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INTRODUCTION

The great financial crisis erupted unexpectedly during the last decade in the USA and then, due to globalization, expanded around all the world, and so also in Europe, has represented a turning point, not only from an economic point of view, but also political, beyond which things did never come back as before.

Due to the fact that the financial crisis, and the subsequent economic recession, has upset the economies and the banking systems of many countries, since 2007 the main Central Banks have taken measures so strong to face the crisis that what would be considered exceptional in normal times has become normal.

Exactly because the use of these tools has become daily, and given that such maneuvers directly affect from several years the political and the economic situation of many countries around the world, it has become extraordinarily important understand them in order to make them more and more useful in the future, if they will be still necessary.

It is for this reason that I will dedicate three chapters to describe in details the recipes utilized by the two most important Central Banks, the Fed and the ECB, to cope with this great financial crisis.

Before to know which recipes, or monetary policies, the two Central Banks employed for this aim, it is important to understand what they consist of. This is the reason because of which, in the Chapter 1, I will describe first of all the general framework in which they operate to obtain certain objectives.

Such framework is constituted by a hierarchy of targets, characterizing the transmission mechanism of monetary policy, based on how much all the variables are related to the final aims.

Then, I will focus on the evaluation of the monetary policy effectiveness, bound to some dimensions, and to complete the issue I will describe several strategies pursued to maximize it.

Only after have described all the instruments utilized by the policymakers, I will mark a boundary between the conventional measures, pursued in normal times, and those unconventional, implemented in time of crisis. The demarcation line flows on whether for the Central Banks it is possible to continue to manage the key short-term interest rates, by lowering it more until enter in negative territory, where now is situated the lower bound.
When such bound is reached, they have to resort to other two means described soon after, which are the forward guidance, aimed to affect the expectations on the short-term rates, and the portfolio-balance channel, when the Central Banks widen their balance sheet by purchasing private or public assets.

In the second half of the Ch.1, I will describe all the unconventional measures included in the second mean, with the addition of related advantages and disadvantages. These measures are the credit easing, including purchases of private assets, direct or indirect depending on whether the Central Banks buy them directly or against collateral, and the quantitative easing, including purchases of public sector bonds.

And so, throughout the thesis, I will describe all the unconventional measures taken by the main Central Banks on the basis of this distinction, without considering them all forms of quantitative easing, as the thesis title seems to suggest.

I will close the Ch.1 with a brief description of the unconventional policies pursued by the Bank of Japan and the Bank of England, before to pass for a more detailed treatment regarding the Fed and the ECB. I will do it for two reasons: about the BoJ, because it represented the first example of pure quantitative easing of the history, and to underline the difference with what the Fed considered as “quantitative easing”; about the BoE, in order to create a comparison term between the ECB and a country still in the EU, although the Brexit.

Subsequently, in the Ch.2, after have briefly illustrated how the financial crisis burst in the USA, I will describe all the measures carried out by the Fed, that had two goals.

In the first phase, they were aimed to revive the financial system (firstly through conventional measures; then, after the Lehman Brothers’ collapse, through those unconventional). They included different forms of credit easing, both direct and indirect.

Soon after, there was the necessity to face the expanding economic recession, and so the Fed implemented 3 rounds of QE, by purchasing in the first round mainly Agency debt and Agency MBS, while then more and more Treasury securities. At the end of the description of all the single rounds, I will briefly expose their singular impacts both on the financial and macroeconomic variables.

Towards the end of chapter, exactly after have mentioned the tapering from QE, I will describe in details the improvements obtained by the QE, but also the factors that could undermine the recovery in the long period. I will end the chapter by reporting the last attempts
to normalize the monetary policy, started with the tapering and continued with the federal funds rate raise.

Then, I will write the Chapter 3, the last of my thesis, focused on the measures carried out by the ECB, in a symmetric way with respect to the Ch.2.

In fact, due to the financial crisis expanded in Europe through the globalization, also the ECB was forced to take some measures, aimed in the first phase to restore the financial system (also in this case, until the September 2008 they were mainly conventional; then, obviously, it became necessary resort to unconventional means).

These means included mainly several forms of indirect credit easing, since in Europe the ECB mainly provided funds to the private sectors through the banks, differently from the Fed that bought mostly debt instruments from non-banks.

Subsequently, the macroeconomic recession was felt also in Europe since the 2010, when some countries were about to collapse on their sovereign debt. For this reason, it was implemented a first form of quantitative easing (SMP), aside from the institutional of some mechanism for the financial stability for the emergencies (incorporated after some years in the actual ESM).

By the way, these attempts initially failed in uplifting the stressed countries from the defaulting and so the feared contagion effect expanded to other countries in the euro area. The situation did not improve during the following years, when the OMT programme was announced, but never started.

Only since the 2014 it occurred a stronger reaction from the ECB through the implementation of different unconventional measures, among which mainly the APP, that included both the quantitative easing and the direct credit easing still in course.

Due to some events occurred during the second half of 2015, to whom I will dedicate a paragraph apart, these measures became stronger in the 2016, until arrive nowadays when, due to the improvements of both several financial and economic indicators, a debate about the possibility of tapering is in course (on this debate I will close my thesis).

But before to do it, as I will do for the Ch.2, also in this case I will dedicate a section to describe carefully the improvements in all the different variables occurred through the ECB’ QE, but also the reasons that, during the overall course of QE, most likely are slowing down its impact on the economic revival and to which skeptics about tapering appeal.
The reasons that I will explain in this section are, for the most part, at the basis of the difference in the reaction to the financial crisis and in the impacts obtained through the unconventional measures between the Fed and the ECB.

The differences between the contexts in which the two Central Banks operate, in the USA and Europe, represent the supporting column of my thesis, not only in the introductions to Ch.2 and 3 or in the conclusions, but also in the whole thesis, and maybe represent the main reason that justifies the elaborated discussion of the assigned topic.
CHAPTER 1:

THE TRANSMISSION OF MONETARY POLICY AND THE UNCONVENTIONAL MEASURES
1. THE GENERAL FRAMEWORK OF MONETARY POLICY

The operations concerning monetary policy are really complex. In fact, they exert their effects with variable time lags, and/or they could meet some difficulties that might hinder their effectiveness.

The attempt to evaluate such operations, and so also their effectiveness, is not easy both because it’s difficult to separate the effects related to monetary policies from those related to fiscal policies or to other financial institutions and because it’s not easy to forecast what would have happened if these policies had not been implemented (Klyuev, De Imus, Snirivasan 2009).

But the main reason is the fact that the Central Bank cannot affect or control directly the ultimate goals (as, for example, price stability, employment, growth, the balance of payments equilibrium, etc.), but it needs to do it by checking the behavior of other variables more or less tied with the final aims.

Since the market conditions are often uncertain, there could be the necessity, by the Central Bank, of some adjustments on such target variables in order to reach the desired level useful to affect the overall policy as expected (Acocella 2005).

This is the reason why it is said that the monetary policy is based on the “transmission mechanism”. In normal times, the Central Bank, by caring only to steer the level of the policy interest rates, is able to handle the liquidity conditions in the money markets and keep the price stability over the medium term (Bini Smaghi 2009).

In such a way, during normal times a Central Bank doesn’t lend directly to the private sector nor the government, neither does it purchase directly government bonds, but in order to reach the main aims it only cares about managing the level of the money-market interest rate (Korniyenko 2015).

But during the present time of crisis, when the Central Bank has already pushed the policy interest rate down to zero or near this value (zero lower bound), while the economy still needs a further monetary stimulus in order to avoid to fall into a deflationary spiral, there’s the necessity to take in consideration alternative monetary actions, classified as “unconventional”, which gained momentum after the 2008-09 global financial crisis among all the most important money makers around the world (Acocella, Di Bartolomeo, Hallett 2016; Moenjak 2014; Roache, Rousset 2013).
Recourse to these measures was heterogeneous across countries, because of differences in the structure of all the financial systems or in the dimension of market disruptions or in the Central Banks’ evaluations. This doesn’t make it easy to find neat conclusions about the effectiveness and the best duration of these measures, as witnessed by a growing literature (Cecioni, Ferrero, Secchi 2011; Roache, Rousset 2013).

The necessity to implement such policies arises in a situation of an impaired transmission mechanism.
2. TRANSMISSION SCHEME: THE HIERARCHY OF TARGETS

2.1. From the intermediate targets to the indirect instruments

As said, a transmission mechanism is accomplished by achieving several variables more or less “far” from the final aims.

In order to reach these objectives, this transmission mechanism should depart from those variables more distant, because less related to the final aims, until arrive to pursue these last ones. For this reason there’s a hierarchy between all the targets.

In fact, monetary policy tries to reach the so-called “intermediate targets”, that are variables affecting the ultimate goals. Among them, we can recall the monetary aggregates as “monetary credit”, composed by the sum of monetary base financing Treasury provided by Central banks plus bank lending to private sector, or money supply (affected by the latter), the long-term interest rates, other forms of credit targets and exchange rates (Acocella 2005).

By the way, these variables are affected by other variables, which are less related to the final aims than the intermediate targets and whose trend is affected by the monetary measures taken in subsequent periods, since the moment when the monetary impulse is transmitted (Acocella 2005; Cecioni, Ferrero, Secchi 2011).

In fact, before this, in order to reach the objectives, the Central Banks transmit their choices firstly to the interbank market, by influencing the monetary base of banks and the short-term interest rates, which are effectively the “operating targets” which occupy a middle position between the intermediate targets and the real monetary policy instruments (Cecioni, Ferrero, Secchi 2011; Acocella 2005; Pailwar 2014).

These two operating targets, together with credit targets (which are intermediate targets) could be classified between the “direct instruments”, so called because they could be directly affected by monetary authorities without any lag; instead, among the “indirect” ones (the real instruments I was mentioning before influencing operating targets, as we will see), there are:

- The open market operations, which are Central Banks transactions with banks, implemented by Central Banks’ choose. This instrument could be divided into 2 main kinds:
  - sales or purchases of assets, in general debt securities;
  - lending operations, conducted in general through auctions.
The standing facilities, which are Central Banks operations, but this time born by banks’ initiative, and we can distinguish 3 kinds of facility:

- discount facility: banks can sell some short-term shares to Central Bank at any time, which establish discount rate suitable to calculate the price depending on securities’ returns;
- overnight borrowing facility: banks can borrow at any time, with the guarantee of a collateral, at a specified rate fixed by Central Bank;
- deposit facility: banks can deposit at any time funds at Central Bank, which remunerate them at a specified rate.

The first two are liquidity-providing facilities, the last one is liquidity-absorbing.

The reserve requirements: for banks it’s compulsory to hold a minimum level of deposits in their account at Central Bank, applied to single day-ends or an average of a period of time like one month, always checked from end-of-day values, whose amount for every bank depend on specific items on its balance sheet that should be reported every month (Bindseil 2014; Buzeneca, Maino 2007; Acocella 2005).

2.2. Eligibility requirements for instruments

The instruments choice is not easy, but in order to do it is important that they respect some main requirements:

- they should ensure the link between intermediate targets and the final objectives;
- they should be controllable by Central Banks; in the sense that they could be changed flexibly as needed, in the amount desired, frequently or seldom, also quickly (sometimes in the same day), independently of the initiative of the other banks and within the established monetary policy parameters;
- they should be thought in such a way that they create a correlation between the banks and the Central Bank as explained before;
- they should be implemented in such a way that the exchange rate policy is compatible with the domestic interest rate policy; by sterilizing some consequences due to the intervention on the monetary base;
- they should be chosen in such a way that the monetary policy should be understood and, in a certain way, foreseen by the market;
- they should be efficient and effective, in the sense that they should transmit the policy signal in an efficient way in order to achieve the Central Bank’s aim (Wadsworth, De Juvigny 2012; Bofinger, Reischle, Schachter 2001; Mohr 1996).
2.3. Monetary policy effectiveness

By resuming the last instruments’ eligibility requirement and, in particular, by focusing on the effectiveness of the monetary policy, it can be evaluated under two dimensions: quantitative and temporal.

2.3.1. Quantitative dimension

The first dimension concerns the choice of an appropriate size of the monetary impulse as a reaction by the Central Bank to a context of economic recession. This reaction could be more or less aggressive, and the challenge for policymakers is to understand how much cut the interest rate, and so, increase the money supply.

The aim is to find an equilibrated policy that should be aggressive as needed (in some sense, effective), but at the same time enough cautious as possible, in order to avoid economic imbalances and since the money makers and, in general, all the economic agents learn from other actions.

In fact, implement a too cautious policy reaction risks to leave the economic situation of recession unchanged and to nullify the expected impact, by requiring a further interest rates cuts. But, on the other hand, a too aggressive stance may create some destabilizing effects, as the growth of inflationary pressures.

If the agents expect a failure in the attempt of stimulating the economic recovery, since they know that there will be a further cut on interest rates, on one side they could try to wait better financial conditions and postpone, for example, their investments. By the way, it is also true that a policy failure, by showing the bad economic conditions, reduces the possibility of success in the future policy (this could make not profitable wait).

But, on the other side, they could also fear that such aggressive stance is so successful that it will be only temporary, and therefore this create a condition of urgency in order to take advantage from these easier conditions for their investments (Sauter 2013; Meier 2009).

2.3.2. Temporal dimension

This dimension is related to the exit strategies from this kind of policies, which means to unwind these measures once the economy is ready to return back to a “conventional” framework (as we will see, in the case of quantitative or credit easing it means to sell assets outright and in great amount) (Meier 2009; Bini Smaghi 2009).

About this latter, it matter to distinguish between two further dimensions, which are:
2.3.2.1. Length

If the easing is too long, and so the exit is belated, there could be an inflation overshoot as much as a greater volatility for the reasons explained before. But, on the other hand, a premature policy tightening, especially in a middle phase of the economic revival, may undermine it and cause great capital losses for lenders (this lead to a great sale of assets, whose prices depreciate; unless they are mainly illiquid that makes very difficult recover monetary base for Central Banks) (Meier 2009; Kawai, Morgan, Takagi 2012).

2.3.2.2 Right sequence and speed of actions

On one hand, in the case of large excess liquidity, a standard increase in interest rates may have less contractive effect than desired, because, although the Central Banks wants to begin to reduce the liquidity in circulation, its rising remuneration for banks, as well as their profits, could make the attempt unsuccessful.

On the other hand, the unexpected announcement of large-scale asset sales, if the lending mechanism is not restored correctly, could undermine banks’ incentive to fund private sectors or savers’ incentive to purchase longer-term assets and bring to a lose in credibility for Central Banks about policy stance (Meier 2009; Bini Smaghi 2009).

In addition to these two main features, about the temporal dimension we have to remember also three kinds of lags related to the pursuit of the policies:

a. the recognition one, between the change in economic conditions and the moment in which policy-makers understand they have to change;
b. the administrative one, between the recognition of this need and the change’s execution: this lag is shorter for monetary policy than other policies that need mediation, as fiscal policy, because of the Central Banks independence from the political forces, although there are many risks and limitations for it;
c. the effect one, between the policies’ implementation and the moment in which the first effects are seen: this, differently from the previous, could be long and variable, especially regarding some variables like income, employment or price stability, since the portfolios’ substitutability and readjustment is complex for all the economics subjects, as households or banks (Acocella 2005; Gwartney, Stroup, Sobel, Macpherson 2014).


2.3.3. Effects asymmetries

About the monetary policy effectiveness, another factor to be analyzed are the asymmetries of effects between restrictive and expansionary policy:

a. while there is no limit on an infinite upward movement of the interest rate in the case of monetary tightening, in the opposite case there’s the existence of a “floor limit” for it, the “zero bound”(although we will see that the interest rates have been already pushed to a negative level), or, sometimes, as in the case of Keynesian liquidity trap (when it’s not useful reduce the interest rate and add money in the system in order to change the price level and stimulate the economy because of preference for liquidity due to negative expectations for economic growth or bad events) it is neither reduced below a certain positive value;

b. in the case of restrictive monetary policy, there’s a sure reduction in the volume of credit granted, since the credit supply is rationed, even if the demand doesn’t fall; instead, in the case of expansive policy, an increase in the credit supply is not always followed by an increase in credit demand, because of possible recessions in the economy that brought to a lack in profitability and to hold excess reserves, and so the volume of credit granted not necessarily increases: ‘You can lead a horse to water, but you can’t make it drink” (Acocella 1998).

2.3.4. Monetary policy strategies

2.3.4.1. Main approaches

In order to reach price stability, which is the main aim of monetary policy although there are some differences between Fed and ECB, and, in general, the different policy aims, there are several different monetary policy strategies:

- monetary targeting, for which it is tried to get the desired level of prices by checking the growth rate in monetary aggregates and by announcing their targets;
- interest rate pegging, for which the Central Bank sets the short-term nominal interest rate target for monetary policy;
- Taylor rule, where the Central Bank sets the short-term nominal interest rate relative to the gap between the actual level of both inflation and output and
their desired target rate. The “neutral level” is that level where both the inflation rate and the output reach their target rate;

- inflation targeting, for which monetary authorities announce and directly try to reach the final target of price stability.

2.3.4.2. Advantages and disadvantages

The first two show some serious disadvantages.

The first one needs for its implementation a very good knowledge of all the parameters affecting demand for money, but in an economy characterized by a fast financial liberalization they are unstable. Another problem is that there’s a conflict between stabilizing inflation and stabilizing monetary growth around their target, because if more volatility in interest rates is brought, more variability in output therefore there will be and this, finally, will lead to a greater inflation variability.

The second one was also subject to several critiques, especially from Friedman, who argued that peg an interest rate too low would risk to create an unbalanced situation with an excessive inflation, and so he resumed the Wicksell’s argumentations, with the difference that Friedman took in account opportune, rather than the other one, the distinction between nominal and real interest rates. Not only, but he also criticized the pure rate-pegging rules.

Lately, it was also argued that this strategy could also lead to an indeterminacy of the aggregate price level, aside from the inflationary instability (Smithin 2003; F. Koenig 2012).

About the Taylor rule, in the short run, the neutral interest rate represents the main policy variable under the central Bank’s stance (in a certain sense, it is the target interest rate).

But this rule assumes that the Central Bank can set the interest rate it prefers, but this is not true because, as we have seen especially during the financial crisis, the nominal interest rates cannot be pushed below zero and a negative rate should require that depositors at the banks pay for the holding of reserves at the Central Bank. (Burda, Wyplosz 2013).

For these reasons many Central Banks have adopted in the last years the fourth approach, since it doesn’t depend on the attainment of some observable intermediate targets in order to reach the desired level of future inflation, but only on the credibility of promise to reach it.

But, in order to implement it, inflation targeting needs a great central banks’ independence, an information strategy in which many variables and not only monetary aggregates are used to
reach it and, especially, a great transparency and accountability (Mishkin 2001; Bernanke 1999; Agènor 2000; Peter, Roger, Heenan 2006).
3. FROM CONVENTIONAL TO UNCONVENTIONAL MONETARY POLICIES

As seen until now, the Central Bank can implement different kinds of monetary policy strategies, by activating a transmission mechanism that, in normal times, is based on the determination of a desired money-market interest rate.

3.1. Zero lower-bound

However, when the short-term nominal interest rate falls down to zero because of strong economic shocks, to cut it more would be, in theory, impossible (zero lower bound), and so the attempt to revive the economy would become more difficult. But the zero lower bound is, more than else, a convention (Bini Smaghi 2009).

In fact, many Central Banks, as the Bank of Japan and the BCE, have already implemented negative interest rates. It means that the banks, instead of obtaining a positive interest on the reserves they hold at the Central Bank, are charged a fee if their amount exceeds the limit.

At this point, the question arises about how much the interest rates can be negative. It would be that level that, once reached, leads people to hold currency, which pays zero interest, although hold a great amount of currency is not convenient neither safe for people (Bernanke 2016).

In this way, since there cannot be a further reduction in the interest rate, such liquidity hoarded by people cannot be effective and so demand, production and employment stay blocked at a low level (the situation of liquidity trap) (Mankiw 2014).

After several estimates about the cost of currency storage for banks, the Fed placed this minimum level about -0.35%.

The negative rates could have positive effects for the economic recovery, the same that the policymakers expect from the other unconventional measures. Someone argues that it could be a good middle way between no taking action and implement the quantitative easing.

But they could have some negative effects: for example, they could lead to a breaking the buck of the money market funds. Also for banks they could arise some problems: on one hand, the negative rates could reduce the incentive for banks to borrow reserves from each other and undermine the market for overnight loans among them; on the other hand, they could decrease the profitability of loans and so disincentive them (Bernanke 2016).

By the way, other unconventional monetary policy tools could be taken to face the lower-bound; for example, the Central Banks’ active use of their balance sheet to affect market
prices and conditions, by guiding medium to long-term interest rate expectations, by raising the inflation expectations or setting the inflation target well above zero (in such a way if the nominal rate is equal to zero, the real rate can be pushed on a negative level).

All these measures are aimed to improve the financial conditions beyond the short-term interbank interest rates (Korniyenko 2015; Wu 2014; Cecioni, Ferrero, Secchi 2011; Mankiw 2014).

They could be authorized also when interest rate is above zero, but with a transmission mechanism undermined (because of volatility of reserves’ demand, limited redistribution of liquidity among depositary institutions, disruptions in other segments of the financial market or because of the zero lower bound constraint). In this case, the Central Banks can reduce the short-term interest rate more than in the normal case and/or use directly the unconventional measures (Bini Smaghi 2009; Cecioni, Ferrero, Secchi 2011).

3.2. Main benefits

This kind of policies should “benefit” the banks not only in the case of financial dysfunction, because they could be saved by Central Banks from a bad equilibrium or a debt-deflation spiral, but also after the crisis, thanks to reduction in risk premium due the maturity transformation (short-term debts are substituted with long-term ones) that should make profitable for banks to borrow with low short-term rates, especially if they stay stable in long time, and to invest in profitable long-term assets (Lambert, Ueda 2014).

3.3. Main risks

But, at the same time, too easy monetary policies could “hurt” banks: an excessive speculative bubble may arise, that is when asset prices rise above the asset’s fundamental value shown by expected future payoffs, because when yields and risk premiums fall, banks may be stimulated to take extra leverage and risk, by according too many loans to unreliable firms thanks to the low interest rates.

Besides, the success of these policies, i.e. the quantitative easing, may slow down the implementation of structural reforms and, therefore, reduce the effectiveness of future monetary policy.

For this reason, estimate the overall effect of these policies isn’t easy; a way to do this is to use the surprise element of the announcements relative to the policies, because the expected changes are priced in, but affect the market prices subsequently (Lambert, Ueda 2014; Roache, Rousset 2013; Acocella, Di Bartolomeo, Hallett 2016).
3.4. Eligibility requirements for these policies
Useful elements aimed at increase the probability of success of unconventional policies and minimize the risks are:

- Clear communication of the management of operations related to these policies;
- Distinction between fiscal and monetary authority, since from purchases of assets they have fiscal consequences as, for example, that government expects wrongly that Central Banks monetize its debt (the risk is that once tightening policy starts they can born conflict of interest between the two institutions);
- Reliable assurances from fiscal authority against capital losses that can occur for Central Banks;
- Preserve independent monetary policy, that is have the right to sell assets if needed without fiscal authority’ approval and to pay interest on bank reserves, in order to control rates if there is excessive liquidity. Independency should be ensured by a good exit strategy and by that fiscal authority insurance mentioned before ( Meier 2009; International Monetary Fund 2011).

3.5. Transmission channels
There are two main means useful as transmission channels of unconventional monetary policies to overcome the zero lower-bound:

3.5.1. Signaling channel
In this case, the Central Bank tries to affect the future short-term rates by influencing their market expectations and the policy decisions through communication and explicit announcements ( the so-called “forward guidance”).

In this way, the Central Bank, in order to stimulate investment and consumption in a situation in which the interest rate reaches the zero lower bound, at least until there isn’t a durable economic recovery, tries to keep the short-term interest rates low or by directly increasing expectations of low future nominal interest rates for a certain period of time or by raising inflation expectations, which will push the real interest rates down, even if the nominal rates remain unchanged.

The efficacy of this channel hinges on the central Bank’s credibility to commit the policy (inflation shouldn’t erupt earlier than expected neither fall before the necessary), on the
private expectations on market conditions and on the real comprehension of the message by public (Bini Smaghi 2009; Cecioni, Ferrero, Secchi 2011; Wu 2014; Mr. Klyuev, De Imus, Mr. Srinivasan 2009);

3.5.2. Portfolio-balance channel

As seen, the forward guidance is credible only over the nearest monetary policy horizon, but if a policymaker wants to steer interest rates at maturities beyond this limited horizon, it could directly affect the term premium in another way (Coeuré 2015).

In this case, the Central Bank affects its balance sheet and that of private sector by providing money through purchases of public and private securities, asset swaps and liquidity injections. This channel is useful to alleviate tensions in some segments of the financial markets or to reduce yields more widely.

About this latter, we can identify two kinds of policies, the “credit easing” and the “quantitative easing” (Cecioni, Ferrero, Secchi 2011; Bini Smaghi 2009).
4. UNCONVENTIONAL POLICIES IMPLEMENTED

4.1. Credit easing

“Credit easing” is a policy which consists in direct or indirect credit provision by the Central Bank to specific borrowers, in order to reduce the risk spread between the assets whose markets function well and those whose markets are impaired. This policy could be conducted also when the short-term nominal interest rates is above zero (Bini Smaghi 2009; Mr. Stone, Mr. Yehoue, Ishi 2009).

4.1.1. Direct credit easing

4.1.1.1. Definition

The “direct credit easing” consists in direct liquidity provision to particular market segments (wholesale) through purchases of commercial paper, corporate bonds, asset-backed securities, and in general private sector financial assets.

Buying such private assets is not so much different from buying government bonds (in the case of “quantitative easing”), if we take in consideration the policy impact on the amount of money supply or of the monetary base.

Bernanke treated the operations related to the large purchases of commercial assets in late 2008 as “credit easing”, differently from the “quantitative easing”, by focusing on the lowering of credit spreads rather than on boosting the quantity of money, as hoped by Friedman (Bini Smaghi 2009; Mr. Klyuev, De Imus, Mr. Srinivasan 2009; Congdon 2011).

As for the other measure I will describe, several advantages and disadvantages can occur from this measure.

4.1.1.2. Advantages

It could be useful to alleviate illiquid trading conditions, reduce liquidity premiums, establish benchmark prices or to avoid to go through banks if their capacity to lend is impaired (Mr. Klyuev, De Imus, Mr. Srinivasan 2009).

Other advantages related to this policy could be the support of the financial stability and the fight against the market fragmentation, due to the increased commitments set with nonbanks sector. However, the policy could help also to make available to the same nonbanks sector a greater range of possibilities into the financial system, that would become in this case more diversified and less dependent from the bank system (as we will see it was the case of Fed).
The private asset purchases could be useful to reduce the fluctuations of the asset prices (which, in this case, would raise), and therefore those of the aggregate demand (which would be stimulated); this would lead to a wider stability of both borrowers’ and lenders’ balance sheet (Mr. Bayoumi, Mr. Dell’ Ariccia, Mr. Habermaier, Mr. Mancini Griffoli, Valencia 2014; Kawai, Lee 2015).

4.1.1.3. Disadvantages

But, on the other hand, it risks to affect negatively the risk situation of the Central Bank’s balance sheet and to compromise its financial independence, since it takes directly on its balance sheet all the risks related to the assets purchased, mainly the credit risk, but also that these private securities are illiquid and whose value is uncertain.

One of the greatest difficulties related to this kind of policy is that these assets cannot be used in normal times for the open market operations and so, in the moment in which the inflation risks to become excessive, there could be some problems into the attempt to drain liquidity into the economy.

In this case, the Central Bank can absorb the excess of liquidity by selling the government bonds with the commitment to buy back later them or by heightening the remuneration rate for its reserves, but this could undermine the interbank lending market, and therefore the transmission of money in favor of the economic circuit (Mr. Bayoumi, Mr. Dell’ Ariccia, Mr. Habermaier, Mr. Mancini Griffoli, Valencia 2014; Bini Smaghi 2009; International Monetary Fund 2009).

Not only, but also the size of the issuer matters, since this policy should be very advantageous for large firms, but this is not sure for small or medium-size enterprises (Bini Smaghi 2009).

Another problem that could born is the political interference between the Central Bank and the fiscal authority, because sometimes the latter could better implement programs like direct loans to the households or subsidies supporting lending, because of their redistributive features (Mr. Bayoumi, Mr. Dell’ Ariccia, Mr. Habermaier, Mr. Mancini Griffoli, Valencia 2014).
4.1.2. Indirect credit easing

4.1.2.1. Definition
Alternatively, the “indirect credit easing” implies that the Central Bank lends for longer maturities to banks against collateral including between the eligible securities also the assets whose markets are undermined, in order to protect itself from losses due to the assets’ devaluation and to be sure that the funds are used for the designed aim (Bini Smaghi 2009; Mr. Klyuev, De Imus, Mr. Srinivasan 2009).

Monetary authorities could provide liquidity to financial institutions, with a relaxation of the access conditions, in order to promote bank lending, i.e. provide them resources to devote to firms and consumers through new or existing facilities: in this case, Central Banks can overpass problems like counterparty credit risk, uncertainty about firms’ collateral or about institution’s financial needs by enlarging the pool of collateral accepted and by lending funds at longer maturities (Mr. Klyuev, De Imus, Mr. Srinivasan 2009; Bilbao-Ubillos 2014).

If in normal times the overnight rate should be almost equal to the short term refinancing rate, since there is no need that the size of the Central Bank’s balance sheet increases; during the crisis the overnight rate would be lower than the other one.

Another feature of this policy is related to the quality of collateral: during the market stress banks naturally use many assets of low quality (Bini Smaghi 2009).

4.1.2.2. Fixed-rate full allotment
The indirect credit easing affects directly the yield curve over the total horizon of time related to the policy operation, especially when such measure is pursued at a “fixed-rate full allotment”, which means that the banks have unlimited access to the Central Bank’s liquidity (the quantity) at the main refinancing interest rate (the price), subject to adequate collateral (Bini Smaghi 2009; De Haan, Oosterloo, Schoenmaker 2015).

Obviously, if implemented in a context of unconventional measures and, mainly at the zero bound, the full allotment at a zero rate makes liquidity a free good and contributes to stabilize the inter-bank market. However, in some sense, the Central Bank behaves as a lender of last resort.

There are several advantages related to this procedure: it is more automatic than the variable-rate procedure with fixed quantity, since such automatism makes it more simple and transparent; it should reduce the liquidity risk; excessive bids relative to the variable-rate
tenders are avoided, and therefore also the volatility of marginal interest rates; the Central Banks allows to understand, through it, how much allotment provide to restore the target rates desired.

But, on the other hand, there’s the risk that the overall bids of banks don’t correspond to their liquidity needs, because of asymmetric information between the Central Bank and the market participants; the risk that they have some problems for the interbank market; the risk of arbitrage for operations whose maturity expires after the achievement of the committee related to this measure (Bindseil 2014).

After this short bracket on the “fixed rate full allotment”, I will return back to describe the “indirect credit easing” policy, with related advantages and disadvantages.

4.1.2.3. Advantages

Between the advantages of this policy, the Central Banks can extend the scope of their operations to a greater number of financial institutions and, through the widening of the collateral accepted for refinancing operations, it can facilitate the financing conditions (reduction in the credit spreads) by banks to the borrowing sectors, mainly the corporate sector.

Besides, increase bank reserves in this way is easy, because for this aim is necessary the usual credit creation, without the danger that Central Banks suffers a very likely credit risk. In this way, also the risk of bank runs is reduced, as well as they don’t exist exit problems, since this policy ends automatically when there’s no more need to continue to pursue it, differently from other unconventional measures.

4.1.2.4. Disadvantages

But, on the other hand, there is the risk that this policy fails if banks worry so much on the capital adequacy, because this could hinder the flow of a great amount of credits to households and enterprises; but the same could happen if they worry about reducing the risks existing on their balance sheet, or if they don’t trust the economic framework where the borrowing firms belong (Mr. Klyuev, De Imus, Mr. Srinivasan 2009; Bini Smaghi 2009).

4.2. Quantitative easing

4.2.1. Definition

The “quantitative easing” implies the direct purchases of longer-term government bonds, by lowering their risk-free rates, with the aim to reduce the long-term rates across many financial
private assets, independently of their risk, since long-term treasuries yields are the benchmark for pricing many riskier private assets.

The other aim of this policy is to extend new credit, through the newly created money injected into the domestic economy, the prices securities’ pushing up and their yields’ reduction, in order to boost the economic activity, i.e. increase spending, production and investments, and so prevent deflation.

The main channel useful for this policy’s implementation, according to someone, is through the inflation expectations, in the sense that investors should believe that short-term rates in future will remain lower rather than how much they expect now and that yields will decrease (and so financial asset prices increase).

This policy, differently from the “credit easing”, is used when the monetary transmission is really impaired and the Central Banks had already lowered the policy interest rates near zero (the lower bound) (Bini Smaghi 2009; Mr.Klyuev, De Imus, Mr.Srinivasan 2009; Toporowski, Michell 2012; Mr.Stone, Mr.Yehoue, Ishi 2009; Rochon, Olawoye 2012; Eggertsson, Woodford 2003).

It focuses more on the level of money into the economy, similarly to monetarism, where monetary aggregates are more important than interest rates for controlling the demand and the rate of inflation.

Also in this case, several positive and negative consequences could arise from this policy.

4.2.2. Advantages

According to the “reserve position doctrine”, when banks gain reserves they are incentivized to lend to the private: this, hence, lead to re-establish their target reserve value and to stimulate the economy.

Not only, but this policy’s supporters claim also that the purchase of government securities will lead investors to require other assets, in order to rebalance again their portfolio toward their ideal composition. In this way, asset prices will increase, and the same will happen to the household’s wage, the demand and the consumption (inflationary spiral) (Toporowski, Michell 2012).

It has a great support due not only to the positive signal launched from Central Banks of an accommodative stance for a certain period, but also to the fact that this kind of purchases is
related to a minimal credit risk, and to the other reason explained before (Mr. Klyuev, De Imus, Mr. Srinivasan 2009).

4.2.3. Disadvantages

Despite the great support the policy received from many economist, it is often controversial because of some aspects.

One of the risks is that this instrument is seen as an excuse to reduce macroeconomic discipline, and so for not realizing the necessary fiscal policy measures; not only, but there’s also the fear that this monetary supply lead to an excessive increase in inflation rates or a premature long-term interest rates rise because of higher inflation expectations and risk premium, due to the expected reduction of macroeconomic discipline (Rochon, Rossi 2015; Mr. Klyuev, De Imus, Mr. Srinivasan 2009).

Besides, although securities’ yields fall, in a context of risk aversion, the substitutability between government and private assets could decrease, and so, in this way, rates condition for private borrowers won’t be eased as hoped.

In addition to that, there’s also the risk that the banks hold this new liquidity received for bonds in their reserve accounts at the Central Banks, maybe because of low profitable lending advantages or as a buffer due to an economic crash. In order to contrast this problem, the Central Bank has to conduct this policy only at the lower bound, when the remuneration for deposits is null, and so there is no incentive for banks to enclose money into central reserve.

Finally, another disadvantage could born for Central Banks, that is the risk to suffer capital losses if they purchase securities during their lower phase, since an economic recovery will lead to an yields’ increase (price/value decreases), except for the case of hold-to-maturity assets (Bini Smaghi 2009; Mr. Klyuev, De Imus, Mr. Srinivasan 2009).

5. DIFFERENCES BETWEEN POLICIES

The quantitative easing has with the credit easing the common characteristic that they both involve the expansion of the Central Bank’s balance sheet. But there are also some differences between the two policies, aside from the aspect related to the interest rates’ level and taken risks (Smaghi 2009).

5.1. Quantitative easing focus

The quantitative easing focuses more on the quantity of banks’ reserves (the Central Bank buys government securities and the additional money is put in the reserve accounts that the
banks have at the Central Bank, i.e. the liquid overnight deposits from which the same banks can draw upon when they prefer).

In fact, all the operations fulfilled on the asset side of its balance sheet are calibrated in order to reach the desired amount of reserves belonging to the liability side, independently of the type of paper (loans and securities) bought and put on the asset side.

Substantially, under this policy, more emphasis is given to the size of its balance sheet, while the composition is almost incidental (Mr. Klyuev, De Imus, Mr. Srinivasan 2009; Dewatripont, Freixas, Portes 2011; Mercier, Papadia 2011).

With the quantitative easing, an active stance is committed to the role of the balance sheet (but, as seen before, more on its size) (Cobham 2016).

5.2. Credit easing focus

Conversely, the credit easing focuses on the mix of loans and securities (in the case of “direct credit easing”) and on the mix of the assets eligible as collateral (in the case of “indirect credit easing”) that the Central Bank holds on its balance sheet and, therefore, it pays attention more on its composition, rather than its size which is mainly incidental. In this way, it affects the credit conditions for enterprises and households.

More in general, in the case of credit easing there’s a more passive use of the balance sheet, due to the fact that the Central Bank is seen as a last resort of rescue.

Essentially, the focus of these two kinds of credit easing is on the asset side of the Central Bank’s balance sheet; instead, all what concerns the narrow monetary aggregates is considered not relevant, or at most, secondary (Mr. Klyuev, De Imus, Mr. Srinivasan 2009; Cobham 2016; Dewatripont, Freixas, Portes 2011; Mercier, Papadia 2011).

By the way, between these two forms of credit easing, there’s a difference about how much they affect the Central Bank’s balance sheet: the indirect credit easing necessarily increases it, while the direct one not mandatorily, because, in the latter case, the Central Bank can raise the amount of certain types of assets to hold, while decrease other (Mercier, Papadia 2011).
6. JAPAN’ S EXPERIENCE

6.1. ZIRP policy
The Japan was the first country to implement the quantitative easing in 2001 (Hausken, Ncube 2013).

But, before to arrive to this point, the BOJ (its Central Bank) implemented in 1999 a “zero interest rate policy” (ZIRP) in order to reduce this rate as lower as possible because of the economy and banking sector’s weakness and face deflation.

The ZIRP’s exit was made in 2000, although the government’s opposition aimed to increase the output, but this decision was pursued too early, since the inflation rate was still negative and the prospect of economic growth were weak (Dewatripont, Freixas, Portes 2011).

6.2. ZIRP/QE policy
For this reason, in the March of 2001 the ZIRP was restored in a different way, i.e. it was added also the excess reserve target (the quantitative easing) that should have been continued until the inflation reached a stable level above zero.

The quantitative easing implemented in 2001 in its purest form, whose operating target was the current account balances (CAB) held by the financial institutions at the BOJ through the purchases of government bonds, lasted until the March of 2006.

This first form of quantitative easing really helped to reduce yields and credit spreads thanks to the commitment effect aimed to keep the expected interest rates low and the portfolio rebalancing and signaling effect aimed to the expansion of the balance sheet.

All the same, its effect on the inflation was found to be limited, and the same happened about the economic activity.

In fact, although this policy contributed to create a more accommodative environment for the financing of corporate sector restructured after the banking crisis of the late 1990s and although the financial institutions were now more inclined to lend and expand their balance sheets, the banking sector was dysfunctional because of its damage credit channel and the demand for loans was low, despite the corporate deleveraging.
6.3. Comprehensive Monetary Easing

After some years, in the October of 2010, because of the global financial crisis, the insistent deflation and the policy rate which reached the zero lower bound, in order to reach the price and, in general, the financial stability, the BOJ implemented the CME (Comprehensive Monetary Easing), according to which they were bought both government securities and risky private assets (essentially, it was implemented a quantitative easing mixed with the credit easing).

This time, probably because of the fact that this easing included also private assets purchases, it was found that the economic activity was stimulated more than in the past earlier experience of the pure quantitative easing thanks to the improved monetary policy transmission, although the impact has been moderate; however, the impact on the inflation rate was weak as before and, besides, there was no impact on the exchange rate (Fasano-Filho, Wang, Berkmen 2012; International Monetary Fund 2011).

6.4. Quantitative and Qualitative Easing

Finally, in the 2013, The BOJ, in order to face deflation and revive the economic growth, launched the “Abenomics”, including the QQE (Quantitative and Qualitative Easing), through which the inflation target was clearly established at the 2% and involving a great volume and a wider scope (of assets) than the past (Nakano 2016; OECD 2016).

Then, since the inflation expectations were below, and also now, the inflation target and due to the economic uncertainty, the QQE was strengthen firstly then with the NIRP (Negative interest-rate policy), which helped lower market rates and rebalance portfolios but generated a problems related to the financial costs, and then, in September 2016, with the Yield Curve Control (Green, Cooper 2017; International Monetary Fund 2016).
Monetary Policy since the 1990s

Call rate (overnight, uncollateralized)
Zero interest rate policy
Quantitative easing
Comprehensive monetary easing
Quantitative and qualitative monetary easing (QQE)

Adding a negative interest rate dimension

Source: Bank of Japan.
7. ENGLAND’ EXPERIENCE

7.1. The first phase of crisis
The global financial crisis of the 2008-2009 generated some macroeconomic problems also in England, where the monetary policy has operated under flexible inflation targeting since the 1992 that now had to face new challenges, as the aggregate spending slowdown during the late 2008 (Great Britain: H.M. Treasury 2013; Collective of authors 2013).

The Bank of England cut interest rates in order to avoid an inflation’s fall below the target of 2% in order to increase spending and the future inflation, but nominal interest rates cannot decrease above the zero levels.

7.2. The first quantitative/credit easing in 2009
For this reason, the Monetary Policy Committee of the BOE authorized the purchase of many assets; at first, during the March of 2009, purchases mainly of government’s bonds (the so-called “gilts”), realizing the pure quantitative easing, and then, during the same year, also a smaller quantity of high-quality private sector assets was included, realizing the credit easing.

Then, in 2010, the easing program continued, although someone wanted an interest rates’ increase because if the increase of inflation above the target of the 2%.

More in general, the easing continued in the same way during the first following years, until 2012, with the commitment by the BOE to don’t buy more than the 70% of any issue of government debt. During the same year, the BOE showed that the quantitative easing had benefit people in direct proportion than the assets they hold, i.e. the richest people.

Another feature of these policies was that an higher weight was given to the quantity of money supplied than the short-term interest rate (Collective of authors 2013; Reith 2009; Kennard, Hanne 2015).

7.3. Carney’s policy in 2013
Then, in 2013, with Carney as head of BOE, there were some changes about the Central Bank’s policy: first of all, he wanted to copy the Bernanke’s example at Fed related to the “forward guidance” for the future trajectory of the monetary policy rate; then, he preferred to make the inflation targeting more flexible in order to face the fluctuations in the output and the employment.
About the policy stance from the Central Bank, he wanted to leave unchanged it; rather, he continued to follow the purchases of gilts and of an amount of private assets greater than before, while keeping the interest rate at 0.5% (Jones 2014).

7.4. After Brexit
Finally, last August 2016, two months after the Brexit referendum, the BOE announced to want to pursue different accommodative measures, such as a cut in the policy rate of 25 basis point, the reduction in the banks’ capital buffers and the recovery of the quantitative easing, in order to cope with the risks related from the exit and restore the economic confidence.

From the fiscal point of view, a certain policy easing could be necessary in order to operate better, but with the prior assessment of the medium-term deficit target (International Monetary Fund 2016).
Still plenty of liquidity being added to markets: ECB and BoJ buying a combined approx. $180bn every month

Monthly Fed, ECB, and BoJ asset purchases

USD bln

BoE  Fed  BoJ  ECB  Total

250  200  150  100  50  0


Note: 12m moving average.

Source: DB Global Markets Research

Approx $180bn per month
CHAPTER 2:
THE UNCONVENTIONAL MONETARY POLICIES BY THE FEDERAL RESERVE
1. THE DIFFERENT PHASES OF FED’ S INTERVENTION

The real estate bubble burst in 2007 in USA anticipated and partially caused the great financial crisis and obliged many Central Banks to adopt aggressive monetary actions in order to contrast financial and macroeconomic instability (Hausken, Ncube 2013).

We deal with the initial financial shock in some detail in Section 2 of this chapter; then in Section 3 we shall examine the unconventional measures meant to stabilize the financial sector in the aftermath of the Lehman Brothers collapse; section 4 is devoted to a discussion of the different rounds of quantitative easing, aimed at macroeconomic stabilization in the face of the Great Recession of 2008-2009.

Due to the crisis, the Fed introduced many monetary programs both before and after the Lehman Brother’s collapse, and such actions were, over time, more and more unconventional.

In the attempt at stabilizing the financial sector, the Fed implemented many policies similar to what has been called in Ch. 1 “credit easing”. This credit easing is particularly important for those economies, such as that of USA, where, differently from the Eurozone, credit flows are mainly regulated by financial markets rather than by banks and where the Fed purchased mostly debt instruments issued by non-banks institutions.

Afterwards, in order to stimulate more the economy in a situation of deep recession, the Fed implemented three rounds of QE, which differed from one another in size and composition of purchases, as well as in their effects on long-term interest rates and on other macroeconomic variables.

We will see that opinions about QE are very discordant, but it is undeniable that the Fed’s reaction, much quicker and more aggressive than that of the ECB, and also with counter-cyclical fiscal policy, ended up with stimulating a certain recovery, while uncertainty, as we shall see in the next chapter, exists about the effects in the Eurozone (Mercier, Papadia 2011; De Grauwe 2016).

One of the reasons at the base of the gap on the reaction and outcomes of the policies between the two areas could be traced back on the differences of financial systems between USA and Europe: while in the USA the capital markets are so developed that they are able to ensure funding if the corporations require them by issuing of shares and bonds, in Europe the corporate bond market is weak, and corporations could attract money only through borrowing (Erdogdu 2016).
Another reason could be that Fed, such as the Bank of England, plays a role of lender of last resort also for the government sector, and not only for the financial system, as in the case of the ECB.

This depends on the fact that the USA are not constrained, as it happens for the Europe, to organize the program in a way to avoid political risks or violation of the constitutional laws.

Besides, as we know, the USA are a real state both in political and economical sense, while the Europe is half a state: this may have damaged, in the Old Continent, the ability of the Nation-states to find social compromises useful to face the crisis (Erdogdu, Mustafa 2016; Ove Madsen, Olesen 2016; Jäger, Springler 2015).

I will close the chapter by showing the latest developments of the Fed’s monetary policy, tending to a normalization of the monetary policy. The proof of that is not only the tapering policy conducted by the Fed during the 2014, but also the following federal funds rate cut, began in the December of 2015 and still in progress today. The debate about these recent measures is opened because of the skepticism on the QE’ effects that I will expose more later.
2. BEFORE LEHMAN BROTHERS’ COLLAPSE

2.1. The real estate bubble

The United States was the country where the global financial crisis, begun ten years old, is exploded. This is the same crisis that, all around the world, led to a crash in the industrial production, to an increase of the unemployment and the deflation, as well as bankruptcies, and to the destruction of the economic growth and the real wealth.

The crisis originated in the real estate market, where, after the recession of the 2001, the mortgage interest rates were low and so people expected that housing prices were going to increase.

During the years between the 2001 and the 2006, there was an high demand for the real estate, and for this reason many credit providers, mainly banks, supplied subprime mortgages, which are loans given to someone with a low probability to repay the debt.

These loans were also non-recourse, which means that mortgagors can walk away from their mortgages only by allowing the creditor to distraint the borrowers’ homes if they were unable to repay their debt.

Besides, these mortgages were sold to the consumers and then they were repackaged and sold to investors through different financial instruments. Housing prices continued to increase until the peak of the 2006, and then it began a slump in 2007. This decline of the houses’ prices hit negatively the homeowners, the banks and all who invested in the real estate, due to the fact that this caused many capital losses (Lopus 2013; Tony Ciro 2012).
2.2. The liquidity crisis period

The crisis started in the subprime mortgage sector and then, through the financial innovations as CDOs (Collateralized Debt Obligations) and CDSs (Credit Default Swap), quickly expanded to other markets. This happened because the raised number of subprime mortgage defaults led to an increase in the spreads in this sector, with the consequence that such securities suffered a cut in their rating and in their prices.

Many banks suffered great losses and failed since they had to write off a considerable amount of money due to mortgage delinquencies (Hacioglu, Dincer 2017).

This explains because the banks began to cut heavily the lending in favor of the individuals and entrepreneurs, to the point that the credit crunch turned into a liquidity crisis (Lopus 2013; Brooks, Dunn 2011; Tony Ciro 2012).

During the first part of the crisis, called “Liquidity crisis period”, going between August 2007 and the Lehman Brothers’ bankruptcy in September 2008, not only there was an high volatility in the banks’ liquidity demand, but also the funds redistribution’s mechanism in the interbank market was impaired (Cecioni, Ferrero, Secchi 2011; Veronesi 2016).

A clear indicator signal of such crisis could be traced back into the spread between the LIBOR (London Interbank Official Rate) and the OIS (Overnight Indexed Swap) rate.

During the decade that led to the crisis, the LIBOR became the index of choice, since many adjustable-mortgage rates were indexed to it in the USA, and such index represents the rates that banks are charging each other for the credit. While the OIS is a derivative contract on the total return of a reference rate, computed daily over a time period as the weighted average of the trades between banks for the overnight holding of deposits at the Fed. In the US dollar swaps market, the reference rate is the federal funds rate (McDowell 2017; Smith 2014).

The LIBOR-OIS spread measures the risk premium that banks charge to lend each other above and beyond the funds rate. For this reason, it represents a good signal to check the health of the financial system and evaluate the liquidity risk.

It had been stable for many years, but since the August of 2007 it began to widen, oscillating between 50 and 100 basis points, and remained high until there was a further increase to 350 basis points when the Lehman bankruptcy was announced (Corb 2012; Smith 2014).

Therefore, after the widening of such spread, the Fed tried to face the liquidity crisis through the traditional policy tools, designed not only for intermediaries and depository institutions,
but also other financial institutions, in a context where Fed used to lend indirectly to the bank system through the primary dealers, since the banks, differently from the Eurozone, were not the most important players in the securities markets (Murphy 2009).
2.3. First measures against the crisis

It cut the fund target rate from 5.75% to 4.75% between the August and the December of the same year (the same it did until the end of 2008 by reaching the interval between 0 and the 0.25%). About the failed banks, they were bailed-out programs by governments or merged.

In addition to these interventions, the Fed adopted some policies in order to face against its main concern of such period, which was the market illiquidity (Hacioglu, Dincer 2017; Veronesi 2016; Murphy 2009).

One of these was the TDWP (Term Discount Window Program), with which the Fed enlarged the maximum maturity of emergency loans provided to the depository institutions through the Discount Window and reduced the discount rate premium of these loans.

All the same, because of the perceived stigma on discount window borrowing, because of the no limit on volume of loans due to the fact that the discount rate was set by Fed, and also because the discount window was opened only to the depository institutions, its use was limited.

And so, in the December of 2007, the Fed introduced the TAF (Term Auction Facility), which allowed the depository institutions to borrow at a fixed rate long-term liquidity against collaterals and which allowed an increase in the bank reserves. It was similar to the discount window borrowing, with the difference that in TAF the amount of funds to lend and the interest rate charged depended on the auctions.

By September 2008, $75 billion of one month credit and $25 billion of three month credit were offered during each action, while by early 2009, $150 billion were offered at a single auction. In early February 2009, the Fed had outstanding loans up more than $400 billion.

At first TAF was working, because the Libor/Fed funds spread reduced and firms were receiving more liquidity, but when the crisis developed, the interbank market began to suffer again, because no sufficient funds were provided, and also because the liquidity premiums were too high, due to the fact that not everyone felt sure to lend for risky assets.

Therefore the Fed implemented other facilities. One of these was the TSLF (Term Securities Lending Facility), with which the Fed would lend up $200 billion of US Treasuries for one month (28 days) to primary dealers against other less liquid securities held by dealers (it is two way repo).
This program freed up liquidity, because by using other non-Treasury securities as collateral the dealers weren’t able to find enough takers; it liquefies illiquid bonds, by reducing also the non-default part of the credit spread for eligible assets and it does not change the money supply, since bank reserves don’t change in this “bond for bond” exchange.

Another one was the PDCF (Primary Dealers Credit Facility), which was an overnight collateralized longer-term (120 days) loan facility to primary dealers against a wider number of collateral accepted than TSLF.

The amount of loans provided increased to about $38 billion in the April of 2008 and then sharply decreased when the markets stabilized. Soon after the Lehman Brothers crisis, they rose to $148 billion. After May 2009, the loans ended and the facility was closed in early 2010 with an overall amount of $8.95 trillion in loans provided.

Because of the failure of banks to distribute money in the financial system during the crisis, the Fed continued to chose, both in the case of TSLF and PDCF, to give the primary dealers the possibility to obtain liquidity with the same conditions of depository institutions.

The PDCF policy had the effect to increase the bank reserves when the borrowings were not compensated by open market operations, which was a common feature with the TAF.

This kind of policies, in times of market stress, could be useful for providing funds for risky bonds in order to calm the market and restore the financial stability. But they in general cannot last forever, because there is the risk to take too many risky collaterals.

All the same, in the late 2008, the TSLF policy was implemented together with the TAF, where the first tried to provide funds for the assets and the second one was used to distribute money, and this was due to the crisis expansion, which led to an increase of the assets eligible as collateral, also ABS.

All these programs were ended in 2010 (Koch, Macdonald 2014; Veronesi 2016; Murphy 2009; Cecioni, Ferrero, Secchi 2011; Thomas 2013; Burton, F.Nesiba, Brown 2015).
2.4. The Lehman Brothers’ collapse and the outbreak of the crisis
In spite of these early interventions by the Fed, during the 2008, and in particular in September, the situation precipitated.

Many large companies that have invested in the housing market collapsed, but while the new Federal Housing Finance Agency put in the government conservatorship Freddie Mac and Fannie Mae, or Bear Stearns was acquired by JP Morgan bank, or AIG “too big to fail” was helped with a loan facility by the Fed in order to avoid an increase in the market fragility and borrowing costs or a reduction in the household wealth or in the economic growth, the attempt to save the Lehman Brothers from bankruptcy failed.

The reaction of the global financial markets was immediate and dramatic. The equity markets collapsed, in fact, the S&P 500 and the FTSE 100 fell sharply in two months (respectively 25% and 35%); the issuance of ABS dropped; the credit default spreads increased, due to the increased interest rate spreads on the AAA-rated tranches of ABS; obviously, the investors and the depositors were afraid because of this scenario.

Despite the interest rates lowering, the banks’ real cost of funds was the same high and the difficulties in the interbank financing markets stayed. And so, since it was not possible lower more the short-term interest rates, the Fed began to take in consideration the implementation of unconventional measures in order to overcome both the financial and, consequently, the macroeconomic problems arose since the October of 2008 (Veronesi 2016; Tony Ciro 2012; Lopus 2013, Murphy 2009).
3. FINANCIAL STABILIZATION AFTER THE LEHMAN BROTHER’S COLLAPSE

As regard the financial problems, there was the necessity to provide more liquidity to all the banks and the financial institutions being in difficulties, especially in the shadow banking system, although the banks often preferred to hold this increased liquidity in the reserves rather than take the risk of lending. But mainly the Fed found fundamental address directly the credit concerns with the aim to help consumers and enterprises, and the ABS market is really important to provide funds to provide consumer credit and loans to small businesses.

Due to the nature of the unconventional measures implemented by the Fed, this first period after the Lehman Brothers’ bankruptcy was called the “Credit crisis period” (Veronesi 2016; Lopus 2013).

One of these was the AMLF (Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility), pursued in order to grant loans to the depository institutions at the primary credit rate and allow them to buy high quality asset-backed commercial papers from money market mutual funds (it is quite similar to an indirect credit easing, with the difference that, in this case, banks buy high quality papers rather than low ones).

The main aims of this policy were to stabilize the commercial paper market, by boosting the demand for the same papers in order to save the shareholders from their unloading and avoid fire sales; and assist the money market mutual funds, which were facing a disintermediation because of the bank run from uninsured deposits. About this last aspect, the Treasury extended the deposit insurance to all those deposits that paid a premium for the coverage.

Loans to banks grew from $22 billion in the third week of September 2008 to $151 billion less than a month later, but then, by the August of 2009, they began to fall to less than $1 billion and, finally, in the early 2010, this program was ended (Mr. Peter Stella 2009; Cecioni, Ferrero, Secchi 2011; Thomas 2013; Burton, F. Nesiba, Brown 2015).

After all, this unconventional measure was effective, because by using the diff-in-diff approach it was shown that redemptions reduced in those markets owing more AMLF-eligible assets. Not only, but AMLF-eligible commercial papers saw a reduction in the liquidity risk component of 80 basis points (Cecioni, Ferrero, Secchi 2011).

AMLF financing is nonrecourse and tries to pursue the same objective of the CPFF, about which I am going to talk, although the duration of its financing is longer than the latter’s one (Cecioni, Ferrero, Secchi 2011; Mr. Peter Stella 2009).
Another measure implemented during this period has been the CPFF (Commercial Paper Funding Facility) to support this commercial paper market which was facing tensions. In fact the volume of outstanding commercial papers decreased, the rates on longer term papers rose and “roll over” them was quite difficult, since it was done on a overnight basis.

In this context, investors had no great intention to buy these papers, and, therefore, all the both financial and nonfinancial firms were not able to satisfy their liquidity needs that would have been generated thanks to the issuance of these commercial papers.

For this reason, and in order to fund this market, ensure the repayment to the investors from the issuers at maturity and overcome the “roll-over risk”, after the Lehman Brothers’ collapse this policy was fulfilled, by purchasing eligible three-month unsecured and asset-backed commercial papers directly from their issuers (the so-called “direct credit easing”).

Issuers, in order to receive funds however at an interest rate above normal, must hold the highest available rating for their commercial papers, because dangers related to the borrowers’ creditworthiness or to the liquidity fall could make the paper value irrecoverable from any collateral.

In order to adapt these incentives in the right way and avoid any abuse, the Fed charged an up-front fee.

During the first months of 2009 the commercial papers’ purchases reached a very high level ($350 billion in January and $260 in February); all the same, by the passing of the same year, they decreased until $15 billion in December, until to arrive to the early 2010, when the program was ended (Mr. Peter Stella 2009; Thomas 2013; Burton, F. Nesiba, Brown 2015).

Also this program can be considered as effective, due to the increased commercial paper issuance and to the spread reduction between these papers’ rates and those of the other markets to normal levels by mid-2009. Not only, but after the pursuing of this policy, the correlation between the corporate spreads’ raise and the commercial paper issuance was broken, since this latter increased the same (Cecioni, Ferrero, Secchi 2011).

By the way, on the other hand, it is also true that the corporate sector came into the recession in a quite healthy condition, because otherwise a deterioration in the economy could have undermined the markets’ situation, especially when the reliance upon the agency ratings was questioned (Mr. Peter Stella 2009).
Then, there was also another measure, the MMIFF (Money Market Investor Fund Facility), which was implemented in order to complete the role of CPFF and AMLF into funding the short-term credit markets.

In fact, it is a special lending facility that helps to provide liquidity to US money markets by allowing the purchase of short-term CDs and commercial paper from money market mutual funds and investors.

This could be useful to restore the investors’ confidence for investing in these financial instruments, due to the fact that this new liquidity allow them to redeem shares, if they want (Burton, Brown 2014).

Another unconventional measure implemented during this phase was the TALF (Term Asset-Backed Securities Loan Facility), a special lending program designed to help by providing up to $200 billion to the issuers in the asset-backed securities markets, because the financial crisis led to a reduction in their issuances that are useful to provide funds for consumer credit and Small Business Administration loans.

Here, the public balance-sheet was substituted by the private one, since banks exercised a great credit crunch due to the great deleveraging and risk aversion.

The Fed granted private investors long-term loans (3 to 5 years) in order to purchase eligible AAA-rated asset-backed securities collateralized by student loans, auto loans, credit card loans, ext. and then the proceeds derived from the loans were used to issue new asset-backed securities (it is a form of “indirect credit easing” with the difference that private rather than public balance-sheet took risks) (Cecioni, Ferrero, Secchi 2011; Burton, F.Nesiba, Brown 2015; Mr.Peter Stella 2009).

TALF was initiated in November 2008 when the Fed committed to make available $200 billion of loans to securities issuers. During the 2009, it expanded a lot from less than $1 billion in March to around $47 billion by the end of the same year. It was closed in mid-2010 (Thomas 2013).

This facility was then extended also to issued highly rated commercial mortgage-backed securities.

The implementation of this program led to an increased ABS issuance and a reduction in the spreads between AAA-rated ABS and interest rate swaps, but no evidence was found between
its acceptance and ABS returns, maybe because the program didn’t affect the single securities, but only the general market conditions (Cecioni, Ferrero, Secchi 2011).

Besides, it was important to consider the risks that TALF could have caused, since, as seen during the crisis, the evaluation of ABS was unreliable, so much that UST (United States Treasury) chose to utilize TARP (Troubled Asset Relief Program) funds to protect the Fed against the first 10% of losses due to TALF (Mr. Peter Stella 2009).

The TARP has been a program implemented in the October of 2008 by the government’s Treasury in order to allow its Department to purchase $700 billion of toxic assets stating on the banks’ balance-sheet and impairing the credit channels; in a certain way, it was one of the means used in order to restore stability and liquidity in the financial system (Thomas 2013; Thompson 2012).

Other aims were to preserve homeownership, protect home prices and stabilize their related mortgages’ ones and increase the mortgage loans (Thomas 2013).

It lasted until the December of 2014, when the Treasury sold its remaining shares to Ally Financial. TARP assets were rather repaid and their total net value was more than the overall investments’ expenses for financial assets made during the program, which was closed with profits, although government held a great amount of mortgage debts ( Thompson 2012; U.S. Government Office of Management and Budget 2015).
Dollars in billions
1,200
1,000
800
600
400
200
0

Month and year

TALF
CPFF
AMLF
TSLF
PDCF
TAF

Source: GAO analysis of Federal Reserve System data.
4. MACROECONOMIC STABILIZATION: FROM QE1 TO QE3

Aside from all the different forms of credit easing, one of the most important unconventional measures implemented after the Lehman Brothers’ collapse was the “Quantitative Easing”, consisting in the expansion of Fed’s balance sheet through large-scale asset purchases (Labonte 2011).

The reason behind the Fed’s choice to resort to this policy should be traced back to the great economic recession arose after the October of 2008. In fact, if the Lehman Brothers’ generated the troubles in the financial markets and in the interbank markets explained above, it was easily predictable these problems would have flowed also toward the real economy.

The economy was in a situation of recession since the January of 2008, but it was certainly widened by the great financial crisis, and it lasted officially until the June of 2009. The signals shown by the recession were an high unemployment and a slow economic growth, and this probably depended also from the lack of credit for enterprises described above (Lopus 2013).

For this reason, the range of unconventional monetary policies was broadened also by including the quantitative easing, aimed not only to stimulate the real economy and the inflation growth and to support the sovereign debt markets (Veronesi 2016).

Following the definition of the different form of unconventional measures adopted in the first chapter, I will include in this group the purchases related to Agency debt, Agency MBS (mortgage-backed securities), the toxic waste of housing bubble, and long-term Treasury bonds, with the exclusion of the other measures about which I spoke before, classified as different forms of credit easing, differently from other literary approaches (Gagnon 2010; Hackmann 2013).

4.1. QE1

The QE1, began in November 2008 and lasted until March of 2010, had different objectives, in addition to that general of containing the deflation and pursue the price stability (Brandl 2016; Labonte 2011).

Firstly, it was aimed to pull the US economy out of the recession and help the working of activities by lowering long-term interest rates, in order to encourage people to borrow money. In fact these great purchases led to an increase in the asset prices and to a reduction in the bonds’ yields (E.O’ Connor 2014; Pilkington 2014).
Then, it was aimed to increase the liquidity in the financial system through a major lender of last resort operation, with the creation of new money through the Fed’s payments for the assets sent electronically to the banks. In this way, this process allows to enlarge reserves in the banking system, lend to commercial banks and, therefore, increase the country’s money supply, included that lent by banks in order to stimulate the economic growth and jobs creation.

All these arrangements are also aimed to restore private and public asset holdings (E.O’ Connor 2014; Pilkington 2014; Hackmann 2013).

All in all, during all the QE1 the Fed bought around $1.75 and $2.1 trillion of financial assets, mainly consisting in purchases of agency and mortgage-backed securities, rather than Treasury ones (Pilkington 2014; Hackmann 2013).

4.1.1. Agency debt and MBS purchases

During this phase, and exactly in the November of 2008, the Fed announced the purchases of assets up $100 billion in Agency debt (for example Fannie Mae and Freddie Mac) and up to $500 billion in Agency MBS (an example of forward guidance). Such loans will be fully collateralized and priced at LIBOR plus 50 basis points (Brave, Genay 2011; Ashcraft 2009).

It was done in order to restore confidence in GSE’s debt and MBS, since spreads on GSE debt and on GSE-guaranteed mortgages was widened. In fact, many rating agencies cut ratings on these issues due to the suspension of the dividends, caused also by the diluitive government’s injection. Essentially, the Fed wanted to support the housing markets, by reducing the cost and providing credit for houses’ purchases, and the financial markets in general (Cecioni, Ferrero, Secchi 2011; International Monetary Fund 2009).

This policy seems to be a combination between quantitative and credit easing, since the Central Bank purchases government bonds, which, all the same, are investments in the private sector and so subject to the relative risks, so much so they are covered by mortgages.

Then, during the following December, Agency debt purchases began, and in the January of 2009, also those related to Agency MBS (Brave, Genay 2011).

Then, in the March of the same year, since the economy was still weak and the houses’ and mortgages’ markets still impaired, the Fed increased the purchases of Agency debt and MBS respectively of $200 billion and $1.25 trillion (Gagnon 2010; Cecioni, Ferrero, Secchi 2011).
Both the direct effect of the announcement and the following changes carried to the policy led to a reduction in the debt spreads between Agency debt and MBS and comparable Treasury securities. The risk premium on the GSE’s short-term discount note and long-term debt auctions decreased, and this allowed the GSEs to guarantee other mortgages (International Monetary Fund 2008).

Not only, but it was reduced the duration and therefore the default risk, causing a shrink in the term risk premium across all the asset classes. Yields were affected also by other factors, as for example the portfolio balance effect caused not only a reduction in the returns of these assets, but also a spill over in the yields of other assets (Gagnon 2010).

Essentially, interest rates paid by borrowers decreased, and these reductions were heterogeneous across the different cases; the borrowing activity increased; and there was a shift in the borrowers’ features since this financing became skewed between those with high credit (Cecioni, Ferrero, Secchi 2011).

Finally, during the July of 2010, Bernanke announced that the Fed wasn’t reinvesting the repayments of Agency debt and MBS on the same program, but that was going to do it in favor of long-term Treasury securities, giving life, as we will see, to the second round of QE (Brave, Genay 2011).

4.1.2. Treasury securities purchases

In fact, already in mid-March of 2009, it was announced the purchase of up $300 billion of longer-term Treasury securities, over the following six months, by the Fed, which predicted also that these purchases would have been concluded by March 2010, overlapping with the end of the first round of QE (also in this case Fed provided forward guidance about the path of funds rate) (Labonte 2011, Brandl 2016; Brave, Genay 2010).

In normal times, the Fed limits itself to purchase only short-term Treasury securities, but during all the round of QE it bought a great amount also of longer-term securities; and this was made in order to reduce firstly the long-term bonds’ yields and, therefore, indirectly, the long-term interest rates and stimulate long-term borrowings both by corporations and entrepreneurs for capital expenses and by individual consumers for, ad example, buy homes.

It should be remarked that, although the short-term interest rates were near the lower zero bound, an important part of expenses made by such entrepreneurs and consumers were subject to the long-term interest rates (Madura 2016).
But, in general, these purchases were pursued with the aim to improve conditions in private credit.

This could be possible since the mortgage rates are set relatively to 10-year Treasury rates and there’s no penalty for refinancing mortgages, although in this way the only benefit for banks is the null cost of funding, while the possibility to obtain further returns is rather limited (Labonte 2011; Kregel 2014).

4.1.3. QE1 effects

Some economists stated that, in overall, this first round of QE was rather successful, since the Fed restored the confidence in the markets and the mortgage rate decreased of around 1 percent (Zestos 2015).

About the real attempt to lower the long-term interest rates, it was found that already with the announcement of the policy the 10-year Treasury rates dropped about 90 basis points and, with the implementation, Treasury yields dropped more than 100 basis points (Cecioni, Ferrero, Secchi 2011).

Not only; they have occurred also other advantages: the QE1 helped the financial sector to reduce its leverage; then, the increase in the asset prices and their related yields reduction led to an improvement both in the property market and in the balance sheets of the banks, thanks to their better solvency; finally, as expected, it was improved also the market liquidity and, as said, the confidence in the markets (Duncan 2012).

QE1 also helped to reduce the borrowing costs, and this was important for the health of financial system (Zestos 2015).

Some of the criticisms expressed against the way of implementing the policy were that the Fed focused only on financial institutions and not on the other economic sectors; or that if some of these financial institutions, especially securities firms, were able to pay high salaries to their employees, they shouldn’t have needed to be taken out from the bankruptcy by the government. By the way, the Fed, for example, didn’t save the Lehman Brothers (Madura 2016).

Another critique was related to the fear that the Fed could finance the government’s deficit. By the way, the Section 14 of the Fed Act forbids the direct purchase of debt from Treasury, but allows to buy Treasury securities in the secondary markets (Labonte 2011).
However, the economy grew a little (besides, as we can see in some charts further on, the inflation increased), and for this reason the measure was ended in the March of 2010, but the recovery was slighter than expected and, in general, the program didn’t reach its objectives.

This was due to several reasons: firstly, the banks weren’t opening their lending windows in favor of households and corporations (in fact, although the Fed printed money to buy bonds, the banks didn’t favor the cash flow).

Besides, the consumers had many difficulties into spending, the recovery in output was slow and the unemployment rates were still at an excessively high level, as in the immediate moment after the outback of the crisis (Ozga 2012; Hackmann 2013; Cecioni, Ferrero, Secchi 2011).

All this should be added to the fact that, some weeks after the end of QE1, the ten-year long-term Treasury yield increased and the U.S. stock market began to suffer a flash crash, lasted then until the August of 2010: this drop destroyed too much paper wealth and, therefore, there was a negative effect on the wealth; besides, not last, there was the fear of falling again into recession (Duncan 2012).
4.2. QE2 and its effects

Since the Fed stated that the economy wasn’t growing enough and the inflation rate was low again, in the August of 2010, its Chairman Bernanke announced that a second round of QE (QE2) was going to be launched (another example of forward guidance) and, in the same month, the Fed chose to keep its holdings of securities constant by reinvesting all the returns derived from Agency debt and MBS in long-term Treasury securities and to roll over the same maturing Treasury securities (Kennard, Hanne 2015; Duncan 2012; Cecioni, Ferrero, Secchi 2011; Brave, Genay 2010, Zestos 2015).

Then, on November 3 of 2010, in order to face the financial problems and the high unemployment, to promote a stronger rhythm of economy recovery and to help the inflation to come back to its desired level, the QE2 was officially started with the announcement by the Fed of its plan to purchase $600 billion of long-term Treasury securities until ending it in the June of 2011, with a pace of $75 billion per month, to be expanded of another $200-300 billion afterwards, if necessary (Labonte 2011; Hackmann 2013; Brandl 2016; Pilkington 2014).

This time, the focus was more on the Treasury bonds rather than the mortgage ones. The idea was that substituting the provision of liquidity to the big banks with its directs injection in the economy should, more likely, imply a successful recovery. (Hackmann 2013; Pilkington 2014).

Unlikely, the great economic response expected with this second round didn’t occur. Paradoxically, it was more effective the pledge taken in the August by Bernanke to begin a new round of QE (forward guidance) rather than the announcement for the same policy made in November.

In fact, between August and November, the interest rates decreased strongly and, with the summer “soft patch”, the stock market took off again, by leading to an increase in the stock prices and so, therefore, to a positive wealth effect, with the following boost in the consumption (Duncan 2012; Zestos 2015).

But then, after the announcement of the official beginning of the QE2, the interest rates began to return to their pre-announcement levels, and so the policy’s impact on their lowering was low; besides, the asset purchases led to an increase of less than 0.1 percent of the real GDP after two years, and so the effects on growth began to vanish by the passing of the time and the overall US economy couldn’t recover as expected (Zestos 2015; Lindsey 2016).
All the same, many economists found that the measure helped to avoid a further deterioration of the economic situation. But, although the real interest rates decreased, the dollar depreciated and the equity prices rose, the effects of the QE2 are rather similar to those due to a conventional reduction in policy rate, and so quite limited (Zestos 2015; Pilkington 2014).

We know that the main aim of the QE2 was to monetize the government’s deficit: since the interest rates were already at rock-bottom levels, if the government would have tried to reduce deficit and borrow less, interest rates would have not fallen. For this reason, a reduction in public spending would have only avoided the boost in the investments and consumption, because it would have resulted in fewer jobs and less aggregate demand, although a great part of the American society required a reduction in the government spending.

Therefore, given that economy was near to collapsing, the deficit spending was useful, especially for the private sector became unstable (Duncan 2012).

But, in the first quarter of 2011, when the QE was still in progress, many shock hit the US economy, as, for example, the winter storms, the disrupting imports from Japan for industries that needed components and semi-finished goods, or the political revolutions in the Middle East and North Africa (Pilkington 2014).

In addition to this, the QE2 was clearly showing that its costs were becoming higher than the benefits (with these latter subject to the law of diminishing returns). In fact, the US GDP didn’t grow enough until June, the date of end of QE2 (0.8 percent on an annualized basis). This was due mainly to the pick-up in the inflation and to the following reduction in consumption, especially that of food and oil, whose prices rose with QE (Duncan 2012).

Other critical issues were that QE policy focused more on its effect on the indicators related to the financial markets, as interest rates and risk premiums, rather than on the real economy and, besides, the suspicion that the Fed’s choice to purchase Treasury securities instead of toxic assets was only a way increase the dividends for its shareholders, since in this way the income taxes serve only to pay interests on the country’s debt (Hackmann 2013; Lindsey 2016).
4.3. Operation Twist

Due to this climate of economic uncertainty and the concerns related to the coming back of inflation, the Fed adopted a particular measure in order to modify the composition of its balance sheet. This program was called “Operation Twist” and was implemented with the particular aim to reduce the long-term interest rates.

In order to do it, the Fed began to sell the short-term government securities and use the returns obtained from them to purchase the long-term ones (Zestos 2015).

The overall expected expenses to be allocated for the operation were amount $667 billion, divided in two separate supplies: the first one of $400 billion between the September of 2011 and the June of 2012, the second one of $267 between the July of 2012 and the December of 2012.

Although this new umpteenth liquidity enhancing program launched by Bernanke, there were no important positive effects on the banks’ lending activities, neither the labor market conditions improved.

Essentially, in general, printing money was resulting ineffective for the trigger of the economic recovery spiral (bank lending-employment-consumption), since they weren’t being implemented suitable measures aimed to devote liquidity in the sectors which needed more (Hackmann 2013).

For these reasons, because of the failure of this operation, there was the quick launch by the Fed of the third round of Quantitative Easing (QE3), occurred in the second half of the same year 2012 (Zestos 2015; Hackmann 2013).
4.4. QE3

At the end of August of the same year, Bernanke announced that, because of the worrying labor conditions, a new monetary policy was needed to stabilize the economy. Then, on September 13, the QE3 was announced by the Fed in order to awaken the bank lending (Hackmann 2013; Zestos 2015).

This new round provided an open-ended (without any time limit) bond purchases of agency mortgage-backed securities for an amount of $40 billion per month. Besides, the FOMC announced to maintain the federal funds rate near zero at least through 2015 (Brandl 2016; Hackmann 2013; Kennard, Hanne 2015).

In fact, such MBS purchases were aimed not only to decrease the mortgage rates and thus stimulate house purchases, but also to restore the labor market conditions and the employment, in a context were the weak job market led to a great waste of ppan skills and talent. Thus, while the other great aim of the Fed’s dual mandate, the price stability, was widely reached since the mid-1990s, the employment situation needed more strong actions, mainly additional asset purchases.

These purchases, by the way, had to take in consideration also the inflation trend. And about this aspect, during the QE3, and exactly some months after its announcement, on December 12 of 2012, the FOMC announced new bond open-ended purchases of $45 billion per month long-term Treasury securities. In this way, the overall range of the program reached the amount of $85 billion per month (O’Connor 2014; Kennard, Hanne 2015).

The Fed bought these bonds in Operation Twist, with the hope to sterilize such purchases due to the fear of a sudden excessive inflation increase, but this attempt resulted to be unsuccessful since in the Central Bank’s balance sheet there weren’t enough short-term Treasury left to sell.

Bernanke was trying to incentive investors to move their cash in favor of the equities and commodities rather than the bonds in order to prevent inflation, but this could have damaged the economy, without allowing it to grow.

In fact, this could have led to sacrifice the dollar and the fiat currencies, and to destabilize the world monetary system, since all the other countries, due to competitive reasons, would have reacted to this currency depreciation of the dollar. Not only, but in a context of high unemployment and weak labor market and demand, neither the consumers nor the banks are willing to take new debt (Hackmann 2013; G. Pento 2013).
Because of its open-ended nature, the QE3 was also called “QE-Infinity”, which would have continued until lending operations revived, or, in general, the economic activity was restored (Kennard, Hanne 2015).

This objective was of such vital importance that the Fed announced, during this phase, a new policy called “future guidance”, which would have represented an alternative to the usual forward guidance.

In fact, this time, instead of seeming to commit for a specific objective or forecasting the exact date for the eventual firming, Fed preferred to create certainty about its policy by introducing an explicit threshold both for unemployment and inflation rate.

It would have kept the funds rate really low until the unemployment rate hasn’t fallen to 6.5% and until the expected inflation after one or two years hasn’t exceeded to 2.5% (Lindsey 2016; Zestos 2015).
Federal Reserve Asset Composition (% of GDP)

% of GDP

2007 2008 2009 2010 2011 2012 2013 2014

QE1

QE2

QE3

Source: Federal Reserve
4.5. Tapering

Subsequently, during 2013, thanks to the continuing improvement of the economic conditions, Fed chose to return back to a normal economic policy, by announcing a “tapering” of the quantitative easing policies, that is decrease gradually the bond purchases for the following months until, at a certain point, end them definitely (Zestos 2015).

In fact, the economics growth reached the good level of an annual rate of 2.4%, the unemployment rate by May fall to 7.6% and was going to lower further. Both the stock market and the consumer confidence increase a lot, as much as the Dow Jones Industrial Average increased up more than 15%. Besides, the housing market was growing enough, as much as the prices in the sector were increasing until up more than 12% (CQ Press 2016).

For this reason, the possibility of winding down QE3 was in the air, and this, by the way, caused such skepticism among many economists, who, because of this fear, forecasted a certain volatility in the stock market. This depended also on the fact that there was who thought that such recovery was still weak, and for this reason the Fed had to continue along the way of the monetary easing (Wiedemer, A. Wiedemer, S. Spitzer 2015; CQ Press 2016).

Nevertheless, on December 18 of 2013, the Fed announced a gradual scale-back of government securities from $85 billion to $75 billion a month to begin in the next January of 2014. While both Bernanke and Yellen, the new Fed’s chairman, forecasted further scaling back from QE during the following months, they ensured that interest rates would have remained the same near zero.

After all, this seemed to work, since, during the scaling back, the economy wasn’t damaged by the operation.

Subsequently, on January 29 of 2014, the Fed announced a further QE tapering by reducing securities purchases from $75 to $65 billion per month and then, during the following March, it announced a further tapering from $65 to $55 billion per month to start in the April of the same year.

During the following month, the QE bond purchases were reduced more and more, until exactly the October 29 of 2014, when the purchases were halted after having accumulated $4.5 trillion in assets (Zestos 2015; CQ Press 2016; Kennard, Hanne 2015).
5. CONCLUDING REMARKS ON FED’S QE

The positive indicators observable after the end of QE are in contrast with the effects on long-term yields following the announcements of all the three rounds of QE. In fact, QE1 had a stronger impact on them than the other two rounds.

The difference could be due to the fact that while QE1 was novel and without notice, the other two were already announced and anticipated by the markets and have already affected bond rates through expectations; not only, but it could depend also on the fact that, during the last two rounds, there were faster portfolio adjustments, with the prices of government bonds reflecting quickly on the prices of the other assets; or it could depend on the higher bond rates before QE1, that made the policy more successful (Shahin, El-Achkar 2016; F. Humpage 2015).

![Chart showing Treasury yields during Fed's QE programs](chart.png)

Beyond the more or less large success that the QE rounds obtained thanks to the forward guidance, it was shown that the Fed’s large-scale asset purchases lowered MBS yields and mortgages rates more than what would have been proposed by the only changes in market expectations, and this means that the portfolio rebalancing channel is important to take in consideration in order to evaluate the monetary policy transmission (Hancock, Passmore 2014).

Although there’s a wide consensus that QE lowered long-term government yields (between 90 and 200 basis points depending on the event window and the methodology), at least in the
short-run after some announcements, the objective was to reduce the long-term yields beyond the levels they would have reached without any QE.

In order to evaluate the achievement of the aim, an analysis was conducted in order to check if there was a change in the spreads between long-term sovereign yields in USA and those of the countries (as, United Kingdom, France or Germany) which didn’t engage in QE during that period.

The three spreads rose so much between the November and the December of 2008 (the implementation of QE1), but this increase was short, since, after the peak in the January of 2009, it began to decline throughout the year (Thornton 2014).

Even with regard to the QE effects on the real economy, there’s evidence of a positive correlation between QE and many economic indicators, although the size and the persistence of the effects vary largely across the studies. Shock to QE raised industrial production and employment, as much as they increased the equity returns and reduced the financial market uncertainty.

As opposed to the results shown from the long-term yields, it seemed that QE2 and QE3 had stronger effects than QE1 on some real economy variables. In a particular way, QE2 had the strongest effect on the industrial production growth (Meinusch, Tillmann 2014; Federal Reserve Bank of Philadelphia Research Department 2016).

The total average increase in the US GDP seems to be of about 2 percentage points (its real growth rate, after being negative in the early recession, began to increase until the QE end), although the range of estimates varies from 0.1 and 8 percentage points. By the way, the monetary aggregate growth was larger than nominal GDP growth, and the spread between these two increased since 2009, by reflecting the low velocity, or the difficulty, with which the increase in money demand translated into an increase in GDP.

By taking in considerations the data collected in the 2015, apart from the real GDP growth rate that surpassed the 3%, the unemployment rates decreased to less than 6% and the inflation rate, after the first drop in the early crisis and the peak in 2011, stabilized above 1.5% (Shahin, El-Achkar 2016; Federal Reserve Bank of Philadelphia Research Department 2016).
It was estimated also that, in absence of policy actions, it would have been impossible to avoid deflation or output collapses similar to those that took place during the Great Recession. In fact, without QE, the annualized inflation rate would have reached the -1%, the real GDP would have been 0.9% lower, and the unemployment rate 0.75% higher (Baumeister, Benati 2013).

All the same, there’s a wide literature which argue that in the short-run such policies are effective for these indicators, while in the long-run are ineffective and sometime negative (Song 2014).

While the QE pumped money into the US economy, it was unlikely that it produced much inflation, because people and businesses were deleveraging, and so they weren’t spending, and because with high unemployment there was too much unused labor, and if there’s unused capacity neither the money stimulus can revitalize the inflation or the economy (Newsmax Finance 2015).
In some sense, the Fed overestimated the impact of QE, and not only because the lowering of long-term rates didn’t easily translate in higher GDP, since many businesses preferred to minimize their debt, but also because such lowering of long-term rates was nothing of particular, given that such rates weren’t increasing neither before the Lehman collapse, due to the strong private savings. The only reason because of which the Treasury yields fell so much is that the government was the only lasting borrower.
But, in the same time, the Fed also underestimated the costs of QE: for instance, the problem related to the market’s price-signal distortion that, as happened in many countries, can make hard to address the government recession, since a reduction of government bond yields in a context of fiscal deficit may be seen from the government as an encouragement signal to run deficit, while a rate rise may be seen as pledge to pay for the economy because of deficit with the dismissal of investments.

But, given the rate lowering, it probably happened the opposite: very low rates could have been seen as a great opportunity to reduce the deficit, just because the rates are low, and not as a stimulus for the economy (Koo 2014).

For these reasons, since from the moment when the tapering began, there was the trade-off between continue the easing policies or unwind them.

In the first case, there’s the risk of an high inflation and of an excessive risk-taking by the investors, that could create high market volatility in the case of subsequent rate rise, especially if policy is too long. By the way, there was no great evidence of financial instability due to QE, neither of high inflation until early 2016.
In the other case, if the Fed unwinds too quickly, there’s the risk of undoning all the progress reached by the Fed with QE. Not only, but if banks haven’t got high-quality assets in order to obtain reserves among the Fed (so much to becoming more difficultly accessible), they would make liquidity crunch.

A solution could be inflate the asset prices again, and so reduce their risks (almost the credit easing policy) (Newsmax Finance 2015; Federal Reserve Bank of Philadelphia Research Department 2016).
6. LATEST DEVELOPMENTS

After the end of tapering from QE in 2014, the process towards the normalization of the monetary policy is continued and strengthened since the December of 2015, when the Fed began to increase the federal funds rate (from the 0.25% to the 0.5%); after that further reductions occurred and more are expected also nowadays (De Vijlder 2016).

The strongest way to return to a normal monetary policy would be to remove the excess reserves through the asset sales. The Fed planned a gradual reduction on its balance sheet in order to avoid creating instability in these markets; nevertheless, it not only refused completely to sell MBS or, at least in the near term, to sell Treasury securities, but also continued to roll over the securities at the maturity.

Rather than sell assets, the Central Bank increased the market interest rates by raising the rate on reserves that the Fed pays to banks and by modifying the repo rate through large-scale reverse repos.

A debate similar to that of tapering arises: although the monetary policy now is less expansive than the previous years, the Fed is still keeping rates below the “neutral rate” and is waiting for a stronger economic recovery to raise them more. In this context, a too slow raise in interest rates could lead to high inflation and financial instability, while a too quick raise could undermine the more or less strong economic recovery obtained until now (Labonte 2017).
CHAPTER 3:
THE UNCONVENTIONAL MONETARY POLICIES BY THE EUROPEAN CENTRAL BANK
1. OBSTACLES ON THE WAY TOWARDS QE

Due to the globalization, the effects of the real estate bubble burst in the US during the first years of this millennium expanded all around the world and so also in Europe. Consequently, also in Europe it was soon felt the need to implement suitable measures in order to face the ongoing crisis.

As was done by the Fed, also the ECB limited itself to introduce quite conventional measures during the first period of the crisis (from August of 2007 to September of 2008). Then, after the Lehman Brothers’ bankruptcy, also the ECB began to adopt unconventional measures, since the effects of the crisis became stronger and were leading to a collapse in the financial sector and in the economy.

As I have said many times, the ECB’s intervention was less strong and more delayed than that of the Fed. In fact, during the first years of unconventional policies, the Fed has already implemented not only many forms of indirect credit easing, but also a program of direct credit easing (CPFF), another that was a mix between direct credit and quantitative easing (LSAP) and rapidly in the 2009 the first round of QE.

By contrast, the ECB pursued for many years different forms of only indirect credit easing (the first form of direct credit easing was implemented in the 2016); this was due to the fact the ECB, differently from the Fed that began in 2009 to directly purchase private assets, preferred to provide funds via the banking sector through covered bonds.

In the 2010, with the SMP, it was carried out the first form of direct/quantitative easing, mainly quantitative, in order to face the Greece crisis and concerns related to other indebted countries.

Then the SMP was ended to be substituted with a similar program, the OMT, which was only announced. In fact, we have to wait until the 2014 for the implementation of an important asset purchase program (APP) and the 2015 for the first government bond purchases of QE, broadened during the following year.

This was due to many reasons, partly already described in the introduction to the previous chapter.

Differently from the US, which have a unique monetary and fiscal policy, the UE is a mixture of countries, different between themselves, and so it’s not easy choose which policy follow.
On one hand, there are the stressed countries in the southern and western Europe, which need credit flow to renovate their economy and avoid the default; on the other hand, there are countries, as Germany, being in a surplus condition, that are reluctant to the easing in favor of these states, not only because they historically fear the inflation, but also because they don’t trust them about the implementation of structural reforms to repay the debt. This has limited the magnitude of the program.

Obviously, a constraint for the program is represented by the European treaties, that prohibit the Central Bank to directly finance the governments’ deficit and force it to buy them on the secondary markets.

Similar issues could be found due the differences between the banking systems across countries.

These are the reasons that can be traced back to explain why the ECB’s ability to make decisions was hindered. But not even about the transmission of ECB’s monetary policy things are better.

In fact, the money provided by the Central Bank often remains imprisoned into the banks, without reaching the real economy (and this implies all the negative consequences related to the deflationary spiral many times described). For this reason, aside from the differences in the banking systems and the need to avoid the bailout procedures from governments to save banks, it is more and more likely that a new banking and fiscal union will born in the euro-area.

As we will see, these explained were some of the causes that slow down the functioning of the ECB’s unconventional measures.

However, about the QE effectiveness on the economic revival, there’s in the air a certain optimism, due to the improvements in some indicators. Nevertheless, such optimism is cautious, maybe because of the fluctuating economic and financial performances occurred after the implementation of the unconventional measures during the previous years.

In fact, after the initial recovery following the first unconventional policies since the October of 2008, the problems related to the Greek crisis in 2010 and to the fear of “contagion effect” led to an increase in the borrowings costs and to a loss of confidence by the markets. This was the reason for the implementation of SMP and mostly of some programs, as the EFSF and the
EFSM, aimed to save some countries (Greece, Ireland and Portugal) from default, then substituted by the ESM.

All the same, the monetary easing guaranteed by these programs was low, due to the opposition of Germany, that didn’t accept the risk that German taxpayers would suffer losses, neither the risk of moral hazard on the fiscal discipline of the indebted countries, neither the bail-out principle to save banks in difficult. The power of these programs was so limited that it was not sufficient to support the stressed euro area countries (Bastasin 2015).

This have contributed to the sovereign debt crisis expansion also to other Member States in the second half of 2011, with all the negative consequences on the financial markets and in the economic performances that were found.

It is because of these fluctuating performances that, although they are turning now voices about the possibility of tapering from QE in the next year, the debate is opened, and the opinions about whether the impact on the economic and financial conditions in the different countries disagree among themselves.
2. CONVENTIONAL MEASURES UNTIL OCTOBER 2008

As the Fed, also the ECB implemented several measures in order to face the first crisis effects. The ECB, differently from the US Central Bank, managed to offset the shocks in the distribution of reserves in the banking system, both because it handled its balance sheet in order to preserve an high liquidity deficit and also because the depository institutions could directly access to ECB’s liquidity, with a wider range of collateral accepted than in the case of the Fed (Cecioni, Ferrero, Secchi 2011, Murphy 2009).

In particular, the effects of the crisis began to be visible in the August of 2007, when the swap spread between the EONIA (it is the OIS reference for the Eurozone and represents the euro overnight index average, the effective reference rate for the euro, computed daily as a volume-weighted average of unsecured euro overnight lending transactions in the interbank market) and the EURIBOR (euro interbank offered rate, the benchmark rate for euro money market for maturities longer than overnight, from one week to one year) sharply increased (de Haan, Oosterloo, Schoenmaker 2009; Nyborg 2016; Smith 2014).

Such spread reflects the credit risk, or, in other words, the price of liquidity, and if it is high it means that the interbank market for liquidity is impaired.

![Euribor EONIA spread](image)

The same happened to the stock market: it collapsed, since it lost the half of its value from the August of 2007 until the March of 2009 (Nyborg 2016).
And hence, in order to remedy the shortage of liquidity due to the dysfunctions in the interbank markets, the ECB responded, in the first phase of the crisis, and so between the August of 2007 and the September of 2008 (the Lehman Brothers’ collapse) by resorting mainly to two instruments:

- Large-scale overnight fine-tuning operations (conducted from time to time in particular circumstances at ECB’s discretion), through which additional liquidity was injected in order to offset the increased volatility in liquidity demand;
- Additional longer-term refinancing operations (LTROs), that act as a complement of the main refinancing operations (MROs) and have a maturity of three months, through which the ECB increased the frequency and the liquidity assigned to banks (Burda, Wyplosz 2013; Brinkmeyer 2014; Cecioni, Ferrero, Secchi 2011).

In addition to these, there were implemented during this period other measures, as the Reciprocal Currency Agreements, with which the Fed provided US dollars to foreign Central Banks to satisfy the high demand for them, or the “supplementary long-term operations”, with a maturity of six months, in order to face the increase in the volatility of Eonia and in the money market spreads after the Bear Stearns’ collapse in the March of 2008.
Although it’s difficult to assess the ECB’s effectiveness for this period in facing the frictions in the euro-area money market, during this first phase of the crisis, the Eonia stayed close to the official interest rate and this could have represented how the ECB was facing the volatility in the euro-area overnight rate quite successfully (Cecioni, Ferrero, Secchi 2011).

All the same, from the September of 2008 onward, the situation, as we know, worsened. The Lehman Brothers’ bankruptcy led to a strong tightening in the liquidity market of the euro-area and to an obvious deepening of the financial crisis, and this is due to the great interconnectedness that the global markets have by now reached during the last years. After this event, the spread between Eonia and Euribor reached a peak.

In order to response to the financial crash burst, the ECB changed necessarily its monetary operations in favor of more unconventional measures (Nyborg 2016).
3. THE FIRST UNCONVENTIONAL MEASURES AGAINST THE FINANCIAL CRISIS

During the following October, the ECB started to implement such unconventional measures, exceptional for nature, scope and magnitude, which, as it is easy to imagine, went beyond the simple interest rate cuts. By the way, between the October of 2008 and the May of 2009, the ECB official interest rate was brought from 4.25% to 1% (Talani 2016; International Monetary Fund 2009).

3.1. Enhanced credit support

The first non-standard measure implemented by the ECB was the “Enhanced credit support” in the October of 2008. This represented a new way to provide liquidity, focused mainly on the banks, which are the main source of credit in the euro-area, aimed to ensure a flow of credit greater than that provided through the “conventional” interest rate cuts (Stavrev, Harjes, Cihák 2009).

Such policy relied on some building blocks:

- increase in the share of liquidity provided to LTROs with respect to the MROs;
- extension of maturity of LTROs (initially to six months, then, in the May of 2009 the ECB announced three 1-year refinancing operations to be held in the following June, September and December of the same year);
- all the ECB’s refinancing operations were conducted at a “fixed-rate full allotment”, rather than a variable rate used before, where the rates were gradually reduced (first 1% and then down to 0.25%);
- widening both of the list of collateral accepted for the repos, including also those less liquid, and of the list of eligible counterparties for Eurosystem operations, with the protection of their anonymity to avoid domino effects;
liquidity provision of US dollars through swap lines with the Fed.

These elements allow us to consider such policy, according to the definition provided by myself in the first chapter, as a form of indirect credit easing (Talani 2016; Stavrev, Harjes, Cihàk 2009; De Haan, Berger 2010; Parker, Whaples 2013; Sinn 2014; Cecioni, Ferrero, Secchi 2011).

About the point b), this choice was aimed to reduce the commercial banks’ uncertainty for lending to households and firms. Thanks to this, it was provided a great amount of liquidity to banks (€442 billion), probably thanks to the drop in the Eonia to a rate close to that of deposit facility (0.25%). Also the Euribor decreased after the announcement made in May 2009 (Cecioni, Ferrero, Secchi 2011, International Monetary Fund 2009).

About the point c), this policy was aimed to offer to the commercial banks, and hence to households and firms, a possibility to obtain credit alternative to the distrustful interbank market, where other banks preferred to keep money into themselves.

And about the point d), the ECB enlarged the list of assets accepted as collateral in order to guarantee the widest access to the refinancing operations and avoid the massive sales of low assets that the banks were going to do (Cecioni, Ferrero, Secchi 2011, Sinn 2014).

In January 2009, in order to restore the money market, the ECB also restored the interest rate corridor (the difference between the rates charged on lending to banks and paid on deposits) from +/- 50 to 100 basis points around the policy rate and restricted the risk control measures for many asset-backed securities and unsecured bonds (Stavrev, Harjes, Cihàk 2009).

3.2. CBPP

In addition to these measures, during this period, and exactly in the May of 2009, the ECB implemented another policy, the CBPP (Covered Bonds Purchase Program), where the covered bonds are debt securities issued by the banks that, through these bonds, can access to funds of longer-term maturity than that of ECB’s refinancing operations (it is another form of indirect credit easing) (International Monetary Fund 2009).

This policy, aimed to complement the other liquidity measures displayed above and to restore the functioning in that market segment impaired because of the financial crisis, implied the outright purchases, both in the primary and in the secondary market, of €60 billion of covered bonds issued in the euro-area, to be completed in the June of 2010 (Cecioni, Ferrero, Secchi 2011; Parker, Whaples 2013).
These bonds are useful for banks to handle the maturity mismatch between the assets and the liabilities and they are also useful to provide credit to banks, without leading to an excessive increase in the credit risk taken in the euro-area (International Monetary Fund 2009).

3.3. Policies’ effects

There’s a good evidence that these first measures contributed to restore confidence in the money market. In fact, the term money market spreads decreased sharply and the liquidity premium have been eliminated. The spreads are still high, but they won’t fall more until trust between banks won’t be restored (Stavrev, Harjes, Cihàk 2009).

By taking into consideration the single policies pursued during this phase, it was found that the FRFA (Fixed-rate full allotment) procedure was effective into reducing spreads between interest rates on unsecured and secured loans only at the moment of the announcement, but maybe the effects seem to be limited because the procedure impacted both the secured and unsecured rates.

About the CBPP, it seemed to have a positive impact on the reduction in the spreads on the eligible covered bonds and on secondary markets, but the impact of the overall amount was deadened, and this because there could have been a crowding out effect between covered and uncovered bonds (Cecioni, Ferrero, Secchi 2011; International Monetary Fund 2009).

Aside from the positive effects that the “enhanced credit support” had on interest rates, there was also a recover in the private interbank activity and, although with a delayed effect, also in the real economic activity. In some sense, all this provision of credit represented a success (Stavrev, Harjes, Cihàk 2009; Parker, Whaples 2013; Sinn 2014).

These positive effects were easy to find in the healthy banks of those economies that, however, were still sound and where the improvements following the measures were quick. This was due to the fact that the markets began to distinguish between all the different country and institutional risks, but this, at the same time, as we will see, represented a problem (Sinn 2014).
4. THE FIRST MEASURES AGAINST THE SOVEREIGN CRISIS

4.1. The Greece crisis

Since from the early 2009, due to the financial crisis of 2007, many Eurozone countries were beginning to suffer what would have become a sovereign debt crisis. There were many concerns about this.

There was the fear that the weaker economies would default on their debt, since the growth of their economies was low; another worry was that their governments wouldn’t implement reforms to reduce public spending and rebalance their fiscal policy. In this way, they couldn’t take funds on capital markets to finance their deficits, but only though financial package from IMF or EU.

Not only, but there was also a risk of a “contagion effect” that would have caused default also in other Eurozone countries, that would have caused an increase in their borrowing’s costs and in the probability of recession, aside from the risk that banks holding bonds of defaulting governments depreciated the assets (Shuibhne, Gormley 2012).

When the markets reassessed the risks related to these countries, it was foregone that they had to pay higher risk premium than the normal, since the confidence in their solvency was impaired. Their commercial banks were really frail for two reasons: firstly, they were full of government bonds with damaged markets and without holding equity against them; secondly, they had provided loans to the private economy that became bad with the real-estate market crisis (Sinn 2014).

The first country that was seen clearly in the early 2010 to suffer the sovereign debt crisis was the Greece, whose budget deficit increased and whose bonds were downgraded, but similar concerns were growing also about the Ireland and the Portugal (Shuibhne, Gormley 2012).

Such concerns became more evident in the April of the same year, when the ECB decided to relax the collateral requirements for sovereign debt issued by the Greek government (Tuori, Tuori 2014).

For this reason, in the next month, and exactly in May of 2010, two actions were taken by the EU.
4.2. ESM

The first was the creation of the EFSM (European Financial Stabilization Mechanism) and of the EFSF (European Financial Stability Facility).

The EFSM allows the European Commission to obtain borrowings for up €60 billion from the capital markets or other financial institutions on behalf of the EU in order to loan this money to stressed countries. It was instituted to grant immediate financial assistance to Greece.

The EFSF allows to issue bonds guaranteed by the Eurozone countries for up €440 billion, again with the aim to provide loans to those States in difficulty. It was instituted to operate beyond the short-term emergency and support not only the Greece, but also the Ireland and the Portugal.

In both the cases, the financial support was subject to the implementation of some reforms agreed in order to restore the public accounts (Shuibhne, Gormley 2012; Henning 2017).

Then, it was felt the necessity to overcome the incompatibilities with the Article 125 TFEU (establishing that the ESM Members guarantee the debt of defaulting countries), given that, due to this reason, the Germany opposed strongly the EFSF (De Lhoneux, Vassilopoulos 2013).

Therefore, the programs were both substituted by the ESM (European Stability Mechanism), instituted in 2011, but working only since the autumn of 2012. The program, regulated as the IMF (International Monetary Fund), is financed pro-quota by the Eurozone Member States on the basis of subscription by their national Central Banks to the ECB’s capital (Fabbrini 2016).

It has always the aim to provide financial support to countries that need it because of their emergency conditions, by granting loans, by purchasing their government bonds both in the primary and secondary markets (for this reason, it substituted the ECB for the emergency interventions), or by recapitalizing their banks, provided that, as for the previous programs, they implement the reforms agreed (strict conditionality) (Shuibhne, Gormley 2012; Fabbrini 2016).

This would have involved that in the stressed countries there would have been a fiscal policy of austerity, strengthened by the Fiscal Compact (and so cutting of public spending, increasing of taxes, privatization of the public services and other measures to improve the public finance), with the risk to cause of lack of public investments useful to face deflation and improve the economic conditions in those countries (Shuibhne, Gormley 2012).
Until now, the countries that required support from the program are Spain, Cyprus and, in 2015, the Greece for the renegotiation of a third package of rescue. (Fabbrini 2016; Guderzo, Bosco 2016).

All these programs seem to have been successful for the Ireland, that at the end of 2013 exited from EFSF; for the Spain, that few days later exited from ESM; and for the Portugal, that exited its program on the June of 2014. Instead, the Greece, after the first package negotiated May 2010, the second in March 2012, will renegotiate, as said, a third package in 2015 because of a further crisis erupted, and so, in this case, the program is still unsuccessful (Guderzo, Bosco 2016).

4.3. SMP
In the same month, and exactly on May 10, in order to face the tensions in the financial markets and to reduce the yield spread of sovereign Greek, Irish and Portuguese bonds relative to the German (benchmark) bond rate, the ECB launched the SMP (Securities Markets Programme), through which it began to purchase great amounts of Member State bonds and keep them into its balance sheet (Tuori, Tuori 2014; Henning 2017; Ringe, M Huber 2014).

Although they were bought both private and public debt securities in order to ensure liquidity to those market segments become impaired, it was soon clear that the main aim was to buy the government bonds of the troubled countries ( I have the doubt here if consider such program as a form of direct quantitative/credit easing or only quantitative) ( Talani 2016; Tuori, Tuori 2014).

The ECB didn’t purchase bonds directly in the primary market, because it couldn’t finance the countries’ debt, in fact it purchased such bonds on the secondary markets. This would have eased also the outright purchase of such bonds, as the Fed and the Bank of England were already doing.

It also implemented such policy only after that the Eurogroup approved the adjustment program negotiated with the Greece (but in general, in launching the program, the ECB insisted on the fact that it would intervene only in those countries where suitable measures were taken in order to reach certain fiscal targets) ( Henning 2017; Shuibhne, Gormley 2012).

Such purchases were sterilized in a way to don’t affect the monetary stance, in the sense that the same liquidity provided through these purchases was reduced from the market through
other means, as, for example, through weekly fixed-term deposit operations (Cecioni, Ferrero, Secchi 2011; Tuori, Tuori 2014).

The total amount of securities purchased by the program were of €219 billion and the liquidity provided was absorbed by weekly operations after its end until June 2014. Such securities will be also held until maturity (Schmolke 2017).

The introduction of this program would entail also some risks: firstly, the risk of losses at which the ECB was now subject due to the outright purchases of these bonds; then, this program wasn’t integrated with the troika programs, and this raised concerns about moral hazard, and therefore about the price stability, since the responsibility for the financial stability was committed to the national authorities; and finally, in this way, the ECB was coming into a totally political ground that would have undermined its independence (Henning 2017, Tuori 2015).

The purchases were strong during the first phase of the program, then they were stopped in the July of 2010, after that they have returned to be strong at the beginning of 2011.

Then, during the same year, from the February until the July the interventions were low, except for the relax of collateral requirements for the sovereign debt carried out also for Ireland in the March of 2011 and for Portugal in the July of 2011, similar to those made in the previous year in Greece (Cecioni, Ferrero, Secchi 2011; Tuori, Tuori 2014).

4.4. The crisis overflows
But during the following August, it became clear that the “contagion effect” described above took hold in the euro-area capital market.

Uncertainties didn’t concern more only the first three countries (Greece, Ireland, Portugal), but, without any intervention, the risks of dysfunction in the government debt markets and of an extension of these tensions toward the other markets increased also in larger economies as Spain and Italy, threatening to involve at a certain point also the France.

For this reason, they were reactivated the large-scale purchases of government bonds, especially those of the new countries involved in the crisis (Italy and Spain) (Tuori, Tuori 2014; Shuibhne, Gormley 2012).

During the same period, they were implemented also other measures. It was started the second round of the CBPP (CBPP 2) of about € 40 billion between the November of 2011 and the October of 2012.
After the election of Draghi as a president of the ECB, it was announced also a new form of LTRO, which provided around €1 trillion to banks between the end of 2011 and the beginning of 2012, with weaker collateral requirements and a longer than before maturity of three-years (Talani 2016; Ringe, M Huber 2014; Daniele, Simone, Cisotta 2017).

4.5. From SMP to OMT

About the effects of the SMP, there’s the evidence that it helped to avoid a market meltdown in the May of 2010, although evaluate the single effects related to this program isn’t easy since many measures (as, for example, the EFSF) were started during this period to assist the stressed countries.

When the program was restarted in the August of 2011, the government bonds yields of Italy and Spain fell, but then, after some time, they returned to a relatively high level (Cecioni, Ferrero, Secchi 2011).

Maybe also for this reason, during the summer of 2012, the SMP was stopped and replaced with a new program, the OMT (Outright Monetary Transaction) (Tuori, Tuori 2014).

![Figure 13: Euro Area Periphery – 10-year Generic Bond Spreads](image-url)

**Figure 13: Euro Area Periphery – 10-year Generic Bond Spreads**

Percentage point difference to generic German bond yield, daily
4.6. OMT: announced, but never realized

Exactly on the September 6 of 2012, the implementation of such OMTs was announced by Mario Draghi. The program was aimed to preserve the singleness and the transmission mechanism in the euro-area countries of ECB’s monetary policy; to reduce the borrowing costs in capital markets for the Eurozone Member States and to face the distortions in the government bond markets due to the fears of investors about the reversibility of the euro by trying to avoid its “dissolution” or “convertibility” (Cotti, Lastra, Tietje, Satragno 2014; Davor 2017).

Also the OMTs, likewise the SMP, would have involved the outright purchases of sovereign bonds in the secondary markets.

All the same, the OMTs, differently from the other one, would have had open-ended nature (as the QE3 of Fed), but they would have been subject to a strict conditionality (here I am using the past conditional because such program was announced by ECB but never carried out) (Gliner 2014; Nyborg 2016; Chalmers, Davies, Monti 2014; Arnall, Chalmers 2015).

In fact, the ECB outlined the conditions for the OMTs:

- Participating countries should implement and fully respect the measures related to an appropriate ESFS (European Financial Stability Facility) / ESM (European Stability Mechanism) macroeconomic adjustment program;
- Government bonds maturities will be between one and three years;
- The OMTs will be “fully” sterilized like the SMP;
- There is no limits to their size, as said;
- Holdings of securities will be published on a weekly basis, while the duration breakdown by country on a monthly basis;
- The ECB would accept the same treatment as private or other creditors for all OMTs holdings (Gliner 2014; Rochon, Rossi 2015; Lazowski, Blockmans 2016).

Although such program has never been implemented, the only announcement of the measures has brought several benefits (the positive effects related to the forward guidance). This is true although the “forward guidance” was introduced officially as communication policy by ECB in the July of 2013 (the ECB’s forward guidance was more qualitative than the quantitative forward guidance of Fed and BoE, which set the thresholds levels of unemployment and
inflation above which the interest rates begin to raise again) (Brooks, Prahan 2015; Tache 2015).

Since the announcement, the excessive risk in the stressed sovereign markets decreased and the confidence in the euro was re-established. Also the spreads on Spanish and Italian government bonds decreased to the levels previous to the worsening of the sovereign crisis.

Also the firms and the banks took advantage from this announcement. In fact, the credit default swap spreads for them decreased with the drop in the sovereign risks, and hence more bonds were issued. All the same, for banks the effect was quite limited, since the issuances were falling relative to the post LTRO period, and the CDS spreads were resurfacing in the 2013 (Brooks, Prahan 2015).

4.6.1. The dispute between the ECB and the Germany

Beyond these benefits, some doubts have arisen on whether the ECB’s decisions are compatible with its mandate: not only there’s an explicit Treaty prohibition that doesn’t allow the direct purchases by the ECB of debt instruments from the governments (“monetary financing” prohibition), but also, as for the SMP, there was the risk that this kind of policy escaped from the monetary policy ground and from the objective of the price stability (Lazowski, Blockmans 2016).

In fact, in the June of 2013, the German Constitutional Court began to do hearings about the legitimacy of the measure and then, in the January of 2014, it made a preliminary reference to the ECJ (European Court of Justice) in order to rule the question (Cottier, Lastra, Tietje, Satragno 2014; Arnull, Chalmers 2015).

In some sense, according to the German Court, these measures looked to be actions related to an economic policy, more than to a monetary policy. It argued that the ECB’s aims were to allow a debt cut to some countries through the reduction in the government bond spreads, to intervene in favor of only some countries and that these measures were similar to the EFSM/ESM assistance programs (Lazowski, Blockmans 2016).

The Bundesbank President Weidmann also stated that the ECB was quite financing the States through the money press, although Mario Draghi argued that such OMTs weren’t a subsidy for the government financing, but that they were useful to remove only that part of the interest rates on governments’ borrowing due to unfounded destructive forecasts for the euro-area.
The question was complex: on one hand, the ECB can provide liquidity support to “financially sound” banks, while the LOLR (lender of last resort) assistance was a national competence, and distinguish between them isn’t easy during a crisis (Davor 2017; Cottier, Lastra, Tietje, Satragno 2014).

Subsequently, the ECJ gave reason to the ECB, by stating that such purchase program isn’t contrary to Union Law, that it is necessary to safeguard the transmission and singleness of its monetary policy and maintain the price stability, that it cannot be considered as an economic policy only because it could have effects on the stability of the euro-area and that such purchases didn’t cross the limit of provision.

Lately, there is a debate in place on whether the ECB could have a key player in the government bond markets in a true banking and fiscal union (euro-area budget and debt), since, without it, the Central Bank’s actions seems to be ineffective (Lazowski, Blockmans 2016; Rochon, Rossi 2015).

4.6.2. OMT failure

In fact, despite the improvements in the financial conditions explained above, the money transmission in the stressed markets remained damaged since the private interest rates have increased with respect to the same rates in the ECB’s policy (that in the November of 2013 saw a new reduction in the MRO rate down to the 0.25%) and in other more sound countries in the middle of Europe. Such difference, began in the 2011, then expanded, and therefore for Spanish and Italian firms borrow was more expensive than those German (Brooks, Prahan 2015; Da Costa Cabral, Goncalves, Rodrigues 2016).

The strong increase of spreads in sovereign bonds between “core” and “peripheral” countries was due mainly to the lack of intervention in this market by ECB (differently from all most important Central Banks) and to the institutional differences in the euro-area, given that there was one Central Bank, but 17 national fiscal authorities (Rochon, Rossi 2015).

The problems in the Eurozone remained also after the announcement of the OMTs, and the evident proof of this is on the continued use of the full allotment policy in the open market operations and in the more and more likely hypothesis to implement further unconventional measures.

Maybe, the only announcement of these unlimited purchases of troubled sovereign bonds wasn’t enough to ensure a long-lasting stabilization of this market in the euro-area, because real action needed (Nyborg 2016; Rochon, Rossi 2015).
5. 2014: NEW MEASURES TO THE HORIZON

The year 2014 was really important for the ECB’s monetary policy since, in order to keep the inflation stable a little under the 2% and to encourage the credit flowing toward the private sector, they were implemented many measures, all relative to an expansionary policy.

5.1. Negative deposit facility rate
The interest rate was lowered until it reached the 0.05% in the September 2014; in addition to this, a negative deposit facility rate was applied to reserve holdings in excess of the minimum reserve requirements to penalize those credit institutions that park the liquidity received back into ECB ( when it was introduced, in June 2014, the negative rate was -0.10% until reaching the -0.20% in the following September) (Tache 2015; Veronesi 2016).

5.2. TLTRO
Besides, on the June 5, the ECB launched eight TLTROs (Targeted Longer-Term Refinancing Operations), with maturity in September 2018 and early repayments two years after each TLTRO, at MRO interest rate, on a quarterly basis.

During this phase, two tenders were launched, respectively in the September 2014 and in the following December, with some borrowing limits on the basis of the amount of loans to euro-area non financial corporations and households (the 7%), except loans to households for house purchase, outstanding on April 30 (Tache 2015; Bassan, Mottura 2015).

During the following year, the program was continued with six further operations between the March of 2015 and the June of 2016, with the difference that the counterparties had right to wider borrowing allowances, and so they could require an amount of up to three times their net lending (new loans minus redemptions) to non-financial private sector.
The main aim of this measure was to overcome the limitations of auctions launched during the third round of LTRO, which didn’t inject the liquidity provided by the ECB to the markets (in a particular way, to households and firms), given that the banks used it only to buy the government bonds, without supporting the real economy.

In fact, under the program, the counterparties must increase their credit in favor of the real economy, otherwise they will repay back the money borrowed in September 2016 (Tache 2015; Daniele, Simone, Cisotta 2017).

By the way, the first two tenders of TLTRO seemed to fail, because the amount of loans granted was lower than that expected.

5.3. APP

In addition to the previous measures, in the September of 2014, the ECB announced two new purchase programs, belonging to the APP (Asset Purchase Program), where the monthly €60 billion were shared between these two programs and the PSPP, about which I will talk after this section.

These purchase programs are the third round of CBPP (CBPP3) and the ABSPP (Asset-backed securities purchase program). These measures were aimed to produce indirect credit
easing for the banking sector and steer the size of the ECB’s balance sheet to the dimensions of 2012 (Schmolke 2017; Tache 2015; Bassan, Mottura 2015).

The CBPP3 reached an amount of up € 160 billion over a two-year term. These purchases began in the following October to be ended in the March of 2017. As for the other two rounds, the purchases of the assets were made in both primary and secondary markets, they weren’t sterilized and had as goal the support of this segment of the financial market.

The ABSPP purchases started in the November of the same year, reached an amount of up € 250 billion over a two-year term. Also such purchases weren’t sterilized and were made on both the primary and the secondary market. As we know, the underlying assets serve as collateral of private non-financial sector, but the same function could be performed by the mortgages.

The program’s aims are to help banks to diversify the funding sources, stimulate the issuance of new securities and provide credit to the private sector, especially in favor of small-medium enterprises and households ( Tache 2015; Schmolke 2017).

Although the private asset purchases had a great impact on their prices, they failed into the attempt of prevent the contraction of the ECB’s balance sheet and stop the trend decline of the inflation expectations. For this reason, further actions needed by the Central Bank in addition to those implemented in the 2014 ( International Monetary Fund. European Dept 2015).
6. 2015: THE QE START

6.1. PSPP

At the beginning of the following year, and exactly on the January 22 of 2015, the ECB launched the EAPP (Expanded Asset Purchase Program), which implied the monthly purchases of €60 billion of private and public securities to begin the next March 9 until September 2016 across many issuers in the euro-area as governments, but also banks, pension funds, insurance companies or other private investors on the basis of the ECB’ capital key in the secondary markets (Herdegen 2016; Veronesi 2016; Moro, Beker 2015).

In few words, in addition to the ABSPP and the CBPP3, the private sector purchases already activated in the 2014 and being part of the APP, it was added another program, the PSPP (Public Sector Purchase Program), which involved purchases in the public sector, not only from euro-area central governments, but also from euro-area agencies or other international institutions. This measure, obviously, represents a form of quantitative easing (Moro, Beker 2015, Schmolke 2017).

The Central Bank decided to implement such program in order to provide a monetary support to the economy in a context where the key interest rates have already reached the zero lower bound, and to respect the main ECB’s aim of the price stability, and so try to maintain the inflation rate below, but close to the 2% over the medium term.

The intention was to face the pervasive deflation in the euro-area, ease the financial conditions by decreasing the borrowing costs for firms and households, support the demand, the investments and the consumption (Veronesi 2016; Moro, Beker 2015, Meiers 2015).

The two main channels through which the QE works in the euro-area.

The first one is the “forward guidance” effect, by showing to the markets and the firms the level of inflation that the ECB is willing to reach. The other one is the exchange rate: the value of euro was already decreasing since the end 2014, given that markets expected the QE’s implementation, and continued to depreciate at the beginning of 2015 since the announcement of the policy (its exchange rate depreciated by about 10%).

Obviously, the euro depreciated against the dollar during this period, both due to the QE by ECB and the tapering pursued by the Fed (Moro, Beker 2015; OECD 2016; Marelli, Signorelli 2016).
This depreciation could be useful to provide a boost in those countries, especially in the southern Europe, suffering a loss of competitiveness since the single currency was established (Elliot, Atkinson 2016).

The maturity of the securities here involved is in a range between 2 and 30 years. Such program includes also “two limits”: the Central Bank won’t buy more than the 25% of each issue and not more than the 33% of each issuer debt. Besides, in case of default, the Eurosystem would be treated as the private investors (Veronesi 2016; Meiers 2015).

About the risk sharing, and so the possibility of losses due to an euro decay, the ECB stated that not more than the 20% of the additional asset purchases will be subject to the risk sharing, and within this portion the ECB was going to hold only the 8% of the asset purchases, while the remaining 12% will be subject to risk sharing, but the securities were going to be purchases by the National Central Banks.

The remaining 80% will fall on the balance sheets of the NCBs which will assume most of the responsibility of losses due to default or restructuring of their’ country debt (as a form of restrictive quantitative easing) (Veronesi 2016; Moro, Beker 2015, Meiers 2015).

6.2. The political challenges to face

This represented a change with respect to the previous government bonds purchases, since it was in place a trade-off between the need to satisfy the market expectations about the achievement of the inflation target by facing the euro-area stagnation, and that to placate the fears, especially from Germany and Bundesbank, that the massive QE would have alleviated the necessity for the Eurozone governments to control their budget and implement structural reforms.

In fact, although Mario Draghi argued that such monetary easing isn’t enough to face the risk of a too long period of deflation, this measure was opposed by the Bundesbank and the majority of the ECB’s Governing Council, which were wary about the effectiveness of these massive bond purchases, on whether begin them soon and how, given that the euro-area bond market is fragmented. For these reasons, the ECB waited for a too long time to start this program (Moro, Beker 2015, Meiers 2015).

There were several worries at the base of the Germany opposition to the QE. Between these, there was the fear that the Germany taxpayers had to be forced to cover the losses occurred on the ECB’ s balance sheet due to the defaulting in one of the stressed countries, more likely the Greece (Moro, Beker 2015).
Differently from the US, UK and Japan, where the debt was issued by their governments, the Bundesbank was reluctant to the idea to support QE by allowing that the printed money finance spendthrift governments (Italy, Spain, Portugal and, in a certain way, also the France), with the risk of an increase of inflation, so feared by the same Germany (Bootle 2015).

Without a fiscal and political union, and with the great gaps in the fiscal discipline, the economic growth and the access to capital markets, the Germany will be always contrary to provide the monetary stimulus (Bootle 2015; Herdegen 2016).

On the other hand, the stressed countries as the Greece can neither devaluate their currency to favor the international competitiveness or create money to pay their debts. The main trouble should be that if a weak country leaves the euro, its international debt will become more expensive, since the national currency will worth less and the debt must be paid in euro (Herdegen 2016).
7. QE EFFECTIVENESS: JOYS AND PAINS

7.1. The first failure in 2015

A great debate is under way about the effectiveness and the timing of QE in the Eurozone (OECD 2016).

Since the announcement of the program until the first quarter of 2015, there were found positive effects related to the measure. In fact, the QE had an immediate impact on financial conditions and expectations. Such impact, stronger and wider than expected, is the display of the forward guidance effect.

The inflation expectations rose; through the asset purchases the spreads of sovereign bond in stressed countries were kept low; the equity prices rose; the value of European stock exchanges increased by about 20%; the interest rate on bank loans decreased (also the gap to which the small and medium enterprises was subject was reduced) and there was more confidence by the consumers and businesses (OECD 2016; International Monetary Fund. European Dept. 2015; Elliot, Atkinson 2016).

Figure 1: Measuring redenomination risk in peripheral sovereign bonds

Another financial improvement, due not only to the QE, but also to the APP in general and to the TLTROs, was the increase in the banks’ lending which, since this period, began to grow until today, although, as we will see, this trend has slowed down in the end of the 2015 until to revive then and although the opinions about the strength of such growth disagree between themselves.
Differently from the period 2011-2014, when the reduction in the key ECB interest rates didn’t translate in a reduction of borrowing costs, especially in stressed countries, in the period after the announcement of the credit easing measures in June 2014 the bank funding conditions really improved and the spread between the core and the peripheral countries about the deposit rates disappeared, while narrowed about the lending rates (Brooks, Prahan 2015; ECB Economic Bulletin 2015).

This supported the credit flows to the private sector. Also the credit demand increased. According to the data collected in the April of 2015 (during the first financial improvements), the impact of these policies on the loans was stronger as regards the credit terms and conditions and lower for the credit standards (further on I will discuss about the difficulties in the credit sector); besides, the impact was stronger for loans to enterprises and households for house purchases, while it was lower for loans to consumer credit and other loans (the impact on credit terms and conditions was -19% for loans to enterprises, -15% for housing loans, while only -8% for consumer credit and other loans for households) (ECB Economic Bulletin 2015).

Despite the ECB launched the QE in order to face the deflation and the credit crunch, the Central Bank didn’t obtain a great success, and the first positive effects lasted little for several reasons (Minenna, Maria Boi, Verzella 2016; Elliot, Atkinson 2016).
One of these is related to the exchange rate of euro. After its first depreciation, during the course of 2015, it occurred an appreciation in the euro against other currencies because of different reasons: against that of many emerging countries, because their currency was losing value to the decreased exports; against that of many countries, as the Japan, because they were increasing the size of QE; while, against the dollar, because, after the tapering from QE of 2014, the Fed was delaying the interest rates rise, by pushing down the value of the dollar.

The weaker exports of the emerging countries, especially China, were the main problem at the base of the slowing down that the real economy growth was suffering during this period (Elliot, Atkinson 2016).

Another failure was related to the fact that the amount of credit provided to the economy wasn’t growing enough, mainly because the credit demand was still insufficient (Marelli, Signorelli 2016).

But mainly, since in the autumn of 2015 the inflation expectations were back again to the levels before QE. It could be due also to the “oil counter-shock”, but the same the core inflation was low (in the spring of 2016, the inflation rate reached also negative levels). During the first weeks of 2016, there was also a fast decrease in equity and bond prices for the banks (Marelli, Signorelli 2016; Minenna, Maria Boi, Verzella 2016; Elliot, Atkinson 2016).

The recovery was so low that the fear related to the spiral of low growth and inflation was returning again, and with this also the lack of confidence that there would have been more investments, production and employment (Elliot, Atkinson 2016).

**7.2. What does not work?**

I have explained above the reasons due to the events in this first period that could have undermined the economic recovery expected with the implementation of QE.

But there are many critical points that could have contributed to compromise (or, at least, could have risked to do it) the functioning of QE, independently from the events of this period, and not only during this first phase, but also after the further measures undertaken in the March of 2016, that I’m describing later.

I will discuss about these critical issues in this section, in order to move then the attention to the actual debate about the tapering.

Some of the reasons arise from the international framework, in the sense that not only Europe wouldn’t have got the same benefits of competitive devaluation with respect to the United
States since now many countries were doing the same, but also the emerging markets had imposed controls to avoid that they suffer disadvantages (Stiglitz 2016).

Another critical point is related to the almost total lack of risk-sharing between the member States, and this reconnects us to the lack of an authentic union (Minenna, Maria Boi, Verzella 2016).

One of the greatest problems of the QE in Europe is that the liquidity provided to the banking system doesn’t reach the real economy. In the previous page I have written that the credit supply to the economy was low due to the insufficient credit demand, likely related to the lack of confidence in the economic growth (Minenna, Maria Boi, Verzella 2016).

But it’s true also the opposite: the aggregate domestic demand, and therefore the credit demand, would be little if credit channels don’t work, and also in this aspect Europe was worse than United States. In addition to this, the crisis and the decrease in the production and aggregate demand made many loans non-performing, and this led the banks to grant new loans only in the exchange of more capital. Consequently, no enough lending was provided to the countries in difficulty and to the businesses, especially SMEs (small-medium enterprises) (Minenna, Maria Boi, Verzella 2016).

There was also, as we know, the basic problem that financing the governments’ deficit from the Central Bank was seen as a taboo, not only for the treaties, but also because of the strong fears among German people of an hyperinflation due to the money creation (the only objective foreseen in the ECB’s mandate, as we know, is the price stability).

In fact, between the conservatives, there was the idea of a trade-off between the inflation objective, which was prior, and the achievement of the economic growth and job creation (although the unemployment rate was reaching record levels), by forgiving that these two aims could be reached together through appropriate fiscal interventions. Consequently, this led to take in consideration excessively the price stability by forgiving the real economy (Mitchell 2015; Fagerberg, Laestadius, R. Martin 2015).

But, beyond the tightness of the monetary policy, much of the money was held by banks without that much loans were provided by them. Therefore, without more spending, it is impossible that an excess of inflation arises (Stiglitz 2016).

Not only, but the expected impact of QE on sovereign yields led banks to purchase and then sell-off the government bonds, in order to reach low-risk profits. This allowed them also to
increase their risk-free deposits at the ECB. Also for this reason, money didn’t reach the real economy (Minenna, Maria Boi, Verzella 2016).

On this hand, they could be found the critics about the tightness of the monetary policy of ECB. But also the opposite problem was in ambush.

The large expansion of the Central Bank’s balance sheet could have led, for example, to asset price bubbles and, therefore, to an economic volatility. Also in this case, the Fed was more prepared to face against this problem, since in its mandate, aside from the economic growth, the employment growth and the price stability, there was also the achievement of the financial stability, that, as many other, ECB lacks (Stiglitz 2016; Fagerberg, Laestadius, R.Martin 2015).

From a macroeconomic point of view, the low domestic demand and the high unemployment were due both to the fiscal austerity (the so-called “structural reforms” wanted by Draghi) and to the internal devaluations (price and wage cuts), aimed to increase the external competitiveness, that especially the periphery countries were suffering, since the single countries couldn’t adjust the nominal exchange rate.

About the structural reforms, they were required by Draghi also even he recognized the importance of stimulating the aggregate demand to reduce the unemployment. In order to achieve this aim, he rather supported the role of an effective monetary policy, since the fiscal capacity in some States was limited. But, as we have seen, the monetary transmission was low, especially in stressed markets and defaulting countries (J.Murray, Forstater 2017).

There are several solutions that could be considered in order to solve the problems of the Eurozone.

It could be introduced the zero-spread target in the ECB Statute, in order to have a single interest rate term structure and avoid the economic dysfunctions and wealth transfers that some countries suffered; there could be taken further interventions to help the real economy and overcome the credit crunch, through the revision of many tools used by the ECB; but also it needs a better regulation of capital requirements for the access to new loans, to avoid that banks take excessive risks (Minenna, Maria Boi, Verzella 2016).

In order to increase the employment, some solutions could be taken in consideration: a) establish a true European federation able to address money to create enough jobs; b) the ECB would underwrite the fiscal deficits of the Member States, by overcoming the limits that the
private bond markets establish for their spending; c) walk the exit option (J. Murray, Forstater 2017).

Besides, the ongoing project of the banking union, aside from give more effectiveness to the ECB’s action and ensure that the liquidity given to the banks is really used in favor of the production and the economic growth, could be useful to prevent the bail-out of the banks by the national governments, given that since the January of 2016 a bail-in regime came into force to solve the banks’ crises (Minenna, Maria Boi, Verzella 2016; Marelli, Signorelli 2016).
7.3. 2016: Desperate further easing

And so, given the first failures of QE explained above, in the early December of 2015 the ECB extended the APP at least until the March of 2017 (the purchases were then extended and currently they are foregone at least until the next December of 2017) and then, in the March of 2016, it adopted other unconventional measures to stimulate the Eurozone economy (Herrmann, Dornacher 2017; Marelli, Signorelli 2016; Minenna, Maria Boi, Verzella 2016).

In addition to the temporary extension, the asset purchases were also extended into their size, in fact from the following April the monthly purchases increased to €80 billion.

Also a new round of TLTROs (TLTRO2) has been implemented, with some modifications: the interest rate applied to them would not be the MRO rate, but that on overnight deposits, which has been cut to -0.4%: this modification was aimed to incentive more the banks to loan money to firms and households. The maturity of the operations would be of four years. In the same time, the MRO rate was cut exactly to zero, while the marginal lending rate to the 0.25%.

Draghi stated that there was the possibility that the interest rates, already low, will be subject to further cut (Marelli, Signorelli 2016; Walton 2017; Da Costa Cabral, Goncalves, Rodrigues 2016).

Another innovation was the implementation of a new program, the CSPP (Corporate Sector Purchase Program), with which the APP were supplemented by the purchases of investment grade bonds of private companies with an appropriate rating and of bonds issued by euro-area non-banks. Obviously, this program represents a form of direct credit easing, the first until now activated by the ECB.

These purchases began in the June of 2016 and were conducted both in the primary and in the secondary markets (Schmolke 2017; Marelli, Signorelli 2016, Walton 2017).
Expanded asset purchase programme (outstanding, € bn)

Amounts purchased by the Eurosystem under the expanded asset purchase programme (€ bn)

Source: Datastream, Amundi Research

Assets held by the Eurosystem for monetary policy purposes (in €bn)

Source: Datastream, Amundi Research
7.4. 2017: Taper or not?

After some months, and exactly on the last 8 December of 2016, the ECB’s Governing Council decided to cut the asset purchases from €80 to 60 billion from April 2017 onwards until the next December. Draghi ensured that this isn’t a tapering from QE, but only an adjustment for the program due to reduced risks relative to the deflation and, in general, to the economic outlook (Petersen 2017; Bomholdt Henneberg 2017).

We have to wait until the next September to know if the ECB is going to begin the tapering in the beginning of the 2018; instead, as regards the key policy rates, it seems that the Central Bank is going to hold its actual forward guidance and so it would increase such rates only when a “genuine” tapering is started (Ducrozet 2017; Petersen 2017).

The raison behind the birth of this debate is in the more or less broad consensus about the effects on the economic recovery due to the QE. In fact, differently from the first period since the announcement of the program, when the benefits obtained were only financial (maybe because the impact on the real economy needed more time to materialize), it seems that there are ongoing improvements also in the economy (International Monetary Fund. European Dept. 2015; Ducrozet 2017).

Signals about it are shown by the stronger business confidence, by the increase in the bank credit flows, as much as by the growth in the inflation rate and wages, as much as by the reduction in the unemployment rate. And, at least for this year, the forecasts about the GDP and inflation growth are positive.

But, there is also a great skepticism that this trend could continue in the long-term, in the sense that someone asserts that there’s too optimism about the outcomes until now reached (Ducrozet 2017).

In fact, the core inflation remains too low, especially in the periphery countries, in spite of the oil price recovery, and the inflation criteria (2% over the medium-term, durable adjustment, self-sustained without the need of a monetary support and covering of the whole region) won’t likely to be fully reached until the end of the year. The only criterion met until now is the broadening nature of the adjustment, since the 75% of the region reached an inflation rate above the 1.5% (Ducrozet 2017; Bomholdt Henneberg 2017).
G 5: Explanatory Contribution to Eurozone Inflation
(in %)

Source: Eurostat
At the same time, the wage growth subdued, neither the GDP growth has really picked up, while the unemployment rate is still high. These limited effects regard, once again, mainly the periphery countries, which have a labor market still slack (Potka 2017; Bomholdt Henneberg 2017; J.Murray, Forstater 2017; Ducrozet 2017).
However, there are several arguments in favor of the “QE-exit” decision.

There could be the fear of an excessive increase in the inflation (we are now in a reflation phase), due to the higher inflation rates and market-base long-term inflation expectations; but also there’s the fear of a weaker euro due to the Trump’s policy which would lead to a more appreciated dollar with respect to the euro; besides, concerns are growing about the loss in the banks’ profits and the taking of financial risks. An incentive to exit could be provided also by the possibility to attribute to the fiscal policy the key role to boost the economic growth (Petersen 2017).

On the other hand, there also several strong reasons that don’t make the idea of “tapering” so tempting.

Aside from the still low core inflation and the still impaired labor market in the stressed countries, a tapering could also damage their recovery, by leading to a weaker growth in the GDP and in the core inflation; besides, concerns could easily grow about the possibility that the indebted countries, already facing political risks and the lack of reforms, would repay their debt; and still a “tapering” policy would be in contrast with the actual ECB’s attitude and this could damage its credibility.

Another problem is related to the uncertainty in the euro-area about the different elections that occurred and are going to occur that can create a new political panorama (Petersen 2017; Bomholdt Henneberg 2017).

In addition to these, concerns arise about the risks in the financial system. Despite something have been done to reduce the probability of a new crises, a sudden unwind from QE could have negative consequences on the financial situation, differently from the US, where there were no adverse effects.
The scenario that could arise with a “QE-exit” in Europe would be worse than that in US for two reasons: the Trump’s choice to abrogate the Dodd-Frank act and the internal problems in the financial system of Europe (the Italian banks are full of non-performing loans, while Greek crisis isn’t ended).

In a certain sense, the debate on whether taper or not is opened, but nobody knows if do it, when and how strongly (Potka 2017).

For this reason, the approach to a policy normalization is still prudent. However, in the next June, there will be a meeting about the possibility of a change toward a normal policy stance and a normal guidance on policy rates, although the Governing Council is willing to leave the policy rates at present or lower levels for a certain period and that it is always ready to increase again the size and the duration of QE, if necessary (Ducrozet 2017).
CONCLUSIONS

As you can easily guess in the last two chapters of the thesis, there is a strong difference between the unconventional monetary policies implemented by the Fed and those pursued by the ECB.

First of all, the Fed’s reaction, as said, was faster and stronger than that of the ECB.

Before, but mainly after the Lehman Brothers’ collapse, the Fed intervened to solve the tensions that were developing on the financial markets, by implementing many forms of direct credit easing (when the Central Bank directly purchases private sector assets), as the CPFF, and indirect credit easing (when the Central Bank provides liquidity to banks for longer maturities against a wider pool of collateral accepted), as TAF, TALF, AMLF, etc.

Then, in order to solve the macroeconomic recession, in the 2008 it was implemented the LSAP program (which involves both elements of credit and quantitative easing), and, since 2009, it pursued three rounds of quantitative easing (the direct purchases of long-term government bonds).

Instead, the ECB, also after the financial crisis burst in the October of 2008, pursued mainly indirect credit easing programs, as the CBPP, to face the financial troubles; then, in 2010, with the risk of Greece default and of a contagion effect, the ECB started the SMP, which was a first form of quantitative easing; while the EU implemented the EFSF and EFSM, to provide financial support to some stressed countries, after some years incorporated in the ESM, that substituted the ECB for the emergency interventions.

These measures failed into their attempt in the first phase; in fact, a sovereign debt crisis burst in many countries in 2011, and so the ECB announced to intervene through the OMT program, rather similar to SMP, but this did not happen. Only in the 2014, it was implemented a strong APP program, that included also the PSPP (the quantitative easing), started in 2015, and the CSPP (direct credit easing).

There are several reasons behind the difference in the reaction to the crisis through unconventional measures between the two Central Banks, that have, in some way, affected also the different outcomes obtained (while the USA have seen a constant growth in the key parameters, the Europe suffered oscillating performances).

In the USA the capital markets are so developed that they are able to ensure funds to the corporate sector in exchange for the issues of shares and bonds; instead, in Europe, the only
way that the corporations have to borrow money is through borrowings, since their bond market is weak.

Besides, in the USA the Fed, by playing a role of lender of last resort not only in favor of the financial system, but also for the public sector, could finance its deficit, since it can directly purchase on the primary market the government Treasuries. Instead, for the ECB this is forbidden by the treaties, in fact it could buy sovereign bonds only on the secondary market.

But the institutional framework and the constitutional laws are at the basis of the differences between the Central Banks’ reactions. This is true both from a banking and a political point of view.

As regards the banks, there are several differences in the banking systems of the European countries that are moving them to build a banking and fiscal Union, to whom attribute important challenges, as overcome the bail-out procedures to save the banks’ failures or ensure that the liquidity provided by the Central Bank is used by banks to promote loans to households and enterprises or ensure the financial stability, on which the situation in USA is better.

As regards the political framework, we know that the USA are a really political and economic State, they can choose which policy follow without the need to find compromises with other countries. The opposite happens in the European Union, in essence divided into two great areas: the core area, composed by the Northern Europe, the France and the Germany, and the peripheral area, including many stressed countries in the Western and Southern Europe, as Greece, Portugal, Ireland, Spain and Italy.

The countries belonging to the core area are featured by an higher core inflation, a strong economic activity, a low unemployment and an healthy banking system; while the peripheral countries live the opposite situation (the Greece in particular); besides, they have heavy debt (and for this reason they suffer high sovereign bond spreads and lending costs) and need liquidity to promote their economic recovery and low borrowing costs.

One of the problem related to the ECB’s unconventional measures is the persistence of the negative interest rates on deposits at the ECB. This represents a risk for the German banks, due to the features of its banking and insurance sector.

In fact, neither the corporate bond market nor the risk capital market is developed in Germany, and this leads customers to save more than they lend from the Sparkassen (the
local savings banks), that are forced to put the liquidity in excess in their reserves at the Central Bank at negative rates, without charging equally negative rates to the customers’ savings in order to avoid bank run.

But the greatest difficulty is that in the European context, introduce liquidity through the quantitative easing is not easy, because this meets the opposition of countries, like the Germany, where the inflation rate is already high and represents a problem not only for the consumers, who lose purchasing power, but also for the entrepreneurs, who lose competitiveness.

For this reason, it is tiring to balance the necessity to face deflation in the stressed countries and avoid an inflation outbreak in other. This was due not only to the fact that between many members in the ECB’s Governing Council there was the idea of a the trade-off between the restraint of the inflation and the increase in the employment rate, and so in the economic activity, but also to the Germany distrust that the stressed countries would implement the structural reforms.

Maybe the German pressures to stop the monetary easing are behind the actual debate on the possibility of a tapering from QE in the next year, aside from the improvements obtained not only in the financial variables, as was in the first period, but also in the economic variables.

Unwind from the QE could prevent the risk of taking excessive inflation or could allow the possibility of a fiscal easing, although it was so far opposed by Mario Draghi and mainly by the same Germany; but the tapering could undermine the weak recovery in the core inflation and productivity in stressed countries, as much as the possibility to recover on their debts, besides, as said, it could generate financial tensions that the Europe is not ready to face.

Probably, given the difference between the credit and the quantitative easing, where the first cares mainly to reduce the spreads between good and impaired assets, without giving much importance to the inflation, and the second focuses more on the quantity of reserves that banks have at the Central Bank, and so affecting more the inflation rate, the quantitative easing policy could be stopped, while the credit easing not. This could represent a middle way between the necessity to fund the private sector and calm the German fears around inflation.
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APPENDIX

Bank of Canada; Haver Analytics

Bank of Japan

Bloomberg data

Bloomberg Financial Services, Financial Times

BLS

BTIG LLC

Capital Genève Investment Company

Datastream Amundi Research

DB Global Markets Research

DTZ Research, BOE

ECB

Eurostat

Federal Reserve

Federal Reserve Board, U.S. Bureau of Economic Analysis, PolEcon

Federal Reserve, Bureau of Economic Analysis

Federal Reserve Flow of Funds & H.8 Reports

FRED

GAO analysis of Federal Reserve System data

Haver Analytics, Barclays Research

Merk Investments, Bloomberg

Pictet WM-AA&MR

Thomson Reuters Datastream

Thomson Reuters Datastream/ECB
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