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"Unconventional monetary policies effects on the Italian and European banks' financial portfolio performances"

RELATORE:

CH.MO PROF. Francesco Zen

LAUREANDO: Filippo De Francesco

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1. ABSTRACT

The purpose of this thesis is to analyze what influence had the unconventional monetary policy, introduced by the ECB, on the proprietary portfolio of the top Italian and European banks. The events of recent years have caused a change in the banking institutions revenues, which, increasingly, had to rely on income from non-interest. In particular, the factors that led to the change in the banks' management with a more traditional business model will be described and will then be compared to the European panorama. Will performed two econometric analysis, one focused on the Italian scenario and the other focused on the European scenario. To do this, a panel dataset will be used, built by extrapolating data from individual financial statements, for the Italian banks, and from the "Bankscope" database for the European banks. The results show that some macroeconomic variables resulted to be significant for both samples, while other variables, related mostly to the banking dynamics, have had a different incidence, depending on the nature of the banking institutions and the states in which they operate.

2. INTRODUCTION

The European Central Bank is the body that is responsible to formulate and implement the monetary policy within the euro area. Operational since 1999, the ECB has as its main objective the maintenance of price stability at a level below but close to 2%. The Eurotower in addition to defining and implementing the Community's monetary policy must: operate on the exchange market; hold and manage the official foreign exchange reserves of member countries; facilitate the supervision of credit institutions and the stability of the financial system. In the early years after its establishment the ECB has been able to pursue the achievement and maintenance of price stability; to do what, it has made use of the instruments provided for in the Treaty on the Functioning of the European Union and the Treaty on European Union (Maastricht Treaty), which we will call "conventional tools."

Since 2007 the European Central Bank had to face a severe malfunction in the money markets that prevents the proper functioning of the monetary policy: the traditional transmission mechanisms that normally lead the economy policy impulses no longer fulfil their function, also in the European financial markets arose asymmetries that make unbalanced the effects of the measures taken.

The ECB had to employ a series of innovative tools, called non-standard or unconventional measures, to restore the functioning of the transmission channels and thus give effect to its monetary policy decisions.

In this thesis after having set out the role of the European Central Bank and the instruments at its disposal under the Treaties, I will divide the analysis into three parts, the first part is intended to analyse the non-conventional measures introduced by the central bank in order to restore the proper functioning of markets, secondly I analyse what were the results of these manoeuvres on the public debt of European countries and on credit default swaps with underlying European government bonds. Finally, I will conclude this thesis with a quantitative analysis of the effects of monetary policy on portfolio performance of a sample of Italian and European banks.

3. MONETARY POLICY OF EUROPEAN CENTRAL BANK

The European Central Bank is the central bank responsible for implementing the monetary policy for the European Union countries that have joined the euro, and which form the so-called "euro zone."

The European System of Central Banks (ESCB) comprises, as provided by the Article 106 of the Treaty on European Union (the Maastricht Treaty), the European Central Bank and the national central banks of the EU member states regardless the adoption of the single currency; only the national banks governors of the countries belonging to '"Eurozone", however, take part in the decision-making and implementation process of the ECB's monetary policy. The so-called Eurosystem is in fact composed by the ECB and the national central banks of the countries that have adopted the euro; the national central banks of the countries outside the "euro zone" are empowered to lead an independent national monetary policy.

The European Central Bank is an independent, supranational body composed by three basic authorities: the Governing Council, the Executive Board and General Council. The Governing Council's primary task of the European Central Bank is to formulate the monetary policy of the euro area, to be implemented by the Executive Board which shall indicate to the central banks of the countries that adopt the single currency and the banking institutions, the manoeuvres to be implemented in order to ensure the proper transmission of monetary policy.

The main purpose of European Central Bank is to keep under control the price trend by maintaining the purchasing power in the euro area. The ECB exercises, in fact, the control of inflation in '"euro area" taking care to contain, through appropriate monetary policies, the average rate of inflation for the year to a level below, but up to, the 2%.

3.1. <u>Conventional Monetary Policy</u>

Since its establishment until the beginning of 2007, the ECB in order to reach the achievement and maintenance of price stability has used the tools at its disposal provided by "treaties." These instruments can be divided into:

- Open market operations (OMA)
- Require to credit institution to hold minimum reserves on account with ECB
- Operations of standing facilities

3.1.1. Open Market Operation

They are the most important tools, and are intended to influence interest rates, the liquidity of the money market and finally report the performance of monetary policy; with these operations, the ECB aims to ensure the smooth functioning of the money market and to help banks to meet their liquidity needs in a smooth manner.

Open market operations can be divided into four categories:

1. **Main refinancing operations**: MROs are liquidity-providing operations that are conducted regularly on a weekly basis. They generally have a maturity of one week. (before March 2004, the maturity of the MROs was 2 weeks). The maturity of the MROs and LTROs[1] may also vary occasionally, depending on, inter alia, bank holidays in Member States. From the beginning of 1999 to June 2000 the Eurosystem conducted its MROs as fixed rate tenders. All counterparties fulfilling general eligibility criteria may participate in these operations. In principle, all credit institutions located in the euro area are potentially eligible counterparties of the Eurosystem. From 27th June 2000, the MROs were conducted as variable rate tenders with a minimum bid rate using a multiple rate procedure. Starting from the operation settled on 15 October 2008, the MROs were conducted as fixed rate tenders with full allotment.

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[1] Long Term Refinancig Operation, in the next section are explained in detail.

MROs
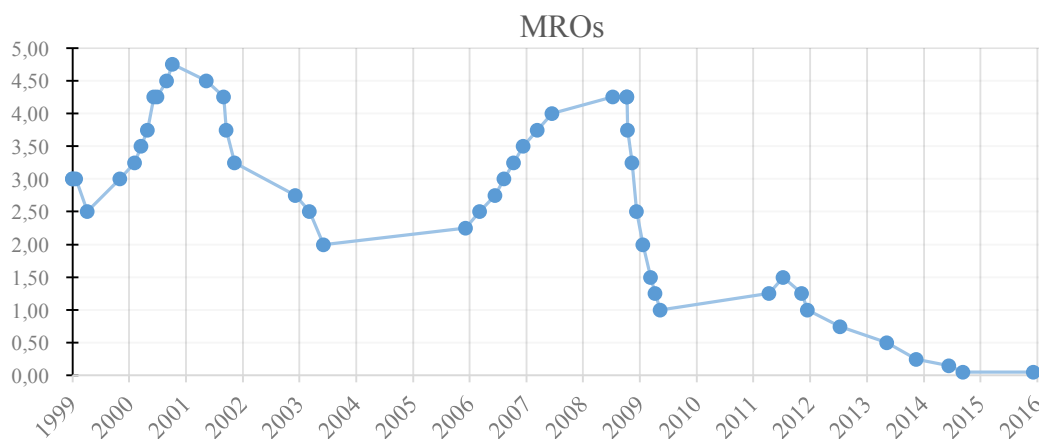
Graph 1 – Source: Personal elaboration on ECB data

Since the October 2008 the MRO rate was lowered regularly, in order to inject more money into the banking system and facilitate access to credit for financial institutions. On March 10th 2016 the ECB took the historic decision to bring to 0% the MRO interest rate, so no more interest should be paid to the Central Bank.

2. **Long-term refinancing operations**: LTROs are refinancing operations with a monthly frequency and normally a quarterly basis, with a 3-month maturity. The ECB may also conducts additional LTROs which can have other maturities (e.g. a maintenance period of 6 months or 12 months). In 2011, the ECB introduced the first LTROs with maturity 36 months. These operations are aimed at providing longer-term liquidity to the banking system. This is deemed useful in order to prevent all the liquidity in the money market from having to be rolled over each week and to give counterparties access to longer-term refinancing. In order not to blur the signal arising from the ECB's the MROs and the LTROs are normally executed in the form of pure variable rate tenders with preannounced allotment volumes.

3. **Fine-tuning operations**: "fine tuning", are open market operations on an ad hoc basis, which are not conducted on a regular basis and they aim to smooth the effects of unexpected liquidity imbalances on interest rates; the frequency and maturity of such operations are not standardised. They are aimed at managing the liquidity situation in the money market and steering interest rates, in particular in order to smooth the effects on interest rates of unexpected liquidity fluctuations in the market. FTOs can also be executed through bilateral procedures, where the Eurosystem conducts a transaction with a limited number of counterparties without a tender (in order to facilitate access

during the financial crisis, the list of counterparties eligible for FTOs was extended, increasing from around 140 to around 2,000 eligible counterparties).

4. **Structural operations**: these operations are implemented when the ECB wishes to adjust the structural position of the Eurosystem liquidity in the financial sector, i.e. the amount of liquidity in the market over the longer term. In principle, structural operations can be liquidity-providing or liquidity-absorbing and their frequency can be regular or non-regular. Structural operations in the form of reverse transactions and the issuance of debt instruments are normally carried out through standard tenders. Structural operations in the form of outright transactions are normally executed through bilateral procedures.

3.1.2. Minimum reserves required

Euro area banks are required to hold a certain amount of funds as reserves in their current accounts at their national central bank. These are called minimum reserves. A bank's minimum reserve requirement is set for six-week periods called maintenance periods. The level is calculated on the basis of the bank's balance sheet prior to the start of the maintenance period. Banks have to make sure that they meet the minimum reserve requirement on average over the maintenance period. So, they do not have to hold the total sum in their current accounts at the central bank on a daily basis. This functions like a valve, allowing banks to react to short-term changes in the money markets, where banks lend to each other, by adding or withdrawing funds from their reserves at the central bank. This helps to stabilise the interest rate banks charge each other for short-term funds. Until January 2012, banks had to hold a minimum of 2% of certain liabilities, mainly customers' deposits, at their national central bank. Since then, this ratio has been lowered to 1%. The total reserve requirements for euro area banks stand at around 113 billion euro (beginning of 2016). Credit institutions' holdings of required reserves are remunerated. The remuneration corresponds to the average, over the maintenance period, of the "marginal rate of allotment" (weighted according to the number of calendar days) of the MROs.

The objectives of the minimum reserve requirement are two in principle:

1. Stabilisation of money market interest rates
2. Creation or enlargement of a structural liquidity shortage

Stabilisation of money market interest rates. This function is performed by the averaging provision: it allows credit institutions to smooth out daily liquidity fluctuations (e.g. those arising from fluctuations in the demand for banknotes), since transitory reserve imbalances can be offset by opposite reserve imbalances generated within the same maintenance period. The averaging provision implies that institutions can profit from lending in the market and run a reserve deficit whenever the shortest money market rates are above those expected to prevail for the remainder of the maintenance period. In the opposite scenario, they can borrow in the market and run a reserve surplus. The averaging provision works very smoothly during the maintenance period. However, at the end of the period, the reserve requirement becomes binding and banks can no longer transfer a liquidity surplus or deficit into the future.

Creation or enlargement of a structural liquidity shortage. The need for credit institutions to hold reserves with the NCBs contributes to increasing the demand for central bank credit

which, in turn, makes it easier for the ECB to steer money market rates through regular liquidity providing operations.

3.1.3. Operations of standing facilities

These operations are aimed at providing and absorbing overnight liquidity. On the basis of how they are used by the counterparties, they are divided into two categories:

- **Marginal lending facility**: which allows counterparties to obtain overnight liquidity from the national central banks against eligible assets deposited as a guarantee.
- **Marginal deposit facility**: used by counterparties to make overnight deposits with the national central banks.

Marginal lending facility. Counterparties may use the marginal lending facility to obtain overnight liquidity from national central banks at a pre-specified interest rate against eligible assets. The facility is intended to satisfy counterparties' temporary liquidity needs.

Marginal deposit facility. Counterparties can use the deposit facility to make overnight deposits with national central banks. The deposits are remunerated at a pre-specified interest rate. Under normal circumstances, the interest rate on the facility provides a floor for the overnight market interest rate. The overnight deposits accepted from counterparties are remunerated at a fixed rate of interest. No collateral is given to the counterparty in exchange for the deposits. On 11th June 2014, the ECB introduced a negative deposit facility interest rate, applied even to average reserve holdings in excess of the minimum reserve requirements and other deposits held with the Eurosystem.
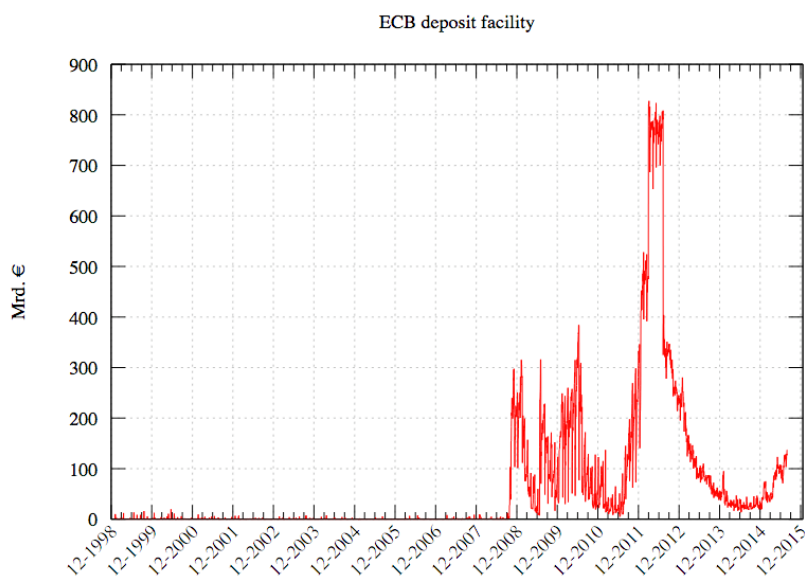

Graph 2- Source: European Central Bank

The graph above shows the amount of overnight deposit at the ECB. With the outbreak of the financial crisis, the instrument of deposit facility has been increasingly used over time. During the sovereign debt crisis, it has reached the peak of overnight deposits at the ECB, 800 billions share, and in 2012 the average overnight deposit exceeded the 400 billions[2]; This spike was driven by a climate of tension and lack of confidence in the interbank market; banks that had excess liquidity rather than lend to other banks preferred to deposit it at the ECB.

The interest rates applied to these two operations constitute the so-called "corridor" rate that is lower and an upper limit on the rate of the interbank money market interest. In normal circumstances, there is little incentive for banks to use standing facilities, as the interest rates applied to them are normally unfavourable when compared with market rates. In normal times, the EONIA has generally remained close to the rate on the MROs. This behaviour changed in October 2008, when the ECB adopted nonstandard measures to counter the negative effects of the intensification of the financial crisis. The EONIA exhibits a pattern of occasional spikes. This pattern is related to the ECB's minimum reserve system. The differences between the standing facility interest rates and the rate on the MROs were kept unchanged between April 1999 and October 2008 at ±1%. The width of the corridor was then temporarily narrowed to ±0.5%, before being widened again to ±0.75%in May 2009, when the ECB decided to set the rate for the MROs at 1.0%. At present, the width of corridor is narrowed to ±0.25%.

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[2] Source: European Central Bank Monthly Bulletin, June 2012
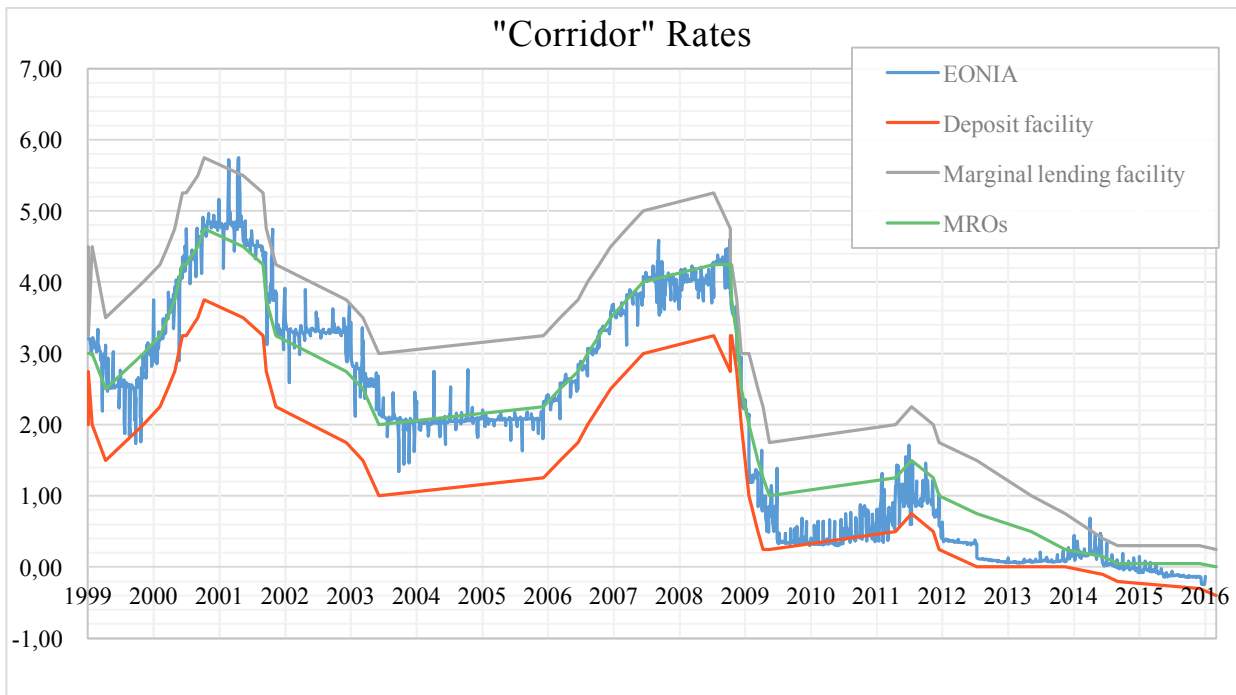
Graph 3 - Source: Personal elaboration on ECB and Thomson Reuters data

Regarding the primary task of the ECB, as it's possible to see from the chart below, that shows the price trends in the euro area, from 1999 until the beginning of 2007, the achievement and maintenance of price stability at a level close to 2% over the medium term has been reached, thus the instruments provided by 'Treaties' were effective.
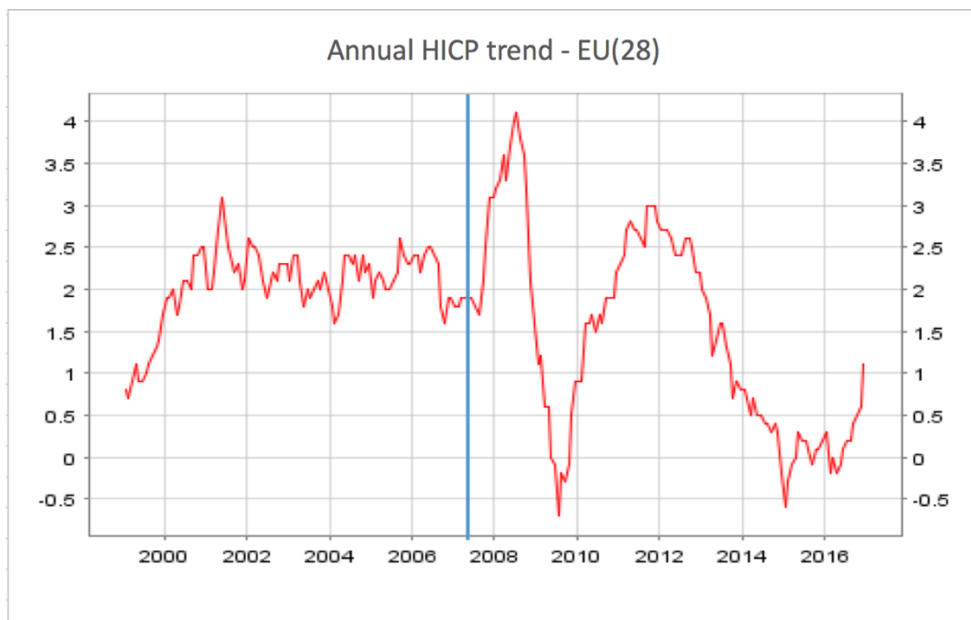
Graph 4 - Source: Eurostat data

While, since 2007 the situation changes and the conventional measures are no longer sufficient to achieve the purpose, for this reason will be introduced non-standard measures.

3.2. <u>Monetary policy transmission mechanisms stop to work</u>

Since the beginning of 2007, the imbalances in the US markets following the subprime crisis, are reflected in financial turmoil in European markets up to result in a real financial crisis that mainly affected the real economy. The ECB has been deal with such turmoil that led to a weakening of the monetary policy transmission mechanisms, the weakening has seen its peak and became a real block of the interbank market in the second half of 2008 following the bankruptcy of US bank Lehman Brothers. Recalling that the monetary policy transmission mechanism is the process by which the ECB aims to influence prices throughout the euro area, by acting on the reference interest rate, by the time such a mechanism is hindered by disruptions in certain market segments, the ECB may intervene and in periods of extraordinary financial market tensions, can use any tool that is compatible with the Treaties and that it is essential to achieve the intended goals. Therefore, it may decide to tackle these tensions through non-conventional measures, which form part of the implementation of monetary policy instruments at its disposal, but which by definition are of an exceptional and temporary nature. These measures are generally directed to the banking sector, as firms in the euro area mainly depend on the banks funding, rather than funding from the capital markets. Regarding the interest rates channel, the transmission of the Governing Council intents on monetary policy to the money market rates depends critically on the banks behavior and their willingness to exchange liquidity in the interbank market. In general, considering the minimum reserves imposed by the ECB, banks with excess liquidity at the end of the trading day make loans to other financial institutions needing funds. However, in an environment in which mutual trust between banks is lacking, the link between monetary policy rates and money market rates could weaken or even crash completely. In this case even solvent banks would have difficulty to obtain funds on the market because of information asymmetries on the interbank market; the various actors who work in such market have access to a limited set of information that prevents them from distinguishing solvents counterparts from the insolvent one, the interbank market become more "cautious"; occurs then a lack of liquidity, this is drained from the fact that banks that may provide liquidity do not, not relying on the possibility in turn to raise funds in case of need, thus they keep the liquidity that they already possess. When the supply of interbank credit is scarce for the difference between the market players, the situation that has arisen since the first tensions of 2007, the cost of interbank lending, which is the first step in the transmission process, increases above the level that would be consistent with the monetary policy of the ECB.

The failure of this transmission channel has made ineffective the ECB's maneuvers on interest rates; following the aggravation of economic conditions, the ECB lowered its key interest rates. Under normal circumstances these reductions would be transmitted in a relatively and evenly manner to households and businesses throughout the euro area, but in that period the cuts to rate were broadcast entirely in some countries, in others countries, the bank loans rates to the real economy declined only slightly or not at all, and in others countries, have in fact increased. Through the monetary policy transmission channels so the effectiveness of a maneuver diverged between different economies.

The blocking of transmission mechanisms is served so to the central bank to justify the use of the new instruments. They have been developed so-called "unconventional measures", designed to bring back financial markets to work properly, allowing monetary policy to be transmitted effectively to the economy. There is no clear definition that allows a clear discrimination between conventional instruments and not, the differences may be subtle; Can be considered unconventional measures those indicated by the ECB itself as such:

- Fixed rate tender procedures with full allotment
- Expanding the list of assets eligible as collateral
- Longer-term liquidity Dispensing
- Foreign Currency Liquidity Provision
- Change in reserve requirement ratio
- Government Bonds purchase programs

4. THE "NEW" MONETARY POLICY OF ECB DURING THE CRISIS

4.1. <u>Introduction of unconventional monetary policy</u>

In 2007, a season of "reforms" of monetary policy opened, the season that is in place today. The crisis of 2007 has generated imbalances in European markets requiring extraordinary commitment by the ECB, which launched in July 2009, the Covered Bond Purchase Programme in support of some financial market segments that were in dysfunction.

The 2010 is the year in which the financial crisis originated in US financial markets and enlarged to the EU financial markets and economy changes affecting the European public debt of some European countries, straining their ability to repay debt. Only thanks to the intervention of the ECB and the provision of highly restrictive policies on public accounts, it has been possible to contain the effects of this "new" crisis that Europe has had to face, called "sovereign debt crisis."

In the European financial system, the government bond segment is an important element in the monetary policy transmission process; this is why the dysfunctions of this segment are an obstacle to the good functioning of the traditional measures taken by the ECB.

The loss of value of government securities in fact struck directly in banks' balance sheets institutions which held them in large quantities and this, has impaired the ability of these banks to finance itself on the market. In front of these difficulties, the returns needed the intervention of the ECB to provide liquidity to the financial system, in order to replace the interbank market dried up again.

The sovereign debt crisis manifested initially in Greece, following the course of months it also extends to other countries such as Ireland, Portugal, Italy and Spain; the stability of the entire euro area is at risk; The Italian and Spanish government bond prices fall to peak and the spread, between 10 years Italian and German government bonds (BTP-BUND), rears up, until to reach the 500-basis points threshold on November 2011.

By now it is clear the need for intervention by the ECB that put in place, since May 2010, unconventional policies to restoring the proper functioning of the monetary policy transmission mechanism. We can define these instruments as a definitive purchase operations of certain debt securities on secondary markets.

In order to ensure the proper transmission of the monetary policy impulses to the economy as a whole and ultimately to the general level of prices, the Eurosystem may take action on debt securities markets of public and private issuers of euro area, by making outright purchases of certain activities (rather than simply accepting them as collateral).

In May 2010 the ECB decided to introduce the Securities Markets Programme in order to ease tensions in some market segments that hindered the monetary policy transmission mechanism, i.e. the process by which the ECB aims to influence prices in the euro area by acting on the reference interest rates. Under this initiative, if the functioning of the transmission mechanism was compromised by failures in some segments and the signal inherent in the ECB rates not evenly was transmitted to the whole area, the European Central Bank could intervene by buying in the secondary market (i.e. by banks at market prices) securities which usually accepts as collateral.

The last purchases in this context were made in February 2012 and the following September, the program ended.

Then, in September 2012, the ECB has defined the specifications of the Outright Monetary Transactions (OMT) announced the previous month:

➢ Introduction of an unlimited purchase plan in its range;
➢ The purchases of securities didn't place into question the integrity of the monetary base, or they did not involve an increase in the circulating medium;
➢ The purchase of securities addressed bond with maturity from one to three years, leaving out those with six-year expiration (average Italian public debt expiration) and ten-year expiration;
➢ The intervention plan provided for the beneficial country, a "macroeconomic stabilization" program, agreed with the ESM, i.e. compliance with a memorandum of reforms imposed by the European Central Bank.

The purpose of the OMT is to preserve the proper transmission of monetary policy as well as its uniqueness in the whole euro area, offering a fully effective support mechanism in order to prevent adverse scenarios, which could potentially pose significant challenges for price stability in the euro area. Unlike the Securities Markets Programme, one of the necessary preconditions for the OMT-run is the respect of strict and effective conditions related to an appropriate program of structural reforms; the aim is to safeguard the primacy of the ECB's mandate of maintaining price stability, and to ensure that governments are always properly incentivized to implement the fiscal consolidation and necessary structural reforms. Another difference from

the previous program is that the OMT are not subject to predetermined limits and is conducted in the government bonds secondary markets with maturities between one and three years.

However, both the Securities Markets Programme and the Outright Monetary Transaction cannot be considered monetary easing maneuvers, since the entire additional liquidity provided by these operations within a week is reabsorbed in the next week. Sterilization can take place for example by offering fixed-term deposits that banks may hold at the central bank. The net effect of purchases and sterilization on the overall liquidity of the interbank money market is therefore null.

In the mid-2013, the sovereign debt crisis seems to have diminished in some European countries, but many countries of South-Europe were still in serious difficulties. It generated an economic gap, between the various European Union countries, which since 2013, the ECB decided to reduce, intensifying the unconventional policies and allowing deficit countries to close the gap.

On 5th June 2014, the ECB Governing Council has decided to suspend the weekly fine-tuning operation aimed at re-absorbing the liquidity provided under the SMP, de facto leaving in the system the equivalent of 170 billion euro issued with SMP and not yet been drained. Technically, this represents a monetary easing action, the first since the crisis began. ECB also launched a combination of measures to achieve a further monetary policy easing and to support the process of lending to the real economy. Package includes further reductions in key ECB interest rates, bringing the interest rate of deposits with the ECB, for the first time in history, to a negative level[3].

On September 2014, the ECB launched a TLTRO[4] plan (targeted LTRO), a long-term bank loan, this time aimed at the credit support of companies in the non-financial sector ("real economy"), the results of which, however, were minor than expectations. At this point, given the persistence of the credit crunch and the depletion of conventional monetary policy (lowering interest rates to zero, negative interest rate for deposits at the ECB itself), it was decided, with increasing consensus, a true quantitative easing program in the Eurozone.

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[3] The Marginal Lending Facility rate fixed at -0,10%, and further lowered to -0,2% then in 4th December 2015 led to -0,3% and finally the 10th March 2016 at -0,4%

[4] The TLTRO have a maturity of 4 years and are linked to the duty for the banks to issue loans to the real economy, otherwise the sums of money must be returned before the deadline

Meanwhile, in the second half of 2014 and in the start of 2015 there were fears for the solidity of some banks, especially those in the most distressed countries; Most concern are the non-performing loans present on the bank balance sheets, which have undergone a considerable increase over the previous years. For this reason, on 22th January 2015, The ECB Governor Mario Draghi announced at the World Economic Forum that the Central Bank will purchase public and private debt securities as of March 2015, at first, at least until September 2016 for an amount of 60 billion Euros per month and in any case until the inflation rate in the Eurozone will come back to get closer to 2%[5].

The ECB will buy in the secondary market securities issued by governments or by the European institutions[6]. The public debt of the Member Eurozone members will be purchased in proportion to their shares of the ECB's share capital held by the respective national central banks, by allocating 92% of the relative risk on individual national institutions (which falls to 80% if also purchases of public debt securities of the European institutions).

On 4th December 2015, the Board of the ECB approved the second phase of quantitative easing program. "QE2" consists of an extension of monetary stimulus for another six months, until March 2017[7], with the same "power" of the stimulus, 60 billion euro per month, with the purchase extended to securities issued by local authorities, and the rate of bank deposits at the ECB, already negative, fell further from -0.2 to -0.3%.

On 10th March 2016, the ECB decided by a majority, with Germany voting against, to bring from 60 to 80 billion Euros of the monthly purchase amount with quantitative easing, already from April 2016; to extend the purchase in non-government securities, issued by private non-banking, with more than BBB-. Furthermore ECB decided to maintain at 0% MRO interest rate, down further from Deposit facility rate from -0.3% to -0.4%, again in the negative area; unprecedented decisions in the ECB's history, with the devaluation effects on the exchange rate euro/dollar; regarding TLTRO starting from June 2016, the limit for lending cash to banks rose from 7% of some applications, planned since their inception in September 2014, to 30% of total lending volume resulting in budget 2016, excluding from counting mortgages in order to avoid dangerous housing bubble. If banks increase lending to businesses at least of 2.5% a year, they

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[5] The names of the programs are "asset-backed securities purchase programme, ABSPP", and "covered bond purchase programme 3, CBPP3". Included in the general program "Extended Asset Purchase Programme", i.e. QE

[6] ECB Press release of 22th January 2015

[7] With respect the first deadline set for September 2016

obtain cash which to be repaid in four years at a rate between 0 and interbank overnight rate, of unlimited amount in advance, if not by subsequent interventions.

On 6th December 2016, the ECB Governing Council decided to extend the Quantitative Easing program up to December 2017, but reducing the monthly purchasing from 80 to 60 billions of euro.

4.2. <u>Unconventional monetary policy effects</u>

As explained in detail in the preceding paragraph, in the wave of the economic and financial crisis, the ECB has implemented some unconventional policies of different nature: from the purchase of government bonds to the injection of liquidity into the financial system. The evaluation of their effectiveness is controversial: on the one hand, these measures seem to have had an effect on the performance of certain financial ratios, on the other hand they have not been able to reverse the trend of the main economic indicators[8].

Much of the recent literature has tried to measure the macroeconomic impact of the programmed purchases to provide additional monetary stimulus also when, by now, the short-term interest rates tend to zero. Generally, we accept the positive impact that these programs have had on the financial system and to a lesser extent, in the real economy. In fact, if on one hand the LTRO operations helped to improve the Eurozone monetary conditions, by injecting liquidity into the system and decreasing the government bonds rates indirectly, on the other hand the long-term refinancing operations have not significantly contributed to stimulating the lending to the private sector, mainly due to the behavior of the banks, more willing to deposit to the ECB liquidity surplus[9] or invest in high-yield government bonds. However, it can be stated that the LTRO operations have prevented the collapse of lending system, have ensured the funding of banks, as well as supported the banking system and the market for government bonds during the liquidity crisis. Through the LTRO, the euro zone banks have got about 1,000 billion euro from the ECB at a rate of about 1%. The two tenders with three-year maturity, dating December 2011 and February 2012, injected into the system an additional cash amount of around 523 billion. As already mentioned, one of the main objectives of the program was to put remedy to the impasse that had arisen in the interbank market due to the mutual trust crisis

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[8] As the HICP index, which remain still far from the 2% target.

[9] Because of to the lack of confidence in the interbank market.

regarding creditworthiness and liquidity of the counterparties. It has been estimated that the liquidity injections of the LTRO have permanently decreased the interest rates on the interbank market of about 70-100 basis points[10].

Regarding the operations of the Securities Markets Programme, they have had a positive effect, but short-lived, on the functioning of markets. The SMP provided the purchase on the secondary market of government bonds accepted by the ECB as collateral in the refinancing operations: the program was launched in May 2010 for Greece, Ireland and Portugal and has been extended in August 2011, to Spain and Italy. The last purchases made under the SMP date back to September 2012; the total amount of euro employed with this program is 218 billions of euro, of which 103 for the purchase of Italian government bonds. The impact of the program on the spreads of government bonds has been immediate and significant: during the first day of operation, the spread between Greek and German government bonds fell by over 400 basis points; at the time of reactivation in 2011, the Spanish and Italian spreads dropped by over 100 basis points. Even the long-run effect on yields is significant and is estimated in a reduction between the 0.1 and 7 basis points for ten-year bond for 100 million euro of securities purchased (respectively, for Italy and Ireland)[11]. Both the Security Market Programme and the Outright Monetary Transaction also had a significant effect on the yields of European bonds, thanks to the fact that for the first time, the ECB monetary policy operations were linked to demands for structural reforms to the countries; this request was appreciated a lot by the markets leading to a reduction in the volatility of government bonds.

In addition, there have been further effects on bond yields following the introduction of the Extended Asset Purchase Programme, i.e. the QE, in January of 2015; in fact, this maneuver was long overdue, and once announced, led to a further decline in yields on government bonds, particularly those Italian and Spanish.

Concluding, we can say that the measures taken over the years by the ECB have had the effect of reassuring the markets, in fact, already from the announcement itself, we have seen the first effects on the financial markets. In particular, the SMP before, the OMT after, and finally the new plan of Asset Purchase Programme have encouraged a decline in volatility on government

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[10] Casiraghi et al., 2013

[11] Ghysels et al., 2014

bonds yields of the countries in difficulty; The effects of the unconventional monetary policy will be explained in detail in the section 5 of this elaborate.

4.2.1. Focus - effect on real economy

By definition, the ECB's monetary policy has the main purpose to maintain the level of inflation in a medium term at a rate less, but close to 2%; at this main purpose, some other secondary purposes are added, that can be reached only if the main purpose is centered, for example, the employment growth and a sustained economic growth. As highlighted in the preceding paragraph, the two financial crises have seriously undermined the monetary policy transmission mechanism, therefore the central bank has failed to hit the main objective and in turn the secondary goals. The ECB has been forced to adopt new and exceptional measures to restore the proper functioning of the monetary policy machine; in this regard, the strategy followed by the ECB consisted of two phases: in the first phase the prefixed aim of the ECB was to refinance the Eurozone banking sector, because banks and financial institutions were the first subjects and the most affected by the 2007 crisis before, and by the sovereign debt crisis then; in the second phase the aim was to support investment and loans to non-financial sector within the euro-area, key elements for achieving the objectives set by the Treaties.

Financial institutions, since the first signs of crisis, were quick to express the need for liquidity, as the classic refinancing channels had been compromised. The ECB then decided to undertake policies in order to support the banking system, considered vital cog of the monetary policy transmission mechanism. For this reason, the first maneuvers were intended to provide unlimited liquidity to the banking system, for example via the fixed rate tenders with full allotment. Even the expansion of eligible collateral and the extension of the maturity of the LTRO may be considered tactics designed to facilitate the banks' refinancing.

The "Securities Market Programme" and the "Covered Bond Purchase Programme" provided repurchase plans of government bonds and covered bonds, held mainly by Banks. The huge amount of money, were rarely transmitted to the real economy, that is, households and businesses in the Eurozone; very often the excess liquidity was deposited at the Central Bank accounts rather than being issued in the form of loans. This situation was dictated primarily by the need for banks to reduce their leverage and consequently to take less risk; Also, the increase in NPLs accounted in large part on the decision to restrict credit to the private sector. The environment that had been created in Europe had it guaranteed stability and reliability in

financial markets but did not guarantee the achievement of the ECB objectives. Until a couple of years ago, the Central Bank accepted this compromise in exchange for the stability of European markets and the achievement of the objectives set in its first phase of the exceptional monetary policy.

In recent times, when the liquidity emergency was diminished and has become manageable, thanks to the ECB that it was able to replace the interbank market, monetary policy has taken the road of supporting the real economy. In particular, the loans level to the private sector remains very low, as well as the level of investment in the euro area; these two elements are considered essential for achieving the objectives of the ECB. In June 2014, the ECB launched the first TLTRO *"Targeted Long Term Refinancing Operation"*, in order to encourage the banking sector to issue loans to real economy. These TLTRO, re-named later TLTRO1, provided the possibility for banks to borrow at a rate equal to that of the main refinancing operations. The sums of money had to be returned after four years, provided that such payments were used to deliver loans real economy, otherwise the refund should have been made in advance. With the introduction of this maneuver begins the second phase of the ECB monetary policy and the Central Bank, for the first time since the start of the crisis, concretely expresses its willingness to support the real economy. The TLTRO1 consisting of two tranches: the first in September 2014 and the second in December of the same year. However, as the months passed, low confidence in the private sector and the need for reorganization of the banking sector, don't help the process of issuing loans to real economy. The percentage change in the rate of loans to non-financial sector remains constant and weak around 0%.

M3, M1 and loans to the private sector

(annual percentage changes; adjusted for seasonal and calendar effects)

- M3
- M1
- loans to the private sector
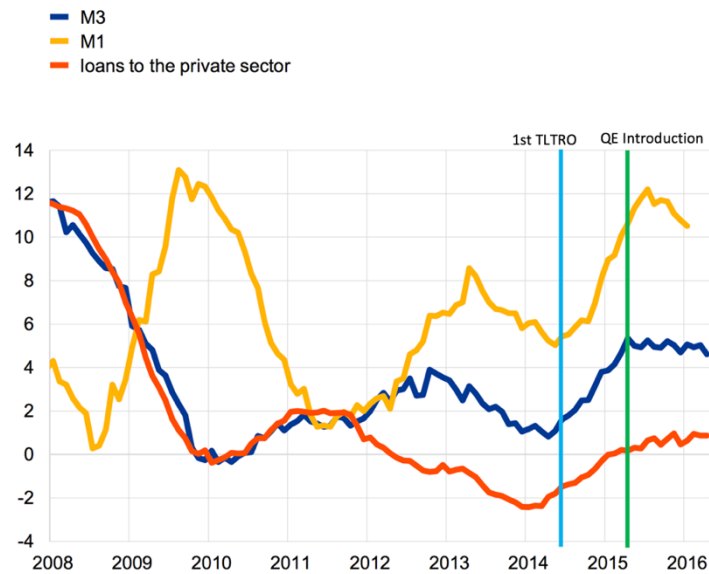
Source: ECB.
Note: The latest observation is for April 2016.

In January 2015, the ECB announces the launch of the EAPP *"Extended Asset Purchase Programme"*, that is the QE, which should also support loans to non-financial sector. Since the launch of the first TLTRO and EAPP the monetary aggregates M1 and M3 are growing constantly, reaching growth rates of about 4% on an annual basis; only in the first quarter of 2016 the monetary aggregates mark a trend decline, but remaining still at very high levels; Nevertheless, loans to the private sector will not grow properly, or at least are not satisfactory for the standards imposed by the ECB[12].

In March 2016, the ECB launches the TLTRO2 program, which was attended by 514 financial intermediaries for a total amount disbursed of about 400 billions. Unlike the TLTRO1 the rate of interest is equal to that of the main refinancing operations but can be lowered, depending on the level of loans granted to the real economy, up to the current level of interest rate set for the Deposit Facility, rate that is negative, so the banks could also obtain positive returns on capital borrowed from the Central Bank.

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[12] Also because of the worrying levels of NPLs and the coverage level required for them.

The following graph shows the trend for the loans to Non-Financial Company "NFCs" and to households for some selected coun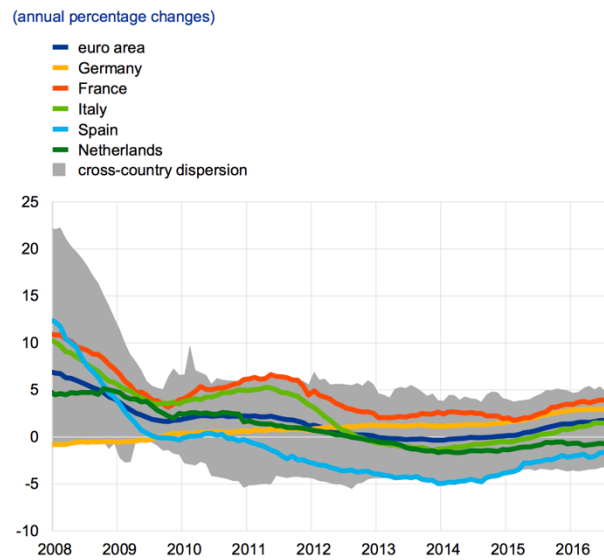tries and for the euro area[13]. It's possible to see that the contraction in loans was most significant in the peripheral countries, such as Spain or Italy, which recorded their minimum in the 2014, just before that the new maneuvers, aimed at supporting the real economy, were introduced.

MFI loans to NFCs in selected euro area countries
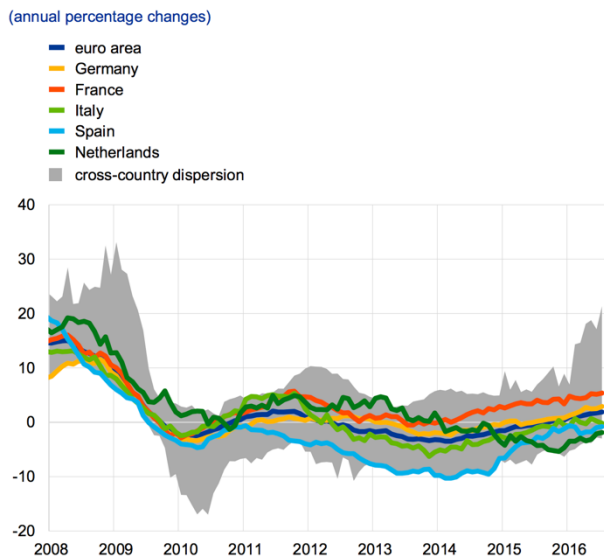
MFI loans to households in selected euro area countries

(annual percentage changes)

- euro area
- Germany
- France
- Italy
- Spain
- Netherlands
- cross-country dispersion

(annual percentage changes)

- euro area
- Germany
- France
- Italy
- Spain
- Netherlands
- cross-country dispersion

Source: ECB.
Notes: Adjusted for loan sales, securitisation and notional cash pooling. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries. The latest observation is for July 2016.

Source: ECB.
Notes: Adjusted for loan sales, securitisation and notional cash pooling. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries. The latest observation is for July 2016.

Only Germany has recorded a steady and growing trend, with respect to loans granted to households, throughout the considered period (2008-2016), while for the non-financial company loans it's possible to see a corresponding drop in 2010 and a slight decline in 2014, probably the most sensitive subjects from the crisis of 2010. The euro area in general is marking an upward trend but with still a strong duality inside, the peripheral countries are still struggling to keep up with the shooting countries such as Germany and France.

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[13] Data update at July 2016.

5. GRAPHICAL ANALYSIS OF THE EFFECTS OF UNCONVENTIONAL MONETARY POLICIES

5.1. European sovereign Bond indices

Over the past few years, the financial turmoil, unleashed in the European markets, have had relevant implications on government bond yields, and therefore on the "Spread" and on Credit Default Swaps of individual European countries. While the financial crisis of 2007 has impacted marginally the government bond yields and the risk of the latter, the same cannot be said with regard to the sovereign debt crisis broke out in 2011. In particular, the crisis of a sovereign debt consists of an excessive rise in interest rates on government bonds which are regularly put up for auction in order to finance the renewal and growth of public debt. The state to be able to sell their debt securities may be forced to raise the interest rate, but a high rate of interest rate in presence of a large amount of debt can undermine the state's ability to cope with the debt payment.

In this regard the European Central Bank, from the outbreak of the crisis until today, has undertaken accommodative monetary policies targeted to provide liquidity to banks as well as also to guarantee a ceiling on yields on government bonds of European countries in greatest difficulty. The dynamics of the Government Bonds are closely linked to the European banks profitability, especially for those located in countries most affected by the crisis.

The first turbulence in European markets born in 2009, when Greece revised upwards the deficit/GDP ratio from 3.7% to 12.7%; until then, the government bonds yields in the euro area, and the consequent risk of countries, did not cause particular concern. However, thenceforth it will open a period of instability and distrust especially towards the south-European countries. The sovereign debt crisis first hit the Greece in October 2009, then Portugal, in December of that year, followed by Spain, Ireland and finally Italy in the summer of 2011. Just Italy represents a particular situation, in fact until early summer 2011, the Italian government bonds have retained contained yields and desirability on the market, enough to be considered, for some, a "safe haven", like the bond of the strongest Eurozone countries regarding the reliability of the debt profile (Germany, the Netherlands, Austria and France)[14]. For over ten years since the introduction of the single currency, Italy had been able to sell at favorable rates their

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[14] Il sole 24 ore, 20 marzo 2011

government bonds, despite the objective differences between the economies of the member countries and in spite of the major difficulties encountered by Italy, prior to accession the Eurozone, in the distribution of government securities.

Before the Greek crisis erupted, in spring 2011, the Italian Treasury refinanced public debt by placing the government bonds at auction with average costs of issuance dropped to record levels of 2.1%. In an auction held in mid-July, however, the government bonds with 15-year maturity were sold at 5.90%, the highest in the history of the single currency, while those 5 years at 4.93%. Meanwhile in 2010 the crisis in Greece and in Portugal intensifies, so having to involve the ECB and the IMF in case of Greece, requiring structural reforms in exchange for monetary aid. This climate of tension within the Europe influenced in negative the Greek government bonds yields, grew at unprecedented levels.

On 10th May 2010, the ECB announces the start of the Securities Market Programme; the announcement had immediately positive effects, making calm markets and lowering temporarily the Greek sovereign bond yields of around 400 percentage points in a single day.
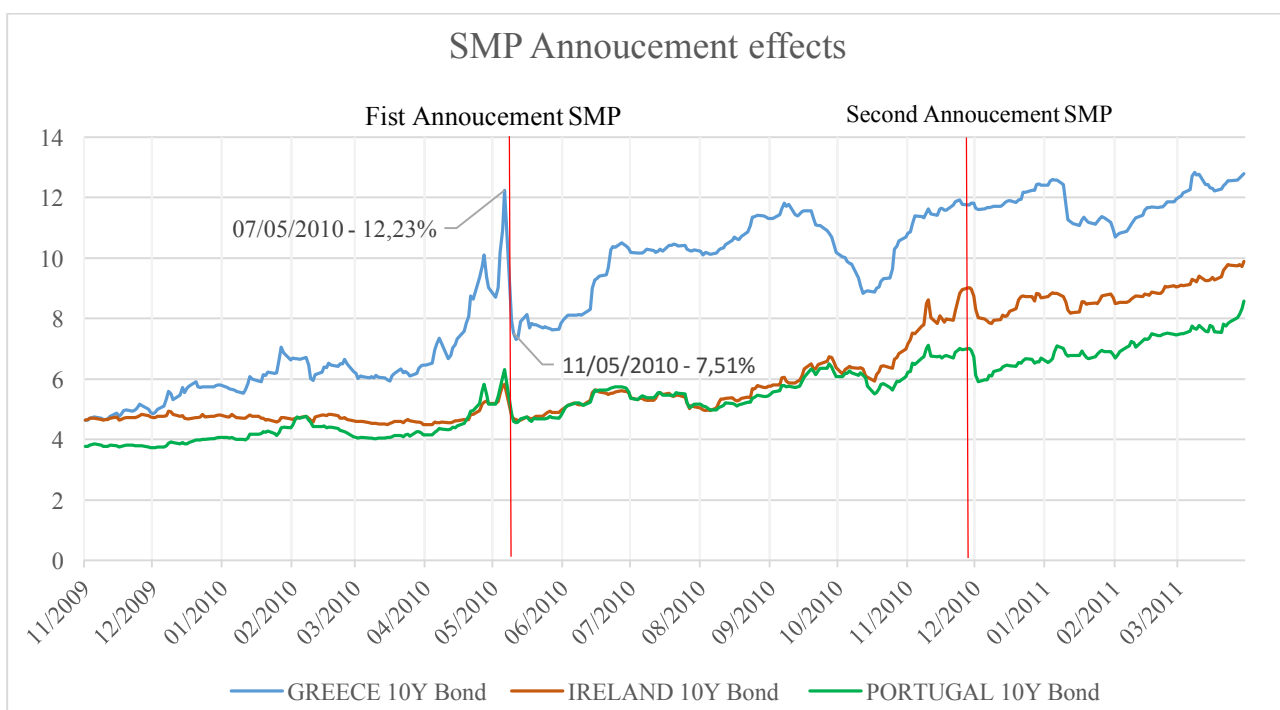
Graph 7 - Source: Personal elaboration on Thomson Reuters data

Unfortunately, the benefit effects of the SMP were short, or rather, cyclical; in particular both following the first announcement, took place in May 2010, and the second announcement, which took place in November 2010, it's possible to see that first the Bond yields come down in a determined manner, before recovering within a few weeks. A note to consider is that following the announcement of the reactivation of the SMP program in the third week of

November, weak were the effects on the Greek bond yields, confirming the very low confidence of markets and investors in the ability of Greece to exit from a situation of serious difficulty.

Yields on government bonds of Greece, Portugal, Ireland and Spain continue to grow steadily in the following months until the summer of 2011 when Italy is added to the countries in difficulty, forming what in the jargon are called PIIGS countries[15].

On 8th August 2011, in front of the deterioration of the situation, with the yields on Italian BOND and Spanish BONOS that were growing, the ECB announced the implementation of a massive intervention in the bond market, resorting to the purchase of the European securities most exposed to sales and speculation. The intervention of the ECB (Securities Markets Programme), already decided on May 2010, ceased for 19 weeks, and who became more significant with the increase in tensions on Italian bonds, was an important change in the role of the institution in charge of the Eurozone monetary policy, compared to the previous belief that it should be left primarily to national governments the responsibility of the containment of internal imbalances. This intervention helped the Italian and Spanish "spread" to remain contained, however the crisis, especially as regards Italy intensifies over the months of October and November, partly due to political turmoil in the country.

On 8th December 2011, the ECB Governing Council decides to bring the compulsory reserve ratio from 2% to 1%, and to launch the first Long Term Refinancing Operation (LTRO) with 36-months expiry. Just the LTRO have allowed banks to obtain liquidity, cash that will be used largely to buy government bonds, especially Italian and Spanish, by decreasing in the course of the following months, the differential with the German securities; in particular the IT-DE "spread" will decrease from approximately 550pp reached in November 2011 to 300pp of March 2012 month.

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[15] Portugal, Ireland, Italy, Greece and Spain

10y Spread Trend

- 10Y Spread IT-DE
- 10Y Spread ES-DE
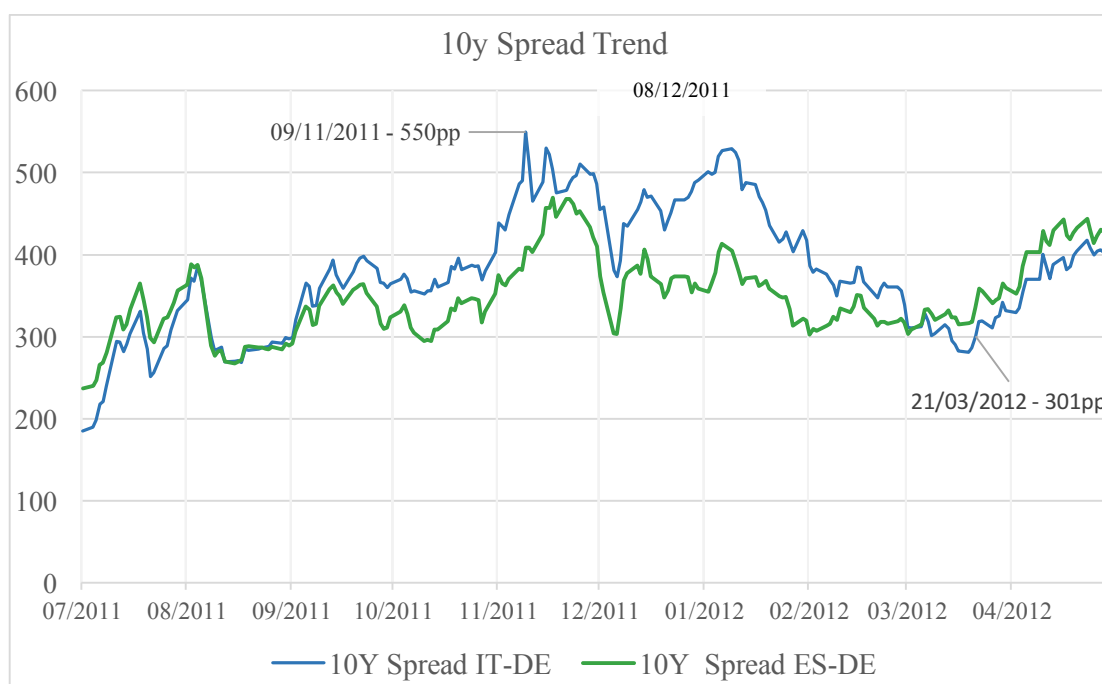
Graph 8 - Source: Personal elaboration on Thomson Reuters data

Meanwhile, in June of that year, the Spanish banking system has gone through a period of great difficulty, demanding economic aid to Europe in order to recapitalize its banks.

On 6th September 2012, the Governing Council takes two big decisions: Introduction of the Outright Monetary Transactions (OMT) and the simultaneous conclusion of the SMP. The debt securities purchased under the SMP will be maintained until maturity of the same year and all the liquidity provided into the system will be absorbed with fixed-term deposits on a weekly basis.

Unlike the SMP, a necessary condition[16] for the activation of the OMT is the agreement between the applicant country and the European Stability Mechanism (ESM)[17] for the subscription of a new macroeconomic adjustment program or a precautionary program of financial assistance (Enhanced Conditions Credit Line). The Outright Monetary Transactions got major, and above all lasting effects than its predecessor. In particular, it's possible to distinguish the "announcement effect" and "presence/possibilities effect." For "announcement effect" we mean the effect that the announcement of this new non-conventional monetary policy has had, particularly on yields on government bonds of PIIGS countries.

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[16] Necessary but not sufficient, as confirmed by Draghi at the press conference on 8th November 2012

[17] The ESM was established on December 2010 and will replace the EFSF from the 1st July 2013
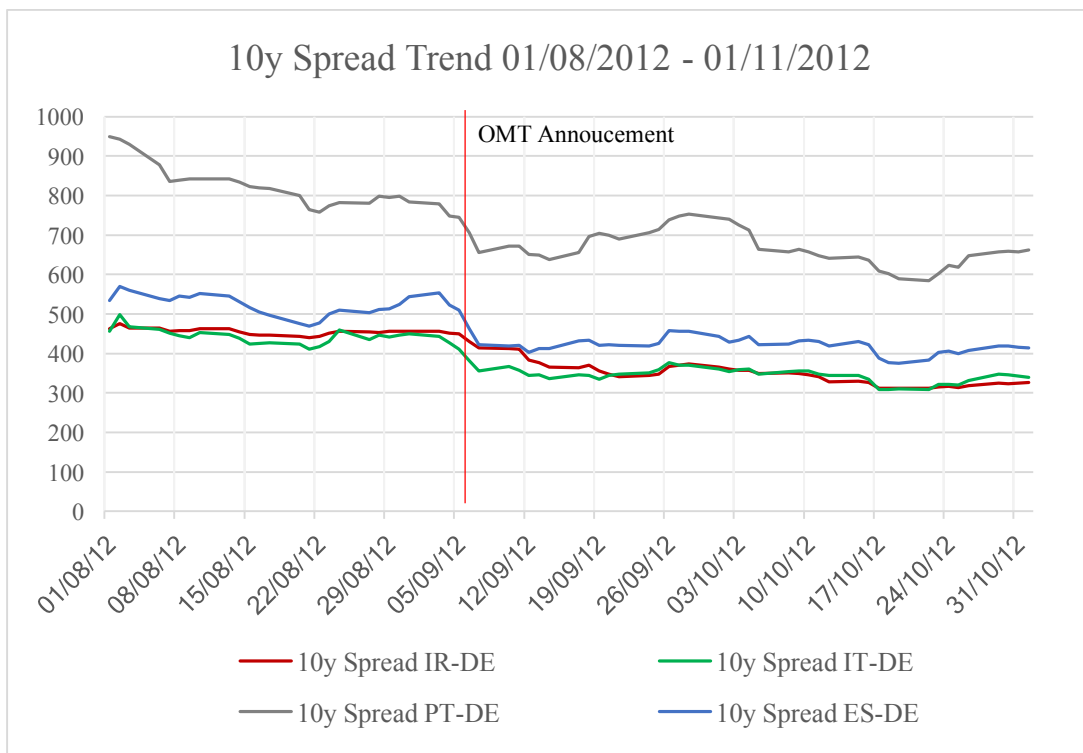
Graph 9 - Source: Personal elaboration on Thomson Reuters data

Country	10y Yield Gov Bond at 04/09/2012	Spread vs. Germany at 04/09/2012	10y Yield Gov. Bond at 10/09/2012	Spread vs. Germany at 10/09/2012	△% on Spread
Ireland	5,921	452	5,643	413	-8,65%
Italy	5,67	427	5,178	366,5	-14,17%
Portugal	8,878	748	8,234	672,1	-10,12%
Spain	6,634	523	5,698	418,5	-20,04%
Germany	1,400	-	1,513	-	-

Table 1 - Source: Personal elaboration on Thomson Reuters data

As can be seen from the table and from the graph[18], we had considerable "announcement effect" which reported confidence to the market by allowing a reduction on government bonds yields and in the "spread" w.r.t Germany. Despite that no State had requested the activation of this purchase bonds program in the 2013-2014 biennium, the government bonds yields have remained at significantly lower levels compared to the months before the announcement. This

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[18] In the graph and in the table, does not appear deliberately the spread between Greece and Germany as much affected by the instability of the country and affected only marginally by the unconventional policies.

situation is due to the "presence/possibility" effect, that is by the fact that all Member States can request, at any time, the OMT activation. Precisely because of this second "effect" that the cycle[19] you which had with the SMP broke. Investors, in fact, know that in the event that a State would find itself in a situation no longer economically sustainable can require this "lifesaver" to the ECB, with of course determined costs, in a manner to be able to significantly improve, with a time horizon not too high, their situation. This "protection net" put in place by the ECB had, again, allowed to keep yields and "spreads" to significantly lower levels than in the past[20].

The government bond yields continued their decline during 2013 and the first half of 2014 thanks to the lowering of interest rates by the ECB in January 2013 before, in May and in November 2013 after. Especially the Greek government bond yield decreased from 40% interest in March 2012 to 7% in March 2014, mainly thanks to the regained credibility and the reforms undertaken in concert with the ECB.
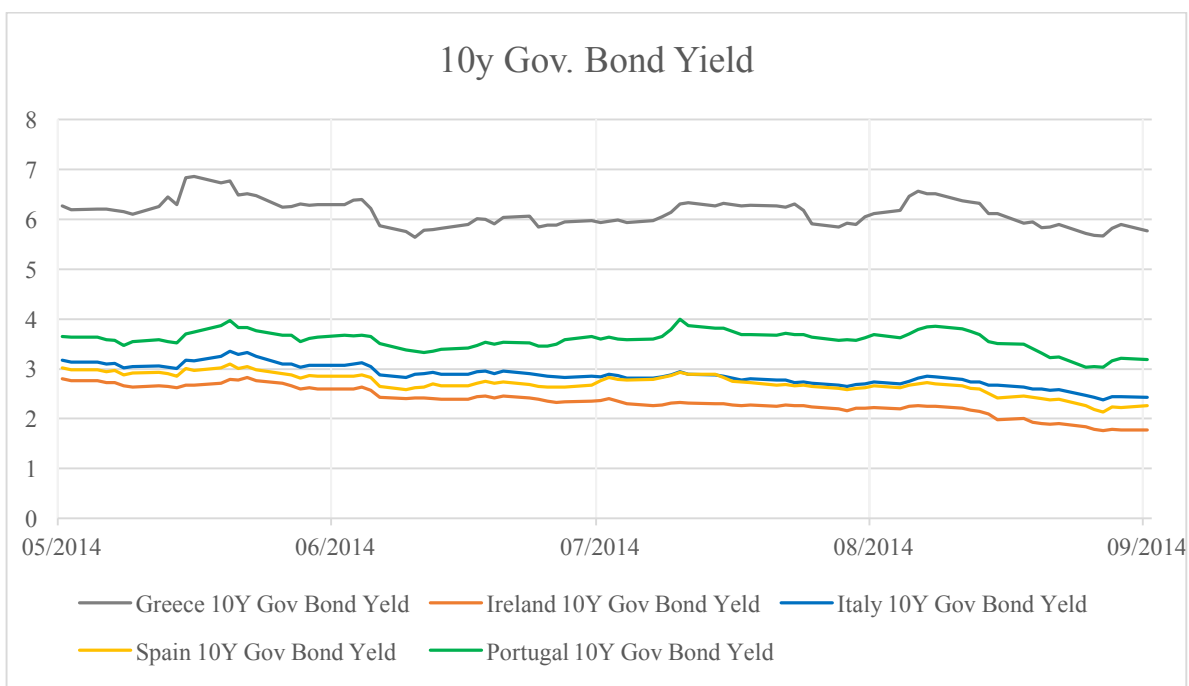
Graph 10 - Source: Personal elaboration on Thomson Reuters data

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[19] Decline in yields in the days after the resumption of purchases, increase of the same once the ECB ceased to intervene in the market.

[20] Italy in March 2013 experienced a rise in yields, and consequently in the "spread" primarily due to political instability in the country more than the ECB maneuvers

The situation in Europe stabilizes and the emergency on government bonds yields seems to fall, although in some cases the yields remain very high and complicate the reform process undertaken by the states. In January of 2015 the ECB launched the "Extended Assets Purchase Programme" EAPP, i.e. quantitative easing; this contributes to a further decline in yields during 2015 and 2016, also leading to a negative rate the yields on German government bonds. The decline in yields was most significant regarding Italy, Spain and Ireland; regarding Portugal yields continued to be fairly volatile, while Greece during Spring/Summer 2015 has seen an increase of its yields still due to the fragility of the country.
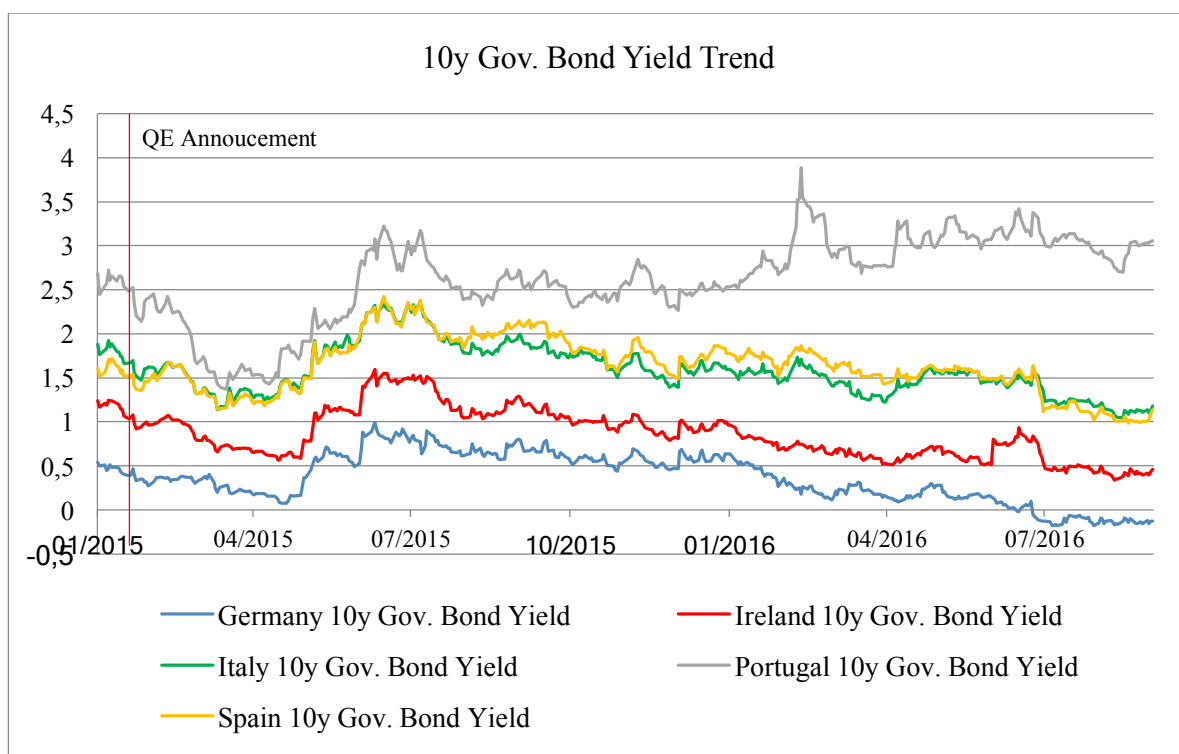
Graph 11 - Source: Personal elaboration on Thomson Reuters data

5.2. <u>European sovereign Credit Default Swap</u>

Born in the mid-nineties with the specific aim to act as a protection and risk management tool, the CDSs have reached an important level in the financial news thanks to the Greek crisis. These tools have become the barometer, along with spreads, of an entity reputation on the market. In fact, the higher the price of the CDS, the higher the risk of default. The credit default swap (CDS) is in effect a credit derivatives contract, is therefore a swap used to transfer the credit exposure of fixed income products between parties.

The CDS is certainly the most widely used credit derivative. Technically it is an agreement between a buyer (called protection buyer) and a seller (protection seller) through which the seller agrees, in front of a premium paid by the purchaser, to make a specific payment in the case of a specific event called "credit event", which typically is the third-party default. Whereby to the protection buyer, the CDS market offers the opportunity to reduce the concentration of credit exposures and tied assets for regulatory capital purposes. To the protection seller, the CDS market allows him to take positions on a custom period, perceiving the proceeds without having to finance them.

It's definitely a very evolved financial instrument but not necessarily complicated, in essence, the CDS is comparable to an insurance against insolvency of an issuer. This is why the CDS is often used as an insurance policy or coverage for the subscriber of a bond.

Credit default swaps (CDS) on sovereign issuers account for a small share of the overall market. In December 2010, they weighed about 16 percent of the total gross notional value and 20 per cent on the net notional value of outstanding contracts; about 80 percent of the positions at the end of 2010 was, therefore, related to companies and private issuers. The sovereign CDS market has, however, registered a strong growth rate in the most recent period: in 2009 the net positions grew by 20 per cent and gross by 30 percent; in 2010, however, the net positions are more than doubled, while gross ones have grown by over 50 percent[21]. The development of the CDS market on sovereign issuers is therefore a relatively recent phenomenon, probably due to the growth of the hedging needs revealed by the sharp deterioration of the public finances in the major advanced and emerging countries.

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[21] CONSOB Discussion paper, 2011

The segment of CDS on sovereign issuers is very focused. In December 2010, the top 10 sovereign reference entities accounted for about 55 percent of the notional value (both gross and net) of the total CDS on sovereign issuers, and 44 per cent in the number of positions.

According to the theory, the CDS price is equal to the underlying security return less the risk-free rate. The price is expressed in basis points, then when the price is 100b.p. it means that on an amount of one million Euros of Bonds, we should pay €10,000 to be protected against the default risk, i.e. 1% of the total.

The CDS prices reached, for the first time, worrisome levels between 2009 and 2010. The January 1st 2010 in fact, the price of Greek CDS was at 270 basis points level, the Portuguese price stood at around 90 basis points, the Spanish ones around the 113 and the Italian stood at a level of 108 bp. However, is in April of 2010 who register early peaks in CDS prices, reaching levels of 700 basis points in the case of Greece, while the other countries mentioned above, attested around the 100 bp level.
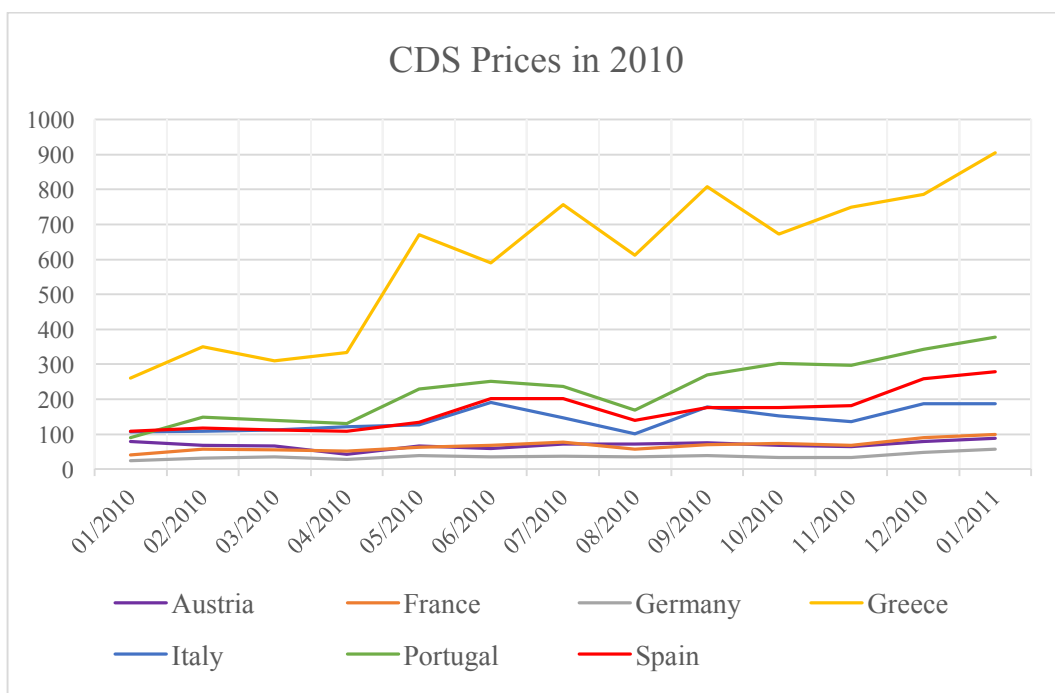
Graph 12 – Source: Own elaboration on Thomson Reuters data

In May 2010, following the Greek bailout and the announcement of the Securities Market Programme, the prices growth slow down and the situation will calm down until November when prices returned to rise to high levels. Meantime, the Greek crisis drag up also the prices of Portugal, Spain and Italy making them to exceed 200 basis points. The announcement of the reactivation of the SMP, made on December 2010, had shortly effects on the CDS prices, in fact, initially the prices fall, before recovering within a few weeks.
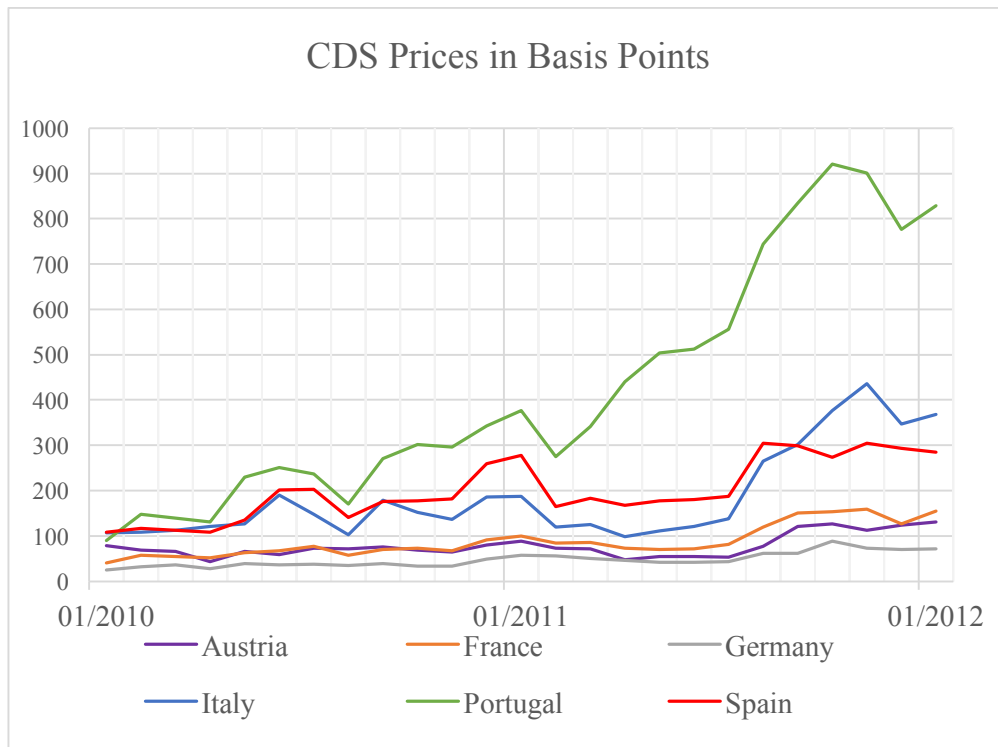
Graph 13 – Source: Own elaboration on Thomson Reuters data

Things get worse in July 2011, when the Greek derivative exceeds the 1500 basis points, reaching 2000 b.p. in September (graph 14), while the Portuguese CDS, following the internal crisis, suffers an escalation from January 2011 to January 2012 (graph 13); The Spanish and Italian CDS seem to go hand in hand throughout the course of 2011, undergoing a strong growth in September.

Graph 14 – Source: Own elaboration on Thomson Reuters data

At this point throughout the course of 2012, the Greek CDS continue to rise dramatically, nor the announcement of the second Greek bailout and the introduction of the OMT in September have had effects on the CDS prices. While Portuguese, Spanish and Italians CDS began recording a steady decline in prices, helped also by the introduction of the OMT, up to reach pre-crisis levels around November 2014
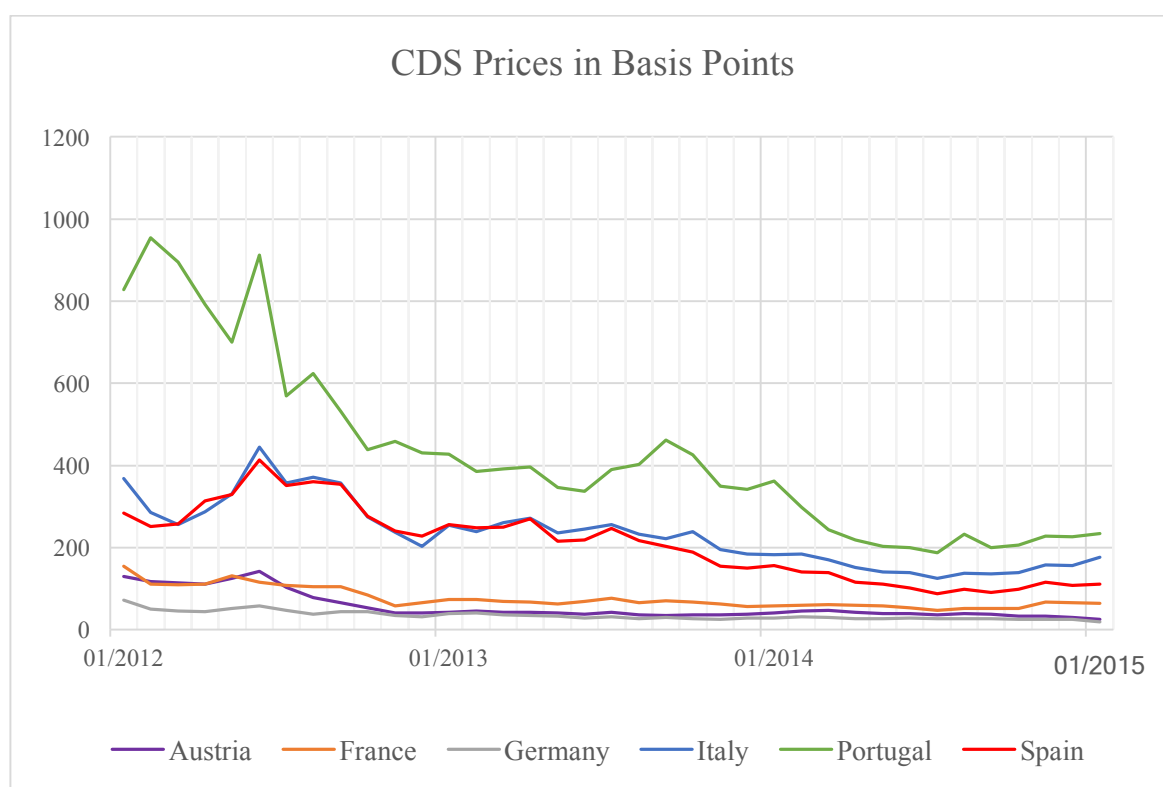
Graph 15 – Source: Own elaboration on Thomson Reuters data

There is an interesting aspect to be introduced with regard to CDS prices during the Sovereign debt crisis. In theory, the yield on a government bond, net of the premium paid for the acquisition of protection must be equal to the risk-free rate, which means that the government bond spreads (yield - risk free rate) must be equal the price of CDS. Again, in theory, a portfolio consisting of a bond and of a CDS on the same bond synthetically replicates a risk-free rate. However, since the financial crisis, the prices of CDS on sovereign issuers have been systematically higher than the spreads on government bonds (so-called situation of "positive basis"); only in the case of Greece, there have been persistent episodes of negative base. There are several reasons that can explain this phenomenon linked mainly to the counterparty risk of

the CDS contracts, as market imperfections that impede the arbitrages and the different liquidity of the two markets.
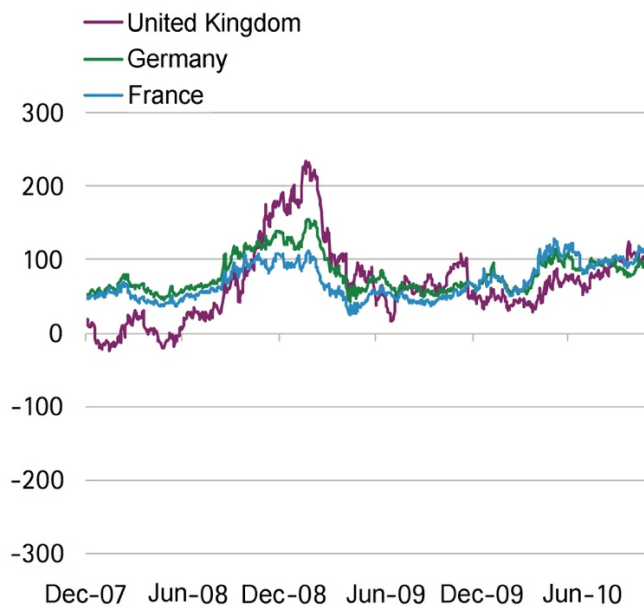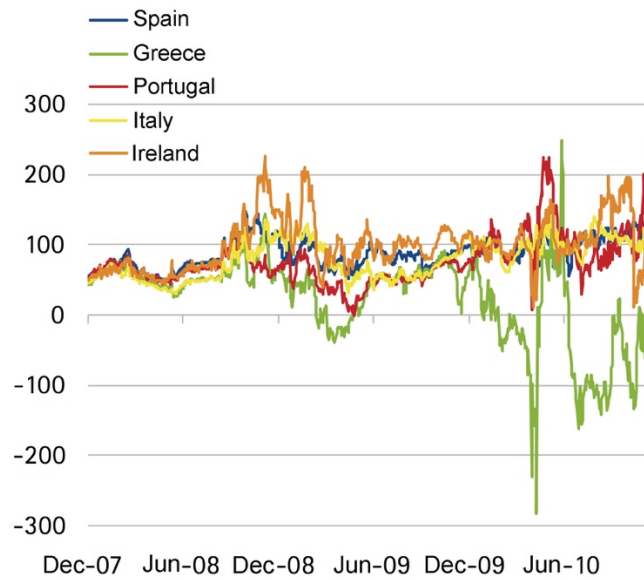
Graph 16/17 – Source: CONSOB elaboration

6. THE DETERMINANTS OF BANKS PERFORMANCE

6.1. <u>Introduction to the determinants of banks performance</u>

Many are the determinant of the banks' performances, but the two crises that occurred in the recent past have highlighted some determinant performance factors that worth to be analyzed. These factors directly affect the net profits of financial institutions and for that reason have been the subject of studies over the past years including by the European supervisory authorities. We can identify four main determinants:

I.   Interest margin (Net interest income)
II.   Non-interest income
III.   Non-performing loans
IV.   Operating costs

These factors deserve to be explained, and to understand why they directly affect bank performances:

I. Interest Margin (Net interest income)

Regarding the net interest income, it is the most important determinant of performance for the banks with a classic business model, which is based mainly on the collection of savings and on loans to clients, therefore relying principally on interest income from loans. Literally the net interest income is the algebraic sum between the active interest income, i.e. mainly income deriving from loans, and passive interest income, i.e. mainly the interest paid by banks to the debtors[22]. The net interest income was subject of discussions in the recent years and it is closely related to the monetary policy decisions of the ECB; in fact in the recent years the Central Bank with its monetary policy has achieved a lowering of the interest rates; if on one hand it is true that today financial institutions are able to borrow money at zero cost from the ECB, in the other hand it is equally true that the rate of interest required to customers have been lowered in turn, causing a decrease in net interest income and as consequence a contraction in the net profits. If you consider that the banks to reduce their risks, have had to reduce their leverage, even if there would be the possibility to generate a margin, it cannot, and is not, exploited by banks. The weak macroenomic conditions in the South-European countries, and the consequent

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[22] Including active and passive interest from financial investment

contraction of loans to clients, brought the interest margin to have less and less weight in bank balance sheets.

As we will see in the next few pages, the contraction in net interest income has been uneven within the euro area. In fact, there is a strong duality in progress; the South-European countries[23] have undergone a very significance interest margin contraction, both as a result of falling rates, but mostly due to the huge increase in non-performing loans on banks' balance sheets. In fact, the NPL levels have a significant impact in the financial statements of banks and are caused mainly by the poor economic situation of the countries in difficulty.
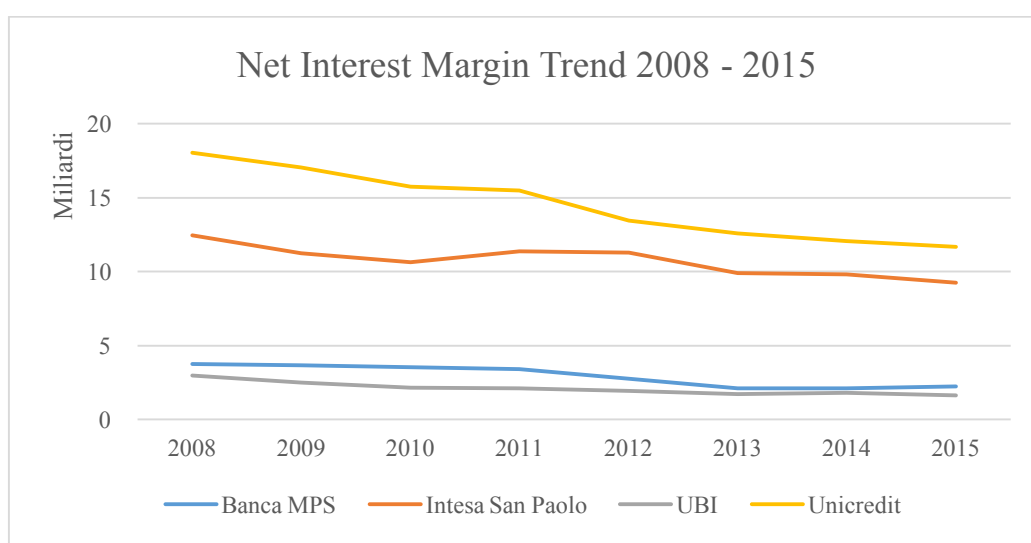
Graph 18 - Source: Own elaboration based on the consolidated financial statements of each bank

This figure represents the Net interest income trend for the top four listed Italian banks[24]. As it's possible to observe, the interest margin over the years has undergone a steady decline for the entire sample. Only two banks in the sample considered[25] had increased their Net interest income for the period 2008-2015[26].

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[23] In Particular Italy, Spain and Greece

[24] Top four for Total Assets.

[25] The sample is available in the section 9.1

[26] Banca Desio e Brianza, Banca Popolare di Sondrio, Fineco

Δ% Variation in Net interest income: 2008-2015	
Banca Desio e Brianza	13,98%
Banca MPS	-40,57%
Banca Carige	**-58,75%**
Banca Popolare di Sondrio	13,32%
Banca Profilo	-27,30%
Banco Di Sardegna	**-51,60%**
Credito Emiliano	-32,09%
Credito Valtellinese	-12,81%
Banca Popolare di Milano	-24,69%
Banco Popolare	-31,46%
BPER	-8,39%
Intesa San Paolo	-25,82%
UBI	**-45,57%**
Unicredit	-35,39%

Table 2 - Source: Own elaboration based on Bankscope data

The average decline for the sample is -26,22%, with peaks, above, or near, the 50% achieved in the case of Banca CARIGE, Banco di Sardegna and UBI bank[27]. This data confirms that owing to the contraction of the interest margin, banks have had to rely less on revenue from interest and have focused more on revenue from non-interest income.

While, regarding the European bank situation, the overall picture is quite different; in fact, the general trend recorded, during the same period, is positive, with only a general downturn, for the majority of the sample[28], for the biennium 2012-2013, and then a relevant increase in the 2014-2015 is recorded. The only two banks, in the sample considered that recorded a huge contraction in the net interest income for that period are the Greek National Bank and Intesa San Paolo, coming to reach the 47,11% of the margin reduction for the Greek bank and 25,82% for the Italian one, while the Europe average stands at +21,83%.

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[27] The decline was -58,75% for CARIGE, -45,57% for UBI bank and -51,60% for Banco di Sardegna

[28] The sample is available in the section 9.b
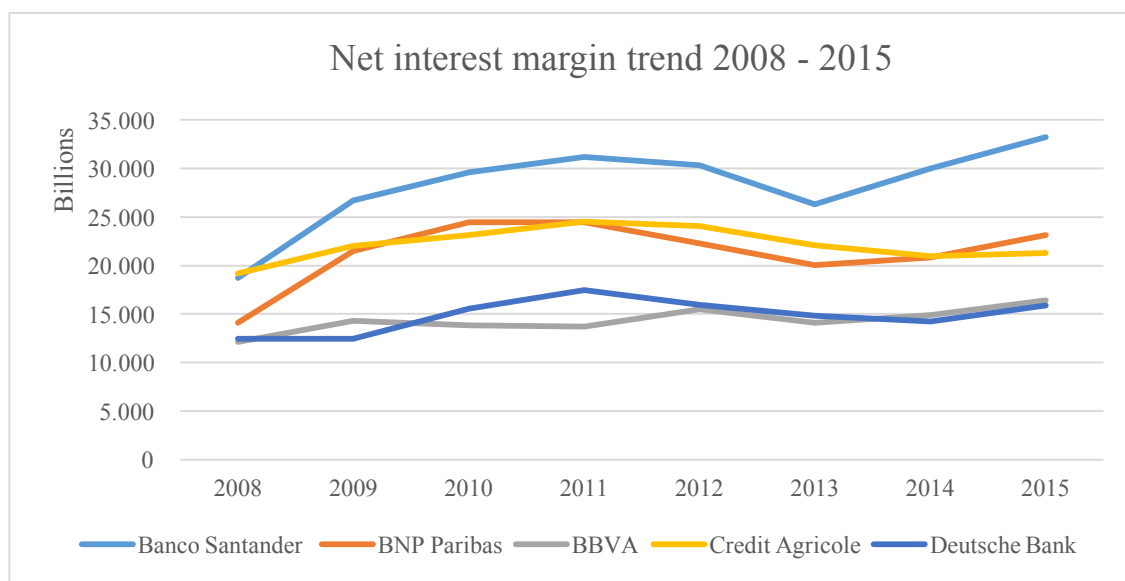
Graph 19 - Personal elaboration on Bankscope data

In the figure the Net interest margin trend for the top five banks for total assets level are reported. This graph support the thesis for which banks with a less classic business model suffered less from the deterioration of macroeconomic condition in the EU countries;

	YoY% 2012	YoY% 2013
Banco Santander	-2,78%	-13,29%
BNP Paribas	-8,90%	-10,07%
BBVA	13,04%	-8,88%
Scocietè Gènèrale	-7,93%	-9,78%
Credit Agricole	-1,88%	-8,29%
KBC	-18,88%	-12,52%
Natixis	-34,27%	28,04%
Deutsche Bank	-8,43%	-7,14%
Commerzbank	-3,52%	-5,03%
Erste Bank	-6,15%	-8,51%
Banco Sabadell	21,47%	-2,98%
Banco Popular Espanol	29,95%	-10,79%
Deutsche PostBank	-7,11%	-8,88%
Credit Industriel et Commercial	-30,03%	39,38%
Raiffeisen Zentralbank	-4,98%	7,91%
Greek National Bank	-12,43%	-6,18%

Table 3 - Source: Own elaboration based on Bankscope data

The data reported in the table above, show the year on year percentage variation for the biennium 2012-2013; as it's possible to see, about the entire sample suffered a contraction in net interest income in the concerned period, and then a huge recover in the following year. This scenario could be, among others, related to the Non-performing loans rate in the banks' balance sheets; In fact, from a combined analysis with the data reported in the next paragraph, we can observe that countries with a low level of NPLs recovered quickly the contraction in interest margin, while the countries with a high NPLs level, as Italy and Greece, have not yet recovered the gap.

II.   Non-interest income

As described earlier, in a general situation of macroeconomic difficulties with limited confidence in the real economy accompanied by a classic business model, banks have suffered a substantial decline in the net interest income; Therefore, the banking institutions in order to compensate for these losses and support the net profits have sought to increase the non-interest income, such as commissions on services, fees and income from investments in the portfolio. Just these two items have always had more importance, over time, within the banks' balance sheets, sometimes equalling the net interest income as in the case of UBI, or even assuming more weight as in the case of Intesa San Paolo, for the Italian scenario. In the Italian context, it can be said that the monetary policy of the ECB has made a significant contribution to revenues from the portfolio of banking institutions, in fact, the more revenues from non-interest were recorded following the support to sovereign government bonds by the ECB, securities which represent a substantial part of the banks' portfolios.

III.   Non-Performing Loans

Another factor, probably the most important during financial crises, which influences the performance of banking institutions is the level of Non-performing loans in banks' balance.

Non-performing loans are activities that are no longer able to repay the principal and interest owed to creditors. In practice the claims for which the collection is uncertain both in terms of meeting the deadline and for the exposure amount. NPL, constitute a drag on economic activity, especially for countries that rely mainly on bank financing, as is the case in the euro area. High NPL reduce profitability, increase funding costs and tie up bank capital, which negatively impact credit supply and ultimately growth.

More specifically, the presence of non-performing debt on banks' balance sheets weighs on their ability to lend to the real economy through essentially three channels:

<u>Lower profitability</u>: NPLs imply higher provisioning needs, which in turn lower banks net operating income. Profits are further reduced by the increased amount of human resources needed to monitor and manage high NPL stock;

<u>Higher capital requirements</u>: NPLs are risky assets which attract higher risk weights than performing loans; High NPLs tie up banks' resources and crowd out new credit;

<u>Higher funding costs</u>: Investors and other banks are less willing to lend to banks with high NPLs levels, leading to higher funding costs for these banks and a negative impact on their capacity to generate profits.

Since the start of the crisis, the distribution of NPL has been highly unequal among Member States, with stressed countries[29] suffering major increases in NPL ratios. At the end of September 2015, the two countries which had to implement strict capital controls, Greece and Cyprus, reported NPL ratio of more than 40%. Bulgaria, Croatia, Hungary, Ireland, Italy, Portugal, and Romania all report gross NPL ratio between 10% and 20%. Accounting practices may also differ across jurisdictions and have, to a lesser extent, some impact on the relative levels of NPL.

In the EU, the average rate of non-performing loans is slowly decreasing, from 6.4% in December 2014 to 5.9% at the end of September 2015[30], however le level remains three time higher than in other major developed countries[31].

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[29] Countries mostly hit by the crisis

[30] European Parliament, March 2016

[31] EBA Reports on NPLs, 22 July 2016

Non-Performing Loans ratios as of 30/09/2015

| ≤ 3,9 % | 4,0 - 9,9 % | 10,0 - 24,9 % | ≥ 25,0 % |

FI 1,4 %
SE 1,0 %
*EE 2,2 %
LV 4,9 %
DK 3,6 %
LT 5,5 %
IE 20,6 %
UK 2,5 %
NL 2,8 %
PL 7,3 %
BE 3,9 %   DE 3,2 %
LU 1,5 %
CZ 3,4 %
SK 4,8 %
FR 4,2 %
AT 7,4 %   HU 16,0 %   RO 16,1 %
*SI 15,2 %
HR 13,6 %
PT 18,5 %
BG 12,7 %
ES 6,8 %
IT 16,9 %
EL 43,5 %
*SI, MT, EE figures as per ECB
Source: EBA Risk Dashboard
*MT 3,7 %
CY 50,0 %
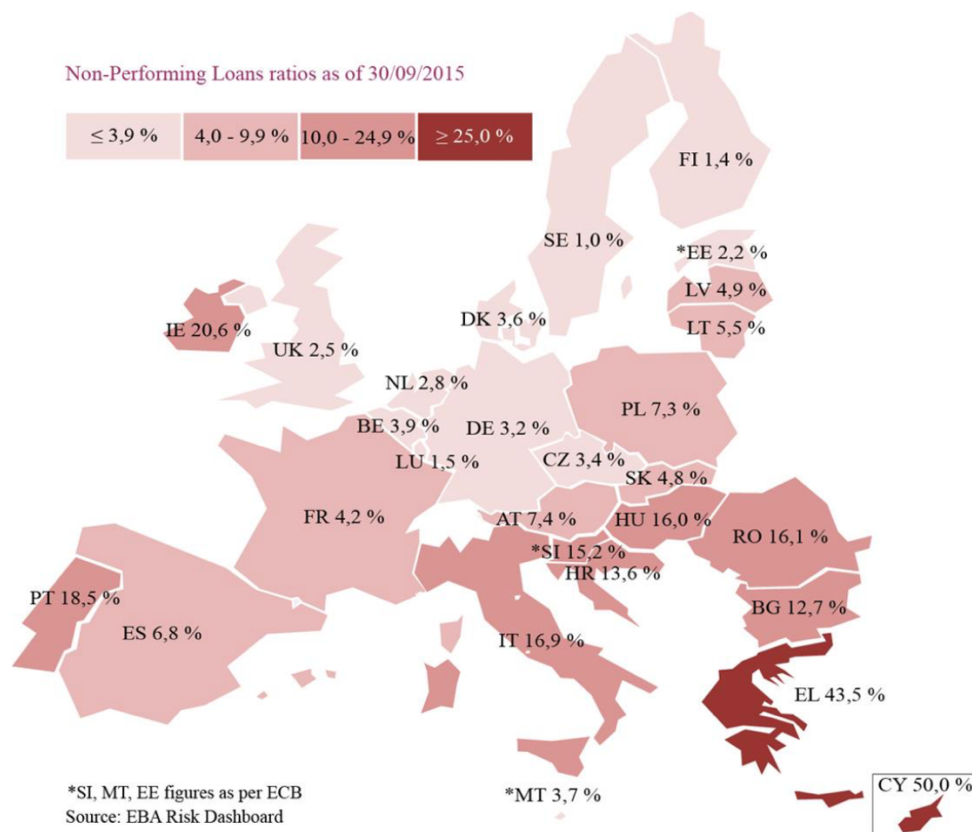
Figure 1 - Source: European Parliament Focus, March 2016

IV.   Operating Costs

Operating costs are an important determinant of banks performances, however, they were often underestimated before the outbreak of the financial crises; in some countries, including Italy, operating costs have a negative impact on bank balance sheets, by reducing significantly the net profits. The phenomenon of the high operating costs, such as personnel costs and other operating costs, is not a recent phenomenon, but already in the 90s some studies had shown an inefficiency from this point of view. However, during the financial crisis, when the net interest margin shrank, the problem of too high costs emerged becoming a critical component of bank performance.

Analysing the profitability of European banks, with a particular focus on the Italian environment, in the last decade, the banks' profitability has sharply deteriorated, and despite the mild recovery in the most recent period, it has nowhere reverted to its pre-crisis levels[32].

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[32] Albertazzi, Norapietro and Siviero 2016

While recent data show that the profitability gap of Italian banks vis-à-vis the rest of Europe is closing, it had been ample in the previous decade. The average ROE of Italian banks was 3.0 per cent, lower than in the other countries, where it was on average 7.5 per cent. Specifically, banks' ROE was 8.1 per cent in non-euro area European countries (including Swiss, British and Swedish intermediaries); 7.6 in the other euro area economies that have been directly hit by the sovereign debt crisis (henceforth: "stressed"); 6.9 per cent in non-stressed euro area countries[33].

ROE[34]
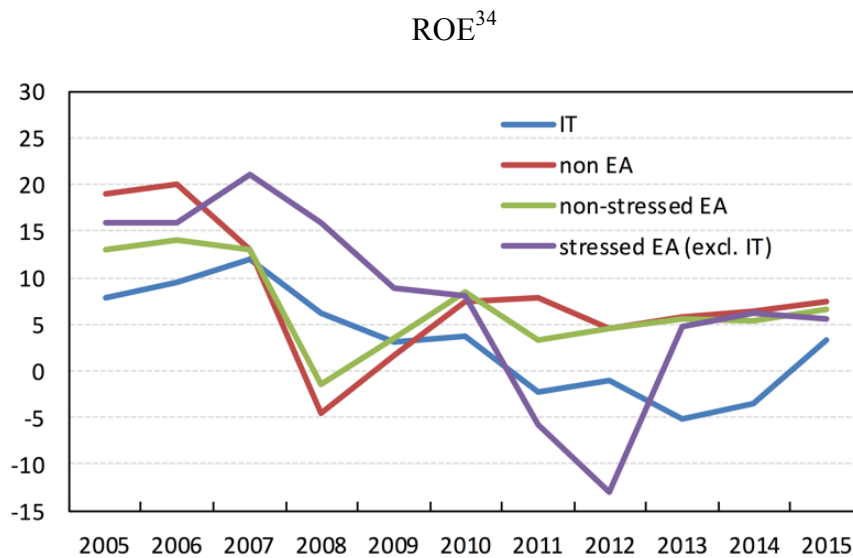
Graph 20 - Stressed euro area countries: ES, GR, IE, IT, PT; non-stressed euro area countries: AT, BE, DE, FR, NL; non-euro area countries: CH, GB, SE. Weighted averages, with weights equal to total assets

Source: Bank of Italy, 2016

In the other hand, if we consider ROA, defined as the ratio between net income and total assets[35], as index of banks performance, the underperformance of Italian banks is mitigated;

---

[33] Albertazzi, Norapietro and Siviero 2016.

[34] Percentage ratio of net profits (excluding non-recurring items) to total equity (common equity and reserves).

[35] The ratio usually considered in the banks' performances analysis, as in the case of Albertazzi, Norapietro and Siviero, Banca d'Italia, 2016. ROA is calculated in this way, in this context, since costs (especially labor costs), provisions (due to the high level of NPLs) and taxes (until a few years ago on average higher than the European level) have a relevant impact on the banks' profitability, they are included in the calculation in order to have a more accurate estimate of the management's ability to generates profits from the available assets.

This suggests that the leverage ratio pays a nontrivial role in explaining part of the lower ROE of Italian banks.

$$ROE = ROA * \frac{TOT\ ASSETS}{EQUITY}$$

where $\frac{TOT\ ASSETS}{EQUITY}$ = Financial leverage

The total assets-to-equity ratio is often referred to as the bank's equity multiplier, which measures financial leverage. Generally, banks with lower leverage (higher equity) will report higher ROA, but lower ROE.

ROA[36]
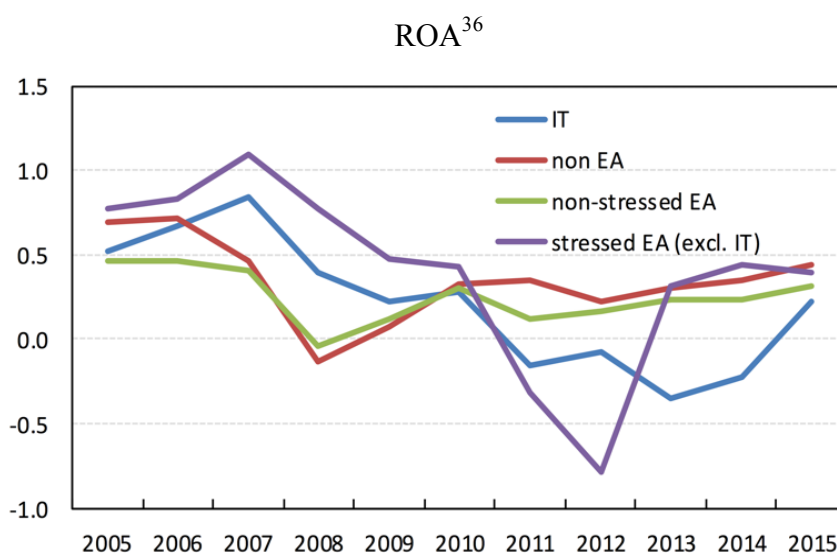
Graph 21 - Source: Bank of Italy, 2016

Decomposing the ROA into main components, as follow

$$ROA = \frac{NET\ PROFITS}{TOTAL\ ASSETS}\quad \text{where}$$

NET PROFITS = net interest income + non-interest income – costs –provisions – tax

It's possible to guess how the Italian and "stressed" countries banks' ROA diminished during the global financial crisis and the sovereign debt crisis. The Net interest income represents the major contributor to Italian banks and stressed euro area banks' ROA, reflecting the mainly

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[36] Percentage ratio of net profits to total assets. Net of non-recurring items.

traditional business model, based on the raising of savings and lending to real economy. Because of their traditional business model, Italian banks and more in general south European banks were relatively shielded from the impact of the global financial crisis but suffered relatively more from the deterioration of the macroeconomic environment, particularly following the sovereign debt crisis. In addition to the traditional deposit-taking and lending activities, banks supply a wide array of other services[37]. The expansion of these services increased markedly in the pre-crisis period, owing to financial deregulation and liberalization; the increase varied considerably across institutions and countries.

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[37] These services include: more traditional services as cash management or safety deposit boxes; investment service as trust accounts; insurance services, investment banking, brokerage and other non-interest services.

6.2. <u>Interconnection between monetary policy and banks performance</u>

The shocks occurred in the last years, in first place the global financial crisis of 2007 and more recently the European sovereign debt crisis, have highlighted the interconnection between Banking sector and macroeconomy. The performances of credit institutions are mainly influenced by macroeconomic developments, which affect several areas of the banking activity. First, in several countries, including Italy, the two recessions have resulted in a great and unprecedented worsening of credit quality, with a substantial increase of bad debt and other non-performing loans (NPLs), leading a fall in the banking profits. At the same time the worsening in financial conditions has contributed to the fall in economic activity during the global financial and sovereign debt crisis. Secondly, in recent years we have witnessed a steady decline in the banks' profitability margin, especially for those banks with a more traditional business model.

The profitability of Italian Banks, and more in general, of other South European countries, went under scrutiny in the last few years, because in the context of persistently weak macroeconomic environment, rising credit, together with the reduction in intermediated funds and the contraction of interest rate spreads, due, mainly by the ECB expansionary monetary policy, have exerted downward pressure on both bank profits and bank capital. These developments have in turn affected the availability of credit for real economy, exacerbating and lengthening the effects of the crisis[38]. Furthermore, considering the new Basel III requirements, the capitalization level became even more important and the ability of banks to extend credit to the economy heavily depends on banks performances and on the cost-efficiency level.

Focusing on the Italian scenario, the analyses available in literature shows that the weak profitability of Italian banks is by no means a recent phenomenon. Already in the early 1990s, and for the rest of that decade, Italian banks were underperforming their competitors in other major advanced economies[39]. In particular, the differences in profitability were sizable and only

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[38] Gambacorta and Mistrulli 2004; Albertazzi and Marchetti 2011; Bonaccorsi di Patti and Sette 2012

[39] Gambacorta, Gobbi and Panetta 2001

partly ascribable to differences in national economic conditions, in fact Italian banks were also heavily disadvantaged by low-cost efficiency levels.

6.2.1 Why monetary policies influence banks performance?

In an environment of market instability, due to the recent European crisis, and economic hardship for many Eurozone countries, monetary policy plays a crucial role in supporting financial institutions and economies. Many were the policies that support the liquidity of European banks following the global crisis of 2007; Firstly, these policies were aimed at supplying liquidity to credit institutions and to alleviate the turmoil on financial markets; In a second time, during the sovereign debt crisis, monetary policy has focused mainly to support for government bods of Southeast European countries, significant component in the banks' investment portfolio; in fact the monetary policy conducted by the ECB has the aim to support government Bonds and to avoid further losses on banking portfolio. In particular, the Main refinancing operation (MRO) "at a fixed rate and with full allotment" and Long-term refinancing operations have been able to make up for the dysfunction of the interbank market and meet the liquidity demand from the Eurozone banks, since the latter had ceased to provide liquidity; the unlimited supply of funds by the central bank has allowed the ECB to replace the money market as an intermediary between financial institutions. As a result, money market transactions decreased significantly, hampered by distrust on the strength of the counterparties, and the Eurosystem's balance sheet size has increased significantly. After the considerable expansion in October 2008, the Eurosystem's balance sheet has increased further in June 2009 on the occasion of an extraordinarily high level of demand (€ 442 billion) in the first longer-term refinancing operation (LTRO) with a maturity of one year, which allowed banks to obtain long-term liquidity, very precious in that period. The increase in the Eurosystem's balance sheet has also helped the expansion of the number of counterparties taking part in the refinancing operations. If before the crisis around 360 financial institutions participated on average in each refinancing operation, afterwards, given the limited access to interbank and securities markets, the number rose to more than 800 during the crisis.

With an eye to the Italian landscape, the analysis of the literature identified several factors responsible for the low profitability of Italian banks; The most important elements will be discussed in the following paragraphs.

7. ANALYSIS OF THE MONETARY POLICY EFFECTS ON BANKS' PORTFOLIOS PERFORMANCES

The analysis that follows has the aim of studying the effects of the monetary policy of the ECB on banks' portfolio performances; Usually in the literature, two profitability variables are taken into consideration as index of banks' performance: the profits to assets ratio, i.e. the *return on assets*, ROA, and the profits to equity ratio, i.e. the *return on equity*, ROE. In principle, the ROA reflects the ability of a bank's management to generate profits from the bank's assets.

In this analysis, another type of performance is studied, in particular, we want to focus on the investment portfolio performance of the majors Italian and European banks. With this analysis, we want to study how investment portfolio changed following the two recent crisis and after the decision taken by the European central bank.

The main idea is that, banks with a more traditional business model, generally south European banks (including Italian banks), suffered more from the poor economic conditions in their countries since they recorded a fall in the net interest income and an increase in the Non-Performing Loans. If on one hand, Italian and stressed-EU countries banks had to relatively change their business model increasing the non-interest income, in the other hand the Monetary policy conducted by the ECB in the last years had the purpose of supporting the weak macroeconomic conditions in the south-EU countries, giving unlimited amount of money to financial institutions, and to supporting financial market, especially the government bonds which suffered particularly during the Sovereign debt crisis.

This following analysis is divided in two parts: the first part focuses on the Italian scenario and the second part focuses on the more general European scenario.

Regarding the Italian landscape, the 14 banks listed on the Italian stock exchange[40] are taken into consideration, while for the European analysis a group of 17[41] major European banks, from the principal European countries, is considered. Then a quantitative analysis will be provided, taking into consideration different monetary policies, macroeconomic and controlling variables.

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[40] Excluding Mediobanca, Fineco and Banca Finnat for their particular business type.

[41] Principal european banks for capitalization.

7.1. <u>Italian case</u>

As anticipated in the previous pages, the profitability of Italian banks depends on several factors, some related to the backing activity itself and others related to external variables as the macroeconomic conditions. More in general the relative performance of Italian intermediaries, comparatively weak in the pre-crisis years, improved during the global financial crisis, when the deterioration of their profitability was mild, mainly in relation to the limited losses on structured credit products and other toxic assets[42]. Furthermore the profitability gap is also due to the fact that most countries in EU carried out a massive rescue programme, while Italian banks received a negligible support from the governments; considering only recapitalizations, troubled assets purchase programs and liquidity measures, state-aid used in Italy in the context of the recent crises amounts to EUR 8 billion, compared to 149 billion in Germany, 114 in Spain, 58 in the Netherlands, 26 in France[43]; The size of the rescue programs implemented in Italy remains comparatively low also when including guarantees provided on bank liabilities. Furthermore, the profitability gap reflects a more conservative positioning along the risk-return frontier of Italian bank equity holders[44], for this reason the leverage ratio plays a non-trivial role in explaining the lower performance of Italian banks. According to a recent study[45], the profitability gap of Italian banks is strongly influenced by the low efficiency level for the operating costs, especially the labour costs; If the labour costs were in line with those of other European countries, the efficiency gap over the past ten years would be one third lower. Another factor that significantly influence the banks performance is the low level of GDP growth in Italy over the last decade; in the same way if the GDP growth were closing with respect to that of the European partners, the profitability gap would be reduced in an important way. Many other factors influence banks' performances as the dividend policy, that were generous in Italy until a short time ago[46], or the profits taxation level that were higher w.r.t the other European countries before it was aligned in recent time. Furthermore, the provisions have weighted on

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[42] Bank of Italy, 2009

[43] European Commission, 2015

[44] Acharya, Pierret and Steffen, 2016

[45] Bank of Italy, 2016

[46] As documented by Acharya et.al (2016) while in the euro area about 47 per cent of after-tax profits were on average distributed to stockholders, the share was considerably higher in Italy, where it amounted to about 67 per cent.

banks' balance sheet; in a weak economic environment, the credit quality deteriorates, leading to an increase in the bad debt and in the non-performing loans (NPLs); banks must set aside a relevant amount of capital to hedge from the credit risk.

The idea of this study is that Italian banks, having suffered a fall in the net-interest income, have tried to compensate for these losses by increasing revenue from non-interest income, as fees and service revenues, and from investment portfolio. The relationship between the portfolio investment performance and monetary policy is indirect, in fact, during the two-financial crisis the monetary policy has supported the banking sector providing unlimited economic resources and alleviating market turmoil on sovereign debt securities. Traditionally the Italian banks held a relevant portion of the Italian sovereign debt securities, for this reason when the ECB stated to support the sovereign debt securities, the financial institutions were able to generate profits both thanks to the revaluation of assets at fair value, and thanks to the sale of part of the portfolios, once the securities have appreciated.

On the April 2011, the spread between Italian 10y sovereign bonds and German 10y government bonds was about 120 percentage points, on July was about 225pp and in November it reaches the level of 575pp. Simultaneously, on December 2011 the ECB launched the first Long Term Refinancing Operation with maturity 36 months in order to inject long-term liquidity to the banking sector. It is plausible that the Italian banks bought additional Italian government bonds during the low-price periods and they resold the bonds after the intervention of the European central bank, despite the high volatility and riskiness of the Italian debt securities, while securities already in the portfolio, and the part not sold, registered revaluations in the income statement. With these manoeuvres, they generated profits in investment portfolios, thus we can say that monetary policy affected the banks' investment portfolio.

7.1.1. Model Data

The analysis of the monetary policy effects on banks' portfolio profitability is performed on a sample of 14 Italian banks, that is, the banks listed on the Italian stock exchange[47] at 31st December 2015;

Proceeding in the analysis the semiannual investment portfolios revenues amount of each bank is considered for a time window of 8 years, from 2008 to 2015. The investment portfolio data are extrapolated from the consolidated half-year financial statements of each financial institution for every year; in particular, four items feature the banks' investment portfolios revenues:

INCOME STATEMENTS	
10	....
20	....
….	....
70	….
80	**Net income from trading activities**
90	....
100	**Profits/Losses on disposal or repurchase of**:
	a) ….
	b) *financial assets available for sale*
	c) ….
	d) ….
110	**Profits/Losses on financial assets and liabilities designated at fair value**
120	….
130	**Net losses / recoveries on impairment:**
	a) ….
	b) *financial assets available for sale*
	c) ….
	d) ….
140	….
….	….

---

[47] Excluding Mediobanca, Fineco and Banca Finnat for their atypical business model

The algebraic sum of the four items identifies the net Investment Portfolio income:

80 – Net income from trading activities +
100/b – Profits/Losses on disposal or repurchase of: *financial assets available for sale* +
110 - Profits/Losses on financial assets and liabilities designated at fair value +
130/b – Net losses/recoveries on impairment: *financial assets available for sale* =

Investment Portfolio income

In particular[48]:

Item 80 - Net income from trading activities:

This item, reports the algebraic sum of the balances of referred to in points a) and b):

i. The balance between gains and losses on transactions classified under "financial assets held for trading" and "financial liabilities held for trading", including the results of evaluations of such transactions; excludes gains and losses related to derivative contracts linked to the fair value option, being partly under interest (items 10 and 20) and partly in "net income from financial assets and liabilities at fair value" (item 110).

ii. The balance between gains and losses on financial transactions other than those designated at fair value and those for hedging, in foreign currency, including results of measurement of such transactions.

The results of trading and the valuation of financial assets and liabilities in foreign currency for cash must be kept separate from those relating to foreign exchange activities. For this purpose, the results of the said transactions are to be determined in the same currency of denomination, and converted into euro applying at: 1) the results of trading: the exchange rates used for accounting; 2) the results of the evaluation of the current exchange rates at the balance sheet date. In the case of derivatives, however, the results of evaluations and negotiations also include any foreign exchange differences.

The balance referred to in subparagraph a) includes:

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[48] The following explanation has been extrapolated by the Bank of Italy circular no. 262 of 2005 – 4° update 15 December 2015

1) Gains and losses from the sale of financial assets and liabilities held for trading cash; these gains and losses are calculated as the sum of the opening balance for the year (value of securities corresponding to the one entered in the budget for the previous year), the costs of purchases settled during the year (including the subscription of the securities in issue), revenues from sales settled during the year (including the repayment of matured securities) and the final inventory year (a "book value", that is, before the balance sheet valuations);

2) The results of the valuation of financial assets and financial liabilities held for trading cash;

3) Differentials and margins, positive and negative, of the derivative contracts classified in the trading book, other than those relating to derivative contracts linked to the fair value option, due between the "interests" (ref. Items 10 and 20);

4) The results of evaluation of derivatives classified in the trading book, other than those relating to derivative contracts linked to the fair value option, due to the item "Net income from financial assets and liabilities at fair value" (item 110);

5) Gains and losses arising from trading in precious metals (other than gold) and the results of their evaluation;

6) Conventionally gains and losses relating to derivatives, other than those of interest rates, embedded in hedging derivative contracts of structured financial instruments (for example, the implied equity-linked options in the "interest rate swaps") and the results of its evaluations;

7) Conventionally the "reversals" in the income statement of valuation reserves of hedges of cash flows, when it considers that the transactions are no longer probable or when unrealized losses taken these reserves cannot be recovered.

The balance referred to in point b) includes:

1) Gains and losses arising from trading in currency and gold;

2) The exchange rate differences, both positive and negative, relating to the assets and liabilities denominated in foreign currencies, other than those designated at fair value, those subject to fair value hedging (exchange risk or fair value) and cash flows (risk exchange) and the related hedging derivatives. But including the results of the measurement at fair value of forward currency sale and purchase of components entered into with the purpose of hedging, net of accrued contractual margins recorded in interest with the appropriate algebraic sign (ref. Items 10 and 20).

Item 100/b - Profits/Losses on disposal or repurchase of financial assets available for sale:

The sub-item b) report the balance, positive or negative, between gains and losses realized on the sale of "financial assets available for sale".

about the "financial assets available for sale" gains and losses represent the balance of two components: an already detected in the relevant revaluation reserve (so-called "reversal" in the income statement of reserves); the other consists of the difference between the sale price and the book value of the assets sold.

Item 110 - Profits/Losses on financial assets and liabilities designated at fair value:

This item includes the balance, positive or negative, between gains and losses from "financial assets at fair value" and "Financial liabilities at fair value", including results of measurement at fair value of these assets and liabilities, and the results of the credit and financial derivatives valuations linked to the fair value option.

Item 130/b - Net losses / recoveries on impairment financial assets available for sale:

The sub-item b) reports the balance, positive or negative, between the value adjustments and write-backs related to the impairment of receivables from customers and banks of financial assets available for sale.

The following graphs show the annual investment portfolio trend for each bank:
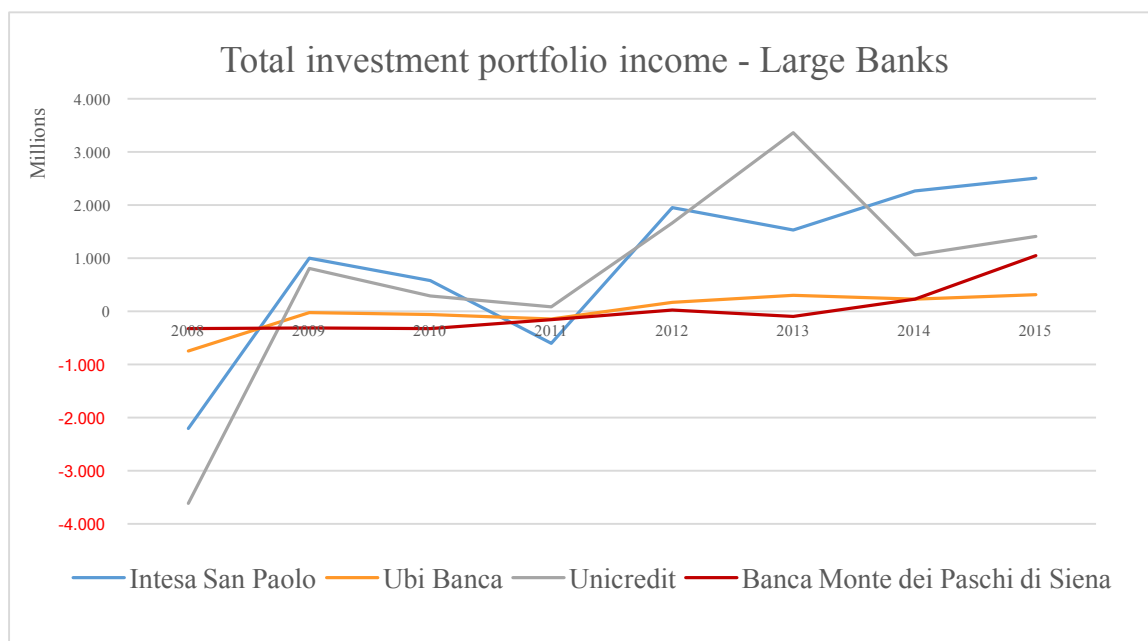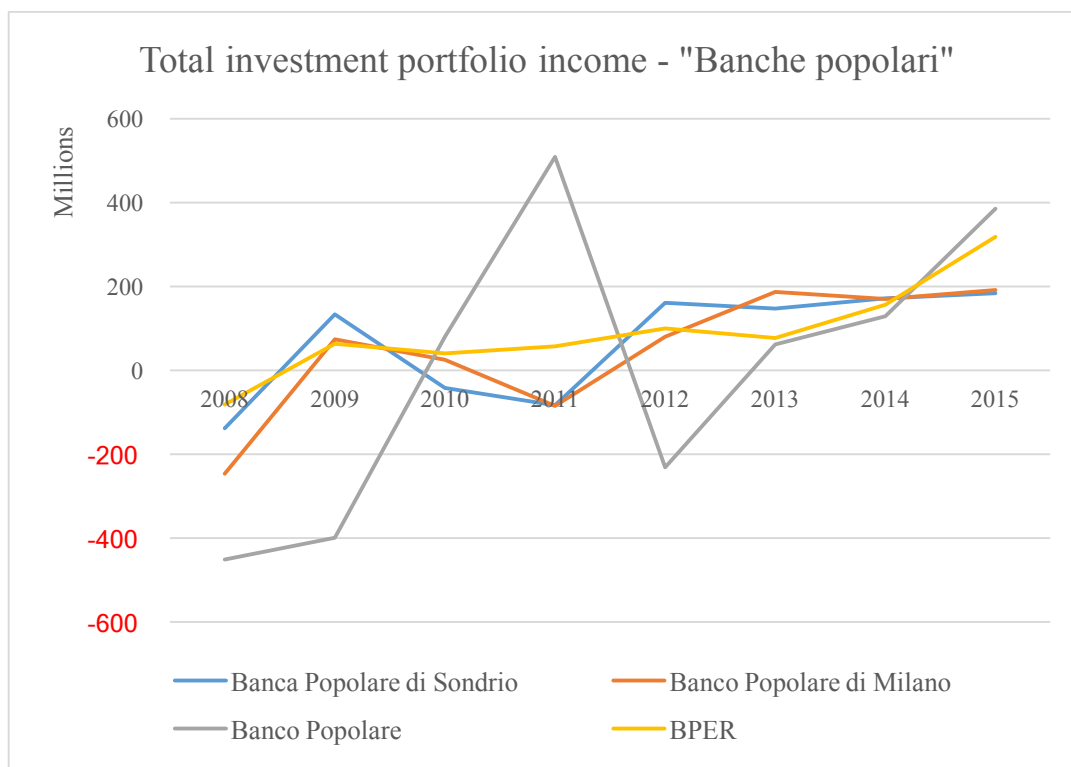
Graph 23 – Source: Own elaboration based on the consolidated financial statements of each bank
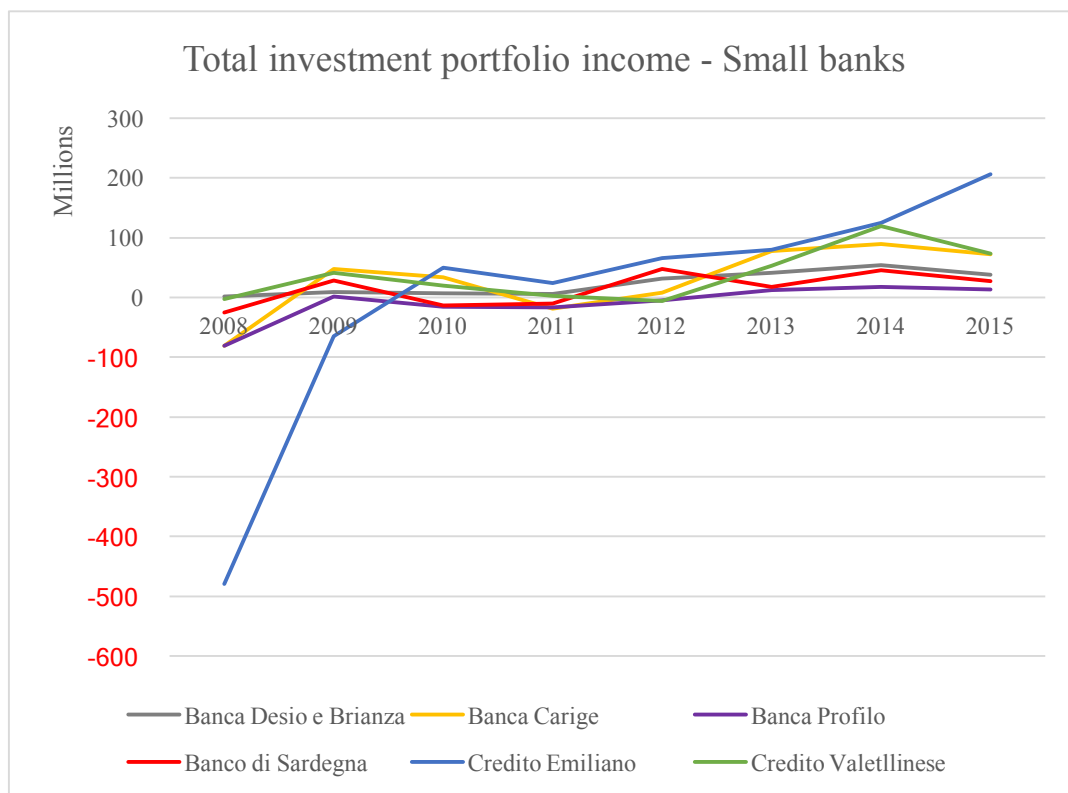
Graph 24 – Source: Own elaboration based on the consolidated financial statements of each bank

An interesting common factor that emerges directly from a graphical analysis is the that the revenues on investment portfolio for the year 2011, for some banks, recorded a sharp decline, while for others, especially for the Small Banks, the trend is quite constant; The only bank that recorded a huge increase in Investment portfolio for the year 2011 is Banco Popolare, reaching its relative maximum, and then suffer a sharp decline in 2012. Another common factor is the steadily increase in the investment portfolio revenues, for the major part of the banks present in the sample, starting from the biennium 2011-2012.

The reason of the common drop in the 2011 is that many European sovereign debt securities faced a severe fall in prices, due to lack of confidence in the markets, resulting in increased volatility; The Italian banks more exposed towards the Italian government bonds recorded a decline in the investment portfolio; afterwards the banks preferred to direct their strategies toward two directions: the first increase income from commission and fees, and second to sell government bonds, after the ECB maneuvers, in order to get a positive margin.

In order to compare the investment portfolio income of each bank, the total investment portfolio revenues are divided by the total amount of investment portfolio recorded in the same period in the banks' balance sheet. The total amount of investment portfolio is extrapolated from the bank's assets, in particular from the items: 20, 30, 40 of the banks' balance sheet[49].

Balance Sheet		
Assets		Liabilities
10)	…	
20)	**Financial Assets held for trading**	
30)	**Financial Assets designed at fair value through profit and loss**	
40)	**Financial Assets available for sale**	
50)	…	
60)	…	
…	…	

---

[49] As provided by the Bank of Italy 262/2005 directive.

The algebraic sum of the four items identifies the total amount of Investment Portfolio:

20 – Financial Assets held for trading +
30 – Financial Assets designed at fair value through profit and loss +
40 – Financial Assets available for sale +

___

 Total Investment Portfolio amount

Then the index is calculated as follow:

$$\frac{\textbf{Investment Portfolio income}}{\textbf{Total investment portfolio amount}}$$

This index will represent the dependent variable in the empirical analysis described in detail in the next paragraph.

The denominator is composed by the items listed above:

Item 20 – Financial Assets held for trading:

This item includes all financial assets (debt securities, equity securities, loans, derivatives etc.) allocated in the trading portfolio, including expired and deteriorated derivatives. In the case of derivatives forming part of a compensation agreement (master netting agreement) that are subject to early closing (early termination), the net balance determined by the parties should be noted, if positive, among the credits (item 60 or 70 of the balance sheet) and, if negative, as liabilities (item 10 or 20 of the balance sheet liabilities). This item includes the positive balance of compensation made in accordance with IAS 32 paragraph 42 of the derivatives allocated to the trading portfolio and hedging contracts, if the absolute value of the fair value of derivatives allocated to the trading portfolio exceeds the absolute value of the fair value of hedging derivatives. This items also includes investments in companies subject to significant influence or joint control that the IAS 28 and IFRS 11 let to assign to this portfolio.

Item 30 – Financial Assets designed at fair value through profit and loss:

This item includes all cash financial assets (debt securities, equity securities, etc.) designated at fair value with the effects recognized in the income statement based on the faculties given to companies (so-called "fair value option") IAS 39, IAS 28 and IFRS 11.

Item 40 – Financial Assets available for sale:

This item includes all financial assets (debt securities, securities, capital, etc.) classified in the portfolio as available for sale.

The total portfolio amount does not include the item 50 of the balance sheet: "Financial assets held to maturity". The reason lies in the fact that this part of the portfolio is not used so much by banks; in the sample of banks considered for the analysis, about half had no financial assets held to maturity portfolios, and very often banks holding this portfolio, held it in a negligible amount.

7.1.2. Econometric Model

In the light of the foregoing analysis, a quantitative model is provided, in order to study the impact of the monetary policy and other variables on the banks' investment portfolio performance.

$$
\begin{aligned}
portperf\_corr_{i,t} \\
&= \beta_0 + \beta_1 d\_10YGov\_bond_t + \beta_2 EuriborAvg\_corr\_infl_{t-1} \\
&\quad + \beta_4 \Delta lnGDP\_it_{t-1} + \beta_5 \Delta lnGDP\_it_{t-2} + \beta_6 E\_inflnext12mIT_{t-1} \\
&\quad + \beta_7 \Delta pat\_levelT1_{i,t-1} + \beta_8 \Delta NPL\_cov_{i,t-1} + \beta_{9_{i,t}} ROA_{i,t-1} \\
&\quad + \beta_{9_{i,t}} \Delta ln \_mint_{i,t-1} + u_{i,t}
\end{aligned}
$$

where:

$portperf\_corr_{i,t}$: It represents the semiannual investment portfolio performance index for each bank over time. It is calculated as the total amount of investment portfolio revenues for each bank over time divided by the its relative amount of investment portfolio reported into the balance sheet; then at the numerator there is the sum of the item 80, 100/b, 110, 130/b of the income statement for the various years, at the denominator the sum of the investment portfolio items[50] excluding the financial assets held to maturity. This index is reduced by the inflation

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[50] Balance sheet items: 20) Financial Assets held for trading; 30) Financial Assets designed at fair value through profit and loss; 40) Financial Assets available for sale;

recorded in Italy in the same reference period, in order to get the "real" investment portfolio performances. *"portperf_corr"* represents the investment portfolio performance, and for this reason it's influenced by several variables, the aim of this study is to measure the influence of each variables.

$d\_10YGov\_bond_t$: It represents the six-months variation in the 10-year Italian Government Bonds yields. As we explained in the previous pages the Italian government bonds make up a very large part in the portfolios of Italian banks. The 10-year bond maturity were those most affected by the sovereign debt crisis; as shown above in 2011, these securities have fallen dramatically in price, resulting in an increase of the BTP-BUND spread; then, starting from December 2011, the price of these securities was supported by expansionary monetary policies of the ECB, which led to a steady rise in prices. The decrease in prices, and then the increase, have certainly had an impact in the investment portfolio performance of banking institutions. Consequently, the banking institutions should have benefited from the support of the securities by the ECB, either because they recorded a positive delta fair value or from the possibility of getting a positive margin from the sale of such securities. From this variable, we expect a negative relationship with the dependent variable.

$EuriborAvg\_corr\_infl_t$: This variable represents the average semiannual EURIBOR value over time corrected by inflation. The EURIBOR (EURo Inter Bank Offered Rate) is used as the average rate charged by major banks for forward transactions on the interbank market (with counterpart other leading banks) with a maturity of one, two and three weeks, and from one to twelve months. The EURIBOR only varies depending on the duration of the loan and does not depend on the amount of capital. In this analysis, the average of a 3-months maturity EURIBOR is considered[51]; The EURIBOR rate is influenced by the monetary policy of the ECB; a low EURIBOR rate level mean a lower interest margin for banks; for this reason, when the rate is low, banks may decide to invest resources in the investment portfolio which is more remunerative.

$\Delta lnGDP\_it_t$: Represents the semiannual variation of the Italian log GDP rate. This variable may influence investment portfolio; in fact, a low GDP growth rate can be translated in a low demand for loans by the real economy, then less interest rate revenues. A low demand for loans by the real economy may have a negative impact on bank' balance sheets. Furthermore, generally, periods of low economic growth, associated with periods of recession, may lead to a

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[51] 3-months maturity annualized, the EURIBOR expressed in the more conventional form.

deterioration in credit quality, further impacting the bank' balance sheets. As in the previous case banks compensate the gap increasing the non-interest income, among which investment portfolio revenues.

$E\_inflnext12mIT_t$: indicates the expected inflation for the next 12 months on a semiannual basis; the idea is that in period of low expected inflation it's logical to expect higher real investment portfolio performance, vice versa in period of high expected inflation. Thus, we can consider the expected inflation as an unexpected component; For this reason we expected a negative relation between the expected inflation and the dependent variable.

$\Delta pat\_levelT1_{i,t}$: Represents the semiannual difference between the TIER1 capital ratio and the TIER1 capital ratio of the previous period for each bank; since banks must respect rigid ratio imposed by Basel agreements, if the regulatory capital level doesn't increase (then the gap remain stable) they cannot lend money to households and firms. Then a low level of patrimonalization growth may lead to an increase in investment portfolio revenues to compensate the impossibility to make loans.

$\Delta NPL\_cov_{i,t}$: this variable represents semiannual delta of the Non-Performing Loans coverage level on banks' balance sheet. In distressed countries as Italy, in the recent years the lending activity assumes greater risks for banks, then a high level of NPL coverage could be translated into a more revenues from interest rate because banks can assume more risks, vice versa a low level or NPLs coverage may influence the banks decision and may lead an increase in investment portfolio revenues.

$ROA_{i,t}$: ROA represents the biannual return on assets index for each bank. The ROA is included in the regression as control variable and generally it's used to represents the banks' management capacity[52]; in particular a high and positive ROA means a great capacity to generate profits from assets, then the ROA may influence the investment portfolio performance. It's likely to expect a higher investment portfolio performance index from the bans with higher ROA.

$\Delta \ln\_mint_{i,t}$: this variable represents the half-year variation, expressed in percentage, of the net interest margin calculated considering only the classic bank activities, i.e. including only active interest from loans to customers and passive interest due to clients. With this variable we want

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[52] According to many financial Papers, the variable ROA is often used as proxy of the management ability to manage the assets, in the regression we took the ROA with one-time lag, to capture the managers' ability to forecast and to adapt to the economic evolutions.

to analyze if there is a direct relation between net interest income and the portfolio performance, or if the relation results indirect.

$u_{i,t}$: It's the error term; it represents the unobservable components of the model.

It is plausible that banking institutions base their choices and strategies after observing certain economic indicators, such as EURIBOR or expected inflation, therefore for each explanatory variable, except for the 10-year Government Bond variable, a time lag of a six-months has been applied. In other words, it's likely that the values of an explanatory variable at time "t" influence the dependent variable at time "t + 1". Regarding the variable $\Delta lnGDP\_it$, it is included in the regression with two-time lags as well; since Italian banks are based principally on a classical business model, as explained in the previous paragraphs, it's likely that the GDP variation at lag two, has a relevant impact on banks' management decisions and on banks' portfolio performances as well[53].

In order to estimate the Panel data, three estimation methods were evaluated: Pooled OLS, Fixed Effects and Random Effects; in the next section we will explicate which of the three methods was used and what results has generated the model estimate.

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[53] Two model were examined, the first included only GDP with one lag, the second included both lags; we observed that the model with two lags were more accurate, since the GDP at lag 2 was significant at level of 1% we decided to include it in the regression.

7.1.3. Estimation results

As explained in the previous paragraphs, the dataset analyzed is an Unbalanced Panel model[54], made up of 14 individuals observed for 16 periods; for this reason, three types of panel data analysis methods were considered: Pooled OLS, Fixed effects and Random Effects.

In order to decide whether of the estimation methods it's the most appropriate, three test were made:, Hausman Test, Breusch-Pagan Test and F-test.

The first test run, is the Hausman test, in order to evaluate which model is consistent between Fixed effects and Random effects; below the result of the test is reported:

Hausman Test:

$$H0: E\left(c_i \middle| X_{i,t}X_{i,t+1}\ldots X_{i,t+n}\right) = E(c_i) = 0$$
$$H1: E\left(c_i \middle| X_{i,t}X_{i,t+1}\ldots X_{i,t+n}\right) \neq E(c_i) \neq 0$$

```
Hausman test statistic:
 H = 12.1698 with p-value = prob(chi-square(9) > 12.1698) = 0.203903
(A low p-value counts against the null hypothesis that the random effects
model is consistent, in favor of the fixed effects model.)
```

According to the Hausman test result, the Random effects model fits better the panel data, in particular the GLS estimator results consistent and efficient. The high p-value suggests us to accept the null hypothesis that the time-invariant factor is uncorrelated with the explanatory variables.

Then the second test done is the Breusch-Pagan test, which compare the Random effects model with the Pooled OLS model[55]:

Breusch-Pagan test:

```
Breusch-Pagan test statistic:
 LM = 0.22336 with p-value = prob(chi-square(1) > 0.22336) = 0.636492
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the random effects alternative.)
```

---

[54] The Panel is unbalanced for the impossibility to recover data for some banks included in the sample.

[55] The Breusch-Pagan test has as null hypothesis that the variance of α_i is equal to 0. If the null hypothesis is rejected, we can conclude that there is a significant random effects component in the dataset and the Random effects model fits better the heterogeneity respect to the Pooled OLS model.

The Breusch-Pagan test suggests us that the Pooled OLS model best fits our dataset, and the OLS estimator is the most efficient. The test just mentioned suggests us that in the model is not present heteroskedasticity, to confirm this affirmation a White's test[56] is applied to the Pooled OLS regression model.

White's test:

```
White's test for heteroskedasticity -
   Null hypothesis: heteroskedasticity not present
   Test statistic: LM = 32.703
   with p-value = P(Chi-square(47) > 32.703) = 0.943773
```

The White's test confirms the absence of heteroskedasticity in the model, since the p-value is very high we cannot reject the null hypothesis.

In order to have a further confirmation that the Pooled OLS is the best model for our case, the F-test is done; in the F-test the null hypothesis is that the cross-sectional units have a common intercept, i.e. that all a_i. If the null hypothesis cannot be rejected the Pooled OLS is the best model to use.

F-test:

```
Joint significance of differing group means:
 F(12, 150) = 1.35036 with p-value 0.196232
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the fixed effects alternative.)
```

The p-value is higher than 0,05, then even the F-test suggests us that the Pooled OLS is the best model for the type of analysis.

As a result, after performing a series of tests to figure out which model did to our case, we decided to utilize the method of Pooled OLS.

The instrument used for the econometric analysis of the data is the open-source software Gretl. In the data analysis, the software assigns to the significant explanatory variables a number of asterisks (from 1 to 3) which varies according to the level of significance of the estimate. In this analysis, it was decided to accept significance levels equal to 10% since on the base of the

---

[56] The White test in the case of Pooled OLS ha sas null hypothesis the non presence of heteroscedasticity, while the alternative hypothesis suggests us there is heteroscedasticity

dataset structure, we have a small group of individuals observed for a not very large number of periods.

The results of the Pooled OLS estimates are reported below:

Dependent variable: portperf_corr_ann

	coefficient	std. error	t-ratio	p-value	
const	0.0158315	0.00376328	4.207	4.28e-05	***
delta_lnGDP_it_1	-0.636346	0.136836	-4.650	6.84e-06	***
delta_lnGDP_it_2	-0.194852	0.0665316	-2.929	0.0039	***
E_inflnext12mIT_1	-1.86270	0.279387	-6.667	3.90e-10	***
delta_pat_leve~_1	-0.00801501	0.00313354	-2.558	0.0115	**
delta_NPL_cov_1	0.00907200	0.00664872	1.364	0.1743	
ROA_1	0.262439	0.131477	1.996	0.0476	**
EuriborAvg_cor~_1	-0.376262	0.163429	-2.302	0.0226	**
d_YGov_Bond	-0.879004	0.224990	-3.907	0.0001	***
delta_ln_mint_1	0.000815628	0.00152959	0.5332	0.5946	

Mean dependent var	-0.009449	S.D. dependent var	0.018221
Sum squared resid	0.017008	S.E. of regression	0.010246
R-squared	0.700410	Adjusted R-squared	0.683766
F(9, 162)	42.08212	P-value(F)	5.26e-38
Log-likelihood	548.9976	Akaike criterion	-1077.995
Schwarz criterion	-1046.520	Hannan-Quinn	-1065.225
rho	0.105917	Durbin-Watson	1.635648

It's possible to observe immediately that the major part of the variables are significant while $\Delta NPL\_cov_{i,t-1}$ and $\Delta ln\_mint_{i,t-1}$ resulted not significant. Remember the decision to establish the significance level to 0.1. The significant variables are therefore: $d\_10YGov\_bond_t$, $\Delta lnGDP\_it_{t-2}$, $E\_inflnext12mIT_{t-1}$, $EuriborAvg\_corr\_infl_{t-1}$, $\Delta lnM1_{t-1}$, $\Delta pat\_levelT1_{i,t}$ and $ROA_{i,t-1}$, while the non-significant variables are $\Delta NPL\_cov_{i,t}$ and $\Delta ln\_mint_{i,t-1}$. Focusing the attention on the significant variables, it's possible to observe how the estimates seem to confirm the initial expectation.

In particular the results of the estimate are reported below:

$\Delta lnGDP\_it_{t-1}$, $\Delta lnGDP\_it_{t-2}$: These two explanatory variables are resulted both statistically significant at 1% level. Their coefficients are both negative, this means that a decrease in the delta GDP ratio lead an increase in the portfolio performance; This relation is in line with the arguments made earlier: a low, or negative, delta GDP rate has a negative impact in the banks' balance sheet, both for the contraction in the loans to non-financial sector, leading a decrease in the net interest income, and for the deterioration of the credit quality, with a consequent decreasing of the net interest income. The estimate results suggest us that the $\Delta lnGDP\_it_{t-1}$ has a major impact on the portfolio performance, as it's logical to expect, but even the $\Delta lnGDP\_it_{t-2}$ has a relevant impact on the portfolio performance as well; thus, we can conclude that our supposition in which investment portfolio management decisions are influenced not even by the GDP level of the previous six-months but also by the GDP level yet the first half is confirmed by the empirical analysis.

$E\_inflnext12mIT_{t-1}$: This variable is resulted statistically significant at a level of 1%; As supposed in the previous pages, the β was found negative, in fact it's logical to expect that a decrease of the expected inflation for the next twelve months has a positive impact in the portfolio performance. Vice versa with an high expected inflation we may expect a low real portfolio performance index.

$EuriborAvg\_corr\_infl_{t-1}$: This variable was found statistically significant at 5% level with a negative coefficient; even in this case our expectation are confirmed; in particular, a reduction in the interbank exchange rate lead a contraction in the banks' net interest profitability; banks, in order to increase profit, may decide to act on investment portfolio, increasing the investment portfolio revenues. This relation is confirmed by the results of the estimate.

$d\_10YGov\_bond_t$: The semiannual difference in the 10-year Italian Government Bond resulted to be statistically significant at a level of 1%. Our expectation about the influence on the investment portfolio performance is confirmed. The sign of the variable confirms the reasoning made in the preceding pages: the expansionary monetary policy, supporting the government bonds prices, has led to an increase in the investment portfolio performance of Italian banks, both because of the revaluation of these securities and the likelihood for banks to generate a profit by selling government bonds in the moment of greatest appreciation.

$\Delta \boldsymbol{pat\_levelT1_{i,t}}$: The delta patrimonialization level was found to be statistically significant at 5% level; this data confirms what said in the previous pages. The banks with higher patrimonialization level can assume more risks and then can lend more money to the non-financial sector. The estimate suggests us that a decrease in the capital ratio required level led an increase in the portfolio performances, since banks had to increase profits by increasing non-interest income.

$\boldsymbol{ROA_{i,t-1}}$: This variable is resulted to be statistically significant at a level of 5%. In particular, the estimated coefficient is positive, this means that if we consider the ROA as index of management capacity[57] to generate profits from the available assets, an increase in the ROA, lead an increase in the portfolio performance. This relation may be interpreted as the higher capacity of the management to compensate the net-interest income gap increasing the portfolio performance. Even this result confirms our expectation on β_9.

$\Delta \boldsymbol{NPL\_cov_{i,t-1}}$: This variable, against our expectation, have resulted to be not significant. This means that a variation in the Non-performing loans coverage has no effects on the bank's portfolio performance. Then it's possible that the recorded variation of the variable could be linked to the requests made by the ECB and the will to provide stability to the bank title on the stock exchange, in a market situation of fragility[58]. Consequently, the variation in the non-performing loans coverage rate may not be interpreted as the will for banks to assume more risks, and in turn to lend more money, but in the will to guarantee stability for the banks. Thus, our arguments are not confirmed, and then we can conclude that the non-performing loans coverage ratio does not influences directly the portfolio performance.

$\Delta \boldsymbol{ln\_mint_{i,t-1}}$: the delta percentage of the interest margin resulted not significance; this means that the variation in the interest margin does not affect directly the portfolio performance, but it's logical to expect that a variation in the interest margin influence indirectly the performance of portfolio, for example affecting the bank's management strategies and decisions.

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[57] Net profits/ Total assets. As suggested by the Bank of Italy paper of the October 2016, in the calculation of the ratio, costs, provisions and taxes were included, because of their relevant influence, in the Italian environment, on the banks performance.

[58] Since the biennium 2013/2014 the increase in the non-performing loans rate in the banks' balance sheet has caused concern in the markets for the stability of some banks.

The synthesis of the estimates is shown below:

Pooled OLS		
	Estimated $\hat{\beta}$	p-value
const	0,0158 (0,0037)	4,28e-05 ***
ΔlnGDP_it_1	-0,6363 (0,1368)	6,84e-06 ***
ΔlnGDP_it_2	-0,1949 (0,0665)	0,0039 ***
E_inflnext12mIT_1	-1,8627 (0,2794)	3,90e-10 ***
EuriborAvg_corr_infl_1	-0,3763 (0,1634)	0,0226 **
d_10YGov_Bond	-0,8790 (0,2250)	0,0001 ***
Δpat_leveT1_1	-0,0080 (0,0031)	0,0115 **
ΔNPL_cov_1	0,0090 (0,0066)	0,1743
ROA_1	0,2624 (0,1315)	0,0476 **
Δln_mint_1	0,0008 (0,0015)	0,5946

Standard error in parenthesis $R^2 = 0,70 \mid F(9, 162)=42,08$

With the estimated equation:

$$pse\widehat{curiti}es\_corr_{i,t}$$

$$= 0,0158 - 0,8790\ \Delta10\text{YGov\_Bond}_t - 0,3763\ EuriborAvg\_corr\_infl_{t-1}$$

$$- 0,6363\ \Delta lnGDP\_it_{t-1} - 0,1949\ \Delta lnGDP\_it_{t-2}$$

$$- 1,8627\ E\_inflnext12mIT_{t-1} - 0,0080\ \Delta pat\_levelT1_{i,t-1}$$

$$+ 0,2624\ ROA_{i,t-1} + u_{i,t}$$

7.2. <u>European case</u>

This part of the thesis aims to analyze how the expansionary monetary policy, undertaken by the ECB in recent years, influenced the portfolio performance of a group of European banks. In particular, will be studied whether the variables resulted relevant and significant in the Italian analysis had the same impact in the European scenario. First, we must remember that, as pointed out in chapter 6 of this thesis, there was a gap regarding the effects of the two crises in the European Union. On the one hand the most exposed banks to the American markets and more inclined to invest in financial derivative instruments, such as the German banks, were affected more by the financial crisis of 2008, while the more traditional banks, such as those of southern European countries, suffered a major impact during the sovereign debt crisis of 2010/2011. Regarding the determinants of bank performance, as stated previously, the decline in net interest income was less pronounced for the sample of European banks, while it has had a significant impact on European's southern banks' balance sheets. Also, since the average level of NPLs was found to be lower for the European banks with respect to the Italian ones, two variables will be considered: the delta percentage change in the level of NPLs over the total loans and the delta percentage of the NPLs coverage. For this reason, the analysis will provide for some common variables with the analysis of the Italian case, and other variables that are better adapted to the European case.

7.2.1. Model data

For the analysis of the monetary policy effects on European banks' portfolio, a sample of 17 major European banks[59] is considered. In order to normalize the sample and to analyze comparable data, the empirical analysis will be made on data recovered by the database "Bankscope". Every variable will be extrapolated by the consolidated annual data available in the database for a time windows of 9 years, forming a balanced panel data of 153 observations.

As for the Italian case, the annual index of investment portfolio performance of each banks is considered.

In particular, the index will be calculated as the total investment portfolio income at the numerator, over the total amount of the investment portfolio, recorded in the banks' balance sheets, at the denominator.

The total investment portfolio calculation is reported following:

Income Statement	
	(Interest income loans)
	…
	…
	Net Gains/Losses on Trading and Derivatives
	Net Gains/Losses on Other securities
	Net Gains/Losses on Financial Assets a FV through Income Statement
	…
	…

The algebraic sum of these three items identifies the Net investment portfolio income:

Net Gains/Losses on Trading and Derivatives +
Net Gains/Losses on Other securities +
Net Gains/Losses on Financial Assets a FV through Income Statement =
Investment Portfolio income

---

[59] The top 17 European banks for total assets at 31st December 2015, excluding three Italian banks for the impossibility to recover data from the database.

With a simply numerical analysis emerged that the investment portfolio income trend, varies on the basis of the banks' "internationalization", in facts, the banks more exposed toward the international markets recorded the major losses during the 2008, while the more classical banks, as the south-European banks, have suffered the most damages during the sovereign debt crisis, for then recover in the following years:
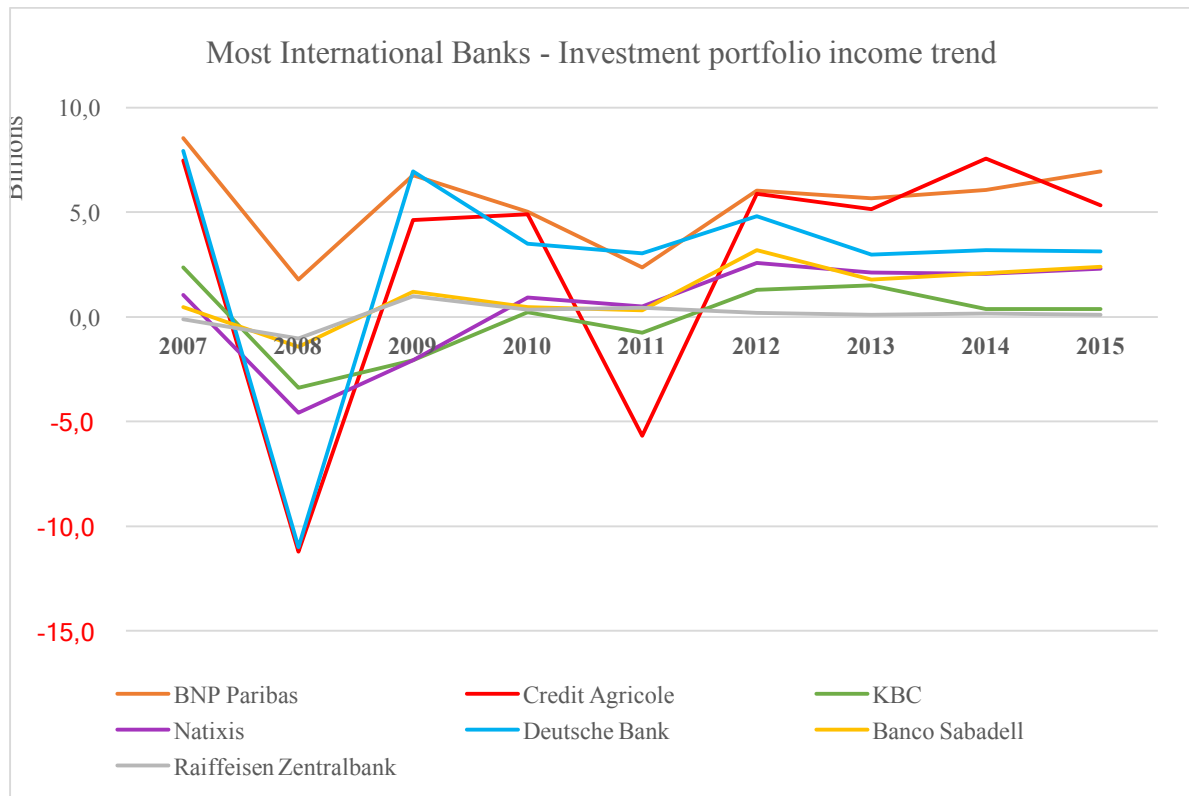
Graph 25 – Source: Own elaboration based on "Bankscope" data

As it's possible to observe from the graph, two banks particularly suffered the financial crisis of 2007: Deutsche Bank and Crédit Agricole. In particular, the first recorded a loss of 33[60] billions on derivatives positions, while the second recorded a loss 10 billions on the assets evaluated at fair value. Furthermore, Crédit Agricole suffered a loss of 5 billions at the end of 2011.

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[60] 33 Billions of loss in the derivative positions and a Net Gains of 22 Billions in assets at Fair value, for a total loss of 11 Billions.

Then proceeding with the analysis, the total amount of the investment portfolio is extrapolated from the balance sheets assets of each bank:

Balance Sheet	
Assets	Liabilities
… **Trading Securities and at FV through Income** **Derivatives** **Available for Sale Securities** *[61] … … …	

The algebraic sum of these three items provide the total amount of investment portfolio:

Trading Securities and at FV through Income   +
Derivatives +
Available for Sale Securities =
_____
Total amount of Investment Portfolio

Regarding the total amount of investment portfolio recorded in the banks' balance sheets we observe a gap within the Eurozone. In particular Spanish, Italian and Austrian banks increased their total amount of portfolio in their balance sheets, while French, Belgium and German banks generally reduced their portfolios, but sketchily are the banks that have increased, more than all, the net interest income during the considered period.

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[61] The item "Held to maturity securities" is not included for the same reason as the italian case.

	△% 2007-2015
Banco Santander	92,6397%
BNP Paribas	-20,6157%
BBVA	65,9135%
Scocietè Gènèrale	-4,8604%
Credit Agricole	-51,4683%
KBC	-29,4709%
Natixis	-18,2113%
Deutsche Bank	-23,5491%
Commerzbank	-31,4123%
Erste Bank	25,3345%
Banco Sabadell	311,3436%
Banco Popular Espanol	443,6051%
Deutsche PostBank	-7,6353%
Credit Industriel et Commercial	-71,0334%
Raiffeisen Zentralbank	26,4034%
Greek National Bank	-46,8160%
Intesa san paolo	106,7196%

Table 4 – Source: Own elaboration based on Bankscope data

The table above reports the delta percentage variation in the total amount of portfolio in the banks' balance sheets during the period 2007-2015; it's possible to note the huge increase in the portfolios for the Spanish banks and in the Italian bank, which they doubled, and in some case tripled, the total amount. While, in general, Greek, French and German banks recorded a he reduction in their investment portfolio, reaching the relative minimum of 71% in the case of Crédit Industriel et Commercial.

Therefore, as in the Italian case, the index of banks' portfolio performance is calculated as follow:

$$\frac{\textbf{Investment Portfolio income}}{\textbf{Total amount of investment portfolio}}$$

This index will represent the dependent variable in the empirical analysis.

7.2.2. Econometric model

As in the Italian case, a quantitative model is provided, in order to study the impact of the monetary policy and other variables on the banks' investment portfolio performance.

$$port\_perf\_corr_{i,t}$$
$$= \beta_0 + \beta_1\Delta EUGov\_Bond\_Bench_t + \beta_2 EuriborAvg\_corr\_infl_{t-1}$$
$$+ \beta_3\Delta lnGDP_{i,t-1} + \beta_4 inflation_{i,t-1} + \beta_5\Delta tier\_level_{i,t-1}$$
$$+ \beta_6\Delta NPLcoverage_{i,t-1} + \beta_{7_{i,t}}ROA_{i,t-1} + \beta_{8_{i,t}}\Delta ln\_M1_{1_{t-1}} + u_{i,t}$$

where:

$port\_perf\_corr_{i,t}$: It represents the annual investment portfolio performance index for each bank over time. This variable is the same as the Italian case, and it is calculated as the total amount of investment portfolio income recorded in the income statement over the total amount of investment portfolio recorder in the balance sheet[62]. As illustrated above, at the numerator there is the algebraic sum among the item "Net Gains/Losses on Trading and Derivatives", "Net Gains/Losses on Other securities" and "Net Gains/Losses on Financial Assets at FV through Income Statement". At the denominator there is the sum among "Trading Securities and at FV through Income", "Derivatives", "Available for Sale Securities", which form the total amount of investment portfolio. This index is corrected for the inflation registered in the different European countries over time in order to get a "real" investment portfolio performance index. This variable represents the dependent variable in the econometric analysis.

$\Delta EUGov\_Bond\_Bench_t$: This variable represents the delta percentage of the return on the 10-year European government bonds benchmark. This benchmark is composed by a basket of European government bonds. The idea is that the Government Bonds, following the introduction of expansionary monetary policies, have seen an increase in prices resulting in lower yields. This index captures the aggregate effects of the central bank monetary policies on the Government Bonds of various European countries. As in the Italian case, we expect that a decrease in the benchmark index led to an increase in the investment portfolios performance

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[62] By structure, this index is influenced both by the gain/loss from the sale of assets and the revaluation/devaluation of assets according to the market developments.

held by banks, both because of the positive delta fair value recorded, and for the possibility of obtaining a margin by selling the securities.

$EuriborAvg\_corr\_infl_t$: This variable represents the average of a 3-months maturity EURIBOR[63] over a period of one year. Also in this case the EURIBOR is used as proxy of the ECB monetary policy: the reduction in the ECB key interest rate has as consequence the reduction in the interbank interest rate. When the interest rate is near to zero, the interest margin it contracted, reducing the profitability of banks. Consequently, when the EURIBOR decrease we may expect an increase in the portfolio performance in order to compensate the interest rate reduction effects and increase the net income. This variable is corrected for the average inflation recorder in the Eurozone over the same period. In the light of previous observations regarding the evolution of net interest margin for the European banks sample, we want to see if and how this variable has had an impact on banks' portfolio performances.

$\Delta lnGDP_{i,t}$: This variable represents the annual variation of the log GDP rate, for each country, over time. Unlike the Italian case, where the delta log GDP rate was the same for the entire sample, in the European analysis, the delta log GDP rate will be different with respect the country in which the banks considered has its main headquarter. In this case we have a strong duality inside the European union; in fact countries where banks follow a more traditional business model[64] sre the most affected by a contraction in the GDP level, while the countries with more "international" banks was less affected by a reduction in the GDL level; we have to underline that in general, the peripheral countries, are the countries in which banks have a more classical business setting and are the counties which registered the largest contraction in GDP. Vice versa it's true for the countries with a more "international" banks[65]. Thus, in this analysis we want to estimate the behavior of the portfolio performance with respect the change in the GDL level.

$inflation_{i,t}$: This variable represents the level of expected inflation for each country for the next twelve months. Unlike the Italian case, the level of expected inflation change among countries and is not the same for the entire sample. We can consider the expected inflation as

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[63] EURIBOR (EURo Inter Bank Offered Rate) is used as the average rate charged by major banks for forward transactions on the interbank market (with counterpart other leading banks) with a maturity of one, two and three weeks, and from one to twelve months.

[64] Italy, Spain, Greece

[65] French, German, Austria

an unexpected component; in fact, if the expected inflation for the next 12 months is high then we may expect a reduction in the real portfolio performance and vice versa. It's reasonable to expect a negative relation between the expected inflation and the dependent variable.

$\Delta tier\_level_{i,t}$: Represents the annual percentage difference between the TIER1 capital ratio and the TIER1 ratio of the previous year for each bank; since banks must respect rigid ratio imposed by Basel agreements, if the regulatory capital level doesn't increase (then the gap remain stable) they cannot lend money to households and firms. Then a low level of patrimonalization growth may lead to an increase in investment portfolio revenues to compensate the impossibility to make loans. Furthermore, if the bank has to increase the level of TIER1 capital ratio it must employ significant resources; for this reason, we may expect a negative relationship between the delta TIER1 capital ratio and the dependent variable.

$\Delta NPLcoverage_{i,t}$: This variable represents the delta percentage of the Non-Performing loans coverage[66] between two consecutive years. If the delta is positive, it means that there was an increase in the NPL coverage ratio and vice versa. The NPL coverage it's an important factor for the peripheral counties, in which the NPL represents a problem for the banks' profitability and stability. We observe a low level of NPL for the banks situated in Germany, France, Belgium and Austria, while we observe a significant level of NPL in the banks' financial statement of the peripheral countries. However, the level of NPL coverage is lower on average in the central countries and is higher in the stressed countries. We may expect that a decrease in the NPL coverage leads to an increase in the portfolio performance for the same reason of the Italian case.

$ROA_{i,t}$: ROA represents the annual return on assets index for each bank. The ROA is included in the regression as control variable and generally it's used to represents the banks' management capacity[67]; in particular a high and positive ROA means a great capacity to generate profits from assets, then the ROA may influence the investment portfolio performance. As for the Italian case, it's likely to expect a higher investment portfolio performance index from the bans with higher ROA.

Δln_M1_t: It represents the annual variation of the log primary liquidity level in the Eurozone over time. It includes currency in circulation (circulating), and other financial assets that can

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[66] Reserves for impared loans/Impaired loans

[67] As explained in the Bank of Italy paper, October 2016

serve as a means of payment, such as overnight deposits, whether transferable on demand by check, and the traveler's checks; banknotes and coins deposited are not considered to fall in this aggregate, so not in circulation, in order to avoid double counting, once as banknotes and coins, the other as current account deposits. The monetary aggregates measure the existence supply of money at a particular time in the economic system; their extent influence the interest rates and inflation: in theory, an increased supply of money, in fact, results in a lower interest rate, that, in an optimal situation, mean higher loans to private sector and then higher revenues from active interest in the banks' income statement. We want to study which relation had the increase in the money supply on the investment portfolio performances of the banking institutions. We expect that an increase in the money supply lead an increase in the portfolio performances for the same reasoning made for the EU Government Bond Benchmark.

$u_{i,t}$: It's the error term; it represents the unobservable components of the model.

Since the data we have available are annual, not all the explanatory variables are regressed with a lag. For example, in this regression it would be useless to apply a two-time lag at the GDP variation as in the Italian case, because it's unlikely that the variation of GDP at time "t-2" influences the portfolio performances at time "t". While for the variables "$\Delta\ln\_M1_t$" and "$\Delta NPL\ coverage$" a zero-time lag was considered. The variable *"$\Delta EUGov\_Bond\_Bench$"* it's included in the regression without lag, because it's likely that the portfolios performances of banking institutions are influenced by the benchmark at time "t".

7.2.3. Estimation results

Unlike the Italian analysis, the dataset considered for the European analysis is a balanced panel, made up of 17 individuals observed for 9 periods[68]; the methodology used to make the analysis is the same as the Italian one, in particular three types of panel data analysis methods were considered: Pooled OLS, Fixed effects (FE or WG estimator) and Random effects (RE estimator).

In order to decide whether of the estimation methods it's the most appropriate, three test were made: Hausman test, Breusch-Pagan test and F-test

The first test run, is the Hausman test, in order to evaluate which estimator is consistent and efficient between Fixed effects and Random effects, the result of the test is reported below:

Hausman test:

The null hypothesis for the Hausman test is that the estimation made with the GLS methods, then the RE model, is consistent and efficient, while the alternative hypothesis is that the FE estimator is consistent and RE not consistent:

```
Hausman test statistic:
 H = 7.67644 with p-value = prob(chi-square(8) > 7.67644) = 0.465698
(A low p-value counts against the null hypothesis that the random effects
model is consistent, in favor of the fixed effects model.)
```

According to the Hausman test result, the Random effects model fits better the panel data, then we accept the null hypothesis since the p-value is higher than 0,05. This result suggests us that the time invariant factors are uncorrelated with the explanatory variables.

Then the second test done is the Breusch-Pagan test, which compare the Random effects model with the Pooled OLS model[69]:

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[68] Annual data from 2007 to 2015

[69] The Breusch-Pagan test has as null hypothesis that the variance of α_i is equal to 0. If the null hypothesis is rejected, we can conclude that there is a significant random effects component in the dataset and the Random effects model fits better the heterogeneity respect to the Pooled OLS model.

Breusch-Pagan test:

```
Breusch-Pagan test statistic:
 LM = 3.58816 with p-value = prob(chi-square(1) > 3.58816) = 0.0581928
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the random effects alternative.)
```

The Breusch-Pagan test suggests us that the pooled OLS model fits better our dataset, and the OLS estimator is the most efficient[70]. The test just mentioned suggests us that in the model is not affected by heterogeneity problem; in order to have a confirmation of this affirmation a White's test[71] is applied to the Pooled OLS regression model:

White's test:

```
White's test for heteroskedasticity -
   Null hypothesis: heteroskedasticity not present
   Test statistic: LM = 35.1109
   with p-value = P(Chi-square(42) > 35.1109) = 0.765265
```

The White's test confirms the absence of heteroskedasticity in the model, since the p-value is higher than 0,05 we cannot reject the null hypothesis.

The third test made is the F-test[72], which compare the Fixed effects model with the Pooled OLS model:

F-test:

```
Residual variance: 0.0209913/(136 - 25) = 0.000189111
Joint significance of differing group means:
 F(16, 111) = 1.88637 with p-value 0.0288971
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the fixed effects alternative.)
```

In this case, we observe a p-value quite low, less than 0.05, then statistically we must reject the null hypothesis that the Pooled OLS model is better than the Fixed effects model. However, from the Hausman test result we know that the RE model is better than the FE model.

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[70] Even if the p-value is not too elevated, since is greater than 0,05, statistically we must accept the null hypothesis.

[71] The White test in the case of Pooled OLS has as null hypothesis the non-presence of heteroskedasticity, while the alternative hypothesis suggests us there is heteroskedasticity.

[72] The F-test for the fixed effects model has as null hypothesis that the time invariant factors are identical for all the units. Reject the null hypothesis means that the time-invariant factors are not-null, then if we reject the null hypothesis we can conclude that the fixed effects model is better than Pooled OLS model.

As a result, after performing a series of tests to figure out which model did to our case, we decided to utilize the Pooled OLS method.

As for the Italian analysis, the instrument used for the econometric analysis of the data is the software Gretl and the number of asterisks associated on the basis of the variable's significance is the same as for the Italian analysis. Even for the European analysis we decide to accept level of significance equal to 10% since on the base of the dataset structure, we have a small group of individuals observed for a not large number of periods.

The results of the Pooled OLS estimates re reported below:

```
Dependent variable: port_perfor_corr

                      coefficient   std. error   t-ratio   p-value
        ---------------------------------------------------------------
        const            -0.0255680   0.00524567   -4.874    3.20e-06 ***
        delta_lnGDP_1    -0.0984546   0.0529318    -1.860    0.0652   *
        Inflation_1      -0.0490194   0.151223     -0.3242   0.7464
        EuriborAvg_cor~_1 -0.481491   0.145440     -3.311    0.0012   ***
        delta_tier1_le~_1 -0.0181174  0.00442164   -4.097    7.39e-05 ***
        NPLcoverage      -0.0208570   0.00754479   -2.764    0.0066   ***
        ROA_1             0.469853    0.134548      3.492    0.0007   ***
        delta_EUGov_Bond~ -0.000234426 0.000133824 -1.752    0.0822   *
        d_Ln_M1           0.252049    0.0699328     3.604    0.0004   ***

Mean dependent var   -0.006838   S.D. dependent var    0.018922
Sum squared resid     0.026699   S.E. of regression    0.014499
R-squared             0.447620   Adjusted R-squared    0.412824
F(8, 127)            12.86425    P-value(F)            1.91e-13
Log-likelihood      387.4576     Akaike criterion     -756.9153
Schwarz criterion  -730.7014     Hannan-Quinn         -746.2626
rho                   0.409592   Durbin-Watson         0.994508
```

From the regression results it's possible to observe that the major part of the variables are significant, while only $inflation_{i,t-1}$ resulted statistically not-significant. The significant variables are therefore: Δln_M1_t, $\Delta lnGDP_{i,t-1}$, $EuriborAvg\_corr\_infl_{t-1}$, $\Delta tier\_level_{i,t-1}$, $\Delta NPLcoverage_{i,t-1}$, $\Delta EUGov\_Bond\_Bench_t$, and $ROA_{i,t-1}$. Focusing on the significant variables, it's possible to observe how the estimates seem to confirm the initial expectations.

The estimate results are reported below:

Δln_M1_t : This variable resulted to be statistically significant at 1% level. The coefficient is positive, then our thoughts are confirmed: an increase in the money supply leads to an increase in the portfolio performance. The most likely hypothesis is that the performance has increased both due to the increase in fair value and from the possibility to make profits by selling government bonds.

$\Delta lnGDP_{i,t-1}$: The delta percentage of the GDP level resulted statistically significant at a level of 10%; this data is in line with the Italian analysis, in which the economic conditions of the country have an influence on the portfolio performance of the banks; in particular, the coefficient suggests us that a decrease in the delta GDP lead an increase in the portfolio performance. That's an interesting result because from the non-statistical pre-analysis we observed that the even banks situated in countries which had a positive GDP growth increased their portfolio performance.

$inflation_{i,t-1}$: The expected inflation resulted to be not statistically significant; this means that an increase in the level of expected inflation for the next twelve months could not have an impact on the real portfolio performance. This data is in contrast with data from Italian analysis in which expected inflation had an important impact on portfolio performance.

$\Delta tier\_level_{i,t-1}$: The delta percentage variation in the level of TIER1 capital ratio resulted statistically significant at a level of 1%; the negative coefficient suggests us that a decrease in the level of capital required lead an increase in the portfolio performance; this data is interesting because confirm our expectation about the banks management decision in presence of low capital ratio; if the "patrimonialization" level doesn't increase, cannot also increase loans to customers by banks; however this data is in contrast with the graph shown previously in which is reported the interest margin trend for the banks in the sample. We have to remind that the interest margin observed included also the active and passive interest from non-lending activities, then for the impossibility to recover more precise data we cannot observe the contribution to the portfolio performance of the only classical banking activities.

$\Delta NPLcoverage_{i,t-1}$: Despite the average level of non-performing loans in the Eurozone is not elevated, the delta coverage of the NPLs resulted statistically significant at a level of 1% with a negative coefficient, we have to underline that especially for the German and French banks the level of NPLs coverage is not too elevate, rather it results on average about one half with respect to the NPLs coverage for Italian and Spanish banks. The coefficient

suggests us that a decrease in the NPLs coverage lead an increase in the portfolio performance; then our expectations have been respected; it's interesting that for the Italian analysis the same variable resulted non-significant despite the high level of NPLs in the banks' balance sheets.

$ROA_{i,t-1}$: The ROA level resulted to be statistically significant at a level of 1%. The coefficient is positive; this result suggests us that an increase in the ROA level leads an increase in the portfolio performance; we can say that our expectation about the capacity of the management to manage the assets and to predicts market behavior seems to have a relevant impact on the portfolio performance[73].

$EuriborAvg\_corr\_infl_{t-1}$: The average annual EURIBOR level corrected by inflation resulted to be statistically significant at a 1% level; This result is in line with Italian analysis. An interesting fact is that, in Europe there is a strong dualism: among the top 17 banks for total assets about two-thirds didn't recorded a decrease in the interest margin. However, form the regression we see that the variation in the EURIBOR level had a relevant impact on the investment portfolio performance of the banking institutions.

$\Delta EUGov\_Bond\_Bench_t$: this variable resulted to be statistically significant at a 10% level with a negative coefficient. This data suggests us that the variation in the European long-term government bond yields had a impact on the banks' portfolio performances. In particular an increase in the Government Bonds prices seem to lead an increase in the performance; however the coefficient is very close to zero, then we can conclude that the impact has not been so accentuated as in the Italian case.

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[73] The ROA is calculated as Net Profits/Total assets as for the Italian case

The synthesis of the estimates is shown below:

Pooled OLS		
	Estimated $\hat{\beta}$	p-value
const	-0,0256 (0,0052)	3,20e-06 ***
ΔlnGDP_1	-0,0984 (0,0529)	0,0652 *
Inflation_1	-0,0490 (0,1512)	0,7464
EurAvg_corr_infl_1	-0,4815 (0,1454)	0,0012 ***
Δtier1_level_1	-0,0181 (0,0044)	7,39e-05 ***
ΔNPLcoverage	-0,0208 (0,0075)	0,0066 ***
ROA_1	0,4699 (0,1355)	0,0007 ***
ΔEUGov_Bond_Bench	-0,0002 (0,0001)	0,0822 *
Δln_M1	0,2520 (0,0699)	0,0004 ***

Standard error in parenthesis $R^2 = 0,45 \mid F(9, 126) = 12,86$

With the estimated equation:

$$\widehat{port\_perf\_corr}_{i,t}$$
$$= -0,0256 - 0,0984\,\Delta lnGDP_{i,t-1} - 0,4815\ EuriborAvg\_corr\_infl_{t-1}$$
$$- 0,0181\,\Delta tier\_level_{i,t-1} - 0,0208\,\Delta NPLcoverage_{i,t-1}$$
$$+ 0,4699\,ROA_{i,t-1} - 0,0002\,\Delta EUGov\_Bond\_Bench_t + 0,2520\,\Delta ln\_M1_t$$
$$+ u_{i,t}$$

8. CONCLUSIONS

After examining what are the determinants of banks' performance, with a particular focus on the determinants of the banks' proprietary portfolio, two econometric analyzes were performed, the first on the Italian scenario and the second on the European scenario. Interesting results have emerged from the analysis, some macroeconomic variables were found to be significant in both analyzes and with the same impact on the portfolio of individual banks, as the GDP behavior; also it emerged a strong duality within the Eurozone between the core countries and countries considered "stressed", i.e. the peripheral countries: the banks of the central countries such as Germany, France and Austria have suffered the worst consequences as a result of the financial crisis 2007 and were only marginally affected by the sovereign debt crisis of 2010. This is mainly due to the banks business model of those countries that is less classical than the peripheral countries; some banks, including Deutsche Bank, in fact, have recorded the major losses in the biennium 2008/2009, due to the nature of their portfolios, since there were significant percentages of derivative securities. Regarding the peripheral countries, some very important data emerged: most of the banks in these countries over the years has undergone a sharp decline in the net interest income, due both to the fall in the interest rates and to the lower lending activity to the real economy, meanwhile they recorded a significant increase in the non-interest revenue, including those from the investment portfolio. In addition, the level of NPLs is most decisive for the peripheral countries than for the central countries, whereas the coverage level of these impaired loans is higher in stressed countries than non-stressed countries. Finally, the level of regulatory capital required by the Basel agreements was found to be very significant for all the banks involved in the Italian and European analysis. In a future work, it could be interesting to deepen the current European analysis by increasing the number of banks included in the sample and by analyzing more specifically what variables, in addition to the regular course of the financial markets, mostly influence the portfolio performance of European banks; also, it could be an interesting analysis to consider a broader time window and seeing how changed the performances following the outbreak of the financial crisis.

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10. ANNEX – BANKS INCLUDED IN THE SAMPLES

<u>Italian analysis</u>

Bank	Total assets at 31/12/2015 in €
Unicredit	860.433.000.000
Intesa San Paolo	676.496.000.000
Banca Monte dei Paschi di Siena	169.011.977.000
Banco Popolare	120.509.595.000
UBI Banca	117.200.765.000
Banca Popolare dell'Emilia Romagna	61.621.231.000
Banco Popolare di Milano	50.203.300.000
Credito Emiliano	37.455.301.000
Banca Popolare di Sondrio	35.537.648.000
Banca Carige	30.298.856.000
Credito Valtellinese	26.901.681.000
Banco di Sardegna	13.205.940.000
Banca Desio e Brianza	12.248.130.000
Banca Profilo	2.039.951.000

<u>European analysis</u>

Bank	Country	Tot. ass. at 31/12/2015 in million €
BNP Paribas	FR	1.994.193
Crédit Agricole	FR	1.698.859
Deutsche Bank	DE	1.629.130
Banco Santander	ES	1.340.260
Scocìetè Gènèrale	FR	1.334.391
BBVA	ES	750.078
Intesa san paolo	IT	676.496
Commerzbank	DE	532.641
Natixis	FR	500.257
Crédit Industriel et Commercial	FR	253.976
KBC	BE	252.356
Banco Sabadell	ES	208.628
Erste Bank	AT	199.743
Banco Popular Espanol	ES	158.650
Deutsche PostBank	DE	150.597
Raiffeisen Zentralbank	AT	138.426
Greek National Bank	GR	111.232