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Monetary Policy Responses to the Recent Crisis
– Federal Reserve vs. European Central Bank –

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Abstract

In responding to the recent crisis, the American and European central banks implemented unlike approaches to monetary policy with different results. In order to understand their decisions and their actual outcomes, as well as prepare further situations like this one, it matters to analyze the monetary policy measures undertaken by both central banks and compare them. The present work particularly focus on unconventional monetary policy measures and examines credit easing implemented by the European Central Bank, in comparison to the Federal Reserve Bank's quantitative easing. The results, emphasizing the decrease in bond yields due the increase in the banks' balance sheets, the capacity to control inflation and unemployment and the ability to enhance production, reveal that the Fed was more effective and prompt in taking action against the crisis. In addition, the Fed was also more successful in its communications, with a better management of expectations, capacity to adapt to the markets' response to quantitative easing and faster implementation of forward looking guidance, a feature determinant to the success of monetary policy. Moreover, the differences between the two banks that may limit the implementation of unconventional monetary policy measures and comprise additional challenges for the ECB are also discussed.

Key-words: monetary policy; economic and financial crisis; quantitative easing; Fed; ECB

Sumário

Em resposta à presente crise, os bancos centrais norte-americano e europeu implementaram abordagens diferentes à política monetária, com resultados também eles distintos. Por forma a compreender as decisões tomadas e os seus resultados efetivos, bem como preparar futuras situações similares a esta, importa analisar as medidas de política monetária implementadas pelos dois bancos centrais e compará-las. A presente tese foca-se particularmente em medidas não-convencionais de política monetária e estuda a aplicação de *credit easing* pelo Banco Central Europeu, em comparação ao *quantitative easing* da Reserva Federal Norte-Americana. Os resultados, salientando a descida no valor de títulos em consequência do aumento das folhas de balanço dos dois bancos, a capacidade de controlar a inflação e o desemprego, e a aptidão para impulsionar a produção, demonstram que o Fed teve mais sucesso e foi mais rápido em agir em resposta à crise. Adicionalmente, o Fed foi também mais bem-sucedido no que diz respeito à comunicação, com melhor capacidade de gerir expectativas, de se adaptar às respostas dos mercados ao *quantitative easing* e uma mais rápida adoção de *forward looking guidance*, uma questão determinante para o sucesso da política monetária. São ainda discutidas as diferenças entre os dois bancos centrais que podem limitar a implementação de políticas monetárias não-convencionais, bem como constituir obstáculos adicionais para o sucesso do BCE.

Palavras-chave: política monetária; crise económica e financeira; quantitative easing; Fed; BCE

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I. Introduction

During the summer of 2007, the United States faced an economic crisis that prompted an action from the American central bank, the Federal Reserve (Fed), which was obliged to act accordingly. In the first place, the policies adopted by the Fed were not always consistent and the bank decided to contradict the most conventional rules of monetary policy until then, which was in itself a controversial decision. On the other hand, the European countries suffered the impacts of a crisis that became global little later, and the European Central Bank (ECB) was also impelled to act. As the global financial crisis reached the countries of the European Union, the ECB reacted differently to it, tending to respond following more conventional manners, based on the interest rate cuts, and reaching the unconventional measures later than the USA.

The analysis conducted throughout the work was focused on the decisions made by central banks, which are generally classified as either conventional or unconventional policy measures. However, this thesis has been mainly dedicated to the unconventional policies adopted by the Fed and the ECB, since those are the ones in which both the implementation and the results differed the most. This matter of unconventional monetary policy measures is surrounded by great discussion among economists and despite the fact that it does not offer solutions, the present work aims to offer insights on the arguments supported by authors from both sides.

The results of the monetary policy responses to the crisis registered unlike outcomes in the USA and the European Union. The two central banks sought differently to ease the monetary policy stance due to the deterioration of the economic outlook, by increasing their balance sheets, and both banks were able to reduce bond yields significantly. However, these outcomes in the United States resulted in an improvement of market liquidity, reduction of highly risky assets from private portfolios, and, consequently, decrease of longer-term private borrowing rate, and overall recovery of the economy. In the euro area, on the other hand, the outcomes were more noteworthy in countries in greater struggles, including Greece, but also Italy, Portugal and Spain, but within few weeks the reductions in bond yields had either been dissipated or reversed. Regarding macroeconomic indicators, the USA and the countries of the euro zone equally suffered consequences of the crisis. It can be observed through data on the growth of Gross Domestic Product and inflation, but in Europe these costs were experienced with greater impact, with particular emphasis for the fact that in 2012 the

USA was already showing encouraging signs of recovery, while some of the European countries faced sovereign debt and external financial assistance programs.

Therefore, this work aims to analyze the monetary policies adopted to respond to the recent economic crisis, as well as its effectiveness. With that in mind, a comparative study is undertaken of both the actions of the Federal Reserve's and European Central Bank's actions, regarding its final purposes, objectives, instruments and results. During this analysis, it is granted particular attention to the communication of the central banks and how it influenced the results of monetary policy, through the review of the main announcements made between 2007 and 2014. It is emphasized that one of the unconventional monetary policy measures adopted by central banks is forward looking guidance, a decision made by the ECB later than the by Fed. The reason for the differences in monetary policy decisions between the ECB and the Fed is based not only on unlike measures though, but also on the characteristics of the two potencies. Given the fact that the USA is a 50-state federalist country, with control for its own currency, while the European Union is 28-country economic and political partnership, in which only 19 of the countries share a common currency, it is complicated to expect the same political and economic measures, even more outcomes. Therefore, following the comparative study, the results are discussed with focus on the possible limitations for the ECB to follow the actions undertaken by the Fed, which does not serves as discouragement for the central bank to implement unconventional monetary policy measures, but rather to encourage the rethinking the European structure itself and the adaptation of the policy making to its characteristics. This is also a reason why the conclusions of the thesis may even be extrapolated to rethinking the roles and challenges in the power of institutions, in responding to economic crises like this one.

This thesis is organized as follows: the subsequent section of this work is dedicated to the basic economic theories at the back of it, and behind the foundations of the modern monetary policy, as currently known, while the debates regarding the effectiveness of unconventional measures of monetary policy are summarized within the third chapter. The following chapter is focused on the discourses, speeches and announcements of the central bank, and in the last section the ECB's policy measures and communication are analyzed in comparison to the Fed's, as well as potential limitation that influence the results of the policies.

II. Concepts

a. Monetary Policy Through the Times

Using the concepts of conventional and unconventional measures of monetary policy implicates speaking about a determined regal, which is considered about central banks as effective within a certain time. However, what is currently thought as an effective mode of conducting monetary policy has not always like that been classified. The uses and decisions of the centrals have changed, as well as the theories in which they are based, reason why it is necessary to review the history of monetary policy and its basic concepts, in order to better understand the decisions made by the central banks, as well as the classification as conventional or unconventional policy measures. In addition, among the different visions and actions of economists and bankers throughout the times reside some of the evidence that explains economic cycles, both prosperity and crisis.

There is a major event that impacted not only economies all over the world, but also the way in which inflation and monetary policy is today faced. It cannot, therefore, be ignored. The Great Inflation affected the United States between 1965 and 1982, and the difference between this episode of exacerbated inflation and previous high inflation ones is that it was the first time that such event occurred without being related to any war or revolution, requiring the attention of the American government to the financial budget deficits. Benati and Goodhart (2010) expressed the opinion of Athanasios Orphanides (2001 and 2003) that the Great Inflation was a period during which the U.S. government failed to determine the productivity slowdown timely, leading to a regular overestimation of the country's accurate gap. Other cause stressed was the search to accomplish unrealistic and over-ambitious macroeconomic goals by the governments in duties during the 1960s in the Unites States, under the direction of the presidents John F. Kennedy, Lyndon B. Johnson and Richard Nixon.

"The key idea behind Clarida et al.'s (2000) interpretation of the Great Inflation is that, before October 1979, U.S. monetary policy had been so weakly counter inflationary as to allow the economy to move inside what is technically called 'indeterminacy region'. The key feature of such a peculiar 'state of the economy' is that, since expectations are no longer firmly pinned down by policy, macroeconomic fluctuations no longer uniquely depend on fundamental shocks (technology, etc.), and,

in line with Goodfriend's[1] analysis of 'inflation scares', may instead be influenced by non-fundamental elements. According to this view of the world, a central bank which is perceived by economic agents as not sufficiently strongly counter-inflationary injects volatility into the economy simply because it allows expectations to 'take a life of their own', thus causing large and persistent inflation fluctuations." (Benati and Goodhart, 2010: 11) There are, however, other theories that blame either an excessive trust in the trade-off between unemployment and inflation, or even bad luck for the inflationary episode. In addition, the authors state that one of the results of the Great Inflation was the American new tendency to avoid at any price other economic shortfalls, which influenced the country's inflationary policies. Another important feature that needs to be considered is the collapse of the milestone system for the control of both monetary and exchange rate, the Bretton Woods Agreement, in August 1971. After being established in 1944, together with the creation of the International Monetary Fund and the International Bank for Reconstruction and Development, the system introduced an adjustable pegged foreign exchange rate system, in which currencies were fixed according to a gold standard and the IMF was responsible for managing situations of imbalanced payments.

Regarding the monetary policy after the Great Inflation, Benati and Goodhart (2010) distinguish three different periods of the history of the modern monetary policy: the years of experimentation, between 1979 and 1992, the nice years from 1993 to 2006, which are followed by the financial crisis, starting in 2007. Even though the authors focus their analysis on the American market, the temporal division made is related to several factors, most of them global. The first phase, the experimentation, is described as universal, with exception for Germany and Japan, and was related to the adoption of practical monetarism, based on either borrowed or non-borrowed reserve base, monetary control and targeting inflation, as well as the implementation of external monetary measures, including pegged exchange rates and the Exchange Rate Mechanism of the European Monetary System, and the agreement to financial regulation and supervision. On the other hand, within the political sphere, which is crucial to the definition of monetary policy rules, the world assisted to the opposition of

[1] Reference to Goodfriend, M. (1993): "Interest Rate Policy and the Inflation Scare Problem: 1979˝U1992," Federal Reserve Bank of Richmond Economic Quarterly, 79(1), 1—23

Capitalism to Communism, impacting the antagonism between free market regulation and state control, as well as the guidelines regarding production and resources.

As stated above, at the end of the 1970s, the U.S. was struggling with great inflation and a sinking currency, which required an intervention of policy makers. Due to an inversion in the monetary policy under the power of Paul Volcker, chairman of the Federal Reserve between 1979 and 1987, and with directions from the Presidents Jimmy Carter and Ronald Reagan, the country was able to recover from the recession. However, there were still consequences not only in the United States, but also in other countries, mainly in primary producing ones, affected by a commodity prices and demand decrease.

When it seemed the United States were tracing the path for a prosperous economic period in world, it was the time for Mexico, Argentina and Brazil to dangerously draw near default, given their disability to meet their liabilities with banks from developed countries. In result of this period, a more stable and less unpredictable political system was adopted, in which the reserve's target was changed from non-borrowed to a borrowed one. Therefore, banks started depending more on interest rate differentials, instead of adjusted interest rates in order to balance the gap between reserves needed to monetary growth and the ones available to its actions.

The period in question became known as Practical Monetarism, which was considered a time of general confidence in the medium to long term reliability of the correlation from monetary growth, nominal incomes and inflation; in the stability and predictability of the money demand to be an intermediate target; in the elasticity of interest rated to permit the adjustment of the expenditure and monetary aggregates; as well as a disbelief in systems of monetary base control. The period of Practical Monetarism, conducted under the direction of the Fed's chairman Paul Volcker, was mainly characterized by the abandon of a direct concern with interest rates, money market conditions and economic performance as targets of monetary policy, which was substituted for an increasing attention and use of quantity and rate change of monetary aggregates, as new policy targets. Monetarism also implicates putting the Fed in a situation of last resort lender, which means that the bank would act as savior of institutions in distress and stabilizer of financial markets, by providing refinancing to banks. In addition, the authors remember that "a remarkable common feature over the years 1979-82 was the collapse of the (supposed) prior stability of velocity, and of demand for money functions, in a range of countries, especially those with an 'Anglo-

Saxon' background, e.g. Australia, Canada, the U.K., and the U.S." (Benati and Goodhart, 2010: 21). The reasons for the end of the belief in that stability may be explained in different ways, including the existence of previous imprecise econometric relationships, the behavior changed due to the actual conversion of monetary aggregates in an intermediate target, or even the nature of the monetary system itself and its aggregated uncertainty.

Following this period, between 1988 and 1989, New Zealand was pioneer to implement inflation targeting policies, as an option to targeting exchange rate pegs, as well as to conduct a public sector reform. By the time, the choice was criticized based on the argument that it would result in an arbitrary choice of a nominal interest rate that the central bank would then continue to work with, regardless the economic situation. Despite those appreciations, through the 1990s, the idea of monetary policies focused on internal price stability, associated to external floating exchange rates, became popular. In addition, after 1992 the structure of the economy in the world was modified. In result of the collapse of the Communism, with the fall of the Berlin Wall in 1989 and the reunion of Germany two years later, the principles of free market prevailed, and the missions of central banks redirected to price stability, apart from the USA. This was also the time during which central banks started focusing on the adjustment of short term interest rates in order to control inflation, due to the design of the Taylor Rule, in 1993, by John B. Taylor. According to Sorensen and Whitta-Jacobsen (2010), the Taylor Rule defines the central banks' adjustments to the short term exchange rate, as a reaction to deviations to the target product, defined as its tendency. The Taylor rule is based on the correlation between levels of actual inflation and its target, the levels of actual employment and full employment, which leads central banks to increase (decrease) interest rates in reaction to high (low) inflation or with employment above (below) its full level. Sorensen and Whitta-Jacobsen explicit the deviation to the rule prior to the crisis in the following figure.

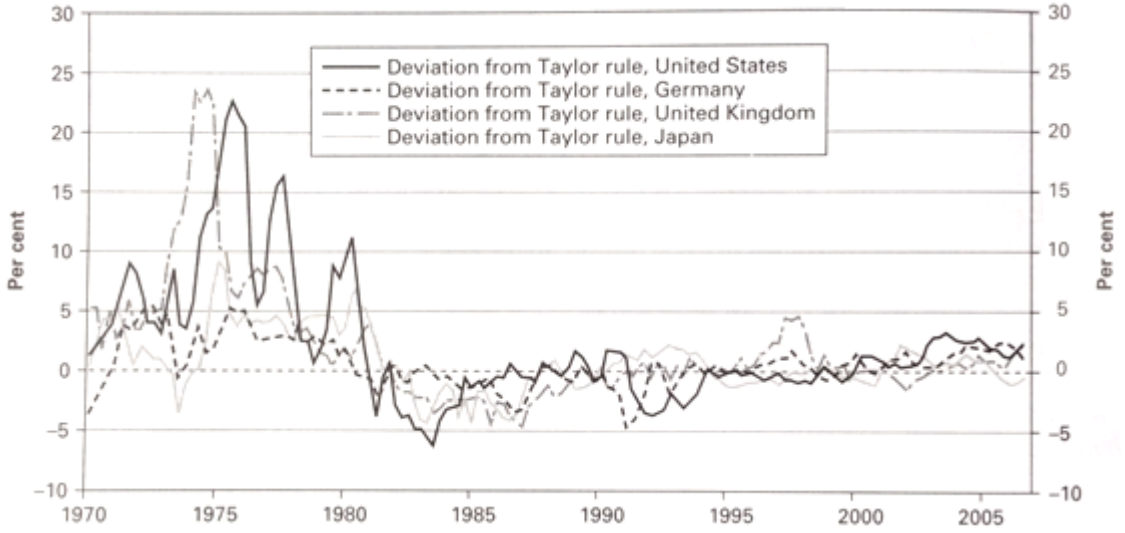

Figure 1 – Deviation from the Taylor rule in the United States, Germany, United Kingdom and Japan between 1970 and 2005. Source: Sorensson, 2010: 462

Apart from the 1992 collapse of the asset price in Japan related to economic real estate and stock market crisis in the country that was installed since 1986, the global economy experienced a period of prosperity between 1992 and 2007, during which the central banks were being successful in achieving price stability. The economic growth per capita in the world was never as fast as during this period, with China and India being great contributors to it. The inflation lowered, the unemployed, despite low, experienced an episode of great stability, and the deviation of macroeconomic variables such as output growth and nominal interest rate were low all over the world, which became known as the Great Moderation. There are, however, some less prosperous episodes that impacted the world economy and are worth mentioning. The first of them was the South East Asian crisis that took place between 1997 and 1998, and provoked both the Russian default, great speculation in Hong Kong, the fall and rescue of the Long Term Capital Management (LTCM) and turbulence in the U.S. Treasury bond market. In addition, the United States faced eight months of recession (from March 2001 to November 2001) after the blow up of the Nasdaq/Tech bubble in 1999, for which also contributed the terrorist attack in September 9, 2001. In these situations, the Fed reacted accordingly by cutting the interest rates and retrieving the confidence and stability of the markets, actions undertaken by what became known as the "Greenspan Fed", the Federal Reserve under the directions of the chairman Alan Greenspan.

In addition, this phase also assisted to the birth of the single currency some of the countries of the European Union, after the collapse of the Exchange Rate Mechanism (ERM) that prevailed in the EU. After experiencing a period of great

inflation and raise of the cross-sectional dispersion of inflation rates during the 1970s, the countries of the European Union started planning in 1980s a process of disinflation and the long pass towards the Economic and Monetary Union (EMU). The EMU brought structural alterations to the inflation dynamics in Europe, including the anchoring of long-term inflation expectations, and the fading of inflation persistence, defined as the tendency for a deviation of inflation from its unconditional target, instead of a fast return after a shock. The Euro was adopted in January 1999, and three years later it became the new official currency of 11 member states, with the completion of its second phase of implementation. Besides the establishment of currency boards or unions throughout several countries, the European one-of-a-kind model created for the first time a monetary and currency union, in which its members preserved the management of fiscal policies. The experiment received critics from several external stakeholders, and it is currently thought, even by Euro supporters, that the union is yet to be completed in order to be sustainable, a topic that will be further discussed later.

Given all the reasons stated above, after this period of prosperity, markets and investors had confidence in the monetary policies and authorities, which were expected to protect the financial markets from crises and were thought to have mastered the theory to have economic success. However, during the summer of 2007 the situation was other, and the crisis exploded, catching several trustful players unaware. Interbank markets started to shut down, causing a great withdrawal of liquidity and a raise in credit risk premia. "The proximate cause was the broad decline in housing prices across the USA, leading to rising delinquency rates on sub-prime mortgages, and growing doubts and uncertainties about the valuations of mortgage backed securities. On August 9 BNP Paribas suspended the calculation of asset values for three money market funds exposed to subprime, and halted redemptions. In view of the withdrawal of liquidity, the ECB injected 95 billion euro overnight, alerting the world to the existence of a major problem." (Benati and Goodhart, 2010: 77).

Mishkin (2010), on the other hand, demystifies the common tendency to attribute the U.S. crisis to only one cause, as he believes three other contributors were equally important. The author distinguished two phases of the crisis, being the first one, dated 2007 and named the subprime mortgage crisis, the result of the housing prices boom and later decline, which lead to losses of mortgage-backed financial securities. This is a long process, during which the banks used mortgage-backed securities collaterals and insecurity to create credit market disruptions, as demonstrated by interest

rate spreads between safe and risky financial instruments. The next summer, everything looked like it could be controlled, the credit markets were calmer, and the credit risk was rising, when the second phase, or the global financial crisis exploded. On Monday, September 15, 2008, the U.S. fourth largest investment bank, Lehman Brothers, became also the largest bankruptcy filling in the history of the country, bringing down an institution of the size of over $600 billion in assets and 25,000 employees. Even though it is largely accepted that the bankruptcy of Lehman Brothers was the trigger of the subprime crisis, Mishkin believes that it was as relevant as the collapse of the Financial Products Unit of American International Group (AIG), the run on the Reserve Primary Fund, both of them on the day after, as well as the difficulties in getting the Troubled Asset Relief Plan (TARP) approved on the Congress, the weeks after.

Taylor (2009), who is also skeptical in attributing the crisis worsening only to the Lehman Brothers bankruptcy, used a measure method of counterparty risk and compared it to the Libor-OIS spread, revealing a close correlation between the two, as well as that the problems of the market were more result of risk than of liquidity. Moreover, the author calls attention for another policy implemented by the Fed, in mid October, in addition to TARP, including the Emergency Economic Stabilization Act, which temporarily increased the basic insurance coverage of the Federal Deposit Insurance Corporation (FDIC).

"In considering these events, it's also important to remember that the financial system had been greatly weakened before September 2008 in ways that had not yet been fully recognized at that time. Just as relatively small sound or vibration can trigger an avalanche high, it may be that with given the amount of systemic risk embedded in the financial system, some other stress or failure of a failure of a financial institution would also revealed the fragility of the financial system – and then led to a chain reaction that could also have tipped the financial system over the cliff." (Mishkin, 2010:4).

Fahr et al (2011) explain the connection between the American crisis and the European crisis, as they believe that the Lehman Brothers collapse unveiled underlying imbalances that were installed in the financial sector of the countries of the EU. Despite the fact that both the U.S. and the EU experienced an almost simultaneous period of prosperity, characterized by a rise in stock prices related to increasing shares of credit and investment in GDP, the period of crisis was not so similar. The authors explained that a drop in risk premia, long-term interest rates and the installment of macro-economic uncertainty were common features, while Europe faced the problem of the

share of government and corporate debt, which was larger than the American. After the collapse of the Lehman Brothers and the trigger of the crisis in the U.S., a European bank declared incapacity to value the underlying assets in funds invested in American sub-prime mortgages, greatly contributing for the trigger in Europe.

Additionally, the authors believe that the crisis has led to a rethinking of the Jackson Hole consensus, which determined that central banks should act only in response to asset prices and financial imbalances, regulating the inflation, as they believe it may not be enough to guarantee monetary and economic stability, an opinion based on the aftermath of the Great Moderation. Based on this prosperous period, it remain the thought that unemployment was needed to establish order, while the central banks and governments should leave the efforts to managing the economic demand or try to stabilize the economy, since the non interference with the market would automatically lead to stabilization. As can be seen, the Great Moderation period rethink the Keynesian model of demand management, revolutionizing the finances. However, the success is explained by the fact that governments and central banks did not actually abandoned demand management, and have instead restored it by harmonizing both the risks of high inflation and unemployment. In addition, given that the risks of accelerated inflation were already known, more effective macroeconomic tools have been used to manage it. "We examine some of the sources of the boom and bust episodes in the euro area and argue that in line with the ECB's monetary policy strategy responding to money and credit developments helps stabilizing both inflation and output. We, therefore, argue that an enhanced role of money and credit in monetary policy strategies is one of the important lessons from the crisis." (Fahr et al, 2011: 7). The authors further argued that the adoption of unconventional monetary policy measures is a result of the Great Recession, as central banks understood the need to intervene in financial markets in order to avoid liquidity problems and consequent solvency, as well as due to the need to ease the monetary policies with cuts on short-term interest rates close to the lower bound at zero, a model implemented primarily in the United States. "The notion that the policy-controlled short-term interest rate is the sole tool of monetary policy has therefore been questioned." (Fahr et al, 2011: 7)

b. The Roles of E.U. and U.S. Central Banks

The actions of the central banks are defined by an agenda, a mission well established either by the Congress, in the case of the American Federal Reserve Bank, by the Maastricht Treaty, in the case of the European Central Bank, or by the governments, in other cases, such as the Bank of Canada, Bank of England or Bank of New Zealand. Therefore, in order to understand the actions taken by the central banks, it is required to dissect which is this mission.

U.S. President Woodrow Wilson established, on a 1913 law, the Federal Reserve Bank's mission, which was updated on an amendment in 1977 and reaffirmed in 2000, as the follow to maximum employment, stable prices and moderate long-term interest rates, given that long-term interest rates and expected inflation are invariably related, since that last purpose is basically consistent with price stability, as explained by Poole (2007). However, it must be taken into consideration that the ideas expressed by the author were prevalent mainly until the trigger of the economic crisis, since he was theorizing at time when the economic situation was different that the one faced today, during which the interest have been lowered to levels not considered at the time, and deflation was not yet a reality included within this convention. In order to pursue its monetary policy, the Fed encloses three main tools, the open market operations, which are controlled by the Federal Open Market Committee (FOMC), as well as the discount rate and the reserve requirements, which are responsibility of the Board of Governors of the Federal Reserve System. Through this set, the Fed is able to influence the demand, the supply, and the federal funds rate. The FOMC includes twelve members, seven of them are members of the Fed's Board of Governors, in addition to the president of the Federal Reserve Bank of New York and four presidents from the other eleven Reserve Banks, who meet eight scheduled times annually, as well as other times considered needed to decide about the Fed's monetary policy, including interest rates.

Mishkin (2004) stated that "in recent years, the Federal Reserve has increased its focus on the federal funds rate (the interest rate on overnight loans of reserves from one bank to another) as the primary indicator of the stance of monetary policy. Since February 1994, the Fed announces a federal funds rate target at each FOMC meeting, an announcement that is watched closely by market participants because it affects interest rates throughout the economy." (2004: 393) However, Poole (2007) argued that price stability should be the number one priority for central banks, in order to maximize employment and economic growth, in the long term, as prior to the crisis thought to be

possible; in addition to market confidence, it enables the compensation of disturbances that could cause fluctuations of the employment and output; as well as price instability set off arbitrary and unmerited distributions of both revenue and wealth.

On the European side, and according to the Maastricht Treaty, during which the European monetary policy was established, the European Central Bank works focused on price stability in the short to medium term, and with the target of inflation below but close to two percent. "The Treaty creating the monetary union establishes price stability as the primary objective of monetary policy in the euro area. To provide a clear yardstick against which the public can hold the European Central Bank (ECB) accountable and with a view to anchoring medium- to long-term inflation expectations, the Governing Council of the ECB adopted a quantitative definition of price stability in 1998. This definition reads: 'Price stability shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%. Price stability is to be maintained over the medium term.' Following a thorough evaluation of the monetary policy strategy in 2003, the Governing Council clarified that it aims to keep HICP inflation 'below, but close to, 2%'." (Fahr et al, 2011: 8) In order to address its purposes, the institution holds two standing facilities, which can be used by the banks, but only are as last resource. The marginal lending facility and the deposit facility are the first kind of ECB's instruments. In addition, the institution is able to control the money market interest rates through the provision of more or less liquidity to the banks, while the liquidity in the money market and steer short-term rates is controlled through open market operations, the second kind of ECB instruments. Finally, the third kind of instruments available to the central bank is the set of minimum reserve requirements, which not only contribute for the creation of enough structural demand for the bank's credit, but also for the stability of the money market interest rates. The European monetary policy is based on the ECB's Governing Council, a group that includes the six members of the Executive Board, as well as the governors of the national central banks of the 19 countries in the euro area, who meet to decide on guidelines and measures to assure the ECB's mission, to undertake banking supervision actions, and to formulate the monetary policy for the euro area, including monetary objectives, supply of reserves and key interest rates (interest rate on main refinancing operations, rate on deposit facility, and rate on the marginal lending facility).

A crucial function of central banks that cannot be forgotten given its impact on economy is the management of expectations. By choosing to following and stick to a

policy rule, central banks facilitate its understanding and assimilation for the public, stabilizing the expectations. The need for public understanding of the actions of a central influences not only the legitimacy of the bank, but also the effectiveness of the monetary policy measures. However, there are times, in which a central bank's actions are less predictable, or not accordingly to what was expected by the public, during which central banks need to take particular attention. "For successful monetary policy is not so much a matter of effective control of overnight interest rates as it is of shaping market expectations of the way in which interest rates, inflation, and income are likely to evolve over the coming year and later. On the one hand, optimizing models imply that private sector behavior should be forward looking; hence expectations about future market conditions should be important determinants of current behavior. It follows that, insofar as it is possible for the central bank to affect expectations, this should be an important tool of stabilization policy. Moreover, given the increasing sophistication of market participants about central banking over the past two decades, it is plausible to suppose that a central bank's commitment to a systematic policy will be factored into private-sector forecasts—at least insofar as the bank's actions are observed to match its professed commitments." (Woodford, 2003: 15)

Another important feature about central banks that is determinant for the success or not of monetary policies is the mechanism of transmission, according to Mishkin (2004). The most common transmission channels used in a closed economy are the expectations, already analyzed, and the aggregate demand channel, which is able to influence with a lag the aggregate demand itself through the short real interest rate. Consequently, and according to the Phillips curve, aggregate demand also affects, with another lag, the inflation. Within an open economy, in addition to the transmission channels mentioned, there is also the exchange rate channel. The exchange rate is influenced by the disparity between domestic and foreign nominal interest rates, and expected future exchange rates, trough an order of interest parity. While the real exchange rate impacts the relative prices from domestic and foreign goods, and, consequently, domestic and foreign demand; the direct exchange rate channel influences the prices of domestic currency prices of imported goods, and, as a result, the Consumer Price Index (CPI).

III. Debates Pro and Con Unconventional Monetary Policy Measures

When the United States of America entered recession in September 2007, the Fed used its tools, the federal funds rate, lowering it to almost the zero-bound, an expression used when the short-term interest rates are decreased by the central bank to near zero or even zero. Given the fact that interest rates cannot by regulation be negative, the decrease of the federal funds rate has impelled the Fed to adopt new measures to both stimulate the economy and keep its stability. Therefore, the Fed implemented unconventional measures of monetary policy, based on two rounds of quantitative easing (QE), having used the central bank's balance sheet to acquire long-term government bonds, as well financial assets from the private sector, focused mainly on mortgage products, with financing from deposits of reserves.

The Fed implemented a first round of QE in December 2008, in response to the stress of the financial markets with highly fixed interest rate premiums. The central bank increased its reserves, as well as the money supply through open market operations, and the first round of QE was initiated with a $500 billion purchase of mortgage-backed securities (MBS) complemented by a $100 billion purchase of debt of government ventures related to housing. Moreover, the Fed decided to enlarge the measure in 2009, raising the MBS to $1.25 trillion purchases, the housing purchases to $200 billion and adding to the package $300 billion in purchases of long-term Treasury securities. In addition, a second round of QE was undertaken by November 2010, which lasted until June of the following year, with the purpose of answering to a slower recovery of the economy than expected. This second turn was comprised of $600 to be invested in long-term Treasury securities, while it was given independence to the FOMC to keep supplying both agency debt and mortgage-backed securities. Following two rounds of QE, in September 2011, the Fed announced a $400 billion purchase program of up to 30-year-maturity bonds in order to extend the average maturity of its portfolio, without needing to print additional money or expand even more its balance sheet. A third round of QE was initiated in September 2012, whose withdrawal was gradually initiated in October 2014, comprising $1.7 trillion in longer-term Treasuries and mortgage-backed securities.

The idea behind QE was brought to the Fed by its Governor Ben Bernanke (Bernanke et al. 2004), based on the writings from Tobin and Buiter (1980)[2], who suggested the acquisition of equities in order to increase the prices of assets and, consequently, stimulate the investment in the economy, as explained by Thomas I. Palley (2011). In a situation of zero bound, the Fed is impelled to limit the short-term federal funds rate in order to maintain the macroeconomic stability. The main purpose is to inject liquidity into the financial system through the purchase of assets, which were expected to stimulate the economy. In order for QE measures to be effective the main five channels of expansionary effect are crucial. The first of the channels is the traditional Keynesian interest rate channel, which works through the long-term bond rate and the term structure of interest rates, as the central bank acquires long-term bonds and consequently decreases the long rate relative to the short rate, fixed at zero. The Tobin stock market q is also an expansionary channel of the QE, as it determines the market value of firms, divided by the replacement cost of capital, making it possible for the companies to issue equities and purchase them at higher price, which causes the raise of stock prices and, consequently, of the investment due to the liquidity injection towards equity purchases. The third expansionary channel works through the effects of the consumption wealth and is related to the higher levels of bonds and equity value. In addition, expected inflation is a channel, to the extent that the higher it is, greater incentives are given both to households and firms to consider future consumption and investment, as a way of keeping away from higher prices, an effect known as expenditure acceleration effect. Finally, the expansion of the QE effects is influenced by the exchange rate channel, as there is liquidity targeted to foreign currency purchases, provoking appreciation of the real exchange rate.

However, the methods and efficacy of QE is no consensual matter and there is great discussion among economists about its implementation. The main question that divide authors within this debate is whether it is beneficial to implement counter-cyclical economic policies, as well as the efficacy of these policies. New Keynesians and traditional Keynesians, in which are included J. Bradford De Long, Roger Farmer, Paul Krugman and Michael Woodford, see it as an effective option and a model to be

[2] Reference to Tobin, J. and Buiter, W., "Fiscal and Monetary Policies, Capital Formation, and Economic Policy," in von Furstenberg (ed.), The Government and Capital Formation, Ballinger Publishing, 1980, p.73 – 151.

further followed. On the other hand, authors such as the monetarist Allan H. Meltzer, Nouriel Roubini, the new classical macroeconomist John B. Taylor, or the free marketer John H. Cochrane, criticize the adoption of QE. Among the greatest concerns regarding QE, and particularly based on the Japanese experience, dwells in the risk of liquidity trap, a situation in which both money and additional financial assets are in perfect situation of substitution and there is, therefore, no impact from an injection of liquidity through the acquisition of assets.

a. Supporting Quantitative Easing

Roger Farmer (2009, 2012a, 2012b) compares the recession that started in December, 2007, in the United States to the situation lived in the country during the 1930s, and acknowledges the uncertainty about how to act. Despite the fact that policy makers have been acting according to Keynesian ideals, the author believes that the academics already gave up on it, which resulted in 40 years of disconnection, during which policy makers were working with no manual. The Fed has been focused on fiscal and monetary policy, particularly the stimulation of the aggregate demand with the interest rate, to avoid recessions. However, similarly to the period of the Great Depression, after 2007, this method was no longer available, since the interest rate on the treasury securities was almost zero, limiting the span for easing.

Due to the financial crisis, Fed lowered the interest rate in 2008 to near zero and, according to Farmer, the conventional monetary policy measures were no longer effective. Therefore, the author advocated the inevitability of the implementation of unconventional monetary policy measures, including the purchase of assets, such as mortgage-backed securities and long-maturity government bonds. "One of the lessons of post-war monetary policy is that policies are best modeled as rules rather than as discretionary events," he stated, though. (Farmer, 2012b: 12) The statement is related to the importance of expectations, since repeated actions from the central banks, influence the agents into learning to respond accordingly. "But monetary policy rules are not set in stone. They can and do change from time to time as policy evolves in response to changing circumstances and as policy makers learn from experience. When the policy-rule changes, there will be a period where households and firms learn to respond to the new rules of the game. The current crisis has engendered one such period of adaptation and change as the rule used to conduct policy over the past thirty years has broken down. The need to adapt monetary policy to a new set of circumstances has led to a dilemma since the rule that worked well in the period after 1982 cannot easily be adapted to the current crisis in which the interest rate is close to zero. (...) [An] alternative rule might have prevented a sharp drop in inflationary expectations like the one that occurred after the bankruptcy of Lehman Brothers in 2008. But moving to an alternative rule cannot be achieved through conventional means. (Farmer, 2012a: 12)

Moreover, Farmer focused on the expectations management, as he considers that despite some gaps and failures in the theories of Keynes, it is certain that psychology is crucial for determining the behavior of the markets. The author (2008) exposed the

example of households, whose expenditure is influenced by their belief in the value of the assets. Consequently, according to more or less spending, the unemployment can either decrease or increase, becoming or not self-fulfilling. During the recession, both households and firms were less confident in the value of the assets and spent less, as a result, forecasting future failures in the price levels. This situation comprises the larger danger of making the prediction a reality, and making the economy stagnate, as he believes that the only actor large enough to restore confidence in the US market is the US government. Therefore, Farmer advocated that QE is a step towards the right direction but it has not gone nearly far enough.

Despite his critics to the actuation of the Fed and Ben Bernanke, Paul Krugman, who has been debating in several papers and opinion articles the problem (2011, 2012a, 2012b, 2014), defended the implementation of unconventional measures of monetary policy in situation of crisis. Krugman (2012a) focused his discussion in the writings from Bernanke during the 1990s about the Japanese economic crisis, remembering the options presented by the former chairman of the Fed. The first proposal consists on the purchase of long-term government debt and bonds backed by home mortgages, which would strengthen the position of the Fed within the financial market and led to a decrease in the assets' interest rates. Instead of just working, as typically with the short-term government debt, and given the fact that short-term interest rates cannot be lowered even more, the idea was to work with the long-term rates and expand the Fed's portfolio. In other words, what Bernanke is defining and Krugman defending is QE. In fact, Krugman (2012b) believes that ending the depression is easy, based simply in the end of austerity measures and in the implementation of policies to boost spending, decreasing unemployment.

In addition, the author explained the importance of the expectations of the markets in the recovery of the economy, explaining that investors trust in the economy recovery, the Fed is able to begin raising the rates. On the other hand, expectations also impact the actual economy through inflation, due to the believe of investors that the Fed is only going to raise rates until it can control an inflation not much above two percent. Similarly to several other economists, Krugman believes in the expectations, since higher expected inflation during a period of zero lower bound would stimulate the economy due to the belief from the investors that spending is a better idea than saving.

However, the problem is, according to Krugman (2012a, 2012b), politics. His critics to the QE dwell first of all in the amount spent, as the economist believes that it

is far from enough to guarantee the recovery of the economy. Regarding expectations, Krugman also considers that the Fed failed to be aggressive enough, as it focuses only on the short term. Therefore, Krugman states that Bernanke castigated the Bank of Japan, advocating for more aggressive policies, but adopted a passive attitude while at the Fed. The author questioned then whether there was a conflict between "professor Bernanke" and "chairman Bernanke" and stateed that regardless the answer, which may be influenced by politics, the Fed is in the right direction, but was not aggressive enough. "By the time that big shock arrived, the descent into an intellectual Dark Age combined with the rejection of policy activism on political grounds had left us unable to agree on a wider response. So the era of the Samuelsonian synthesis was, I suspect, doomed to come to a nasty end. And the result is the wreckage we see all around us." (Krugman, 2011: 26) Still in the thematic of politics, the economist theorized about "sadomonetarism," a phenomenon during which a central bank increases interest rates and stops encouraging employment, despite the economic situation, and he explained that it is also related to ideology. According to Krugman these actions are influenced by class interests and in particular by the will of the top 0.01 percent of the American population. He even went further and answered to the critics that QE and low interest rates affect the retired Americans who earn money from their CDs' interests, by explaining, based on the national statistics, that the only ones who are affected by the measures are the wealthy, the 0.1 or 0.01 percent in question.

J. Bradford De Long (2009, 2010, 2012) is another author that advocates QE, not for its benefits specifically, but rather for the disadvantages of not implementing it. De Long recognized the controversy associated to the thematic and the uncertainty experienced by both governments and central banks about how to deal with recession. Being a New-Keynesian, he addressed the problem remembering Keyes, and stated that there is a too high demand from the investment sector for safe, secure and liquid assets, coexistent with a low demand for assets able to strengthen and finance the capital productivity in the economy. For the author, the most effective option is creating more cash, through the acquisition of government bonds, in order to satisfy the demand for safe, secure, liquid assets, as well as push down the price of cash. "Assume an economy in which output is well below its potential, cyclical unemployment is elevated, supply constraints on short-run demand are absent, conventional monetary policy is constrained by the zero lower bound, and the central bank is either unable or unwilling to, but in any case does not, provide additional stimulus through quantitative easing or other means.

(...) A combination of real government borrowing rates in the historical range, modestly positive fiscal multiplier effects, and small hysteresis effects are together sufficient to render fiscal expansion self-financing." (De Long, 2012: 235-236)

Despite his support, the author acknowledged the discussion among economists about the effectiveness of QE, as well as when or under what circumstances to implement it. He recognized the difficulty in determining if governments should increase the velocity of money through bond selling and increasing short-term interest rates, raise spending to decrease unemployment, provide liabilities to financial institutions, buy undesirable or discount assets, recapitalize or nationalize banks, or even continue money printing despite the exhaustion of the capacity to inject liquidity in the economy using the typical models of open-market operations. However, De Long argued that there was not yet sufficient information about when, in which circumstances and in what order should governments that as described, so the best solution would be a combination of these measures (quantitative easing, bank guarantees, purchases, recapitalizations, nationalizations, direct fiscal spending and debt issues) and as soon as possible, in order to avoid the price from the consequences of inaction.

In addition, De Long (2010) also believes in the effects of QE in the situation of unemployment and he deconstructed the arguments that advocate that the unemployment experienced between the financial crisis in both the Unites States and Europe was structural, instead of cyclical. Structural unemployment, and he focused particularly in the mismatch between the work force and the labor market, cannot be combated with expansionary policies meant to enhance the aggregate demand, since that is not the problem. However, he believes that the situation was not yet, but could turn into within two or three years, the one of structural unemployment, as a consequence of prolonged unemployment. In a situation of structural unemployment the aggregate demand is not affected, since there are structural facts that cause a divergence in the distribution of the demand and the skills that the working force has to offer. However, that is not the situation of the Unites States since 2007, since the decline in employment was gradual and generalized, causing a fall in the aggregate demand.

Vasco Cúrdia and Michael Woodford (2010) investigated in several papers the conventional and unconventional monetary policy, seeking to improve the methods of QE implemented by the Fed, by including the heterogeneity of spending chances, two sources of credit spread and the possibility of the central bank to use its balance sheet in equilibrium determination. It does not mean, thought that they do not support it and

among the reasons to advocate the use of QE is the inadequacy of measures focused solely on inflation and real GDP, like the Taylor rule, during a situation of crisis such as the one lived. "John Taylor himself (Taylor, 2008) has suggested that movements in this spread should be taken into account in an extension of his famous rule." (Cúrdia and Woodford, 2010: 230). At the Jackson Hole Economic Symposium, Woodford (2012) presented arguments that summarized the discussions and experimentations conducted in a series of countries during the past few years. The first of the two alternatives in analysis was forward guidance, comprised of the central bank's announcements and statements about future actions and its use to influence the economy, expectations and the agents' confidence. Despite already considered by the banks, the economist believes that the management of expectations is still underrated, but particular crucial at zero lower bound.

In addition, Woodford also theorized about balance-sheet policies, measures based on the fluctuation of the size or composition of the central bank's balance-sheet, regardless the alterations in the overnight interest rates target. Starting from the experience of QE implemented by the Bank of Japan between 2001 and 2006, the author explained that the idea behind it is based on the correlation between the monetary base of a central bank and the aggregate nominal expenditure. Therefore, in addition to conditioning the interest rate, the governments also have the possibility to buy long-term securities and supply high-powered funding to the economy, in order to boost expansion. Consequently, the increase in spending would gradually decrease deflation. However, Woodford called attention for the fact that the traditional thinking about QE consider its effectiveness based on liabilities expansion and regardless the nature of the assets purchased. In fact, he believes it is more careful and less invasive if the central bank's actions focuses solely in purchases meant to safe government securities. On the other hand, he emphasized that Friedman (2003)[3] had already improved the theory by conceiving that the raise in the monetary aggregate, as a result of the increase in the monetary base, is proportional to stability of the "money multiplier", while the increase in the aggregate nominal expenditure resultant from the raise in the broad money, is dependent on the stability of the money velocity. "The economic mechanism behind the causal chain is one according to which there should be a finite demand for real base money, proportional to the real volume of transactions in

[3] Reference to Friedman, Milton, "The Fed's Thermostat," Wall Street Journal, August 19, 2003

the economy, and a decreasing function of the opportunity cost of holding base money. If the nominal size of the monetary base increases, one or more of these determinants of desired holdings must also change, to maintain equilibrium." (Woodford, 2012: 51)

Woodford further analyzed the implementation of the QE by the Fed, explaining that its purpose was decrease the market yields of longer-term bonds and consequently increase prices, with the main perspective of easing as available credit to households and firms, and he reaffirms the importance of the expectation management. "While it is difficult to be certain about the effects of such policies without a greater body of experience than is so far available, some provisional conclusions may be possible. (…) there seem to me to be fewer options that are likely to be effective, and that are likely to be attractive on other grounds, than central bankers sometimes suggest when seeking to reassure the public." (Woodford, 2012: 83) In addition, he concludes that the tendency during the lower zero bound has been for central banks to focus on monetary stimulus that do not obligate them to commit with future decisions, at the same time that they announce that are going to alter general financial conditions in order to impact all economic agents.

Lars E. O. Svensson (2011) is such an advocate for the implementation of QE that he left the Swedish Riksbank due to the insistence in raising rates regardless the risk of deflation. The author believes that while during normal times, the standard monetary policy tools, from which he privileged policy rate and communication, are enough, during times of crisis, the same is not true, being necessary for the central banks to use more aggressive methods, unconventional monetary policy tools. "During the crisis when policy rates have been at or close to their zero lower bound, we have seen other more unconventional instruments being used, including large-scale asset purchases (LSAPs) by the Federal Reserve. I believe the LSAPs conducted by the Federal Reserve have had substantial beneficial effects on the U.S. economy and that the objections that have been raised against them are not convincing." (Svensson, 2011: 36) Svensson emphasized the distinction between financial-stability policy and monetary policy, given the fact that the two are often confused. Therefore, he stated that the main purpose of good monetary-policy framework is to both stabilize inflation at a low level and resource utilization at the highest sustainable level, which are both consistent with the missions of the Federal Reserve to pursue maximum employment and price stability. However, Svensson reached the conclusion that neither price stability nor interest rate policy are enough to guarantee financial stability. "The fact

that financial stability policy and monetary policy are distinct and different does not mean that there is no interaction between each policy and the other policy's objectives. Monetary policy affects the real economy and thereby profitability, asset prices, and balance sheets. Thereby it affects financial stability. Financial stability policy directly affects spreads, lending, and other aspects of financial conditions, as well as the transmission mechanism of monetary policy." (Svensson, 2011: 40-41) Therefore, the author defined as good monetary policy the one that considers financial stability, as well as fiscal policy, being the vice versa situation also true.

Regarding the argument that the lower rates as a consequence of LSAPs, and the related depreciation of the dollar compared to foreign currencies, Svensson argued that it is normal for countries with open economies to gain a weaker currency due to more expansionary monetary policy measures. However, he explained that it is possible to deal with this situation by lowering the policy rate and the policy rate path, which is able to stimulate the economy, as well as moderate the nominal and real appreciation. In addition, the author emphasized the importance of forward looking guidance, supporting the regular publication of policy rate forecasts. He uses the examples of the Bank of Canada and the Bank of Japan, which have, in addition to the Fed, already been using forward guidance in its statements as unconventional measure of policy, while other banks use it as conventional policy tool, in the form of published policy rate forecasts, including the Reserve Bank of New Zealand, the Norges Bank, the Riksbank and the Czech National Bank. The author based his thoughts on the topic on the importance of knowing the longer interest rates for both the economy and the private-sector decisions, which consequently determines the formation of expectations regarding future policy rates and term premiums. This is, in fact, and according to Svensson, more important than what the policy rate is during the months until the next policy meeting, as it has the capacity to influence the economy through capital costs, stock market, exchange rate and other asset prices.

b. Criticizing Quantitative Easing

On the other side are the economists that refuse the effectiveness of QE, criticizing the actions of the Fed for implementing it. Among them is John H. Cochrane (2009, 2010), who demystified the common thoughts about QE. The economist remembered that the main purpose of the measure is to combat unemployment, as he cited[4] an interview from Ben Bernanke, regardless of the common thinking that the goals are set on inflation, dollar devaluation and trading. However, despite the purpose, Cochrane believes that none of them can be right, since the short-term interest rates were near zero, which made money and short-term bonds virtually the same. If a bank can chose to hold Fed reserves that offer to pay 0,25 percent interests or one- to three-month treasury bills, which also pay the same interest and are easier to buy, Cochrane believes it is indifferent for banks the one to hold. Therefore, the economist believes that while purchasing banks' short-term debt and provide them reserves in turn has no effect, QE only restructures maturity of U.S. government private debt. In addition, he remembered that holding $2 billion of excess reserves, the banks are inundated with liquidity. "Central banks can and did turn to dramatic "quantitative easing," increasing M [money supply] by buying both government B [bonds] and private D debt. (...) At a zero interest rate, M and B are perfect substitutes, especially to a bank. People trade perfect substitutes at will, so trading M for B can't do anything in either equation." (Cochrane, 2010: 5)

Regarding inflation, Cochrane based his arguments on the same idea that the measure makes nothing else than changing money in the system without effective outcomes. Despite the common thought that more money in the economy would boost inflation, the economist explained that it is only true in times when the interest rates are higher than zero and, consequently, the agents are more willing to spend. On contrary, with lower zero bound, and with a liquidity flood in the banking system, previous experiences may not provide the same lessons, since when inflation and short-term interest rates recover, the central bank may be undo the operation overnight, according to the author. "Many authors think 'a little inflation would be a good thing.' Many more, including the Fed, say we shouldn't worry about inflation yet, as there is still lots of 'slack,' unused capacity, and 'big gaps.' Well, will a fiscal inflation reduce gaps, and will we be warned by declining gaps? Or will it be a stagflation? I'm worried.

4 http://www.cbsnews.com/news/fed-chairman-ben-bernankes-take-on-the-economy/

Historically, fiscal inflations and currency collapses have come with terrible real outcomes. If inflation always meant a boom, Zimbabwe would be the richest country in the world. Monetary theory already envisages many circumstances of neutrality or stagflation: currency reforms, supply shocks, 'loss of anchoring.' Expecting inflation always to come with a boom ignores a lot of sorry history." (Cochrane, 2010: 8-9) However, the author also questioned the pursue for two percent inflation, as he believes it is only one definition of price stability, which the central bank makes seem as the only one. Increased expected inflation, however, causes stagflation, according to the most conventional theories that correlate inflation and unemployment. The same way that unexpected inflation is damaging for savers, unexpected deflation has disadvantages for borrowers. Therefore, Cochrane believes that the preferable situation in the long term is the one of zero inflation or of slow, steady and expected deflation, since it enables the healthy renovation of the system and its cash flows without interest cost.

In addition, Cochrane theorized about two main dangers he believes to be associated to QE. The first of them is that the US are more vulnerable to bad news due to the short-term debt, similarly to what happened to Bear Stearns and Lehman Brothers, and, therefore, the author considers that by selling long-term debt, the government is able to avoid a situation of crisis, while rolling over short-term debt, can cause the incapacity to borrow money to cover maturing bills, and consequently the enhancement of the crisis. The second risk dwells in the fact that QE works as a distraction, alienating the agents from the real problems in the economy. Cochrane believes that the case of unemployment is the most prominent example of that, since even though the high rates are not related to the maturity structure of the government debt or to a shortage of liquidity that is common idea perpetuated by the noise created by the QE, according to the author.

John B. Taylor (2009, 2010, 2011, 2013), who defined one of the most well-known parameters of conventional policy, the Taylor rule, is not surprisingly a great opponent to QE. Since the beginning of its implementation in the US, Taylor (2009) raised a series of concerns and questions about the measure. His critics are based particularly on four pillars. First of all, he defined the inflationary risk associated to QE. Despite the fact that inflation was not a problem by the time of the program's initiation, a situation of crisis, with a weak economy and a decrease in the prices, but the concerns were that inflation would raise if the Fed would know exactly when to remove its reserves, a politically difficult decision to make. The second main concern dwells in the

methods chosen by the Fed, which he even designated as "selective credit easing," since the central bank decided to invest in determined securities, sectors and institutions. Therefore, Taylor questioned "what justification is there for an independent government agency to engage in such a selective credit policy?," as he believes that such decisions should be made under the Congress approval, not to compromise the independence of the central bank. The third question lies in the effectiveness of the policy itself, while he is skeptical about Fed's statement that QE was needed, as well as offered evidence that the Term Auction Facility was ineffective for the interest rate spreads and could even extend the crisis. Finally, the fourth concern is that QE would alter the course of the central bank's actions, and even its role and it is based in its conviction that discretionary policies are always a worst option, compared to rules-based policies.

About this topic of discretion vs rules, Taylor (2011) justified its arguments with the American economic history. He distinguished three different periods of modern history, during which the American economy diverged from one to another. "The rise of discretionary policies" took place between the 1960s and the 1970s, "the rise of rules-based policies" from the 1980s to the 1990s, and "the return of discretionary policies" in the latest years. "Much economic theory supports the more straightforward explanation that rules-based policy caused the improved performance. Any dynamic model in which people are forward-looking and take time to adjust their behavior implies that monetary and fiscal policy works best when formulated as a policy rule. (...) Some argue that the recent crisis shows that these models have failed, and therefore one might discount this theoretical case for rules. But the evidence I report here does not support such an argument. Rather the evidence shows that the models were right and the policies were wrong, because policy makers did not follow the rules-based policies recommended by the models." (Taylor, 2011: 5-6)

Therefore, Taylor arguments that there is a wrong idea about the inevitability of QE in response to the crisis, while he believes that the recovery has been much slower than it could have been had the Fed stick to conventional measures due to the ineffectiveness of a series of measures implemented. In addition, not only was the Fed unable to prevent the panic associated to the crisis, as the author believes the measures helped cause it or enhance it. A last critic is stated by Taylor regarding the consequences of fiscal packages in increasing debt, and of monetary packages in increasing monetary overhang. The only credit given by Taylor to QE regards its effectiveness in rebuilding the agents' confidence.

Alan H. Meltzer (2012, 2013, 2014a, 2014b) is strict when considering QE, which he classified as a big mistake. The economist stated that there were already $2.5 trillion in the balance sheets of the American banks, as well as $2 trillion on corporate balance sheets, making the additional capital provided by QE useless to the economy. Not only does Meltzer believes in the ineffectiveness of QE in boosting the national economy, but he also considered the hypothesis that it could affect the foreign economy. The economist explained that even ending QE would not prevent the international markets from suffering its posterior consequences, as the American government would continue struggling with a massive federal budget deficit. The consequence is, according to Meltzer, inflation, generalized inflation. The author based his writings in the argument that despite earning 0.25% in interests, the banks pay almost zero to the depositors, which made him believe that they would prefer less risky interest and keep the capital still, instead of making it flow through the economy. This situation results then in banks lending to the government, large stable corporations and commercial real-estate dealers, but not agents that compose a higher risk, such as smaller entrepreneurs and individuals willing to buy its first house. In addition, both speculators and bankers are receiving the profits from the decreased interest rates caused by the QE asset purchase program. The monetary and credit stimulus are, however, nonexistent, according to this economist. In addition, the author believes that part of the problem dwells in the fact that there is not a good model of inflation for the central bank to follow. He stated that using the Phillips Curve to measure inflation is no longer as reliable and the economic reality is not that linear as the pure correlation between inflation and unemployment. In addition, Meltzer remembered that both Paul Volcker and Alan Greenspan, two successful former chairmen of the Fed, recognized that the Phillips Curve is not reliable, and he believes that the forecasts of the bank regarding inflation do not take into account the advice from Milton Friedman that excessive money growth relative to the growth of real output always causes inflation everywhere.

Despite the fact that the Fed advocated the advantages of QE regarding unemployment, Meltzer believes that the benefits are not real, based on data from the employment in the years during which QE was implemented in the US. That happens since, according to the author, the American problems are real, instead of monetary, which he says is a common confusion. "The most recent Fed action is the attempt to “twist the yield curve” by buying long-term debt and selling short-term. Reserves and money do not change. This is not a monetary action. The Fed is again engaging in debt

management or credit market policy that is the province of the Treasury. The Fed responded again to the financial market soothsayers who warned of another recession. We know that was wildly wrong. The preliminary estimate of third quarter growth is 2.5 percent, double the second quarter rate. Of course, in advance of the Fed's announcement, the market again lowered bond yields, so some nimble speculators gained. How does that help the economy or the unemployed? It is a mistake that the current Fed keeps making." (Meltzer, 2012: 3). The author's critics were based in data from previous situations of recession and explains that recovering from a crisis like this, is usually easier and implicates a faster growth in employment. This time, however, the expansionary measures adopted by several countries were ineffective, making workers believe that they would not have the capacity of finding a job again and causing a massive left from the labor force. Therefore, he blames the Fed for responding to slow employment growth with the implementation of additional QE rounds.

Nouriel Roubini (2009, 2011, 2013) is also very critical regarding the implementation of QE, which he considered the cause for the creation of "zombie" banks, corporations and households, a term that came to circulation by the time of the Japanese crisis, referring to insolvent institutions supported by easy capital. Therefore, the author placed a series of questions about the risks and effectiveness associated to the unconventional measure, starting from the point of view that it is not as essential as the Fed claims.

First of all, Roubini compared the option of austerity with QE, explaining that if the former causes depression, the latter creates an army of zombies, leading ultimately to a zombie government. In addition, the economist questions the effectiveness of implementing repeated rounds of QE, due to the wear and clogging of the transmission channels throughout time, explaining that with decreased bond yields the bond channel is inefficient, just like the credit channel with the stuck capital and liquidity in the banks, and the stock-market channel when the recovery in the economic growth is not the one expected. The third concern regards the foreign-exchange transmission channel, due to the fact that QE causes the weakening of the currency, but there is the incapacity of decreasing or increasing all currency's value at the same time, QE becomes a zero-sum game. Moreover, in advanced economies, the excess of capital flow in emerging markets due to QE implicates a political decision of whether to opt by a sterilized foreign-exchange intervention, and the consequent high domestic interest rates and inflows, or by a unsterilized intervention, which may cause the decrease in domestic

interest rates and excess of liquidity, asset or credit bubbles, or even both, and that is the fourth challenge. However, the risk of asset bubbles is always associated to QE, the fifth question, since they are fueled by lowered rates in the long term.

The sixth question raised by Roubini regards moral-hazard, due to the fact that QE may weaken the motivation of the governments to conduct necessary economic reforms, as well as implementing fiscal austerity. The seventh concern regards ending QE, which needs to be made in the right time, existing the risk of inflation and asset or credit bubbles when made too slowly and late, as well as the risk of incapacitating the recovery due to the selling of the long-term assets during the exit, and the risk of losses in the balance sheets central banks resultant from the increase in the interest rate in excess reserves during the exit. The eighth point dwells in the redistribution of income and wealth that happens as a consequence of the negative real interest rates in the long term, and may cause deleveraging of growth, savings, orderly debt restructuring, or taxation of wealth, as well as debt monetization, while the major damaged are savers and creditors, such as pensioners. In addition, there is the risk of severe and unexpected consequences, including excessive inflation or a drop in credit growth, which is the ninth concern. The last one dwells in the incapacity to returning to conventional monetary policies.

The German author Daniel Gros (2012, 2013) alerted for the dangers for the European Central Banks to follow the lead set by the Federal Reserve, by demystifying the better results accomplished by the Americans. In order to do so, he compared the QE measures implemented by the Fed with the ECB's long-term refinancing operation (LTRO), which comprised the provision of over $1.3 trillion invested in low-cost financing to banks of the euro zone, within three years. His purpose is to correct the mistaken idea that the Fed was more efficient in stimulating the economy than the ECB. According to Gros, the common argument was that the Fed had expanded its balance sheet proportionally more than the ECB. However, the Fed increased the balance sheet in about 20 percent of its GDP, while the ECB increased it in about 30 percent. In addition, he believes that this is not the main point, since there is a qualitative difference between them, which is the risk that each institution is willing to take. Gros privileged the measures implemented by the ECB as he criticized the Fed, and the decision to adopt QE, for purchasing almost exclusively less risky or risk-free assets, such as government bonds. On the other hand, the ECB, which opted for measures of credit easing, has purchased less assets, but more risky ones. The same way, while the ECB

has invested in the recapitalization of weak banks that struggled to obtain funding from the market, the Fed has given less attention to the banking system. Therefore, Gros emphasized that QE and credit easing (CE) are different, stating that the European decisions were more beneficial to the economy than the American ones.

The author criticized, then, the underlying purpose of the measure. While QE is meant to lower long-term interest rates through the acquisition of large amounts of longer-term government bonds using bank deposits, CE works to support banks that are in distress and were excluded from the inter-bank market. The purchase of government bonds does not carry credit risk, rather, it holds interest-rate risk, actions that Gros considered to be common from typical banks and not a central bank. In addition, he introduced the term "maturity transformation," or the use of short-term deposits to finance purchasing long-term securities. However, there is a difference between a commercial bank and a central bank regarding QE, since the former would need to consider the risk of fluctuations in the funds' cost, while the latter is able to determine the cost of the funds by defining the short-term interest rate. Given the fact that the central bank would want to cause itself losses, Gros questioned if the decision of keeping the rates low is not related to more concerns with the recovery of the economy.

Concluding, recovering from a recession is closely related to the velocity by which each institution is able to end the debt overhand created by the credit boom. That is the factor that determined the difference between Europe and the United States, and not the success of QE, according to the author. "Moreover, the corporate sector in Europe has a much lower capacity to finance investment from internal sources of funds. This implies that a recovery of investment in Europe will be much more difficult than in the United States as long as the banking sector remains weakened by excessive levels of leverage. This problem, not excessive austerity, is the reason why the cost of the crisis could be much larger in Europe than in the United States." (Gros, 2013, 17)

c. Further Discussion

There are a series of benefits and disadvantages associated to the adoption of QE, according to several authors who analyzed the recent crisis and the implications of the measure, as stressed in the previous sub chapters and in the chart above. Despite the fact that there are some arguments that are incompatible and dependent from each school of thinking and theory, being the most prominent examples of that the effect of QE in the inflation and in employment, even the economists that advocate QE can identify its disadvantages, being the contrary also true.

Authors	Pros	Cons	Authors
Farmer, Krugman, De Long, Woodford, Svensson	Lack of effectiveness of conventional measures (during periods of crisis)	Money and short-term bonds are virtually the same	Cochrane
Farmer, Krugman, Woodford	Higher emphasis on expectations management or forward guidance	Makes the country more vulnerable to bad news and is a distraction from real problems	Cochrane
Krugman	Affects negativity only the wealthy 0,01% of the population	Inflationary effect	Taylor, Meltzer, Roubini
De Long	Ensures safe and secure liquid assets able to strengthen and finance the capital productivity	Compromises the central bank's independence or the government’s motivation to conduct necessary reforms	Taylor, Roubini
De Long	Increases employment	Ineffective and extends the crisis	Taylor, Meltzer
Woodford	Increases aggregate nominal expenditure	Unconventional policies are historically less effective than conventional	Taylor
Woodford, Svensson	Controls inflation	Affects the foreign economies	Meltzer, Roubini
Woodford	Central banks can manage the expectations through forward looking guidance	Banks will always prefer less risky interest and maintain the capital still	Meltzer, Gros
Woodford	Reestablishes the confidence of the agents in the economy	Unfair distribution of benefits and incomes	Meltzer, Roubini

Svensson	Critics against QE lack evidence	Creates 'zombie' banks, corporations, households and governments	Roubini
Svensson	Necessary to guarantee financial stability and fiscal policy	Clogs the transmission channels and drops credit growth	Roubini
Svensson	Capable of influencing the economy through capital costs, stock market, exchange rate and other asset prices	Incapacity to return to conventional monetary policies	Roubini
Svensson	Modern successful experience in other countries	Does not carry credit risk, but interest-rate risk, characteristic of common and not central banks	Gros

Figure 2- Pro and Con Arguments on Quantitative Easing (divided by author).

Considering the pros and cons of implementing QE as an answer to the crisis, and the exhaustive list of arguments from these authors, research suggests that the unconventional measure of monetary policy is a better alternative than either trusting in the poor alternatives provided by the conventional policies or implementing austerity measures, both of them more likely to have slower results and decrease the population's quality of life. It is important to emphasize the importance of conventional measure of monetary policy not only in periods of prosperity, during which it may be beneficial to let rest more aggressive policies, but also during periods of crisis to be kept in mind as indicators and foundation for the implementation of further policies. As advocates De Long, the need for unconventional policy measures lay in part in the risk of sticking to the limited conventional measures. With a lack of confidence from the agents in the economy, a stimulus based on the original ideas of Keynes, with the owing restrictions and safeguards, may be the better solution to combat the situation. Instead of opting for the most common option of adjusting interest rates in order to discourage saving and encourage investment, improving the cash flow with QE may be able to both improve the safe, secure, liquid assets in the economy, as well as the confidence of the agents, particularly in times when the interest rates were already pushed to its lowest level.

Moreover, most of the arguments stated by the authors who criticize QE can have great value helping preventing potential risks associated to the unconventional measure, but they fail in presenting a more effective option than waiting for the crisis to pass.

Having in mind the purpose of the U.S. rounds of QE, which was to ease the monetary policy stance in response to the deterioration of the economic outlook, as stated by to the Fed, other authors have quantified these results. Gagnon, Raskin, Remache and Sack (2010) analyzed the first round of QE and concluded that the Fed's LSAPs have successfully reduced the 10-year term premium from 30 to 100 basis points, as well as improved market liquidity and ruling out highly risky assets from private portfolios, which resulted in the decrease of longer-term private borrowing rate, giving a boost to the economy. In order to reach these accomplishments, the Fed had to undergo unexpected measures, which included numerous challenges for the central bank, including operational barriers, as it expanded significantly its balance sheet and purchased large amounts of securities. "While the effects are especially noticeable in the mortgage market, they appear to be widespread, including in the markets for Treasury securities, corporate bonds, and interest-rate swaps. That conclusion is promising, as it means that monetary policy remains potent even after the zero bound is reached." (Gagnon et al., 2010: 29)

Nellis (2013), who used the work of Gagnon et al. as foundations for his own, detailed how the communication channels enabled these results. By purchasing long-term securities, the Fed has artificially increased demand for them. The markets reacted to the purchases by reducing its supply, which resulted in the raise of the prices and a fall from the yield. In addition to the actual purchases, there is a crucial role played by the announcements and communication of the central banks, a topic that will later be addressed with more detail. "In addition to affecting the yield on a particular security, yields on securities with similar characteristics may also be affected through the portfolio channel. The portfolio channel relies on the assumption that if the Federal Reserve's bond purchases reduce the supply of a particular security, investors are pushed into holding other assets with similar characteristics, thus reducing the yield on those assets as well. Since QE1, QE2, and QE3 involved primarily the purchase of agency MBS, 10-year Treasuries, or some combination of the two, the yields of these assets theoretically will be affected by each round of QE" (Nellis, 2013: 110). The effectiveness of the QE implemented by the Fed was not, however, constant. The first was the most effective, while the third round was also more effective than the second

one, which is first of all related to the capacity of the market to adapt to the measure, but also to the ability demonstrated by the Fed to readjust its decision and communications to the response. The implementation of QE1 resulted in greater yield alterations than initially predicted by the Fed for the 10-year Treasury and 30- year MBS, however the contrary happened with QE2. The success of QE3 in lowering long-term interest rates, which amount was not officially announced, was also more positive than previewed.

The success of QE is determined not only by the communication associated to the bank's actions, but also by the structure of the measures. According to Krishnamurthy and Vissing-Jorgensen (2011), if QE is focused on mortgage-backed securities (MBS), the results have more impact on MBS rates, being the situation not similar when QE is based on Treasury purchases, explaining why the second round of QE, which was mainly based on the latter option, had significant impact on long-term Treasury rates and on rates from highly-rated corporate bonds, but little effects on MBS rates. Similarly, the first round of QE, which involved large purchases of agency MBS, had smaller impact on nominal default-adjusted interest rates on less safe assets. Therefore, the QE measures raised expected inflation, suggesting that the decrease in real rates were greater than in nominal rates, as well as that one of the major QE channels is the impact on price equilibrium of mortgage-specific risk. One of the main concerns regarding the implementation of QE was inflation. The measure resulted on a total expansion of $2 trillion in the Fed's balance sheet, which caused highly expectations among investors about the inflation raise, due to the effects of the additional capital circulating in the financial system. In fact, the inflation rates reacted to the announcements and purchases, but the Fed was able to control it, in line with its mission of pursuing maximum employment and stable prices, being the inflation rates in the United States positive and around two percent from 2007, with exception for 2009, during which the inflation was negative during most of the year, followed by inflation rates than surpassed the 5 percent during the summer of 2008, as can be seen in the table below.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
2007	2.08	2.42	2.78	2.57	2.69	2.69	2.36	1.97	2.76	3.54	4.31	4.08	2.85
2008	4.28	4.03	3.98	3.94	4.18	5.02	5.60	5.37	4.94	3.66	1.07	0.09	3.85
2009	0.03	0.24	-.38	-.74	-1.28	-1.43	-2.1	-1.48	-1.29	-.18	1.84	2.72	0.34
2010	2.63	2.14	2.31	2.24	2.02	1.05	1.24	1.15	1.14	1.17	1.14	1.50	1.64
2011	1.63	2.11	2.68	3.16	3.57	3.56	3.63	3.77	3.87	3.53	3.39	2.96	3.16
2012	2.93	2.87	2.65	2.30	1.70	1.66	1.41	1.69	1.99	2.16	1.76	1.74	2.07
2013	1.59	1.98	1.47	1.06	1.36	1.75	1.96	1.52	1.18	0.96	1.24	1.50	1.47
2014	1.58	1.13	1.51	1.95	2.13	2.07	1.99	1.70	1.66	1.66	1.32	0.76	1.62

Figure 3- Inflation rates by month between 2007 and 2014 and annual average (in percentage). Data source: InflationData.com

Moreover, it is also important to remember the option adopted at many European countries, austerity, for which QE is also a better alternative, not only for being a counter-cyclical policy rather than pro-cyclical, but also due to its social negative consequences. Spending cuts and higher taxes have demonstrated its outcomes most recently with the European experience. While increasing taxes may distort the labor markets, taxes to the consumption may increase inflation, and spending cuts may aggravate inequality. The Oxfam report (2013) alerted that not only have the austerity policies failed to restore the market confidence, improve employment and renovate the economies by balancing budgets and decreasing deficits, but it has also reduced the quality of life of the citizens. According to estimations of the confederation, austerity implemented in Europe can create between 15 and 25 million new poor citizens until 2025, being women the most affected. Besides, Joseph Stiglitz reminded in the report that the consequences may go even further and compromise in the long term the way in which European face solidarity between countries and consequently people. "The wave of economic austerity that has swept Europe in the wake of the Great Recession is at risk of doing serious and permanent damage to the continent's long- cherished social model. As economists, including myself, have long predicted, austerity has only crippled Europe's growth, with improvements in fiscal positions that are always disappointing. Worse, it is contributing to inequality that will make economic weakness longer-lived, and needlessly contributes to the suffering of the jobless and the poor for many years." (Oxfam, 2013: 2)

IV. Critical Analysis of Fed's Communication

"There is some evidence that central bank communications can help to shape public expectations of future policy actions and that asset purchases in large volume by a central bank would be able to affect the price or yield of the targeted asset." (Bernanke et al., 2004: 1) This evidence stated by the former chairman of the Federal Reserve became increasingly stronger as the crisis imploded and the bank realized this, having adapted its actions accordingly. In order to further understand this evidence, the main announcements of the Fed regarding its unconventional policy measures will be analyzed in the following pages. First of all, it matters define which communications from the Fed and its representatives between 2008 and 2014 were focused on its intentions of implementing or the implementation itself of unconventional monetary policy measures. And these include twenty press releases, announcements and speeches from the central bank's authorities.

A press release from the FOMC issued on November 25, 2008, marked the beginning of the first round of QE, with the Fed announcing that was going to purchase up to $100 billion in direct obligations of housing-related government-sponsored enterprises (GSE), through a series of competitive auctions held by primary dealers, as well as $500 billion in agency MBS, through a competitive process of selection of asset managers. The main purpose was to "reduce the cost and increase the availability of credit for the purchase of houses, which in turn should support housing markets and foster improved conditions in financial markets more generally." (FOMC, 2008a) The Fed's chairman, Ben Bernanke addressed the topic for the first time on December 1, 2008, during a speech at the Greater Austin Chamber of Commerce, in Austin, Texas. At the time, Bernanke confirmed the measures announced a week before and already announced the first effects of the press release in the markets. In addition, he addressed the thematic of the crisis, and the economic and political conjunction in order to reassure that QE is not only necessary, but the right decision, justifying it, legitimating it and underrating the critics.

On December, 16, 2008, the FOMC released another announcement, specifying that the Fed was going to initiate its program of purchases of large quantities of agency debt and mortgage-backed securities, as well as that it was ready to expand them as conditions warrant. In addition, the press release provided more insights on the possibility of purchasing longer-term Treasury securities, which had already been suggested by the Fed's chairman. The Federal Reserve Bank clarified, on a press release

issued on December 30, 2008, that the program was going to be initiated by the beginning of January, 2009, and that the private investment managers to serve as agents for the program implementation were Fannie Mae, Freddie Mac and Ginnie Mae.

At the statement released on January 28, 2009, the FOMC announced that was going to manage the Fed's balance sheet at a high level, as well as that it was prepared to purchase longer-term Treasury securities in case its effectiveness became proven by the evolving circumstances. In addition, the FOMC claimed to be ready to expand the quantity of purchases and the duration of the purchase program, according to the conditions, being it the second announcement in which the possibility of additional stimulus is addressed. On February 23, 2009, the FOMC released new and detailed information on the balance sheet of the Fed, as well as information on a website developed to increase the understanding of the public about QE and the unconventional actions being undertaken by the committee. The FOMC announced on March 18, 2009, that was going to increase the size of the Fed's balance sheet with additional purchases worth up to $750 billion of agency MBS, $100 billion of agency debt, and $300 billion in purchases of longer-term Treasury securities over the following six months.

The press release issued on August 12, 2009, the FOMC updated information on the economy recovery, explaining that the economic activity was leveling out. Therefore, the bank was going to purchase a total of up to $1.25 trillion of agency mortgage-backed securities and up to $200 billion of agency debt until the end of that year, while they would be able to gradually slow the pace of Treasury securities purchases to complete them until the end of October. The press release from September 23, 2009 resembled the former one in both form and information, reaffirming the monetary amounts previously stated, as well as the date. It adds, however, that in addition to finishing the Treasury securities purchases by the end of October, the Fed would also finish the agency mortgage-backed securities and agency debt during the first quarter of 2010. The last announcement of the FOMC regarding the first round of QE took place on November 4, 2009. The committee reevaluated the amount to be used in the purchases, being $175 billion involved in the agency debt purchases, instead of the $200 billion previously announced. In addition, it was reassured that the purchase program would end during the first quarter of 2010, which effectively happened by the end of March.

After almost a year-long gap, the FOMC addressed the thematic of QE again on August 10, 2010, by explaining that the recovery had slowed in the previous months

and, with the purpose of enhancing it in a context of price stability, the committee would "keep constant the Federal Reserve's holdings of securities at their current level by reinvesting principal payments from agency debt and agency mortgage-backed securities in longer-term Treasury Securities." (FOMC, 2010a) The FOMC was starting to reveal the idea of undergoing a second round of QE. On September 21, 2010, the FOMC reaffirmed what it had already announced in the previous press release and specified that the new measure "will maintain its existing policy of reinvesting of principal payments from its holdings," (FOMC, 2010b) with the main purpose of preventing eventual deflation due to the decrease in money supply. Additional accommodations were also an option if the economic recovery and return to inflation levels consistent with bank's mandate required it.

At the 2010 Jackson Hole annual meeting, chairman Bernanke hosted a long speech, during which addressed topics such as the crisis, the Fed's response to it and the effectiveness of the measures, as well as future options. Without unveiling the following decisions from the FOMC or his own opinion about it, Bernanke said he believed that "additional purchases of longer-term securities, should the FOMC choose to undertake them, would be effective in further easing financial conditions." (Bernanke, 2010) In addition, he explained the option to reinvest the payments regarding Treasury securities, while the MBS holding were ending faster than expected and until the end of 2011 "an additional $400 billion or so" (Bernanke, 2010) could be repaid, since the committee's policy of allowing the balance sheet to shrink would be inconsistent with the policy of monetary policy necessary to support the economic recovery. Few months later, the president of one of the most important division of the central bank, the Federal Bank of New York, and vice-chairman of the FOMC stood in public to support Bernanke and the FOMC, if they decided to undergo another round of QE. On October 1, 2010, William C. Dudley spoke about the policy choices of the Fed and its mandate, saying that he believed "further action is likely to be warranted unless the economic outlook evolves in a way that makes me more confident that we will see better outcomes for both employment and inflation before too long." (Dudley, 2010) In addition to showing its support, Dudley also suggested that the implementation of a second round of QE was eminent.

The official announcement that the FOMC was going to initiate QE2 was made on November 3, 2010. "To promote a stronger pace of economic recovery and to help ensure that inflation, over time, is at levels consistent with its mandate, the Committee

decided to expand its holdings of securities. The Committee will maintain its existing policy of reinvesting principal payments from its securities holdings. In addition, the Committee intends to purchase a further $600 billion of longer-term Treasury securities by the end of the second quarter of 2011, a pace of about $75 billion per month." (FOMC, 2010b) After that, the committee did not address to topic again to make any additional purchases or alterations to the plan and it was terminated as scheduled by the end of second quarter of the following year.

More than a year after the end of QE2, the FOMC started proving the first suggestions that it was preparing or at least discussing the implementation of a third round. On August 22, 2012, the FOMC released the minutes from its last meeting, stating that the members "exchanged views on the likely benefits and costs of a new large-scale asset purchase program." (FOMC, 2012a) The idea given was that it was yet uncertain, since there was no consensus about it, but "many participants expected that such a program could provide additional support for the economic recovery," while it was necessary that the new purchase program was flexible enough to allow adjustments. The official announcement about QE3 was made on September 13, 2012, through a statement issued by the FOMC. "The Committee agreed to increase policy accommodation by purchasing additional agency mortgage-backed securities at a pace of $40 billion per month," (FOMC, 2012b) was written in the press release. However, unlike what happen with the first two rounds, the total amount or scheduled end for the program were not announced.

It is also still worth remember a speech given by the president and CEO of the Federal Bank of San Francisco, John C. Williams on November 2, 2012. By the time, his words reinforced the uncertainty about QE3, as Williams made clear that the program could be extended, altered or shut down anytime the FOMC thought it was in the best interest of the economic recovery. "This purchase program is intended to be flexible and adjust to changing circumstances. Unlike our past asset purchase programs, this one doesn’t have a preset expiration date. Instead, its duration will depend on what happens with the economy. Specifically, we’ve said we’ll continue buying mortgage-backed securities until the job market shows substantial improvement. We also said we may expand our purchases to include other assets. But, if we find that our policies aren’t doing what they’re supposed to do or are causing significant economic problems, we’ll adjust or end them." (Williams, 2012)

On December 12, 2012, the FOMC announced an extension of the program to a total $85 billion of monthly purchases, divided into the already known $40 billion in agency mortgage-backed securities and new $45 billion in long-term Treasury securities. The committee explained that the program remained with the purposive "a stronger economic recovery and help ensure that inflation, over time, is at the rate most consistent with its dual mandate," while almost doubling it was justified by the need to "extend the average maturity of its holdings of Treasury securities." (FOMC, 2012c) After that, the FOMC announced on December18, 2013 that QE3 was having encouraging results that enabled the reduction of its pace. "Taking into account the extent of federal fiscal retrenchment since the inception of its current asset purchase program, the Committee sees the improvement in economic activity and labor market conditions over that period as consistent with growing underlying strength in the broader economy." Given the "cumulative progress toward maximum employment and the improvement in the outlook for labor market conditions," (FOMC, 2013) the committee started reducing it the next January from monthly $40 billion to $35 billion of agency mortgage-backed securities, as well as from $45 billion to $40 billion of longer-term Treasury securities purchases.

Between 2008 and 2014, the communications from the Fed suffered some alterations in both content and form, which are consistent with the understanding about its importance in the management of expectations and the effectiveness of its policy measures, as well as with a proper adaptation capacity. The Fed has made its main announcements through the issuing of press releases from the FOMC, which have a very strict structure to follow. FOMC's announcements are always initiated with a brief economic outlook and updates on the economic recovery, as well as updates on the inflation or inflation expectations, which may be seen not only as indications for the markets, but also as justifications for the following measure to be implemented. Unlike the speeches addressed by Ben Bernanke, the FOMC announcements are mainly informative, providing data on the political measures and its purpose, but without great explanations or the bank's expectations regarding future results. Similarly, the FOMC's announcements about QE did not address critics or risks associated to it, something that was left to be done by Bernanke.

Following the announcements of both the first and second, but not the third, rounds of QE, the Fed's chairman spoke about it to prominent audiences comprised by economy leaders. In both cases, Bernanke started by addressing the economic situation

in the country, making efforts to be realist, but not alarmist, as well as to remember that the economic and financial crisis are not American phenomena, but are instead a global situation. These options may intend to distance common critics that the U.S. central bank or government are the ones to blame for the crisis, or that the Americans are alone in a critical situation. The idea to transmit is that the situation is averse, but the Fed is making everything it can and the decisions being made are the right ones. "Recent events have revealed a serious weakness of our system: the absence of well-defined procedures and authorities for dealing with the potential failure of a systemically important nonbank financial institution. (...) Fortunately, we now have tools to address any similar situation that might arise in the future. (...) Despite the efforts of the Federal Reserve and other policy makers, the U.S. economy remains under considerable stress. (...) The global economy has also slowed." (Bernanke, 2008)

The same way, Bernanke affirmed his support, but did not hide the existence of opposition to the measures or risks. On contrary, he spoke about them, but underestimated them, explaining that they were either unfounded or that despite them, the Fed's positions were the right decisions at the time. The chairman also focused on the previous actions from the Fed and justified them across his speeches, while topics such as inflation and employment were also recurrent. Also worth noting is a moment, after the announcement of the first round of QE, in which Bernanke legitimated the work undertaken by the Fed regarding the audacious move of resourcing to unconventional policies. "The Administration, with the support of the Federal Reserve, asked the Congress for a new program aimed at stabilizing our financial markets" (Bernanke, 2008), he stated referring to the Emergency Economic Stabilization Act (EESA). One might, therefore, question if it is not the case that the FOMC's announcements are directed to inform the agents, while Bernanke's speeches are expected to comfort them. Consistent to both the FOMC announcements and Bernanke's speeches was the noticeable concern about transparency, which was substantiated in the February 23, 2009 press release, as well as in the informative website created, and may also be related to the legitimacy of the unconventional measure.

Nellis (2013) summarized the effects of the announcements and speeches made regarding QE, particularly focused in their ability to lower the yield of both 10-year Treasury and 30-year MBS, as can be observed in Figure 4 to 6.

Date	Event	10 Year Treasury	30 Year MBS Yields
11/25/2008	Initial Announcement	-0.24***	-0.45***
12/1/2008	Bernanke Speech	-0.21***	-0.15*
12/16/2008	FOMC Statement	-0.16**	-0.28***
12/30/2008	FOMC Statement	-0.02	-0.10
1/28/2009	FOMC Statement	-0.12**	0.07
2/23/2009	FOMC Statement	0	-0.03
3/18/2009	New Purchase Announcement	-0.51***	-0.15**
8/12/2009	FOMC Statement	0.01	0.03
9/23/2009	FOMC Statement	-0.02	-0.01
11/4/2009	FOMC Statement	0.07	0.00
Total		-0.96	-1.04

Figure 4- Treasury and MBS 1-day yield change on QE1 event dates (in basis points). Note: The Treasury yields and MBS yields are from Bloomberg. *denotes significance at 10% level, **denotes significance at 5% level, ***denotes significance at 1% level. (Nellis, 2013: 117)

Date	Event	10 Year Treasury	30 Year MBS Yields
8/10/2010	FOMC Statement	-0.07	-0.01
8/27/2010	Bernanke Speech	0.16**	-0.12*
10/1/2010	Dudley Speech	0.01	-0.02
11/3/2010	Official Announcement	0.04	-0.02
Total		0.14	0.07

Figure 5- Treasury and MBS 1-day yield change on QE2 event dates (in basis points) *denotes significance at 10% level, **denotes significance at 5% level, ***denotes significance at 1% level. (Nellis, 2013: 119)

Date	Event	10 Year Treasury	30 Year MBS Yields
8/22/2012	Release of FOMC Statements	-0.07	-0.15**
9/13/2012	Official Announcement	0.16	-0.25***
11/2/2012	Williams Speech	0.04	-0.06
Total		0.13	-0.46

Figure 6- Treasury and MBS 1-day yield change on QE3 event dates (in basis points) *denotes significance at 10% level, **denotes significance at 5% level, ***denotes significance at 1% level. (Nellis, 2013: 120)

In addition, MarketWatch (2014) released an evaluation of the influence of the main announcements of QE in the S&P 500 index.

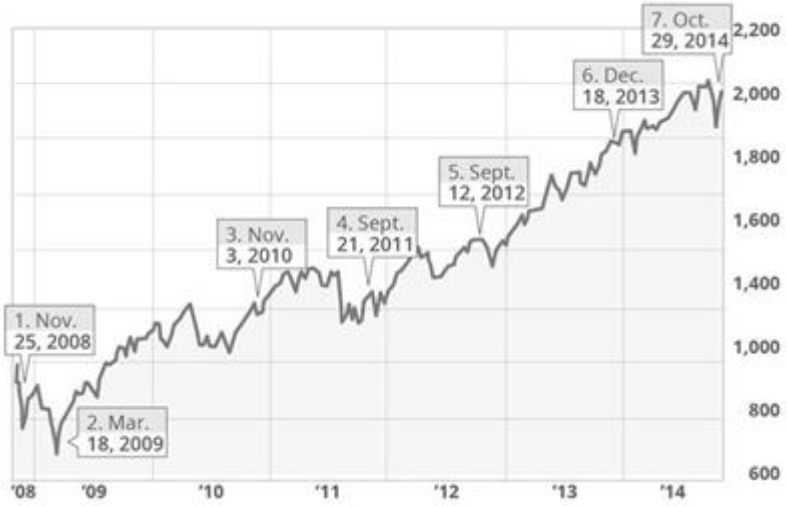

Figure 7- S&P 500 Points Between November 2008 and October 2014. Source: MarketWatch

The data schematized in the tables and chart above demonstrated the practical effectiveness of QE, in particular the superiority of QE1, which caused significant and lasting decreases of long-term interest rates, in comparison with the two other rounds, as well as the inferiority of QE2. These results are explained by the markets' capacity to adjust to a new reality. Despite the fact that QE is an unconventional monetary policy measure, the agents reacted to it, by adjusting their expectations. Given that fact, it would be expectable that both QE2 and QE3 were less effective than QE1. However, the Fed knew how to read the results of its policies, adapting to them as well, and give the proper importance to communication and expectations. Inexperienced about implementing a second round of QE and confident about the effects of the first one, when the Fed decided to do it, all information was revealed upfront: form, amount and pace, which provided the agents time to adjust.

Regarding the third round of QE, however, the situation was different. By the time, the FOMC announced that was going to initiate it and how much would dedicate to the measure per month. But, unlike QE1 and QE2, the total amount or scheduled end were not made public, and that information was only known few months prior to the end of the program. The importance of the speeches from Dudley and Williams dwells essentially in the support received from representatives of important divisions of the central bank (New York and San Francisco), which is determinant to demonstrate the consistency and consensus within the Fed about the implementation of unconventional policy measures. Williams, in particular, contributed to the uncertainty associated to the third round of QE. Saying nothing, he said everything: all options were open and the

program could be expanded, reformed or terminated whenever the Fed considered it beneficial.

Additionally to monetary policy, the recovery of the economy is influenced as well by fiscal policy, which tends to follow a determined trend but is also tuned in response to an economic and fiscal crisis. Unlike monetary policy, fiscal policy, which mainly includes taxation and spending policies, is responsibility of the US Congress and Administration. The dissociation between the two policies is expected to enhance independency. Historically, the U.S. governments have opted for implementing countercyclical state, local and federal fiscal policy. This means that during times of crisis, the government tends to expand its spending, which is a part of the country's GDP, as well as to shrink the spending during times of growth. Similarly, the US government stood loyal to the methods that were tendency in the country when responding to the recent financial and economic crisis, and implemented expansionary measures, meaning that increased spending. The decision was based on two paradigms. On one hand, the Administration expected the countercyclical policies to help increase the money circulation and consumption that are determinant to leave the recession cycle, while working as automatic stabilizers. On the other hand, the countercyclical policies are intended to help the population getting through the crisis, particularly the ones with fewer resources. This last goal is based on the investment in strengthening assistant programs, including health and unemployment insurance.

There is a simultaneous tendency for tax revenue to decline due to the decrease in the values of incomes, sales and property. The decision from the President of the United States to invest in great magnitude in the health care system, a program that become known as Obamacare, was very controversial due to the risks associated to increasing spending at a time in which tax revenue is also decreasing. The increases in US not only federal, but also state and local deficits are partially a result of the fiscal policy decisions made. Despite that fact, President Barack Obama argued about the importance of proving the American population a wider access to health at more reachable costs. It is particularly noteworthy the period between 2007 and 2009, during which the increase in state, federal and local spending registered a greater increase. Prior to the crisis, the country registered higher tax revenue and slighter expenditure. However, after 2007 the US Congress and Administration opted by countercyclical expansionary fiscal policies, a decision that was being adapted throughout the period but was not abandoned after the end of recession.

Moreover, to understand the overall results of the Fed's policies, it matters to review the evolution of the main macroeconomic indicators, with due attention to the fact that these indicators are influenced not only by monetary policy, but also by other factors, such as fiscal policy or governmental budget. In the graphics above, regarding interest rates (fig. 8), inflation (fig. 9), GDP growth (fig. 10), unemployment (fig. 11) and federal debt (fig. 12) between 2007 and 2014 respectively, there is a notorious resonance of, primarily, the crisis and, later, the sharp cut in the interest rates conducted by the Fed in 2009. The other indicators followed it, both inflation and GDP negatively and federal debt and unemployment positively. Also worth noting is that despite the fact that interest rates were maintained particularly low, inflation started to raise, passing the mark of three percent in 2011 and stabilizing in values between one and two percent the following year. The oscillation in GDP growth was abrupt as well, but its increase after 2009 was faster than inflation's, having also stabilized at positive levels from two to three percent. USA's federal debt registered a continuous increase since 2007 that has not been stopped yet, while unemployment started to decrease since 2010 at a moderate pace, following a great increase between 2008 and 2009.

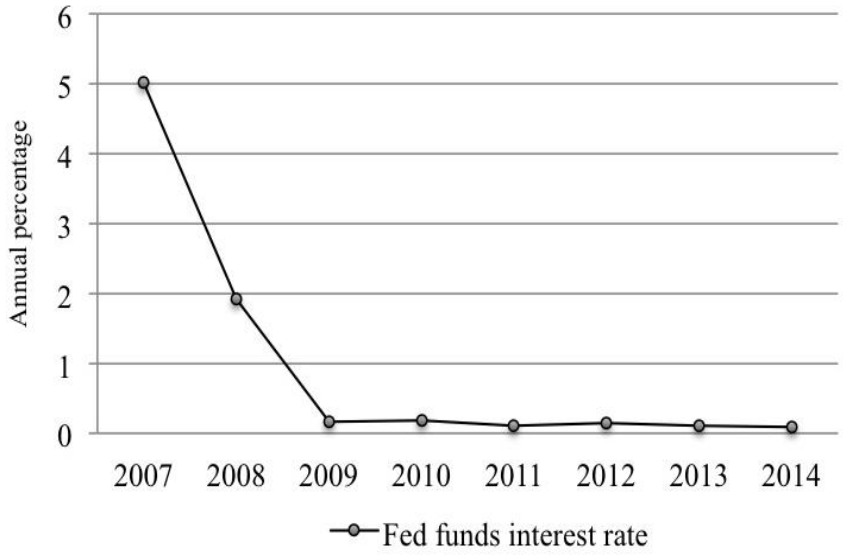

Figure 8- Annual Percentage of interest rates of the Federal Reserve Bank funds. Data source: Federal Reserve Bank

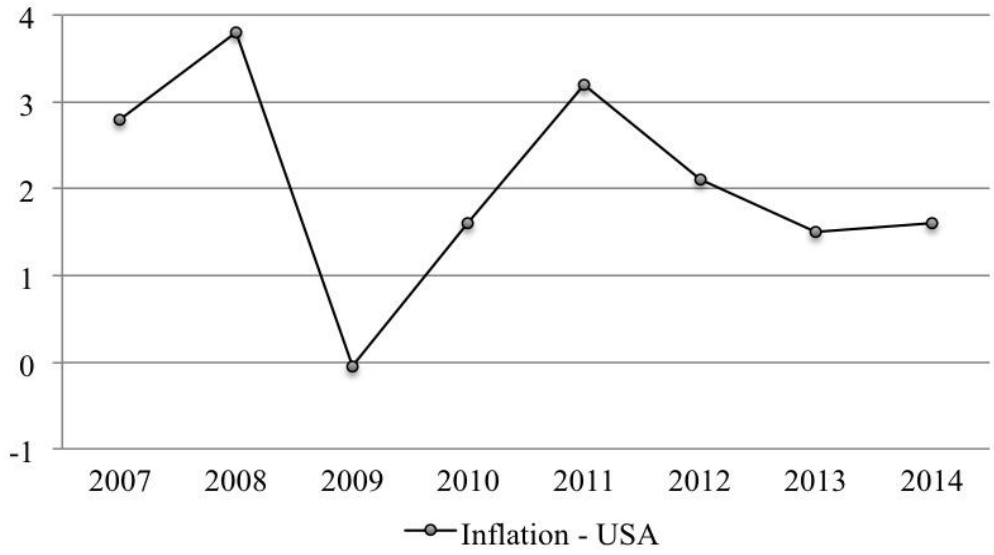

Figure 9- Inflation rate in the USA, measured according to the Consumer Price Index. Data source: Fed's Bureau of Labor Statistics

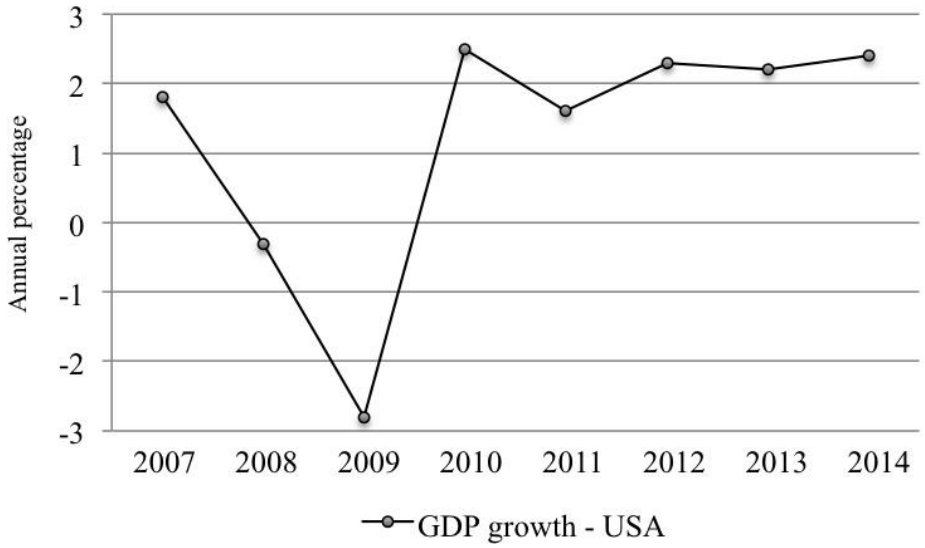

Figure 10- Annual rate of Gross Domestic Product (GDP) growth in the USA. Data source: World Bank

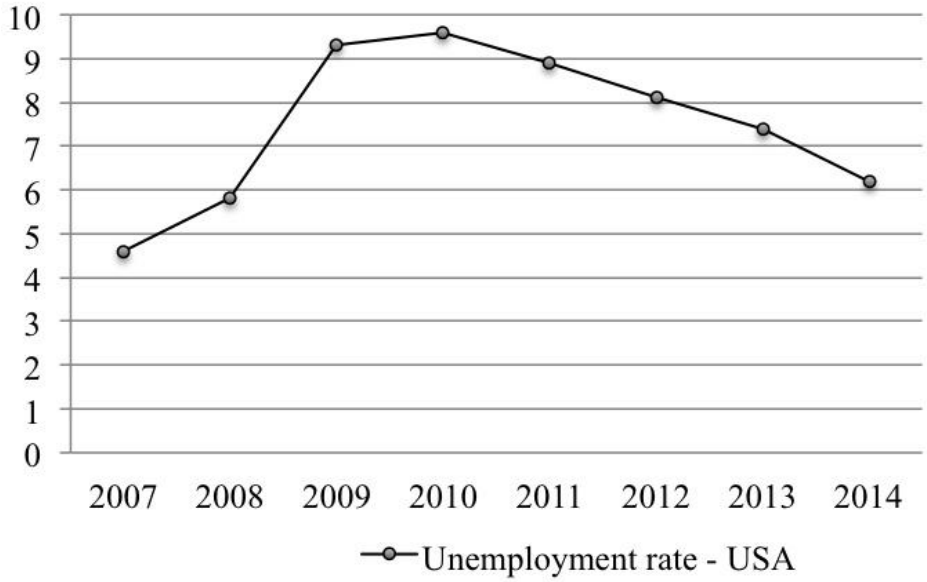

Figure 11- Unemployment rate in the USA. Data source: Bureau of Labor Statistics

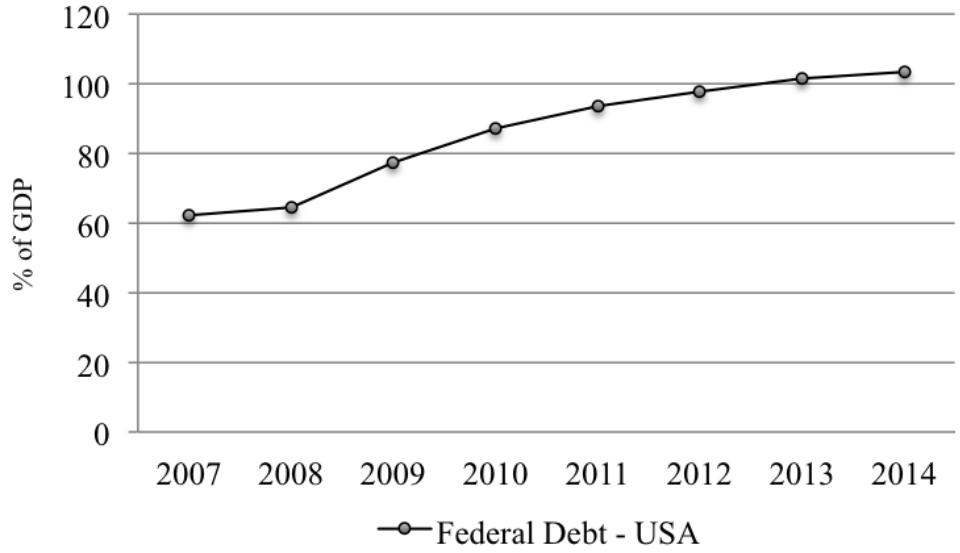

Figure 12– Federal debt in the USA, measured by percentage of the GDP. Data source: Federal Bank of St. Louis

V. Monetary Policy in the EU: Past and Future

a. ECB's Response to the Crisis

The European Union was confronted by the financial crisis, not only with resonances from the crisis in the United States, but also as a consequence of the sovereign debt crisis in some countries of the euro zone. It may be commonly thought that the EU stood loyal to conventional policy measures, but the union did indeed increase its balance sheet, both in nominal terms and in percentage of its GDP. The European Governing Council did so, however, differently from the FOMC. Following the beginning of the crisis, by the summer of 2007, the ECB reacted to the stress in the interbank money markets with the adjustment of its liquidity management operations, including the provision of large amounts of liquidity at term maturities, while it eased its collateral requirements to enable access to liquidity. However, the ECB continued to prioritize its two-pillar mandate, an important mission that, despite the achievement difficulties, the bank left clear.

Even though the Governing Council did not decrease its policy rates immediately, after the Lehman Brothers' bankruptcy, it seemed inevitable. In October 2008, within a coordinated decision, the ECB, the Fed, and the central banks of the United Kingdom, Canada, Switzerland and Sweden announced the cut of its interest rates by half a percentage point, while the Chinese central bank cut its rate by 0.27 percentage point. Simultaneously, the ECB adopted a series of unconventional measures mainly focused on the banking system that became known as Enhanced Credit Support. The program was meant to address the uncertainty in the interbank market and was comprised of unlimited liquidity provision at fixed rate tenders with full allotment through main refinancing operations (MROs) and long-term refinancing operations (LTROs), expansion of the collateral list increasing the amount of private sector assets, provision of liquidity in foreign currencies such as US dollars using swap lines with the Fed, and the creation of the Covered Bonds Purchase Programmes (CBPPs) to reenergize the covered bond market. The maturity of the LTROs was also in 2009 expanded from the original six to 12 months in order to increase trust in the liquidity planning of the commercial banks.

In addition to the Enhanced Credit Support, the ECB launched in 2010 the Securities Market Program (SMP) with the main purpose of avoiding tensions in determined markets, beginning with the secondary market of government bonds of the

euro zone to assure depth and liquidity, as well as restore the proper transmission channel of monetary policy, which was expected to result, as a consequence, in the maintenance of price stability. Following a first phase of implementation throughout that year, the program was brought again for a second phase in August 2011. The SMP was terminated, after a €208.3 billion investment in government securities, due to the implementation of a new strategy, the Outright Monetary Transactions (OMTs). The new program came to public in August 2012 and was focused on the secondary sovereign bond markets with the intention of ensuring the existence of a proper monetary policy transmission, similarly to its predecessor.

In addition, it is worth noting that in between, in June 2010, it was created the European Financial Stability Facility (EFSF) including all members of the euro zone. By the end of 2011, the ECB made a major reduction in its interest rates, while it also announced two LTROs, lending nearly €490 billion on a first phase and €530 billion on a second one, to 523 and 800 banks, respectively. In October 2012, the EU created an additional fund called European Stability Mechanism (ESM) that later helped recapitalize banks in Cyprus and Spain. While the inflation was near zero, the unemployment was increasingly high, particularly among younger workers, Greece, Portugal and Ireland, in addition to Cyprus and Spain, needed some kind of bailout from troika.

The ECB has taken a different direction from the Fed for several reasons, mainly due to different perspectives regarding monetary policy responses to the crisis, since in the words of the former president of the ECB, Jean-Claude Trichet, "the ECB did not embark on non-standard measures because we had attained a zero level and thought that the scope for further standard easing of the monetary policy stance was exhausted. Our first non-standard decision - namely the unlimited supply of liquidity at fixed rates provided appropriate collateral was given - was made August 9, 2007, when the minimum bid rate of our main refinancing operation was at 4 percent." (Trichet, 2013: 236) The use of unconventional monetary policy measures is mainly related to two purposes: supporting the banking money market intermediation and introducing liquidity in lack to the banking system, avoiding its blockage caused by the accumulation of illiquid assets. While the two objectives are correlated, the different central banks focused on different methods to achieve them. While the Fed turned in the direction of QE, as previously scrutinized, the ECB opted for a different approach, based on credit easing. This paradigm focus on more independent roles of the monetary

policy measures and the short-term interest rates policy, making the decisions about either of them disconnected from the other. In addition, while the former is usually seen as a substitute for conventional monetary policy measures, the latter is often associated to complementary measures to the conventional ones. This way, the ECB intended to guide the short-term interest rates near its main policy rate, but avoiding the risks associated to enhancing liquidity measures. The central bank is able to influence the interest rates in the money market by adjusting the amount of liquidity available to banks, which means the liquidity allocated to fulfill the banks' requirement for liquidity at a price aligned with the ECB's purposes.

Additionally, other differences between the United States and the European Union are in the foundations of the policy measure decision process. The institutional and financial structure of the EU and the Economic and Monetary Union (EMU) needs to be taken into consideration when analyzing the decision of the ECB. Financing in euro zone is mostly based on the banking system, on contrary to other economies, such as the American, in which financing relies more on the market, which explains the importance granted by the ECB to providing liquidity to banks. Moreover, the existence of a single currency, but not capital transference or joint fiscal and structural policies is also a challenge for the central bank, similarly to the lack of proper incentives for the governments to rule focused on the financial stability of the whole. "Unconventional monetary policy frameworks may comprise three elements: (i) large-scale liquidity support to banks; (ii) forward guidance of ultra-low policy rates over extended policy horizons; and (iii) large-scale financial market interventions, in particular huge asset purchases. (...) Our analysis suggests that while the ECB's balance sheet has increased dramatically during the crisis (both in nominal terms and as a percentage of GDP), the non-standard monetary policy measures had only a moderate impact on the composition of the ECB's balance sheet compared to other central banks such as the Fed and the Bank of England." (Pattipeilohya et al., 2013: 2-3) The increase in the two central banks' balance sheets was in fact remarkable, with the Fed having expanded it from $800 billion in 2007 to over $3.200 billion in 2013 and the ECB from $400 billion to $1.200 billion during the same period. What is also important to consider is the composition of the balance sheets. In 2007, the Fed's balance sheet was mainly composed by treasuries, a situation that remained a reality, with a constant increase, with exception for the year of 2009, during which the amount of term auction credit, liquidity swaps, repos and other lending, was predominant in the balance sheet of the

bank. Starting on 2010, there was also a great increase in the amount of MBS and a slight increase in agency debt. On the other hand, the ECB's balance sheet was in 2007 mainly composed by main refinancing, while the major expansion was done due to long-term refinancing, with a slight participation of foreign currency. In addition, it is also worth noting that the increase in the ECB's balance sheet was much more gradual than the one in the Fed's balance sheet, since the ECB only registered a major increase between the middle of 2011 and 2012, which can be verified in figure 13.

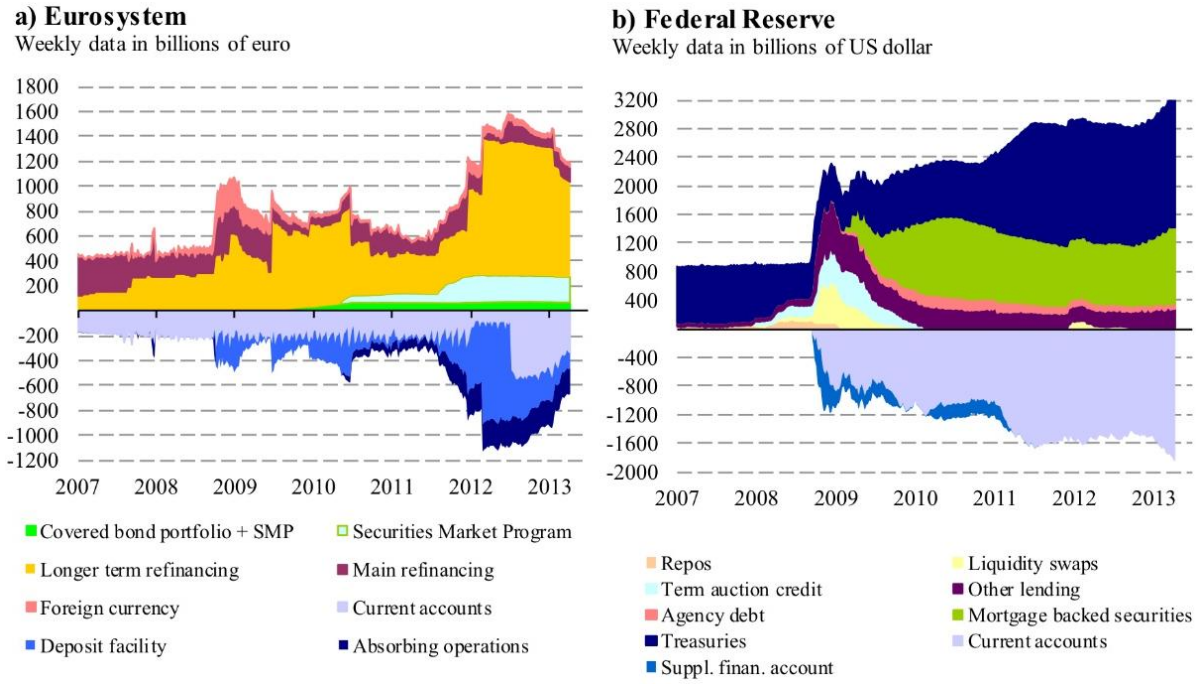

Figure 13– Central banks' balance sheets composition and size between 2007 and 2013 (Nellis, 2013: 37)

Prior to discussing the results of the policy measures implemented by the ECB, and given the importance of communication in the outcomes of monetary policy, it matters to take some time to reflect on the announcements and communications of the ECB, mainly addressed by press releases from the ECB's governing council, as well as by speeches from its presidents, first Jean-Claude Trichet and now Mario Draghi, but also from other ECB representatives. On August 2, 2007 Trichet started providing insights on the possibility of unconventional monetary policy measures when he stated in a press briefing following a meeting of the Governing Council that, despite a sustained economic growth in the euro area, there were a series of risks to price stability in the medium term, including rising oil prices, emerging capacity constraints and potential stronger wage and cost dynamics. "Strong vigilance is therefore of the essence to ensure that risks to price stability over the medium term do not materialize." (ECB: 2007a). Later that year, on December 12, the ECB, the Fed, the Bank of Canada, the

Bank of England and the Swiss National Bank announced joint measures to address elevated pressures in short-term funding markets. Particularly, the Governing Council decided to provide up to $20 billion funding to the euro system counterparts, through reciprocal currency arrangement, which means swap line.

However, more drastic measures were only undertaken after the bankruptcy of the Lehman Brothers. On September 29, 2008, the Governing Council announced a special term refinancing operation to inject liquidity into the European banks, and emphasized that it would "continue to steer liquidity towards balanced conditions in a way which is consistent with the objective to keep very short term rates close to the minimum bid rate." In spite of announcing on October 2, 2008 that the Governing Council had extensively discussed the intensification of the turmoil in the financial market and decided to leave the ECB interest rates unchanged, six days later, the central bank changed its mind. "Inflationary pressures have started to moderate in a number of countries, partly reflecting a marked decline in energy and other commodity prices. Inflation expectations are diminishing and remain anchored to price stability. The recent intensification of the financial crisis has augmented the downside risks to growth and thus has diminished further the upside risks to price stability. Some easing of global monetary conditions is therefore warranted. Accordingly, the Bank of Canada, the Bank of England, the European Central Bank (ECB), the Federal Reserve, Sveriges Riksbank and the Swiss National Bank are today announcing reductions in policy interest rates. The Bank of Japan expresses its strong support of these policy actions." (ECB: 2008b). Individually, the ECB decided to reduce the minimum bid rate on the main refinancing operations of the euro system by 50 basis points to 3.75 %, the interest rate on the marginal lending facility 50 basis points to 4.75 %, as well as the interest rate on the deposit facility by 50 basis points to 2.75 %.

A month later, on November 6, 2008, the Governing Council announced its decision to reduce the key ECB interest rates further by 50 basis points, while it expected the inflation rates to continue declining. "The Governing Council will continue to keep inflation expectations firmly anchored in line with its medium-term objective. In so doing, it supports sustainable growth and employment and contributes to financial stability." (ECB: 2008c) In fact, between the summer of 2007 and the end of 2014, the ECB's Governing Council released 91 announcements regarding the bank's key interest rates, from which 12 declared intentions to decrease the minimum bid rate on the main refinancing operations of the Eurosystem, the interest rate on the marginal lending

facility, the interest rate on the deposit facility or the three all together, while only three announced increases in the rates and the rest of them were meant to state that the rates would be maintained unchanged. It is worth noting that there were no increases or decreases between June 2009 and April 2011, a situation that was altered with a raise, which revealed an early confidence in the recovery of the markets.

Going back to 2008, by December 19, the Governing Council communicated the update of its list of securities settlement systems (SSSs) eligible for credit operations collateral in the euro system. On April 6, 2009, the ECB released a press release stating that the group of central banks working together had decided to expand its swap arrangements and that the ECB was going to establish a temporary reciprocal currency arrangement with the Fed, until 30 October 2009. Less than a month later, the Governing Council continued to intensify the measures with the conduction of additional LTROs with a maturity of one year, regardless the regular and supplementary longer-term refinancing operations. On June 4, 2009, the Governing Council released the details of the Covered Bonds Purchase Program, an initiative that had been announced on May 7, and that comprised the direct purchase of €60 billion euro-denominated covered bonds, distributed across the euro area, in both the primary and the secondary markets. By the end of the year, the ECB continued its efforts to pacify the tumultuous environment in the banking system, by amending the rating requirements for asset-backed securities (ABSs) to be eligible for use in euro system credit operations, a decision announced in a press release on November 20, 2009. In addition, it is worth noting that prior to the end of the year, on December 3, 2009, the ECB announced details for the first three months of the following year regarding its MROs.

In 2010, the efforts of the ECB to enhance financial cooperation with the European Commission, as well as between international institutions was notorious, namely through the organization of the "Financial integration and stability: the legacy of the crisis" conference, during which Jean-Claude Trichet stated that "preserving financial stability and promoting further integration of European financial markets will require consistent action by all policymakers, at European and national level," (ECB: 2010a) sending a message to the policy makers and national central banks of the euro zone. "The financial crisis has shown how close our financial markets are interlinked in Europe. If we want to avert future crises, monetary authorities, supervisors and financial services regulators need to collaborate more closely. The conference today marks a new

step in our common efforts to build a new system where financial integration and stability go hand in hand," added the European Commissioner for the Internal Market and Services, Michel Barnier (ECB: 2010a). The conference took place on April 12, 2010, seven days prior to the release of an ECB report on the lessons learned from the financial crisis, emphasizing the importance of the European financial market infrastructures in supporting the liquidity and stability of financial markets.

In order to address the severe tensions in certain market segments that were hindering the monetary policy transmission mechanism, the ECB announced on May 10, 2010, the launch of interventions in the euro area public and private debt securities markets, which is the Securities Markets Programme. By the same time, the ECB announced that the euro area governments had committed to "take all measures needed to meet [their] fiscal targets [that] year and the years ahead in line with excessive deficit procedures." (ECB, 2010c) Two other announcements are important to highlight. On December 16, 2010, the ECB increased subscribed capital from €5.76 billion to €10.76 billion, reaching the limits of the Statute of the European System of Central Banks and the ECB, as well as the Council Regulation No 1009/2000, with the purpose of increasing volatility in foreign exchange rates, interest rates and gold prices as well as credit risk. In addition, on October 6, 2011, the ECB released a new covered bond purchase program, the CBPP2, including €40 billion of direct purchases conducted in the primary and secondary markets between November 2011 and October 2012.

José Manuel González-Páramo, who is a member of the Executive Board of the ECB, hosted the closing speech at the Tenth Economic Policy Conference, in Malaga, Spain on 21 October 2011, during which he remembered that despite the unconventional policy monetary measures undertaken, the main purpose of the ECB was price stability, legitimating it by saying that "this is the primary objective which euro area governments have delegated to the ECB as an independent central bank, and which is enshrined in the Treaty on the Functioning of the EU." (González-Páramo, 2011) In addition, he highlighted that since January 1999, when the objective of achieving an average inflation rate around two percent was established, the ECB was successful in doing so until September 2011, which includes almost five years of crisis.

"Despite these challenging times, the record in delivering price-stability is outstanding and stronger than that of any of the national predecessors of the ECB." (González-Páramo, 2011) However, González-Páramo remembered that the pursuit of price-stability requires an effective monetary policy transmission mechanism,

emphasizing the importance of the interbank market, the covered bonds and the sovereign bonds, which showed his support to the decisions made by the ECB. "Note, however, that even with price-stability guaranteed, the ECB should only contribute to the smooth functioning of the financial system. Financial stability is a responsibility of governments, while our responsibility is price-stability. Indeed, if governments respond appropriately to risks to financial stability and banks reinforce and efficiently restructure their balance sheets, the ECB may have to be less concerned with non-standard measures to restore the monetary policy transmission mechanism," (González-Páramo, 2011) he added, sending a clear message to the states about structural reforms.

On July 26, 2012, the new president of the ECB, Mario Draghi made all heads turn and pay special attention to the ECB's actions, when he addressed the potential incapacity of the euro and the financial crisis and stated that "within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough." (Draghi, 2012) In just one sentence, the president assured the markets that the ECB was loyal to its two-pillar mandate, open to go further in the implementation of unconventional monetary policy measures, as well as confident in the euro system, a great example of short and effective communication.

On September 6, 2012, the Governing Council announced on a press release the technical features of its outright transactions in secondary sovereign bond markets, the Outright Monetary Transactions (OMTs), which were launched to safeguard the proper monetary policy transmission and the singleness of the monetary policy. However, on April 15, 2013, Mario Draghi left clear that the purpose of providing liquidity was not subsidize failing banks and governments or pricing out break-up risk in sovereign debt securities, on a speech given at the “Room for discussion” of the Study Association SEFA and the Faculty of Economics and Business, in Amsterdam, Netherlands. In addition, Draghi addressed for the first time the topic of forward looking guidance on the intentions of the central bank's monetary policy rate, saying that it "mainly aims to manage expectations regarding the future evolution of the short-term interest rates. (...) Changes in the level of the current policy rate always have an intrinsic signaling content with respect to possible changes for short-term rates in the future. But during crisis times, when short-term nominal rates are at zero or close to zero, they cannot be adjusted further down. The central bank may then engage in active communication reassuring markets that the future path of policy rates would not deviate from the

current low level for a certain period or until certain observable conditions are verified." (Draghi, 2013)

That year, the ECB clearly turned for the first time to forward looking guidance, a strategy based on the communication in advanced of the central bank's forecasts regarding future interest rates, based on the evolution of macroeconomic indicators and taking into consideration the importance of expected future short term interest rates, and which was implemented in Europe considerably late compared to other central banks, such as the Reserve Bank of New Zealand (1997) or the Norges Bank (2005). The alteration was marked by two sentences issued during the introductory statement following the Governing Council meeting of July 4, 2013, when the ECB president said that "the Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time. This expectation is based on the overall subdued outlook for inflation extending into the medium term, given the broad-based weakness in the real economy and subdued monetary dynamics." (ECB, 2013) The ECB did not need to use the words forward guidance, since by announcing that its expectations were for a long period of time, it was already both implementing it and letting the agents know about the decision to do it. Benoît Cœuré (2013), who is a member of the Executive Board of the ECB, explained on a speech before the Money Marketeers Club of New York, on September 26, 2013, the importance of the decision, as well as the form that it would take. "Up until 1970s that central bank communication was based on secrecy and market surprise. But central banks moved away from surprising markets and, instead, moved to open and transparent monetary policy making. (...) Forward guidance aims to ensure that market expectations on future monetary policy are indeed consistent with the policy intentions of the respective central bank. (...) But the premium on clear communication is particularly large in extraordinary situations, for example when policy rates are at, or close to, their effective lower bound, or when the normal channels of monetary policy transmission are impaired, or when there is exceptional uncertainty on the state of the economy. Such situations occur only seldom. This makes it difficult for private agents to infer the future monetary policy path from past regularities. Hence, there is a clear added value in such a situation to making central bank communication more explicit." (Cœuré, 2013)

b. Comparative Analysis

Similarly to the Fed's FOMC, the communications of the ECB's Governing Council also hold a strict structure. The group reunions twice every month, with the first meeting being used to evaluate the economic situation and establish its monetary policy, and the second one to discuss other topics related to the ECB's responsibilities. Despite the fact that the minutes of the reunions are not released, following the first meeting, the Governing Council sends a brief press release announcing the decisions taken regarding the key interest rates, after which the president and the vice-president host a press conference, also conducted according to a determined standard. First, the president gives an introductory statement, during which the monetary decision is explained, followed by the economic analysis, monetary analysis, fiscal policy and structural policies, remarks that are made to justify the decision of the Governing Council. The press conference ends with a session of questions and answers from the journalists.

Another common feature identified in both the communication of the Fed and the ECB is the importance granted to transparency, which is not surprising given the main role of legitimacy and independence for central banks to conduct their work. Throughout the attempts to reemerge the European economy and eliminate the threat of the crisis, the ECB was very concerned to explain its decisions and its purposes. "We are very keen to issue information not anonymously but publicly as frequently and as soon as it is necessary because (...) we have a policy of communicating only publicly," (ECB, 2007a) stated Trichet back in August 2007, by the time he emphasized that the ECB never pre-committed. Transparency is a constant in the press briefings and statements of the ECB regarding interest rates and new monetary policy measures. The concern may also be related to a mistake also made by the Fed at first as already seen, which is providing too much information. Likewise the moment when the Fed provided information about the second round of QE, the ECB also announced its Purchase Program for Covered Bonds with all details, including date of beginning and end, final amount and pace. This was a characteristic never abandoned by the ECB, and information about the purchases is currently known until 2016.

Simultaneously to the engagement in providing all information on the intentions and outcomes of its unconventional monetary policy measures, another constant was the ECB's commitment to its mandate. "We discussed extensively the recent intensification of the financial market turmoil and its possible impact on economic activity and inflation, recognizing the extraordinarily high level of uncertainty stemming from latest

developments. In this context, we stressed the crucial importance of keeping inflation expectations firmly anchored in line with our objective. Price stability fosters an efficient allocation of resources, contains inflation risk premia and longer-term financing costs, and preserves the purchasing power of our currency. In so doing, it supports sustainable growth and employment and contributes to financial stability," (ECB, 2008b) stated Trichet in one of the press briefings when he announced the Governing Council's decision on key interest rates. The frequent regards about price stability may be related not only to informing the markets that the ECB's remained vigilant about price stability and inflation, but also to shut down critics from less favorable countries to the implementation of unconventional monetary policy measures. With German heading it, there is a group of European countries that did not appreciate ECB's decision to conduct MROs and LTROs, but the central bank may have tried to minimize the attacks by stating that it is aware of its responsibilities.

Pattipeilohy et al. (2013) studied the impact of the increase in the ECB's balance sheet on bond yields and verified significant decreases, between 10 and 150 basis points in the yields of Italy, Portugal and Spain in comparison with a situation of intervention inexistent, but revealed that the biggest beneficiaries were Greece and Ireland, which suggests that the unconventional monetary policy measures implemented by the ECB were particularly effective in helping boost the economies in greater need. "Yet conspicuously, this positive effect often lasts only for a matter of weeks before dissipating or even reversing. For Greece, estimations are extremely volatile and – with the exception of the re-start of the SMP in Summer 2011, when yields fell by 400bp compared to the hypothetical – show little consistency with the expected effects of European-level interventions. This highlights that Greece – so often a driver of European action against the debt crisis – remains a different case when it comes to policy impact." (Pattipeilohy et al., 2013: 31) Therefore, the authors emphasized that despite the encouraging results of the policies verified initially, those are limited to short term in the overall of the countries included in the euro zone. Moreover, when compared to the actions undertaken by central banks in other countries, including in the United States, the ECB's policies were less effective in impacting the economy and combating the crisis. "The overall conclusion is that central banks' liquidity support has significantly reduced money market rates and thereby supported financial transmission and the economy. (...) The results suggest that the LTRO interventions in general had a favorable (short-term) effect on government bond yields. Changes in the SMP only had

a visible downward effect on bond yields in summer 2011, when the program was reactivated for Italy and Spain, but this effect dissipated within a few weeks." (Pattipeilohy et al., 2013: 32)

In addition, Carlo Rosa (2013) analyzed the correlation between the ECB's communication and euro exchange rates, noting the uniqueness of it, since the central bank announces its policy decisions through two different moments. "Estimation results show that the surprise component of communication has highly significant effects on exchange rates, whereas the response of the euro to unanticipated changes in the policy rate is more muted. For instance, a hypothetical positive news shock of 100-basis-points is associated with an appreciation of the euro against the US dollar of roughly 3.6%. To investigate the economic importance of the ECB monetary news, I consider the financial market impact on euro exchange rates of a broader set of data surprises such as US, European and German macroeconomic news announcements. I find that the impact of the ECB press conference is substantial, similar to that of the US ISM index and the German IFO announcement, but smaller than the response to US non-farm payrolls. Second, intraday data allow to better assess the microstructure details of how new information is impounded into exchange rates." (Rosa, 2013: 167) The author concluded that all parts of the ECB's communication matter for the agents in the markets, particularly taking into in consideration the element of surprise associated to the communication, which corroborates the idea that central banks should not reveal all details about its monetary policy measures. Therefore, monitoring the markets' response to monetary policy announcements can help policy makers better understand the policy transmission mechanism, as well as investors predict alterations in the asset prices and exchange rates.

Similarly to what has been done regarding the United States, it is also important to briefly analyze the fiscal policy in the European Union, due to its importance for the economic growth, macroeconomic stability and inflation. Unlike the United States, in which monetary policy is responsibility of the Fed and fiscal policy is responsibility of the Congress and Administration, the system in the European Union is much complex. As already seen, the ECB is in charge of monetary policy for the countries included in the euro area. Fiscal policy, on the other hand, is a duty of each national state. However, it does not end here. Due to the fact that 19 countries share a common currency and monetary policy, the ECB believes that fiscal discipline is determinant for the accomplishment of macroeconomic stability in the union. Since the nations hold

responsibility for its fiscal policy, but no longer have the possibility to use national monetary and exchange rate policies to respond to country-specific shocks, the ECB determined certain goals and rules regarding governments' expenditure, revenue, budget deficits and debt.

Regarding this topic there are a series of arrangements agreed at EU level with the purpose of limiting the risks to price stability. Those start with the prohibition of the ECB to provide monetary financing to the states, the prohibition of privileged access to financial institutions, and the no-bail-out clause. Perhaps the most important determinations for the thematic in discussion are, however, the fiscal provisions to avoid excessive government deficits, and the Stability and Growth Pact. According to the excessive deficit procedure, one of the basic rules of budgetary policy, the states shall avoid excessive government deficits, defined as three percent, as well as gross debt of 60 percent of the GDP. Temporary exceptions are tolerated, but if a member state remains for too long in a situation of excessive deficit or debt, it may be discussed at the ECOFIN Council and sanctions may be applied to the country. In addition, the Stability and Growth Pact was designed to detail the budgetary rules of the union, comprising preventive and corrective approaches. The former is based on the procedures for multilateral budgetary surveillance, while the latter are the conditions that determine that a country is in situation of excessive deficit and what to do in this case. The EU is also planning on implementing a balanced budget rule at national level as well as on reinforcing the procedures of the Stability and Growth Pact.

Importantly, five countries in the euro area needed during the present crisis to request international bailouts. Having received financing help from the troika – EU, ECB and International Monetary Fund (IMF) – Cyprus, Spain, Greece, Portugal and Ireland, became even more powerless about its fiscal policy. The rules imposed by the EU and ECB and already expressed, and the IMF was throughout the all crisis a great advocate for contractionary fiscal policy as well as structural reforms. In 2010, both Greece, in May and Ireland in November asked for €240 billion and €85 billion in financial support respectively, followed by Portugal the following year, which requested €78 billion. Cyprus and Spain both asked for external assistance in 2012, one €23 billion and the other €40 billion. However, the international institutions did not lend the money lightly and demanded the accomplishment of a series of reforms and benchmarks, which were regularly monitored by representatives of a troika. Therefore, it is worth noting that those were bounded to strict measures, mainly based on austerity.

Fiscal policy during the crisis in Europe, in particularly in the five countries that needed external assistance, was based on contractionary measures and austerity, including both tax increase and sharp cuts in government spending, mainly in public services such as education, health care and social security. The institutions assumed that the countercyclical work was being boosted through the implementation of the European Economic Recovery Plan, a program launched by the European Commission on November 2008 and approved by the European Council the month after, as well as that shrinking spending and increasing taxes would guarantee price stability, reduce national debts, restore market confidence and ultimately lead to job creation and renewed economies. Despite the fact that the UK did not ask for external financial assistance, it is also a case in which austerity was implemented to respond to the crisis. While the effects of the policies implemented regarding government debts will be further discussed, the downturns associated to contractionary fiscal policy are debatable. The linear effectiveness of these policies in reducing spending and expanding revenue can be limited by factors such as increased unemployment, and its opponents remember the social and economic costs, since it may affect the consumption, while strong governmental programs may help low-income earners and create employment. What is also important to consider is the importance of each of these countries within the euro area. According to the weights used by the ECB to calculate the Harmonised Index of Consumer Prices (HICP), between 2007 and 2014, the Gross National Income (GNI) of Cyprus represented about 0.2 to 0.3 percent of the total of the union, while in Ireland it ranged from 1.3 to 1.6, in Portugal from 2.1 to 2.4, in Greece from 2.6 to 3.8 and in Spain from 12.0 to 12.8. This means that the GNI of the five countries that needed to request the help from a troika comprised during the crisis from 18.2 to 20.9 percent of the euro area. On the other hand, Germany and France head the GNI list, holding 27.7 and 20.6 percent in 2014 respectively. In addition, it is also significant the fact that the third country in the list is Italy, with 17.7 percent in 2014, which is a country that was at risk of also needing to ask for external financial assistance.

To analyze the results of the monetary and fiscal policy measures implemented by both the Fed and the ECB, it is worth recall data previously presented regarding the US interest rates, inflation, federal debt, GDP growth and unemployment between 2007 and 2014 respectively (figures 8 to 12), and compare it to data from the same macroeconomic indicators and period of time in the euro area. As explicit in the first chart (fig. 14), the Fed was fast to cut the interest rates to near zero in 2009 and

maintained them like that, while the ECB reduced effectively the rates the same year, but not so sharply (to 1.75 percent), having increased the rates the following year. Only by 2011 has the ECB started a gradual decrease on the interest rates, reaching 0.30 percent in 2014, which denotes again a slower answer from the bank, compared to the American one. Regarding inflation (fig.15), the oscillation was in the US stronger than in the EU, as in 2009 the American population faced a negative inflation of -0.4 percent, which in two years rose until the 3.2. In Europe, on the other hand, the values ranged between -0.16 in 2014 and 3.07 in 2007. The tendency was, nevertheless, similar in both areas, with emphasis for the exacerbated inflation experienced in the US in 2008 due to the bankruptcy of Lehman Brothers, which was not significant in Europe.

Also, the GDP in both USA and euro zone suffered the crisis' and monetary policies' consequences (fig. 16), but is demonstrated that the countries of the euro zone suffered a greater decrease in GDP growth, particularly on 2009, as well as on 2012, when the American economy was already recovering and some of the European countries were struggling with sovereign debt (fig. 18) and external financial assistance from troika. Similarly to the case of GDP, it is important to note about unemployment that the data is influenced by the fact that the euro zone comprises 19 very different countries. This may explain why on average the unemployment was higher in the United States than in the euro area (fig. 17), since countries like Germany, Luxembourg and Malta were pushing the statistics higher, while Greece, Spain and Croatia dealt with unemployment rates of 27.2, 24.9, and 17.1 percent, respectively last year.

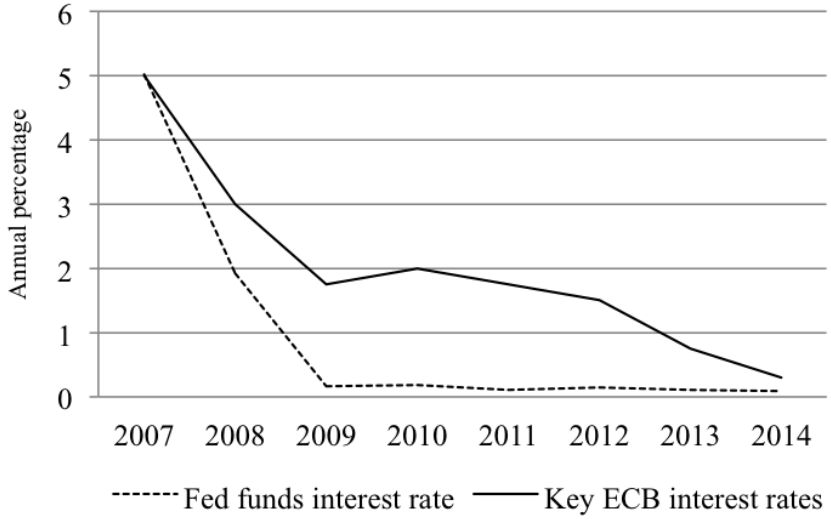

Figure 14- Annual Percentage of interest rates of the Federal Reserve Bank funds and the ECB interest rates (annual percentage). Data source: Federal Reserve Bank and ECB Statistics

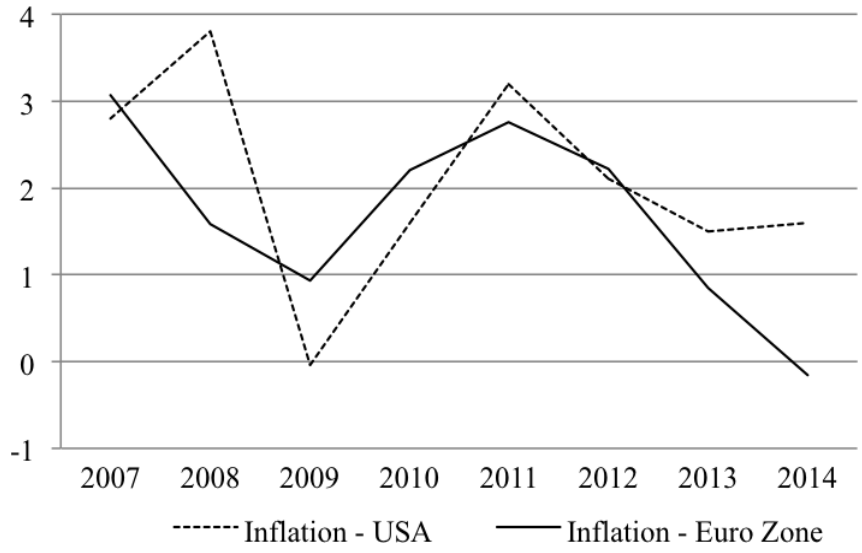

Figure 15- Inflation rate in the USA and in the Euro Zone, measured according to the Consumer Price Index (annual percentage). Data source: Fed's Bureau of Labor Statistics and ECB Data Warehouse

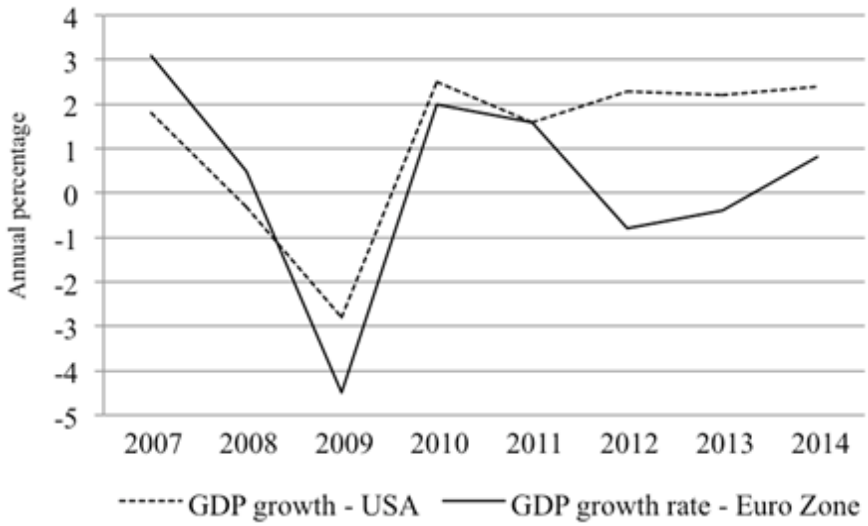

Figure 16- Annual rate of Gross Domestic Product (GDP) growth in the USA and Euro Zone (annual percentage). Data source: World Bank and Eurostat

Figure 17- Unemployment rate in the USA and Euro Zone (annual percentage of labor force). Data source: Bureau of Labor Statistics and ECB

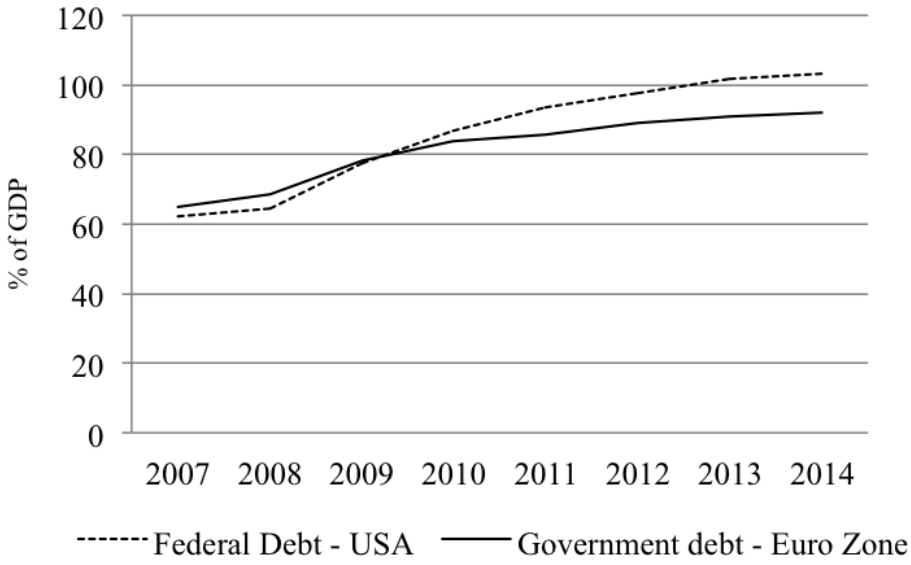

Figure 18- Federal debt in the USA and Government debt in the euro area, measured by percentage of the GDP. Data source: Federal Bank of St. Louis and European Central Bank

c. Discussion of Results and Possible Limitations to QE in Europe

Different central banks implemented distinct types of unconventional monetary policy measures and, despite the fact that the present work is focused on the United States and the European Union, the United Kingdom and Japan are also examples of that. However, all shared a similar, if not equal, purpose of improving the effectiveness of monetary policy and reduce the effects of shocks to the economy. Therefore, each institution decided its policies according to its own characteristics, which explains the importance of discussing the results accomplished by both the Fed and the ECB and the hypothesis of implementing American-style measures in the euro zone. Despite the fact that this not means it is a mistake for the ECB to implement such policies, the following challenges and limitations may comprise both starting points for discussion and elements to carefully be taken into consideration regarding the topic of QE in the euro area.

First of all, the BCE needs to consider the timing of intervention. When analyzing the outcomes of the Fed's decisions, is important to remember when they were made, which means seven years ago. A lot has changed in the global economy throughout this time and the ECB may be entering the race too late. The comparison with Japan is inevitable and while the Asian country still managed to implement QE, the efforts made were remarkably stronger as it could have been, a risk that the European bank may want or not to take. Closely connected to the problem of time is the question of expectations. While in the United States, the fast and uncommon answer to the crisis caught the financial markets off guard, causing a higher decrease in bond yields, the green light to QE in Europe was widely anticipated, particularly by the countries in greater struggle. Consequently, the results may not be as positive as expected. As previously mentioned, expectations play a central role in the policy's results and the anticipation of the measure may cause disappointment. The same way, the ECB decided to provide all information about its MROs and the less fortunate results of doing the same with QE were attested by the Fed during its second round of the measure. In addition, it is important for the ECB to consider the timing of its actions not only regarding this crisis, but in an overall manner. Forward looking guidance was only implemented in 2013, QE in 2015, several years after the United States. On one hand, the ECB prevents disastrous outcomes, as it waits to see the international experiences, on the other hand, waiting may significantly lower the policy's results, as

well as it may decrease the trust of the markets in the bank's capacity to respond properly and on time to stressful situations.

It is worth note, however, that the ECB, unlike the Fed, does not need to take into consideration the benefits for one country, but for the all 19 countries of the euro area and consensus is not always easy, especially political consensus. The ECB is prohibited by the EU foundation treaties to directly finance governments, and buying government bonds is a borderline measure that the critics state contradict this guideline. The opposition to QE is led by Germany based particularly on the argument of hyperinflation and its risks, a reality close to the country that still remembers the period from 1921 to 1924, following the I World War, during the Weimar Republic. In addition, the German policy makers advocate that the provision of liquidity will provoke disincentives for the national governments to invest in their economies and conduct reforms needed to increase competitiveness. Also, to join the German opposition to QE and regarding the topic of politics, the ECB is currently facing the challenge of managing the rise of a series of extremist anti-euro political groups from both the right and left wingspans, fueled by slow job creation and income growth, particularly in Greece, Italy and Spain, but also even in France and Germany.

Moreover, there are other points associated to the fact that the ECB is ruling for a group of countries, instead of a country. The euro zone comprises a monetary union, but not a fiscal union, which is in itself a limitation to the ECB's actions. When deciding its monetary policy, the central bank needs to take into consideration that the euro area includes multiple sovereign states, and consequently, multiple sovereign debts, being each of them different in liquidity and associated risks. While previous analysis was made about the five countries that needed bailouts, all of the countries were concerned with their debt ratings and suffered the consequences of contractionary measures implemented. Hardly will the ECB find political measures able to both benefit and please all of the state members, but within its mission and two-pillar approach, it is implicit the union's good. It may be summarized about this point that the ECB is being limited by the nature of the European financial system in itself. But is it the nature or the state of evolution of the European Union? The completion or incompletion of the European Union, including monetary, fiscal and banking system is a wider question that could enrich this discussion on further studies.

If the critics to QE emphasized the problem of unequal distribution of benefits, with very different countries when it comes to GDP growth, the question deserves

particular attention. In addition, other distinct characteristics in the United States and the European Union are also important to emphasize due to its potential influence to the implementation of American-style unconventional monetary policy measures in Europe. While the United States are surrounded by oceans and alone in the North America with Canada and Mexico, Europe needs to manage the question of location and neighboring. It is connected to Asia, almost connected to Africa and is still dealing with the inheritance of the late Iron Curtain, with all its social and economic consequences, as well as associated conflicts. Other feature is the labor market, more liberal in the United States, which benefits are debatable, but also more mobile, since the theoretical work mobility within the member states is still limited by culture, language, legislation or prejudice. Lastly and closely related to work capacity, competitiveness and the sustainability of the social security systems, is the European population. The tendency is for an aging population and a considerable drop in the working-age population, coexistent with the increase in old-age dependent residents. These characteristics join another one, already stated, which is the fact that the financing system in the US is more based on the markets, while in the EU it relies mostly on banks.

The existence of challenges and obstacles do not comprise a reason alone for the ECB to give up on the idea to implement QE. In fact, the European Union is a challenge in itself and one that is still in construction. Contrary to this apocalyptic idea, it should rather provide the central bank with insights to prevent the potential downturns associated to the unconventional monetary policy measure. On one hand, the central bank could use the foresights to implement complementary policies designed to address the obstacles or even to adapt the type of policies used in order to fit better the specifications of a union of countries, instead of a country. On the other hand, and considering the cyclical feature of the global economy, the ECB could also use the lessons learned from this crisis, the first experimentation with unconventional monetary policy measures and now with QE to act better against a future stressful situation, including learning not to wait too long to see what happens, running after other central banks or acting only when is taking the risk for it to be too late. The following timeline (fig. 19) provides both an overall idea about the monetary policy measures implemented by the Fed and the ECB in response to the economic and financial crisis, while it also helps support the conclusions of this thesis.

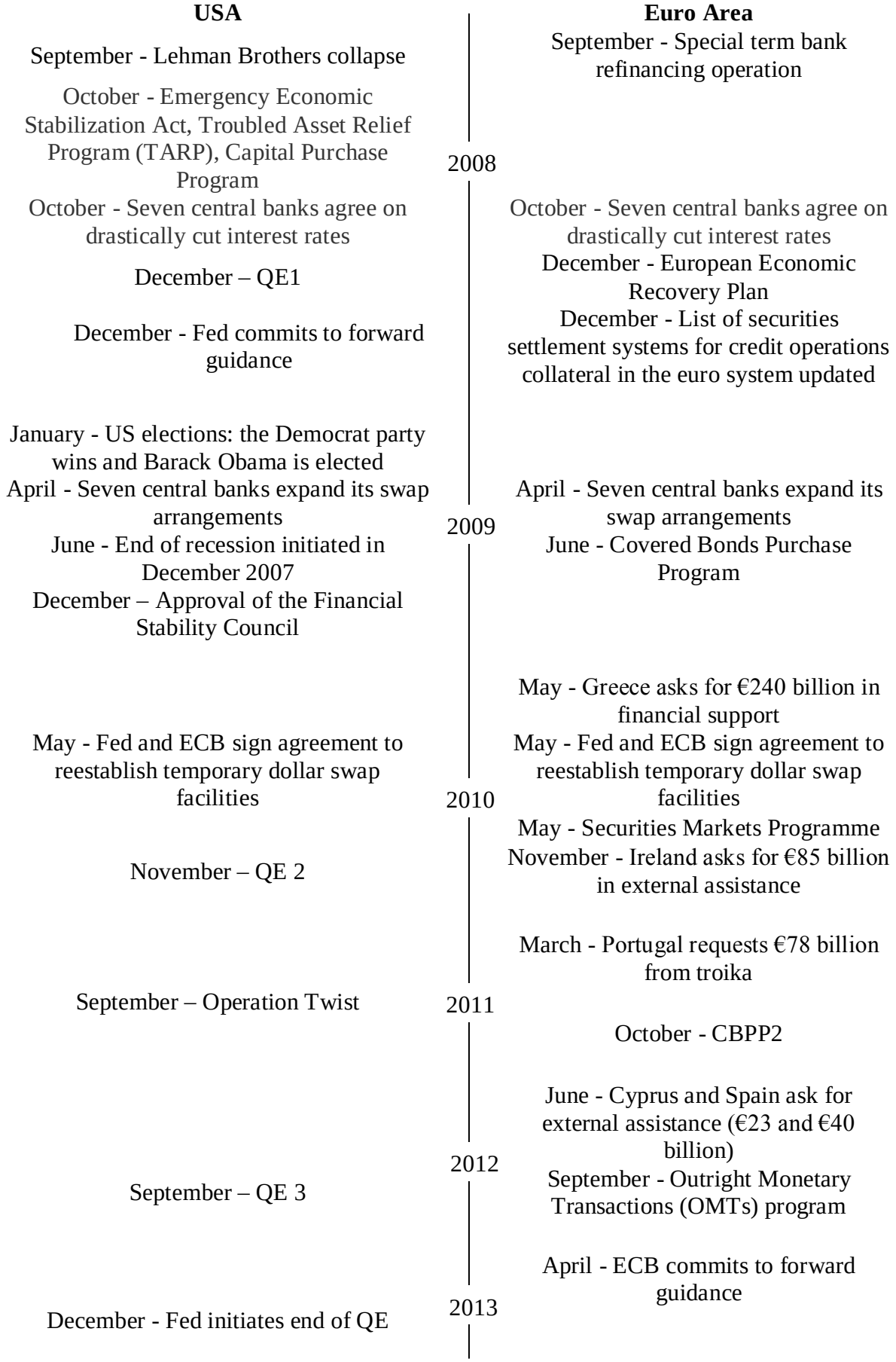

Figure 19– Crisis main events timeline (USA and EU comparison, 2008-2013)

VI. Conclusion

Confronted by an escalating crisis that soon became global, central banks acted to recover the economic sustainability and avoid the contagious effect very differently and according to both its established missions and visions about monetary policy. Research and macroeconomic indicators suggest that the Fed was not only faster, but also more effective than the ECB in responding to the recent economic and financial crisis. Regarding the speed in responding to the crisis, evidence demonstrates it based on data from the cut in interest rates and both pace and amount invested in unconventional monetary policy measures. When it comes to effectiveness, it regards the comparison in the results of the increase in both banks' balance sheets. While the Fed and ECB were equally able to decrease bond yields significantly, the results were in the United States synonym to improvements in market liquidity, to the fall of highly risky assets from private portfolios, and, consequently, to decline of longer-term private borrowing rate, and to overall recovery of the economy. However, in the euro area, these results not only had better in countries in greater struggle, such as Greece, Italy, Portugal and Spain, but they were also in few weeks dissolved or overturned. Both the USA and the euro area suffered the impact of the crisis, according to macroeconomic indicators, like GDP growth or inflation. But it was Europe that experienced greater costs, and in 2012 the USA was already recovering, as the euro area faced problems with sovereign debt and five countries needing external financial assistance from troika.

Despite these evidences, stating that the Fed was more successful than the ECB might be short-sided. The Fed focused its monetary policy measures in a fast and sharp cut to the interest rates, combined with a large program of QE, comprised of LSAP of assets with medium and long-term maturities, such as Treasury securities and mortgage-backed securities. On the other hand, the ECB was more moderated in the cut of its interest rates, but it also implemented unconventional monetary policy measures. However, in the Euro area, the central bank opted for less aggressive measures, mainly focused on banks, instead of markets, and including main refinancing operations, long-term refinancing operations, a purchase program of covered bonds and provision of liquidity in foreign currencies.

Following the analysis of the unconventional monetary policy measures undertaken by either one of the central banks, the present work leads to the conclusion that the ECB was not wrong in adapting the type of policies implemented to its characteristics. However, the implementation of QE was also a hypothesis that the ECB

should have considerer earlier, since it might now have to deal not only with the difficulties inherent to a new monetary policy measure, but also with the fact that it was expected much earlier. Despite these considerations, it might be unfair to blame the ECB and simply say that the bank's actions were 'too little, too late,' since the ECB works under a series of constraints that the Fed does not need to consider. From the challenges and limitations faced by the ECB that may impact its decisions, and particularly decisions taken regarding the present crisis, is important to emphasize the differences between the 19 countries that comprise the euro area, in areas such as productivity, employment or sovereign debt. In addition, the ECB had to outline its mandate, which determines the bank's mission as the inflation control and prohibits the direct financing to governments. While the ECB struggled to implement unconventional monetary policy measures, to help rescue five countries, and decided if QE was the best option, closely observing the American steps, it also faced great pressure from the most productive countries to stay still and from the sinking ones to pull the trigger.

In addition to these drawbacks, the European countries were waiting for a decision of the ECB on QE for a long time now and the question of exceptions might be determinant for the success of the measure. The depreciation granted to this fact suggests that the ECB still has work to do in the field of management of expectations and communications. This may be one of the greatest differences between the two central banks in responding to the recent crisis. Regarding forward looking guidance, there is no doubt that the ECB was slower to incorporate it in its functioning than the Fed. While the American central bank was not fully successfully in its communication of QE, for which the over sharing of information during the second round is a perfect example, it was successful in adapting to the market response and learning from its mistakes, correcting its communication.

Therefore, had the ECB not relied so much on waiting to see the outcomes of more aggressive unconventional monetary policy measures, before realizing that they could be effective and implementing, may be had the outcomes to the crisis been different. It is hard to tell what could have happened and the conclusions of this work cannot be extrapolated in that way. However, most importantly, if the ECB also adapts its actions accordingly to the lessons learned from the recent crisis, it will start granting more credit to forward guidance, as well as to act promptly in response to a stressful situation, and not only after trying a series of other methods.

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