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THE GREAT RECESSION: ANALYSIS OF US AND
EUROPEAN INTERVENTION

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ABSTRACT

La Grande Recessione, cominciata negli Stati Uniti e, successivamente diffusa in tutto il mondo, ha avuto gravi ripercussioni sulle principali economie mondiali, per la prima volta, in seguito alla Seconda Guerra Mondiale, abbiamo assistito ad una riduzione della produzione mondiale con il relativo calo della crescita economica.

Lo scopo di questo elaborato è quello di analizzare i principali interventi adottati dai Governi e, in particolare dalle Banche Centrali di due economie importanti come Stati Uniti ed Unione Europea per affrontare questo fenomeno recessivo; partendo da quelle che sono le cause della crisi finanziaria, per poi arrivare agli effetti che essa avrà sull'economia globale, sarà necessaria l'introduzione delle principali caratteristiche delle politiche monetarie e fiscali, inerente ad obiettivi, strumenti e struttura delle istituzioni per poter comprendere ed analizzare il complesso di interventi convenzionali e non intrapresi dalle due economie, che hanno portato ad effetti eterogenei, talvolta indesiderati, nelle due economie globali.

INTRODUCTION

Since 2008 the financial crisis has been transmitted to the real economy: in first place in the United States and, subsequently in the other industrialized economies and then throughout the world. The slowdown in growth has turned into recession, for the first time since World War Two, in 2009, there was a reduction in world production, with an even greater decrease in industrial production and a double-digit fall in trade volumes.

Although financial crisis represents a recurring event in economic history, size, intensity negative effects of the Great Recession make this one of the most important macroeconomic phenomena of history; after the fall of Lehman Brothers, the financial crisis will influence all global economies.

This entailed a significant decrease in key macroeconomic indicators, such as GDP growth, short-term interest rates, unemployment, and inflation. The impact on the global economy is substantial and, although it started in the US, had a non-negligible repercussion all over the world, economic growth had taken a negative value in most of developed countries as well as inflation which was below 1% and afterwards unemployment rose significantly.

The aim of this thesis is to analyse in detail this recessive event understanding first the principle causes that gave birth to the Great Recession and afterwards its effects on the main world economies.

In addition, it will focus on the methods and the extent of two of the most important economies in the world, the US and Europe; this study will be referred firstly to the immediate effects on those two economies and their subsequent reactions, then will be focused on the intervention adopted by the institutions in the medium-long term; in doing so, some macroeconomic framework are going to be defined, considering, especially the importance of Central Banks and their monetary policies.

This analysis will be fundamental in order to understand and evaluate the main reasons that explain why the US and the Euro Area obtained different results through different interventions, and allows to recognize how the crisis widened the gap between the two economies and within the countries of the Euro Area.

On the one hand, we observe that the US was able to have a quick recovery being able to restore GDP and unemployment levels back to prior crisis ones by the mid of the last decade; on the other, the Euro Area, due to its complexity, structural and institutional differences as well as time differences, has not been able to react efficiently to the crisis, those problems were subsequently amplified by European sovereign debt crisis experienced by countries with weak fiscal institutions that will lead the Euro Area to a second crisis in 2012, first signs of European recovery will come out only in the last years of the decade.

The first chapter of the thesis is aimed at explaining the characteristics of the pre-crisis global framework and the elements that led to the burst of the housing-

bubble, the second part of the chapter gives a general overview of global economy in the aftermath of the crisis with an in-depth survey of the 10-years period in the Euro Area, Japan, US, and UK.

Chapters 2 and 3 present the two pillar of economic policy, the former describes the structure of monetary and fiscal policy, explaining tasks, targets and instruments of the two, with a further distinction among the two observed economies institutions and the balance sheet of central banks; the latter, evidence the change in institutional intervention and presents the non-standard monetary policies.

Chapters 4 and 5 show and explain the different set of interventions undertaken by both of the economies, revealing the effectiveness and the performances derived by the actions of the policymakers.

CHAPTER 1

LEHMAN BROTHERS FALL AND GLOBAL EFFECTS

Until 2007, global GDP growth was positive, employment was low and inflation target was reached by most of world economies; however, it happened that the golden period had a sudden and traumatic end.

In 2007, markets understood that the growing defaults of freely granted mortgage loans in the United States would cause a significant depreciation of most of the financial assets linked to land credit, this, will lead to uncertainty and fear in the markets, credit market froze and the shock born by the new financial instruments had a breakdown in all world economies.

That shock, which seemed insignificant compared to the size of the world financial industry was enough to collapse the whole house of cards that years of uncontrolled and then degenerated financial growth built.

In understanding the present and conceive the future is needed to go back in time, in order to analyse and study the process that provoked the crisis and the main factors and causes, alongside with authorities decisions and policies that gave birth to this crisis.

2.2 HOW THE CRISIS WAS BORN

The starting point in understanding the framework of the crisis brings us back to the beginning of the millennium, in particular, related to monetary interventions adopted by the United States to contain the New Economy bubble burst¹.

In order to avoid the risk of a possible deflationary spiral alike the one of the Japanese economy in the previous years Federal Reserve reduced the interest rate from 6,5% at the end of 2000 to 1% in 2003²; this first step, as well as the following monetary policy decisions taken by Fed will have a great influence on the market.

In 2009, Anna J. Shwartz blames expansive monetary policy by stating:

¹ The New Economy bubble, directly reconducted to the discovery of the new information technologies, has generated the Dot-com crisis. The Dot-com era began in 1994, with the quotation of Netscape – the company that developed the first commercial browser – and ended by 2002 with the bubble burst, with it, a new economic cycle began, defines New Economy. In a few years we witnessed the surprising development of companies operating in the internet sector or, more generally, in the IT sector, called Dot-com companies (from their “.com” suffix), also facilitated by the low cost of capital in a context of low interest rates (from 1995 to 1995 Fed lowered the interest rate from 6 to 4,75%).

Extreme confidence from investors in products and companies, rapid growth of prices and high capital flows lead to the bubble burst. See John J. Morris, Pervaiz Alam, *Analysis of the Dot-com Bubble in the 1990s*, 2008.

² After the decrease in 1999, Fed rose the rate to 6,50 in July 2000, available on <https://fred.stlouisfed.org/series/FEDFUNDS>

“It has become a cliché to refer to the asset boom as a mania. The cliché, however obscured why ordinary folk become avid buyers of whatever object has become the target of desire. An asset boom is propagated by an expansive monetary policy that lowers interest rates and induces borrowing beyond prudent bounds to acquire the asset. The Fed was accommodative too long from 2001 on and was slow to tighten monetary policy, delaying tightening until June 2004 and then ending the monthly 25 basis point increase in August 2006”³.

Indeed, the decrease of the Effective Federal Funds Rate consequently will allow, on the one side the possibility for businesses to repay part of their debts, and, on the other, entailed an increasing debt taken by households mainly in the housing market due to low interest rates.

Regarding this situation, Krugman P. states:

“Houses are houses: Americans have long been in the habit of buying houses with borrowed money, but it’s hard to see why anyone should have believed, circa 2003, that the basic principle of such borrowing had been repealed. Low interest rates should have changed the mortgage payments associated with a given amount of borrowing, not much else”⁴.

Advantageous interest rates led to a substantial increase of mortgage loans, all of which have been accepted by lenders; financial intermediates were giving loans to

³ SHWARTS A., *Origins of the financial market crisis in 2008*, (2009), P. 19

⁴ KRUGMAN P., *The return of depression economics*, (2009), P. 148

citizens with none or very low deposits, this dubious lending went under the heading of “subprime”, concerning loan buyers with low creditworthiness.

So why lenders lowered their standards?

Here, again Krugman P. goes on to say:

“First, they came to believe in ever-rising home prices. As long as home prices only go up, it doesn't matter much from the lender's point of view whether a borrower can make his or her payments: if the payments are too high, well, the buyer can either take out a home equity loan to get more cash or, if worst comes to worst, just sell the home and pay off the mortgage. Second, the lenders didn't concern themselves with the quality of their loans because they didn't hold on to them. Instead, they sold them to investors, who didn't understand what they were buying”⁵.

As long as housing prices kept rising, everything looked fine; the growth of real estate values led more private consumers to consider buying a property as a good investment, knowing that, even if facing difficulties they could resell the property at a higher price.

The whole house of cards was held by Securitization, a transaction aimed at creating securities, assembling large pools of mortgages, then selling investors shares of the payments received by investors; those securities are known as MBS

⁵ KRUGMAN P., *The return of depression economics*, (2009), P. 149

(Mortgage Backed Securities), the guarantee for underwriters is completely based on the presumed certainty of collection of credit by the debtor.

The financial innovation rearrangement that made securitization of subprime mortgage possible was the CDO (Collateralized Debt Obligation); a CDO offered shares in the payments by large pools of mortgages, but not all shares were defined at the same level, only some of them were considered as “senior”, seen as safe investments since are the first ones receiving claims on payments; only after this, less senior shares were refunded. At this point rating agencies started classifying senior shares in CDOs as AAA, even considering the high risk taken since mortgages were dubious, overestimating the instruments resulting from securitization, with the belief that they were extremely safe and the insignificant credit risk in them.

By reason of low interest rates, this opened to large-scale financing of those lending, involving several institutions, which realized the significantly higher returns they could obtain compared to ordinary bonds. The constant increase of demand pushed also banks in this market - also due to the repeal of the Glass-Steagall Act that allowed them to diversify their activities⁶ - commercial banks began taking on risky investments in order to boost their profits, by overusing

⁶ After the Great Depression, in 1933, the Glass-Steagall Act was introduced, this, would separate investment and commercial banks activities; the Act was repealed in November 1999 the Congress

financial leverage, many of them got into debt in order to acquire CDOs covering those expenses with the idea of appreciation of those securities.

The increase of prices sent out a high level of protection for investors, however, from 2005 we can see the first signs of difficulties, due to the shift of preferences of the market the Federal Reserve decided to increase the Effective Federal Funds Rate since mid-2004 in order to attract investors for ordinary bonds; the consequence will be directly related to the real estate sector, with the increase of the interest rate, families couldn't subscribe or change loans at advantageous rates, doubtless, this provoked a rapid increase in insolvency, families will see their homes foreclosed and afterward the decrease of their value.

In 2005, the constant increase of prices of properties, symbol and driving aspect of the whole real estate sector of the latest years dramatically stops, and with it the whole chain related to it. The decreasing value of houses will lower the collateral value of the securitized securities of financial intermediates in the mortgage sector; at this point, the less senior shares values begin to fall, and in no time, the same fate was applied to the senior ones, considered as highly safe investments. Suddenly, the demand for securities disappears, and it led to a pronounced devaluation of them, at this point one would ask: what would be the real value of those securities?

For sure it is related to the risk associated with it, if the latter, of course, is evaluated properly. The wrong vision in them was the extreme trust and safety

that the market created around the sector, indeed the risk related to mortgage back securities has certainly been underestimated, conducting to a wrong and overestimated price of them.

The consternation in a shock was rapidly increasing, however, in September 2006 Alan Greenspan, the president of the Federal Reserve will declare that any major decline in home prices would be "most unlikely." There might be some "froth" in local housing markets, but there wasn't a national bubble⁷.

The issue was bigger than expected, the aim of the whole system was not concerned with financing the purchase of new houses, rather, the direct goal was to increase the size of mortgage-backed securities to generate commissions; this was allowed by the constantly increasing growth of synthetic instruments generated from securities guaranteed by mortgage loans.

When the market realized the danger a panic phase in which investors began selling securities, even considering a loss relating to them, with the only aim of getting rid of them; at that point demand was non-existent, subsequently, the

⁷ In September 25, 2006, Alan Greenspan ensures the reliability of securitization relying on flexibility of U.S. market by stating “ *In a highly flexible economy, such as the United States, shocks should be largely absorbed by changes in prices, interest rates, and exchange rates, rather than by wrenching declines in output and employment, a more likely outcome in a less flexible economy*”, available on <https://www.federalreserve.gov/boarddocs/speeches/2005/200509262/default.htm>

issue is related to the absence of liquidity, final investors were asking for refunds, but the liquidity needed in doing so wasn't anymore fulfilled by the market.

In participating in this whole system weren't only financial intermediates, the high returns attracted lots of investors, including banks from all over the world, liquidity problem was common in all world markets, and global uncertainty increased the fear in lending resources to other banks since there was not the possibility of evaluating the risk of the counterpart; directly, this will have a terrific effect on the economy of all the world, the decreasing trust between banks will bring to freeze the level of credit in all the economy, affecting companies and families inducing to a rapid decrease of consumption and investments.

Krugman will state *"Banks are wonderful things, when they work. And they usually do, but when they don't, all hell can break loose - as it has in the United States and much of the world over the course of the past years"*⁸.

Indeed, the presence of several banks will lead to a credit crunch⁹ worrying the whole global economy, several financial institutions started being hit by the collapse of the real estate, banks such as Goldman Sachs and Merrill Lynch announced critical loss due to MBS; but with the progress of time, those issues kept increasing. In March 2008 Fed and the Treasury moved in to rescue Bear

⁸ KRUGMAN P., *The return of depression economics*, 2009, 153

⁹ Credit Crunch refers to a decline in the lending activity by financial institution reflected with a shortage of funds.

Stearns - one of the five major investment banks – to protect its counterpart; however, some months later, the same policy wasn't applied to another investment bank, Lehman Brothers.

Fed and the Treasury considered its failure not to be too severe, so allowed the firm to bankruptcy, this will be the last straw of the housing-bubble burst; in fact, even if uncertainty about a possible crisis rose the year before, the triggering event seems to be the fall of Lehman Brothers in September 2008 due to its impossibility to refund investors.

In avoiding the total collapse of economies, the first intervention undertaken by world institutions was the one of injecting liquidity in the market, this, on the one side had a positive effect but, it could not fulfil the needs of financial markets; the continuous presence of financial crisis will be transmitted to the real economy in all the world.

1.2 GLOBAL OVERVIEW AFTER THE GREAT RECESSION

The consequences of the financial crisis were immediate and influenced all the world. For the first time after World War Two, there was a decrease in world production, and a negative value in global growth has been faced since 1970; this was different in terms of size and timing in the different geopolitical areas.

Although different countries had different goals and policies in facing the crisis with no doubt can be confirmed that the Great Recession influenced all the world.

Figure 1 and Figure 2 show Real GDP Growth for 2008 and the following 2009; the consequence of the crisis is evident, from western to the east the change in colour sets, which represent the different result in GDP growth, is present in the general overview of each continent and in countries part of them; only a few countries, mostly in Middle East and Africa such as China, India Vietnam, Ethiopia, Nigeria, and smaller realities have been able to report a significant positive growth in 2009; since then we observed a global slow recovery, each country acted independently and in different timing, obtaining different results.

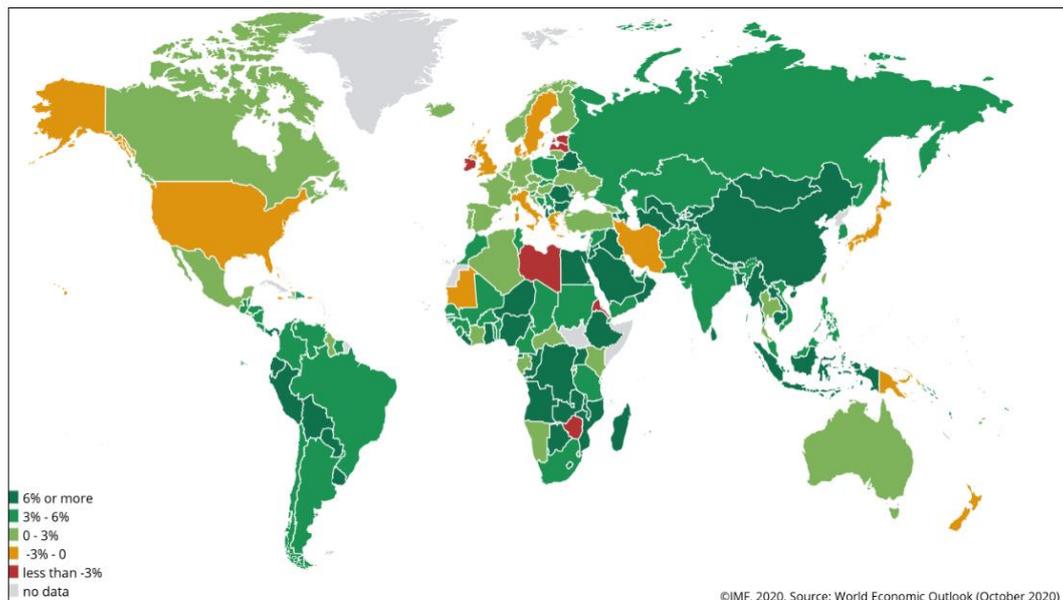


Figure 1: Real GDP Growth (Annual Percent Change, 2008)

Source: International Monetary Fund, World Economic Outlook 2008

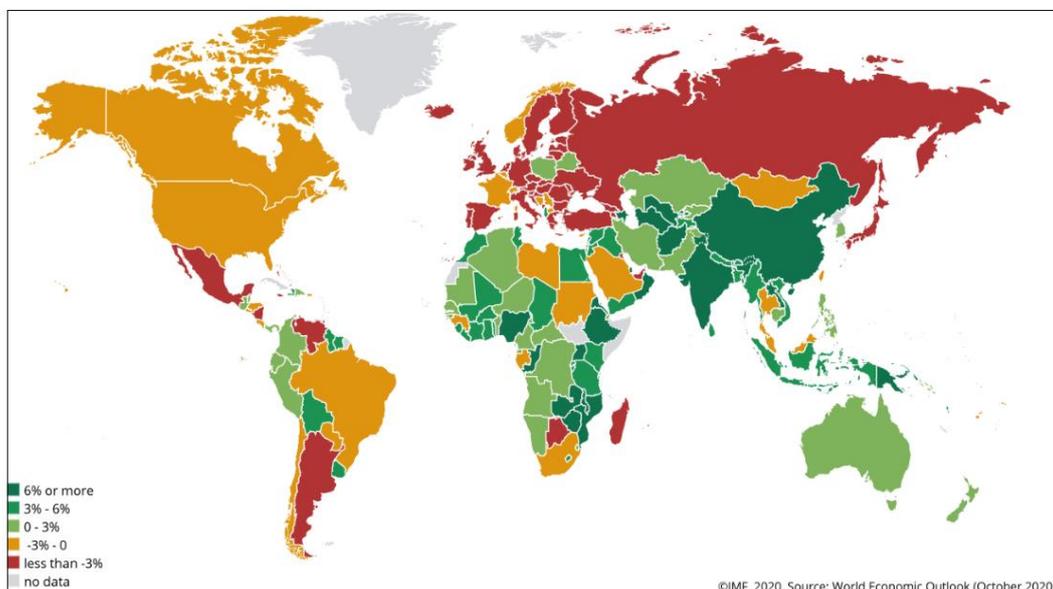


Figure 2: Real GDP Growth (Annual Percent Change, 2009)

Source: International Monetary Fund, World Economic Outlook 2009

Since the scope of the thesis is related in understanding the US and the Euro Area interventions in the next chapters, further analysis can be done through a more detailed review of the result of some main global economies, such as the two mentioned, UK, which as we will see will have a similar approach of US and Japan, which already faced a bubble burst alongside with a stagnation¹⁰ issue.

¹⁰ Stagnation refers to a condition of negligible or no economic growth in a market-based economy, represented by a low development that appears unable to rise. The concept of “Global Stagnation has been introduced for the first time in history by Alvin Hansen in 1938, and then again in 2013 by Lawrence Summers.

1.2.1 A focus on main global economies

In evaluating the performance of those different economies, a study in two main macroeconomic indicators, such as GDP growth and Unemployment rate is very important. Figure 3 analytically represents how the Real GDP has evolved over the years from 2000 to 2019.

At first glance we see that US and UK over the 20 years follow a similar trend, indeed, after the fall of Lehman Brothers, the two economies reacted in a similar way, with homogeneous policies in term of size and timing of injection of liquidity in the market by Federal Reserve and Bank of England which led them to a quick recovery assuring a growth rate over the period following the crisis with a medium growth of 2%, still lower than pre-crisis levels but significant.

The Euro Area, in 2009 suffers a decrease of 4,5%, due to its complexity, structural and institutional differences, as well as time differences, has not been able to react efficiently to the crisis, those problems were subsequently amplified by the European sovereign debt crisis experienced by countries with weak fiscal institutions that will lead the Euro Area to a second crisis in 2012 which will bring to another negative performance of 0,9% in that year and 0,2% in the following one. Only from 2014, we see a substantial and constant increase in the economic indicator.

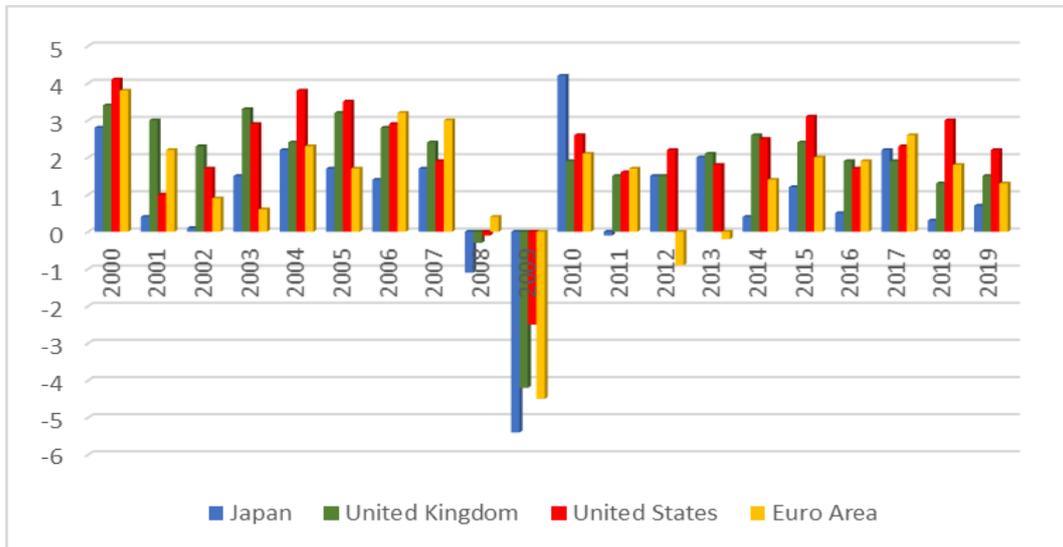


Figure 3: Real GDP Growth (Annual Percent Change)

Source: Author’s elaboration from International Monetary Fund

On the other side, Japan seems to have a different and confusing trend over the period, with a start in the decrease of real GDP from the beginning of the century (0,4% and 0,1% in 2002 and 2003) and again recently in 2018 (0,3%) and 2019 (0,7%); indeed, Japan is facing the consequences of an economic stagnation caused by the asset price bubble’s collapse in late 1991, and still today we see a discontinuity in the growth of the country reflected by fluctuations over time of its indicator.

The other indicator fundamental to assess a country’s economic path is the Unemployment Rate, given by the share of unemployed citizens of a certain country over its Labor Force; the unemployment rate is essential to evaluate the performance of a country, the more a country is able to use efficiently its human

capital, the more it can increase its productivity, consumption and investments, therefore its economic growth.

Figure 4. presents this index; as we can see, from 2009 unemploymnet rate starts increasing significantly in all economies; only after some years, in 2011/12 Japan, UK and US will be able to initiate a decrease in this rate reaching in 2015 pre-crisis levels and today obtaining even better result being able in 2019 to lower unemployment down to 2,4%, 3,8% ad 3,7% respectively.

On the other hand, the Euro Area had some difficulties to overcome the crisis, those will hinder both growth and employment until 2014; in 2013 jobless population reached a dramatic value, 12% of the workforce was unemployed.

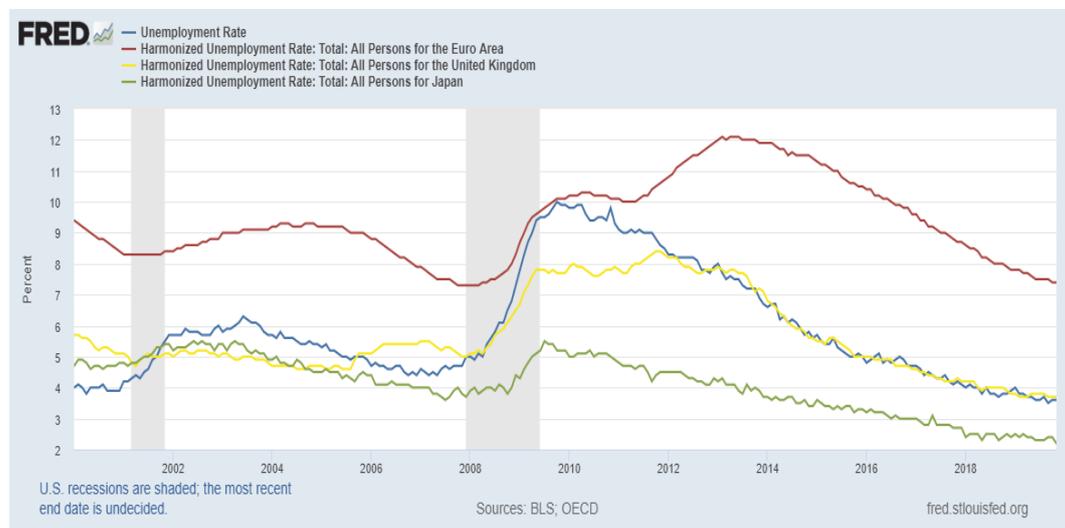


Figure 4: Unemployment Rate in US, the Euro Area, UK and Japan

Source: Federal Reserve Economic Data (FRED)

However, despite of the positive results of the following years, today's unemployment rate is still notable, exceeding the 7,5%, the situation becomes worsens if we look at youth unemployment (under 25) that sticks out the 15%. Hence after 10 years, some areas are still facing the impact of the Great Recession with poor performances and low growth.

The center of attention of this thesis is based on the study of two of the most important aggregates in the world, US and the Euro Area, with a macroeconomic view the aim is to explain and evidence the main steps that led to the Great Recession and the relative actions taken by the two respective authorities

The impact on the two economies will be similar, liquidity shortage in the interbank money market will be common in both of the two realities, however, the reaction of the two monetary institutions, the Federal Reserve in the US and European Central Bank in the Euro Area will be different.

Indeed, as we have seen from Figure 3. and Figure 4. US in the post-crisis period will be able to react in a positive and effective way, achieving notable results that enabled an ncrease in real GDP growth and employment rate.

Despite different attempts, the Euro Area won't be capable to overcome the difficulties that arose with the crisis, with the outbreak of the economic crisis the money transmission channel lost its function; the tools adopted were different in terms of structure, final objective and timing

The leery attitude of The European Central Bank and Governments of member states, will bring to some scant result in the afterward of the crisis, nevertheless some complications will return from 2010 and conduct to the European sovereign debt in the following years.

CHAPTER 2

MACROECONOMIC OVERVIEW: FISCAL AND MONETARY POLICIES IN US AND THE EURO AREA

There is no such way to define if the performance of a country is efficient or not by only looking at GDP, Unemployment, Interest Rate or, Inflation; diversity in structure, objectives, institutions, geopolitical framework, etc... make each country different from another.

Growth in history has never had a constant trend, production hardly follows exactly the trend, giving rise to expansion and recession phases, for this reason to avoid unpleasant events, the goal of an economy is to lower as much as possible the gap between Actual and Potential Output.

Potential Output is used to measure the highest level of production that an economy can reach without generating inflationary pressure. The output Gap is given by the difference between Actual and Potential Output.

A positive Output Gap depicts an economy producing more than its equilibrium capacity; demand exceeds sustainable capacity, so that inventories fall, imports rise, and producers add extra hours for existing employees or hire more workers, changes in prices usually push demand back down to the level of potential output; when demand falls short of supply, inventories rise, imports fall and producers cut

back on labour input, an opposite set of endogenous changes leads to a rise in demand.

But these automatic adjustments may be slow so that shocks or recessions may be protracted over time; the objective of countercyclical macroeconomics policies is to shorten the periods when an economy is experiencing output gaps.

The commitment to achieve this goal is held by Fiscal Policy, by which a government adjusts its spending levels and tax rate to monitor and influence national economy, and Monetary Policy through which the Central Bank influences the national money supply target.

These are different by structure and objectives from each other, furthermore also between US and the Euro Area.

2.1 FISCAL POLICY OUTLINE

Fiscal policy, the first pillar of economic policy, is where political theory and ideology intersect with the everyday practice of governance and the economics of budget constraints. Legislators must make practical decisions on how much to spend, how to allocate this spending, which activities, and citizens to tax, and at what rates, but actual decisions are often influenced more by electoral politics than lofty principles. Key aspects in the respect of macroeconomic stability are the level and composition of government expenditure and revenue, budget deficits, and government debts. Policies adopted by governments can be both

Expansionary and Contractionary; policy markets may want to intervene in the economy when a recession occurs with an expansionary fiscal policy, usually reflected with an increase in government spending, a decrease in tax revenue, or a combination of the two in order to temporarily spur economic activity; the contractionary monetary policy will have the opposite effect.

The fiscal policy plays a central role in macroeconomic stability, the two most important aspects of this role are the smoothing of economic activity over the cycle and, from a longer-term perspective, making sure that spending and taxation policies of the government are consistent with a sustainable debt burden. The Government's budget should help stabilize the economy over the cycle, this may happen in two ways.

Through Automatic Stabilizers, in which the GDP-stabilizing changes in revenues and expenditures and expenditures that occur automatically during periods when actual GDP departs from potential GDP, and, second, by discretionary policy actions, when fiscal policy is moved to reduce the amplitude of GDP cycles.

Distinguishing the main difference between the two is fundamental, Automatic Stabilizers occur in absence of any policy action during cycles, so, directly through the quantification of the latter, there is the possibility to evaluate the necessary amount of stimulus to face the cycle from the Government.

However, Governments can't always appeal to discretionary policies, indeed it may have different implications for the government's debt position over time.

In evaluating the Fiscal System in US and the Euro Area it is fundamental to notice that, despite goals of Governments in a general pattern are the same, financial systems differ enormously between countries, reflecting differences in governmental structures, analysis of each country requires an understanding of its institutional structure and the corresponding presentation of data.

2.1.1 US and European fiscal policies

The US Fiscal System is common to all countries of the Federation, there is a national integration of fiscal policies decisions taken by common institutions, shared by the participating sub-federal governments; assigns to the central government the responsibility for macroeconomic stabilization and income redistribution, whereas the decentralized governments provide goods and services whose consumption is limited to their jurisdiction.

On the other hand, the European outlook is quite different.

Countries in the European Union deepened their economic integration by launching the Economic and Monetary Union (EMU) in 1992, and, some of them integrated further creating Eurozone in 1999. Although limits of indebtedness and deficits are common for each member, fiscal policy decisions about taxes and spending largely remained at a national level.

Fiscal Policy measures are taken individually by each country as long as they could be in line with the two pillars of the Stability and Growth Pact, signed in

1992; a budget deficit of less than 3 percent of GDP and a public debt of less than 60 percent of GDP, however even in the adoption of the SGP there were some signs of awareness on the risks, in fact, Article 126 of the Treaty of the Functioning of the European Union “unambiguously” states that “*The Member States shall avoid excessive government deficits*” and “*excessive deficit procedure*”¹¹.

Only an exceptional and temporary excess of the deficit over the limit can be free from being considered excessive. Since several countries were exceeding the established limits and, the need for a detailed control was increasing; for this reason, the decision as to whether a Country is in a situation of the excessive deficit was given to ECOFIN, upon a proposal from the European Commission.

In true federal states, there is a strong federal level of government, is more severe and more integrated, sub-federal governments are restrained in the possibility of running deficits, hence to use fiscal policy as a macroeconomic tool; instead, in the Eurozone, each country undertakes individual measures, the only common authority that can use fiscal policy is the Commission, however, its budget is too small to play an important economic role (1% of GDP).

The difficulty in integrating fiscal policy at a European level is evident, the need for a fiscal union is increasing recently, especially, after the European sovereign debt crisis and the dramatic performances of some of the member states; a fiscal

¹¹ See Baldwin R. and Wyplosz C., “*The economics of European integration*” 465-489

union unequivocally is reflected with a certain degree of political union, and the idea of giving part of the national sovereignty to EU governing bodies would not be accepted by all member states in the same way, the distance between countries and the difficulty to reach a full integration is not only expressed by the fiscal framework, even if the Eurozone brought members closer, not all of them decided to use the same currency.

2.2 MONETARY POLICY FRAMEWORK

Monetary policy, the other side of economic policy, refers to activities undertaken by the Central Bank of a country to control money supply through its main instruments to achieve the central banks ultimate objectives.

A country's monetary policy framework is the formal statement of how the decisions of the central bank on the nominal variables under its competence are constrained; this must understand the transmission mechanism¹², considering how

¹² The transmission mechanism, according to this view, works through interest rates and, as long as the central bank sufficiently controls short-term interest rates, it does not matter, from a macroeconomic perspective, how it does so. In a financial crisis, when the usual arbitrage relationships between various financial instruments break down, and funding constraints become pervasive, the short-term rate loses its property as sufficient operational target of monetary policy and the central bank therefore takes so-called non-standard monetary policy measures to directly impact upon different elements of the transmission mechanism of monetary policy.

See also BINDSEIL U., *Monetary Policy Operations and the Financial System*, 2014, 12

operational target, indicator variables, intermediate targets, and exogenous shock are linked to the final objectives.

As for the Fiscal Policy, Monetary policy also can have an Expansionary and a Contractionary measure, as for the former, also, the latter aims in smoothing economic activity over the cycle; generally, during a recession, the monetary authority will be oriented to an expansionary policy, it usually tends to lower the interest rate in order to promote spending and investment and make money-saving unfavourable aiming in an increased economic growth; of course the pattern is not so simple, every country has its structure, needs, and conditions, there is no such a standard way out, in fact in time of crisis, when the interest rate has already been lowered, the authorities can't use it as an anchor to overcome crisis.

In making fundamental monetary policy decisions a central bank must know the constraints of the impossible trilemma, it can't simultaneously fix the exchange rate of the currency, maintain openness to external financial markets and pursue an autonomous monetary policy.

2.2.1 Central banks scope, objectives, and strategies

The central bank is the only issuer of banknotes and bank reserves, this means it is the monopoly supplier of the monetary base and can set the conditions at which banks can borrow from the central bank; hence can influence the conditions at which banks can trade in the money market.

In the short run, a change in the money market interest rate alongside with a change in the money supply in the economy moves different economic agents and launch different mechanism so as to achieve the final goal of the transmission channel; this will be reflected in a change of the general level of prices, in doing so, with a consistent level with price stability, in the medium-long run can raise the growth potential of the economy by maintaining an environment of stable prices; it can be stated that the main objective of central banks is to maintain price stability, through its instruments to influence financial conditions of the economy of a country, this will lead to a complete influence in the overall level of activity in the economy and can ensure that the inflation target desired by the central bank is met. Nonetheless, even if price stability is considered as the primary objective of a central bank, this may have others – in order to increase the wellness of the country as well as citizens - which can be put at the same degree of importance or considered as secondary, such as full employment and economic growth.

In achieving the final objective, a central bank can fix some intermediate ones, that can reach by direct and precise control of monetary policy strategies.

Regarding those, in order to control the money supply, the authority in the 1970s abandoned the Interest-Rate Targeting¹³ in favour of a Money-Supply Targeting

¹³ Where at the centre of the monetary policy strategy there was a low interest rate policy in order to encourage investments and growth, however, the policy won't allow the control of the money in the market.

policy, where the approach was mostly aimed at achieving a growth goal of the monetary aggregate, the money target was defined and based following calculation of potential GDP, the strategy, adopted until contributed to a process of disinflation for some countries, but as innovation accelerated in 1980s the *“confidence in a stable relationship between money and the conventional variables in the money demand equation eroded”*¹⁴.

By the early 1990s, monetary operations shifted from a Money-Supply Targeting to an Inflation Targeting (IT) orientation, through which the central bank defines a level of inflation as THE desired one in order to maintain and follow the goal of price stability; nevertheless, there isn't a better strategy, both of them are considered and used by central banks.

Being the monopoly supplier of the monetary base, the central bank is the sole issuer of banknotes and bank reserve, so, essentially, has the power to change the money base in the market, however, this quantity, due to the presence of other banks in the market is never equal to the total amount of resources present in the economy, for this reason, is fundamental to explain the concept of monetary aggregates and to recognize them.

Money aggregates are broad categories that measure the money supply in an economy that can perform the same functions of money; those can be identified as

¹⁴ See also LIPSCHITZ L., SHADLER S, *Macroeconomics for professionals*, (2019), 101-102

M0, M1, M2, and M3 based on their degree of liquidity and by the activities that they cover.

M0 is considered as the monetary base, so it consists of physical paper and coin currency in circulation; M1 includes M0 plus traveller's cheque and demand deposit, that can be expressed directly in money and used immediately; M2 is the sum of M1 and deposits with an agreed maturity up to two years or refundable up to three months; the last monetary aggregate is M3, which includes M2, repurchase agreements, money market fund shares and debt securities with a maturity up to two years.

Through the money multiplier¹⁵, the central bank can control the growth of the monetary aggregates, their components and their counterparts, and so the money supply, in fact, is a fundamental analysis that can fix the strategy of a central bank; however, for the latter is impossible to know exactly the quantity of money present in the market - possible only in the case of constant money multiplier over time - due to unpredictable behaviours of citizens and banks.

The distinction between monetary aggregates is essential since the creation of monetary base doesn't provoke directly an increase of inflation, in fact the latter is influenced by private banking and citizens actions referring to the M3 aggregate.

¹⁵ Is the ratio between the stock of money supply and the stock of monetary base, this allows to understand the evolution of the monetary base - that the central bank controls – into the market reflected by the money supply.

Therefore, as the aim of the central bank is to guarantee price stability with a certain level of inflation, and, as we just have seen, can't determine with precision the money supply by only fixing the monetary base, this, has different instruments in order to influence the final aggregate.

2.2.2 Monetary control instruments

Circa the control of the final quantity of money in the market central banks have different tools that use to influence it by directly influencing actions of agents inside the market and so to reach its operational target, those are Open Market Operations, Standing Facilities, and Reserve Requirements.

The first is directed to control the monetary base, the others are aimed at modifying the multiplier and can be considered instruments of indirect control over the creation of money by banks.

Open market operations are operations of buying and selling of financial activities such as government bonds and currencies and short-term loans that the central bank provides to commercial banks in exchange for a collateral. Every time the authority acquires an activity, this, increases lending increasing the disponible bank deposits by the central bank, and so the monetary base for the same amount of the activity; the higher availability for the commercial bank will allow it to lend this to other clients and create new deposits, thus an increase in the final stock of money higher than the one released by the central bank.

The strategy of the central bank, regarding this event, is identified as an expansionary monetary policy; on the other side, a contractionary strategy is reflected by the activity through which activities are sold, so, resources are withdrawn from the monetary base.

The second tool under the control of the monetary institutions are standing facilities, those, are closely related to the interest rate charged by the central bank to depository institutions on short-term loans, also, are aimed at injecting or absorbing liquidity into the money market through overnight operations after the overnight operations after the request of the counterparty.

The third instrument is reserve requirements, this, oblige banks to hold a certain minimum level of sight deposits on their account with the central bank; the authority can influence the monetary multiplier by changing the deposit requirement, the lower this coefficient will be the expansive will be the monetary policy undertaken.

Those are the conventional tools under the control of central banks in “normal times”, however, when there is a shock in the economy, uncertainty and certain limits can come out, the market and its agent won't behave in an expected way so these three instruments can lose some of their effectiveness; in the next chapter, we will see how the burst of the housing-bubble will force central banks in adopting Unconventional Monetary Policies.

2.2.3 Monetary policy in US and the Eurozone

As for the fiscal policy, US and the Euro Area differentiate also in terms of monetary policies. Most countries have a single mandate, in adopting their policy decisions they may consider a range of developments in the economy; despite that, they are formally charged to minimize deviations from the inflation target.

The US authority to which belongs the control of it is the Federal Reserve System (Fed) which differentiate by some of the global central banks by the nature of its objectives; in fact, Fed has a dual mandate, a formal objective for the minimization from inflation target and the maximization of employment¹⁶.

The Chairman of the Federal Reserve, Ben S. Bernake, in February 2009 states:

“The Federal Reserve will carefully weigh the implication for the exit strategy. And we will take all necessary actions to ensure that the unwinding of our programs is accomplished smoothly and in a timely way, consistent with meeting our obligation to foster maximum employment and price stability”¹⁷.

However, a central bank with a dual mandate can have difficulties in achieving both targets together, so, even temporarily, to one goal must be assigned a lower priority; in explaining how the monetary policy designates the level of importance

¹⁶ See also LIPSCHITZ L., SHADLER S., *Macroeconomics for professionals*, 2019, 110-112

¹⁷Speech at the National Press Club Luncheon, Washington, D.C. available at <https://www.federalreserve.gov/newsevents/speech/bernanke20090218a.htm>

for the two goals the Taylor Rule provides a summary of how the monetary policy works.

$$i_t = \pi_t + r_t^* + \alpha(\pi_t - \pi_t^*) + \beta(y_{rt} - y_{rt}^*)$$

The nominal interest rate adopted in period t is set according to the inflation rate (π), the interest rate in equilibrium (r^*), the target inflation rate (π^*), real GDP(Y_r) and potential GDP(Y_r^*); α and β define the degree of importance that the central bank gives to the two targets.

By assumption, if inflation and production were at potential the nominal interest rate would be set by the equilibrium real interest rate plus inflation at time t.

Also, the lending process implemented by the Fed allows commercial banks - that are unable to borrow from other banks - to borrow and manage short-term liquidity needs directly from the central bank's discount window paying the federal discount rate.

This is one of the differences between the US and the Eurozone monetary framework; in fact, for its members, the Eurozone offers credit institutions two standing facilities; the first is the marginal lending facility, by which banks can borrow at any time against the provision of eligible collateral, the second, the deposit facility defines the interest rate charged to banks in order to make overnight deposits with the central bank.

A second difference between the two economies is the fact that the European Central Bank has a single mandate and, unlike Fed its primary and priority when comes to monetary policy is price stability, the ECB aims at inflation rates below, but close to 2% over the medium term.

However, the monetary structure of the Eurozone is more complex due to the recent and long foundation of the Economic and Monetary Union of the European Union, launched in 1992, with the following institution of ECB in 1997 and the adoption of the same currency in 2002, yet, today, not all members have decided to join the Euro, only this, can even partially show the complexity of the European Union with difficulties in implementing monetary policies.

2.3 CENTRAL BANK BALANCE SHEET

Regardless of the monetary framework, monetary accounts are similar across most countries. The financial system is composed of the central bank, commercial banks, and other institutions such as credit unions, investment banks, hedge funds and asset management companies.

Figure 5 reflects a simplified central bank balance sheet, essential for the analysis, doubtless, the monetary base – which represents the total size of the liabilities – must be equal to the total value of central bank's assets. The monetary base is given by the sum of currency in circulation and bank deposits, these, can be

divided in required reserve – which is one of the standard instruments of the central bank – and excess reserves.

Assets	Liabilities
Net foreign assets (NFA ₁)	Monetary base (or reserve money (MB))
Net domestic assets (NDA)	<ul style="list-style-type: none"> • currency in circulation (CiC) <ul style="list-style-type: none"> • currency in banks (CiB) • currency outside banks (CoB) • bank reserve deposits with the CB (RD) <ul style="list-style-type: none"> • required reserves (RR) • excess reserves (ER)
<ul style="list-style-type: none"> • claims on banks (CB) • net claims on government (NCG₁) • claims on other sectors (CO₁) 	
Other items net (OIN ₁)	

Figure 5: Central bank balance sheet

Source: Lipschitz L., Shadler S., *Macroeconomics for professionals*, 2019, 116

On the left side of the balance sheet, net foreign assets plus central bank lending to banks, government and other sectors and other items (usually small or relatively stable) compose the asset side.

The analysis and study of the balance sheet of the central bank is fundamental, still, it can be used as a tool in order to identify the policies of the authorities, but not to understand and evaluate the final effect of the transmission mechanism on the final amount on the supply money, the difficulty in controlling the money multiplier, led to a constant increase of the money market which conducted of the burst of the housing-bubble and the consequent global crisis.

CHAPTER 3

THE AFTERMATH OF THE CRISIS: INSTITUTIONAL INTERVENTIONS AND THE UNCONVENTIONAL MONETARY POLICIES

Such as previous crises, the great recession was preceded by a period when asset prices increased sharply, long-term credits expanded, risky credits resulting from low risk premium and liquidity abundance were financed; what differentiated this, from the previous ones was that it gained a global dimension as it affected all the economies, especially in two ways; first, almost all global banks were affected by the crises as they invested in mortgage-back securities to gain higher returns, second, transactions in the interbank money market had a dramatic contraction due to the uncertain environment.

In the strategy to overcome the crisis, monetary policy plays a crucial role in supporting the recovery, in the first place, central banks tended to cut the interest rate to generate a monetary policy relaxation, by encouraging banks to lend each other for the purpose of avoiding a systematic crisis; then along with the open market operations had the purpose to sustain the credit market by lowering credit costs and encouraging banks to lend each other.

Through a process of liquidity support for banks and other financial intermediaries and large-scale purchases of public assets, central banks expanded

their balance sheets to provide the necessary degree of monetary stimulus to prevent a deeper cyclical downturn and to avert the risk of outright deflation.

The continuation of such monetary stimulus remains important to ensure a sustainable adjustment of the inflation process towards levels consistent with the price stability objective.

After the economic and financial crisis, central banks have pushed the short-term interest rate to previously unthinkable low levels - including negative in the Euro Area and Japan - and have created new instruments to complement or substitute its effects. Those, will be quite effective in preventing a further financial crisis, restoring the functioning of financial markets.

3.1 INTRODUCTION OF UNCONVENTIONAL MONETARY POLICIES

With the advent of the crisis, Central Bank couldn't keep adopting continuously its "standard" instruments to stimulate and supporting the recovery of the economy, in fact from 2008, the first action undertaken by global major central banks was to decrease the interest rate, reaching the zero lower bound, and, in some cases a negative value. This is one of the three Unconventional Monetary Policies (UMP) undertaken by central banks following the crisis.

Negative Interest Rates is a monetary policy operation undertaken only by a small share of global central banks, in particular, the European Central Bank and the Bank of Japan, which decided to establish an interest rate under the zero lower

bound in order to charge, rather than paying interest rates on reserves held by commercial banks to the central one. The expectation about banks action will be related to a reduction in excess reserves reflected with an increased lending process to businesses and familiar alongside with the purchase of other financial assets to increase credit supply and boost prices across financial markets.

Forward Guidance is the second unconventional tool adopted by authorities, it aims in providing market participants – households, businesses, and investors - with information about the intentions of the policymakers for future decisions.

A more frequent example of forward guidance is the notice of the central bank concerning interest rate policies; for example, the case of confirmed low interest rate may signal that the authority is focused about future economic prospects.¹⁸

The last and the most powerful unconventional measure that the policymaker can exploit is Quantitative Easing, this can be described as a large-scale purchase of bonds and other debt instruments by the central bank.

Usually, is implemented with the acquisition of long-term government bonds finances by an increase in the reserve accounts that commercial banks hold at the central bank, the former will be identified as an asset in the central bank balance sheet, while, the latter as a liability.

¹⁸ See also DELL'ARRICCIA G., RABANAL P., SANDRI D., “*Unconventional Monetary Policy in the Euro Area, Japan and the United Kingdom*”, 2018, P. 147-172

The objective of QE is to stimulate the economy of the country by replacing assets held by financial institutions, such as government debt, corporate bonds, and mortgage-backed securities with more liquidity generated by the policymaker. Quantitative easing can lead to a lower yield on short-term governmental bonds, though, the stimulus created by the policy is aimed primarily at increasing the level of economic activity through an increase in company investment and household consumption.

Moreover, in supporting the economy of the country, the process of quantitative easing by the central bank can be implemented in acquiring securities directly from privates, allowing those to reduce the borrowing costs faced by private and stimulating the economy more directly, however, such action would expose the central bank to credit risks and potential losses.

QE can be seen as similar OMOs, since it involves central banks acquiring assets and therefore increasing the monetary base, however it differs from OMOs in three main ways. First it was undertaken to introduce liquidity stimulus in the market, rather than achieving a target policy interest rate: second, it was aimed at different segments of the financial market; third, it involved the purchase of a larger set of securities and lending directly to the financial institution rather than involving the intermediate function of banks.

The debate concerning the consequences of QE is heated; on the one hand, due to the impossibility of adopting “standard” monetary policies, it can be considered as

the only instrument can that lead to the recovery of a country, with an increase in lending, borrowing, investment, consumptions, so essentially, an increase in the country's wealth that can be expressed by GDP and job growth; on the other the huge increase in central banks balance sheet is subject to uncertainty about the policymaker actions.

Also, QE may be very important for inflation targeting, being a global goal for central banks, the application of the UMP can bring a positive effect reflected also in inflation and price stability.

However, the money supply generated by QE can lead to a process of hyperinflation, for this reason, a proper management is fundamental; since, theoretically, the process of QE has no limitations, or, in a detailed view, the only theoretical limit is the stock of existing assets, the attention of the policymaker has to be concerned in how much to expand the money supply and where to stop. Finally, a potential disadvantage of this policy may be the idea that there is no forced lending, the commercial bank has not the duty to offer loans, in fact, in the afterward of the crisis, many banks decided to keep the reserves instead of distributing resources; to overcome those situations, the authority, with the application of negative interest rates can push banks in the opposite direction, a basic example like this can explain the importance of the mix implementation of monetary policies by the policymaker.

The goals of central banks after the crisis generally will not change, consequences in money market framework will be similar around the globe, but different timing and application methods will be essential to define a loophole from the great recession, and UMP will be vital to achieve this target.

3.2 THE ROLE OF FISCAL POLICY

As we just mentioned, the monetary policy plays a crucial role in defining a strategy to overcome the crisis, however, it could happen that this, is not enough; the supply money stimulus is important, though once an economy falls in the Liquidity Trap¹⁹, and the interest rate cannot be cut further, the effect of the monetary policy can be null, for this reason, the support of the fiscal policy is fundamental to overcome this situation. A fiscal stimulus, alongside with a monetary one, may stimulate the demand, by expanding government spending to try to restore GDP at initial levels.

Fiscal policy can raise the aggregate demand by increasing government expenditures or, by cutting taxes to population; through the former, the policymaker can support the employment process and many other fields to

¹⁹ Liquidity Trap is a situation in which interest rates are very low and agents chose to keep their funds in cash rather than investing in bonds. In a liquidity trap the effect of a monetary policy is null, while a fiscal stimulus by the government would have a positive effect on the economy. See DORNBUSH R., FISHER S., STARTZ R., CANULLO G., PETTENATI P, *Macroeconomia*, 2016

improve economic growth, with the latter, would leave to households more income; the issue, here, is concerned about the willingness of citizens to increase consumption; in fact, this wish won't be realized since uncertainty and low interest rates in the market push economic agents in keeping their funds in cash.

Moreover, it is important to evaluate if the expansionary policy of an authority is whether or not a genuinely an outcome of government decisions, in fact, generally a fiscal policy is considered as expansionary when there is a positive between government spending and tax revenues; in the afterward of the Great Recession, many businesses and households couldn't pay taxes, increasing the gap between the two previously indicated factors, and so erroneously giving the idea of an expansionary fiscal policy, or at least a wrong size of the desired stimulus defines by the government.

Understanding the impact of fiscal policy is more difficult, especially for the Euro Area, in which the competence of it is in the hands of each country, this, won't allow a detailed analysis, due to different structures and decisions by member states governments; in any case, the support of government spending in overcoming the crisis is fundamental. In 2011 Martin Wolf, the chief economic commentator at the Financial Times states:

“What is to be done? To find an answer, listen to the markets. They are saying: borrow and spend, please”²⁰.

3.3 CENTRAL BANK INTERVENTIONS: FIRST SIGNS OF UMP

The need to re-establish consumption, investments, and production to pre-crisis level, pushed central banks to intervene in the money supply significantly in order to ensure an adequate size to meet transactions needed by the economy, by the end of 2008, all major central banks lowered their interest rates approaching zero, this, will sign the era of the Zero Lower Bound, although Japan already hit this limit by the end of the previous century.

Figure 6 shows the convergence of policy rates to the zero lower, the deposit rate of US and UK reached 0,50% by the end of 2009, while Japan lowered it to 0,3%, only in 2014 the ECB will adopt the same measure, that in meantime, has been undertaken by most of the global central banks, the aim was to help the credit market by trying to restore market conditions

Interest rates policy had its positive impact, however, the majority of efforts by central banks have been focused in balance sheet policies, the 4 major central banks implemented the asset purchase programs stating as object provision of liquidity for the purpose of restoring transmission mechanism and the lending activity to real sectors.

²⁰ WOLF M., *“We must listen to what bond market tell us”*, Financial Times, 2011

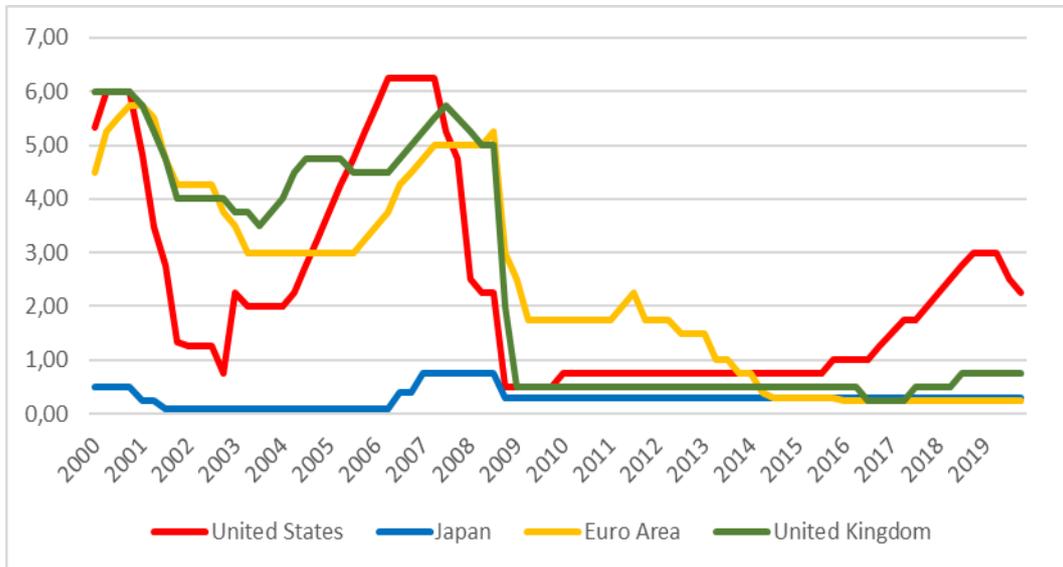


Figure 6: Japan, USA, UK, and EU Interest Rate (Percent per Year)

Source: Authors' elaboration on Fred, Boj, Ecb and Boe

Institutional and structural differences between the United States and European Union have contributed to heterogeneous, somehow undesirable, effects. The next two chapters analyse in a more detailed way both of US and EU policies, defining major channel, mechanism and set of interventions that will lead to different results in the 10-years period after the Great Recession.

CHAPTER 4

US INTERVENTIONS: SIGNS OF QUICK RECOVERY

As already seen in chapter 1, strategy and policies adopted by US will be highly effective in restoring pre-crisis levels in terms of economic growth of the country and unemployment levels. Through a mix of fiscal and monetary expansionary policies the US government, alongside with the support of the Federal Reserve will be able to overcome the crisis. Important will be the high level of harmonization displayed by the accommodation of both authorities in reaching the same objective with the same timing.

4.1 THE IMPORTANCE OF MONETARY POLICY

Before analysing the different set of interventions undertaken by the authority is important to remember what are the objectives of the policymakers; as already anticipated in chapter 2, the Federal Reserve has a dual mandate; the creation of stable economic environment, that is reached by minimizing deviations from the inflation target and the maximization of employment, those are to consider as a starting point to understand the different policies of the central bank; in achieving these objectives the Fed employed both conventional and unconventional policies.

4.1.1 Interest Rate Policies

Even before the burst of the housing bubble, Federal Reserve aimed at repairing the effects brought by the negative consequences of the new financial innovations, in fact already in 2007 the policymaker began decreasing the Effective Federal Funds Rate, reaching 2% in 2008 and, after the fall of Lehman Brothers down to the zero lower bound, Figure 7 Indicates the various actions undertaken by the central bank concerning interest rates.

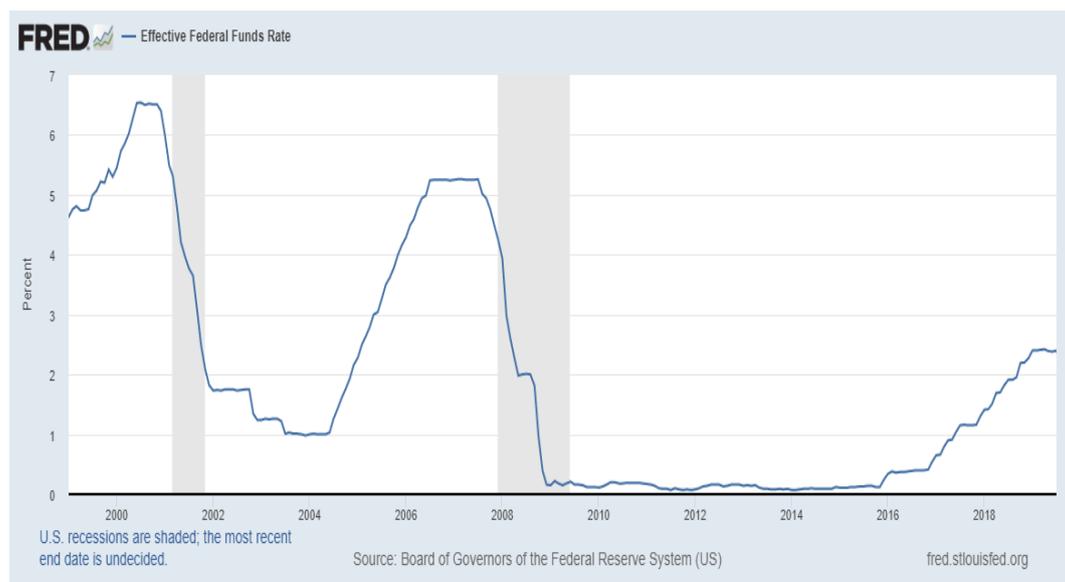


Figure 7: Effective Federal Funds Rate

Source: Federal Reserve Economic Data (FRED)

However, the monetary expansion wasn't enough, the high degree of uncertainty in the market couldn't sustain the credit market and restore the lending process between banks and to businesses and households, hence the attention of the

monetary shifted from a conventional monetary policy to unconventional actions focused on balance sheet policies through QE.

4.1.2 Quantitative easing and Federal Reserve Balance sheet

Alongside with interest rate policies the Federal Reserve began increasing its balance sheet size through acquisition of a larger range of securities than open market operations, a direct lending process to financial institutions and, also, the absorption of part of the toxic securities that gave birth to the crisis.

In the next section, we examine the composition of the balance sheet of the Federal Reserve for two periods of time, the first, indicated by Figure 8a and Figure 8b for the end of 2000 and 2007, while, the following period considers the balance sheet increase of the central bank in the following seven years from 2007 to 2014 by Figure 9a and Figure 9b.

Looking at the first period, we immediately note that there is only a discrete expansion over the seven-year period of the Fed's balance sheet, explained by an increase in base money to supply adequate liquidity aligned with the needed amount due to economic growth.

The main elements that stand out are the increase in currency (Federal Reserve Notes) for about 40%, lower but in line with the cumulative growth of GDP in the same period, and an important increase in government securities holdings and

repurchase agreements (repos)²¹; those are reflected with an increase in the asset side. The two figures alone do not allow us to understand the monetary mechanism undertaken by Fed, however, are important since the following policies of the authority will be way more different from the first period expressed by Figure 8a and 8b. In any case, the expansionary process of the central bank for this period was primarily concerned with just providing adequate liquidity for the markets.

Figure 8: Consolidated balance sheet of the Fed in 2000 and 2007

2000			
Assets		Liabilities	
Net foreign assets	29.6	Federal Reserve Notes	563.5
GSE securities	0.1	Balances of DIs	19.0
US gov't securities	511.7	Balances of US Treasury	5.1
Repos	43.4	Reverse repos	0.0
Other	29.4	Other (incl. capital)	26.6
Total	614.2		614.2

Figure 8a: Federal Reserve balance sheet end 2000 (billions of US dollars)

²¹ Both repos and reverse repos refer to securities purchased or sold by the Fed with the commitment of returning the security on a certain date.

2007			
Assets		Liabilities	
Net foreign assets	37.2	Federal Reserve Notes	791.7
GSE securities	–	Balances of DIs	20.8
US gov't securities	740.6	Balances of	16.1
		US Treasury	
Repos	46.5	Reverse repos	44.0
Other	93.9	Other (incl. capital)	45.7
Total	918.3		918.3

Figure 8b: Federal Reserve balance sheet end 2007 (billions of US dollars)

Source: Federal Reserve Board, Annual Reports 2001 and 2007, LIPSCHITZ L., SHADLER S., “*Macroeconomics for professionals*”, 2019, 122.

To be more precisely, Fed didn't only undertake expansionary actions, in fact, looking at Figure 7, we can see that in the afterward of the market re-establishment after the Dot-com crisis, in July 2003 the authority ceased the cut of the Effective Federal Funds Rate and, one year later started increasing the rate up to 5,25 percent in 2007.

Since the 2008 financial crisis, monetary policy and balance sheet structures have changed in many countries; new actions were urgently needed to prevent the collapse of the financial market and system. Traditional measures were not enough, and the solution to the liquidity needs of the market was Quantitative Easing, through which the Federal Reserve could purchase securities with the aim of massively increasing liquidity in the financial system and spurring the

availability of short-term funds used by financial institutions to finance their operations.

The Federal reserve implemented different programs for liquidity provision to credit markets in order to reduce funding pressure. Those interventions were related to the central bank's role as lender of last resort with the purpose of avoiding fire sales of assets due to liquidity shortages in the financial sector.

The response of the Fed after the fall of Lehman Brothers is rapid, in November 2008 announces the first program aimed at injecting liquidity in the market, the LSAP1 program, through which the Federal Reserve will initiate the purchase of direct obligations of housing-related government-sponsored enterprises (GSEs) up to \$100 billion and \$ 500 billion in mortgage-backed securities (MBS).²²

Then, in March 2009 the Federal Open Market Committee (FOMC) decided to expand LSAP1, it decided to increase the size of the Federal Reserve's balance sheet further by purchasing an additional \$750 billion of agency mortgage-backed securities, bringing the total purchases of these securities to up to \$1.25 trillion, and to increase its purchases of agency debt by \$100 billion to a total of up to \$200 billion, moreover, to improve conditions in private credit markets, FOMC decided to purchase up to \$300 billion of longer-term Treasury securities to be

²² Federal Reserve announcement on November 25, 2008, available at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20081125b.htm>

completed by the end of 2009²³; the program will be also named after “QE1” since will be the first of different aggressive stimulus.

In November 2010 a second LSAP (or QE2) program is announced by the FOMC, stating that it willing to purchase an additional \$600 billion in longer-term Treasury securities until the second quarter of 2011²⁴.

The third phase, the so-called Maturity Extension Program (MEP), was announced in September, through which, under a total of \$400 billion, Federal Reserve decides to swap holdings of treasuries with shorter residual maturities (from three years or less) with treasuries having longer maturities (from six to thirty years) until June 2012²⁵.

The fourth and last step has been the LSAP3 (or QE3) program, launched in September 2012 with the peculiarity of not having a specific set of asset purchase, a determined total size or duration, notwithstanding, every monthly purchase had to be preannounced by the authorities. It ended in October 2014 with a total amount of \$1.3 trillion²⁶.

²³ Federal Open Market Committee statement on March 18, 2009, available at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20090318a.htm>

²⁴ Federal Open Market Committee statement on November 03, 2010, available at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20101103a.htm>

²⁵ Federal Reserve response on September 21, 2011 to the FOMC statement, available at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20110921a.htm>

²⁶ Federal Reserve response on September 13, 2012 to the FOMC statements, available at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20120913a.htm>

Figure 9: Consolidated balance sheet of the Fed in 2007 and 2014

2007			
Assets		Liabilities	
Net foreign assets	37.2	Federal Reserve Notes	791.7
GSE securities	–	Balances of DIs	20.8
US gov't securities	740.6	Balances of	16.1
		US Treasury	
Repos	46.5	Reverse repos	44.0
Other	93.9	Other (incl. capital)	45.7
Total	918.3		918.3

Figure 9a: Federal Reserve balance sheet end 2007 (billions of US dollars)

End-2014			
Assets		Liabilities	
Net foreign assets	35.3	Federal Reserve notes	1298.7
GSE securities	1775.5	Balances of DIs	2378.0
US gov't securities	2461.4	Balances of	223.5
		US Treasury	
Repos	–	Reverse repos	509.8
Other	220.4	Other (incl. capital)	82.5
Total	4492.5		4492.5

Figure 9b: Federal Reserve balance sheet end 2014 (billions of US dollars)

Source: Federal Reserve Board, Annual Reports 2007 and 2014, LIPSCHITZ L., SHADLER S., “*Macroeconomics for professionals*”, 2019, 129.

The effect on the Federal Reserve balance sheet will highly significant, from 2007 to 2014 the monetary base rose more than 4 times, and with it also the total assets on the balance sheet of the central bank, against a cumulative rise of 20 percent in

nominal GDP; this is shown in Figures 9a and 9b, which continues the balance sheet review began by Figure 8b, this time by considering as a starting point the end of 2007 up to end 2014.

The values shown are the result of the different attitudes undertaken by the policymaker in contrast with the ones of the previous period. Generally, there is an increase in every component of the balance sheet, but what sticks is the sharp increase in the liabilities for Balances of DIs - accounting for two-thirds of the seven-year period monetary base - repos besides the expansion of the asset side, mainly for GSE – from 0 to \$1775,5 billion - and government securities which tripled in the period.

The positive results for the US economy, was not only related to the huge credit injection given to markets by the Fed, in fact the increase in monetary base followed exactly the needs of the markets and the objective of the policymaker; taking a look at Figure 10 is evident, that alongside with the interest rate policy, the path of the Federal Reserve balance sheet follows the same line of the monetary base; the harmonization of monetary policies played a crucial role, the usage of its tools focused in the same scope brought to the desired final point, hence, it has major of importance in restoring the US economy after the crisis.

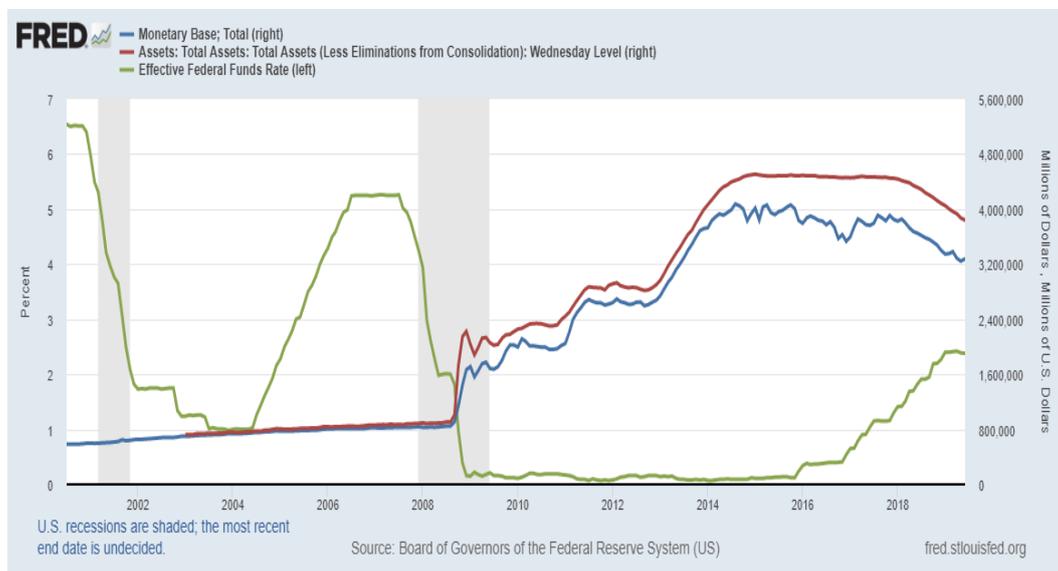


Figure 10: Monetary Base, FED Total Assets and Effective Federal Funds Rate
 Source: Federal Reserve Economic Data (FRED)

This strong consistency is confirmed by the following policies undertaken by the authority, indeed, the Federal Reserve, from 2015 started to increase the interest rate and in the same period stabilized the monetary base and from 2018 began decreasing it with a direct shrink of its balance sheet to enforce contractionary policies after several years of monetary stimulus.

Nevertheless, the US success in overcoming the crisis is given also by the positive impact of the US government fiscal expansionary policies, which supported the monetary authorities in restoring market conditions.

4.2 US GOVERNMENT INTERVENTIONS

The role of US government will be very important in the contribution for the recovery of economic growth, at the centre of fiscal policies adopted by the authority there was the objective of decreasing unemployment. The United States, like many other nations, enacted an expansionary policy through fiscal stimulus programs that used different combinations of government spending and tax cuts to households and firms.

Since the beginning of the millennium US decided to use expansionary fiscal policy, in fact, from 2001, to face the Dot-com crisis the Government started experiencing deficit, that, still today is present; nevertheless, the highest peaks of deficit were reached in the years following the great recession.

The main programs undertaken by authorities are the Economic Stimulus Act of 2008 and the American Recovery and Reinvestment Act of 2009.

The first, was signed by President Bush on February 13, 2008²⁷; the Act provides several stimuli intended to boost the US economy and to lessen the economic recession, it come up with rebates for low and middle-income taxpayers, and tax incentives to stimulate investments by businesses in their company and hire new workers; the size of the stimulus had an impact of \$152 billion in 2008.

²⁷ Available at <https://www.congress.gov/bill/110th-congress/house-bill/5140>

The second, also called ARRA²⁸, will be signed in February of the following year, it included a series of federal government expenditures aimed at countering the job losses associated with the previous recession. The goal of the Act was to give \$787 billion²⁹ to American families and businesses, the aim of the policymaker, again, is focused on tax relief and an increase in transfers for citizens who lost their jobs. Among the principal funds we have: college tuition tax reliefs, tax-credit for first homebuyers, the extension of unemployment benefits up to almost a year, suspension of taxes for unemployed citizens, modernization of federal infrastructures, increasing alternative energy production, health care, education, research and development, small businesses help and a significant support to many other sectors.

The America Recovery and Reinvestment Act had its positive impact on the US economy due to its openness to a large set of activities; the positive effect of the Act will be very quick, the recession ended in June 2009 - just four months after the Congress passed it – in fact, from the third quarter of the year US economic growth obtained positive values (even if in overall 2009 signed a negative performance) and from the following year to 2019 US experienced a decade of increasing GDP growth.

²⁸ Available at <https://www.congress.gov/bill/111th-congress/house-bill/1>

²⁹ Raised up to \$840 billion in the following years until 2015

Nevertheless, the expansionary process undertaken by the US government will be accompanied by a constant and growing public debt of the federation, which will experience several years of deficit.

Figure 11 shows the path of the relation between Real GDP Growth Rate and the US Government general Net lending/borrowing, the former is defined as the annual percentage change, while the latter as the percentage of the size of government deficit over the Real GDP.

As we can see the effort of the government is mostly related to the afterward of the recession, in fact in 2009 and the following three years, the US will report deficits for 13, 11, 10 and 8 percent over the Real GDP, and in 2014, when the US stabilizes, the size of federal deficit decrease.

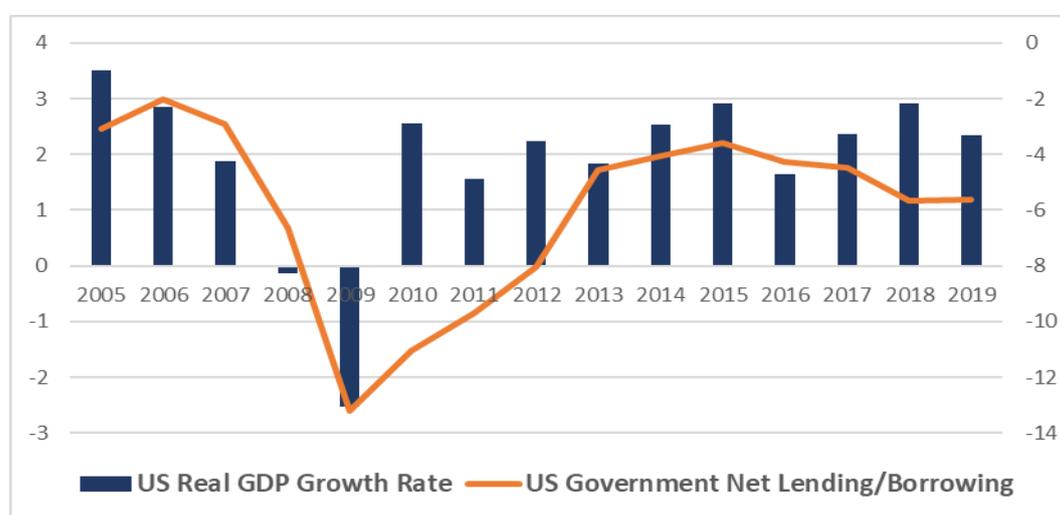


Figure 11: US Real GDP Growth Rate(left) vs US Net Lending/Borrowing(right)
 Source: Author’s elaboration on International Monetary Fund, World Economic Outlook, 2019

Here, again, is very important to note the harmonization of the United States policies, between the monetary and fiscal policy, in 2014, the unemployment level and GDP growth are stabilized and returned with pre-crisis level, and in the same year, both monetary (see Figure 10) and fiscal policy will start reducing the size of the expansion undertaken in the previous years.

4.3 THE IMPACT OF EXPANSIONARY POLICIES

The combination of stimulus by both Federal Reserve and the United States Government helped to end the Great Recession by spurring consumer spending and restoring market conditions, both monetary and real economy benefited from expansionary policies.

4.3.1 Effects on US economy

The stimulus given to the market by the two macroeconomic institutions will have a non-negligible effect on the economy of the country.

Considering the effect on two main macroeconomic indicators such as GDP growth and unemployment rate is notable how after the recession the two policies led to a fast recovery, GDP growth over the 2009-2019 period, except for the first year is always positive and sticks almost every year the 2%.

The increase in GDP is accompanied by a decreasing rate of unemployment, the stimulus given to the market allows the country in restoring pre-crisis levels in

2014, and, since then, the rate kept decreasing over time; although, is needed to say that, the pool of employed citizens increased significantly due to structural changes in the composition of the United States workforce, with an economic model based on the so-called gig economy³⁰.

Maximization of employment is one of the two Fed's objectives, the other is concerned with price stability and the inflation rate, rate that from 2009 has always been positive, reaching and overcoming the 2 percent every year after the financial crisis³¹, facing a deflationary process only in the last trimester of 2008; here, the effort of the monetary expansionary policy with both conventional and unconventional measures led to a constant positive inflation rate over the ten-year period avoiding the returning fear of a deflationary spiral occurred at the beginning of the millennium.

4.3.2 Monetary Market and the importance of Forward Guidance

The intervention undertaken by the Federal Reserve through unconventional monetary policies instilled the confidence needed to boost the economic growth, it aimed in restoring the trust in financial services lost in the previous years and had an important impact on the monetary market.

³⁰ Refers to an economic model based on occasional and temporary work, characterized by a lower level of protection for the employee

³¹ See also <https://fred.stlouisfed.org/series/T10YIE>

A crucial role was played also by the Fed, in particular by Forward Guidance, announcements on future decisions and actions will allow the decrease in the yields of government bonds, restoring trust in the monetary market, and pushing agents in investing in financial activities.

However the effects appear to be more important at their announcements rather than at the actual execution of the program, in addition, once the market expectations have changed the impact of new forwards guidance will be gradually less effective; the first stage of asset purchases have been effective in diminishing yields and relaxing financial conditions, while the effect of the following, LSAP2, MEP and LSAP3 was indeed positive but have produced minor effects on the financial and real economy³².

Indeed, the expansionary process undertaken by Fed during the 2009-2018 period to a higher market stock rise than the economy's fundamentals, hence from 2016 the central bank began a contractionary policy with the increase of the interest rate and later, from 2018 with the need of absorbing money from the markets; the same action will be undertaken by the US government, which gradually from 2013 began shrinking the federal deficit.

³² See also FRATZCHER M., LO DUCA M., STRAUB R., "On the international spillover of US Quantitative Easing", 2018, 330-367

CHAPTER 5

EUROZONE DIFFICULTIES, THE EUROPEAN SOVEREIGN DEBT AND THE FOLLOWING RECOVERY

From the third quarter of 2009, most of global economies intensified economic activity and could be able to recover their economies. The 5,3% of global GDP growth and the notable inflation rate achieved in end of 2009 and the following years by some countries, were accompanied with the idea and the hope of the end of the recession; however, unlike the United States and emerging economies were slowly growing and overcoming the recession phase the Eurozone felt in a second crisis, reinforcing the financial instability situation of some countries.

The decrease in economic activity and production brought to resizing workforce, unemployment rose and with it citizens consumption fell, uncertainty on economic conditions empowered the fear in consumption by families and investment by businesses feeding a lower propensity of consumption for citizens and a lower lending propensity by financial institutions.

Contrary to the United States, the European Union will have a way more different set of actions both in terms of monetary and fiscal policy that will lead to weaker and more problematic results.

Due to its structural and institutional complexity, monetary policies, that are put only for the Eurozone members will need more time, more regulation and more

effort to be enforced, while the fiscal policy will still remain a competence of the government of every single state; the difficulty in controlling and administrating the fiscal framework of each state, alongside with a leery attitude undertaken by both of the two pillars of economic policy will lead the Eurozone to a second recessionary phase.

The next section will be divided into two main periods; the first, related to policymakers interventions from the aftermath of the Great Recession up to the European sovereign debt; the second, is focused on the following slow recovery with the different actions undertaken by authorities to overcome the further recession of the Eurozone.

5.1 FEAR, AUSTERITY AND THE LEERY ATTITUDE TO EXPANSIONARY POLICIES

Despite the recession difficulties each state was facing, objectives of the European Central Bank and single Member States remained unchanged; in line with its goal the ECB kept setting its target inflation “*below 2% but close to that percent*”³³; while countries in adopting their fiscal policies had to follow the two pillars of the Stability and Growth Pact, a budget deficit of less than 3 percent of GDP and a public debt of less than 60 percent of GDP.

³³ See also Jean-Claude Trichet, President of the ECB at the University of Munich, July 13, 2009

As all other global central banks, also the European Central Bank, even if in a more cautious attitude used the interest rate as primary tool in stimulating the financial system, looking at Figure 6 we can see that the Marginal lending facility rate is taken down to 1,75 percent by May 2009; alongside with it, until 2012, the policymaker tried to stimulate financial condition with monetary base expansion, but credit growth did not respond to the ECB policy, this was due to stable uncertainty in markets; central bank's operations were aimed at giving liquidity to European banks, which, uses them to finance governments through the purchase of treasury bonds instead of lending to household and businesses.

Monetary policy contributed in stabilizing the financial system and the credit one, however, if on the one side, the policy adopted was common for all members that decided to adopt the Euro, fiscal policies were in the hand of every single state; the policy adopted by the European Union was not a common policy to protect the banking system, each state, individually had to intervene in order to save its financial system.

In doing it, the attention of each government was focused on restoring credit condition with public intervention, the following need for liquidity in the European market brought several countries to a significant increase of both deficit and public debt from 2008.

By reason of increasing deficits of member states, the European Commission initiated a sanctioning process for members that had deficits over the Stability and

Growth Pact; this will start a process of Austerity³⁴ from European countries, in order to keep deficits in line with the EU Commission.

However, higher vulnerability due to non-sustainable public debt, uncontrolled deficit by some member states and low growth rates won't allow to reverse the trend that in the following years after the crisis led to a dramatic increase of several countries public debt.

While, in February 2009 the US the American Recovery and Reinvestment Act signed by Obama was criticized for the too leery expansionary policy of the government³⁵, in Europe the 3% deficit pillar was needed to be achieved; in 2009, for the first time after years of expansionary process, European countries adopted contractionary decisions, the austerity process adopted by several member states, will lead to another recessionary process, mainly in the so called PIIGS countries, Portugal, Ireland, Italy, Greece and Spain.

From October 2009, the issue of the public debt increased after the declaration of Papandreou, prime minister of Greece, in which he states that the previous government buried part of the debt exposure of the country, the fear of default was increasing and from April of the following year rating agencies began

³⁴ Restrictive budgetary policy undertaken by governments, usually reflected with a reduction of public expenditures or the increase of taxes.

³⁵ The general idea was to avoid a similar situation faced in 1937, when President Roosevelt, in the middle of the fiscal expansionary process decided to cease public expenditures and decelerate the economic growth

reducing significantly the rating of the country's bonds, as a consequence, interest rates and spread rose strongly.

The confidence shock associated with the announcement and the upcoming fear of a Greek default, raised concerns about the high public debt of some other countries, in fact, it had a quick contagious effect in the Eurozone member states with the highest public debts and lowest growth perspectives, first in Portugal and Ireland, and, the next year to Spain and Italy; the same fate will be up to those countries, rating agencies reduced the rating of government bonds, interest rates and spread rose with a consequent decrease of the value of bonds. Large size of those bonds is held by banks, their assets will decrease as well as their quotations that will lead to an increasing insolvency risk.

Figure 12 shows the dramatic increase in the borrowing cost applied to come of the countries with higher public debt issues, the 10-year Government Bond Yields increase for Greece, Portugal, and Ireland; looking at the figure we see that that from 2010 (in the afterward of Papandreou announcement) the cost of borrowing – reflected by a higher risk coming from purchases of Government bonds – increased remarkably, firstly in Greece, reaching dramatic values by the end of 2012, and then in Ireland and Portugal.

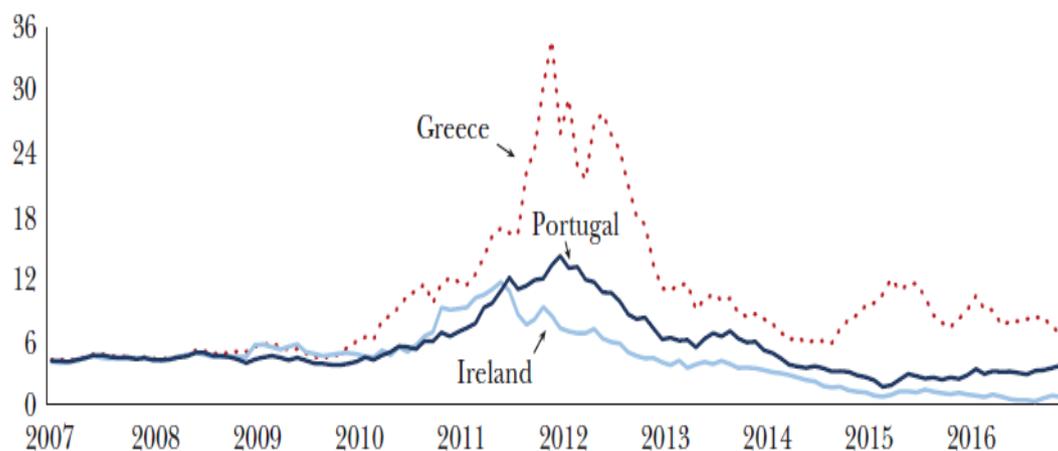


Figure 12: 10-Year Government Bond Yield (percent)

Source: DELL'ARRICCIA G., RABANAL P., SANDRI D., *“Unconventional Monetary Policies in the Euro Area, Japan and the United Kingdom”*, 2018, 155

5.1.1 First phase of ECB interventions

As the interbank market froze in the last quarter of 2008, the ECB revised its approach and decided to fix the interest rate at which banks could take credits; moreover decided to increase the range of assets that could be used as collateral.

In the afterward of the Lehman Brothers fall, the first interventions undertaken by the ECB, in line with all other global central banks was to decrease the interest rate, the policymaker, therefore, decide to put down both the deposit facility down to 0,25% and the main refinancing operations and 1% by May 2009³⁶, alongside

³⁶ Key ECB interest rates available at https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html

with a change in standard tenders Fixed-Rate, Full Allotment (FRFA) by which the central bank set the interest rate on refinancing operations and provide any amount of liquidity to banks leery expansionary policy aimed at restoring liquidity in the markets and, a decrease from 2% to 1% of the minimum reserve requirements of commercial banks at the central bank.

Moreover, in trying to restore market conditions with liquidity injection to make the transmission channel work again, decided to conduct different programs: in May 2009 with liquidity-providing longer-term refinancing operations (LTRO)³⁷ with a maturity of one year, reaching € 442 billion being allotted to the Euro Area banking system at a fixed rate of 1%; in July 2009, with purchases of eligible covered bonds with a target nominal amount up to € 60 billion with the Covered Bond Purchase Programme (CBPP)³⁸ until the following year, and, the Securities Market Programme (SMP)³⁹, introduced in May 2010, which involved the purchase of sovereign bonds on the secondary markets, concerning “ the malfunctioning of security markets and restore an appropriate monetary policy transmission mechanism”, its total volume peaked out at € 210 billion.

³⁷ Conducted as fixed rate procedures with full allotment, see also https://www.ecb.europa.eu/press/pr/date/2009/html/pr090507_2.en.html

³⁸ Purchased entirely on primary and secondary markets by June 2010, available at [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009D0016\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009D0016(01))

³⁹ Aimed in supporting countries with sovereign-debt issues, the intervention will be focused assisting Greece and Ireland in 2010, Portugal and Cyprus in 2011, Spain in 2012, available at [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010D0005\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010D0005(01))

The result obtained by the first set of intervention will be positive, to the point of leading the ECB in increasing again the interest rate, at 1,50 and 0,50 percent respectively for deposit facility and main refinancing operation, the delighted moment however, will be only temporary, and the policymaker will adopt some others policies from October, starting from the two rates, that come to 0,25 and 1%, dropping for other 25 basis points respectively by July 2012.

A second Covered Bond Purchase Programme (CBPP2)⁴⁰ will be initiated in October 2011 for € 40 billion and at the end of the same year and in February 2012; also, the policymaker launched two more waves of a Long-Term Refinancing Operation (LTROs)⁴¹ involving three-year loans to banks against appropriate collateral for a total amount of about € 1 trillion. Until 2012, the last liquidity injection is the Outright Monetary Transaction (OMT)⁴², which promised unlimited purchase of government bonds, aiming at reducing risk premia, however, under OMT no actual purchase was made.

The performance of the policymaker interventions will be scant, although the ECB increased the amount of base money substantially, this did not translate into a commensurate rise of money circulating in the economy, financial markets were

⁴⁰ Available at [https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32011D0017\(01\)](https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32011D0017(01))

⁴¹ Available at https://www.ecb.europa.eu/press/pr/date/2011/html/pr111208_1.en.html

⁴² The programme did not face purchases due to strict conditionality related to European Financial Stability Facility, European Stability Mechanism, and the International Monetary Fund process of monitoring, available at https://www.ecb.europa.eu/press/pr/date/2012/html/pr120906_1.en.html

frozen, economic activity was disrupted and several major economies were at the edge of collapse.

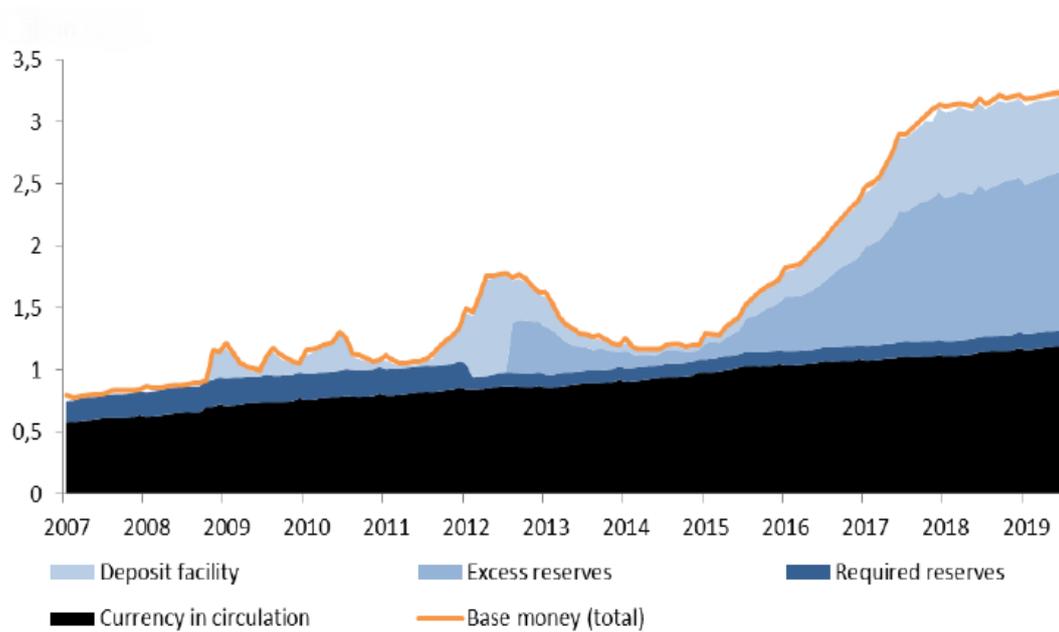


Figure 13: Eurozone Base Money and Reserves at the Central Bank

Source: ECB, ECB Monetary Dialogue, September 2019, “*Monetary Policy in the Euro Area after eight years of Presidency of Mario Draghi: Where Do We Stand?*”, 12

From figure 13, the problem of the lending process is evident, if before of the Great Recession the increasing rate of base money and currency circulation was similar, from 2009, uncertainty in the markets will push commercial banks in not lending resources to households or businesses, instead, they will focus their investments in a two way procedure, to purchase government bonds firstly and

redeposit resources in central bank reserve the remaining, through excess reserves or deposit facility.

The ECB, with conventional and unconventional policies, contributed in restoring partially the credit market, and in some way also growth conditions of the Eurozone, Figure 3 shows that GDP growth has a discrete increase, with a positive value of 2,1% in 2010, and 1,7% the following year, alongside with it, seemed that also ECB goal in term of price stability was met. From figure 14 can be noted that from 2010 to 2012 the inflation rate target is even outdated, reaching peaks of 3 percent, the Harmonized Index of Consumer Prices (HICP)⁴³ explains this rate.

However, the positive effect will only be temporary, the policymaker in adopting its strategies won't be able to stimulate the real economy in the medium-long term; the difficulty in restoring the transmission mechanism was persistent, the credit growth was still low, and the uncertainty of markets, alongside with the poor performance of monetary policy and contractionary fiscal policies will trigger a second recession phase for the Euro Area.

⁴³ Aims to be representative of price developments in the euro area, following the task of the ECB in maintaining price stability, can be considered as a tool to measure inflation, see also https://www.ecb.europa.eu/stats/macroeconomic_and_sectoral/hicp/html/index.en.html

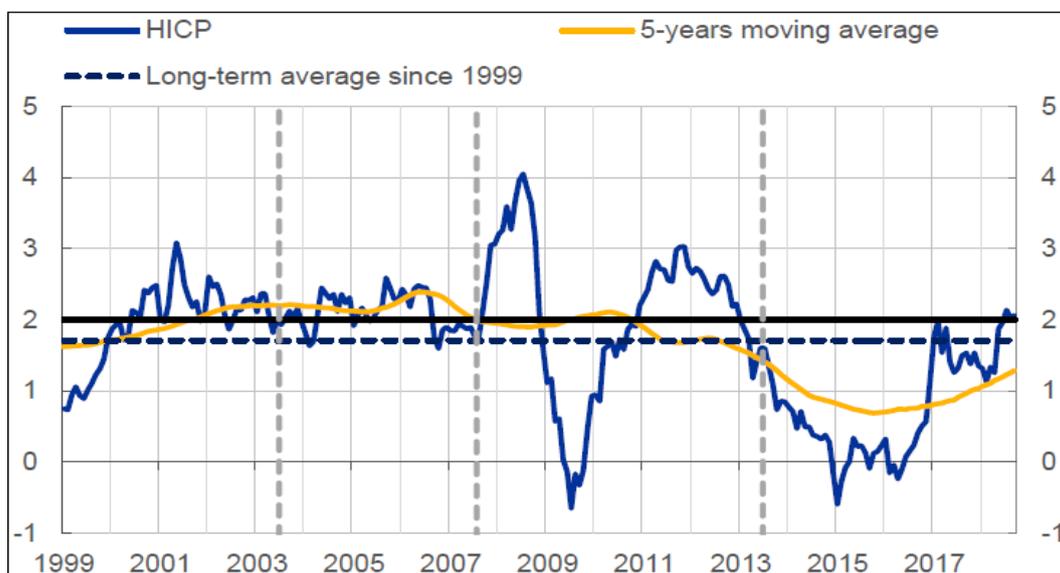


Figure 14: Euro Area headline and 5-years moving average

Source: ECB, HARTMANN P., SMETS F., *“the first twenty years of the European Central Bank: monetary policy”*, 2018, 87

5.2 EUROPEAN SOVEREIGN DEBT AND THE CHANGE IN MONETARY POLICIES

The difficulties of countries with sovereign debt will have a contagious effect in other member states, the crisis spread heavily from the beginning of 2011 affecting two European major economies such as Spain and Italy; if on the one side, ECB interventions put downward pressure on sovereign-debt countries, it did not calm the sovereign-debt markets in the euro area, from 2011 Greece and Portugal face a borrowing cost increase reaching worrying peaks in 2012 (see Figure 12), thereafter, in the same period the same fate will be up also to also

Spain and Italy, Figure 15 compares to the latter countries 10-Years Government Bond Yields with ECB policy rates and the rate of Germany and France, that have a lower level of public debt pressure over GDP, higher liability for the markets and higher growth performances.

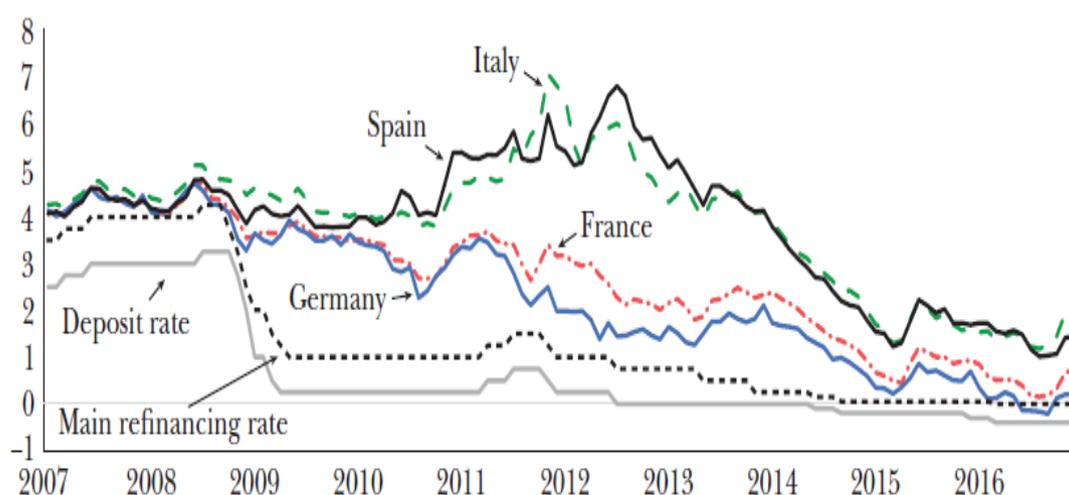


Figure 15: 10- Year Government Bond and policy rates in the Euro Area (percent)
 Source: DELL'ARRICCIA G., RABANAL P., SANDRI D., *“Unconventional Monetary Policies in the Euro Area, Japan and the United Kingdom”*, 2018, 155

As the financial tensions intensified and fiscal consolidation took hold, economic confidence fell and the economy slowed down rapidly, a further recessive trend came across South European countries, contributing to a slowdown for also members immune to solvency risks, as a result, the Euro Area entered a double-dip recession in 2011, the following two years will face negative growth rates for 0,9 and 0,2 percent (see Figure 3), alongside with a constant unemployment rate

increase that reached the dramatic rate of 12% in 2013 (see Figure 4), inducing the impossibility of reaching the ECB's Inflation Target (see Figure 14), that, in the second half of 2013 dropped below 1%.

Interventions were still too moderate, comparing to other central banks policies unconventional policies the ECB's actions seemed to be weaker; up to 2012 the Federal Reserve, Bank of Japan and Bank of England spent for asset purchasing programs respectively 22, 37 and 26% of their GDP; while the European rate reached the 3,5% of the Eurozone GDP⁴⁴.

Figure 16a and 16b show the increase of the Consolidated balance sheet of the Eurosystem at the end of 2007 and 2014, at first glance, comparing the two figures is notable that in general, the increase of the ECB balance sheet compared to the US one for the same period is much lower, explaining the cautious attitude of the ECB that will face an increase of its balance sheet by 50%.

From the asset side what stick out is the high increase of the voice "Securities of EA Residents", this, is composed by securities held for monetary policy purpose and other securities concerning different financial assets, mostly by the CBPP and SMP programs; here is necessary to note the apparent stable level of the lending process that seems unchanged, however as shown by Figure 20 , in 2012⁴⁵, the

⁴⁴ See also Fawley B. W., Neely C. J., "Four stories of Quantitative Easing", 2013

⁴⁵ See also ECB balance sheet in 2012, available at <https://www.ecb.europa.eu/pub/pdf/other/ecb.eurosystembalancesheet2012.en.pdf>

ECB already began reducing its balance sheet, starting from the voice “Lending to EA Credit Institutions, that, in that year reached € 1126 billion mainly by the two LTRO programs.

Figure 16: Consolidated ECB balance sheet for 2007 and 2014

2007			
ASSETS (EUR billions)		LIABILITIES (EUR billions)	
Gold and gold receivables	201,5	Banknotes in Circulation	676,7
ECB claims	214,8	Liabilities to EA Credit Institutions	379,2
Lending to EA Credit Institutions	637,2	Liabilities to other EA Residents	48,8
Securities of EA Residents	96	Liabilities to non-EA Residents	60,6
Other Assets	358,4	Other Liabilities	342,6
Total Assets	1507,9	Total Liabilities	1507,9

Figure 16a: ECB balance sheet end 2007⁴⁶ (billions of €)

2014			
ASSETS (EUR billions)		LIABILITIES (EUR billions)	
Gold and gold receivables	343,6	Banknotes in Circulation	1016,6
ECB claims	377	Liabilities to EA Credit Institutions	366,5
Lending to EA Credit Institutions	630,4	Liabilities to other EA Residents	70,4
Securities of EA Residents	590,3	Liabilities to non-EA Residents	52,7
Other Assets	266,9	Other Liabilities	702
Total Assets	2208,2	Total Liabilities	2208,2

Figure 16b: ECB balance sheet end 2014⁴⁷ (billions of €)

Source: Author’s elaboration on ECB data

⁴⁶ Available at <https://www.ecb.europa.eu/pub/pdf/other/ecb.eurosystembalancesheet2007.en.pdf>

⁴⁷ Available at <https://www.ecb.europa.eu/pub/pdf/other/eurosystembalancesheet2014.en.pdf>

Looking at the liabilities side of the balance sheet the increase is the two elements that have a notable increase are the voice “Banknotes in circulation”(that however from 2012 began falling from € 912 billion, alongside with “Liabilities to EA Credit Institutions) and “Other liabilities”⁴⁸, the change of the latter is explained by the different set of liabilities present in the ECB balance sheet and an increase in Revaluation accounts.

Comparing the ECB balance sheet increase in the seven-years period with the US one by Figures 9a and 9b, the too conservative approach of the ECB is clear, previous interventions were aimed at avoiding the worst scenario of insolvency of some members, however, the main problems remain, fiscal imbalances and increasing public debt; differently from the European policymaker, most of other major central banks were adopting much more aggressive measures.

The response of the economy to an increase of central bank money base, after the financial crisis has changed; banks are not inclined in lending to households and firms, and the latter do not want to get into debt at any interest rate; the need to restore a functioning transmission mechanism to stimulate the real economy was fundamental, moreover, the fear of a deflationary process will push the ECB in adopting further Unconventional Monetary Policy.

⁴⁸ The voice “Other liabilities” is the sum of items 9, 10, 11 and 12 of the ECB balance sheet, see also <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016O0034&from=IT>

5.2.1 Second phase of interventions, from credit operations to asset purchases: the effect on ECB balance sheet

By 2013 the risk of a sovereign debt crisis was averted, but economic growth was still low, unemployment reached tremendous levels, and inflation was below the ECB's target, the need for more strong and aggressive interventions was needed.

The policymaker began revealing more about its future plan with the public, not only in 2012 with the announcement of ECB President Mario Draghi⁴⁹, but from 2013 through forward guidance, mainly communicating policy rate decisions; moreover, in June 2014 announced the introduction of negative interest rate of deposit facility down to -0,10%, in order to induce banks in not holding reserves but rather lending to households to revive the transmission mechanism, ensure price stability over the medium term and sustainable growth in the Eurozone.

Regarding liquidity injections the ECB changed its intervention by shifting the majority of interventions from a credit operation set of actions to asset purchases, indeed a set of credit operations has been anyhow adopted.

From June 2014, to provide financing to credit institution the Targeted Long-Term Refinancing Operations (TLTROs) has been initialized, the aim was to offer to banks long-term funds, in convenient conditions to *“enhance the functioning of the monetary policy transmission mechanism by supporting lending to the real*

⁴⁹ In July 2012, Mario Draghi will state *“The ECB is ready to do whatever it takes to preserve the euro”*, available at <https://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html>

economy” in three phases; the first phase (TLTRO1)⁵⁰ began in June 2014, until September 2018, with an initial allowance up to 7% of loans to the euro area non-financing private sector; the second phase (TLTRO2)⁵¹, aimed at reinforcing the ECB’s accommodative monetary policy stance and to foster new lending, consisted in four targeted longer-term refinancing operations, with maturity of four years from June 2016; the last (TLTRO3)⁵², with seven further operations with maturity of three years; the effect of those liquidity injection will be positive, in the last two TLTRO, the interest rate on commercial banks borrowing was directly linked with the lending pool to non-financial corporations and household, so to achieve a favourable rate on borrowing, banks increased the lending process and so supporting the real economy.

Most important, from September 2014, the European Central Bank declared the first stage of Quantitative Easing⁵³ announcing a large-scale Asset Purchase Program (APP), a package of four monetary measures undertaken from 2014.

⁵⁰ Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014D0034&qid=1598879694432&from=IT>

⁵¹ Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016D0010&qid=1598879694432&from=IT>

⁵² Amended, from 2020 after the Covid-19 crisis, available at [https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019D0021\(01\)&qid=1598879694432&from=IT](https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019D0021(01)&qid=1598879694432&from=IT)

⁵³ Albeit from 2008, ECB began adopting non-standard monetary policies, the decision of embracing more aggressive policies such as QE began in 2014.

From October 2014 to the end of 2018, the ECB activated a third Covered Bond Purchase Programme (CBPP3)⁵⁴, for a total amount of € 260 billion by the end of 2018, mostly in secondary markets (more than 62%) than primary.

In the same period, the policymaker announced the Asset-Backed Security Purchase Programme (ABSPP)⁵⁵ by purchasing the so-called toxic assets, that characterized the housing-bubble burst, asset-backed securities, with the secondary objective of diversifying funding sources and stimulate the issuance of new securities, involving € 27 billion.

Nevertheless, the first stage of the Euro Area Asset Purchase Program won't be significantly effective, if on the one side the path to economic growth is positive, reflected by the low improvement of GDP growth and unemployment is low (see Figure 3 and 4), on the other, inflation remained persistently below the target, with also a deflation phase in the first quarter of 2015 (see Figure 14); hence, the ECB announced a second phase of the QE, in which the acquisition of public sector bonds became predominant.

In March 2015 announced the Public Sector Purchase Program (PSPP)⁵⁶, involving bond issued by recognized agencies, regional and local governments, nominal and inflation-linked central bank governments, and international

⁵⁴ Available at [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014D0040\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014D0040(01))

⁵⁵ Available at [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014D0045\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014D0045(01))

⁵⁶ Available at <https://www.ecb.europa.eu/mopo/implement/app/html/index.en.html#pspp>

organizations and multilateral development banks located in the Euro area, in December 2018, the 10% of the Eurosystem portfolio is given by the latter set, while the remaining 90% is composed by government and recognized agencies bonds. The PSPP program will be the most consistent operation in terms of monetary injection by the ECB, reaching € 2170 billion by the end of 2018.

The last APP intervention undertaken by the ECB is the Corporate Sector Purchase Program (CSPP)⁵⁷, introduced by June 2016 aimed at purchasing corporate sector bonds, for a total amount of € 178 billion.

The Asset Purchase Program package of non-standard monetary policies ended in 2018, the four years period will have a significant impact on the ECB's balance sheet, mainly after the adoption of PSPP; in the second quarter 2018 the size of liquidity injection through a progressive decrease, stabilizes and the QE procedure ceased at the end of the year, notwithstanding, from November of the following year the Governing Council of the ECB, decided to reinvest the payments from maturing security of the APP at a monthly amount of € 20 billion.

Figure 17 and 18 show the monthly and the cumulative size of the asset purchase programs undertaken by the policymaker, the second phase of QE, moved from march 2015 sign the notable increase of ECB's balance sheet, until March 2016 the average monthly purchase is € 60 billion, value, that increases up to € 80

⁵⁷ Availabe at

<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593530521495&uri=CELEX:32016D0016>

billion in the following year and restores at € 60 billion until the end of 2017, after a continuous slowdown, cease at the end of 2018.

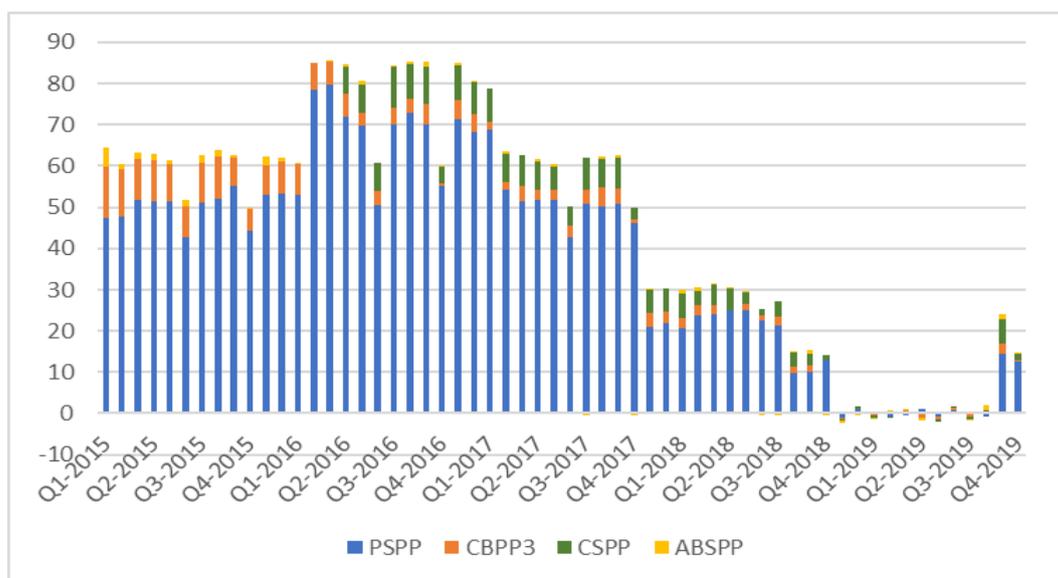


Figure 17: Asset Purchase Program average monthly purchase (billions of Euro)

Source: Author's elaboration on ECB data

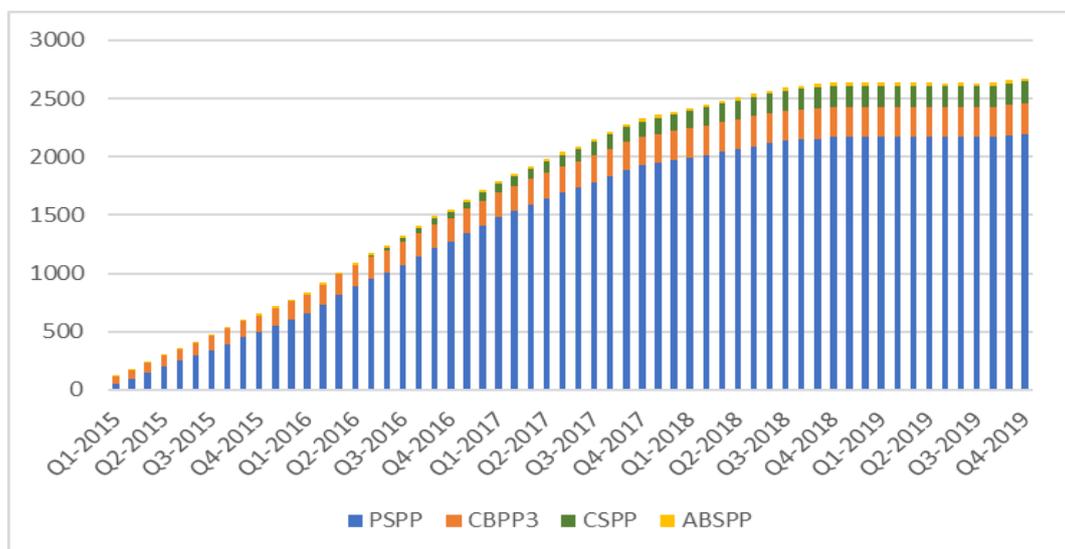


Figure 18: Cumulative Asset Purchase Program purchase (billions of Euro)

Source: Author's elaboration on ECB data

The effect of the APP on the ECB's balance sheet can be seen by Figures 19a and 19b, the starting point is end-2014, we can clearly see that, in the 5 years period the more aggressive measures have a notable effect on it.

Figure 19: Consolidated ECB balance sheet for 2014 and 2019

2014			
ASSETS (EUR billions)		LIABILITIES (EUR billions)	
Gold and gold receivables	343,6	Banknotes in Circulation	1016,6
ECB claims	377	Liabilities to EA Credit Institutions	366,5
Lending to EA Credit Institutions	630,4	Liabilities to other EA Residents	70,4
Securities of EA Residents	590,3	Liabilities to non-EA Residents	52,7
Other Assets	266,9	Other Liabilities	702
Total Assets	2208,2	Total Liabilities	2208,2

Figure 19a: ECB balance sheet end 2014 (billions of €)

2019			
ASSETS (EUR billions)		LIABILITIES (EUR billions)	
Gold and gold receivables	470,7	Banknotes in Circulation	1292,7
ECB claims	408,1	Liabilities to EA Credit Institutions	1813,4
Lending to EA Credit Institutions	624,2	Liabilities to other EA Residents	329,6
Securities of EA Residents	2847,1	Liabilities to non-EA Residents	328,8
Other Assets	321,3	Other Liabilities	906,9
Total Assets	4671,4	Total Liabilities	4671,4

Figure 19b: ECB balance sheet end 2019⁵⁸ (billions of €)

Source: Author's elaboration on ECB data

⁵⁸

Available

at

<https://www.ecb.europa.eu/pub/pdf/other/ecb.eurosystembalancesheet2019~fed8c5244a.en.pdf>

From the asset side is evident the increase in the “Securities to EA Credit Institution” voice, explained by the different interventions in asset purchases; the result of those programs are directly reflected in the liability side, where the increase in liabilities to both EA Credit Institutions and Residents increases significantly, alongside with a lower increase in the non-EA Residents one.

Moreover, in the five-years period the balance sheet measures were not the only unconventional measures undertaken by the policymaker; in fact alongside with Quantitative Easing, the ECB kept focusing on the provision of credit to the euro area economy, with stable Negative Interest Rates and Forward Guidance, encouraging borrowing, investment ,and spending process by households and firms, stimulating economic growth and bringing inflation to values consistent with price stability.

The path of the different interventions undertaken by the ECB can be seen from Figure 20, which compares the interest rate policy – intended as the Marginal lending facility - with the balance sheet ones, the graph confirms the statement of the leery attitude in the first phase of ECB intervention, until 2013 the policies of the policymaker are diffident and cautious in both of the two directions, only from 2014, with the adoption of lower interest rates⁵⁹ (reduced to 0,40 in June 2014,

⁵⁹ After 16 March 2016, no changes in the Marginal lending facility were made, see also https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html

and 0,25 by March 2016) and the significant support of the Targeted Long-Term Refinancing Operations and Asset Purchase Programs that will double up the size of the central banks balance sheet, that will restore credit market conditions and allow the beginning of the slow recovery of the Eurozone.

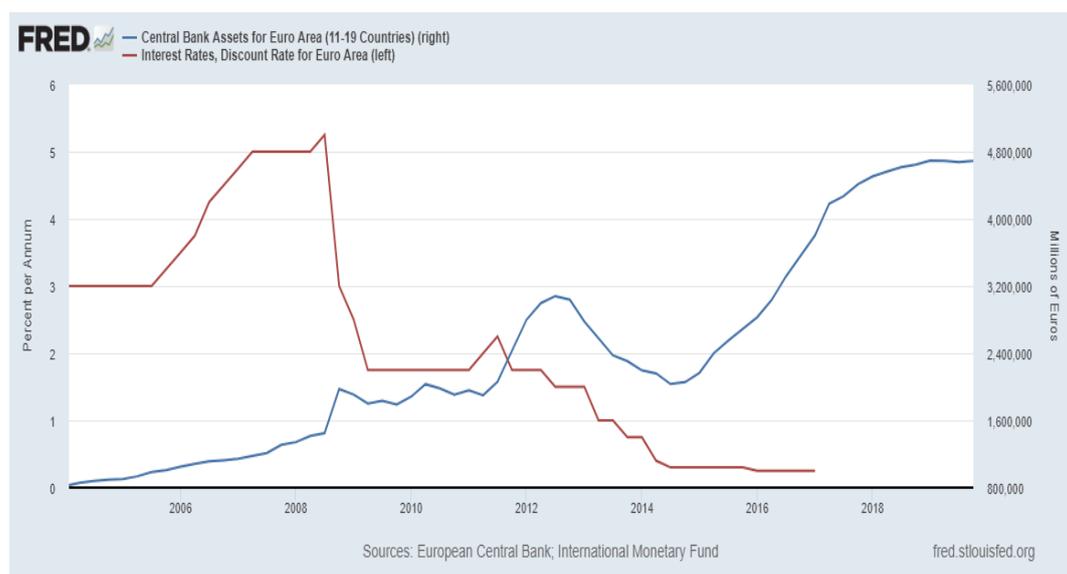


Figure 20: Discount Rate (left) & European Central Bank Assets (right)

Source: Federal Reserve Economic Data (FRED)

5.3 FISCAL POLICY AND THE TRAP OF AUSTERITY

The European approach regarding fiscal policy will be opposite to the US one, the latter, as already seen in chapter 4, will have as main objective the reduction of the unemployment rate, and expansionary policy will be undertaken in an aggressive way through the two acts symbol of the US recovery.

On the other side of the Atlantic Ocean, in the European Union the watchword in “*Austerity*”, member states are constrained by the Stability and Growth Pact instructions, although most of the countries have already exceeded the 60% limit of debt over GDP, the focus and aim regarding European directives were to keep a budget deficit under the 3% of GDP, especially after the second recessionary process provoked by the European sovereign debt.

Figure 21 shows, for the Euro Area the same trend as Figure 11 does for US, the overview of economic growth and the Euro Area Net Lending/Borrowing (in this case intended as the sum of the budget of the Eurozone members).

Beyond the poor performances in term of economic growth, that doesn't reach the 3% increase since 2007, the support of Governments is almost non-existent, European Governments can't and do not intend to spend; since each country does independent fiscal policy the singular evaluation can provide different details for some member, but what we see at an European level, is that since 2008 the fiscal policy is not supporting the economy – the peaks in 2009 and 2010, as we have already seen, are not voluntary – and after the double-dip recession the concept of austerity is applied more aggressively, the result of the Euro Area members fiscal decisions will lead to a much more conservative approach, keeping deficits far lower than imposed limits, reaching 1% deficit over GDP in from 2017 to 2019.

In an economic environment in which demand is low, and neither households and businesses are willing to invest due to uncertainty, a cut in government spending

and higher taxes will only lead to lower aggregate demand, lower employment, and therefore lower economic growth, the fiscal European system in following the idea of austerity and aiming in deleveraging failed in helping the economy.

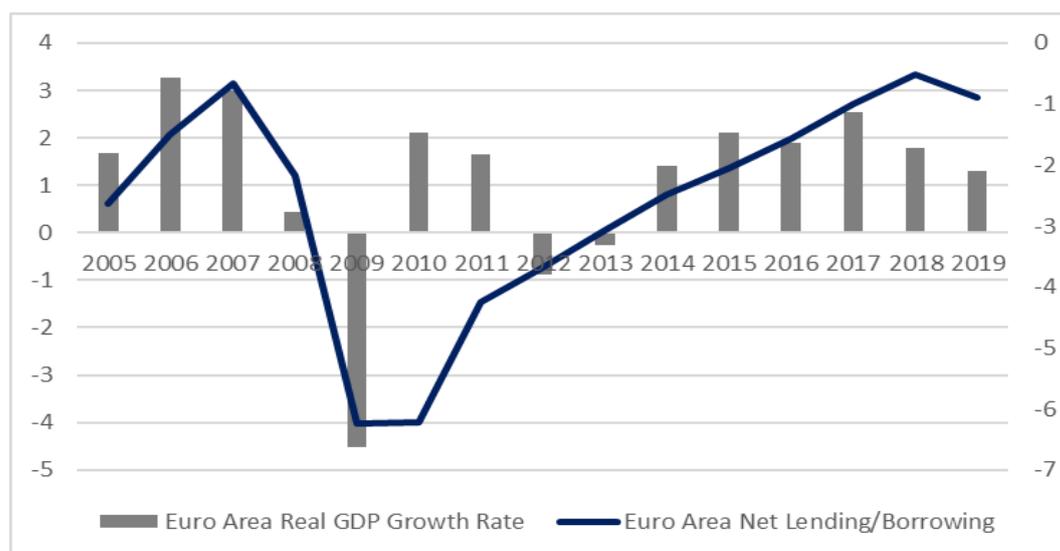


Figure 21: Euro Area Real GDP Growth Rate (left, percent change) & Euro Area Net Lending/Borrowing (right, percent of GDP)

Source: Author’s elaboration on International Monetary Fund, World Economic Outlook, 2019

5.4 THE EFFECTIVENESS OF EUROPEAN STRATEGIES

Unlike the US, the European Union will have a way slower recovery, the Great Recession began in 2008, but only from 2015, the European Central Bank will be able to ensure a stable and constant improvement of European markets and economic growth.

In the afterward of the crisis, the response of both governments and the ECB was clearly more cautious comparing to other major economies, the structural composition of the Eurozone, delineated by centralized monetary policies and decentralized fiscal policies, alongside with singular and independent objective can be considered as the main reason to explain the double-dip recession and the delayed recovery of the Union.

The various efforts undertaken by the ECB until 2012 will be only helpful in lightening the pressure on sovereign-debt countries and easing credit market conditions; in fact, those actions were not concerning in boosting growth, the aim of the central bank is to reach a certain level of inflation that ensures price stability, hence, until the goal was reached (in 2013 the rate reached the 3%) everything looked fine; for the central bank of course.

Economic growth poor performances proved the need for more aggressive actions, moreover budgetary and fiscal conditions played a key role in determining a somehow change in monetary policy.

The path, began from 2013, when the fear of deflation became real; from the decrease of the deposit rate to negative interest rate and the forward guidance implementation have been effective in lowering government yields and lending rates, signing the first step to a delayed recovery.

Furthermore, the implementation of the APP, especially through PSPP will light the recovery of the European Union; from 2014 the major of the effort undertaken

by the ECB is concerned in balance sheet policy in QE, that ensured the functioning of the transmission channel, with a direct decrease of unemployment and a notable economic growth rate of the Euro Area being also able to stay in line with the inflation target from 2016 to 2019, however, in 2019, the results seem changing, inflation falls down to 1,3%, GDP growth faces a slowdown and the process of unemployment decrease stabilizes, this pushed the ECB, from November 2019 in reinvesting the payments from maturing security of the APP with a more cautious attitude.

If on the one side can be stated that the effort of the monetary policymaker started too late, is important to evidence the difficulty – and somehow also fault – of the monetary system, policies adopted were not specific to one single country, moreover, what mostly prevented the policymaker in adopting aggressive actions was the continuous disagreement among the European political framework, especially from the most influential country, Germany.

On the other side, the absence of fiscal policies targeted in increasing public spending or tax cuts, does not support in any way consumption and investment, the functioning of the transmission mechanism and so, the recovery of the Union; in a situation in which uncertainty in the market lowers the proactivity of economic agents, and the intervention of the ECB is not enough (somehow even null), support and the conciliation of fiscal policy is fundamental, concerning this necessity, both EU – with the insistent limits applied to European countries – and

member states governments – through austerity policies - failed in giving the needed contribution for the economic recovery.

The lack of harmonization among the two pillars of the economic policy, concerning both measure of interventions and objective of them, can be stated as the main factor that decelerated the loophole for the recessionary phases faces by the European Union, still today the situation is dramatic, after 10 years facing the Great Recession, the EU could not restore pre crisis growth levels, moreover, the double-dip recession, or the slowdown of 2019 is nothing compared to the global crisis generated by Covid-19; the European Union, not yet recovered by the damage of the financial crisis, has now to face a further crisis, that led more fear and uncertainty; this time, the reaction of the European Union must be quicker and more decisive.

CONCLUSION

From the conducted analysis of the two economies, the heterogeneous set of adopted interventions is evident, both US monetary and fiscal undertaken policies were different from the Eurozone ones, however, what defines the effectiveness of the strategies is not only concerned in the action of the policymakers, but mostly if the desired directions took by the two economic pillar policies are uniform, leading to a harmonized economic policy process.

Federal Reserve and US Government homogeneous and coordinated policies, alongside with the definition of the same objective and the nature of matching interventions will enable a quick recovery through expansionary monetary and fiscal policies undertaken in the same timing (see Figures 10 and 11); the consistency of this ideology, is confirmed when, after the consolidation of the US recovery, the process of contractionary policies began by both of the policymakers, again, in the same period and in the same direction.

On the other side of the ocean, the different objectives of the European Central Bank and member states Governments, will not proceed in the same direction, European Governments focused in deleveraging, reduced public expenditures to decrease the budget deficit, searching for a final result way smaller than the 3% limit (see Figure 21), on the other hand, if it's true that the central bank undertook expansionary policies, is also true that it did it to stick out the inflation target, the

two expansionary phases occurred only after poor performances of the rate or to face the fear of deflation (see Figure 14 and 20); the carelessness of policies aimed in improving growing conditions and reducing unemployment led the European Union in losing the path to recovery, rediscovered it, (maybe) too late and (perhaps) by only one of the two economic policy pillars.

The major of the effort undertaken by the central banks, was concerned in Quantitative Easing, that, from a broad perspective, had a non-objectionable utility in restoring credit activity, supporting financial markets and restabilizing the correct functioning on the transmission mechanism; as well as for the Great recession, also today, one year after the beginning of the Covid-19 crisis, both central banks have increased the balance sheet through QE, the Fed almost doubled its dimension while the ECB had a 50% increase; the remarkable expansion of central bank balance sheets in supporting imbalances provoked by the financial crisis, however, has not been compensated by a substantial growth of the real economy and the heavy exposure in unconventional monetary policies has increased the potential for capital losses and uncertainty in the global markets. Hence, it is fundamental to control accurately the process of quantitative easing, on the one side solves some problems, but on the other can create irreversible effects on inflation and price stability through expansionary process and unemployment, poor economic growth performances and asset bubbles in contractionary intervention; central banks must know when and how to apply the adoption of this

policy; the new crisis forced both US and European central banks to restate the unconventional measure, that, nowadays, can be considered as standard, this, not only caused the stoppage of contractionary policies undertaken in the previous years, but conducted the policymakers in adopting more evident and more aggressive expansionary decisions.

It is still early to determine the effectiveness of the recent post Covid-19 policies but, looking at the past we can understand what to do and mostly, avoid making the same mistakes.

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