks came to the realization that the MBS and CDOs they were creating were treated by regulators and risk management systems as having equivalent risk to US Treasuries, despite the fact that they carried a much higher interest rate. This meant that the banks could boost their own profits and ROE by holding on to these AAA rated securities instead of selling them off to investors. This strategy, which came to be known as “regulatory arbitrage”, enabled banks to earn short-term profits by owning MBS and CDOs which were not subject to regulatory capital requirements. Regulatory arbitrage typically manifested in one of two ways. Either (1) The MBS and CDOs were held off the banks’ balance sheets but guaranteed by the banks (which allowed banks to own both the high-quality AAA-rated securities and the subordinated securities that were much riskier but paid an even higher rate of interest); or (2) banks directly invested in the AAA-rated securities and held them on their balance sheet. This strategy was so profitable for banks between 2003 and 2006 that they pushed their leverage as far as they could and invested in as many MBS and CDOs as they could get their hands on. When the housing market turned in 2007, banks owned so many of these structured securities that nonbank investors in MBS bore only ~4.3% of the losses. The remaining loss wiped out significant portions of banks’ capital reserve and threatened their solvency⁹.

The banks’ MBS and CDO buying spree was fueled by the belief that the only way they could lose is if a massive number of mortgages got hit – which would mean that an economic catastrophe had occurred. The banks happily bet their futures that such a “black swan” event would not happen, despite the fact that their actions effectively guaranteed catastrophe if housing price growth slowed or turned negative.

The growth that securitization spurred in the ARM market created a situation wherein a large number of mortgages being packaged into MBS offered a low fixed “teaser” rate for the first 2 to 3 years, after which the rate would switch to a high, adjustable rate. This type of mortgage was offered with the idea that the owner would flip the house within the first 2-3 years or refinance the mortgage in order to lock in another low teaser rate. Neither a sale nor a refinancing would be possible unless the price of the underlying house continued to rise, and the interest payments after the teaser period were so expensive that if the house wasn’t flipped or refinanced during the teaser period, the borrower would likely default. Effectively, banks and mortgage lenders had inadvertently created an environment which would lead to a wave of defaults if housing

⁹ http://pages.stern.nyu.edu/~sternfin/vacharya/public_html/tail_risk.pdf

price growth slowed or turned negative – which, in turn would further depress housing prices, creating a negative feedback loop that could turn quickly into a contagion¹⁰.

When housing prices did finally slow in 2007, the resulting wave of defaults led many purchasers of mortgage backed securities to realize that their “high-quality” assets were getting hit simultaneously with delinquencies and defaults in the underlying mortgages, meaning that the MBS had little to no resale value. As housing prices continued to decline, the crisis escalated in 2008 and ultimately generated significant losses for the banks that owned MBS and CDOs. In Late 2008, the failures of Bear Stearns and Lehman Brothers led banks to lose trust in each other, paralyzing capital markets and interbank lending markets and exacerbating the crisis further.

The Financial Crisis of 2008 was so severe that lending by commercial banks dried up, causing the contagion in housing to spread to other markets across the US. The Federal Reserve and the Treasury reduced interest rates and created backstop facilities whose aim was to purchase the toxic mortgage backed securities from the banks, in the hope that recapitalizing the banks would encourage them to start lending again. Despite these efforts the economy continued to deteriorate, and the Federal Reserve began to implement a series of unconventional tools including Quantitative Easing.

What is the Fed and what is its relationship with Commercial Banks?

In order to understand QE, we first need to understand what the Fed is and how the Fed interacts with main street banks.

The Federal Reserve System (“The Fed”) is America’s central bank, and it operates under a mandate from Congress to maximize employment, stabilize prices and moderate long-term interest rates¹¹. The Fed achieves these objectives primarily by setting short-term interest rates and controlling the total amount of US dollars in the US economy¹² (which are together known as “Monetary Policy”¹³).

A network of 12 Federal Reserve Banks and 24 branches make up the Federal Reserve System under the leadership of the Board of Governors. The 12 Reserve Banks are often called “the bankers’ banks”, as they store electronic and physical money and perform other functions for their ~3,000 member commercial banks (which are typically larger,

¹⁰ http://pages.stern.nyu.edu/~sternfin/vacharya/public_html/tail_risk.pdf

¹¹ https://www.richmondfed.org/publications/research/economic_brief/2011/eb_11-12

¹² <https://www.investopedia.com/terms/f/federalreservebank.asp>

¹³ <https://www.investopedia.com/terms/m/monetarypolicy.asp>

nationwide banks that play an important role in the financial system, and are therefore required by law to participate in the Federal Reserve System)¹⁴.

Every commercial bank that is a member of the Federal Reserve has a bank account at its local Federal Reserve Bank, at which it stores its reserves and through which it has access to the financial services and loans that the Federal Reserve provides¹⁵.

What are Reserves and what role do they play in the economy?

Reserves are deposits of US dollars that banks keep in their accounts at the Federal Reserve. These deposits are comprised of cash (coins and bills) and electronic money, although the vast majority of reserves take the form of electronic money. Reserves are distinct from the money that people use every day in that only banks, the Federal Reserve, and certain other governmental institutions can make payments using reserves. The money that the rest of us use is actually private money that is created by commercial banks¹⁶.

Banks primarily use reserves to make payments to each other that reflect transactions made using the banks' private money. When money is transferred in between people (or used to complete purchases, etc), it appears as though the private money that banks create moves from one bank to another. Before the creation of the Federal Reserve System, relying on banks to accept private money from one another caused the financial system to freeze up in an economic downturn (what happens if a bank becomes insolvent, and its private money can't be used as a currency anymore?), exacerbating the downturn's negative effects¹⁷.

Reserves solve this issue by creating a common currency that all banks can use to settle interbank payments. When one person transfers money from their checking account to another person's checking account, the transferor's bank reduces the amount of private bank money in his checking account, then sends an equivalent amount of reserves to the transferee's bank. The transferee's bank then reflects the transfer by increasing the amount of private money in her checking account¹⁸.

As an example, assume that I have a bank account with Chase, and a store that I am shopping at has an account with Citibank. If I purchase a \$500 television from the store using my debit card from Chase, this means that \$500 must be transferred from my

¹⁴ <https://www.federalreserveeducation.org/about-the-fed/structure-and-functions>

¹⁵ <https://www.federalreserve.gov/monetarypolicy/reserve-maintenance-manual-account-structure.htm>

¹⁶ <https://www.pragcap.com/what-are-bank-reserves/>

¹⁷ <https://www.pragcap.com/what-are-bank-reserves/>

¹⁸ <https://www.wsj.com/articles/bank-reserves-what-are-they-and-why-a-shortage-is-roiling-a-key-interest-rate-11568891110>

account at Chase to the store's account at Citibank. Since Citibank won't always accept Chase's private currency, the transaction must be settled using reserves – \$500 of Chase's private money will be removed from my checking account, \$500 of reserves will be transferred from Chase to Citibank, and the store's checking account balance will be increased by \$500 of Citibank's private money to complete the transaction.

The Fed requires that banks hold a certain amount of reserves on hand on a daily basis to ensure that the bank can perform its duties (primarily cash withdrawals and transfers) smoothly. Currently, member banks must hold reserves equal to 10% of their overall deposits from consumers (called the “reserve requirement”) – for example, this means that if a bank has \$200 million in bank deposits, it must maintain reserves equal to at least \$20 million at the end of each day¹⁹. The reserve requirement is distinct from the regulatory capital requirement discussed earlier, which is meant to protect banks from losses on their loan portfolio.

As a normal result of participation in the economy, at the end of each day some banks carry excess reserves (over 10% of deposits) and some banks carry too few reserves (under 10% of deposits). Banks with excess reserves are allowed to lend those reserves on a short-term basis to banks that don't have enough reserves to meet the requirement. This allows banks with excess reserves to earn interest (maximizing profits on their capital), and the rate that they charge is known as the Federal Funds Rate²⁰. In today's post-quantitative easing world, reserves in the banking system are abundant and these reserve requirements are not relevant to the daily functioning of the banking system – however, because of new regulations and the need to settle payments, interbank lending of reserves (mainly through the repo market) remains critical to the normal functioning of banks and the economy.

Lending of reserves amongst banks plays a critical role in the Fed's ability to conduct monetary policy. The Federal Reserve primarily raises interest rates by selling short-term Treasuries to banks in exchange for reserves. In doing so, it makes the amount of reserves in the banking system more scarce, and therefore more expensive to lend out, causing the Federal Funds Rate to rise. To reduce rates, the Fed purchases short-term Treasuries from banks in exchange for reserves, making the amount of reserves in the banking system less scarce, causing the Federal Funds Rate to fall²¹. If the amount of reserves in the overall economy is too low, (said another way: if the economy has outgrown the amount of available reserves), the Fed has the power to create new reserves, effectively printing new electronic US dollars.

¹⁹ <https://www.thebalance.com/reserve-requirement-3305883>

²⁰ <https://www.pragcap.com/what-are-bank-reserves/>

²¹ <https://www.thebalance.com/how-does-the-fed-raise-or-lower-interest-rates-3306127>

What is Quantitative Easing and how does it work?

Quantitative Easing, or “QE” is an umbrella term that describes a number of distinct unconventional monetary interventions used by the Fed to combat the Great Recession and its after-effects between 2008 and 2014. Quantitative easing is generally understood to have taken place in 3 stages, called “QE1”, “QE2” and “QE3”, each of which had distinct characteristics as explained below.

First, a little background. For 50+ years prior to the 2008 financial crisis, the primary tool that the Fed used to manage the economy was the Federal Funds Rate, which is the interest rate at which banks lend to each other on a short-term basis²². Banks used the Federal Funds Rate as the basis for the Prime Rate at which they lend money on a short-term basis to consumers and businesses in the US economy, and so the Fed managed the Federal Funds Rate to set short-term interest rates in the economy. Lowering the Federal Funds Rate was generally thought to stimulate additional economic growth (lowering the cost of capital for new investments, which would make a greater number of potential projects profitable) and raising rates was generally thought to slow economic growth.

On December 16, 2008, the Fed reduced the Federal Funds Rate, and thus short-term interest rates in the economy, to nearly zero in an effort to fight the worst recession since the 1930s. This effectively exhausted the Fed’s ability to manage the economy using historically conventional tools; and yet despite this action, the US economy, and in particular US credit markets, continued to deteriorate.

As its conventional tools were failing to stimulate enough lending and investment to generate a recovery, the Fed turned to new, relatively untested forms of intervention in an effort to stabilize the economy. The most visible of these new policy measures has been Quantitative Easing, because of the resulting dramatic increase in the size of the Fed’s balance sheet²³.

The core mechanism of QE is Federal Reserve purchases of various types of financial instruments held by banks. The goal of these purchases is to: (1) inject more liquidity into the financial system by replacing Treasuries and other assets with reserves and (2) lower the interest rates associated with these financial instruments. The Fed believed that these outcomes would ease pressure on the banking sector and incentivize them to

²² <https://www.federalreserve.gov/Events/conferences/2012/cbc/confpaper1/confpaper1.pdf>

²³ <https://www.federalreserve.gov/Events/conferences/2012/cbc/confpaper1/confpaper1.pdf>

start lending again, which would help spark a recovery and make it self-sustaining²⁴. The structure of QE is not explicitly intended to incentivize banks to lend according to any particular quantities or standards; it is simply meant to incentivize an increase in overall lending activity.

In order to fund these purchases of financial instruments from the banks, the Fed created new US dollars in the form of reserves and exchanged them for financial instruments held by the banks by depositing those newly created reserves into interest-bearing accounts that the banks held at the Fed.

²⁴ <https://www.manning-napier.com/insights/blogs/research-library/quantitative-easing-3>

Below is a schematic illustrating the mechanics of QE asset purchases, assuming the Fed purchases \$100 million of Treasury Bills:



Two important effects to note from the diagram above: (1) QE does not add any new assets to banks' balance sheet – it simply increases the amount of reserves that banks have while reducing the amount of less liquid assets; and (2) QE results in the expansion of the Fed's balance sheet.

QE1 Overview & Impact (Initiated January 2009)

In January 2009, the Federal Reserve initiated a program to buy \$600 billion in mortgage-backed securities and \$100 billion in other debt²⁵. The program was expanded multiple times, and by June 2010 the Fed had purchased in excess of \$1 Trillion in mortgage backed securities, bank debt and Treasury securities, bringing the overall size of their balance sheet to \$2.1 Trillion (Up from \$700-\$800 billion before the beginning of QE). At this point, the Fed halted purchasing activity, believing that they had done enough to help the economy recover, and allowed their balance sheet to begin to decline naturally (the assets they purchased would mature and thus be removed from the Fed's balance sheet).

The goal of QE1 was twofold: to encourage additional lending activity by providing liquidity to the banks and removing potentially toxic assets from their balance sheets, and to bid up the prices of Treasuries and distressed MBS (and thus lower their expected yield) via Fed purchases of those securities. When seen from this perspective, QE1 was a bailout of the banks that was intended to stop the economy from spiraling into another Great Depression²⁶.

The Fed was largely successful in preventing a recurrence of the Great Depression, and failures of large banks were prevented by QE1 as the banks held on to the new reserves and used them to buffer against further losses. Since the economy remained weak, banks continued to incur losses and held onto the reserves instead of using them to lend - thus QE1 failed in its goal of encouraging additional lending.

QE 2 Overview & Impact (Initiated November 2010)

By November 2010, QE1 still hadn't spurred the banks to lend enough, so the Fed announced another round of QE. In this round, the Fed announced it would purchase \$600 billion of longer-dated Treasury securities such as 10-year notes at a rate of \$30 billion per month – this would maintain the Fed's balance sheet at approximately \$2 Trillion.

The goal of QE2 was to increase lending by reducing long-term interest rates and to nudge investors towards riskier investments (such as mortgages) by making safe investments like Treasuries less attractive. The Fed believed that (1) Increasing the levels of unproductive reserves on bank balance sheets would force banks to increase lending to companies; and (2) that demand for productive loans would be increased as broader asset value growth resulted in higher consumption. QE2 was successful in reducing

²⁵ <https://www.federalreserve.gov/newsevents/pressreleases/monetary20081230b.htm>

²⁶ <https://creditwritedowns.com/2011/06/qe1-versus-qe2-versus-q3.html>

long-term interest rates²⁷, but banks, still damaged by the fallout from the events of 2008, refused to increase broad lending activity. Instead, lending activity to a smaller number of large companies increased, and those companies mainly used the new funds to increase buybacks instead of investing in hard assets that could help improve future growth²⁸. Lower long-term interest rates on safe investments successfully pushed investors to buy riskier securities, pushing up prices of stocks, corporate bonds, and real estate, but this failed to stimulate significant additional demand for loans.

Overall, QE2 succeeded in lowering long-term interest rates and inflating asset prices, but failed in stimulating lending and helping the economy recover.

QE 3 Overview & Impact (Initiated September 2012)

QE3 began in late 2012 and broke from the standards established by the previous 2 stages of QE. QE3 did not have a total dollar limitation on asset purchases – instead the Fed announced that \$40 billion in MBS and long-term Treasury security purchases per month would continue until unemployment improved significantly²⁹. In December, the Fed increased the amount of monthly purchases from \$40 billion to \$85 billion, and established that the QE program would continue until unemployment fell to below 6.5% or inflation rose above 2.5%³⁰.

In June 2013, the Fed announced its intention to reduce asset purchases from \$85 billion to \$65 billion per month, and suggested that the Fed could end new QE asset purchases entirely by mid-2014. Stock markets responded by declining by 4.3% in the three days following the Fed's announcement, and the negative market reaction caused the Fed to hold off on reducing its asset purchases until January 2014³¹.

When new QE purchases officially ended in October 2014, the Fed held almost \$4.5 trillion in assets, an increase of almost \$3.8 trillion compared to its pre-crisis balance sheet. Although new asset purchases under QE had officially ended, the Fed continued to reinvest the interest and principal payments generated by its vast portfolio of MBS and Treasury securities into Treasury markets, effectively maintaining the effects of its intervention (depressed short and long-term interest rates) through 2018, when it finally decided to begin reducing the overall value of its portfolio.

²⁷ <https://www.federalreserve.gov/Events/conferences/2012/cbc/confpaper1/confpaper1.pdf>

²⁸ <http://www.coppolacomment.com/2013/05/inflation-deflation-and-qe.html>

²⁹ <https://www.manning-napier.com/insights/blogs/research-library/quantitative-easing-3>

³⁰ <https://www.federalreserve.gov/newsevents/pressreleases/monetary20121212a.htm>

³¹ <https://www.cnbc.com/2013/12/18/fed-begins-taper-program.html>

By late 2014, the Fed believed that the big banks had been recapitalized, unemployment had declined to below 6%, and that the economy was on its way to recovery. On the other hand, bank lending remained depressed, with the ratio of bank loans to deposits continuing a decline that began in 2010³².

The evidence that QE added to economic growth is mixed, and many believe that QE in fact did not positively impact the pace of the economic recovery³³. The benefits of the QE-driven economic recovery were distributed very unevenly – with the owners of assets (stocks, bonds, real estate, etc.) benefitting disproportionately as QE reduced interest rates, boosting asset values while hurting normal savers and those whose wealth was mostly held in cash and income-generating products (such as annuities)^{34 35}.

³² <https://www.forbes.com/sites/greatspeculations/2014/12/05/q3-2014-u-s-banking-roundup-loan-to-deposit-ratio/#120c7321e97f>

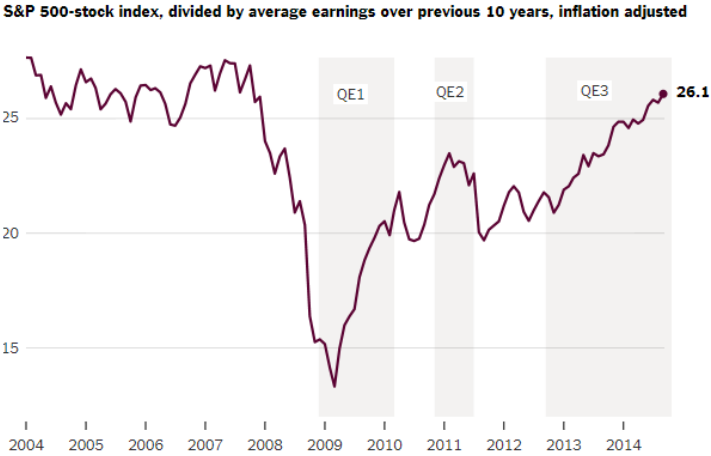
³³ <https://www.cmegroup.com/education/featured-reports/did-quantitative-easing-help-spur-growth.html>

³⁴ <https://www.brookings.edu/blog/up-front/2015/06/10/kevin-warsh-don-kohn-on-qe-and-inequality/>

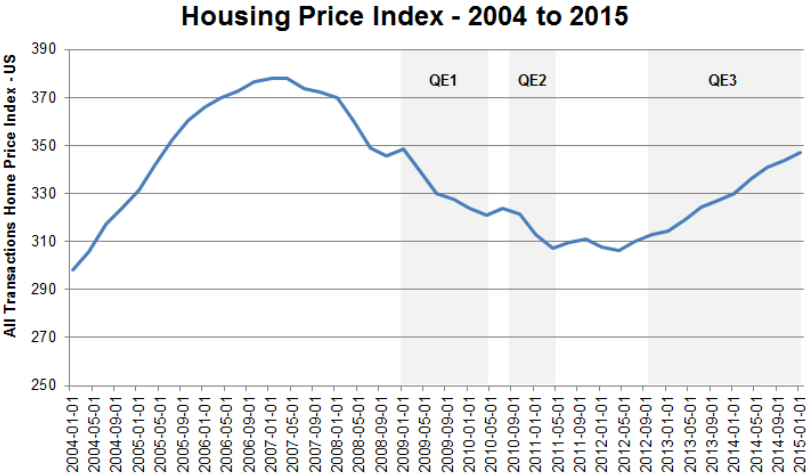
³⁵ <https://www.ft.com/content/6f219ba8-327d-11e3-91d2-00144feab7de?siteedition=uk#axzz2i9RIIONv>

General Impact of QE on Financial Markets and the Banking System

QE, through its large-scale purchases of US Treasuries (in QE2 and QE3), pushed up the price of safe assets and reduced the expected yield of those assets. This effect drove investors to allocate capital to riskier assets, increasing the value of financial assets and real estate (once the overhang created by the housing bubble was cleared) as demonstrated in the below charts^{36 37}:



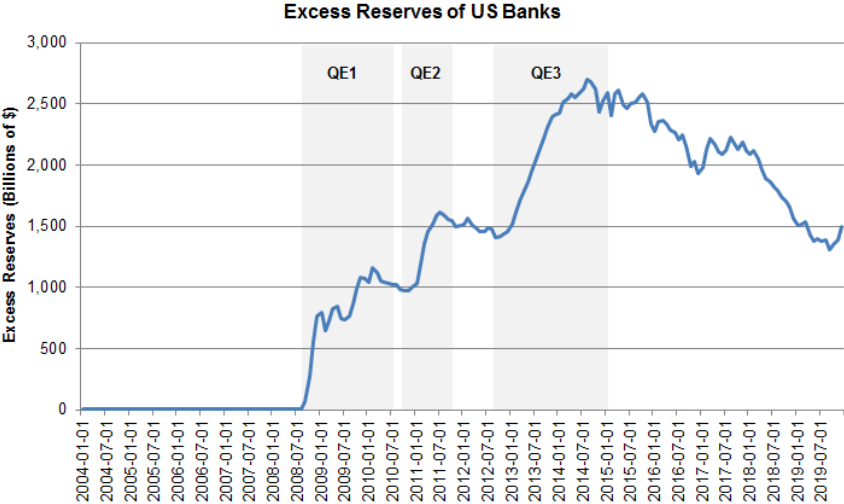
Source: Robert Shiller, Yale University



³⁶ <https://www.nytimes.com/2014/10/30/upshot/quantitative-easing-is-about-to-end-heres-what-it-did-in-seven-charts.html?ref=economy&abt=0002&abg=1>

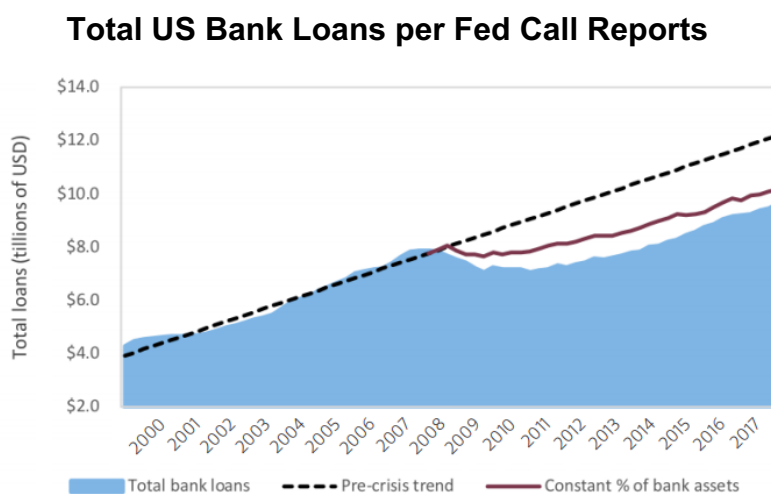
³⁷ <https://fred.stlouisfed.org/series/USSTHPI>

QE also created excess reserves in the banking system, as demonstrated in the chart below³⁸:



³⁸ <https://fred.stlouisfed.org/series/EXCSRESNS>

While it is inarguable that Quantitative Easing (combined with TARP and other Fed programs that removed toxic assets from the banks’ balance sheets) prevented the economy from sinking into a deep depression, the Fed’s efforts to lower interest rates and encourage lending didn’t materialize in significant increases in bank loan activity (and therefore broad-based economic growth) until 2014, a full 6 years after the financial crisis³⁹:



SOURCE FDIC Call Reports

The recovery in lending activity was slow for a number of reasons. After the financial crisis, the banking sector was badly damaged – balance sheets carried large amounts of bad loans and new regulations pressured banks to reduce the size of their balance sheet. The resulting bank deleveraging meant that, despite QE replacing some Treasuries and toxic assets with reserves, banks still needed more time and capital to reduce debt and absorb the losses created by the 2008 crisis⁴⁰.

This effect was made worse by the fact that, after the financial crisis, banks lost trust in each other and thus shifted most of the interbank lending market to the collateralized repo market – and as QE reduced the amount of high-quality collateral (Treasuries) that could be used in the repo market, the ability of banks to flow capital around the economy was impaired, as was their ability to direct loans to businesses that needed them⁴¹.

³⁹ <https://www.bakerinstitute.org/media/files/files/97fc7f24/bi-brief-011019-cpf-banklending.pdf>

⁴⁰ <http://www.coppolacomment.com/2013/05/theres-problem-with-transmission.html>

⁴¹ <https://voxeu.org/article/central-bank-reserve-creation-era-negative-money-multipliers>

Another reason for the slow recovery in lending activity is that QE actually reduced the incentive for banks to fund risky and productive investments in R&D and new capital. As the Fed's policy actions reduced and maintained low short and long-term interest rates (with short-term rates approaching 0%), banks had little incentive to bear a high risk of loss given that the amount that they could earn with such a loan was significantly diminished. As a result, banks looked for opportunities to lend with low risk – and either kept their money in interest-bearing Federal Reserve deposit accounts, Treasuries or lent to large, established companies that had opportunities to purchase existing financial and real assets⁴². Given that QE was directly supportive of financial asset prices, banks were more than happy to direct capital to support financial asset purchases such as stock buybacks at the expense of productive investment in the real economy.

Another important effect of Quantitative Easing was to show consumers, banks and investors that the Fed was willing to do whatever it takes to prevent a major depression. In bailing the banks out, the Fed proved to banks, consumers and investors that it was ok to take large risks and overleverage investments that could put the economy at risk, because if things get too bad, the Fed will intervene. This effect, known as “moral hazard”, creates an asymmetric return profile for systemically important investors and banks – where they are able to capture all of the upside for investments in which they take massive risks, and the downside is limited by the Fed.

Why did the Fed restart asset purchases in 2019? Why was QE officially reinstated in 2020?

The Fed ended new QE asset purchases in 2014, effectively reducing the amount of reserves in the banking system as the economy began to recover⁴³. When President Trump was elected in 2016, his policy agenda of deregulation and tax cuts sped up the recovery from the slower pace experienced between 2009 and 2015. The Fed used the opportunity to tighten monetary policy, allowing the pace of its balance sheet reduction to speed up and raising the Federal Funds Rate from its near zero rate in 2015 to a peak of 2.5% at the beginning of 2019. This gave the US some hope that the Fed could reverse QE and reduce the market's reliance on its support – thereby restoring “normalcy” to monetary policy (reversing the impacts of QE and returning to pre-financial crisis means of intervention).

In 2019, however, the global economy took a turn for the worse, and President Trump's trade war was interfering with American economic growth. In response to these threats, the Fed began to cut interest rates once again – and hinted that further interest rate

⁴² https://web.archive.org/web/20130623060817/http://www.pieria.co.uk/articles/the_slow_death_of_banks

⁴³ <https://www.kansascityfed.org/en/publications/research/eb/articles/2019/how-have-banks-responded-declining-reserve-balances>

increases were off the table until the economy generated core inflation above 2% again⁴⁴. Given that core inflation has not exceeded 2% at any point since 2008 (even in 2016-2018, when the stock market increased significantly)⁴⁵, the Fed was effectively giving guidance that interest rate increases were off the table in the near-term.

The Fed continued its policy of reversing the effects of QE through 2019, but as the financial system became aware of the risks presented by the global slowdown and Trump's trade war, and concerns grew that the Fed cutting interest rates would not provide enough stimulus, funding markets began to seize up. In September 2019, turmoil in the repo market caused a shock to financial markets, and the Fed diagnosed that it had allowed its reversal of QE to go too far – resulting in an amount of reserves in the banking system that was too low. In response to the turmoil in the repo market, the Fed announced that it would begin purchasing \$60 billion in Treasury bills per month in order to manage the level of bank reserves in the system.

Despite Fed Chair Jerome Powell's efforts to distinguish the 2019 policy from QE, this intervention had many of the same effects on risky assets as QE did – for example, in the fourth quarter of 2019, after the Fed's announcements, the value of the S&P 500 increased by 10%.

In February and March 2020, as COVID-19 began to spread in America, financial markets once again began to seize up. Facing a highly disrupted economy and a banking system that was beginning to withdraw from lending activity, the Fed cut interest rates and initiated a new round of QE in the form of \$500 billion of Treasuries and \$200 billion of mortgage-backed securities⁴⁶. Mandatory shelter-in-place orders significantly disrupted business activity and induced households and businesses to spend less, especially on non-essential goods and services. Although the banks entered this crisis with bigger capital cushions and much stronger balance sheets, they began to reduce overall lending and market making activity, exacerbating stress across the broader economy. Seeing this, the Fed stepped in aggressively, launching a massive QE program to help banks build additional capital and encourage them to lend, while simultaneously launching a number of other programs that enabled the Fed to step in to markets where banks were pulling back.

Theoretical Framework for Understanding Quantitative Easing

⁴⁴ <https://www.nytimes.com/2019/10/30/business/economy/federal-reserve-interest-rates.html>

⁴⁵ <https://www.advisorperspectives.com/dshort/updates/2019/12/20/two-measures-of-inflation-and-fed-policy>

⁴⁶ <https://www.cnbc.com/2020/03/15/federal-reserve-cuts-rates-to-zero-and-launches-massive-700-billion-quantitative-easing-program.html>

A fundamental principle necessary to understand QE is that rational economic actors seek to maximize profits and returns while minimizing the associated risks. The term “rational economic actors” here includes both banks and investors, but also consumers. Without demand for profit-maximization and risk-minimization by people who are consuming and investing in housing, banks would not have had an incentive to use securitization to facilitate large-scale lending during the housing bubble – the profit opportunity for banks would not have been large enough to pursue it as aggressively as they did.

Similarly, if banks and investors were not pursuing the same strategy of maximizing their reward / risk ratio, they would not have seen securitization as a path to reduce lending standards and expand mortgage lending to consumers who could not realistically afford the houses they were purchasing.

Below is a recap of applicable theory from the repo article:

When an economic actor possesses asymmetric information, they can use it to create a system in which they believe they have virtually no risk of loss. In doing so, they justify their existence (by generating positive ROI) and minimize their risk of loss by transferring it to other participants in the system. These actions create a situation where the outcomes generated by the system are binary (win or lose) and have personal implications for the economic actor (i.e. a win justifies their existence and a loss creates anxiety by indicating the existence of risk that they didn't externalize adequately or that their information advantage is weak).

Through securitization, banks believed they had created a system where they had a win/win fueled by asymmetric information – they could control the process from mortgage origination to securitization and sale of the MBS / CDOs. By selling off the riskier tranches of mortgage backed securities and keeping the least risky tranches for themselves (both on balance sheet and off), banks ensured that they could (1) offload the risk of losses in 99% of cases to other investors and in the remaining 1% of cases to future wage earners via the Fed; (2) minimize the amount of capital they needed to hold against their assets; and (3) earn excess profits in the short-term, maximizing their short-term ROE.

To expand on point (1) above, by securitizing mortgages into MBS and CDOs, and keeping the least risky tranches for themselves, banks ensured that they would only lose in the case of a broad downturn in the housing market – this offloaded their risk of loss in 99% of cases. Through the complex arrangements the large banks made to house the least risky tranches on and off their balance sheets, they intertwined themselves into the fabric of the financial markets so deeply that if even one of them was allowed to fail, the

impact of their failure could trigger a massive financial and economic crisis. This meant that the large banks were “too big to fail”, and their downside risk would have to be capped via intervention by the Fed.

The mechanism through which the consequences of a massive financial and economic crisis are transferred to future wage earners is QE. The Fed’s interventions in financial markets during times of stress, including QE, are unavoidable given the current structure of the financial market – without these interventions, the contagion in the financial sector in 2008 would have spilled through to the real economy completely unchecked, resulting in an economic collapse with a human cost that would have rivaled the Great Depression.

However, QE is effectively (1) a bank bailout; and (2) a mechanism through which the Fed tries to stimulate broad lending activity by artificially inflating asset prices - without attaching any conditions to ensure that incremental lending is directed towards investments in humanity. Expansion in asset prices necessarily reduces the returns to taking real risks, stymieing real growth. Since both short and long-term rates are depressed by QE, banks don’t have an incentive to make higher risk loans (“the juice isn’t worth the squeeze”). Similarly, the QE-driven increase in asset values have reduced the potential returns to innovation, and concentrated entrepreneurial investment into capital-light sectors of the economy that are still capable of generating some excess returns (such as the Tech sector).

Furthermore, given the reduced returns to risk-taking and innovation, established companies are also not incentivized to drive sales growth by investing in R&D or capital expenditures; instead companies have been cutting expenses – effectively sending larger and larger amounts of money to short-term profit at the expense of investments in medium and long-term growth⁴⁷. Indeed, large company profit margins have never been at higher levels than in the last 2 years⁴⁸.

QE can be thought of as the way in which externalities generated by financial innovations can be resolved. In doing so without explicitly linking new lending to investments in furthering humanity’s capabilities, QE generates a number of externalities that must be solved in order to secure the economy’s ability to generate strong growth in the future.

In our efforts, as a society, to improve the go-forward outlook for all US wage earners, we must seek to build a system in which innovations meet real needs within

⁴⁷ <https://www.pimco.com/en-us/insights/economic-and-market-commentary/investment-outlook/scrooge-mcducks>

⁴⁸ <https://www.yardeni.com/pub/sp500margin.pdf>

communities, without taking actions to minimize or transfer the associated risks. In collaborating with communities in this way, businesses can foster stronger employment and real growth in consumption that will support stronger returns to innovation. In the next article, on inflation, we will examine ways in which businesses can invest in their communities and employees in order to generate non-diminishing marginal returns to labor and strong investment returns.

Background Information / Citations

<https://www.pimco.com/en-us/insights/economic-and-market-commentary/investment-outlook/scrooge-meducks>

<https://www.yardeni.com/pub/sp500margin.pdf>

<https://www.kansascityfed.org/en/publications/research/eb/articles/2019/how-have-banks-responded-declining-reserve-balances>

<https://www.nytimes.com/2019/10/30/business/economy/federal-reserve-interest-rates.html>

<https://www.advisorperspectives.com/dshort/updates/2019/12/20/two-measures-of-inflation-and-fed-policy>

<https://www.cnn.com/2020/03/15/federal-reserve-cuts-rates-to-zero-and-launches-massive-700-billion-quantitative-easing-program.html>

<http://www.coppolacomment.com/2013/05/theres-problem-with-transmission.html>

<https://voxeu.org/article/central-bank-reserve-creation-era-negative-money-multipliers>

https://web.archive.org/web/20130623060817/http://www.pieria.co.uk/articles/the_low_death_of_banks

<https://www.bakerinstitute.org/media/files/files/97fc7f24/bi-brief-011019-cpf-banklending.pdf>

<https://fred.stlouisfed.org/series/EXCSRESNS>

<https://www.cnn.com/2013/12/18/fed-begins-taper-program.html>

<https://www.forbes.com/sites/greatspeculations/2014/12/05/q3-2014-u-s-banking-roundup-loan-to-deposit-ratio/#120c7321e97f>

<https://www.cmegroup.com/education/featured-reports/did-quantitative-easing-help-spur-growth.html> <https://www.brookings.edu/blog/up-front/2015/06/10/kevin-warsh-don-kohn-on-qe-and-inequality/>

<https://www.ft.com/content/6f219ba8-327d-11e3-91d2-00144feab7de?siteedition=uk#axzz2i9RIIONv>

<https://www.nytimes.com/2014/10/30/upshot/quantitative-easing-is-about-to-end-heres-what-it-did-in-seven-charts.html?ref=economy&abt=0002&abg=1>

<https://fred.stlouisfed.org/series/USSTHPI>

<https://creditwritedowns.com/2011/06/qe1-versus-qe2-versus-q3.html>

<https://www.federalreserve.gov/Events/conferences/2012/cbc/confpaper1/confpaper1.pdf>

<http://www.coppolacomment.com/2013/05/inflation-deflation-and-qe.html>

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20121212a.htm>

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20081230b.htm>

<https://www.wsj.com/articles/bank-reserves-what-are-they-and-why-a-shortage-is-roiling-a-key-interest-rate-11568891110>

<https://www.thebalance.com/reserve-requirement-3305883>

<https://www.pragcap.com/what-are-bank-reserves/>
<https://www.thebalance.com/how-does-the-fed-raise-or-lower-interest-rates-3306127>
https://www.richmondfed.org/publications/research/economic_brief/2011/eb_11-12
<https://www.investopedia.com/terms/f/federalreservebank.asp>
<https://www.investopedia.com/terms/m/monetarypolicy.asp>
<https://www.federalreserveeducation.org/about-the-fed/structure-and-functions>
<https://www.federalreserve.gov/monetarypolicy/reserve-maintenance-manual-account-structure.htm>
http://pages.stern.nyu.edu/~sternfin/vacharya/public_html/tail_risk.pdf
<https://www.nber.org/papers/w23740.pdf>
<http://realestate.wharton.upenn.edu/wp-content/uploads/2017/03/689.pdf>
<http://icrier.org/pdf/Session%202%20-%20P%20-%20Viral%20Acharya-2.pdf>
<http://realestate.wharton.upenn.edu/wp-content/uploads/2017/03/689.pdf>
https://www.richmondfed.org/-/media/richmondfedorg/publications/research/economic_quarterly/2019/q1/walter.pdf
<https://www.bankrate.com/mortgages/homebuyers-survey-february-2019/>
<https://spectator.org/42211-true-origins-financial-crisis/>
<https://www.federalreserve.gov/Events/conferences/2012/cbc/confpaper1/confpaper1.pdf>
<https://www.manning-napier.com/insights/blogs/research-library/quantitative-easing-3>