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Titolo

The influence of Monetary Policies on the global Economic output

RELATORE

PROF. Gianfranco Di Vaio

Candidato Matr.

650901

Correlatore

Prof. Marengo Luigi

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Abstract

This study aims to explore the effectiveness of different monetary policies carried out by four different Central Banks in the last two decades: European Central Bank, Federal Reserve, Bank Of Japan and Bank of England.

More precisely this study will go through the different operations taken by each Central Bank to cover from economic crisis and inflation problems, such as the increase or decrease of interest rates.

Changes in the rates and expectations therefore tend to directly condition both the prices of financial tools and the exchange rate. In fact, a global decrease of rates triggers a mechanism by which the financial tools increase their own price, thus leading to an improvement in the financing costs and an increase in consumption and investment. On the other hand, it is possible to notice that a change in the exchange rate directly influences inflation, when the imported goods are consumption ones. It is just thanks to the wealth effect that the transmission mechanism can have complete effectiveness in the real market. This increases the aggregate request for consumption which boosts the price of goods – for a given offer – and thus generates inflation and the increase of salaries. We also point out how at a bank level the change in rates has various effects in the offer of loans, also interbank ones, and how non-conventional Monetary policies are applied throughout different channels that regard macro policy, portfolio rebalancing channel and liquidity premia.

Then we go on to describe how ECB during the economic crisis has managed the different currency situation with different financial instruments finally arriving at the implementation of the Quantitative Easing just as the FED had done few years before.

So in Chapter two we analyze the models of inflation targeting with reference to the Federal Reserve monetary policy during the years of the economic recession and its use of Quantitative easing from 2008 to 2012, highlighting all the adjustments and different operations that have occurred in recent years for the revival of the American economy. We later describe the effects of the operations on the American state corporate Bond markets and stock market. We complete Chapter two with an overview of the current crisis scenario in the United States and of the latest operations implemented by the FED. Through the reading of the tables of the Ministry of Foreign Affairs as well as from the American Stock Exchange and the results of the real economy we can certainly infer that the monetary policy of the Fed was a winning one according to the market. In Chapter three we analyze the Monetary policies carried out by Bank Of Japan and Bank Of England in similar scenarios. Firstly we describe the measures taken by Bank Of Japan since 2001 and how Quantitative Easing has been implemented throughout these years in Japan. The decision made by the Bank Of Japan was a strategy to overcome the economic stagnation and to enter a large amount of money within the economy. We shall see that despite the two financial crises were very different (the first in 2001-2006 and the second in 2008-2012), the BOJ used exactly the same non-conventional monetary policy to contrast the negative effects brought about by them. Later on we describe how these measures affect the Japanese Bond Market and how Japan Governmental Bonds have fallen more in relation to the higher

maturity. Finally we draw a parallel with the different Monetary policies carried out by Federal Reserve and European Central Bank. To conclude the analysis of the world scenario we take into account the Monetary policy of the Bank Of England and how it has been handling the economic crisis since 2009. The policy carried out by the English monetary authorities has implied different financial instruments as Quantitative Easing and asset purchase facility which have led to a lowering of interest rates. They have led to a decrease in 50 basis points more than the ones taken by FED and ECB. Finally we focus on the market of English state securities, Corporate Bond market and Stock Market.

Introduction

The aim of this study is to describe the different types of monetary policies implemented in the recent years and to focus on the effectiveness of conventional and non-conventional monetary policies, with particular attention to how the different Central Banks handle them.

Many studies which try to assess the effectiveness of the implemented monetary policies come from several academic papers that I include in my analysis.

It will be interesting to notice how, in different countries, similar policies have been applied through different transmission mechanism (channels).

The work focuses in particular on the monetary policy measures adopted by the ECB, the Federal Reserve, the Bank of England and the Bank of Japan. More specifically, I will consider for the FED and BofE the period between 2008 and 2012, whereas for Japan the period taken into consideration is from 2001 to 2012. I will then underline the different use and implementation of monetary policies and the results obtained with them. With respect to the monetary policy implemented by the ECB, instead, the analysis will be performed by studying the policies used before Quantitative Easing and with QE itself. This work will particularly highlight the effects of monetary policies on the real economy.

1 Monetary policy and transmission channels

Central banks have a wide range of policies to implement in order to influence the real economy in their own country and the composition of their own financial system. Such policies can be defined as conventional monetary policies and non-conventional monetary policies. **Conventional monetary** policies are those open market policies which are needed in order to influence the interest rates, to manage the market liquidity and to mark the orientation of the monetary policy, through three categories of operations: Main Refinancing Operations (MRO)[1], Longer Term Refinancing Operations (LTRO)[2], and operations of a structural nature to help financial institutions called Emergency Lending Assistance (ELA)[3].

The operations implemented by the Central Bank may be summed up with a cut/increase in the official interest rates according to need, thus influencing the whole real economy through a transmission mechanism. On the other hand, by **non-conventional policies** we mean all the policies implying an extraordinary intervention into the market performed by the European Central Bank, aiming at the achievement of stability in the market prices.

Also in this case, thanks to a transmission mechanism, it is possible to influence prices and therefore to condition inflation. In particular, as Europe is currently struggling inside a liquidity trap, the European Central Bank has been trying to use both these policies in a coordinated and simultaneous way, due to the lack of effectiveness of the conventional policies alone.

Thanks to Quantitative Easing (QE)[4] it is possible to increase the liquidity present in the private sector and therefore to boost the expenses of businesses and families. As highlighted by Benford *et al* (2009) there are different channels through which a greater liquidity can impact real economy. First of all, the purchases implemented by ECB should make the prices of financial instruments higher, reduce financing costs and thus increasing consumption and investment. Secondly, Quantitative Easing can work if the ECB is considered sufficiently credible, and manages to give positive indications regarding the economic trend. As a result, Quantitative Easing works mainly through the expectations it generates within investors, and depends on their trust in the Central Bank. In the following paragraphs we shall analyze in detail the mechanisms of transmission, firstly with reference to conventional policies, and then with

[1] A regular open market operation executed by the Euro system with the purpose of providing the banking system with the amount of liquidity that the former deems to be appropriate. Main refinancing operations are conducted through weekly standard tenders (in which banks can bid for liquidity) and normally have a maturity of one week.

[2] In recent years, the regular operations have been complemented by two liquidity-providing long-term refinancing operations in euro with a three-year maturity

[3] Euro area credit institutions can receive central bank credit not only through monetary policy operations but exceptionally also through the emergency liquidity assistance (ELA). ELA means the provision by a Euro system national central bank (NCB) of:

1 Central bank money and/or

2 Any other assistance that may lead to an increase in central bank money to a solvent financial institution, or group of solvent financial institutions, that is facing temporary liquidity problems, without such operation being part of the single monetary policy.

Responsibility for the provision of ELA lies with the NCB(s). This means that any costs of, and the risks arising from, the provision of ELA are incurred by the interested NCB.

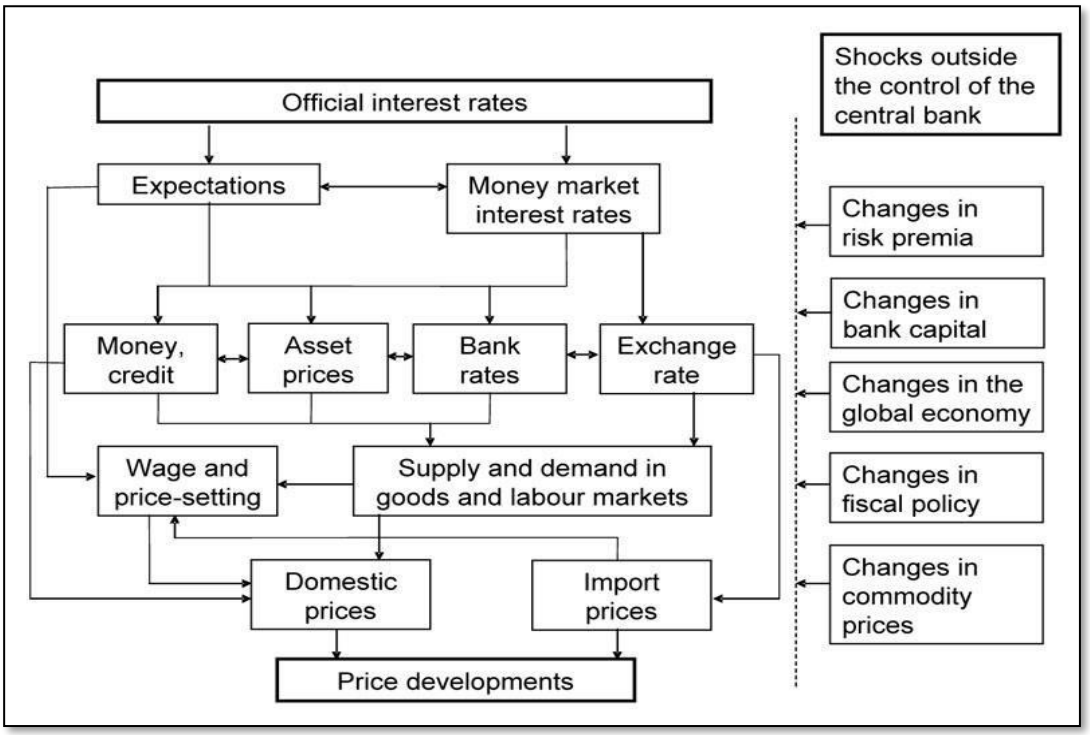
[4] Quantitative Easing is an unconventional monetary policy in which Central Banks purchase government securities or other securities (corporate) from the market in order to lower interest rates and increase the money supply

reference to the non-conventional ones, with the aim to highlight why conventional policies are not effective in this historical period.[5]

1.1 Conventional monetary policies

The main tool through which every Central Bank can influence the market is undoubtedly the possibility to fix in an independent way the official interest rates[6].

Figure 1Mechanism of transmission of conventional monetary policies



As shown in Figure **1** , the changing of the official rates can influence the financial economic system transversally. However, it is difficult to foresee and to estimate the direct effect of these policies *ex ante* and most of all to understand how long it will take to generate the effects they were meant for. The changing of the official rates has as a direct effect both on the variation of the interest rates in the monetary market, and in the agents' expectations. An increase/reduction of the official interest rates generates an increase/reduction of the rates in the monetary market and of the rates on loans and deposits applied by banks to their client. Expectations, instead, have greater influence on the long term rates, even if they are strongly related to the trend of the short term interest rates. Changes in the rates and expectations therefore tend to directly influence both the prices of financial assets and the exchange rate. In fact, a global decrease of rates triggers a mechanism by which the financial assets increase their own price, thus leading to an improvement in the financing costs and an increase in consumption and

[5] The transmission mechanisms presented here are valid in absolute terms, and not only in relation to the euro system

[6] The rule consists of a relationship between inflation and GDP to a conventional monetary policy instrument. In fact, central banks have the possibility to set a rate that is to be equal to the equilibrium real interest rate, that is what gives us a level of demand equals aggregate supply of full employment

investment (wealth effect)[7]. On the other hand, it is possible to notice that a change in the exchange rate directly influences inflation, when the imported goods are consumption ones. It is just thanks to the wealth effect that the transmission mechanism can have complete effectiveness in the real market: as before mentioned, with an increase in the price of financial assets it is possible to increase the wealth of families and businesses that hold those assets, thus increasing the aggregate request for consumption which boosts the price of goods – for a given offer – and thus generates inflation and the increase of salaries.

At a bank level the change in rates has an important effect in the offer of loans. In fact, if interest rates are lower the credit risk is lower too, thus giving the banks the possibility to increase the offer of funds to families and businesses , and the same thing takes place within the interbank market. This channel is particularly relevant at difficult times, as in the case of a financial crisis, when there is not much capital and the banks have greater difficulty in gathering capital. Apart from the channel of the traditional bank credit, which focuses on the quantity of provided loans, there is a channel of risk assumption. This channel is used in order to operate mainly through two mechanisms. The first one, the value of stocks and collaterals grows when the interest rates are low. This, combined with the idea that the growth of prices is sustainable in time, makes investors more willing to take greater risks. Secondly, risky operations become more desirable when the rates are low.

As for banks, these two effects lead to excessive exposure to risky operations. However, this kind of operation has not been very effective in the last few years, mainly if we consider the current financial crisis. According to the Keynesian [8] approach, when economic actors have negative expectations concerning economy, they are induced to a greater preference for liquidity. The greater preference for liquidity then generates the liquidity trap, characterized by a general drop of rates towards zero and the subsequent lack of effectiveness of the open market monetary policies. In the Keynesian approach, one of the basic assumptions is that it would be impossible for rates to drop below zero. However, this assumption must be changed as recently the European Central Bank is experimenting negative interest rates in order to give more stimulus to the revival of economy[9]. As a matter of fact, even changing this kind of assumption, the conclusion would not change: the liquidity trap still continues, showing that consumption is boosted firstly by expectations and trust, and not directly by the changes in the interest rate. As a consequence, the only possible solution is to implement non-conventional policies, despite the lack of literature and the few empiric comparisons available.

The first country to use non conventional policies was Japan in 2001, followed by the United States and England in 2008.

[7] The wealth effect is generated by an increase in real personal wealth, or an increase in their perceived wealth. This effect tends to generate a positive relationship between increasing wealth and consumption: when wealth or perceived wealth, increase, also increase consumption.

[8] John Maynard Keynes, The General Theory of Employment, Interest and Money 2007

[9] Mainly due to the presence of wars, financial and economic crisis, expectations of persistent deflation or fall in aggregate demand.

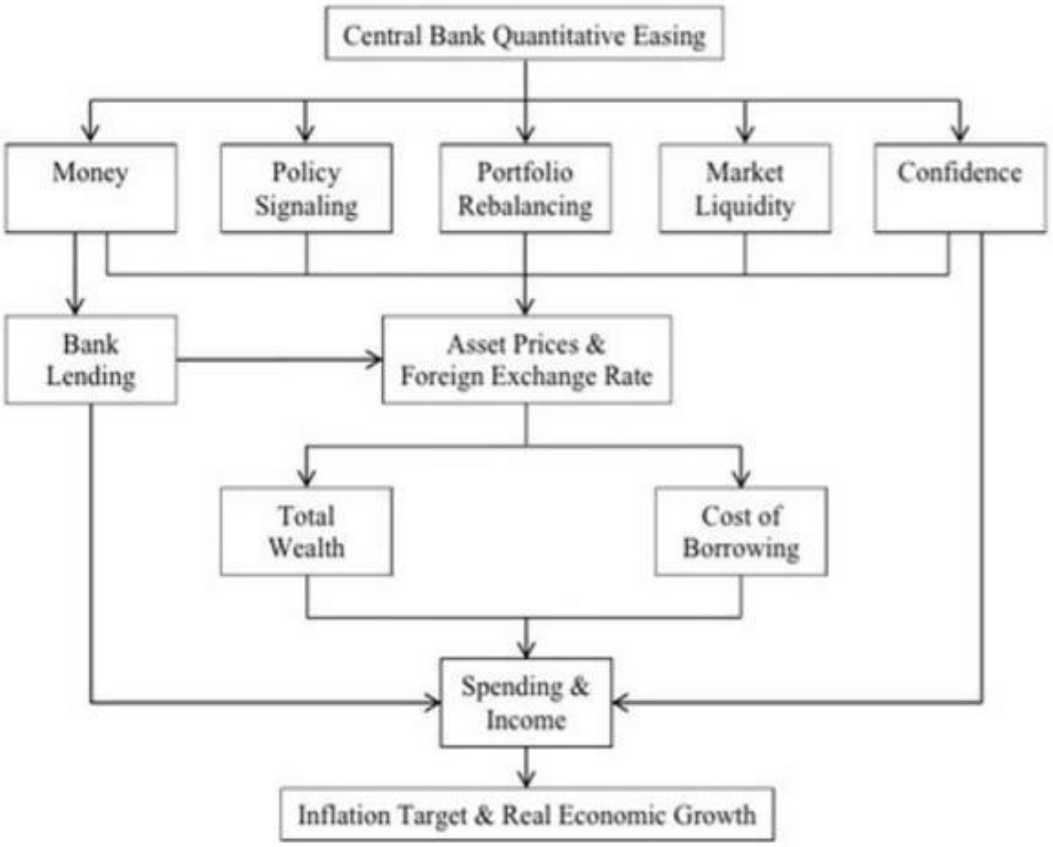
1.2 Non-conventional monetary policies

The first implementation of a non-conventional monetary policy dates back to 2001 in the Japanese system. A persistent deflation since the 1990s has led the Japanese Central Bank to implement policies for the purchase of financial assets on the Japanese market, in order to stabilize the economy and to try to get out from a situation of non-inflation. As before mentioned, other countries such as United States and England have proposed similar solutions, following the Lehman crisis.

By non-conventional policies, we mean all those uncommon policies implemented because of the financial crisis of 2008. Quantitative Easing, Credit Easing and negative interest rates are examples of them.

Credit Easing specifically aims at reducing interest rates and restoring a correct functioning of the market by changing the composition of the balance within the economy by buying private sector asset. Quantitative Easing (QE) in particular is implemented through the purchase of specific quantities of securities from commercial banks and some other private institutions, in order to increase the price of the securities in question and diminish their performance. QE allows central banks to increase the monetary base, because purchases are not sterilized, and to influence the market in a specific way with respect to the purchase government bonds to maintain at some level the interbank interest rate. Quantitative Easing is ascribed to all the implemented actions meant to increase the passive side of the balance in a Central Bank (reserves and currencies). Ben Bernanke, former governor of the Federal Reserve, thanks to the LSAP (Large Scale Asset Purchase) programme has started a Credit Easing policy, trying to improve the bond market rather than only increasing the monetary basis. On the contrary, the BOJ in the early 2000s and more recently the BOE have openly declared their objective to expand their monetary basis through Quantitative Easing policies. In this framework, we can notice that also the ECB is doing the same with all the programs implemented, also making the decision to take interest rates into a negative territory. The use of negative rates has only been implemented once before the current European experience, by Denmark; so we do not have empirically solid results to support its validity. On the other hand, on a theoretical level a further reduction of rates mainly aims at stimulating loans to families and businesses. Using Picture **1.2**, taken from "The financial market impact of Quantitative Easing" by Joyce *et al* (2010), we explain through which channels the purchase of specific financial assets can activate a transmission mechanism whose goal is to stimulate inflation.

Figure 2 Trasmission mechanism of the non-conventional monetary policies



(Source: "The financial market impact of Quantitative Easing" di Joyce et al (2010))

There are three channels through which a Quantitative Easing policy can be effective throughout the economic structure: *macro/policy news effect*, *portfolio rebalancing channel* and *liquidity premia*.

The channel of **"**macro/policy news**"**[10] indicates all the extra information given by a Central Bank when it issues new communications, concerning the tendency of the economic situation. Economic agents then change their expectations regarding the official interest rates and the term premium[11] according to the information received in the announcements. In our case in particular, the purchase of a great quantity of long term actions within the Quantitative Easing, and therefore its announcement, is necessary as a credible commitment on the central banks' side to keep the interest rate low in the future. The reason is that, if the central banks decided to increase rates later on, they would suffer losses on the assets they have purchased with the same operation. The signaling channel should therefore influence interest rates throughout the yield curve, with effects depending on the bond expiring dates (Krishnamurthy and Vissing - Jorgensen 2011). Also according to the Keynesian theory and the Ricardian[12] equivalence, Quantitative Easing works through a signaling effect (Eggerston and Woodford (2003)), and not thanks to the real

[10] Another way to call the macro policy news. Much literature related to QE refers to this effect, see Clouse et al (2003), Bernanke, Reinhart and Sack (2004), Ugai (2006) and Borio and Disyatat (2009) .

[11] The term premium is the additional return required by an investor in order to hold a long-term asset., analyzed already by, Bernake *et al* (2004), Kim and Wright (2005), Gagnon (2010).

[12] Ricardo has the view that the purchases made by public or private agents were completely equivalent.

purchase of assets by public agents. In fact, the change in the future expectations regarding interest rates and inflation condition makes a Quantitative Easing policy work; not the purchase in itself. Nevertheless, both theories are valid given a perfect market[13], but with an imperfect market or with the presence of financial frictions (taxes or credit constriction)[14], we can notice that Quantitative Easing influences the offer of financial tools too. Curdia and Woodford (2011) consider the impact of financial frictions and show how the purchase of financial assets by the Central Bank influences both the demand and the supply, only if Credit Easing is implemented. On the contrary, Quantitative Easing is not effective enough because the reduction of government bond yield makes it the same as the interest rate fixed by the Central Bank, and the two tools are therefore considered perfect substitutes. However, financial assets are characterized by an individual risk, which makes each one different from the other, thus making the perfect replace ability an impossible assumption. Therefore, this makes possible to change the demand and supply of financial assets thanks to Quantitative Easing, introducing another channel**:** The portfolio rebalancing channel. With the purchase of a great quantity of assets held by the private sector, central banks change the offer relating to the classes of the assets they have bought, thus inducing changes which balance their yields. Given the monetary basis and if the financial assets purchased in the scope of Quantitative Easing do not have perfect substitutes, the greater liquidity injected into the financial system will mainly go into other financial assets, similar to those acquired by the president of the ECB. This process pushes up the prices of the assets acquired with Quantitative Easing as well as the prices of their substitutes, at the same time lowering the term premium and the yield. The third and last channel is given by the **liquidity premia[15]**. The presence of the Central Bank makes the market much more liquid and therefore improves its functioning, limiting the problems of moral hazard and adverse selection[16] The problem of liquidity is thus reduced, giving the possibility to investors to sell more easily and to obtain the desired liquidity when in need (Borio, C and Disyatat, P (2009)). If we also consider the monetary policy model proposed by Kiyotaki and Moore (2012), where financial assets are divided according to their liquidity, we notice that firms wanting to finance one of their investments can do it only by increasing their capital (i.e. issuing new shares). The tendency will be to hold a good quantity of liquid assets, in case new opportunities for investment arise. The liquidity may also be used in order to finance investments, contrary to the issuing of new shares. However, when facing a liquidity shock (as in the crisis in 2008), perspectives for investment cease just like the possibility to increase one's own capital. This is the moment when the Central Bank

[13] Theory of perfect competition, where supply and demand are given and there is no possibility to influence prices directly.

[14] The presence of financial frictions (i) preclude the possible arbitrage between short of the expected future interest rate and long-term rate and (ii) allows changes in the maturity of the nominal sovereign debt

[15] Also called liquidity premium: investors demanding higher interest rates to hold illiquid instruments, that is not highly liquid and can be sold quickly.

[16] Related to post contract information discrepancies, leading an advantage to one party over another. Adverse selection is the tendency of individuals and companies with "bad" loans to ask for more loans to banks; while moral hazard is the tendency to think of individuals and businesses at risk more and therefore can not pay off the loans.

intervenes: by entering the market as a buyer, it generates a liquidity surplus in the system in order to give the possibility to start new investments. On the contrary, Krishnamurthy and Vissing-Jorgensen (2011) state that a greater liquidity in the system reduces the premium for the liquidity of government bonds compared with other assets not so liquid, though at the same time it increases their yield, thus mediating the global effect. However, Quantitative Easing can be effective through the premium channel for liquidity only during the action itself and not subsequently. In conclusion, Quantitative Easing policies induce action on stocks prices to be higher, while reducing the expectations regarding short term rate and reduce its term premia. On one hand, the prices of financial assets increase the net wealth of those who hold these assets, while on the other hand they reduce the cost of money. Both the increase of wealth and the decrease of debt costs, created by Quantitative Easing, make the expense of firms and private people grow, so as to reach the desired inflation, foster the real economic growth and reduce the unemployment rate. Quantitative Easing may also have an impact upon inflation and economic growth through the channels of credit and trust in the banks. Because of recession, the credit channel is limited by the banking system even when the market is functioning better. In such circumstances, banks are more likely to keep this liquidity surplus rather than sending it to the real market, thanks to direct loans. For this reason, the first perspective of Quantitative Easing is to signal a future improvement in the economic fundamentals, in order to increase the banks' trust and therefore to induce them to use the surplus liquidity for the real economy. This theoretical approach can be applied to any Quantitative Easing. In fact, all the Central Banks that have used this kind of monetary policy, have done so with the same system: concentrating mainly on the purchase of long term securities, to be replaced by short term liquidity. BOJ (Bank of Japan), BOE (Bank of England) and Fed (Federal Reserve) have performed different purchases, and so has the European Central Bank (ECB), though with the same goals and objectives.

The main purchases carried out by the European Central Bank cover three main kinds of tools: covered bonds, public debt and asset backed securities. We expect an impact mainly on these tools' yields, though taking into account the boomerang effects that take place also for some other asset classes. Because of the unusual policy that we are going to analyze, and due to the lack of a clear consensus regarding the effects that such purchases have on the financial markets, our application will be based on the main assumption of an imperfect and/or incomplete market, though we remain agnostic concerning the dimensions of any market friction. Afterwards, we shall concentrate on the signaling effect, which appears to us the main engine for the activation of the portfolio rebalancing mechanism that we have already described, and mainly on the transversal effects that Quantitative Easing has relatively to all the principal financial classes, in order to verify that this kind of operation has an effectiveness in the long term. Clearly the analysis of a long period cannot incorporate only the effects of Quantitative Easing, as there are other variables afflicting the European social and economic system. Nevertheless, we shall try to point out its effects in the attempt to fully capture the effect of Quantitative Easing.

1.3 The role of the European Central Bank in the management of monetary policy

On January 1, 1999, the European Central Bank (ECB) **took over** monetary policy for the Euro area, when the national central banks (NCBs) of the original 11 Member States of the European Union (EU) decided to transfer their duties, in term of monetary policy, to this institution.

This event marked a turning point in the complex historical process of European integration. Since then, one of the main criteria required to join the Eurozone was adapting to the "**convergence criteria**" that define economic and legal preconditions for the successful participation in the economic and Monetary Union. Convergence criteria or Maastricht criteria are based on economic indicators that member states have to respect in order to enter the euro zone.

1. Price stability: the inflation rate of the candidate country can't exceed 1.5 points the inflation rate of the three best performing member states;
2. Government finance: government deficit of the candidate country must not exceeds 3% of the gross domestic product and debt must not exceed 60% of the gdp .
3. Exchange rate mechanism under the (EMS) European monetary system must be adopted for two years without registering large deviations.
4. Long Term interest rate: they don't have to exceeds 2% the interest rate of the best performing countries in terms of price stability.

The compliance with this criteria will be required also for the other countries already part of the European Community wishing to adopt the single currency and respond to article 140 of the Treaty on the functioning of the European union.

In order to meet such requirements the European countries must adopt also a strict monetary policy if they want to enter in the Eurozone.

The maintenance of price stability is the main objective of European monetary policy. The ECB's Governing Council has given a quantitative definition of price stability: "***Price stability*** *is defined as a year-on-year increase on the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%."* The main objective and the benefits of this, is to provide guidance to the public in the formation of their expectations of future price developments, and to make monetary policy more transparent.

The target is defined as a year to year increase in the HICP 2% or below in order to provide an adequate margin to avoid the risk of deflation.

In the Protocol on the Statute of the ESCB (European system of central banks) and the ECB's annex to the Treaty establishing the European Community reads: the primary objective of the European system of central banks (ESCB) "*is the maintenance of price stability that the ESCB will be put on a separate footing from the politician organ of the community*". Having positioned absolute priority to this objective, coupled with the fact the ECB is defined as an institution independent from the Governments of the Member

countries, has led many observers to claim that the European Central Bank has been shaped in the likeness of the German Bundesbank.

The ECB pursues other real objectives these goals are considered secondary development, employment, social protection of the environment, and the ECB can only pursue them, subject to reaching the main objective of price stability. There are, however, observers who believe that the ECB should first attempt a reconciliation between real and monetary objectives; which isn't easy since the two objectives of price stability and stabilization of the real economy cannot be achieved using just a single instrument18

The ECB's primary task is to achieve price stability, and the objective of price stability is achieved only by fixing the interest rate and also to fix the so-called reference rate, which forms the basis for the structure of euro interest rates. Equally important task is to set the volume of liquidity to be assigned to each applicants.

1.3.1 Operations that the European Central Bank can make

The ECB performs the so-called **main refinancing operations**, deliberated weekly or with a term of two weeks. Since the assignment take place by the auction, the ECB merely sets the minimum bid rate equal to the reference rate (i.e. the interest rate benchmark)

The auction mechanism means that the effective rate is always higher than the reference rate and that it reflects a kind of bid price formulated by individual banks. The outcome is used to calculate an average rate, which can be interpreted as the current money market rate.

Moreover, the ECB allows once a month **longer term financing**, which have a duration of three months.

Finally, there are the very short term marginal loans (i.e. **overnight**). In parallel, the ECB accepts overnight deposits, remunerated with lower rates, in favor of banks with an excess of liquidity. Usually, banks with temporary liquidity deficiencies (or excesses) go primarily into the interbank market and then if the interbank market is not able to clear their demands, they exploit the opportunities provided by the ECB. One can therefore assume that the ECB rates apply respectively to finance and marginal deposits represent the minimum and maximum levels within which the market rates may fluctuate. Through financing and marginal deposits, the ECB will then have the possibility to stabilize market interest rates[18].

1.3.2 Monetary policy instruments used in the current scenario

The financial crisis, originated in the United States in 2007, has been transmitted to the Europe and especially to its weaker countries that have greater sovereign debt.

The Eurozone **Member States** responded by supporting in various ways the national banking systems: entering into the capital of banks, underwriting securities or acquiring directly riskier bonds (the so-called toxic or liquid).

The **European Union's** institutions have responded to the crisis with exceptional interventions on both the banking system and the sovereign debts of Member States. First, the **Commission** took action on the regulation plan expressing in several communications specific guidelines for supporting financial institutions, in a partial and temporary exception from the general rules on State aid. In particular, the Commission has indicated the conditions which must be respected in term of guarantees on liabilities, recapitalizations and supporting measures against impaired assets. Moreover, it has issued guidelines on the conditions for banks restructuring.

The **ECB** intervened on the banking system and guaranteed liquidity to financial institutions through several measures: Main refinancing operations, (MRO) Long term refinancing operations (LTRO), Targeted longer term refinancing operation (TLTRO) and asset purchasing program (APP).

Since the start of the financial crisis, the **European Commission** has worked hard to create a safer financial sector

Then, the Commission has proposed 28 new rules to better regulate, supervise, and govern the financial sector. As the financial crisis evolved and turned into the Eurozone debt crisis in the end of 2010, it became clear that, something more had to be done. In 2012 European governments agreed to create **Banking Union** completing the economic and monetary union, and allowing for centralized application of EU-wide rules for banks in the euro area and also non euro members that wanted to join. The **Banking Union** it is based on a continuous, stable coordinating supervisory interventions and assistance for banks in the euro zone through the creation of a S*ingle Supervisory Mechanism* (SSM) and a *single resolution mechanism* (SRM). Actually, there should be also a third element related to a common **guarantee on deposits**

The deterioration in the credit market access for some Member States is at the origin of the measures adopted to **reinforce the public finance** and to ensure virtuous behavior of States (in this sense must be interpreted the *Six Pack21*, *The Europlus Pact22* and *Fiscal Compact23*) and then to provide the **necessary financial assistance** to Member States in difficult situation, firstly with temporary tools such as the European financial stabilization mechanism (EFSM and EFSF) and secondly with permanent one (ESM). Common rules will also ensure that all EU savers are guaranteed that their **deposits** up to €100.000 (per depositor/ per bank) are protected in the EU (Directive on Deposit Guarantee Scheme –Dg Memo 14/244) This is to prevent another crisis considering that in the previous one, the Eurozone sovereign debt crisis highlighted the potentially vicious circle between banks and sovereign bonds. It has been established

a stronger prudential requirements for banks, requiring them to keep sufficient capital reserves and liquidity.

This will make banks able to control more and better manage risk in link with their investments activities. These are just some measures and policy instruments that the European Union improved to have a more solid system in the Eurozone. The tools used to implement monetary policy underwent a particularly pronounced phase of evolution in all major industrialized countries over the past two decades.

The ECB confirmed that **MRO** will maintain a fixed rate for unlimited amounts (in order to satisfy the whole demand) until January 2013 after the last maintenance period (the reserve requirement) of 2012. In the **Open Market Operations** instead the rates can be determined by an auction mechanism and it may vary depending on market conditions.

The past decade has witnessed the gradual transition from a situation characterized by strong relevance of refinancing to a component based more on open market operations. This change is due to the desire to use forms of financing that interfere minimally with the market mechanisms. The choice of basing the structure of monetary policy on open market operations can therefore be framed in the context of the general principle of free competition.

Repurchase operations are normally conducted through an auction mechanism by the NCBs under the management of the ECB. Auction conditions, volume, duration and possible rate shall be determined solely by the ECB. The NCBs play purely as intermediary: they provide information on the operations and the collection of bids from counterparties. In this way, there is the possibility to exploit the links that already exist between individual NCB and their respective banking markets. Once collected the offers the operation is adjusted and unified by the ECB; decentralization thus concerns exclusively the organizational aspect of the operation (it is not substantial).

In General, the ECB's operations have several purposes. They are used to control interest rates, to determine the amount of liquidity in the market and to signal the target of monetary policy. Every thing in theory. From an empirical point of view, it is one of the first things for which the ECB has been insistently criticized and questioned its **independence** of this institution from the Euro system. The ECB was created as a Central Bank designed to operate independently of politics. Despite its powers derive from political decisions related to the choices of the Member countries, the strategies concerning how its powers can be used and how to achieve its goals have been delegated to the European Central Bank. Independence of the ECB has been largely criticized because very often it has showed that the ECB's behavior deviates from the real needs. The EU institutions and the Governments of the different Member States respect this principle of independence, then avoiding to influence the ECB or the national central banks. Conversely, the ECB remains responsible for its own decisions with respect to the European Parliament and of the Council of Ministers: the ECB must indeed submit an annual report of its work in front of the Parliament while both

their President and the members of the Executive Committee, shall attend the meetings of "Parliamentary Committee for Monetary Affairs"[17].

1.3.3 Required reserves

The ECB sets the amount of the required reserves for banks. The reserves are remunerated according to the average rate of main refinancing operations that, as said before, represents the average money market rate. The modest amount of this rate must be assessed within the general framework of the regulations, which currently requires a particular capital requirements for each credit company (i.e. the capital must be at least 8% of risk-weighted assets).

1.3.4. Quantitative easing (QE)

The *Quantitative Easing* is the mean used to stimulate the economy when standard monetary policies are ineffective. In particular, the banks which have resorted to this policy are: the Federal Reserve (Fed), the Bank of England (BOfE) and the Japanese Central Bank (BOJ) , entering the global economy trillions of dollars in an attempt to revitalize their economies. In the United States, England and Japan the central banks have in fact used the QE, creating new money and injecting it with open market operations, in their financial and economic system and using it to buy sovereign debt securities of their countries.

The term QE marks a series of operations implemented by the central banks, including the ECB[18], aimed to inject into the economic system certain amounts of money. During the American crisis and the European crisis, pushing a lot of liquidity into the system was considered as a possible remedy trying to fight recession and deflationary dynamics. The ECB buys bonds issued by the euro area central governments, agencies and European institutions in the secondary market using central bank money, which then can be used by the institutions that sold the securities in order to buy other assets and to extend credit to the real economy. In both cases, this contributes to support the financial conditions.

To cite few examples, it should be said that the Federal Reserve's quantitative easing in 2008 has allocated with substantial financial aid Troubled Asset Relief Program.

With respect to the use of quantitative easing, the **economic literature** is controversial both in Europe and overseas. What is certain is that this operation was considered a way out during major crises that have characterized the world economy.

During 1932, the quantitative easing was used to restrict the effects of the 1929 crisis but it was considered ineffective if not counterproductive. The causes of failure were the rising expectations of a devaluation of the dollar and gold outflows, generalized panic in the markets, the collapse of confidence in the ability of

[17] MESSORI M. , The financial crisis: Understanding it to overcome it, Milano, Assogestioni (www.assogestioni.it), 2009, p. 37 e ss

[18] Choukairy.w, Ibenrissoul N. "The quantitative easing strategy of Central bank facing the crisis: case of the ECB and the FED" ;International Journal of innovation and applied studies, Vol.2N.3, 2013

Fed to maintain the Gold Standard and in the Government's ability to manage the panic. Quantitative easing has made bonds more "attractive" or in other words it has raised the demand of such assets, and thus its prices, reduced yields and attracted investors (this also due to the relative safety of bond during a recession)[19]. The effect of this measure is stabilization. This happened in the United States of America about a century ago.

Currently using the same instrument in the early decades of the new millennium, and then following the economic crisis, has certainly generated a reduction in the purchase of assets, rising interest rates and liquidity restrain as the market is almost dependent on liquidity injections, and this can be decreased to the placing of new currency.

In Europe, since October 2008, the ECB has decided to open the flow of liquidity to recover. European lending occurred with fixed interest rates. The ECB itself had to intervene in order to stimulate the banking operations because the distribution mechanism of liquidity through the monetary market was heavily damaged by the crisis. Thus, the Euro system has tried to eradicate the uncertainty in the amount of liquidity that is assigned to each bank. However, since mid-September 2008, the marginal rate has exceeded 40 basis points and the average rate of the main refinancing operations was located at 70 basis points above the minimum bid rate. This environment has led the Governing Council of the ECB to adopt the 8 October 2008, a **fixed-rate deal for major lending procedures.** All listings have been granted at the rate applicable to such operations. It is clear that the operations have never been limited to the interbank market but also to relevant securities market segments, considered important in the financing of banks in the euro area. It is necessary to point out that although interest rates in the euro zone have deteriorated, commercial banks have resorted in most cases the ECB also through further long-term refinancing operations. As we shall see in chapter two deposit instruments also confirmed that the ECB continues to replace the interbank market.

1.4 Events occurred in ECB during the financial crisis 2008-2016

On 10th October 2008, it was recorded that the spread between the three-month Euribor rate and the OIS (Overnight Indexed Swap) had reached 198 basis points, peak that had never been reached before. The consequence of this high perception of counterpart risk obliged ECB to introduce **fixed-rate loan**s and to widen the list of guarantees apt to become collateral. In this way, the process of loan concession was inverted. In fact, before the ECB allowed a predetermined amount of loans, while the rate was regularly established depending on the market supply. In normal times, the ECB's traditional political tools for refinancing operations are direct loans to banks with suitable guarantees with two expiry dates. The main refinancing operations (MRO) have a two-week period and the longer-term refinancing operations (LTRO) have a three-months period. Usually MRO and LTRO are predetermined in their amount and the

[19] CHOUKAIRY W., IBENRISSOUL N, "The quantitative easing strategy of the central bank facing the crisis: case of the ECB and the FED", International Journal of Innovation and Applied Studies, Vol. 2 N. 3, 2013

auctions are held on the interest rate.

From **October 2008 to May 2009**, ECB has cut the refinancing rate from 4,25% to 1%. Bini Smaghi (2009) calls the **Fixed rate full allotment** (FRFA) liquidity policy an "endogenous Credit Easing" because the request for fixed rate loans by banks determines the liquidity. Compared to the generous cut of rates, the worries about a counterpart risk have continued to torment the European inter banking market. Starting from the first months of 2009 the lack of trust in banks had dried out inter banking loans (Beirne et al. 2011), leading ECB to introduce the **12-month LTRO**. This was created in order to satisfy the preferences of commercial banks, which prefer loans with longer maturity. At the same time a programme for the purchase of guaranteed bonds[20] (**CBPP**) was introduced, with a turnover of about 2.4 billion in 2008 (+60% compared to 2003) and was meant to decrease the duration misalignments existing between long term loans (active) and short term (passive) ones. Although the market of covered bonds worked well before the financial recession, the Lehman Brothers' failure in September 2008 seriously damaged this market.

As an answer, in May 2009, the ECB purchased € 60 billion of covered bonds, corresponding to approximately 2.5% of the circulating bonds. The 60 billion purchased by ECB stimulated the new issue of 150 million euro, although a great amount of the new issues only represented a switch between uncovered bonds and bonds that were covered by a collateral. In fact, the credit system tried to reduce the credit risk by issuing credit tools covered by a collateral that guaranteed its value and by getting rid of those tools that did not have a guarantee supporting them. However, the ECB was not able to reduce the credit risk anyway.

In May 2010, the escalation of the sovereign debt crisis continued to trouble the European financial markets (De Pooter, Martin, and Pruitt, 2012). On 10th May 2010, the ECB announced the Securities Markets Programme (**SMP**), which allowed ECB to buy public debt in the secondary market. The ECB applied this action only in those market segments which needed greater depth and liquidity (i.e. mainly in the Italian and Spanish market), in order to lower its yield.

SMP differed from other asset-purchasing programmes. First of all, no announcement was made of market purchases by ECB but the market was left to act in an independent way. Secondly, ECB announced that the purchases of assets would be used for stable monetary policies, though it would implement direct policies in the re-absorption of SMP. **Picture 2.1** shows that the monetary basis of the monetary Union did not increase between July 2010 and July 2011. Therefore, SMP does not go under the name of Quantitative Easing. On 7th December 2012, ECB held 208 million € of sovereign debt thanks to the SMP.

The crisis of the European sovereign debt continued to trouble the European and US markets in the autumn of 2011. As an answer, on 6th October 2011, the ECB announced a second round of covered bond purchase programe (CBPP) and the increase of the 12-month LTRO. On 8th December 2011, the ECB

[20] The Credit Easing Policy tools used by central banks to make credit more readily available in the event of a financial crisis, such as the one experienced in 2007-2008. In the United States, the policy tools , as described by Federal Reserve Chairman Ben Bernake in early 2009, include "lending to financial institutions, providing liquidity directly to key credit markets and buying longer-term securities.

called for more auctions, this time of 36-month LTRO. Buiter and Rahbari (2012) think that the 36-month LTRO announced in December 2011 was not only meant to give liquidity – as was announced – but was also meant to finance cheaply the purchase of the sovereign debt, thus allowing the ECB to fulfill its duties. The crisis of the sovereign debt in Europe continued in summer 2012, as was not sure Spain and Italy's solvency. On 2nd August 2012, the governor of the European Central Bank Mario Draghi announced that there would be an expansion in the purchases of sovereign debt, then giving the operative details only in September 2012. The programme of monetary transactions was called OMT (Outright Monetary Transactions) and known as the natural substitution of the SMP programme. OMT allowed ECB to buy the sovereign debt of the euro area on the secondary market, for the countries considered suitable. As for the SMP operations, the OMT will later on be sterilized and will not influence the monetary base. ECB announced the purchase of 60 billion euro in guaranteed bonds in 2009 and of 40 billion euro of similar purchases in 2011, for a total of € 100 billion, then reaching the amount of 220 billion euro thanks to SMP. Most of these were made during two episodes: between the spring/summer of 2010 (with particular attention to Greece, Ireland, and the Portuguese debt) and in the summer of 2011 (focusing on Italy, Spain, Portugal, and on the Irish debt, but without purchases of Greek debt). The total amount of purchases by the ECB was approximately of 320 billion euro (including the sovereign debts). As afore-mentioned, most of these purchases were sterilized, thus inverting their effects on the monetary base. Since 25 January 2013 the banks have had the possibility to pay back the funds borrowed over three years on a weekly basis. Upon a total of € 1,018.7 billion borrowed over two/three years from ECB, the total repayment between 25th January and the 27th June 2013 were € 205.8 billion and € 101.7 billion during the first and second LTRO. This reflects an anticipated repayment for approximately 59 % of the initial net injection of liquidity by the central bank into the market. Since the dimensions of the two operations only differed by 30 € billion, the refunds of the first LTRO seem to reflect mainly a preference to maintain the funds with a greater life span left. This factor is particularly relevant for the counterparts which have obtained funds in both the operations. With this last operations we can consider the first Quantitative Easing concluded. Therefore, from now on we shall refer to it as "Quantitative Easing 1" performed by the European Central Bank between 2008 and 2012. On 4th April 2013 the ECB executive Board decided that the interest rate on the principal refinancing operations, the interest rates on marginal refinancing operations and on overnight deposits will remain unchanged at 0.75%, 1.50% and 0.00% respectively, arriving at even greater cuts in the following periods. Moreover, it was decided to reduce the interest rate on marginal refinancing operations by 25 base points to 0.75%, with effect from 13th November 2013, and to keep the deposit rate unchanged at 0.00%. On 15th October 2014, ECB then decided to start the third purchase trance of cover bonds (CBPP3) and only 4 days later, to start the purchase of Asset backed securities (ABS) too, thanks to the asset baked security purchase program (ABSPP), starting the second stage of Quantitative Easing ("Quantitative Easing 2"). CBPP3 and ABSPP further reinforced the transmission of the monetary policy, making it easier to issue credit in the economy of the euro area,

aiming at generating positive outcomes towards the other markets and, subsequently, to foster the orientation of the ECB's monetary policy and to contribute to bringing inflation rates to levels closer to 2%. In the scope of the single monetary policy, the definitive purchases of suitable guaranteed bonds by the central bank and of ABS were implemented in a uniform and de-centered way, in order to cover all of the Euro system in a suitable way, differently from what had been done before with SMP, where the focus had been kept on the critical sectors of the market.

On 20th October 2014, the Euro system formally started to purchase guaranteed bonds. The programme had a length of at least two years, in conjunction with ABSPP and with the longer-term refinancing operations, which will have a considerable impact on the ECB balance.

On 22nd January 2015, the decision was made to further expand the monetary policy by increasing the monthly purchases of assets to 60 billion euro, meant to be carried out at least until September 2016. In order to satisfy the price stability target of the ECB, this programme has seen and will still see ECB add the purchase of state securities for its existing programmes to the purchase of assets from the private sector, in order to face the risks of a too long period of low inflation. The executive Board made this decision in a situation where most of the inflation indicators in the euro zone were close to historical minimum.

The purchases of securities provide a monetary stimulus to economy, in a context where the ECB reference rates are at their lowest limit. They make monetary and financial conditions even easier, making the access to financing less expensive for businesses and families. This aims at supporting investments and consumption and contributes to the return of inflation rates towards the objective level. In March 2015 also PSPP (**Public Sector Purchase Programme**) was introduced, because of the insufficient effects obtained with the previous policies. 88% of purchases was focused on governmental bonds and bonds of recognized agencies; while 12% was focused on the purchase of debt tools issued by super-national and banking institutions.

On 10 th March 2016, after the last implementation of **ABSPP** enforced on 10th September 2015, Draghi decided to introduce **TLTRO** (Targeted Long-Term Refinancing Operation). Taking inspiration from the initial LTRO operation, Draghi implemented the emission of direct credit with this refinancing operation over a period of 4 years, drawing the financing offer towards a longer perspective.

As we can notice from **Figure 3** and **4**, the Balance of the European Central Bank increased because of these expansive monetary policies, passing from the 39 billion euro held in 2006, to the 1,161 billion in 2016. The assets held by the ECB more than doubles (+141%) between 2006 and 2016, passing from 1,150 billion euro to 2,780 billion euro. Also to be mentioned, the loans issued in favor of the European credit institutes between 2008 and 2009 (point 5), which have seen the increase of their own presence in the balance of the Central bank for approximately 1,126 billion euro, +150% compared with 2006.

The ECB has clearly foreseen a divestment plan, but only when the inflation target has been reached. In fact, for the refinancing operations before the introduction of TLTRO II, we noticed a descent from the

maximum peak reached in 2012, arriving at stabilization again around 500 billion euro in 2015. Whereas, for APP policies, an increase will be expected in the next few years rather than a decrease, given the minimal results obtained so far.

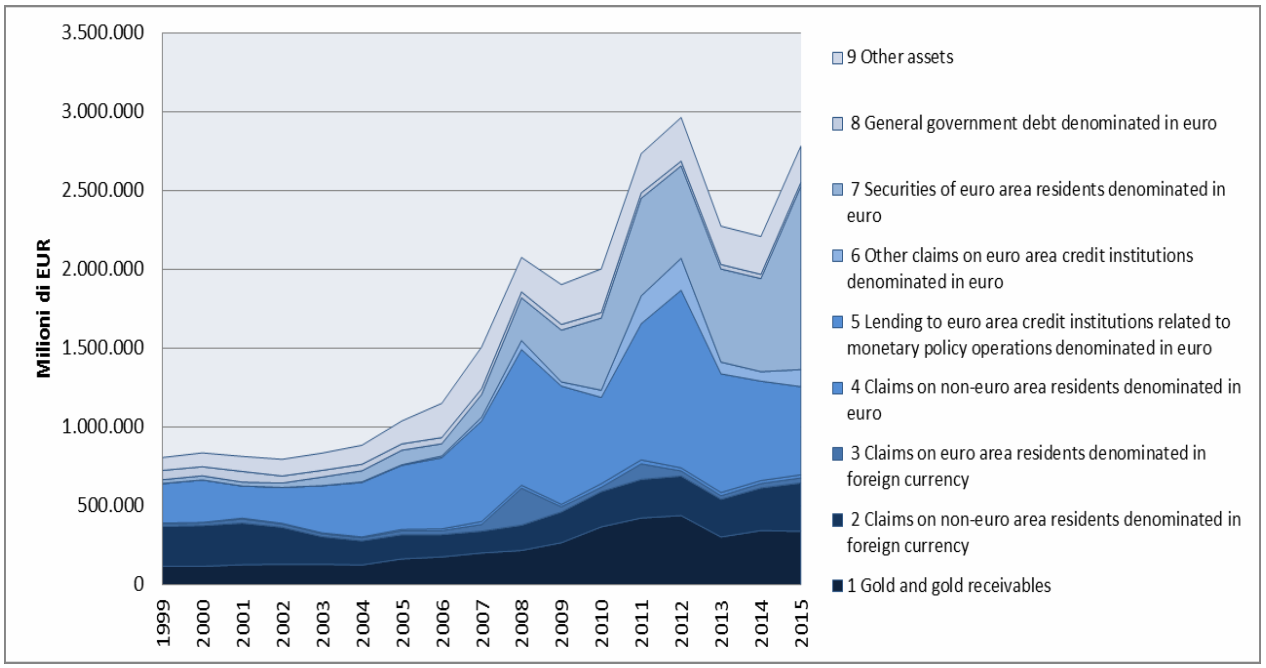


Figure 3 Assets ECB 1999 - 2015

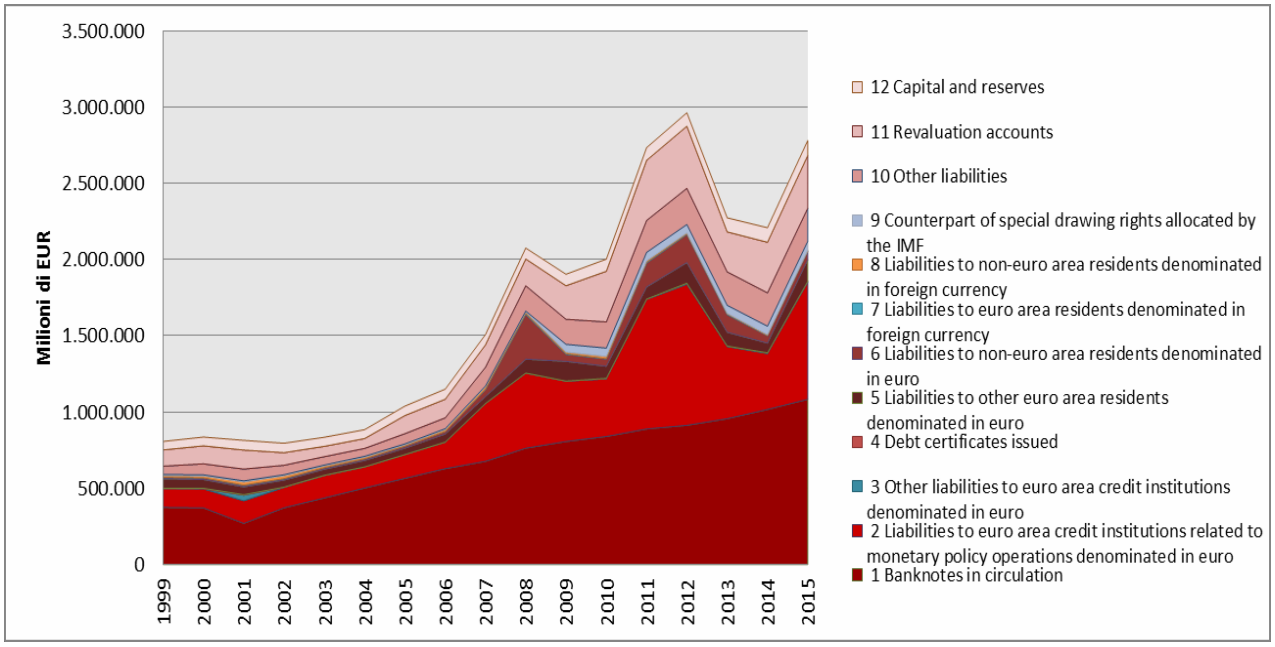


Figure 4 Assets ECB 1999 - 2015

1.5. Results and issues which have emerged from the application of the anti-crisis measures: the problem of inflation

Monetary policy strategies are based on two approaches: **monetary targeting** and **inflation targeting**. The European Central Bank combines elements of both approaches without, however, identifying completely with either one. In pursuing its objectives, the ECB makes use of a set of indicators that signal the need to enlarge or to restrict the volume of liquidity. It is known that monetary stability control can have different theories, the doctrine is divided between two schools, one of which recommends a monetary targeting, the other an inflation targeting.

The **first school** is linked to the traditional quantity theory of money, considering the increase in the quantity of money in circulation as the main cause of inflation[21]. In this perspective, the first item to keep under control is the trend of liquidity of the economic system, since each increase in liquidity could be (though not necessarily) the cause of an upward price movement.

The **second school** moves from a wider theoretical framework and recognizes that the rise in prices (although not necessarily accompanied by an increase in the money stock, or velocity, or both) can derive its origin from different factors, such as an increase in global demand (investment, government spending, exports), higher wages , an increase in international prices etc.

It is therefore necessary to control price developments. The ECB employs a mixture control based on two pillars. The first is the **monetary pillar**, essentially the amount of money. The ECB considers as money stock a very broad monetary aggregate, equivalent to what is called M3 (cash, overnight deposits, deposits with a fixed maturity of not more than two years, deposits redeemable at notice of up to three months, promissory notes, and other securities yet)[22]. The strategy of monetary targeting is based on the announcement by the Central Bank of a monetary aggregate growth rate considered relevant[23]. The Central Bank's action focuses on achieving that rate of growth; as soon as the amount of currency deviates from the expected growth path, the Central Bank intervenes by adopting appropriate corrections. Theoretical studies suggest that the approach of monetary targeting works well only in the presence of a considerable stability of money demand function. This strategy was adopted with significant results by the Bundesbank.

The strategy of **inflation targeting** is instead based on the announcement by the Central Bank of a desired amount of future inflation and decide corrective action whenever an actual inflation deviates from the programmed. The advantage of this approach is to make visible and clear the orientation of the ECB; in fact, it is required to explain to the public the reasons for the failure to achieve the objective of inflation, making it more credible commitment to pursue price stability. The main drawback of inflation targeting is

[21]Graziani A. The Monetary Policy of the European Central Bank Paper Economisti a.IX , Supplement at n. 1/2004, P.47 and ss.

[22] The ECB considers warning sign for monetary stability that the M3 will grow at a higher rate to an increase of 4.5% reference currently. See Graziani, The Monetart Policy of European Central Bank, Rev. IT. Economista/a. IX, supplement n. 1/2004, p.47ss

[23] Amighini O., Blanchard A., Giavazzi F. Macroeconomics. An European Prospective, the Mulino 2011, p.78.ss

that the inflation rate is not directly controlled by the Central Bank, therefore, different measures aimed to reduce the inflation can be applied, this can influence prices.

In order to achieve the objective of price stability, the ECB has adopted a strategy based on two pillars The first concerns the monetary, namely the amount of currency to be introduced into the system to sustain growth of income. So, given that inflation is a monetary phenomenon (Friedman) the money must have a central role:

$$m + v = p + y \quad (1)$$

Where m is the stock of money, v is the velocity of circulation, p the price level and y real GDP (all variables are in logarithmic form). We can also write it in term of differences. After few steps we get:

$$\Delta m = \Delta p + \Delta y - \Delta v \quad (2)$$

where **Δ** indicates the annual variation.

Since we are considering variations in logarithmic form, the equation can be interpreted roughly in terms of growth rates. The growth rate of the stock of money must be the same as the inflation rate target plus the growth rate of the economy minus the rate of growth in velocity. Referring to the ECB is simple to prove the thesis sustained by it, namely the **inverse relationship between interest rates and price level**s. Let us consider the case of an increase in rates being, among other things, that the trend of recent months in the Euro area.

A rise in rates of policy leads to a rise in bank interest rates and market. Also, most likely, operators will have expectations of further increases. The increase in funding costs will result in a reduction in investment, which will affect even the productivity in the area. Asset prices move in the opposite direction of interest rates, thus decrease. The demand for money will decrease. The increase in the interest rate of a zone, relative to other causes an appreciation of domestic currency against the currencies abroad. The appreciation of the euro will encourage imports, but will work against exports. The lower cost of imported goods will result in lower prices for final goods[24].

This will result in a decrease in overall demand for domestic goods helping then to lower the prices. The dynamics of supply and demand of goods will change accordingly and the result will affect labor market too. The decrease in prices will obviously affect the wage level.

In the classical theory, it is hypothesized that an increase in demand leads to an increase in the level of production. Given that firms faces fixed costs (fixed for any production level) and variable costs (generally consistent up to the level of full utilization of production capacity), the increase in the level of production will reduce the average price per unit of output as fixed costs will be "written off" by the greater number of units produced.

Monetary policies based on inflation targeting have been implemented in recent years with satisfactory results in Canada, New Zealand, United Kingdom and Sweden . The positive results achieved from these countries are not sufficient to establish the superiority of the inflation targeting approach than the monetary

[24] Angelici P. "effetti di liquidità e di annuncio nell'area dell'Euro ", Tema di discussione N. 451 BDI, ottobre 2002, p. 45 e ss.

targeting, because the period under consideration is too short and refers to a context of moderate inflationary pressure, where it is easier to achieve the goal of price stability.

In that scenario, the European Central Bank decided to pursue an approach called "stability-oriented monetary policy strategy" where alternate elements from the two different strategies above. The ECB has developed a **strategy** with regard to monetary policy decisions. First, the strategy sets final goals and intermediate ones. One point on which the ECB expressed very clearly is that none of these indicators are taken as decisive for immediate and automatic action. The quantities taken as indicators are considered as a whole and the measures to be taken are decided only after a weighted evaluation. This attitude appears to be justified and reasonable. For example, if the amount of money were taken by the ECB as an automatic indicator of danger, all time observers see growing liquidity in more than 4.5% per annum, they could count on the fact that the ECB considers monetary stability in danger, and it would trigger speculation against the euro. The adoption of this set of indicators was called by some a system of *monetary targeting lit.* In fact, the main objective of the Euro system is to maintain price stability. It is now necessary to assess whether the **effects of monetary policy** on prices and product variations **are homogeneous** in the euro area and over time. Asymmetries between countries and regions can arise for a number of reasons and take many forms. First, different cyclical positions "*can give rise to different effects. Secondly, differences in the nature of the product and production techniques can generate different impacts of monetary policy across sectors. Thirdly, a number of factors could cause differences between countries such as the regulatory and institutional framework, the sectorial breakdown of the product and so on*".

Understanding and knowing the factors that determine asymmetries in the transmission of monetary policy is important because it can help evaluate the overall transmission process, selecting the best indicators and, more importantly, identifying vast areas that might require structural reforms of labor and financial markets,. The monetary policy transmission mechanism always acts in close correlation with the changes taking place within the institutional dynamics. Institutional dynamics are directly related to other forces such as technological change and demographic changes that affect both the short and long term within the economy. There are several reasons why monetary policy changes can affect different sectors of the economy. A very important place is occupied by the demand for their products which is directly tied to the interest rate.. Very important are also the changes in interest rates that have a direct influence on exchange rates. Eventually, it should be noted that the same monetary policy can influence the financing of businesses through its effects on the value of the securities , also the availability of collateral is to any extent sector-specific. A crucial issue is the lack of control by the ECB of the differences in price trends for individual countries. This is because the Treaty gave the ECB and the national central banks a complete institutional independence in order to achieve the objectives in the most appropriate way, also in view of the fact that such monetary policy is inevitably related very closely with policies put in place by the institutions in individual countries of the Monetary Union. This institutional independence wants to avoid

the risk of political pressure aimed at short-term objectives that could undermine the goal of maintaining price stability[25].

This does not mean that monetary policy decisions should never look at short term but only in accordance with the headline goal. A monetary policy geared only for the short term would create inflationary surprises while keeping the product above the "potential" or unemployment below the "natural" level. Opportunistic maneuvers directed to these objectives "neighbors" do not represent most of the surprises, but would be accumulated into current pricing principles by creating an actual current inflation. And that , in the medium to long term, it would produce a permanently higher inflation. In fact products and employment levels tend to a wider horizon at their "potential" or "natural" and not derive any benefit from the rigging work in the short-term. Only structural reforms that can be implemented over time can provide positive change in these indexes. This is one of the fundamental reasons why the Central Bank, especially in the early years, has focused on the need to make more flexible and efficient markets. In this type of operations, there's also the problem of the loss of credibility of the Bank. If even the Bank itself states that, it is its intent to pursue the price stability, in fact, no one would give weight to such statements in front of conduct aimed to stimulate growth or employment in the short term by increasing inflation. It is the ECB itself that states that the pursuit of price stability over the medium term is the best choice for monetary policy. In the box headed "the benefits of price stability" shows four arguments in favor of its argument.

Amended on not maintaining price stability with the consequent reduction of social and political instability creates well being, as demonstrated by empirical evidence throughout the twentieth century. All these arguments are confirmed by economic evidence showing that in many countries, analyzing different historical periods, "Nations with lower inflation , grow on average faster" and, in real terms, this is evident especially in the medium term. By extending this policy in several Euro area countries, this analysis is able to show how the benefits may be even greater than in the United States ". The benefits of price stability oriented the choice to make it the primary objective of monetary policy. Decades of experience and a large number of empirical studies lead to the belief that a monetary policy that manages to maintain price stability in a credible manner, and contributes to achieve high levels of economic activity and

[25] The transmission of monetary policy in the euro zone materializes, as told through different ways that directly affect the prices of goods and services. All modes of transmission of monetary policy called "monetary transmission mechanism" which is the combination of several channels that allow you to directly affect the real economy.

The transmission mechanism is divided into two phases: in the first, changes in the interest rate or the monetary base determine changes in financial market conditions, reflected in market interest rates, prices of financial assets, the exchange rate and the liquidity and credit conditions in the economy; in the second, the changes in financial market conditions determine variations of nominal spending on goods and services by households and businesses. There are two approaches for determining the significance of the different transmission channels of monetary policy. On the one hand you can use structural econometric models in order to identify some of the channels and their relative importance in terms of quantity at the macro level. A negative aspect of this solution consists in the fact that the analysis is dependent on the model and that the result can be partially induced by the choices related to the model. On the other hand, you can employ disaggregated data resulting from the balance sheets of companies financial and banking institutions to analyze some fundamental links of the transmission mechanism, such as the role of financial factors and the supply of bank credit ". This approach is particularly promising in view of the importance of bank loans between sources of financing in the euro area. With this type of research, however, "it's always easy to deduce the macroeconomic importance of supporting evidence of the relevance of financial factors in the mechanism. Therefore, the empirical evidence obtained through the two approaches are complementary and should be considered jointly "the ECB MONTHLY BULLETIN, October 2002, recent results on the transmission of monetary policy in the euro area, pg. 46".

employment by preventing an arbitrary redistribution of wealth and income as a result of unexpected inflation or deflation.

2.Federal Reserve Monetary policy 2008-2012

Following the speculative bubble in the real estate market and the subsequent Lehman crisis, the United States were the first to experience a situation of price collapse, interest rates close to zero and a crazy financial market. For this reason, starting from 2008, FED decided to support its markets injecting liquidity in the financial system in various ways.

On 18 th September 2008, Fed widened its Exchange lines in foreign currency with the foreign central banks, and in October it announced that its exchange lines with BOE, ECB and the Swiss National Bank would have accepted any requested quantity of funds.

On 19 th September, the United States' Treasury guaranteed the monetary market of deposit common funds (FMA) and Fed created the Asset-Backed Commercial Paper (ABCP) program in order to increase the system liquidity.

On 7 th October, Fed created the Commercial Paper Funding Facility (CPFF) to buy high quality commercial paper directly. Although FED had already intervened in the financial market with the Term Auction Facility, these actions were the first to expand the monetary basis.

In November 2008, Federal Reserve announced a purchase plans for 100 billion dollars in debt of governmental securities in debt obligations of Fannie Mae, Freddie Mac and Federal Loan Banks. Moreover, the Fed cut the key interest rate near zero.

In December 2008 the Fed started the purchase of 500 billion dollars in mortgage-backed securities (MBS) increasing them later on.

In March 2009, the Fed expanded the mortgage purchase program and said it would have purchased $750 billion more in mortgage-backed securities. The Fed also announced it would have purchased up to $300 billion of longer-term Treasury securities over a six months period. In November 2008 and in March 2009 the asset purchase program called Quantitative easing 1 "QE1" was planned to support the whole economy, though obviously giving priority to the real estate market, which had been particularly under pressure between 2006-2008 because of the decrease of prices in the US housing market. About 80% of purchases performed by Fed in the first round of Quantitative Easing focused on the purchase of MBS and of debt tools relating to the American "Housing".

The Federal Open Market Committee (FOMC) stated that the initial Large Scale Asset Purchase (LSAP) objective was to "reduce costs and increase the availability of credit for the purchase of housing, which would subsequently support the real estate markets and foster better conditions in the financial markets in general".

Gagnon et al. (2011) claim that the purchases of November 2008 and March 2009 lowered the US real long-term interest rates due to their effects on forward premia.

What was expected to happen was to lower mortgage interest rates and increase availability of credit to help support the housing market and improve financial market conditions.

The reaction of the market was that mortgages rates dropped more than 5% after QE1 started.

Thanks to these operations, Fed had managed to induce the market towards more positive trends already in 2010. However, real economy did not grow, while keeping the consumption goods index below 1 %, showing a worrying deflationary situation for the world's first economy.

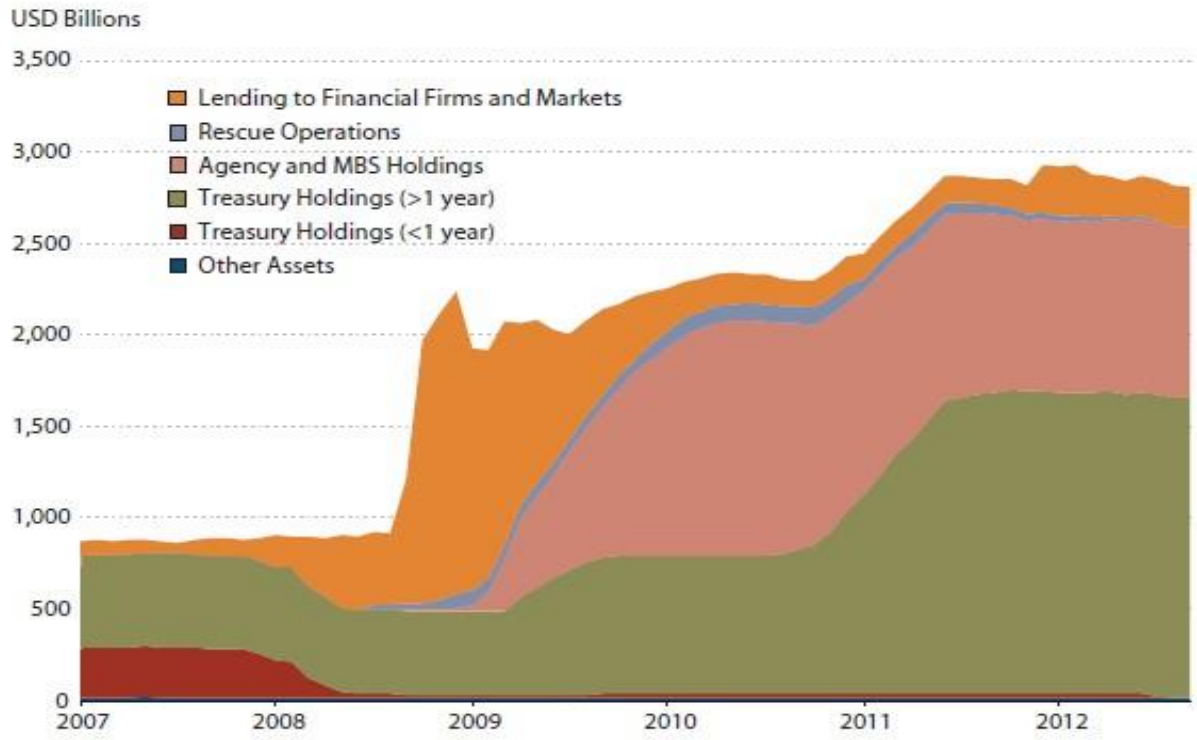
On 10th August 2010, Fed announced that it would have kept the dimensions of its balance under control by re-investing the principal payments of LSAP actions in Treasury bonds. On 27th August 2010, the chairman of Fed, Bernanke suggested buying more goods, if conditions required it.

After having stated his intentions, FOMC finally announced on 3rd November 2010 the purchase of a further 600 billion dollars in US Treasury bonds in order to "promote at a faster pace an economic upturn and to contribute and guarantee that inflation – in due time – would go back to reasonable levels ".This program was called "QE2", explicitly planned to lower long-term real interest rates and to increase the inflation rate to levels considered more coherent with the FED's mandate.

Contrary to what expected , loans rates rose more than half a percentage point in around a month after QE2 started. When the program ended, the 30 year fixed rate mortgage was about 30 basis points higher than it was when QE2 started. From January to June 2011 it rose from 4.00 to 5.50%. %.

In June 2011 QE2 ended, some mortgage lenders expected and feared that rates would have risen, but what happened was that mortgages tumbled and rates reached record lows, from June at 5.50% to August 2011 at 4,25%.

Figure 5 FED active 2001/2012[26]



[26] Source: "four stories of Quantitative Easing" Brett W: Fawley and Christopher J.Neely.

Figure 5 shows the growth of long term Treasury bonds held by the Federal Reserve, while **Figure 6** shows the effect on the monetary base from the beginning of the year 2011.

Figure 6 FED Monetary Base 2007- 2012[27]

At the end of summer 2011 there were new fears of recession in the USA. As answer, Fed announced a third round of purchases of long-term treasury, officially defined Maturity Extension Program and Reinvestment Policy (September 2011). The programme was nicknamed "Operation Twist", because Fed sold 400 billion dollars of short term and bought 400 billion in long-term securities, in order to reduce the long term interest rates thus "twisting" the yield curve.

Operation Twist didn't expand the monetary base because the purchases of long term assets were financed by the sales of short term assets rather than by the creation of money.

In the same meeting, the "FOMC" also announced its will to start reinvesting the mortgage backed securities (MBS) near the expiration date and the agency debt in other MBS rather than in Treasuries.

The Federal Reserve itself had tried to influence the long end of the yield curve with a previous Operation Twist in the early 1960s. Modigliani and Sutch (1966) believed this previous attempt to lower long-term rates was rather successful, probably because the purchases were not sufficiently big and compensated by new issues of the Treasury (Blinder 2000).

On 20th June 2012, Fed announced that it would have extended its program ,which would have enabled Fed to buy long-term Treasuries and an equivalent amount of short-term Treasuries until the end of the year.

The final purchases of the program had originally been planned for the end of June continuing with the same pace, arriving at a total of purchases/sales of 267 billion.

Despite this effort, the labor market remained stagnant. During his annual speech at Jackson Hole, the president Ben Bernanke recognized that "*the labour market stagnation, in particular, is a serious concern*" and that "*the Federal Reserve will enforce additional policies, if necessary*".

As was widely expected, this lead on 13 September 2012 to announce a third round of Quantitative Easing "QE3". In an 11–1 vote, the Federal Reserve decided to launch a new $40 billion per month, open-ended bond purchasing program of agency mortgage backed securities "MBS". Differently from the previous Quantitative Easing program, however, Fed committed to constant and extended purchases, rather than

[27] Source: "four stories of Quantitative Easing" Brett W: Fawley and Christopher J.Neely.

purchasing everything in one trance.

Fed thus started buying MBS with a monthly pace of 40 billion dollars until the labour market perspectives would have improved substantially.

In December 2012, FOMC announced that the purchases of long term Treasuries within the Maturity Extension Program would have continued at the pace of 40 billion dollars per month, further expanding the monetary base.

Federal opening market committee (FOMC) announced that it would have likely maintained the federal funds rate near zero "at least through 2015". The central bank continued to sell short-term bonds and use the money to buy long-term bonds, keeping interest rates near zero. This action was also extended over this period.

QE3 was expected to hold rates down or reduce them on mortgages and other financial instruments. It was hoped that with new cash injections, banks would have lent out the money and given the economy a boost. However the 30-year and 15-year fixed-rate mortgages initially fell but then it has bounced up and down from 5% to 3% and up again.

In September 2013 the FED began reducing its 85 billion per month dollar purchase to 10 billion. The central bank continued to keep the federal fund rate from 0 to 0,25 % and expected to keep it unchanged at least as long as the Fed would have reached its goal of maximum employment, and an inflation rate around the 2% goal.

The Fed wanted to maintain downward pressure on longer-term interest rates, to support "mortgage markets" and to promote economic recovery.

Industry experts anticipated that mortgage rates would have been higher as a direct result of QE3 ending, since the program was maintaining downward pressure on rates, loan rates increased, but only in the short term. The average for the benchmark 30-year fixed-rate mortgage rose from 4.05% the week before the Fed's October 2014 meeting to 4.1% the week of the meeting.

By the end of 2014, rates had fallen to just under 4%. They declined further to the high 3% through the first quarter of 2015, but had reversed course by the end of the second quarter.

We will now show the main effects of the three stages of American Quantitative Easing.

The paper "Four Stories of Quantitative Easing" by Brett W. Fawley and Christopher J. Neely (2013) takes into account the effects on the American Treasuries and of the American corporate bonds. Thanks to an investigation carried out by the researchers of the university of Massachusetts (Montecino, J.A, Epstein, G, (2015) "The Political Economy of QE and the Fed: Who Gained, Who Lost and Why Did it End?"), we will then analyze the equity market.

2.1 American state bond market

For the long-term Treasury bonds, the first LSAP programme (started in 2009) consisted in 300 billion dollars of purchases by the Federal Reserve, whereas the second programme (from the end of 2010 to the

first half of 2011) consisted in 600 billion dollars of purchases (P**icture 4.2.3**).

The calculations suggest that the first LSAP program reduced the yields of long-term Treasuries by approximately 35 base points; the second program, bigger in quantity though smaller for its length, reduced the yields of long-term Treasuries by approximately 45 base points. These estimates are slightly higher than most of the estimates existing in literature. A direct comparison with the other estimates in literature is not possible because of the different systems and samples used.

Several other studies use event studies on LSAP rather than regression procedures, and their estimates are based on the period before LSAP, while the possibility of structural changes in the markets, in particular during the financial crisis, may complicate the task of defining exactly the effects of LSAP. Another important reason making their estimates higher than those of other studies is that they try to assess both the effects of shortage and of length of LSAP purchases, rather than one effect or the other.

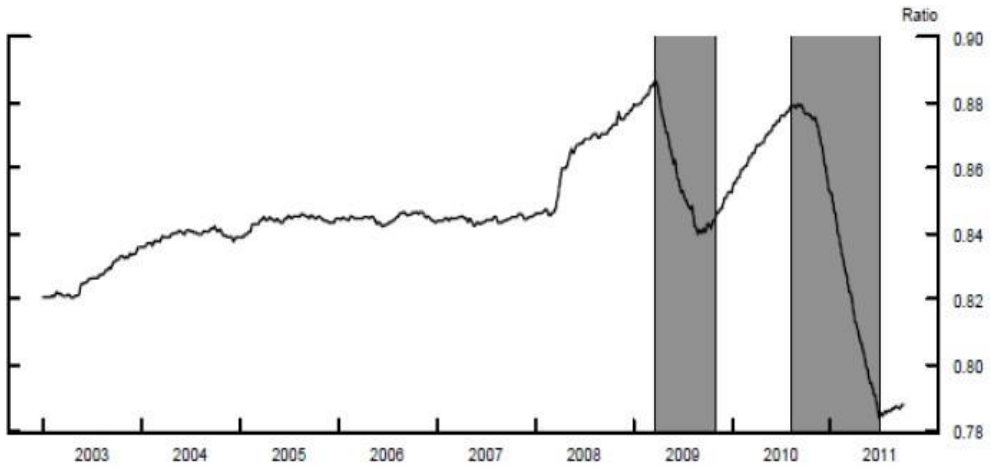


Figure 7 Private held treasury securities/ Total outstading

According to their estimates, every Large scale asset purchase "LSAP" programme corresponds to a substantial loosening in the monetary policy.

In order to quantify to what extent Quantitative Easing actually influenced rates, we need to consider the scenario before the crisis and how it was possible to obtain a change in the rates of the Federal funds before the crisis, using conventional tools.

Bernanke (2011) and Chung, Laforte, Reifschneider, and Williams (2011) suggest that a change of 25 base points in the Treasury Securities rate is on average associated with a variation of about 100 base points in the federal rates. Applied to estimates, this rule suggests that the first Treasury LSAP programme equaled a cut in federal rates of about 140 base points, while the second programme equaled a decrease of about 180 base points. The consequence of this leads the average American investor to concentrate on other riskier markets, such as equity and corporate bonds.

2.2 The American corporate bond market

The riskier bonds, such as corporate bonds with low rating and MBS, had their insolvency risk lowered and their premium for an anticipated redemption risk reduced. 10-year CDS on business bonds with Baa saw their yield drop of about 40 basis points during QE1. These effects on the prices of Credit default swap "CDS" and Mortgage backed security "MBS" could be due to the reduction of risks in the financial sector or to the impacts of a mortgage refinancing boom and its impact on the real estate market and as a consequence on consumptions.

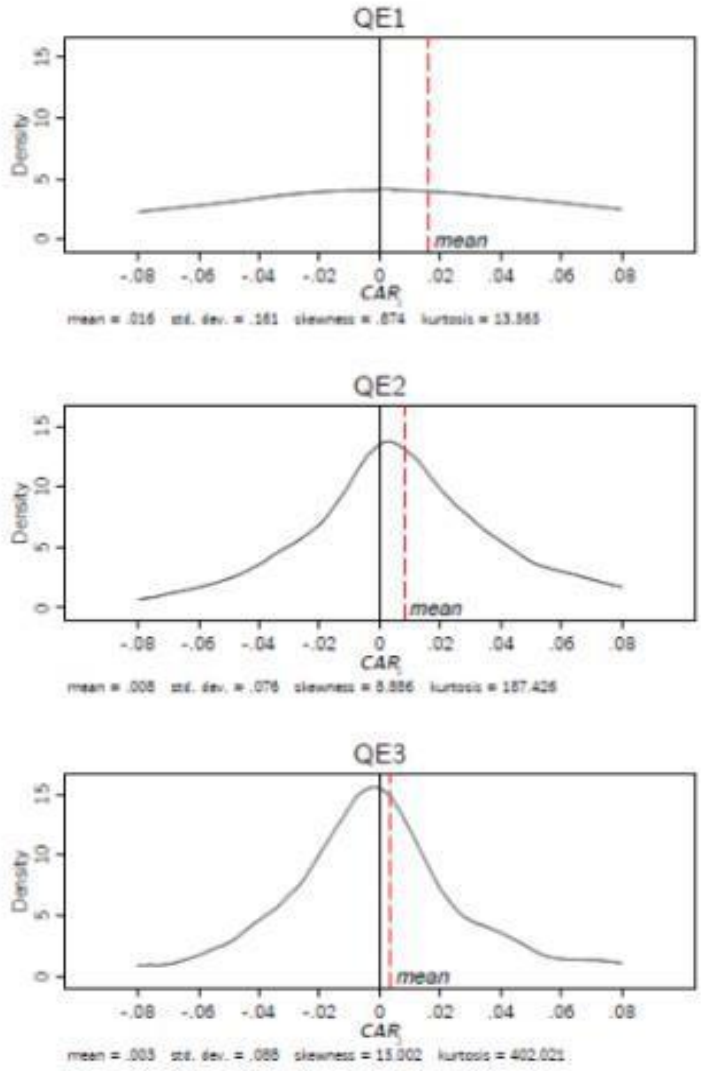
In the second stage of Quantitative Easing we can highlight the effect of two transmission channels which determined a decrease in the yield. Firstly, the signaling channel reduced the yields of 5 years bonds from 11 to 18 bps and on 10 years bonds from 11 to 12 base points depending on the estimate system used. Secondly, the security channel lowered the yield of low risk bonds for default at 10 years from 5 to 10 bps. The effects of the third stage of monetary easing pass through a signaling effect and a rebalancing effect based on the purchases of MBS. The greatest decline was of 23 bps in MBS at 30 years and of corporate Aaa and Baa rates, falling between 15 and 17 bps. It is possible that since QE3 did not change the monetary base, the markets did not perceive that this was an inflationary action.

2.3 The American stock market

In this section we take into account the impact of Quantitative Easing on the individual share yields. Thanks to a research by the University of Massachusetts, "anomalous" yields were calculated for 3120 shares relating to the announcements of extraordinary monetary policies. This allows for the examination of the wider distribution of anomalous yields in the three rounds of Quantitative Easing and to assess evident changes in the course of time, if any.

The density of anomalous yields for each round of Quantitative Easing is assessed by using a core density assessor. This is shown in the **Picture 2.4**, where the whole range of each distribution was cut for exposure purposes. First of all we notice that the expected effect of Quantitative Easing is lower for each subsequent announcement, which shows that market operators become more familiar with these policies so as to nullify the effect of its announcement, and therefore lowering the anomalous yield. The average abnormal yield during QE1 had been of 1.6 per cent, while during QE2 it was 0.8 per cent and 0.3 per cent during Quantitative Easing3. Secondly, QE 1 was associated with a wider range of expectations compared to QE2 and Quantitative Easing3. In particular, the first round of Quantitative Easing had a far greater standard deviation compared with the following rounds. Moreover the estimate of the kurtosis of anomalous yields increases considerably in the course of the three rounds, passing from 13.6 during Quantitative Easing 1 to 40.2 for QE3.

Figure 8 Distribution of anomalous yields of American stocks during the three stager of Quantitative[28]



The first round of Quantitative Easing represented an important change in the management of monetary policy, and as such it came along with great uncertainty concerning the global effects of this new political regime. This shows why the familiarity of this policy slowed down the objective of increasing the prices general level for US equities.

2.4 The models of inflation targeting and monetary policy of the Federal reserve compared with the current crisis scenario

Monetary policy is one of the most discussed problems regarding the achievement of the targeting inflation. As regards European countries with the adhesion to a monetary union, they have lost their monetary policy, and more specifically exchange rate and adjustment factor. The realignment of relative prices (the so called exchange rate) takes place much more easily through realignment of exchange rates through prices and wages adjustment. As shown with all European countries but specifically with Italy. in the seventies and

[28] Source: Montecino,J:A Epstein,G,(2015) "The political Economy of QE and the Fed:Who Gained, Who Lost and Why didi t end")

eighties, the systematic restoring of exchange rate was easily controllable although there were negative inflationary spirals. Nowadays we are in the case that each country and currency , has lost this source of flexibility and we need to find alternative channels to absorb imbalances. First of all in my opinion the first element of flexibility is the mobility of the factors (in particular of work) , that for example in the United States is a very important factor of balance between the different States.. To avoid this adjustment through prices and wages (which in the European case, being average inflation very low, would mean a violent deflation in deficit countries), only a system of transfers between member countries remains.

The current scenario of the euro is certainly that inflation is still not rising. For this reason as seen before the end of 2009, the ECB also started to consider long term refinancing operation called LTRO.

The Long term refinancing operations (LTRO) are long-term refinancing plans which consist of an auction of liquidity in which the European Central Bank gives a 3-year term loan to the applicant banks with an interest rate equal to the average rate on refinancing operations mainly calculated in the same period of the operation. In return, the ECB receives from banks a guarantee on the loan, called "collateral." This collateral is usually composed of government bonds of the member States. But unlike the quantitative easing, the money created by the LTRO has a deadline, which is extendable to a maximum of three years.

The ECB announced it would give as much as required by the banks at a fixed rate. These operations carried out by the ECB despite being extraordinary measures to give a boost to the economy turn out to be very different from those adopted by the Fed. The ECB will sustain QE throughout 2017 too, and very recently the governor of the ECB Mr Mario Draghi has announced that these measures will continue throughout the year 2018.

Figure 9 USA Macroeconomics inidcators

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Nominal Gdp	10.934,39	11.148,3	12.547.039	12.546,31	13.058,34	13.502,45
Var. Real Gdp %	2,4	1,6	2,2	1,5	2,4	2,4
Population (milion)	309,4	311,6	314	316,4	318,8	321,3
Unemployement (%)	9,6	8,9	8,1	7,4	6,2	5,3
Public Debt	62,9	65,9	70,4	72,6	74,4	73,3
Inflation	1,4	3,1	2,1	1,5	1,6	0,1

According to data published by the Bureau of Economic Analysis[29], after + 1.5% in the third quarter of 2015, US GDP slowed down in the last quarter amounting to 0.7% annual and therefore in line with

[29] BARUCCI CORSARO S., MILANI C The point on unconventional monetary policies, Finriskalert, 2014, p. 74 e ss.

expectations. On average the product would have increased by 2.4%, as in 2014. The slowdown in the fourth quarter was due to consumption (up to + 2.2% from + 3.0% in previous quarter), to private fixed investment (down to + 0.2% from + 3.7%) and public spending (+ 0.7%, compared to + 1.8% previous).
The growth of real disposable income remains strong (+ 3.2% vs. + 3.8% in the third quarter) and in perspective should help to sustain consumption. A positive contribution also comes from the occupation, which in December increased by 292,000 units, recording the 70th consecutive month of growth.

Figure 10 Trade Balance

Export	**2013**	**2014**	**2015**	**Forecast 2016**	**Forecast 2017**
Total	1.189.037	1.220.398	1.356.976	1.370.593	1.432.713
Import					
Total	1.707.175	1.762.959	1.790.362	1.803.279	1.902.270

The data indicated show how the Quantitative easing in the US has paid off already since the year 2014. Progressive growth of the public debt, but steady reduction in unemployment in the period 2008-2010 had reached levels not seen for a country like the USA[30].
The important fact for my analysis, is that relative to inflation as a result of placing liquidity in the economic system, this proceeds with the substantial increases that allow for the absorption of the money in circulation. This trend has led to a recovery in industrial production, employment and consumption. Thus leading to beneficial effects in the medium term, with reference to the events of the 2008/2010 period.
In the years before the crisis, the Federal Reserve held activities between 700 and 800 billion dollars, almost entirely of short and long-term government bonds. The monetary policies implemented in recent years have significantly expanded its portfolio, which is currently estimated at more than 4,300 billion dollars. The short-term Treasuries have almost completely disappeared, while the long-term have increased significantly. In the Fed's balance sheet there are also 1.5 trillion of MBS (mortgage backed security).
Unlike the approach taken by the Fed and the BoJ, the euro area, through its economic and monetary institutions, has kept its interest rates relatively higher. The ECB undertook measures such as the isuue of bonds by the European Central Bank to finance productive investment, or a program of purchase the sovereign debt of Member States in difficulty.

[30] CHRISTENSEN, JENS H.E., JOSE A. LOPEZ, GLENN D. RUDEBUSCH . Stress testing the Fed. Federal Reserve Bank of San Francisco. Economic letter n.08. 2014.

In addition, the EU has not implemented policies on the demand side. It introduced a number of fiscal rules. As outcome to these policies, the results were as follows: higher unemployment and lower economic growth (or stagnation) , the opposite of economic growth and employment experienced in Japan and the United States.

From my point of view with quantitative easing we can have different outcomes , and not every time central banks and the different agencies that operates have the results they are looking for. This in some cases may cause higher inflation than desired if the amount of easing required is overestimated and too much money is created by the purchase of liquid assets. On the other hand, QE can fail to stimulate demand if banks remain reluctant to lend money to firms and households. There is a time lag between monetary growth and inflation; inflationary pressures associated with money growth from QE could build before the central bank acts to counter them. Inflationary risks are mitigated if the system's economy outgrows the pace of the increase of the money supply from the easing. If production in an economy increases because of the increased money supply, the value of a unit of currency may also increase, even though there is more currency available. Increasing the money supply tends to depreciate a country's exchange rates relative to other currencies, through the mechanism of the interest rate. Lower interest rates lead to capital outflows from a country to another one , thereby reducing foreign demand for a country's money, leading to a weaker currency. This feature of QE directly benefits exporters living in the country performing QE, as well as debtors, since the interest rate falls. However, it directly harms creditors as they earn less money from lower interest rates. Devaluation of money also directly harms importers, as the cost of imported goods is inflated by the devaluation of the currency.

Chapter 3

3.1 Monetary policies of the Japanese Central Bank (2001-2012)

Japan's response to the economic crisis, that began in 2001 and is still in progress was very similar to that undertaken by the United States and the European Union. Analysts, in the spring of 2013, defined the choice of Japanese liquidity in the monetary system as one of the biggest of the postwar liquidity creation operations, even higher than the amount of money introduced into the system level by the American one in the moments immediately following the collapse of Lehman Brothers. The Japanese attempt was a desperate attempt, and for this reason a very large one. The crisis in Japan is different from the one in the United States of America or the European Union because Japan compounded a decade of economic recession and deflation with prices of goods falling whirlwind except those of food. The decision taken by the Bank Of Japan was a strategy to overcome the economic stagnation and to enter a large amount of money within the economy. Such maneuvers, like what happened in the United States and in the European Union, are not without immediate consequences. Liquidity within the economy causes debt and therefore increases the Debt/GDP ratio.

A persistent situation of deflation brought forward from the end of the 90's combined with the estate crisis of 2001, obliged the Japanese Central Bank to intervene directly on the financial market with several measures. In order to increase its own reserves, BOJ (Bank of Japan) focused on the purchase of three types of assets in particular: long-term governmental bonds, derivative tools such as ABSs and ABCP, and shares held by financial institutions.

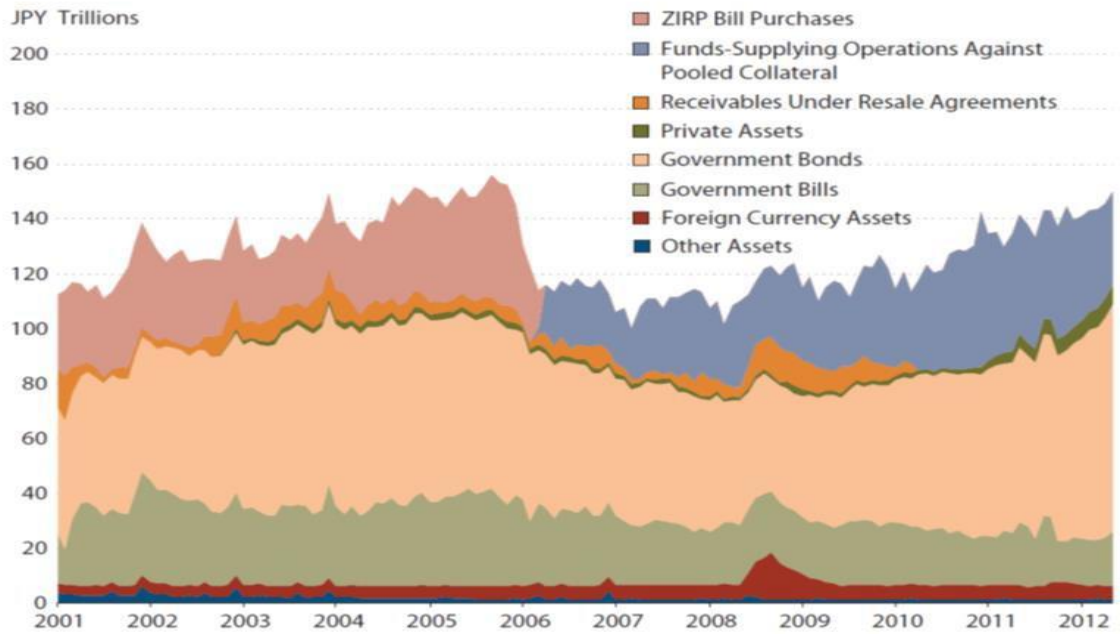


Figure 11BOJ active 2001/2012

On 19th March 2001, the Bank of Japan adopted a new pattern for monetary loosening called QEP (Quantitative Easing Policy) as an answer to an economic crisis triggered by the burst of the global IT bubble and by the estate one. Quantitative Easing had three objectives:

- Change the main target for market operations, passing from the non-collateralized overnight rate to the settlement of the CABs[31] held by financial institutions at BOJ.
- Obtain a growth of consumption prices or anyway do not remain in deflation.
- Increase the purchase of long-term Japanese government bonds (JGBs) in order to bring forward the right amount of liquidity.

BOJ started its action officially in August 2001, as it aimed at purchasing five trillion yen of CABs. The target began to increase following the decline of the economic activity, leading it right up to 30-35 trillion yen in January 2004, thus remaining unchanged until 2006. The liquidity introduced made the overnight rate shift from 0.02-0.03% in 1999, to 0.001% at the end of 2006. The second step was the purchase of long-term Japanese Government Bonds in order to reach the target placed on CABs, with an initial pace of 400 billion yen a month, then reaching 1.200 billion yen from the month of October 2002. In order to support these actions, BOJ introduced new purchases in the ABS market between 2003 and 2006. The consumption price index (CPI) became positive again at the beginning of November 2005, and reached 0.5% at the beginning of January 2006. In March of the same year, the Japanese Central Bank stated that the Quantitative Easing operation was finished, re-establishing the non-collateralized overnight rate as the target. At the end of these operations, BOJ announced the aim of reducing in the following months the quantity of CABs held, also depending on the conditions of the market. This divestment of securities went on without problems until July 2006, when BOJ increased the overnight interest rate. Bank Of Japan was compelled to intervene again in the financial market by issuing bank loans linked to the non-collateralized overnight rate (SFSOs program). On 19th December 2008, BOJ increased the purchase of Japan Credit Bureau (JGB) up to 1,400 billion yen, also thinking about starting to buy corporate financial tools. This took place in January 2009, with the purchase of 3,000 billion yen in commercial paper, Asset Backed Commercial Paper (ABCP) and corporate bonds, supported by regular buyers who put the price up thus reducing the risk for liquidity.

BOJ then increased the purchases of JGB passing from 1,400 billion yen to 21.6 billion in March 2009. In December 2009, the market adverse conditions led to the announcement of Fixed Rate Operations (FROs) with the will to repeat the Short Fixed Rate Operation (SFRO) programme, at least until March 2010. However, FROs were different from SFROs because the quantities were fixed beforehand, and guaranteed by a class of assets. Initially FROs were fixed at 10,000 billion yen with three-month expiry, later shifting

[31] Current Account Balances (Centra Bank Of Japan account balance subject to the complementary deposit facility)

to 20,000 billion in March 2010, after the end of SFROs. In addition 10 thousand billion yen were placed with a six-month expiry on 30th August 2010. Simultaneously to these liquidity support policies, Bank Of Japan added policies for the economic development. On 30th April 2010 it was decided, funds would be given directly to the financial institutions, with the programme 'Growth-Supporting Funding Facility' officially started on 21st May 2010. All the institutions were considered suitable and received an annual loan which could be extended up to a maximum of 4 years. BOJ issued loans for about 3 thousand billion yen at a rate fixed at the origin of the programme. In October 2010, BOJ announced the beginning of another programme: APP (Asset Purchase Program). APP included a wide purchase of several categories of assets, such as short and long expiry Bonds, commercial paper, corporate bonds, ETFs and estate investment funds. The purchase of private assets was necessary to reduce the existing difference between private and public yields. The objective of BOJ was in fact that of reducing the risk premia and the long term interest rate, in order to further expand the monetary basis. Initially APP was placed at 35 thousand billion yen, which included the 30 thousand billion of FROs and the 5 thousand billion of new assets purchased. In 2011, BOJ increased the purchase of new assets to 10 thousand billion yen and issued 6-month loans for a total of 5 thousand billion yen through FROs. In addition, it increased also Growth Supporting Funding Facility (GSFF), opening a credit line of 500 billion yen with two-year expiry for investments in equities and asset-based loans. In a way that was similar to that of BOE, BOJ also increased significantly its purchase of public debt between autumn 2011 and 2012. From October 2011 to December 2012, the Bank of Japan announced another purchase of 60 trillion yen in Japan Government Bonds (JGB) , Treasuries and a thousand billion yen in private assets as part of Asset purchase Program (APP). Bank Of Japan widened the GSFF programme on 13th March 2012, passing from 3.5 thousand billion yen to 5.5 thousand billion yen. Probably thanks to these policies, Japan's economy recorded a quite high growth in the first half of 2012, supported by the firmness of internal demand, though inflation still remained close to zero. Unfortunately, the Japanese economy experienced another decline in growth in the third quarter of 2012. Therefore, BOJ announced a further purchase of 11 thousand billion yen of public and private assets, and stated that it would institute the Stimulating Bank Lending facility (SBLF).

Through these bank refinancing operations, BOJ tried to stimulate loans in the financial sector, by making loans available at the non-collateralized overnight rate (0.1 per cent in December 2012) with a length of 1 to 3 years, renewable up to a maximum of 4 years. The only quantitative limit to the loan given by BOJ depended on the amount of real guarantees, which consisted in about 15 trillion yen, according to experts. Along with SBLF and GSFF they form what is known as the credit support programme, or 'Loan Support Program' (LSP). With the advent of of Shinzo Abe on 16th December 2012, the political autonomy of BOJ was at risk. In fact, Shinzo Abe set as a target to fight deflation, the growth of price level by 2%, thus going against the goal of 1% previously set by BOJ. To sum up, BOJ used through the years very similar non-conventional policies, consisting in the purchase of assets on the public and private market in order to

stimulate the economic growth through the increase of the inflation level (which was close to zero in both the periods we have considered).

In fact, we can see how both between 2001 and 2006 and between 2008 and 2012, though in a way that was different for its quality and quantity, BOJ used exactly the same non-conventional monetary policy to contrast the negative effects brought about by the two different crisis. The next section aims at analyzing the effects of the Quantitative Easing policy on indexes such as the Exchange rate, and interest rate. From Raphael Lam's work ("Bank of Japan's Monetary Easing Measures: Are They Powerful and Comprehensive", Lam (2011)) we find information regarding the main Japanese financial aggregates and the effects that monetary policies had on them.

3.2 The Japanese Bond Market

Sovereign yields for all maturities have fallen in three of the five events at the 5% significance level. The Japan Governmental Bond JGB has fallen more in relation to the higher maturity: 10 years has seen a decline of about 24 basis points, while two-year decline was 14 points, this is because they were already at a level very close to zero.

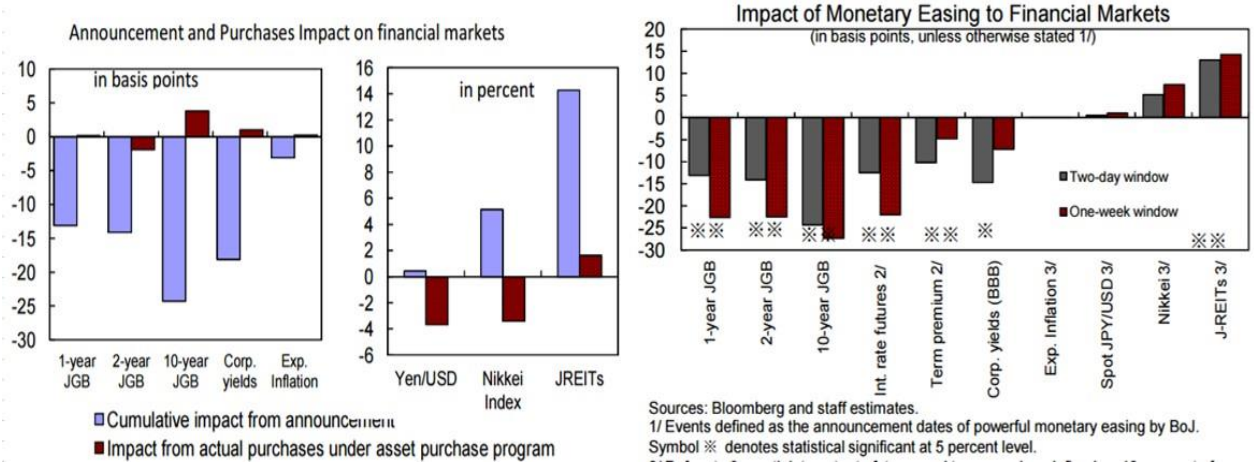


Figure 12 Quantitative easing on Japan debt security[32]

Yields on corporate bonds among the various investment levels have declined substantially between 15-22 basis points in the two days after the announcement (with a p-value of about 0.05), although the impact was substantially the same for the whole week. Bond issues also improve after the announcement of the asset purchase program (Bank of Japan, 2011)[33].

[32] Source: Bank of Japan's Monetary easing Measures: Are they Powerful and Comprehensive? W. Raphael Lam

[33] Bank Of Japan, (2011), Financial Markets Report, February (Japan) .

3.3 Consideration of the maneuvers taken by BOJ in respect to the one of FED and ECB

The decision taken by BOJ was a fast strategy to overcome economic stagnation. Japan is travelling at a speed that is twice the one of the US, with the aim of transferring in three years a volume of debts similar to the one transferred by the Americans in five years. The inflation risk is not to be considered for Japan or better is certainly not comparable to the European situation. It must be taken into account that deflation is affecting the economy in two ways .

First, persistent deflation has created a "deflationary psychology" in consumers, businessmen and investors. The longer the situation that occurred last , the stronger the deflationary expectations of economic agents become. Private consumption remains weak, and this is a symptom of worried consumers, who seek savings in the solution for tomorrow's uncertainties. Secondly, deflation is reducing the value of the yen in the cash flows of the companies with respect to the nominal value (which remains unchanged) of the companies debts. The scenario outlined for a country like Japan is no more sustainable like the one than in the European Union. If the operations put in place will not give the expected result the scenario that we will expect is very similar to that outlined for Japan. Japan has been in a deflationary spiral for the past fifteen years. In the United States this strategy worked because the world economy since 2008 has entered a deflationary phase, and since the world economic recovery is still far away, this same cycle should help Japan to contain inflationary pressures until at least 2015. The monetary stimulus has also added fiscal stimulus to industry. Exports started to increase thanks to a recovery linked directly to the depreciation of the yen already started five years ago. Tax revenues are increasing and these are matters to repay the debt in the hands of the central bank (BOJ). Although it can be said that Japan needs inflation, the undertaken strategy could lead to very heavy and difficult to control inflationary spirals. Here we could find a parallel with the situation in Europe that looks increasingly similar to that of Japan in the early years of deflation.

The austerity policy increases a deflationary spiral from which we could not go out for more than a decade. Moreover, the Japanese financial system is characterized by the prevalence of bank intermediation: both total deposits and lending consistently out-weigh the GDP, with a weight that is particularly high by international standards. This centrality of its role in financing the economy has led the banking sector over the years, to an increasingly stringent regulation, which resulted in a structure with different types of intermediaries. Each structure is geared to a specific field of activity. Considering the separation between the bank and the brokerage activity Japanese banks have distinguished themselves in relation to the time horizon and the territorial scope of operation. Possible strategies to exit from the economic crisis should definitely be directed to stimulate domestic productivity through liberalization and stimulation in the competition process. The low productivity of the sector of services also negatively affects the competitiveness of exports. Sectors such as retail, transportation, and telecommunications services would require greater efficiency. The people and institutions would thus be free to implement their plans without being subject to numerous administrative dictates. Although Japan is renowned for being a country that has always placed great importance in education, according to Roubini it would require some qualitative

reforms to promote recovery of the nation and to keep it from being left behind in the global technology race. The current executive, while following up the increase of tax on consumption from 5% to 8% from the financial year 2014, launched a program of Economic policy (renamed "abenomics") focused on growth, with the aim of permanently pushing the country out of deflation. The Shinzo Abe economic strategy is made up of the so-called "three arrows[34].

1. The expected inflation target of 2% with expansion of monetary base to achieve the goal of fighting deflation and indirectly weakening the national currency, thus promoting exports.
2. Raising the lever of public spending through a vast investment program across the country\
3. Structural reforms to sustain the country's growth in the medium to long term, with the ambitious goal of achieving a real GDP growth of 2% per annum over the next decade.

As mentioned before in section 3.1, the Bank of Japan initiated in recent years an unprecedented quantitative easing plan, consisting in doubling the monetary base within two years, the acquisition of long-term government bonds and an increase in new and diversified risk assets. Ultra expansive monetary policy contributed to the rise of the Nikkei Index and has led to the depreciation of the yen. The international competitiveness and the situation in the trade balance indeed represent one of the priorities. The action of rebalancing the trade balance, for many months so deeply in deficit, aims not only at the weakening of the yen. The ambitious goal 'to increase of up to 70% (from 19%) exports should be achieved in the field with the Free Trade Agreements by 2018. The signing of the Trans-Pacific Partnership is for the Abe government an important step forward on this front, also in order to strengthen the international competitiveness of traditionally protected sectors.

[34] BARUCCI, E CORSARO S. , MILLANI c. Il punto sulle politiche monetarie non convenzionali. 2014,75e ss.

Figure 13Macro-economic indicators

	2012	2013	2014	2015	2016	2017
Nominal Gdp	4.637.879	3.699.214	3.461.874	3.722.634	7.015.886	3.774.210
Real Gdp	1,7	1,4	126,8	126,6	126,3	126
Population (milion)	127,1	127	126,8	126,6	126,3	126
Unemployement (%)	4,4	4	3,6	3,4	3,2	3,1
Public Debt	215,4	220,3	226,1	228,4	231,2	235,8
Inflation	-0,2	1,6	2,4	0,5	1	1,4

Foreign trade represents an essential sector of the Japanese economy. Japan is a country which exports a lot and invests abroad excessive resources that it accumulates. The domestic market is insufficient to take in the whole volume of industrial production.

Figure 14Trade Balance

Export	**2013**	**2014**	**2015**	**Forecast 2016**	**Forecast 2017**
Total	538.493,97	514.726,4	563.334	8,7%	1,8%
Import					
Total	627.371,49	618.931,9	564.287,6	4%	1,4%

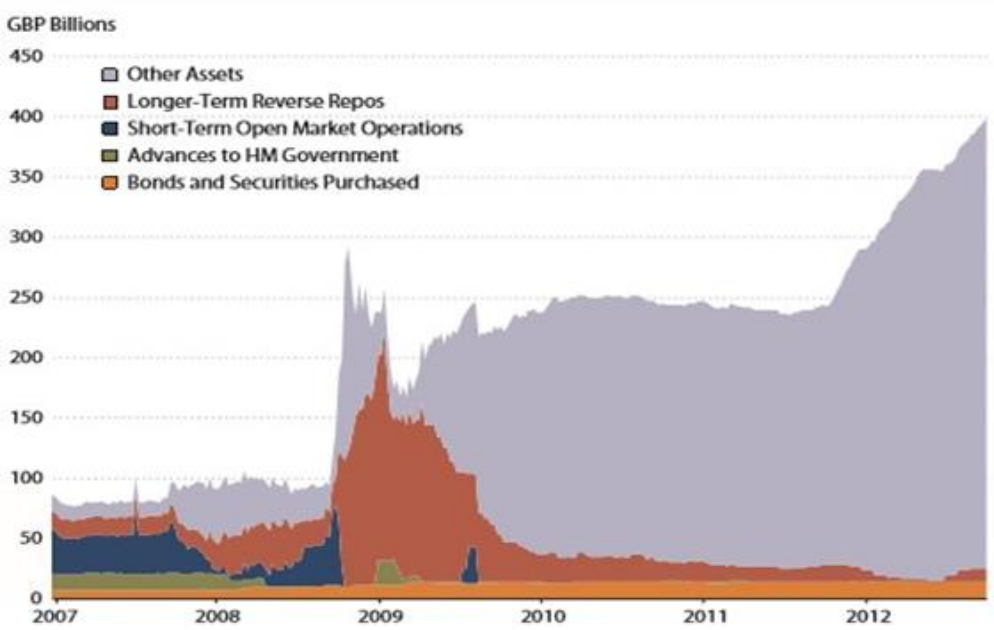
Japanese productions today suffer the gradual erosion of their shares in foreign markets, especially by the South Korean ones, which thanks to agreements concluded with the European Union and with the United States, as well as with other emerging countries (such as Turkey), benefit from a significant competitive advantage against Japanese competitors. To give additional impetus to the economy, in the last decade the country has stepped up bilateral economic cooperation initiatives and accelerated negotiations for the conclusion of important Exchange Agreements with China, South Korea and the EU, as well as for joining the TPP

3.4 Monetary policy of the Bank Of England

The bank of England is the UK central bank. It was founded in 1694 and nationalized on March 1, 1946 and achieved independence in 1997. Being the center of the financial system of the United Kingdom, the bank is committed to promoting and maintaining monetary and financial stability as its contribution to the welfare of the economy. The Bank of England has a monopoly on the issuance of banknotes in England and Wales since the early twentieth century. Since 1997 the bank has been responsible for defining the official interest rate. Decisions on interest rates are taken by the Committee on monetary policy. Monetary stability is one of the fundamental elements of the Bank of England. Price stability is guaranteed by the government inflation target that the bank sets with decisions on the interest rate taken by the Monetary Policy Committee. In May 1997 the government gave independence to the bank to set monetary policy. The bank decides the level of the interest rate on reaching the government's inflation target. An inflation rate is an important factor in helping to promote the long-term stability for the economy. Price stability is a precondition for pursuing the ambitious economic targets and a strong growth in terms of employment. A very high rate of inflation is harmful for the functioning of the economy and a low inflation rate can help promote long-term growth. After an initial period of reluctance towards Credit Easing and quantitative easing, the British Chancellor announced the beginning of policies aiming at the purchase of assets on the financial market in January and March 2009. Just two months before the British authorities launched the “Asset Purchase Facility” (APF), leaving its management completely to the Bank of England (BOE). BOfE implemented two separate and different purchase operations: the first one of private assets in order to lighten specific credit conditions, and the second a traditional form of Quantitative Easing for a simple monetary stimulus. BOfE purchased 50 billion pounds of high-quality private assets to increase the possibility for private businesses to obtain credit, and at the same time to increase the liquidity of the underlying instruments. However, initially the monetary basis was not widened. In fact, every purchase made by BOfE was financed by the authorities with the sale of an equal amount of short-term Gilts. For this reason we can’t consider it yet a form of Quantitative Easing. BOfE described this measure as a last market-making operation. In the same way, BOfE went on with the purchase of company bonds, through an inverse auction, where the potential sellers made an offer on the value they would sell

assets to BOE. The program was meant to improve the conditions of the market. Similarly to the Commercial paper Finding Facility (CPFF) implemented by FED, BOfE bought high-quality commercial paper with a fixed rate above OIS, which therefore established the minimum price. In both markets, the functioning of these policies soon brought benefits to the financial market, increasing the minimum price established by the programme. Moreover, there wasn't a huge purchase of private assets by BOfE, as it purchased only 3 billion pounds out of the 50 total taking place in the second quarter of 2009. In March 2009 the real Quantitative Easing began: BOfE started to expand its monetary basis, first with the purchase of Securities for 75 billion pounds, arriving then at 200 billion in November of the same year. The objective of these actions was to support the supply of money through the purchase of assets on a wide scale, at the same time keeping a consistent level in the demand in order to obtain the desired medium-term inflation. BOfE directed its purchases towards medium and long term bonds, financing the purchases with a monetary expansion widening the reserves of the central bank rather than issuing new state Securities. The Gilts issued before reached maturity without being renewed, and by the end of 2009 all the reserves sustained the purchases performed through APF. Picture 3.4.1 shows how the reserves quadrupled in few months thanks to the operations on the long-term Gilts. In 2010 BOfE and the relevant authorities only decided to keep the stock of assets they had bought, while any new purchase would be financed by the Treasury. On October 2011, BOfE increased the target by shifting to 275 billion pounds in order to finance the Asset Purchase Facility (APF) to reach the fixed inflation goal. The monetary basis was later increased to 325 billion in February 2012, and then again, on 5th July 2012 arriving at 375 billion pounds, to face a drop in the British GDP recorded in the last quarter of 2011 and in the first quarter of 2012. In conclusion, BOfE arrived at holding 360 billion pounds in Gilts and about 100 billion pounds in corporate bonds, showing that BOE focused mainly on the purchase of state Securities for the revival of the real economy and to obtain financial stability.

Figure 15 BOfE active 2001/2012



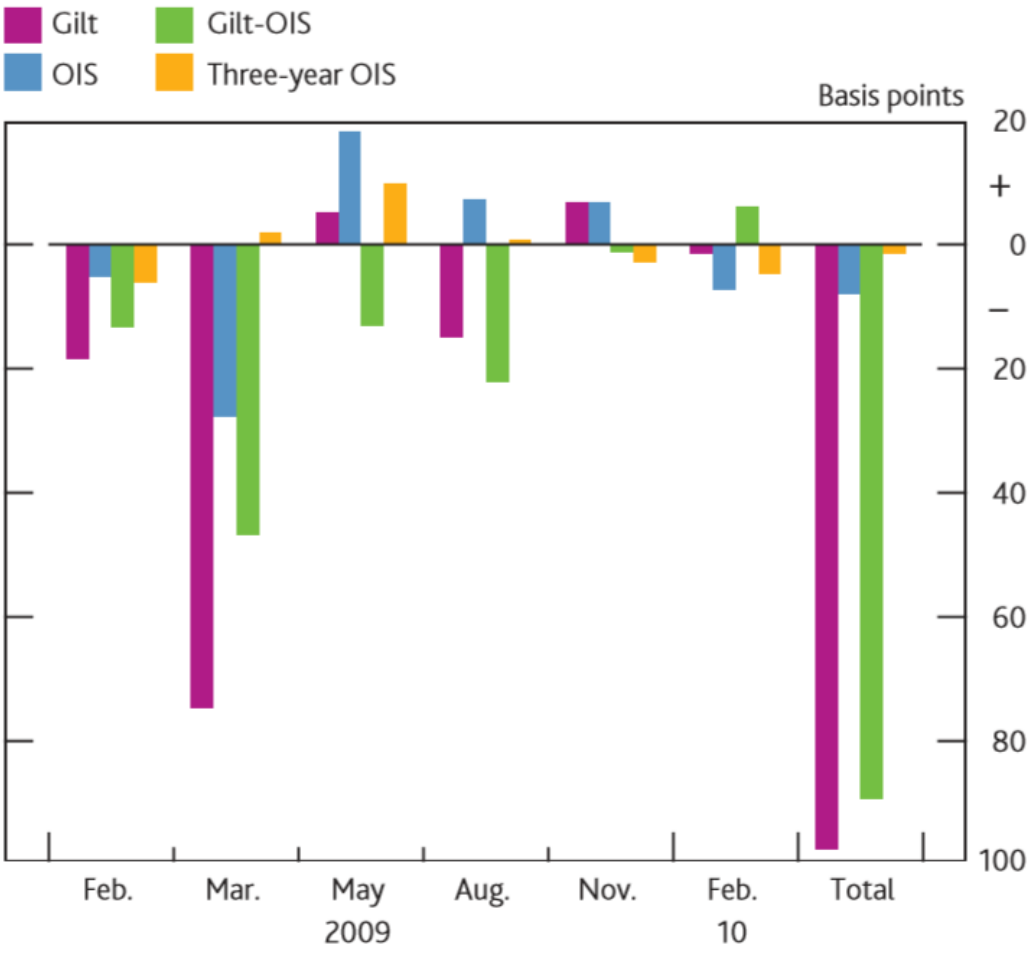
3.5 The market of english state securities

Joyce began the analysis of the effects of Quantitative Easing clearly starting from the Gilts market (Picture 3.5.2) To perform this analysis, all the dates of announcements made by the BOfE before the beginning of the monetary policies were taken into account, since it is normal to expect a direct answer by the market right from the announcement, rather than waiting for the purchase to actually take place. Then the average reaction both of the medium and long term Gilts and of the overnight rate (OIS) were considered, calculating for every announcement date also the spread relative to the two indexes (Yields Gilts-OIS), then considering the difference between the closing rates of the day before the announcement and the following one.

Figure 16 Impact of the announcement on Gilt yield, OIS rate and Gilt OIS spread

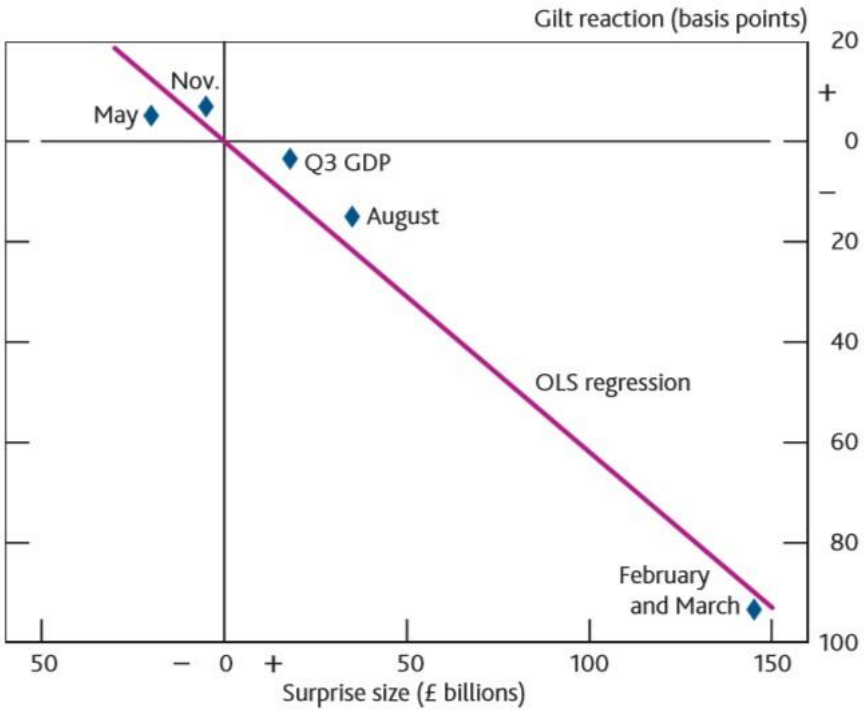
The most surprising result was in March 2009, when the Gilts rate dropped of 75 basis points, arriving at a total average of just below 100 basis points in the period considered. As this was statistically meaningful, we can conclude that these changes were due to Quantitative Easing and not to other economic variables. Most of the decrease in the Gilts yields did not correspond with the overnight interest swap (OIS) rate, which fell of about 10 basis points in total during the six events. As much as we can use the OIS rate as a reference point for the rates that do not have default risk, this suggests that the decrease in the Gilts yields cannot be mainly ascribed to the effects on the expectations on future rates, or more in general on changes in the macro-economic variables. Instead, it is coherent with the main effect due to a rebalancing of the usual portfolio, following the various announcements.

As an alternative measure to the impact of Quantitative Easing on Gilts yields, Joyce and others (2011) used a survey carried out by Reuters on the economists' expectations concerning the total dimension of



Quantitative Easing purchases in order to calculate the quantity of information concerning the purchase announcement. Picture 3.3.3 highlights the strong negative relation between the changes in the Gilts yield within the two days before and after the announcement, and the quantity of new information (surprise rate) on Quantitative Easing in each announcement.

Figure 17Surprise rate relative to the announces and the average change in the Gilt yield



As the Gilt regressed with the surprise rate, a decrease in the Gilts yields of 0.62 base points was noticeable for every further billion pounds of purchase arising from Quantitative Easing but not foreseen by economists. Then, they separately estimated the relation between the information concerning Quantitative Easing policies and the overnight swap (OIS) rate, and the same was done with the spread on rates between Gilts and OIS (Picture **3.5.3**). From the estimates we can notice a change of 125 basis points due to unexpected purchases by BOE for 200 billion pounds, divided in 45 basis points on the overnight swap rate (signaling channel) and 80 in the Gilts-OIS spread (policy of portfolio rebalancing). The effect of portfolio rebalancing would then lead us to expect a term premia leaning downwards. Using a model on the term structure of real and nominal rates, Joyce, Lildholdt and Sorensen (2010) pointed out that there was a decrease of 25 basis points in the term premia in the medium and long term, against a decline in the real interest rate in the short term and an increase in the expected inflation. However, the model cannot capture the further decrease of 25-35 basis points on the term premium that potentially can be explained by the increase in the supply.

3.6 The English corporate bond market

The correlation existing between state Securities and corporate bonds, along with the transmission mechanism already described, should coherently lead to a decrease in the yield of corporate bonds along with the fall of state yields. The Quantitative Easing announcements contain information regarding the economic trend, which for corporate bonds translate into an increase/decrease of risk, and therefore of yields. In spite of this, an effective Quantitative Easing policy is expected to lessen the risk in corporate bonds in the course of time. To sum up, from P**icture 3.5.3** we can notice that the yield of corporate bonds in pounds of an investment-grade type dropped of 70 basis points over the six announcements taken into

consideration, keeping a flat spread. At the same time, the yields of non investment-grade corporate bonds in pounds decreased of 150 basis points, with a spread of about 75 basis points. The contraction of the spread in non investment-grade bonds is coherent with a Quantitative Easing policy, which reduces the perception of the down side risk. Supporting the fact that this effect was due to a Quantitative Easing policy and therefore circumscribed to the United Kingdom only, it is important to notice that in the US and in Europe, investment-grade corporate bonds had only decreased respectively of 23 and 11 basis points: 50 basis points less compared with the corresponding British bonds.

3.7 The English stock market

The drop of the Gilts interest rate following a mass purchase of the afore-mentioned bonds, made the investors concentrate their interest on other categories of assets, such as corporate bonds, the stock market or foreign assets. The increase of the demand in the stock market, made the price of shares increase. Clearly, we cannot ascribe the change of trend of these assets only to a mechanism of portfolio balancing. Quantitative Easing was quite an innovative policy, and therefore to foresee its effects was not so easy as it could be for conventional policies. Therefore, asset managers and investors would very unlikely have been able to fully foresee the effects of a Quantitative Easing policy, and therefore to appropriately rebalance with the right timing their own portfolio. Lower yields of Gilts, *ceteris paribus*, should also increase the current value of the future dividends (going down in the discount curve), and so of the prices of shares. Moreover, the shift from Gilts to equities due to a portfolio rebalancing, induces to decrease the risk premia relative to the assets considered risky, causing a further pressure upwards in the prices of shares. These effects however contrast with future expectations brought forward by Quantitative Easing concerning the fundamentals of economy: in fact, a worsening of the fundamentals brings about an increase in the riskiness of financial assets, thus increasing their risk premia and decreasing the price of the share course in the short term. As for corporate bonds, we cannot say we have a result strongly bending towards one or the other situation, but we can expect that a Quantitative Easing policy, if well implemented, should lead to an increase in the share courses. Not all the stock courses reacted to the announcements in the same way. The FTSE all-share decreased just a little (-0.2 percent) after the report on inflation in February 2009 and subsequently, in March of the same year, of 3.2 percent points following the announcement by the monetary policies committee (MPC) (P**icture 3.5.3**). This would lead us to think that the Quantitative Easing policy did not work, unless we compare it with the other world economies which experimented a drop in the prices of the stock market even greater in that period, thus showing a positive territorial effect in the United Kingdom. However, we do not ascribe this fall to an effect of Quantitative Easing.

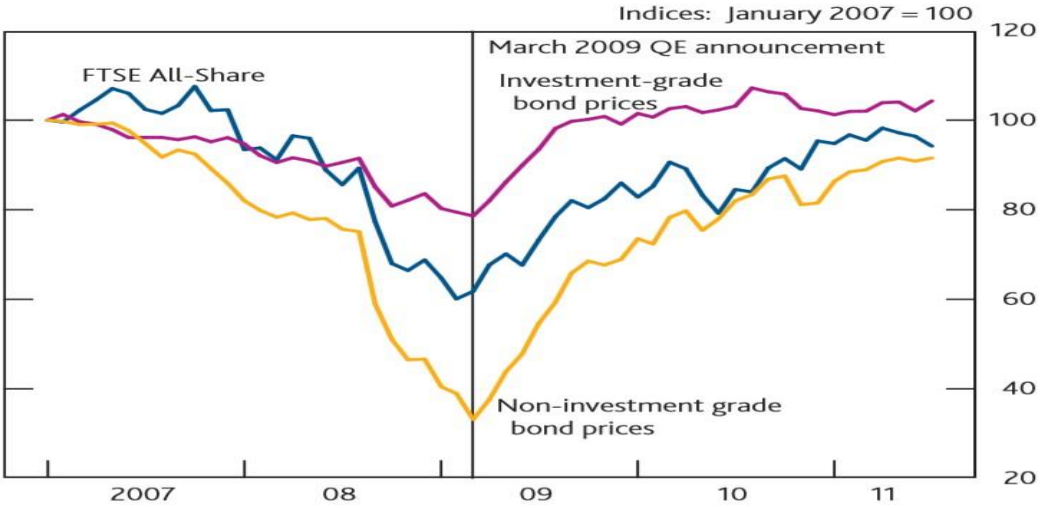


Figure 18 Trend of equity prices and of the Englis corporate bonds between 2007/2011

Conclusions

The work carried out in this thesis focuses on the actions taken by three important central banks: ECB, Fed, BOJ and BOfE. In particular, I posed the attention to the situations in which the afore-mentioned banks have had to make decisions concerning the implementation of QE and some other strategies in order to support the economies of their countries.

In this thesis, I have also described the effects of these operations on the real economy and on the financial markets.

I have also analyzed to what extent the operations performed by each central bank have reached their goal.

The most effective operations implemented by the central banks have had some positive effects in most cases. As for the ECB although its operations started only in 2012, later than the other central banks. The operations under consideration, while presenting the issues that we highlighted in the first part of this thesis, compared to the rate of target inflation in the European Union, have taken credit for narrowing the gap in the interbank rate.

First of all, it is possible to claim that the expected effect of Quantitative Easing is lower for each subsequent announcement, which shows that market operators become more familiar with these policies so to nullify the effect of its announcement.

However, by implementing the QE monetary policies, the Eurozone countries have obtained benefits and positive outcomes in the real economy through inflation targeting policies.

Also the Fed has implemented operations in order to boost domestic economy since 2008, after the crisis of financial markets. Throughout the years, with inflation targeting, Fed has been able to increase internal consumption and to calm down the financial markets with the use of QE policies. This also received positive answers from the markets by lowering the insolvency risk (the riskier bonds, such as corporate bonds with low rating and MBS, had their insolvency risk lowered, and their premium for an anticipated redemption risk reduced. 10-year CDS on business bonds with Baa saw their yield drop of about 40 basis points during QE).

The effects of the American operation have been observed only in the American domestic market and cannot be applied to other markets with the same method.

The position of the BOJ is instead very different, as here an expansionary monetary policy was introduced for the first time already in 2001. It was a strategy to overcome economic stagnation. Japan is travelling at a speed that is twice that one of the US. The inflation risk is not to be considered for Japan or better it must be taken into account that deflation is affecting the economy in two ways.

Firstly, persistent deflation has created a "deflationary psychology" in consumers, businessmen and investors. The longer the situation that occurred lasts, the stronger the deflationary expectations of economic agents become. Private consumption remains therefore weak.

Secondly, deflation is reducing the value of the yen in the cash flows of the companies with respect to the nominal value (which remains unchanged) of the companies' debts.

As for the Japanese monetary policy, even after this operation it did not produce the initially hoped effects. Also because we can see an increase of export directly related to a decrease in the value of the yen and to an increase of taxes, which provoked in consumers and markets a deflationary spiral to take under control. In my opinion these policies have an effect only if they are implemented over a short period of time by injecting into the market an important amount of money.

It is therefore evident that, among the monetary policies implemented by the different central banks, Fed is the one which managed to obtain more positive results on the domestic and non-domestic market.

Comparing the various charts of the different central banks we can observe that the market of the English corporate bonds had a positive effect after the operations performed by the BOE in the years 2009-2011.

To sum up we can say that quantitative easing and non-conventional monetary policies must be carried out over short periods in order to have the hoped effects and not to bring about a deflationary mode, which is what happened in Japan.

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