Aalto University
School of Business

Artificial Stimulus and Animal Spirits

Bachelor Thesis in Economics

Author: Elias Varila

Opponent:

Instructors: Pauli Murto, Mikko Mustonen

Author Elias Varila

Title of thesis Artificial Stimulus and Animal Spirits

Degree Bachelor of Science in Economics and Business Administration

Degree program Economics

Thesis advisor(s) Pauli Murto and Mikko Mustonen

Year of approval 2019 **Number of pages** **Language** English

Abstract

The aim of this paper is to describe the theory of unconventional monetary policy instruments, then follow how these tools were implemented in real life (with international cooperation of major central banks?) in advanced economies. The main part of this paper is a case example about U.S. monetary policy actions since 1990s, which is divided into three sectors: 1) The Greenspan era 2) The Great Recession and 3) Balance sheet expansion. Next it describes in short details how other major central banks (Bank of England, European Central Bank, Bank of Japan and Peoples Bank of China) balance sheets have expanded since the Great Recession. Then follows a discussion of how central bank liquidity shapes financial markets, specifically: 1) the term structure of interest rates, 2) asset price volatility and 3) excessive risk taking.

Keywords: Asset price volatility, Central bank balance sheet, Excessive risk taking

Contents

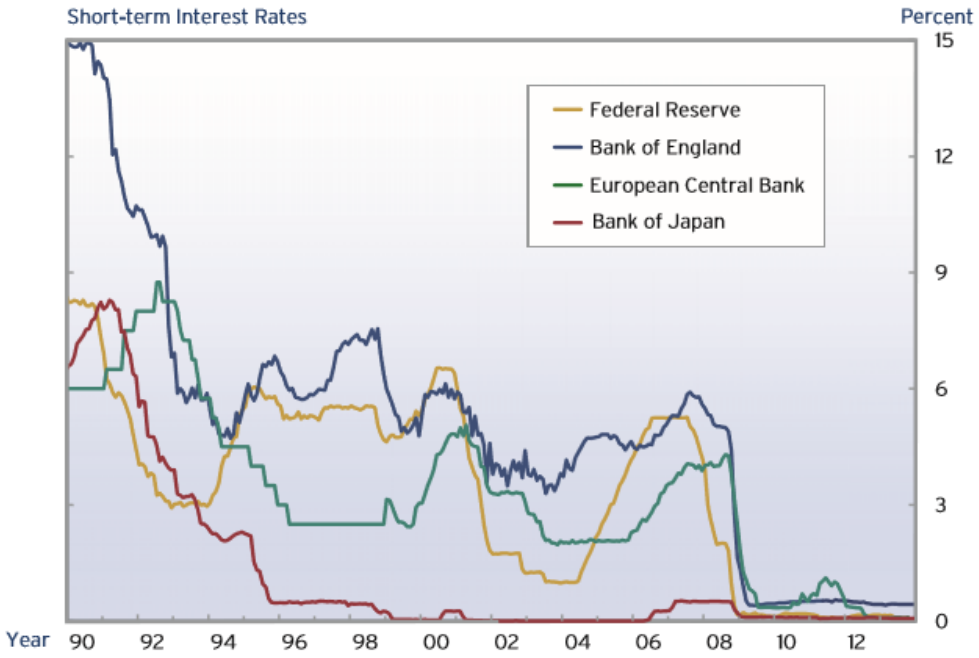
1. Introduction

Until the global financial crisis of 2007-2009 the central bank´s monetary policies relied primarily on controlling the short-term nominal interest rate. Interest rates play a strategic role in the economy, because they represent a cost to the borrower and may influence decisions to invest or to spend on goods and services (IR). However, little or no economic activity depends directly on policy interest rate, as it applies only to overnight borrowing and lending between banks. Instead, the policy rate affects spending indirectly, through a numerous of distinct channels (Kuttner). In response to the Great Recession induced by the global financial crisis of 2007-2009, all the major central banks quickly lowered their target policy rates effectively to the zero lower bound (QE+L). Despite this expansionary monetary policy, the outlook for economic growth remained grim and the threat of disinflation, if not outright deflation, was serious (QE+L). As a consequence, the central banks were forced to implement unconventional monetary policies in order to push down longer-term yields, thus providing additional stimulus to the economy……
……
……
……
……

2. Unconventional Monetary Policy

The Zero Lower Bound

The traditional monetary policy works through interest rates. The short-term interest rate that commercial banks can obtain money from the central bank (e.g. policy rate) influences the rate at which they are willing to lend on similar terms to each other and other financial institutions. In the old days central banks typically conducted monetary policy by targeting their policy rates with open market operations. However, during the global financial crisis major central banks were forced to cut their policy rates virtually to zero. The conditional monetary policy and the policy rate of zero are not a good combination. Zero short-term interest rate is an expansionary monetary policy tool where a central bank lowers the policy rate close or to zero in order to stimulate the economy, stabilize inflation expectations and relieve currency pressures.



As shown in figure 1, the BOJ, BOE, ECB and Fed had virtually cut their policy rates to lowest possible level after the global financial crisis of 2007-2009. (source: Fawley and Neeley)

Zero lower bound is the limit that policy rates can be cut. If the central bank were to lower interest rates significantly below zero, banks could simply swap their bank reserves into currency, which would pay a higher interest rate. Or put another way, the demand for central

bank reserves would disappear, so the central bank could no longer influence the economy by changing the price of those reserves (Money Creation, p. 29).

Central banks ordinarily conduct monetary policy by buying and selling short-term debt securities to target short-term nominal interest rates. These purchases and sales of assets change both short-term interest rates and the monetary base (Fawley and Neeley, p 53). Once short-term interest rates reach the effective lower bound, it is not possible for the central bank to provide further stimulus to the economy by lowering the rate at which reserves are remunerated (Money Creation, p. 29). The zero lower bound creates a liquidity trap where the central bank can no longer provide stimulus via interest rate. In a liquidity trap, increasing the money supply is likely to be ineffective in stimulating economic activity.

In the face of near-zero short-term rates, central banks have recently turned to unconventional policies, which often dramatically increase their monetary bases, to alleviate financial distress or stimulate their economies (Fawley and Neely). These unconventional monetary policies conducted by major central banks are namely forward guidance, asset purchase programs and credit easing.

Forward Guidance

The Forward guidance is a strategic monetary policy tool of central bank used to influence market expectations of future levels of interest rates by unveiling information about the future course of monetary policy actions. Cambell et al. (2012) argue that the forward guidance can be substitute for lower rates at the zero bound (i.e. expansionary monetary policy). They clarify that there are two kind of forward guidance strategies: “Delphic” and “Odyssean”. The idea is that when central bank provides to the market participants direct signal of the central bank´s objectives and future policy actions, individuals and businesses will use this information in making decisions about spending and investments. In consequence of this forward guidance can influence today´s financial and economic conditions (fed). A prime example of forward guidance is the famous announcement made by the president of ECB, Mr. Draghi: “Within our mandate, the ECB is ready to do whatever it takes to preserve the euro.”

The softer one, named “Delphic” – which is derived from the oracle of Delphi – is less-binding version of these strategies. Above-mentioned authors clarify: “Delphic forward guidance publicly states a forecast of macroeconomic performance and likely or intended monetary policy actions based on the policymaker’s potentially superior information about future macroeconomic fundamentals and its own policy goals”. The main benefit of this kind

of forward guidance is that it shapes expectations about the future expectations without committing the policymaker to a certain course of action.

In contrast, an explicit way of forward guidance is named as "Odyssean" – a reference to Odysseus, Greek king of Ithaca – and it signals central banks strong commitment towards a certain kind of monetary policy in the future. It binds the policymaker hands to certain kind of action, just as Odysseus committed himself to staying on his ship by having himself bound to the mast. Eggertsson and Woodward (2003) argues that a credible commitment to the right sort of history-dependent policy would reduce future short-term real interest rates. However, Cambell el at. argues that the implementation of Odyssean policy faces a fundamental challenge. That is when the appointed time for action arrives, any beneficial effects of the policy's anticipation will be bygones that nothing can change.

The Delphic forward guidance seems to be the way to go with the main central banks. However, there are a couple of exceptions such as the US Federal Reserve (which makes quite specific, but still conditional statements) and the Bank of Japan (*).

Large-scale asset purchases

Major central banks cut their policy rates virtually to zero during the global financial crisis. As zero was then considered to be the lower bound for policy rates, further monetary easing needed to be achieved through unconventional measures, such as large-scale asset purchases programs (ZLB). Quantitative easing (QE) is unconventional monetary policy instrument that massively increases the monetary base via open market operations, e.g. by large-scale asset purchase programmes. The purpose behind QE is to lower long-term interest rates, bring inflation and inflation expectations in line with the central bank's target, stimulate economic growth, and lower unemployment (Gern et al. 2015). Central banks engaging in large-scale open market purchases of government bonds are mainly targeted at lowering long-term interest rates.

The theoretical framework of transmission mechanisms of QE is mapped by the Joyce et al. (2011), Krishnamurty and Vissing-Jorgensen (2011), and D'Amico et al. (2012), among others. Large-scale asset purchases can influence economic activity through various channels, including the interest rate channel, the signalling channel, the portfolio rebalance channel, liquidity channel and exchange rate channel. In this paper the discussion is limited to signaling channel, portfolio rebalance channel and liquidity channel. Diego Valiante (2015) argue that the massive asset purchases produce two types of impact: an ex-ante impact on expectations about future prices (term structure of interest rates) and an ex-post impact on the actual availability of those assets in the market (portfolio rebalancing).

The signaling channel affects through shaping expectations on future short-term interest rates and expectations on future inflation. Central bank asset purchases provide an indirect signal of the central bank's objectives and future conventional policy actions (ZLBB). The signaling channel is closely related to the forward guidance communication strategies that central banks have used in order to influence expectations of market participants (Gern et al. 2015). According to Krishnamurthy and Jorgensen (2011) the signaling channel affects all bond market interest rates since lower policy rate can be expected to affect all interest rates. They also conclude that it has a larger impact in lowering intermediate maturity rates rather than long-term interest rates, since the commitment to keep rates low only lasts until the economy recovers and the central bank can sell the accumulated assets.

The portfolio rebalance channel is one of the main theories behind the large-scale asset purchases, since it affects the term premium. Bernanke and Reinhart (2004) concludes that if money is an imperfect substitute for other financial assets, then large-scale increases in the money supply will lead investors to seek to adjust their portfolios, raising prices and reducing yields on alternative, non-money assets. This lowers the yields on long-term assets (i.e. term premium) and therefore stimulate the economic activity. Joyce et al. (2011) deduce that the impact through this channel occurs both on announcement and over time as investors are able to rebalance their portfolios. In addition to portfolio balance theory, Williamson mentions preferred habitat theory, mentioning the importance of how different institutions have preference the assets in its portfolio (Williamson, 2017)

In addition to the portfolio balance effect, the presence of the central bank in the market as a significant buyer of assets may improve market functioning and thereby reduce premia for illiquidity (Joyce, 2011). The liquidity premium is the compensation that an investor receives for investing in securities having low liquidity. The liquidity premium is the reason for upward yield curve seen across the interest rates of the bonds having different maturities. The bonds having long maturity terms carry higher risks, and investors demands the liquidity premium. According to Joyce et al. the liquidity premium channel effects reflects the fact that the thencentral bank's purchases may make it less costly for investors to sell assets when required. In normal times, markets may be deep and liquid, but in stressed conditions, premia for illiquidity could be significant. Since this channel depends on the flow of purchases for its effect, we would expect it to be temporary and limited to the duration of the asset purchase program. (Joyce)

3. U.S. monetary policy last quarter century

United States is the largest economy in the world and the U.S. dollar is widely accepted as a global currency around the world. U.S. monetary policy has a strong influence on worldwide financial conditions and global economic fluctuations. In consequence of the dollar´s double role of national and international currency, U.S. monetary policy can have dramatic effects on the world financial conditions and economic fluctuations. One could argue that the U.S. monetary policy plays an oversized role in determining macroeconomic fluctuations in the world.

3.1 The Case: Federal Reserve System

The Fed has more power to affect the U.S. economy than any other institution, because it controls the money supply which influences aggregate demand in the economy. In fact, one could argue that the chairperson of the Federal Reserve is the second most powerful person in the United States after the President. Since the global economies are interconnected it is vastly important to understand how does the U.S. central bank work in the financial markets.

“The Federal Reserve conducts the domestic monetary policy by managing the level of short-term interest rates and influencing the availability and cost of credit in the economy. Monetary policy directly affects interest rates; it indirectly affects stock prices, wealth, and currency exchange rates. Through these channels, monetary policy influences spending, investment, production, employment, and inflation in the United States. Effective monetary policy complements fiscal policy to support economic growth.” (The Federal Reserve System - Purposes & Functions, p 29)

3.1. The Greenspan put

Something about monetary policy before the dot com bubble…

Moral hazard occurs when someone increases their exposure to risk when someone else bears the cost of those risks. Moral hazard may be created by the financial market interventions of the Federal Reserve and therefore some stock traders call it “the Greenspan put” (Financial Times). Greenspan put occurs when financial institutions have destructive tendency toward excessively risky investment supported by the hopes that when financial markets unravel the Fed will come to aid. In other word the idea is that the investors (too big to fail) get the benefits of their investment decision without assuming the full costs. In 1998, large hedge fund management firm, Long-Term Capital Management L.P. (LTCM), collapsed and the Fed saw no options, but to organize a bailout of $3.625 billion by the major creditors

to avoid a wider collapse in the financial markets. Some industry officials said that Federal Reserve Bank of New York involvement in the rescue, however benign, would encourage large financial institutions to assume more risk, in the belief that the Federal Reserve would intervene on their behalf in the event of trouble. Federal Reserve Bank of New York actions raised concerns among some market observers that it could create moral hazard since even though the Fed had not directly injected capital, its use of moral suasion to encourage creditor involvement emphasized its interest in supporting the financial system……..

Something about monetary policy after the dot com bubble…

3.2 The Great Recession

The myriad causes of the 2007-2009 financial crisis are beyond the scope of this paper, discussion is limited namely to monetary policy and its impact on financial markets. As mentioned earlier, in 2008, the U.S. economy seemed to be in an endless financial freefall that escalated through highly interconnected global financial markets. The Great Recession, which spread rapidly from Wall Street to Main Street, winded up to be the worst economic downturn since the notorious Great Depression of 1930s (Stiglitz). During the Great Recession, several factors about the U.S. economy changed, and the Fed needed new instruments and policies in order to stimulate and support the economy. Specifically, the falling interest rates and acute problems of the U.S. financial system meant that some of the earlier primary tools, like open market operations, were not going to be very effective. Under these circumstances the Fed turned into unconventional monetary policy instruments. There were seven monetary policy actions that were considered extraordinary or unprecedented in the recent crisis of 2007-2009 (Mishkin, 2014):

1. Unusually Easy Monetary Policy
2. New Non-Bagehot Liquidity Facilities
3. International Central Bank Cooperation
4. Non-Conventional Monetary Policy
5. Central Bank Rescues of Financial Institutions
6. Treasury Collaboration/Intervention/Aid
7. Supervisory Actions

(1.) The first glimmers of the incoming financial problems appeared on August 9, 2007, when BNP Paribas announced that it had suspended redemptions on three of their funds,

indicating that they were unable to value the collateralized debt obligations (CDOs) held by these funds because of an evaporation of liquidity for the underlying subprime mortgage assets. Thus, panic in the banking sector developed and lending in the interbank markets seized up. This sudden reduction in the interbank loans urged the Fed to start rapid short-term interest rate cuts. What was unusual was that monetary policy eased while the momentum in the economy was quite strong, with real GDP growing at nearly 3% and inflation rising.

(2.) In addition to interest rate cuts, the Fed created new credit facilities that provided liquidity in order to encourage additional borrowing. The Fed set up a temporary Term Auction Facility (TAF) in December 2007 to auction Fed funds. The TAF auctions started at $20 billion and rose as the crisis emerged to over $400 billion. Furthermore, the Fed broadened its supply of liquidity to financial system by creating lending facilities for investment banks in March 2008 (TSLF, PDCF), as well as lending facilities to promote demand of commercial papers, mortgage backed-securities, other asset backed securities and money-market-mutual fund assets after the collapse of Lehman Brothers in September of 2008 (AMLF, CPFF, MMIFF, TALF). The enlargement of the Fed's lending programs during the 2007–2009 financial crisis was remarkable, reaching a peak of over $1.5 trillion dollars by the end of 2008.

(3.) The Fed also became an international lender of last resort to other central banks during the crisis. In December 2007, the Fed set up swap lines for the European Central Bank and the Swiss National bank and after the Lehman Brothers collapse, the Fed arranged swap lines with the central banks of Japan, the U.K., Canada, Australia, Sweden, Norway, Denmark, New Zealand, Mexico, Brazil, Korea and Singapore. These swap deals allowed other central banks to borrow dollars from the Fed so they could make dollar loans to their domestic banks. At its peak in December of 2008, the Fed had extended almost $600 billion of these swaps to foreign central banks.

(4.) Prior to the 2008, the Fed mainly conducted monetary policy by buying and selling short-term debt securities to target short-term nominal interest rates. However, during the financial crisis the Fed provided so much extra liquidity to the entire banking system that this channel was no more considered to be effective. A swap of zero-interest cash for near zero-interest Treasury bills might not have that significant macroeconomic effects. Thus, the Fed needed to embrace unconventional monetary policy of large-scale asset purchases to lower interest rates of specific types of credit. In order to support the falling mortgage-backed securities market (MBS) the Fed set up a Government Sponsored Entities Purchase Program in

November 2008, through which the Fed purchased $1.25 trillion of MBS guaranteed by Fannie Mae and Freddie Mac (Mishkin).

(5.) Shadow banking banking activities were central to the operations of firms formerly known as “investment banks” (e.g. Bear Stearns, Lehman Brothers, Morgan Stanley, Merrill Lynch), but they also play a role at commercial banks, as a supplement to traditional-banking activities of firms like Citigroup, J.P. Morgan, and Bank of America. The Panic of 2007-2008 was a run on the sale and repurchase market, which is a very large, short-term market that provides financing for a wide range of securitization activities and financial institutions. In March 2008, short-term financing for the investment bank, Bearn Stearns, dried up because of a run on the shadow banking system (Gorton and Metrick, 2009). The Fed worried that the failure of Bear Sterns might trigger a system-wide bank run, so it brokered a deal for JP Morgan/Chase to purchase Bear Sterns, with the Fed, taking $30 billion of Bear Stearns’ toxic assets. The Fed arranged a bailout because JP Morgan was unwilling to take these hard-to-value assets onto its books. Then, on Monday, September 15, 2008, after suffering losses in the subprime market, Lehman Brothers filed for bankruptcy as the Fed stood aside. The Financial Products Unit of American International Group (AIG) had written over $400 billion dollars of credit default swaps, which after Lehman Brothers’ collapse, left it facing enormous payments. On September 16, 2008, the Federal Reserve announced that it would lend to AIG to provide the company with the time and flexibility to execute a plan that would allow it to restructure to maximize its value. Initially, the FRBNY extended a line of credit to AIG for up to $85 billion. Total loans to AIG from the Fed and U.S. government rose to over $170 billion.

6. The collapse of Lehman Brothers created widespread financial market disruption which emerged to wide-spread bank run. The Federal Reserve, the Federal Deposit Insurance Corporation and the U.S. Treasury stepped in to support the financial system on an unprecedented scale. Troubled Asset Relief Plan (TARP) was created in order to support failing financial institutions. The purpose of TARP was to subprime mortgage assets from banks and other financial institutions in order to bolster their balance sheets. However, it soon became clear that agreeing on prices for these illiquid and difficult-to-value assets was impossible. TARP funds were instead used to inject capital directly into financial institutions. In addition, the deposit insurance (which traditionally had been limited to $100,000 for each bank account) was extended to all accounts, increasing the amount insured by some $8 trillion. Fredrick S. Mishkin describes the Feds role in these programs: “Although the Federal Reserve was not directly involved in administering these programs, they were part of a package of bailouts of financial institutions, and the Federal Reserve lobbied Congress to implement these programs.”

7. The Supervisory Capital assessment Program (SCAP) was an assessment of capital conducted by the Fed and office of thrift supervisors to determine if the largest U.S. financial organizations had sufficient capital buffers to withstand the recession and the financial market turmoil. Before the tests were completed, there was two concerns: Firstly, whether the tests would increase or decrease confidence in any companies that did badly on the test and secondly, whether or not the $350 billion in bailout funds that remained could cover the needed funding after the tests (*). Acharyal and Seru (2013) concluded later that the stress test improved overall market confidence and revitalized the recapitalization of these financial institutions and the stabilization of the financial system.

3.2 The Balance sheet expansion

The Fed´s balance sheet was only some $880 billion before the economic crisis struck in 2008. That is to grease every economic transaction throughout the nations entire history up until 2008 required the cumulative injection of 880 billion of circulating base money that the banks could use to lend tout via fractional reserve banking. However, since 2008 system-wide bank run, an additional $3.5 trillion has been created by the Federal Reserve and injected into the system. The majority of this is in the form of excessive reserves (2,3 trillion). The Fed has injected money into the financial system, but most of that money has not been made available to Main Street in the form of new loans.

Some thing like this:

Quantitative easing refers to a set of four asset purchase programs: the three Large-Scale Asset Purchases (LSAPs), commonly known as QE1, QE2, and QE3; and the Maturity Extension Program (MEP), also known as the second "Operation Twist."1 Table 1 summarizes the key features of these programs. QE1 was announced in November 2008.2 Initially, it was limited to purchasing $100 billion of debt issued by the government-sponsored enterprises Fannie Mae, Freddie Mac, and Ginnie Mae, plus $500 billion in agency-backed mortgage-backed securities.3 Its stated purpose was to "reduce the cost and increase the availability of credit for the purchase of houses . . ."4 On March 18, 2009, the Federal Open Market Committee announced that it would expand its purchases of agency debt and mortgage-backed securities, and would also purchase $300 billion of longer-term Treasury securities "to help improve conditions in private credit markets" more generally.5 QE2 was announced on November 3, 2010. The program entailed the purchase of $600 billion in longer-term Treasuries, but no agency debt or mortgage-backed securities. The Maturity Extension Program was announced on September 21, 2011. The program initially involved the purchase of $400 billion of 6-

to 30-year Treasuries, accompanied by the sale of the same quantity of 1- to 3-year securities, with the intention "to put downward pressure on longer-term interest rates and help

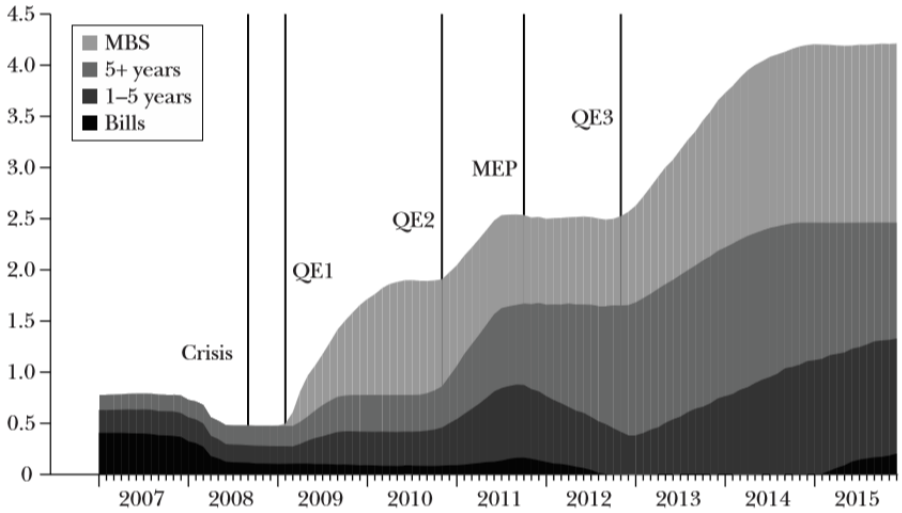
Characteristics of the Four Asset Purchase Programs

Program	*Dates*	*Assets purchased*	*Size (billions)*	*Sterilized?*
First LSAP (QE1)	11/2008 to 3/2009	Agency debt Agency MBSs Treasuries	\$200 \$1,250 \$300	No
Second LSAP (QE2)	11/2010 to 6/2011	Longer-dated Treasuries	\$600	No
MEP ("Twist")	9/2011 to 12/2012	6- to 30-year Treasuries	\$667	Yes
Third LSAP (QE3)	9/2012 to 10/2014 12/2012 to 10/2014	MBSs Longer-dated Treasuries	\$40/month \$45/month	No

Note: Quantitative easing refers to a set of four asset purchase programs: the three Large-Scale Asset Purchases (LSAPs), commonly known as QE1, QE2, and QE3; and the Maturity Extension Program (MEP), also known as the second "Operation Twist." The table summarizes the key features of these programs. MBSs are mortgage-backed securities.

make broader financial conditions more accommodative."6 The Fed announced an extension of the program June 20, 2012, which ultimately amounted to $667 billion. In contrast to the three large-scale asset purchases, all of which entailed balance sheet expansions, this program "sterilized" the asset purchases with offsetting asset sales, leaving unchanged the overall size of the balance sheet. QE3, which commenced in September 2012, initially involved the purchase of $40 billion per month of mortgage-backed securities in a renewed effort to "support mortgage markets." In December 2012, the program was expanded to include $45 billion per month of Treasury securities. Unlike the other three quantitative easing policies, QE3 was open-ended and did not set a dollar limit at the time of the program's launch. These quantitative easing policies differ in clear ways from conventional monetary policy. For example, Figure 1 shows that quantitative easing drastically enlarged and altered the composition of the Fed's System Open Market Account portfolio. In contrast, the quantitative aspects of conventional policy, in terms of the Fed's balance sheet or the money supply, had always been negligible. The magnitude of the open market operations (essentially, temporary asset purchases) required to move the federal funds rate was vanishingly small—virtually undetectable in the Fed balance sheet (Friedman and Kuttner 2010).

The Composition of the Federal Reserve System Open Market Account Portfolio
(in trillions of dollars)



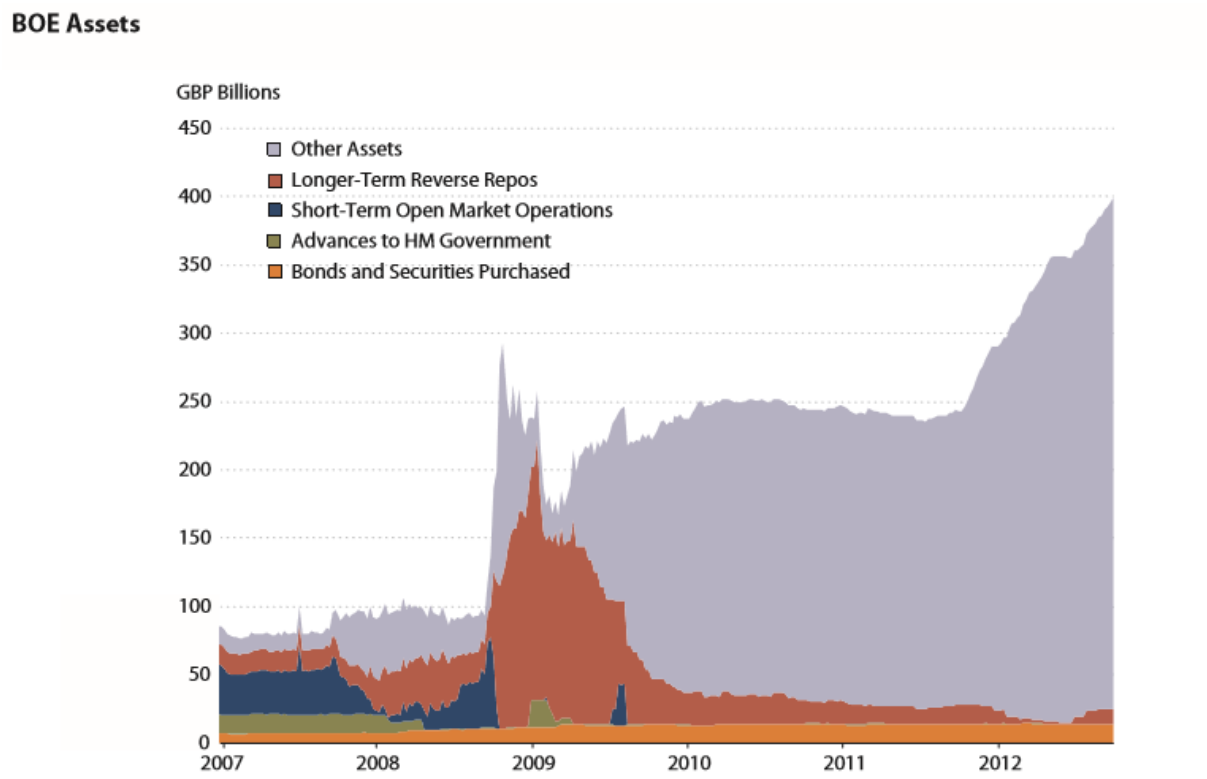
Note: Excludes assets associated with temporary liquidity facilities and US Treasury floating rate notes. "MBS" stands for mortgage-backed securities; "5+ years" stands for Treasuries with maturities of 5 or more years; "1–5 years" stands for Treasuries with maturities of 1–5 years. QE1, QE2, and QE3 are three quantitative easing programs. MEP is the Maturity Extension Program.

Another difference is that the goal of quantitative easing was not stated in terms of an explicit interest rate target.7 And because a $100 billion purchase of mortgage-backed securities is not necessarily equivalent to a $100 billion sterilized purchase of 10-year Treasuries, it is not straightforward to distil the effects of the various quantitative easing programs into an interest rate equivalent. A common misconception is that the purpose of quantitative easing was to increase bank reserves and the money supply. The Fed's pronouncements clearly contradict this view. For example, in the December 16, 2008, meeting of the Federal Open Market Committee, then-Fed Chair Ben Bernanke characterized the approach of the Bank of Japan as based on the theory "that providing enormous amounts of very cheap liquidity to banks ... would encourage them to lend and that lending, in turn, would increase the broader measures of the money supply ..." Contrasting this with the Fed's approach, Bernanke stated, "[W]hat we are doing is different from quantitative easing because, unlike the Japanese focus on the liability side of the balance sheet, we are focused on the asset side of the balance sheet."

4. Total Assets of Major Central Banks

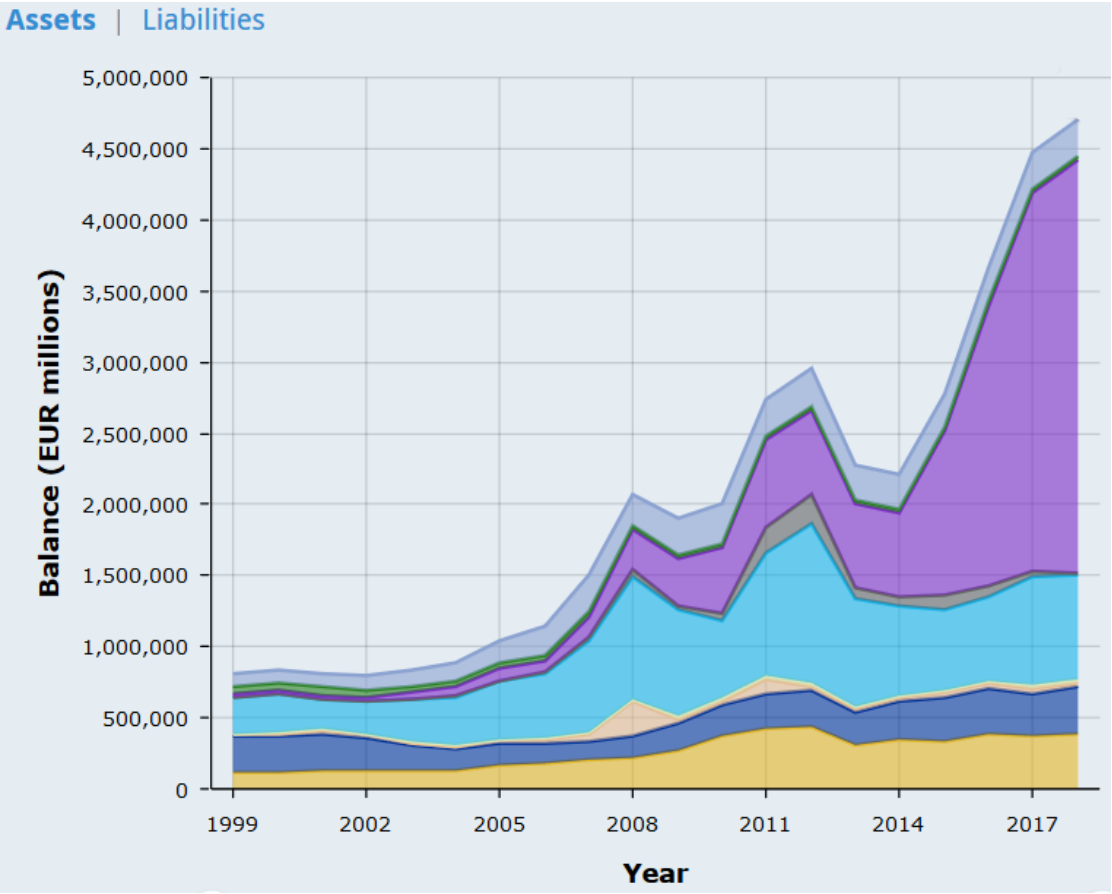
Internationally synchronized artificial stimulus……..

4.1 Four examples of artificial stimulus



Some explanation…. Very similar to FED…

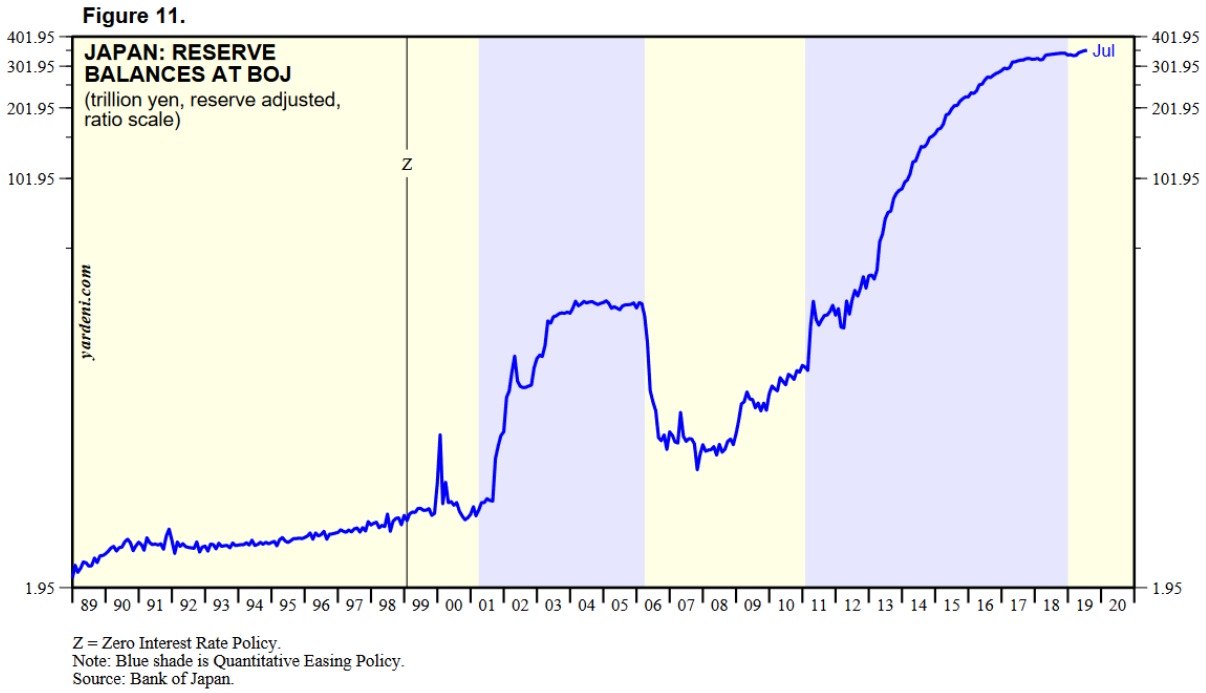
European Central Bank



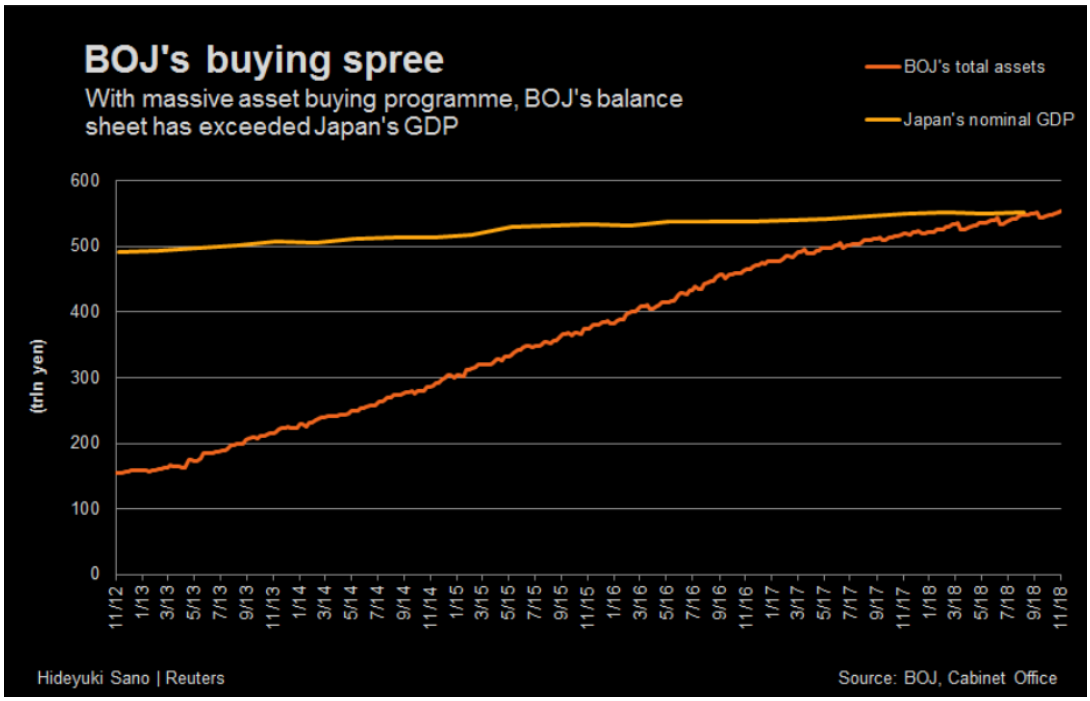
ECB balance sheet operations…. The difference in the financial system between US and the EU….

The financial system in the euro area is more bank-centric than its counterparts in the US and the UK. Given the relatively higher importance of bank credit in the financing of economic activity, the ECB has initially chosen to directly support bank liquidity via its lending programmes.

Bank of Japan

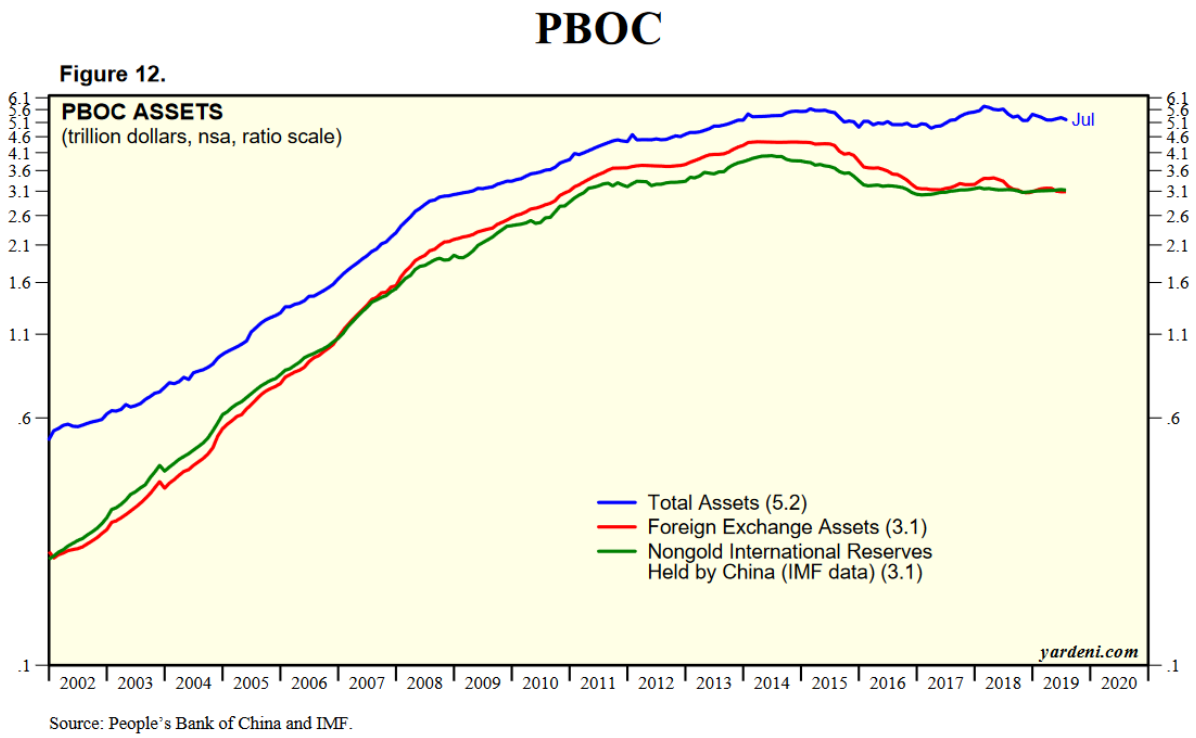


Z = Zero Interest Rate Policy.
Note: Blue shade is Quantitative Easing Policy.
Source: Bank of Japan.



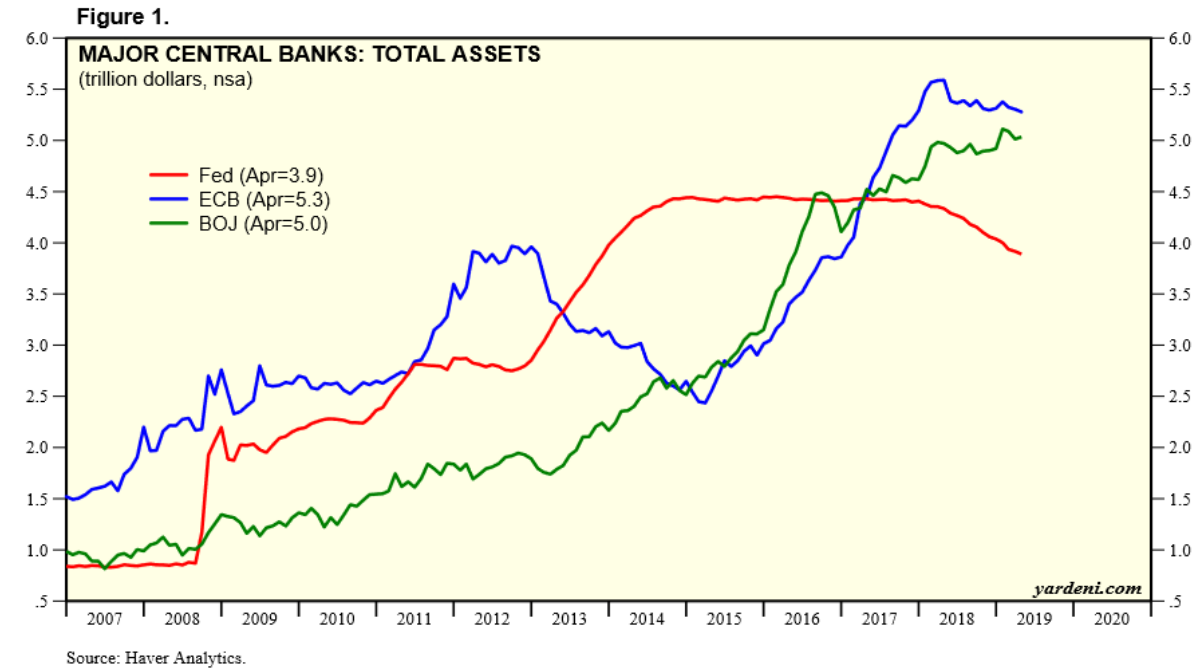
Some explanation…. Lost decade… First QE in early 2000… Bank of Japans balance sheet exceeded Japans GDP….

People´s Bank of China



Some explanation…. China China China….

4.2 Aggregated artificial stimulus **(without PBOC)**



Some conclusions of aggregated stimulus…

5. How central bank liquidity shapes financial markets

Term structure of bonds

Inverted yield curve in U.S and Negative Bond yields in Europe and Japan…..

Negative yielding debt is a strange phenomenon; buying a bond with a negative yield means that investors are willing to pay, in this case, governments to keep their money safe. A quarter of the bonds issued by governments and companies worldwide are currently trading at negative yields…. which means that $14tn of outstanding debt is being paid for by creditors in a bizarre reversal of normal practice

Negative yields have forced long-term institutional investors, such as pension schemes and insurance companies, to make unprecedented changes to their asset allocation mix because sovereign bonds can no longer deliver the returns needed to meet the promises made to retirement savers.

Negative bond yields are a direct result of the vast asset purchase schemes introduced by central banks to stave off a worldwide economic slump after the financial crisis. Quantitative easing programmes were intended as emergency measures that would be withdrawn once it was clear that a sustainable economic recovery had begun.

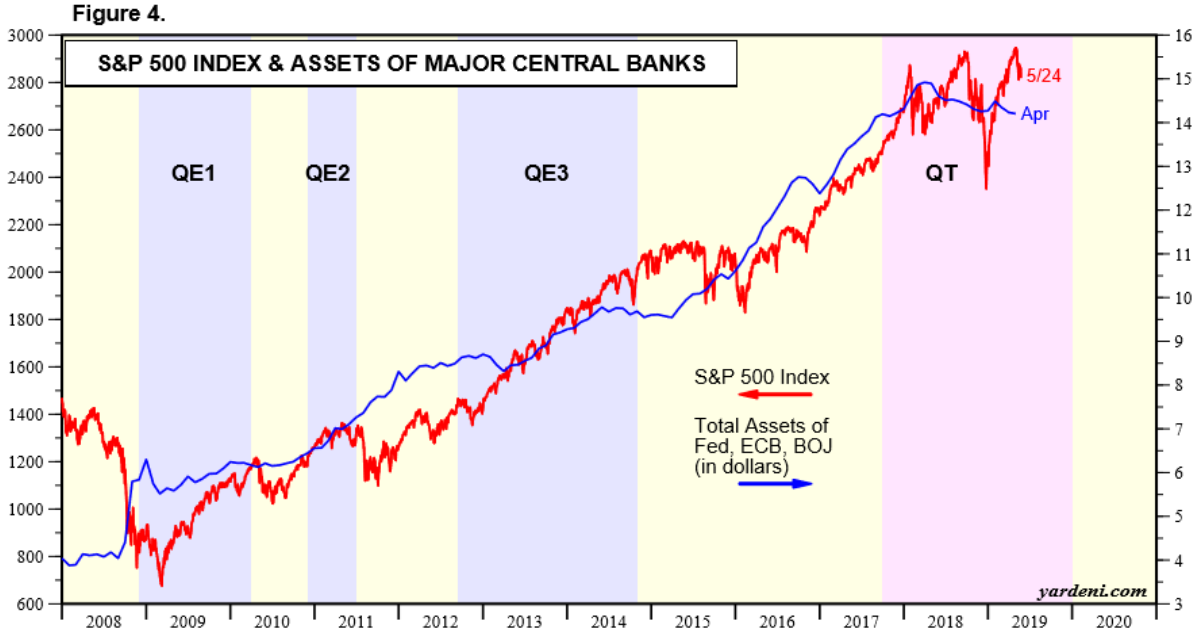
The trade war between the US and China slowly suffocating global economic growth, central banks have embarked on a fresh round of liquidity measures to try to prevent a recession. Investors who buy these bonds hope that central banks will take them off their hands at even lower yields (and higher prices).

Excessive risk taking

No one is buying a negative yielding long-term bond to hold it to maturity……. Additional monetary stimulus could increase the economic divergence further and generate numerous risks (e.g. asset price bubbles, excessive debt accumulation or systemic instabilities) in the countries with currently relatively healthy fundamentals…..

Asset price volatility

Figure 4.



Note: QE1 (11/25/08) = Fed starts buying $1.24tn in mortgage securities. QE1 expanded (3/16/2009) = Fed starts buying $300bn in Treasuries.
QE2 (11/3/10) = Fed starts buying $600bn in Treasuries. QE3 (9/13/12) = Fed starts buying $40bn/month in mortgage securities (open ended).
QE3 expanded (12/12/12) = Fed starts buying $45bn/month in Treasuries. Fed terminated QE net purchases (10/1/14). Fed started paring holdings (10/1/17).
Source: Federal Reserve Board, Standard & Poor's and Haver Analytics.

Some speculation about Quantitative tightening and Asset price volatility….?

Conclusion

REFERENCES

Alan Greenspan - THE AGE OF TURBULENCE

Eggertsson, Gauti B., and Michael Woodford. 2003. "The Zero Bound on Interest Rates and Optimal Monetary Policy." Brookings Papers on Economic Activity no. 1, pp. 139–211.

Gern, K. Jansen, N. Kooths, S. Woltres, M. (2015): Quantitative Easing in the Euro Area: Transmission Channels and Risks.

Joyce, M.Miles, D.Scott, A. Vayanos, D. (2012): Quantitative Easing and unconventional monetary policy

Krishnamurthy, A. Vissing-Jorgensen A. (2011): The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy.

Money creation in the modern economy By Michael McLeay, Amar Radia and Ryland Thomas of the Bank's Monetary Analysis Directorate.(1)

Yardeni Research, Inc - Central Banks: Balance Sheets

Outside the Box: Unconventional Monetary Policy in the Great Recession and Beyond - Kenneth N. Kuttner

Klaus-Jürgen Gern, Nils Jannsen, Stefan Kooths and Maik Wolters* Quantitative Easing in the Euro Area: Transmission Channels and Risks

Securitized Banking and the Run on Repo - Gary Gorton Yale and NBER Andrew Metrick Yale and NBER

MONETARY POLICY at the ZERO LOWER BOUND Putting Theory into Practice – Williams

Negative Interest Rate Policies: Sources and Implications - Carlos Arteta etc…

Monetary Policy Forward Guidance and the Business Cycle∗ Jeffrey R. Campbell Jonas D.M. Fisher Alejandro Justiniano

TOO-BIG-TO-FAIL BEFORE THE FED Gary Gorton Ellis W. Tallman

The Federal Reserve System Purposes & Functions

Following the Money: Evidence for the Portfolio Balance Channel of Quantitative Easing by Itay Goldstein, Jonathan Witmer and Jing Yang

Quantitative easing By James Benford, Stuart Berry, Kalin Nikolov and Chris Young of the Bank's Monetary Analysis Division and Mark Robson of the Bank's Notes Division.

What Happened: Financial Factors in the Great Recession - Mark Gertler and Simon Gilchrist

https://www.federalreserve.gov/faqs/what-is-forward-guidance-how-is-it-used-in-the-federal-reserve-monetary-policy.htm)