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Course of Equity Markets and Alternative Investments

Technical method of State entry into the share capital of Private companies in the recent crises: a comparison between American and Italian experiences and the possible future role of CDP

Marco Morelli
SUPERVISOR

Langer Marshall
CO-SUPERVISOR

711641 Cristiano Colombi
CANDIDATE

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Abstract

During the crisis that started in 2007 in the US and moved into Europe during 2012, several governments were forced to make difficult choices. Governments from all over the world had to understand if and how to inject capital into Systematically important financial institutions and into other strategic companies such as General motors and Chrysler, trying to avoid a financial collapse.

This paper studies first how United Sates of America entered the equity capital of private and public companies under the Tarp and all the collateral programs established with the EESA of Bush Administration. It shows the trial of market volatility reaction after the announcement of the program, trying to understand the effectiveness of those measures to stabilize the financial system.

Then it focuses on the transmission of the crisis to the Eurozone and the origins of the double recession that hit Italy from 2008 onward.

Eventually the Italian crisis experience with Monte dei Paschi di Siena case, understanding the key differences between those two countries crisis reaction and different technical methods of equity purchasing. As made for the American experience I studied the historical volatility reaction after the capital injection into Monte dei Paschi di Siena trying to understand different trend for different measures.

The final aim of this paper is to delineate the possible future role of Cassa Depositi e Prestiti to face the recent Covid-19 crisis starting from the historical performances of two different approaches.

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Introduction

Financial crisis started slowly from a housing boom which suddenly ended into a housing bust, when prices plunged after they reached a peak during 2007, as shown by the housing price index. During this unprecedent development of real estate market, and given the high level of interest rates, financial institutions increased the amount of lending trough asset backed securities, or, to be more accurate, Mortgage backed securities since the underlying assets were pool of mortgages. This type of structured securities helped the financial system to increase their credit power and to boost the economy. The lender switched the default risk of the borrower to a SPV and then to the market, in order to use the proceeds of the selling to lend more money.

Those type of securities were divided in three tranches Senior Mezzanine and Junior. The payments of the different tranches were structured in order to grade the senior tranche as triple A, relying on the idea that mortgages defaults were independent one to another and so that the default risk of the entire MBS was quite low. This is generally true, but this moment of extreme confidence led to moral hazard by lenders which started to give more and more mortgages to people who did not have the right credit score: those borrowers were also known as subprime.

Once the housing price felt and Mortgages default rate increased, those type of securities became riskier and less liquid loosing lot of their value, a major issue for the biggest financial institution who had millions of MBS and CDO into their balance sheets. When the credit score of MBS has been cut by rating agencies and the default rate increased financial institutions occurred into huge losses.

This uncertain situation reduced the ability of banks to access private liquidity, which in several situation could become threatening.

It took only a few before first SIFI's faced hard times, September 2008 showed the U.S government takeover of Fannie Mae and Freddie Mac which officially started the U.S "bailout" season due to the distress of major financial lenders. Few weeks later Lehman brothers field bankruptcy. This event that signed the history of Merchant banks and finance, probably was more a political choice rather than a financial one. The government let Lehman fail to remember

to the financial system that no one – as stated by Andrew R. Sorkin – was really "too big to fail".

Meanwhile AIG one of the biggest Insurance company was able to keep going with its business only thanks to a $85 billion loan form the Federal Reserve.

A major issue in this situation was the lack of trust in financial institutions which reduced the number of transaction and the ability of financial firm to access credit market and so to meet liquidity needs.

This turmoil in the financial market was first driven by the uncertainty about the future and then by the fact that nobody really knew the MBS and CDO exposure of market participant making almost everyone an unreliable counterparty. In this situation, the US Government with the Federal reserve and the department of the treasury started working out on the EESA[1] "Emergency economic stabilization act" which has been amended the 3rd October 2008.

There was more than one possible opportunity to recover the financial system, one of the first idea was to purchase mortgage related toxic assets thus reducing the general uncertainty and at the same time depurating banks' balance sheets. However, in order to recover the stability in the financial system, EESA act established the TARP ("troubled assets relief program").

This program allocated half of its firing power to the CPP ("Capital Purchase program"), a program that directly added capital into banks' balance sheet through the purchase of preferred Shares. Under Tarp other programs were built, as AGP ("Asset Guarantee program") and TIP ("targeted Investment program"). Those were built to reduce the turbulences in the financial markets and at the same time trying to avoid a darker crisis.

At this point in time, the issue of the mortgage related toxic asset still remained, so the TARP also included the Public-Private Investment program PPIP, with the aim of valuing and removing those toxic assets from the balances sheets of heavily exposed financial institution, probably the TARP that was more similar to the TARP first draft.

The overall volume of the program should have reached an amount of $700 billion[2] but once United States reached out how to reduce the uncertainty in the financial system, the focus of

[1] P.L. 110-343, 12 U.S.C. 5311 et seq
[2] David M. Herszenhorn, "Congress approves $700 billion Wall Street bailout", The New York times, Oct. 8, 2008

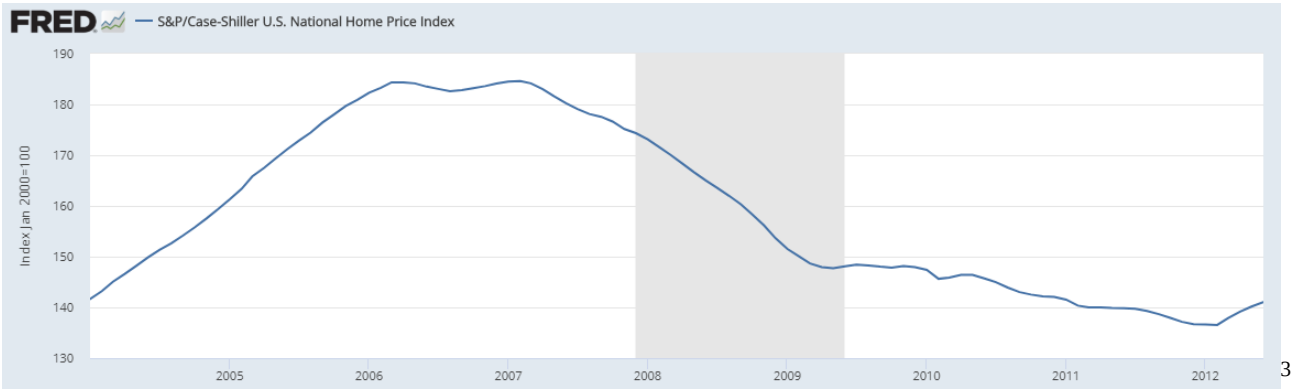
the Congress switched to regulatory changes. This led to the creation of "Dodd-Frank act", which amended TARP authority reducing the total amount to $475 billion.

The TARP action window to purchase new instruments or making new contracts expired the 3rd October 2010, leaving the Treasury with the only goal of maximizing taxpayers' "wealth".

Probably thanks to TARP program and Fed measures, United States of America avoided a darker financial crisis, but in which percentage each program contributed in saving American economy?

Let's go in a deeper analysis of TARP trying to understand first the details of each program and then how effective they have been.

FIGURE 1



[3]

Housing Price Index, source Federal reserve bank of saint Louis databases.

[3]S&P/Case Shiller U.S national home price index, source Federal reserve bank of saint Louis (FRED) databases. https://fred.stlouisfed.org/series/CSUSHPISA#0

Chapter 1:

Troubled Asset Relief Program

After a first phase of intervention in which Policy makers thought the crisis was mainly a Liquidity issue, faced by the Fed through Monetary policy, the Secretary of the Department of the treasury Hank Paulson in conjunction with the Fed and the government elaborated the first draft of Troubled asset relief Program, which was enacted on October 3rd, 2008 after a first rejection by the Congress in September.

In this second phase of intervention, the TARP worked out on the solvency of the Financial system.

The intervention has been very complex. In order to give a more detailed view of the overall program, we can divide Tarp intervention into four broader categories: Bank Support Program, Credit Market Program, Other investments program and Housing program.

1.1 Bank support program

1.1.1Capital Purchase Program

The first idea proposed was to buy from financial institutions those asset-baked-security, hardly hit by the housing bust at a higher price than the actual market price. This way they could restore confidence on the system, while depurating the banks' balance sheets.

This idea was quickly overcome by the final draft of the Tarp CPP. In fact, the Treasury thought to directly inject capital into Banks, in order to increase the capital Ratios, increase ability to recur to private funds and to cover major losses from Mortgage market.

The Capital Purchase program "CPP" has been the first program set out, with the aim just mentioned; the only question was how to add direct capital into banks.

In fact, under Section 2 of the Tarp Act, the program first aim was to "restore liquidity and stability to the financial system of the United states" in conjunction with four more points:

1) Protects home values, college funds, retirement account and life savings

2) Preserves homeownership and promote jobs and economic growth

3) Maximizes the overall returns to the taxpayers of the unites states

4) Provides accountability for the exercise of such authority

If we consider these four goals, we can understand why buying troubled mortgage backed securities was not a suitable option. It would have put "preserves homeownership" and "maximizes the overall return" one against the other. Moreover, it would have been hard to value a fair price for those securities, potentially a huge problem both in the acquisition phase and in the selling one.

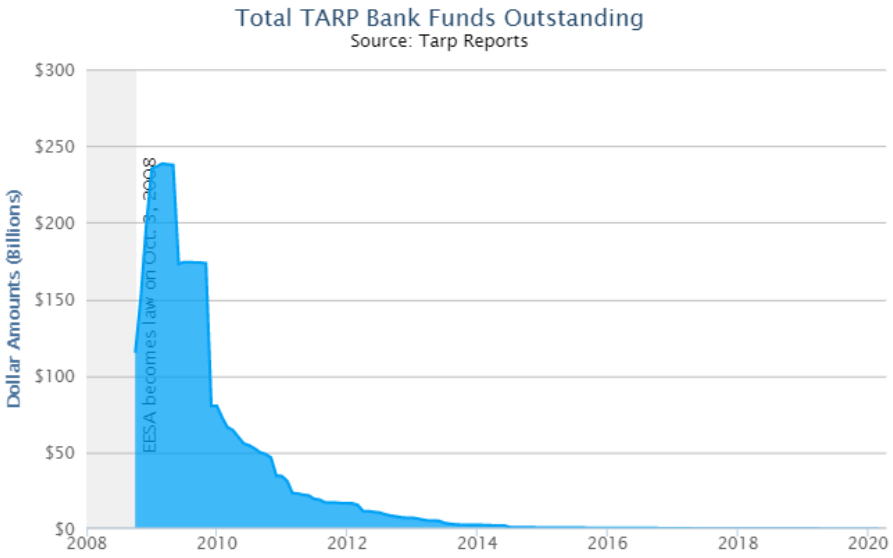
To try to get all four goals together, the Treasury figured out the best plan was to buy preferred shares with a set dividend payment and a grating of warrants. The dividends payment was set at a rate of 5% that after five years of payment would have rose to 9% permanently until the repayment.

For what concerns S-Corp Banks there was a different dividend rate. It was 7.7% and after five years it would have rose to 13.8% until the repayment. By the end of 2008 CPP had 214 participants banks and $172.5 Billion shares outstanding.

Obama administration and the 11th Congress modified the initial structure of CPP. They thought to allow banks to get an anticipated repayment without any financial penalty, as one of the initial clauses prevented the withdrawal from the program for three years. Even if Tarp programs have been useful for banks in the moment of difficulty, some of the restriction on compensation led the participant banks starting repaying Treasury funds as show in figure 2 below[4].

[4]Source Department of Treasury website, TARP tracker https://www.treasury.gov/initiatives/financial-stability/reports/Pages/TARP-Tracker.aspx#Bank

FIGURE 2



It is also important to underline that there was some restriction on the early repayment, to avoid another financial distress scenario. One of the major requirements was to make stress-tests to check the adequacy of the capital levels. Only the banks that got good performances on the tests could get the chance of the early repayment.

The ones who did not get satisfactory results had to raise more capital, or directly injected by the Government through Capital Assistance Program or by a private placement. No disbursement has been made by CAP program.

Citigroup in conjunction with the Treasury decided to convert its preferred shares into common shares, to meet the street test capital requirements. Since, as said before, one of the goals of the TARP program was to maximize taxpayer's wealth, it is crucial to observe the origin of the possible profit and losses on the CPP program.

Starting from the profit, they would have been mainly driven by the dividend's payments, the capital gain from the selling process and the warrants got from the recipients. On the other hands the losses could be generated by the failure in repaying the amount committed by the Treasury.

Analysing more in deep the proceeds from the warrants, Treasury did no used them to purchase common shares, but Treasury allowed those company to buy back their warrants directly in

conjunction with the repayment of preferred shares. To get a fair price of selling, once used option pricing theory with assumption on interest rates and prices, Treasury sold this warrant through an auction process, if not able to find an agreement with the institution. Here below the list of the top nine investments under the CPP program and the respective banks

FIGURE 3

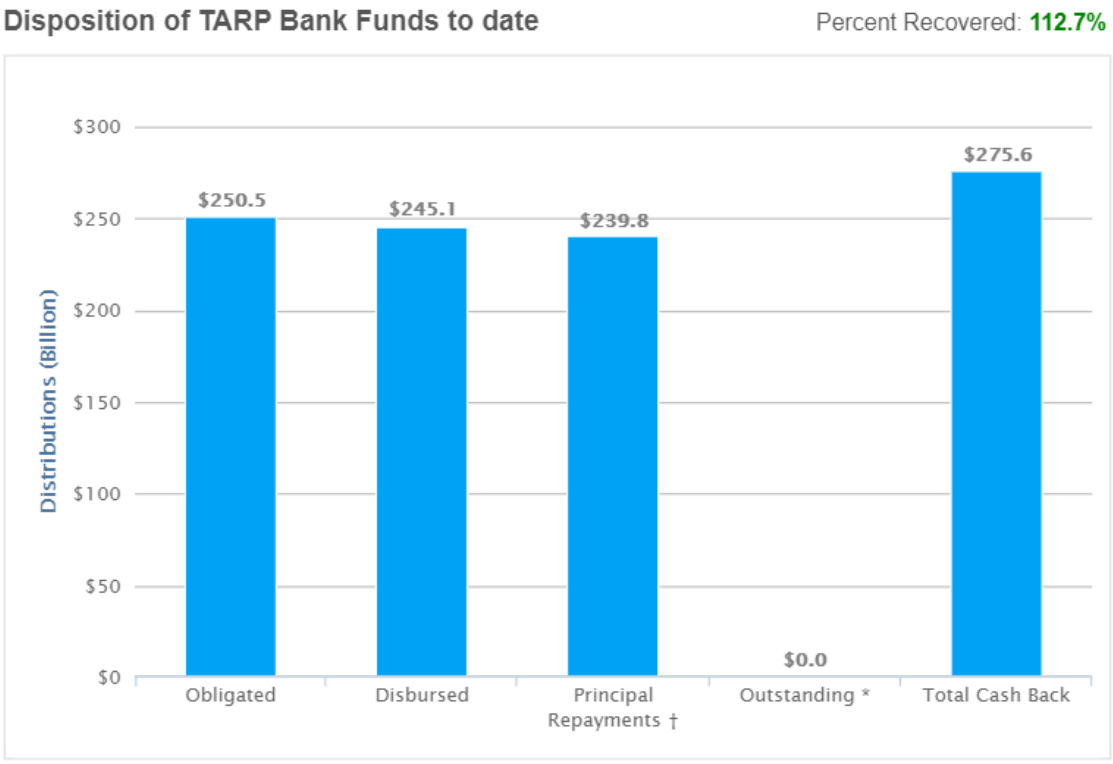
Institution	State	Transaction Type	Amount
Citigroup Inc.	NY	Purchase	$25,000,000,000.00
JPMorgan Chase & Co.	NY	Purchase	$25,000,000,000.00
Wells Fargo & Company	CA	Purchase	$25,000,000,000.00
Bank of America Corporation	NC	Purchase	$15,000,000,000.00
The Goldman Sachs Group, Inc.	NY	Purchase	$10,000,000,000.00
Morgan Stanley	NY	Purchase	$10,000,000,000.00
Bank of America Corporation	NC	Purchase	$10,000,000,000.00
The PNC Financial Services Group Inc.	PA	Purchase	$7,579,200,000.00
U.S. Bancorp	MN	Purchase	$6,599,000,000.00

[5]

The total Cash back of the Bank Support Program is $275.6 billion from a total disbursement of $245.1 but it would be reductive to tell that taxpayers and the treasury got a profit from this program, since we are not counting the risk undertook by the Treasury and the times value of the money, we are just evaluating the nominal profit.

[5] Source department of Treasury website, Amount and Program CPP. https://www.treasury.gov/initiatives/financial-stability/TARP-Programs/bank-investment-programs/cap/Pages/cpp-results.aspx?SortBy=Amount&Program=Capital%20Purchase%20Program&PageNumber=0&Direction=

FIGURE 4



[6]

1.1.2 Targeted Investment Program

Once the CPP has been implemented it included a $25 billion investment cap but since there were some financial companies that still needed help, the Targeted Investment Program has been designed. The TIP has been used to purchase preferred Equity in Citigroup and Bank of America, for a total of $40 billion. The major goal of the TIP was to stabilize those two systematically important financial institutions to avoid a broader disruption of financial markets. During 2009 both Citigroup and Bank of America repaid their investments, considering the warrants and the dividends this program got a total of $4.4 billion gain for taxpayers[7].

[6] Source U.S department of Treasury
[7] Waird Babel (2013). "Troubled Asset relief program (TARP) Implementation and status". Congressional research service, June 27, 2013.

1.1.3 Asset guarantee program

The Asset Guarantee program established by section 102 of EESA supplied Government aid to Bank of America and Citigroup. AGP supported the value of several assets held by those two institutions by an agreement of loss absorption on those assets.

This program has been developed and run by the Department of Treasury in conjunction with Federal Reserve and FDIC.

The main goal of the AGP was to restore confidence in the financial markets and as stated in the section 102, "strengthen the economy and protect American jobs, savings, and retirement security"[8]

Once the program has been closed the taxpayers got roughly $3 billion returns.

1.1.4 Citigroup (CPP/TIP/AGP)

Since AGP and TIP programs were mainly designed for Citigroup and Bank of America, I would like to make a more complex analysis of those two interventions.

On November 23, 2008 has been announced the intervention in Citigroup even if it was already a CPP $25 billion recipient. This additional intervention, made in conjunction by the Treasury, the Federal reserve and FDIC, consisted in a $20 billion-dollar preferred equity purchase (TIP) plus the guarantee of $306 billion of assets, which later was reduced to $301 billion on January 16, 2009 when the deal of AGP was finalized.

In order to enter AGP and to guarantee its assets, Citigroup paid a fee of $4 billion preferred securities with an 8% dividend rate plus warrants (given for both transactions).

Later, to be precise on February 27, 2009 Treasury and Citigroup agreed to convert the $25 billion CPP preferred stock into common equity and to remove the warrants taken under the Capital purchase program. Due to this transaction, through which U.S government owned roughly 33% of Citigroup common equity (7.7M shares), the Treasury priority in the event of liquidation worsened whilst the potential upside reward increased. In fact if the preferred equity

[8]Report to Congress Pursuant to Section 102 of the Emergency Economic Stabilization Act, 31/12/2008 https://www.treasury.gov/initiatives/financial-stability/reports/Documents/sec102ReportToCongress.pdf

could be redeemed only at par no matter the stock performances, this was not the case of common equity. For what concerns Citi, the common equity increased its capital ratios and alleviated the company for the dividend payments. In December 2009, another step forward was made. Citigroup and the treasury agreed to repay the $20 billion preferred equity stake and to eliminate the Asset guarantee program.

In this deal, the Treasury wrote off $1.8 billion of the $4 billion warrants fee of TIP and AGP transaction. Under the asset guarantee program, no funds were been disbursed. The treasury started selling its stake in Citigroup in April 2010. The selling process was divided in tranches, 4.1 million shares sold by September 2010 and by December 2010 all the 7.7 million shares were sold. Average selling price has been $4.14 per share versus the conversion price of $3.25 per share with a gain for the Treasury of roughly $6.9 billion accounted at CPP gains. The profit from interest and dividend and from the selling of remaining preferred equity has been respectively $2.9 billion and $2.2 billion. So, the total nominal gain from the Citigroup intervention has been $12.1 billion.[9]

Here below, figure 2 shows the results in a more practical way.

FIGURE 5

Citigroup Support (CPP/TIP/AGP)

	Federal Government				Terms and Conditions			
Program	Current Asset Holdings/ Guarantees	Asset Holdings/ Guarantees at Peak	Total Income	Realized Capital Gains(+)/ Losses(-)	Dividend/Fee	Warrants Issued	Subsequent Conversion/ Amendment	Expiration Date
Capital Purchase Program	$0	$25 billion	$0.9 billion (dividends); $.05 billion (warrants)	$6.9 billion	preferred: 5% dividend for first 5 years, 9% thereafter; common: none	210 million with a strike price of $17.85 per share	Converted preferred shares to common stock, subsequently sold for $31.9 billion.	None, shares outstanding until sold or repurchased.
Targeted Investment Program	$0	$20 billion trust preferred securities (until Dec. 2009)	$1.6 billion (dividends); $0.19 billion (warrants)	$0	8% dividend	188,5 million with a strike price of $10.61	Converted preferred shares to trust preferred securities.	None, shares or securities outstanding until sold or repurchased.

[9] U.S Treasury, "Taxpayers receive $10.5 Billion in proceeds today from final sale of Treasury departments Citigroup common stocks" press release December 10, 2010.

Asset Guarantee Program	$0	$301 billion (up to $244.8 billion of losses borne by Fed, Treasury and FDIC) (until Dec. 2009)	$0.44 billion (dividends); $0.07 billion (warrants); $50 million termination fee to Fed	$2.2 billion	following termination, $2.2 billion in trust preferred securities with 8% dividend	66,5 million with a strike price of $10.61 per share	$1.8 billion canceled upon termination of Asset Guarantee.	Nov. 2018 (residential assets)/Nov. 2013 (non-residential assets)

Sources: June 21, 2013, Daily TARP Update; October 2011 TARP 105(a) Report; October 2011 TARP Dividends and Interest Report; SIGTARP, *Extraordinary Financial Assistance Provided to Citigroup, Inc.*, January 13, 2011; U.S. Treasury press release, December 10, 2010.

1.*1.5 Bank of America (CPP/TIP/AGP)*

On January 16, 2009 a massive intervention in Bank of America was announced by the Fed, the Treasury and the FDIC, even after the injection of $25 billion under the CPP program (for which the Treasury got with a $30,79 strike price warrants for 121,792,790 shares).

This additional intervention made under Targeted Investment program consisted in a $20 billion preferred equity purchase by the "government" in front of warrants for 150,375,940 shares at $13,30 strike and $118 billions of guarantees under the asset Guarantee program, the major part of them acquired after the merger with Merrill Lynch. The guarantee fee was a $4 billion preferred equity with an 8% dividend rate plus a $2,4 stock worth warrants.

Even if the announcement was being made, a final deal was never reached, after a period of 8 months Bank of America announced that it would not be part of the Asset Guarantee program and that it signed a $425 million termination fee with the Treasury.

On December 2009 Bank of America repurchased the $45 billion preferred stock raised under the CPP and Tip program, meanwhile the warrants raised for the intervention were sold during an auction in March 2010 that generated $1.6 billion.

FIGURE 6

Federal Government					Terms and Conditions		
Program	Current Asset Holdings/ Guarantees	Asset Holdings/ Guarantees at Peak	Total Income	Realized Capital Gains(+)/ Losses(-)	Dividend Rate/Fee	Warrants	Expiration Date
Capital Purchase Program	$0	$25 billion (until Dec. 2009)[a]	$1.3 billion (dividends); $0.3 billion (warrants)	$0	5% for first 5 years, 9% thereafter	121,792,790 warrants sold for $0.3 billion.	None, shares outstanding until repurchased.
Targeted Investment Program	$0	$20 billion (until Dec. 2009)	$1.4 billion (dividends): $1.25 billion (warrants)	$0	8%	150,375,940 warrants sold for $1.25 billion	None, shares outstanding until repurchased.
Asset Guarantee Program	$0	$118 billion (up to $97.2 billion of losses borne by Fed, Treasury and FDIC) (never finalized)	$425 million termination fee to government ($57 million termination fee to Fed)	n/a	n/a	n/a	Jan. 2019 (residential assets)/Jan. 2014 (non-residential assets).

Source: October 12, 2012, Daily TARP Update; October 2011 TARP 105(a) Report; October 2011 TARP Dividends and Interest Report; Congressional Budget Office, *Budget and Economic Outlook*, January 2010; SIGTARP, *Quarterly Report to Congress*, January 30, 2010; OMB, *Analytical Perspectives, FY2011 President's Budget*, Table 4-7; February 2010.

1.1.6 CDCI

The Community Development Capital Initiative has been established in order to support the credit market for low/moderate income communities and small businesses. CDCI purchased preferred shares of the banks who helped the low-income credit market up to 5% of risk weighted asset speaking of banks and thrifts, up to 3.5% of total assets speaking of credit unions. These preferred shares payed a dividend rate of 2%; after eight years it would have increased to 9%, no warrants included into the CDCI preferred equity purchase.

Lot of the participants to this program have been introduced to CDCI once converted by CPP. At the end of the program, eighty-four institutions received roughly a total of $570 million.

1.2 Credit Market Programs

1.2.1 Public Private Investment Program

Public Private Investment Program has been developed and implemented by Timothy Geithner former N.Y federal Bank governor and successor of Hank Paulson at the Department of Treasury. PPIP has been announced on March 23, 2009.

This program was designed to provide liquidity to the "toxic" asset backed security owned by the banking system, through the purchasing of those assets by private investors that provided their capital and manged those securities.

Profit and losses would have been absorbed together by the private investors and the Government.

After the announcement of this program on March 23, 2009 the Dow jones industrial index rose by 500pt roughly 6.84% up to 7775.86.

In the parterre of the investors who decided to participate to this program there were Blackrock and Pimco, attracted by the chance of two digits return given by the structure the transactions. The good reaction of markets and investors came from the great terms of the deal (investors side).

In fact, the Government would lend as much as the 85% of the ABS and MBS prices. Those securities would be sold by auction from the Banks who would clean up their balance sheet even if they could occur into a loss.

Moreover, the Treasury would like to invest, for the remaining 15%, $1 for each dollar invested by the private investors.

This program probably started to increase financial confidence into the system, using the words of Laurence D. Fink "you could say that by the latter part of this year, we could start seeing the economy start restabilising itself"[10]

[10]Andrewes, Dash, (2009), U.S. Expands Plan to Buy Banks' Troubled Assets, The New York Times https://www.nytimes.com/2009/03/24/business/economy/24bailout.html

1.2.2 TALF

The Term Asset Backed Securities Loan Facility program (TALF) has been done in a joint venture of the treasury and the Federal Reserves to sustain the Asset Backed Securities market and the Banks system.

The TALF has been operational since 16th March 2009. Its goal, initially, was to increase new customers and businesses loans, but after this starting idea the program was slightly changed to finance the existing MBS market including asset backed by commercial real estate loans.

Those loans would be only secured by the underling of the contract, so if a default would have occurred the government could dispose of the home/building object of the loans, this way of lending is also known as “non-recursive”.

1.3 AD HOC programs

In this section, we will roughly describe the program assistance for AIG, GM and Chrysler. Those programs have been developed ad hoc to sustain this Systematically important companies.

1.3.1 Systemically Significant Failing Institution Program

The SSFI program was announced on November 10, 2008.

The only use of this program has been the preferred shares equity purchase in AIG, in addition of the other program which addressed AIG.

In fact, the insurance company got totally $172,4 billion before 2010[11].

The assistance to this huge institution was renewed in 2011 with a Treasury peak of $67.84 billion and a total ownership by the government of 92%[12]

The last selling of this program has been made in December 2012; this is one of the major losses coming from Tarp assistance program. In fact, the Treasury disclosed $13.5 billion losses, only considering the equity sales of the treasury, excluding the Fed ones.

1.3.2 Automobile Industry support

During 2008 and 2009 the credit crisis and the economics "recession" created the worst condition for the automotive market, the fear that a failure of a big automotive company could worsen the economic condition led the treasury and the congress to provide loans and preferred shares purchasing for GM, Chrysler and GMAC[13] (General Motors Acceptance Corporation).

[11] Journal of economics Perspectives – Volume 29, number 2, Spring 2015 Calomiris, Khan "An assessment of Tarp Assistance to financial Institution" p59
[12] CRS report R41427
[13] Now called Ally financing

GM received, both the new and the old company, a total of more than $50 billion[14] under the TARP assistance with a Government ownership of 60.8%[15]. Those stake into GM was sold during the time in more than one tranche.

The first one was an IPO in late 2010 reducing the government stake to 33.3%, the second one a stock selling to GM in December 2012 and the last one, a progressive selling to the market.

Chrysler got a lower amount of dollar by the Treasury but those money were crucial to the deal that the company made with Fiat, in fact the equity stake of the Government in Chrysler (13.8%) was sold to the Italian Company in May 2011.

Finally, the GMAC stake selling was planned in 2011 but it has been modified to get more advantageous market conditions. Tarp assistance for General Motors Acceptance Corporation was about $17.2 billion[16] mainly in preferred equity, which was converted into common equity.

This conversion led to a 73.8% Government equity stake but mainly left the company with no responsibility for the potential losses of the equity stake selling (if the price of selling would have been lower than the purchasing price) whilst if this shares selling would get a gain, those money should be accrued to the Treasury lowering the national Debt.

The final selling of the ally Financing shares was in 2014, with a total of $2.5 billion losses for the treasury, without considering the $4.9 billions of dividends previously got for the preferred shares.

[14] https://crsreports.congress.gov/product/pdf/R/R41978/17
[15] CRS report R41427
[16] https://crsreports.congress.gov/product/pdf/R/R41846/14

1.4 Housing Programs

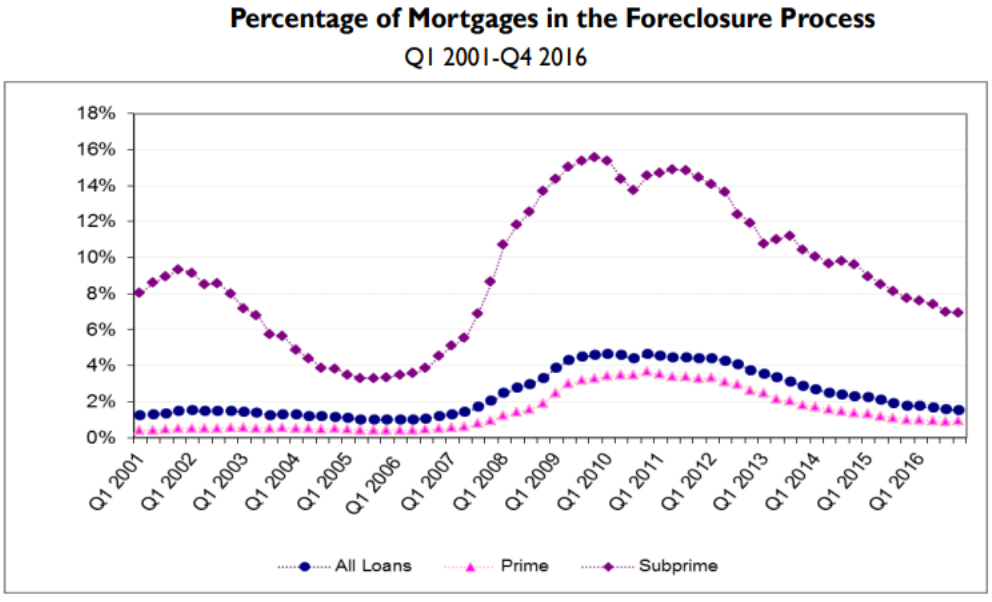
The programs that the Tarp made up to support the House market, unlike the other tarp programs, have not been made to result in assets or returns, but with the only aim to support and sustain mortgages, house prices and householders.

In fact, from 2006 the foreclosure rate started raising, as figure 7 shows, and it kept going for several years. The congress, Bush and Obama administration understood the warning of this signal and took different initiatives to sustain the housing markets. Foreclosures (which has been one of the main objects of the programs) can negatively affect households in many way:

- People who lose their house due to foreclosure may have difficulties in finding a new home or to finance a new loan
- Concentrated foreclosure can impact housing prices, lowering the economic activities, and housing transactions
- Destabilising housing markets can harshly impact economy as whole
- The housing price falling can impact also derivatives markets and limit the overall credit to the economy

The different program that we are going to summarize have been closed by 2016.

FIGURE 7



[17]

[17]Congressional Research Service (2017), "Preserving Homeownership: Foreclosure Prevention Initiatives" R40210 https://crsreports.congress.gov/product/pdf/R/R40210/48

1.4.1 Make Home affordable

President Barak Obama on February 18, 2009 announced the Making Home affordable initiative which was divided into two main programs:

- HAMP which helped troubled borrowers to obtain affordable loan modification
- HARP that made easier to refinance mortgages by homeowners with little equity or no equity in their homes.

1.4.2 Hardest Hit Fund

This TARP program was designed to provide funds to the States in a foreclosure prevention programs environment, possible under certain conditions, such as high unemployment rate or states that experienced deep declines in housing prices.

Under the HHF from the pool of $7.6 billion possible, only $2.6 billion has been used, may due to the condition set for the states.

1.4.3 FHA Short refinance

This program should have promoted mortgages refinancing on those properties on which mortgage balance was greater than the current market value of the house, under the approval of the lenders. Only $0.06 billion has been disbursed by the department of the Treasury.

Total Tarp program saw an obliged amount of $456.56 which has been divided as follow:

***TARP** program*	Obliged Amount
Banks Support Programs	$250.46
Credit Market Programs	$20.08
AIG assistance	$67.84
Auto Industry program	$79.69
Housing Program	$38.49
Total	**$456.56**

1.5 Results

One of the major goals of Tarp since the initial idea through the whole program life has been to stabilize and restore confidence into the financial markets.

Initial CCP program was designed not only to support banks financial statements or their ability to cover losses from toxic assets, but mainly to restore confidence on those institution and giving them back the ability to recur to credit market.

Once banks and financial markets would have stronger position and credibility, credit market and economy could restart. In order to understand if Tarp Program reached its objective, we decided to analyse historical Average volatility taken on 30, 50 and 100 days and to compare the variation of those measures with the announcements of each program.

I decided to take into consideration the major public institution that has been Tarp program recipients plus the S&P 500 which we consider as a proxy of the overall market confidence.

To asses if Tarp program has been effective in reducing volatility and restoring confidence, I did analyse also Ted spread, Libor OIS spread and Vix Index.

Now, to evaluate the results I should know each of the different program announcement and starting date. All this information has been published on the Department of Treasury website, starting from 2008, date in which the first program Idea has been disclosed.

1.5.1 Timeline of the event:

Here below the timeline of the events:

14 September 2007 Northern rock Crisis

17 March 2008 Bearn Stearns Collapse

15 September 2008 Lehman Brother announced the firm were going to fill Chapter 11 of Bankruptcy code.

3 October 2008 EESA passed by the 110th U.S congress and signed into law by the president G.W Bush became law as a section of Public law 110-343

13 October 2008 Paulson, Bernanke, Geithner and the CEO's of nine of the major financial institution meet to discuss about Tarp and CPP. "News of the meeting helped propel a 936 point or 11 percent gain in the Dow Jones Industrial Average – the Dow's largest single-day point gain ever and largest percentage gain in nearly three quarters of a century"[18].

14 October 2008 The Treasury in conjunction with the Fed and the FDIC announced the launch of CPP, disclosing the total amount of $250 billion and that nine of the nation's larger financial institution applied for $125 billion of the program.

12 November 2008 Secretary Paulson announced that Tarp program was not going to purchase toxic asset, he stated that he changed his mind on how to allocate Tarp funds since events has changed. That day Dow Jones industrial felt by 411bp/4.11%

23 November 2008 The Treasury announced the AGP and TIP program for Citigroup, the share price of Citigroup rose by 58bp the following days. Treasury, the Federal Reserve, and the FDIC announced an agreement to provide further aid to Citigroup. Under the agreement, the government would insure a pool of $306 billion in assets against unusually large losses. Citigroup would have responsibility for the first $29 billion in losses. Any losses in excess of that amount would be shared between the government (90%) and Citigroup (10%). The government's share of those losses would first be allocated to Treasury through TARP (up to $5 billion); second to the FDIC (up to $10 billion); and the remainder through a non-recourse loan from the Federal Reserve.

Treasury also agrees to invest an additional $20 billion in Citigroup from TARP in exchange for preferred stock with an eight percent dividend to the Treasury. In addition to the higher dividend rate than available through the Capital Purchase Program (CPP), Citigroup would be required to comply with enhanced executive compensation restrictions and to implement the FDIC's mortgage modification program as a part of this investment.

24 November 2008 Treasury announced the extension of the Money Market guarantee program until April 2009.

[18] U.S Department of Treasury Timeline webpage, https://www.treasury.gov/initiatives/financial-stability/reports/Pages/tarp-tracker.aspx

22 January 2009 Treasury disclosed an additional $1.5 billion investment for Smaller banks under CPP program.

February 2009 First CPP report about lending of the top 20 TARP recipients has been released. The Treasury also announced the beginning of the forward-looking stress test program.

March 2009 Signature Bank, Old National Bancorp, Iberiabank, Centra Financial Holdings Company and Bank of Marin Bancorp became the first five banks even if small ones to repay TARP funds.

7 May 2009 Secretary Timothy Geithner released the Stress test program results, in which it has been disclosed that 10 out 19 institutions would need to raise additional capital in the most adverse scenario for a total of $75 billion. Between those 10 institution Bank of America would need $33.9 billion, Wells Fargo $13.7 billion, GMAC also known as Ally financing $11.7 billion and Citigroup $5.5 billion. Even if those institution required additional capital, the restored confidence in the financial markets and a tightening CDS allowed them to recur to private capital, without additional government spending.

01 June 2009 Federal Reserve outlines requirement in the SCAP program to redeem the Treasury capital injection into the financial system. 10 of the 19 larger financial institutions has received the approval to repay $68 billion of the CPP program.

President Barak Obama told “So today's announcement is welcome news to me” with reference to the taxpayer’s return gained with this operation.

June 2009 Treasury and Citigroup finalized an agreement on the exchange of publicly held convertible and non-convertible preferred and trust preferred securities. Under the agreement, the Government will exchange a portion of its preferred securities with an aggregate liquidation value of up to $25 billion for interim securities and warrants and its remaining preferred securities for trust preferred securities.

Assuming full participation of holders of convertible and non-convertible public preferred and trust preferred securities in the exchange offers, Citi will convert into common shares approximately $58 billion in aggregate liquidation value of preferred stock and trust preferred securities.

23 July 2009 Citigroup announced the agreement with the department of Treasury to convert $12.5 billion of preferred equity shares into common shares, additionally to the previous conversion of June 2009.

03 September 2009 Citigroup shareholders approved the stock conversion thought which U.S Gov would have 33.6% of outstanding shares.

September 2009 Bank of America announced it would exit from the AGP program by paying a $425 million fee.

December 2009 Final investments under CPP program has been made, during the same month Citigroup and Bank of America repaid in full their TIP investments, in addition to $3 billion dividends. Total return has been $43 billion plus warrants.

Since I am going to use several tools in order to analyse the effect of Gov Support during 2008 crise, may it could be useful to understand more in dept how those measures are built up and the way they work.

1.5.2 Historical Volatility

Historical Volatility reflects the price movement of an underlying asset that verified during a defined time frame, and so it reflects the past, meanwhile the implied volatility reflects the market expectation of future volatility.

There are two main version of volatility, the Statistical volatility and the Parkinson Volatility, the first one is computed by the standard deviation of a stock/index over a fixed number of days, returns are defined as the Ln difference of the close to close prices.

The Parkinson's historical volatility is computed as follow:

$$x_t = \ln \frac{P(t)}{P(t-1)}$$

$$\bar{\bar{X}} = \frac{1}{\mathrm{n}} \sum_{t=1}^{n} x_t$$

$$HV = \sqrt{\frac{1}{n-1} \sum_{t=1}^{n} (x_t - \bar{\bar{x}})}$$

In the computation of historical volatility, we divide by (n-1) in order to ger a unbiased estimates of general dispersion, which is critical during small amounts of time.

In order to have a deeper understanding of which is the level of volatility which is associated to a index/Stock it's particular helpful to compare different time horizons of historical volatility in order to get a broader view of the underlying movements.

I am going to use this measure also for its property, in fact as stated by the Corporate Finance Institute "volatility is generally a measure of the riskiness of an investment. Increased volatility serves as an indicator for increased uncertainty and risk", obviously we are going to use this tool in the opposite way, trying to understand the reduction of uncertainty.

I decided to compute historical volatility through the Parkinson model, starting from the price download and then computing the values as stated before.

1.5.3 VIX index

Another important tool in order to assess the volatility in the market, and therefore its confidence, is the Vix Index[19]. This index is designed to be an up to the minute estimate of market expected volatility of the S&P500 index.

The computation of the index starts from the midpoint of real time S&P500 index option bid/ask spread quotes. Its goal is to provide an instantaneous indicator of "how much the market expects the S&P500 index will fluctuate in the 30 days from the time of each tick of the VIX index"[20]

It is computed as follow:

$$\sigma^2 = \frac{2}{T}\sum_i \frac{\Delta K_i}{K_i^2} e^{RT} Q(K) - \frac{1}{T}\left[\frac{F}{K_0} - 1\right]^2$$

- σ = VIX/100
- T time to expiration
- F Forward index level derived from index option prices
- K_0 First strike below the forward index level, F
- K_i Strike price of ith out-of-the-money option; a call if Ki>K0 and a put if Ki< K0; both put and call if Ki=K0
- ΔK_i Interval between strike prices – half the difference between the strike on either side of Ki:

$$\Delta K_i = (K_{i+1} - K_{i-1})/2$$

(Note: ΔK for the lowest strike is the difference between the lowest strike and the next higher strike. Likewise, ΔK for the highest strike is the difference between the highest strike and the next lower strike.)

- R risk free interest rate to expiration
- Q(Ki) The average of the bid quote and ask quote for each option with strike Ki.

[19] https://cdn.cboe.com/resources/vix/VIX_Methodology.pdf
[20] https://cdn.cboe.com/resources/vix/VIX_Methodology.pdf

FIGURE 8

[21]

Vix Volatility index values, period 2007/2011

If we look at the data from figure 8, which represent the VIX index during the period between August 2007 and August 2010, we can see that the higher level of volatility expected by the markets has been reached on October 2008. The grey line represents a recession period.

The same stabilization effected denoted on the historical volatility is observable in the expected volatility. That means the Speech of Hank Paulson, the news about the Treasury buying preferred equity of private companies and all the programs I studied before had a positive effect on the expectation of the market about the US economy.

Since there is a negative correlation between the Vix index and the S&P500[22] performances we can easily understand that the idea of a bailout season and the Government entering into private companies boosted the U.S stock market performances.

[21] https://www.macrotrends.net/2603/vix-volatility-index-historical-chart
[22] CBOE product description webpage:
http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/the-relationship-of-the-spx-and-the-vix-index

1.5.4 Analysis:

I am going to start the analysis on the stabilization process of the HVT 30 days. As shown by the visual representation the historical volatility during the time windows from early September 2008 until March 2009 shown a high level of uncertainty for the following stocks:

1) Citigroup
2) Bank of America
3) JP Morgan
4) Goldman Sachs
5) Wells Fargo
6) Morgan Stanley

If we compare the timeline we studied before, we can easily see that the day after the disclosure of the Department of Treasury in which Tarp Funds has been announced the volatility plunged. Which means that even without a lot of information, just the intention of the Government to intervene into the market with a massive action helped to restore confidence and to reduce volatility.

After a first visual understanding of the HVT plot, I performed a correlation analysis between the historical average volatility of the six stocks trying to understand if the positive shocks of the Government disclosure were correlated between different companies.

The results are shown in the table 9. It's relevant that quite all the correlation is over 0,9 which means that market reaction has been the same in all the different companies which operates in the banking sector, no matter the individual situation.

Most important is to underline that if there is a high degree of correlation it means that the positive shock given by the speech of Hank Paulson the 14th October 2008 has been symmetric for the whole banking sector.

It is important to underline that all the companies in my analysis have been recipient of CPP program, that corroborate the thesis of a symmetric shock since they have been exposed to similar intervention.

The 14th of October is the announcement of the CPP, which let me think that in a period of crises (in this specific case a liquidity/solvency crises), the idea that the Government would purchase preferred equity from financial institution is able to stabilize the market.

Probably the idea that the Government will be potentially exposed to the default risk of such great companies let the market think that Treasury will be fully committed to not let this happen.

The main difference between those stocks has been the level of volatility, in which the specific company current situation influenced market confidence.

FIGURE 9

	Citi	*Bac*	*Jpm*	*GS*	*WFC*	*MS*
Citi	1,000	0,922	0,930	0,882	0,906	0,782
Bac	0,922	1,000	0,960	0,852	0,977	0,784
Jpm	0,930	0,960	1,000	0,919	0,946	0,846
Gs	0,882	0,852	0,919	1,000	0,810	0,934
WFC	0,906	0,977	0,946	0,810	1,000	0,713
MS	0,782	0,784	0,846	0,934	0,713	1,000

The Highest level of HVT has been 292, reached by Morgan Stanley, it makes sense, since the situation MS had during the financial crises.

Morgan Stanley lost over 80% of its market value during the period from 2007 until 2008, mainly because his entrance inside the Credit Default Swap[23] market and due to its prime brokerage activities as Bloomberg news reported[24], moreover MS has been the company that draw more water from the well of Fed, $107 billion to fund its daily activities.

[23] A credit default swap (CDS) is a financial derivative or contract that allows an investor to "swap" or offset his or her credit risk with that of another investor. For example, if a lender is worried that a borrower is going to default on a loan, the lender could use a CDS to offset or swap that risk. To swap the risk of default, the lender buys a CDS from another investor who agrees to reimburse the lender in the case the borrower defaults. Most CDS will require an ongoing premium payment to maintain the contract, which is like an insurance policy.
A credit default swap is the most common form of credit derivative and may involve municipal bonds, emerging market bonds, mortgage-backed securities or corporate bonds

[24] B. Keoun, "Morgan Stanley at Brink of Collapse Got $107 Billion From Fed", Blomberg news, Aug, 23, 2011 https://www.bloomberg.com/news/articles/2011-08-22/morgan-stanley-at-brink-of-collapse-got-107b-from-fed

It's not a case that the second drawer of funds from the Fed has been Ctigroup $99,5 billion, which in fact show the second higher HVT of 272 reached on 23rd March 2009.

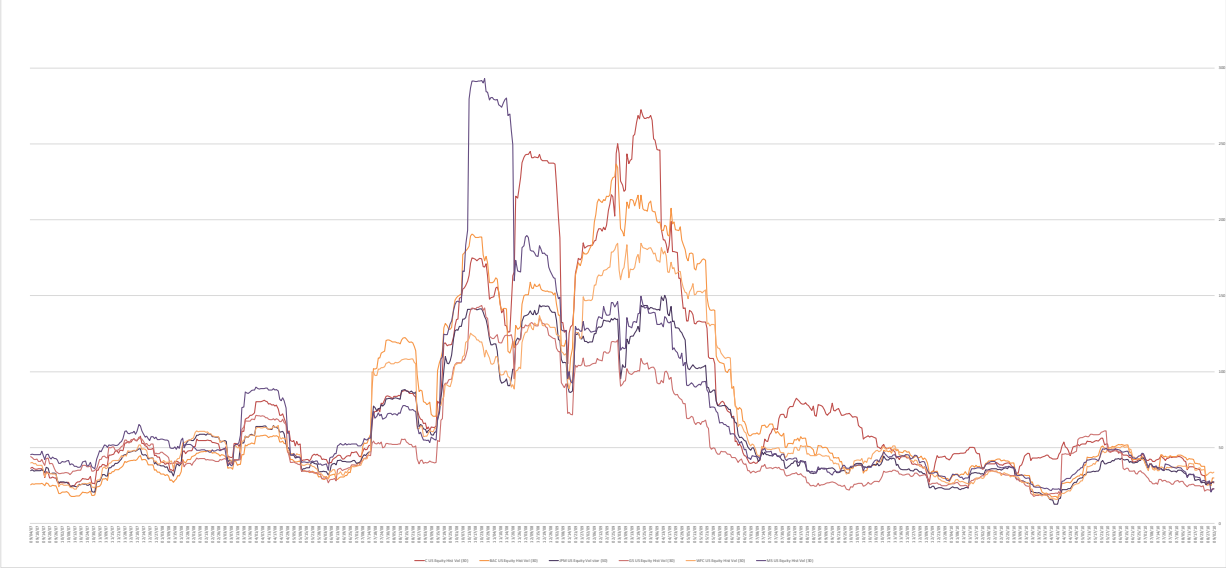
As stated before, Citigroup has been one of the hardest hit Financial institution, so it also means the HVT is a consistent tool in order to understand which companies are facing hard times.

If we go deeper in the analysis, we see that the spike of HVT of Citigroup has been reached during November 20th, 2008, exactly one week later the disclosure of the 12th of November.

In this press conference the Treasury announced it was not going to purchase toxic assets from the banking sector.

Markets reacted badly to this decision fearing a deterioration of the MBS market and so of banks position. In fact, if looking at the Vix index we see a second spike during the month of November, lower than the peak of October but still very high. That means the markets expected a Government intervention directly into banks' balance sheet purchasing toxic asset from the most exposed banking institutions. Third company in the HVT ranking is Bank of America, mostly because it has been involved into the acquisition of Merryl Lynch, due to this situation, and being one of the most important financial institutions, BofA had to take lot of funding from both TARP and the Fed programs.

FIGURE 10



25

[25] Bloomberg dataset, Historical average volatility 30 days, period 2007/2010

If we analyze the S&P500 with the same tool, we got indeed similar results. Indeed, we see a spike in the HVT during the month of October 2008. A second peak during the month of November after the press release of 12nd of November.

Finally, a stabilization after the disclosure of AGP and TIP programs made by the treasury on the 24th of November.

In fact, these last two programs were designed both to inject capital and both to guarantee toxic related assets, which is consistent with the idea that the market probably needed a government participation into the toxic assets market, directly or indirectly.

The time through which the historical volatility stabilized is greater than the one we saw with the VIX index, simply because HV represent the mean of the 30 days before. It is a lagged backward-looking measure, meanwhile the VIX index is a forward-looking measure.

So even if lagged, the results of the analysis look consistent.

FIGURE 11

Historical average volatility 30days S&P500

If we compare all the different indicators, we used to understand the effectiveness of U.S Gov measures we get the same results. The day after the speech of Hank Paulson the volatility in the market felt, reaching a lower level.

After the speech of the 12 November the volatility, both historical and implied, increased since the Treasury was not going to purchase toxic related assets.

The second moment in which confidence was restored has been after the conference of the 24th of November in which it was clear that the Government would never let happen a financial collapse, and it would do whatever it could took to recover the economy and the financial system, even guarantee toxic related asset and inject additional liquidity into banks' balance sheets.

Chapter 2:

2.1 Eurozone Crisis

2.1.1 Overview of the crisis

The global financial crisis was not limited to the United States, but it was transmitted to the Eurozone through European financial institution that had important exposures to toxic assets.

Initially it started as a banking crisis that suddenly turned into an economic recession and a Sovereign Debt Crisis, in order to understand the Italian experience, it is needed a deeper understanding of the Eurozone crisis, which started slowly but it was inexorable.

In the very first's steps of the transmission from the US to the Eurozone the crisis has been faced quite well. Even if several countries with the most exposed banking system faced several bailouts – see Daxia, Northern Rock or Commerzbank – the system was ready to face the situation with prompt actions.

Meanwhile periphery countries with more debt imbalances, and poor fiscal accounts, started to have troubles. Those in trouble (like Ireland or Greece) faced this lately and incompletely also because European Union was not ready to face "politically" and "institutionally" such an asymmetric crisis.

Once the GIIPS[26] countries showed a higher risk of default, the Sovereign debt crises showed up. Indeed, the higher risk of default pushed up the yield of those country bonds, which means higher cost of funding. Consequently, the higher yield pushed down the bond prices, and since the major lender of the States was national banks the crisis involved also the banking system.

The stress of the countries and of the market was faced with austerity measures for GIIPS countries and liquidity injection that took time to show the first results.

Not every member state of the European Union faced the crisis passively, those countries with less fiscal imbalances were free to use deficit to support the economy, the GIIPS countries which had poorer fiscal balances had not the possibility to use deficit, for two main reasons.

The first one is that higher deficit means higher default risk perceived by the market that lead higher yield and so on so forth a vitious cycle.

[26] GIIPS stands For Greece, Italy, Ireland, Portugal and Spain. Source Wikipedia https://it.wikipedia.org/wiki/PIGS

The second one is the austerity rules provided by the EU worried by the default risk that would have been a cascade effect on all the different member states.

The Eurozone crisis is way more complex than the global financial crisis, in fact, is a mix of three crisis[27], a Growth crisis, a Banking crisis and a Sovereign debt crisis, each of them fulfilling the others.

Let's now try to understand the prodrome of the crisis, which is the European situation and the reason why it may be not ready to face such a crisis.

Taking the words of Tommaso Padoa-Schioppa of May 1998 after the introduction of the European common currency "la capacità di politica macroeconomica [dell'unione economica e monetaria europea] è, salvo che per la moneta, embrionale e sbilanciata [...] Per la Banca centrale europea la vera insidia non sarà la poca indipendenza, ma la troppa solitudine [...] operare quasi nel vuoto, senza un potere politico, una politica di bilancio, una vigilanza bancaria, una funzione di controllo dei mercati finanziari. [...] Ha dunque ragione non solo chi applaude il passaggio di ieri, ma anche chi ne rileva l'incompiutezza, i rischi, la temerarietà"[28]

Essentially he said that the tool of macroeconomic policy of the European union was unbalanced and at the very early stage, and that for the European Central Bank the major issue would have been to operate in an institutional void, indeed he said to be happy for the transition to a stronger Europe but he agreed to the ones that announced the incompleteness of the European project, the risk and the braveness.

From these few words we can understand what has been one of the factors that fueled the European crisis, the incompleteness of the Eurozone system.

Since the absence of a political union the *governance* of the EU has been based on a mix between market forces and rules of conduct. The first one has been used trying to reach the economic convergence between countries, the second one to apply prudent fiscal rules.

The economic convergence has been hard, several countries neither bridged the distance between the most virtuous economies, during the period between 1999 and 2008.

[27] Jay C. Shambaugh *Georgetown University the Euro's Three Crises*

[28] T. Padoa-Schioppa, "Il passo più lungo", Corriere della sera May 3rd 1998, http://www.tommasopadoaschioppa.eu/europa/il-passo-piu-lungo.html

If we look to indexes of competitive strength using unit labor costs, the loose of competitiveness is sharp, we go from -9pt of Greece to -37pt of Ireland passing thought -12pt of Italy.

From the unique currency the different countries were far from converged to similar levels, both for what concerns Public Debt with respect to gross product, both in term of competitive strength.

A situation of such diversity should have led to a very different spread level between eurozone countries, because each of the member countries had different fiscal and economic position, so different risks.

Instead, the effect of the unique currency has been to level the differences in the spreads between European government bond and at the same time isolate that debt from the outside world risk. A study from the ECB[29] suggested that:

"the introduction of the euro had a very important impact on the degree of integration of European Government Bond Markets. The markets of those countries that share a monetary policy are less vulnerable to the influences of world risk factors and more vulnerable to EMU risk factors. However, they are only partially integrated with the German market since their markets are still segmented and present differences in their market liquidity or default risk. This result suggests that benefits from portfolio diversification are still possible within the Monetary Union. On the other hand, the countries that decided to stay out of the Monetary Union and maintain their monetary autonomy present a higher vulnerability to external risk factors. So, government bonds from EMU countries may have a better safe-haven status compared to non-EMU countries."[30]

That result help us in understanding why the Sovereign debt crisis had such a diffusion inside the euro area, even for countries with such different fiscal policy and deficit situation, in fact the vulnerability to EMU risk factor meant a possible domino effect of a single county crisis to a widespread zone ones.

[29] Pilar Abad, Helena Chuliá and Marta Gómez-Puig, Emu and European Government Bond Market Integration, Working paper series, No 1079 https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1079.pdf

[30] Pilar Abad, Helena Chuliá and Marta Gómez-Puig, Emu and European Government Bond Market Integration, Non-technical summary pg2 working paper series, No 1079 August 2009.

Moreover, since the beginning of the European monetary union there have been several doubts about the real capacity of the Union to withstand financial shocks and macroeconomic negative outlook.

This doubt derives from multiple reasons, first the absence of the devaluation process which has been for decades a mechanism of adjustment between countries, stronger countries would have revaluation on their currency and from that the weaker ones a devaluation of their currency. This imbalance would have led to a capital flow to the weaker and so cheaper currency rebalancing the gap.

Moreover, following the words of Tommaso Padoa-Schioppa that I reported in the beginning of the chapter the European Monetary union missed to be accompanied by an acceptable level of banking and fiscal union.

Speaking about financial regulation and fiscal policy every member country was in charge of its own policies.

Obviously, lot of benefits came from the European Union and the monetary union, for example the ability to raise money in the same currency, easier trade between member states, cheaper credit line both for countries and both for the overall economy.

The tool of same currency funding raised also some threats of free riding as reported and analyzed by (Buiter, Corsetti, and Roubini 1993; Beetsma and Uhlig 1999)

The "over borrowing" threats have been overcome in two separate ways, first by the Growth and Stability pact limits of 60 percent public Debt to GDP and 3% Deficit to GDP, then by the notorious "No-bailout" clause[31], which states that:

" A Member State shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, ... of another Member State"

Which means that if a member states fail to meet its debt obligation the default will occur.

Probably this clause has been undervalued by the markets for a considerable period, in fact as noted by Ignazio Visco[32] spread between sovereign debt in the euro zone were near to zero until

[31] Art 125 of Lisbon treaty
[32] Ignazio Visco (2013), Interventi governatore https://www.bancaditalia.it/pubblicazioni/interventi governatore/integov2013/visco_010913.pdf

the development of the crisis, which stated the low ability of financial markets to incentivize the adoption of good behaviors.

In a situation in which the monetary policy has been delegated to the ECB the fiscal policy of each country has gained much more importance as national tool for countercyclical macroeconomic policy[33].

Moreover, in such a context, the duty of banking regulation was kept in the hand of each country, which means they bear also the risk and the costs (direct and indirect) of a banking crisis.

The direct cost would have been mainly fiscal costs, as the costs that a country may should have in recapitalizing banks or in support programs, just as an example we saw in chapter one the TARP program, which has been a direct fiscal cost (banks recapitalization) that the US gov had to bear in order to support the financial system or as the Housing program.

The indirect cost are the consequences of a banking crisis, such as a lower GDP and lower tax revenues, which has several reflections also on real economy.

According to P. R. Lane[34], the Eurozone crisis had three different phases which I am going to analyze in order to understand the context and the timeline in which MPS operated.

Moreover, trying to understand also the different causes to the crisis I am going to analyze also the three different interlocking[35] crisis which will help us in the deeper comprehension of why MPS faced such a severe crisis.

[33] Wyplosz, Charles. "EMU: Why and How It Might Happen." The Journal of Economic Perspectives 11, no. 4 (1997): 3-21.; Gali and Monacelli 2008, “Optimal monetary and fiscal policy in a currency union”, Journal of International Economics, no76 (2008) 116-132

[34] https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.26.3.49

[35] Jay C. Shambaugh (2012) . The Euro’s three crises. Brookings Papers on Economic Activity, 2012, vol. 43, issue 1 (Spring), 157-231

2.2 The raise of the Eurozone crisis

Public debt did not seem to be a huge problem during the mid 2000s but of course in the following years it did.

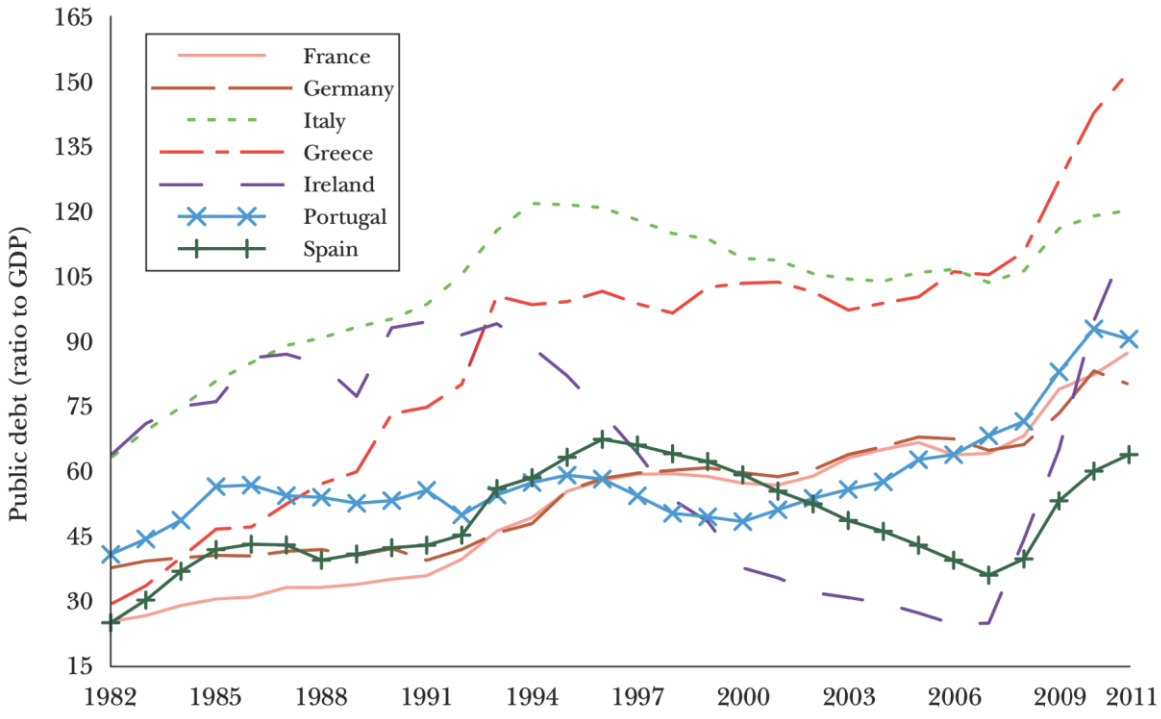
Even if the aggregate value of Public Debt to GDP for the Euro area was not concerning, if we look at the individual country level, it probably is.

Italy one of the major 4 economies in the EU area is the country which had the higher value of Public Debt to GDP, only surpassed by Greece after 2009.

We can easily see the imbalances between seven members state of European union by the following figure, taken by the data of the IMF of public Debt ration from 1982 to 2011, even before the monetary union.

FIGURE 12

The Evolution of Public Debt, 1982–2011



Source: Data from IMF Public Debt Database.

Italy and Greece never achieved the 60 percent ratio required by the Maastricht treaty in the period required, but overall we can see a good performance from 1994 to 2006 for both of them, Italy was able to reduce from 120 to 105 that ratio, meanwhile Greece was more or less stable over time.

Ireland and Spain reduced their ratio considerably meanwhile the other countries, such as Portugal Germany and France shown constant level for the Public Debt to GDP ratio over time, considering also their starting levels.

Moreover, as underlined before, there was low spreads level on sovereign debt which also means markets did not expect a considerable default risk and for sure neither such a severe fiscal crisis, which essentially blocked the Eurozone for a considerable amount of time.

Looking back, the positive financial environment helped masking the fiscal, macroeconomic and financial vulnerability of the system during the years 2000-2007.

If we now want to look at indicator of instability, one of the major predictors of a crisis is leverage, which is mainly driven by long period of low interest rates as stated in the previous chapter.

Gourinchas and Obstfeld 2012 suggest that for advanced economies the most robust and significant predictors of a financial crisis, using discrete choose panel data from 1973 to 2010, are “domestic credit expansion” and real currency appreciation.

FIGURE 13

Private Credit Dynamics

	Loans to private sector from domestic banks and other credit institutions (percent of GDP)		
	1998	*2002*	*2007*
Greece	31.8	56.5	84.4
Ireland	81.2	104.4	184.3
Portugal	92.1	136.5	159.8
Spain	80.8	100.1	168.5
Italy	55.7	77.3	96.5
Germany	112.2	116.7	105.1
France	81.0	85.6	99.3

Source: World Bank Financial Database.

In fact from the Private Credit Dynamics table we can see that the countries that experienced the tougher crises was the country that shown the most important increase in the credit Dynamics, meanwhile the ones that resisted better to the financial crisis and the Sovereign debt crisis was the one that were able to contain that growth.

This situation is probably driven by the easier credit condition after the entrance to the monetary union, banks could get more favorable condition using the shoulders of the Euro and the low interest rates environment in which the Eurozone was before the evolution of the global financial crisis.

Other phenomena that took place during the period 2003-2007 which raised country specific risk has been the growth of account imbalances, in fact following the studies of Blanchard (2012) countries that see their deficit growing can have several harmful impacts in the medium short term economics performances. Obviously if the deficit is not spent in sector that create an economic growth, but in sector that have low productivity in the future, like Real Estate, it can create a real risk, a fortiori in the Eurozone in which the nominal rigidity means a downward wages level that could be offset by a raise of the unemployment rate.

Once again if we take a look to the figure below we can see that countries which had the greater deficit increase are the ones that faced major issues during the financial crisis, and the one as Germany and France which had a surplus or a low deficit level faced the crisis in a better way.

FIGURE 14

Current Account Balances
(percent of GDP)

	1993–1997	*1998–2002*	*2003–2007*	*2008–2011*
Greece	–2.0	–5.9	–9.1	–11.1
Ireland	3.4	–0.2	–2.6	–1.6
Italy	2.1	0.2	–1.8	–2.9
Portugal	–2.4	–9.0	–9.2	–10.5
Spain	–0.6	–3.1	–7.0	–5.8
France	1.1	2.0	–0.2	–1.9
Germany	–0.9	–0.3	5.1	5.7

Source: International Monetary Fund's World Economic Outlook database.

During the period from 2003 to 2007 there has been a boom in the credit market which was originated probably by the global financial structure, as the securitization process which in EU as well as in US was a common way to increase the firing power of financial institution.

The fact that a lot of private agent on the market was taking on more risk fueling the credit boom gave to the countries with larger deficit the chance to change their fiscal policies and adjust their balances.

In fact, going deeper into the analysis, the credit housing boom generated higher taxes revenues for the states, moreover the long period of low interest rates meant borrowing cost much lower than before. This was a perfect situation to apply stricter fiscal policies, unfortunately it has been only a missed opportunity.

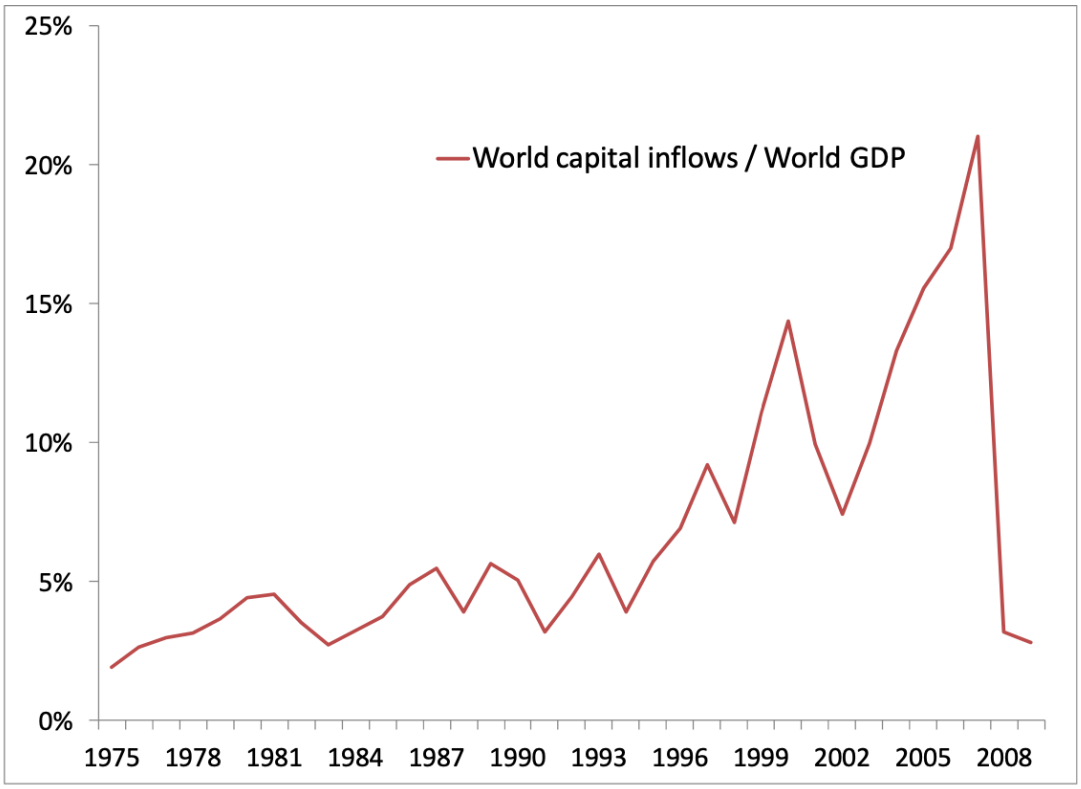
In such a situation there was all the dowels to let the Sovereign debt crisis start, in fact there was domestic recession inside the Eurozone, a banking sector crises derived by the Global financial crisis and a lower risk propension of international investor officially started the Sovereign Debt Crisis.

2.3 The Sovereign Debt Crisis

It is important to underline that the Eurozone was not impacted symmetrically by the Global financial crisis, in fact cross-border financial flow decreased after 2007 with different impact on countries depending on their international exposure levels[36]. As we see in the chart below the capital flow decrease has been drastic and the consequences have been evident.

FIGURE 15

Global Capital Flows, 1975-2009
Percent of world GDP



Note: sum of gross capital inflows across the world's countries, as a ratio of world GDP. Source: Lane and Milesi-Ferretti, EWN II database, and IMF, Balance of Payments Statistics.

[36] Milesi-Ferretti and Tille 2011

Another important fact, underlined by Lane Milesi-Ferretti (2011) is that there is a correlation between the pre-crisis account deficit and the rate of domestic credit boom with the severity of the crisis, the decline in output and expenditure in the first phases of the crisis (2007-2009).

The sudden stop of the credit boom has been especially hard for several countries which relied part of their economies on the construction industry, such as Ireland and Spain.

In fact, the home and properties price index were falling, more and more projects were abandoned such that the real estate sector was collapsing.

For these countries obviously the collapse of such a strategic sector meant troubles for the banks which had inside their balance sheet lot of MBS, like the US situation.

Spain and Ireland, the countries more affected by this crisis, in that period had low debt ratios which helped to keep the confidence that they could have the fiscal capabilities to sustain a medium level banking sector crisis with the appropriate measures.

Even if the crisis was spreading across the Eurozone, the fiscal situation was not that solid, and the macroeconomic imbalances were warring, the Sovereign debt market remained calm until late 2009.

In fact, during 2008 and the first part of 2009 the focus was on the ongoing banking crisis trying to stabilize the system, obviously every country with their financial risk in background.

European Central Bank decided to cut interest rates in order to provide low cost liquidity to a suffering banking sector. Moreover, ECB made the decision to increase euro denominated liquidity in conjunction with swap's contract to make easier for financial institutions to access Dollar denominated liquidity.

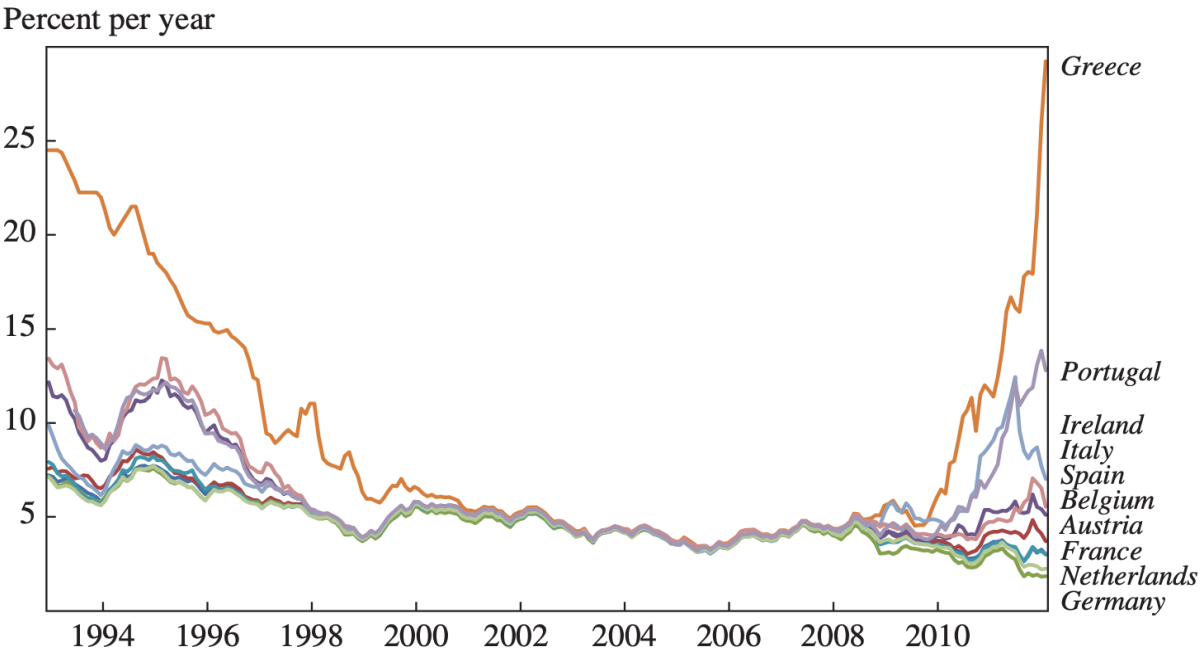
Late 2009 signed a new phase of the crisis, in fact lot of European Government started disclosing larger deficit which increased Deficit/GDP ratios. To this we must add the higher concerning about the losses on the banking sector due to losses on bad loans, which had a real negative indirect impact on the sovereign bond values. Investors thought that a more severe banking crises would led countries to deficit spending in order not to let the financial system "fail", but as we saw in this chapter the fiscal situation in a considerable number of European countries were not positive, which posed a substantial fiscal risk, and risk has to be remunerated.

One of the most concerning news came from the new elected Greece government, in fact on October 2009 Giorgos Papandreou[37] disclosed that Greece was going to double the estimates of 6% budget deficit, but moreover and probably more dramatic they revised the Greek fiscal account for the year before which was a serious violation of the European fiscal law.

This disclosure and other ones made by several countries saw consequently the rising of the spreads on the Souverain bond versus the German Bund which was considered a safe heaven.

FIGURE 16

Ten-Year Yields on Sovereign Bonds of Euro-Area Countries, January 1993–February 2012



Source: Eurostat.

The spreads inside the EU area, thanks to the monetary union were close to zero until 2009, which meant also that markets underestimated the Fiscal risk about the different countries.

[37] Greece prime minister from 6 October 2009 to 10 November 2011

Main underestimation was about the no-bail out rules, investors were lending cheap money to all European union countries trusting on the Union strength.

Analyzing the spread dynamics before the monetary union (Greece joined the euro later than the other countries), there is the evidence of different country risk and different yield. Spreads were high between countries such as Greece reflecting their fiscal stability. Once the monetary union was reached, spreads were near to zero. Zero spread season lasted until the disclosure of budget deficits revision which created a new trend, as we can see from the plot, in which are represented the yield of the 10 years government bond in seven countries of EU, the spread of the Greece skyrocketed and the other countries as well saw their yields increasing meanwhile the German Bund experienced a lowering yield due to the flight to quality phenomenon.

It is important to notice that since all the bond are emitted in Euro the spread represent the market perception of credit risk and perceived volatility, that means the lack of trust and the turmoil about the government obligation signed the beginning of the Sovereign bond crisis.

As I did for the American experience, I think it could be important to underline a timetable of the event of the sovereign debt crisis. I will do this to understand how long it took to spread the crisis and to have a deeper knowledge of the events.

2.4 Timeline of the events

October 2009 Greece Government updated his projection of Deficit/GDP ratio for the year to 12,7%, consequently Fitch downgraded Greece from A to A-

November 2009 Portugal as well update its projection about Deficit/GDP from 5,9% to 8%

December 2009 Fitch downgraded again Greece Sovereign debt from A- to BBB+, followed few days later by Standard & Poors which downgraded Greece from A to BBB+ as well by Moodies. Greece new government approved new financial measures in order to face the ongoing crisis.

January 2010 IMF send a delegation to Greece to understand the feasibility of a recovery plan. Greece government approve a plan thought which they would have reduced the Deficit/GDP ratio to 3% by 2012. Public debt for €8b for five years at a yield of 6%. As well as Greece Portugal approve a fiscal plan with the same goal of 3%, they wanted to reach by 2013. Even

if Greece and Portugal presented this plans their spread with the German Bund keep rising respectively to 400bp and 110 bp.

February 2010 The first "mission" of European Commission, European central bank and International monetary fund which will be known as troika. BCE also announce that it will leave the reference yield at 1%. European Union approve the three-year Greece recovery plan. The recovery plan provided a salary freeze and the stop to new hiring for Public administration during 2010. Moreover, the plan provided a cut of 10% of the spending in all the Ministry, a rise in taxes and the rise in the pension age.

March 2010 European governments approved a support plan to Greece that consisted in voluntary loans by member countries in conjunction with support from IMF. Even after that approval Sovereign Greek Debt remained under pressure in the secondary market.

April 2010 Greece Yield on 10 bond reach 7%, Eurogroup approve the Emergency loan facility plan, a €45b plan of which €15b from the International Monetary Fund. Rating agencies downgraded Greek bonds to junk bond level and downgraded also other countries debt such as Italy, Ireland, Spain, Portugal and Cyprus. Yield in the Eurozone kept rising reflecting the investor perception of country default risk. This phenomenon has been more important in countries with imbalances both fiscal and financial. The spread rose to 270bp in Portugal and 110 bp in Spain, Greek government launch a plan of €40b with huge fiscal policies reforms.

May 2010 The European Union and the IMF agree a €110b loan to Greece under the condition of strict austerity rules. Moreover, EU build up the Security Market Program, this program was established to purchase Government Debt in the secondary markets trying to have under control the spread crisis.

June 2010 The Eurogroup approve the creation of the European financial stability facility (EFSF)**,** Intergovernmental three years fund based on guarantees made by member states of a total amount of €440b. This fund had the goal of potentiate the stabilization mechanism of the euro area and to support financially the suffering member state. Participation is made up pro quota in proportion to the capital given to BCE.

Moreover, for European countries in trouble there is also the European Financial Stabilization mechanism (EFSM) which has €60b firing power. Those funds come from European commission and they are granted by the EU budget.

Other funds came from IMF with a total of €250b.

July 2010 European Banking Authority published the results of banking sector stress testing. the results of the tests implied that only 7 banks over 91 should have been recapitalized.

September 2010 Basilea III has been approved and gradually come to practical application.

November 2010 the crisis of the banking system emerged in Ireland, the governor of Bank of Ireland disclosed the losses of domestic banks up to €85b, or 55% of GDP.

This incredible situation led the European authorities in conjunction with the International monetary fund to use the EFSF giving to Ireland a total loan of €85b conditionally to a fiscal maneuver of €15b which implied a cost reduction during the following four years.

December 2010 European Institutions institute the European Stability Mechanism (ESM) program that would manage the crisis, and which would substitute the EFSF from the first of July 2013. ESM will have a loan availability of €500bn[38], the fund will be disbursed by ESM after a request by a country and only once passed a solvency test.

Moody's downgraded Ireland sovereign debt from Aa2 to Baa1, Fitch downgraded from A+ to BBB+, and Portugal as well has been downgraded from Fitch from A+ to AA-.

January 2011 EFSF emitted titles, to sustain Ireland, in two tranches of €5b with yield oscillating from 2,59%-2,89%, the euro reach a minimum versus the dollar at 1,28, Italian spread vs Bund reach 200bp, Spain 271bp, Portugal 425 bp, Ireland 625bp, Greece 965bp.

March 2011 EFSF increased their funds from €440b to €780b, following also the ESM increased his fund capacity to €550b. Another good news had been the possibility of the EFSF to buy Sovereign debt directly from primary market which means direct support to European member countries. The Greece loans has been rearranged from 5,2% to 4,2% and the repayment window from 5 to 7 years.

April 2011 Portugal as well as Greece has been forced by its fiscal position to ask for funds from EFSF to a total amount of €60b-€80b, and since the inflation in the EU area was rising over 2% ECB has been forced to increase its interest rate of 25bp to 1,25%

[38] Total capital under control €700b

May 2011 Agreement between the Portugal government and the Troika[39] for a three year €78b loan. The fiscal plan included a cut to Deficit/GDP ratio from 8,6% in 2010 to 3% In 2013, with an additional €5,5b privatization by 2011. Rating agencies downgraded several Sovereign debts of European countries. S&P changed its stable outlook for Italy to negative saying that "growth prospective are unlikely", the rating of Greece from BB- to B and their spread vs German Bund reach 13.650bp attracting other sovereign debt as Ireland 7.636, Portugal 6.667, Spain 243, Italy 171 and Belgium 118.

June 2011 Moody's downgraded the Greece Sovereign debt to junk level. EFSF raised fund to sustain Portugal plan. Eurogroup postponed the green light to the fifth tranches of €12b which was destined to Greece. Inside European Financial Institutions an agreement has been reached about the fundamental points of ESM and about the strengthening of the EFSF.

Greek parliament approved a five years fiscal package of €28b, a €50b privatization plan and the renegotiation of debt.

Italian Consiglio dei Ministri launched four years €47b plan which goal is the fiscal account balance.
Mario Draghi become the president of BCE and the Basilea committee approve a change in tier 1 capital from 1% to 2,5% for SIFI's.

July 2011 All the ministries of Finances in the Eurogroup and IMF unlocked the fifth tranche of loan to Greece which was €110b, in the meantime there was a discussion about whether to insert or not private investors in the renegotiation deal of the Greece debt.

International rating companies keep on downgrading European countries in troubles, such as Portugal, downgraded by Moody's by four classes, one classes for Ireland, three classes for Greece, two classes for Cyprus. Warring spread rise also for Portugal which reached a 1000 bp versus the German Bund, Italy with BTP reached 202.

A particularly high inflation rate due to a higher cost of energy goods led the BCE to rise once again the interest rate of 25bp to 1,50%.

[39] t was named the Troika because it was composed of representatives from three organizations: the European Commission, European Central Bank and the International Monetary Fund, European Parliament definition,

An important topic has been raised in July, the ability of the EFSF to buy Sovereign debt in the primary market and into the secondary market, moreover It has been allowed to participate to the bank's recapitalization.

In fact, during the stress testing made by EBA, 8 European large banks had a Core Tier 1 lower than 5% and 16 banks between 5% and 6%. *Good performances for the Italian banking group of which only one is in the second cluster (5%-6%).*

August 2011 BCE starts buying Italian and Spanish debt on the secondary market lowering the spreads and the yield of the Sovereign debt of countries in financial instability. Financial turmoil forced the ESMA to block the short selling in Belgium Italy France and Spain for 15days. Others fiscal authorities acted at national level in order to stabilize financial markets. Moreover, countries in fiscal instability took several actions to chance their fiscal balance.

September 2011 Liquidity inside financial markets looks critical such that BCE realized a dollar financing plan with other four banks (Fed, Bank of England, Central bank of Switzerland and Bank of Japan). Standard and Poor's downgraded Italian rating from A+ to A by the constant worsening of political instability.

October 2011 European Central bank announce a one-year refinancing operation, the prolongation of shorter-term financing operation and the buy of €40b of granted banking obligation. Government of Euro area reach a deal about measures to help countries reducing their account deficit. This deal known as "Six pack" implied a mandatory conversion into each country law system of the rules inside the deal. Downgrading of rating institution keep on going, Moody's downgraded Italy of three steps from Aa2 to A2, Fitch from AA- to A+ and Spain from AA+ to AA-, as a directed consequences S&P downgraded also twenty-four Italian Financial Institution and twelve financial institution in UK. European council gave to EBA the duty to conduct an analysis About the capital in the banking system to check the soundness of the European major banks capital situation.

November 2011 Greece announced the intention to launch a referendum about the new austerity measures implied into the sustainability plan.

Financial turmoil raised in the market with a bearish market and spikes on the Gov bond yield. In Italy between the end of 2011 and the start of 2012 BTP-Bund spread reached 500bp and

yield in short term BTP reached 8%. In the first Board meeting of ECB under Mario Draghi they decided lowering the interest rate to 1,25%.

December 2011 European central bank lowered again the interest rate to 1% and moreover increased the unconventionally monetary policy to fight the credit crunch of the banking sector particularly to family and businesses. In particular ECB launched two refinancing programs, the Long-term refinancing operation (LTRO) of a three years total duration, of about €1000b at 1%.

During the first auction funds has been given to more than 500banks for a total of €490b.

European Banking authority stated that banking sector needed €115b recapitalization by the 30 June 2012.

January 2012 Another wave of downgrading on the Sovereign debt took place. Italy, France, Austria, Spain, Cyprus, Malta, Portugal, Slovakia and Slovene. Another important downgrading has been the one of the EFSF which lose the triple A, that meant even European financial "institution" lost a bit of market confidence.

February 2012 During the second three years LTRO €800b has been assigned to European Banks. Eurogroup close a new deal about Greek debt restructuring taking the total amount to €130b and a reduction to the face value of Greece debt taken by Private creditors, which meant a cut of €100b to the Greece Sovereign debt stock.

March 2012 Fiscal compact has been approved, a deal between 26 member countries of the Union, exception for UK. Looking more in dept into the plan, the fiscal compact implied stricter fiscal national policies, the structural deficit could not exceed 0,5% of GDP and that Public Debt over GDP must decrease each year by 1/20 of the distance between its level and the 60% level.

April 2012 Spanish banking system showed weaknesses linked to the ongoing recession and the real estate crisis. There is indiscretion about the willing of Spanish Gov to create a Bad Bank to buy the NPL from the Spanish banks, S&P as response downgraded 11 credits institution of the country.

May 2012 Bankia, third credit institution in Spain ask for Government Bailout of €19b.

June 2012 Spain disclosed the willingness to ask for financial aid from Europe with the aim of a recapitalization of the banking system. Eurozone countries told their availability to raise funds for €100b thought the ESM and EFSF, also known as State rescue funds, for which has been added the possibility to directly save credits institutes. Spain and their major credit institutes has been downgraded. Also, Cyprus ask for EU intervention for financial aid, becoming the fifth countries to ask for help. This crisis is directly linked to the macroeconomic downturn but also the strong exposition of the Cyprus banks to major Greek institutions. Cyprus debt has been downgraded to junk.

July 2012 Eurogroup approve the financial aid to Spain thought EFSF, in the meantime financial turmoil increase in Spain, and the conjunctural economic downturn implied a lowered

inflation rate, European Central Bank has been forced to lower again the interest rate to 0,75% the lowest rate ever.

August 2012 Turmoil in European financial market is hard, Mario Draghi governor of ECB made a conference in which stated "Euro is irreversible" and the "ECB is ready to do whatever it takes" to sustain euro and countries of the eurozone, this speech appeased financial turmoil.

Agents on the market changed their forecast about the monetary policy of the euro area with more optimistic prevision.

September 2012 ECB launched the Outright Monetary Transaction (OMT) which has been a measure thought which the ECB acquired with no limits Government bond, in the case of spread threatening the transmission of monetary policy. OMT blocked the speculative pressure in the market of Government bond.

January 2013 ECB announced other measures on secondary markets, extraordinary refinancing operation for the banking sector and another lowering of interest rates.

May 2013 ECB cut once again the interest rate of the euro area to 0,50%.

November 2013 ECB cut the interest rate to 0,25%.

April 2014 European Central bank disclosed its availability to use unconventional measures and open the route of a European quantitative easing.

June 2014 ECB strengthened its expansive monetary policy with the disclosure of several measures. One measure has been cutting the interest rate of another 10bp to 0,15%, this intervention has been historical since it took the remuneration on banks deposit to a negative level of -0,1%.

On the other side has been announced another "targeted" long term financing program, the Targeted long-term refinancing operation TLTR, for a total of €400b. The aim of TLTR was to incentivize the credit from the banking system to the private sector not financed by the euro area. The program was divided into two rounds, in the first one the total amount of loans was of €400b which was roughly the 7% of credit portfolio of banks with respect to the private sector.

Funds will be allocated into two auction September/December 2014. The second phase would consist in six quarterly auctions from March 2015 to June 2016. The total additional amount of

funds that ECB will give to the banking sector will be parametrize to the net credit flow started in the reference period to Families and businesses.

ECB also announced that in the very next future it will buy directly Ass4et backed securities and covered bond respectively from the fourth quarter and half of October.

September/December 2014 first two auction of TLTRO of about €200b. At the same time, it started also the buying process of ABS and covered bond, last but not least markets wait the next quantitative easing process.

January 2015 ECB announced the extension of the ABS and covered bond purchasing also to the area euro ones, this program was known as Expanded Asset purchase program EAPP, or also known as Quantitative easing. The duration of the EAPP program was essentially undetermined. The program was designed to purchase a maximum of €60b per month to a total amount of €1.140b, of which the estimates talk about €900b of government emitted securities.

The split for countries will be proportional to the capital given by the different national central banks to the ECB and it will concern securities with maturities between 2 and 30 years. For what concern Italy, based on operation made on the markets by ECB, the Italian public debt purchase should be roughly of €150b, the 30% of the emission projected for 2015-2016.

The European Central bank policy will help the stabilization of market condition, consolidating analyst estimates and alleviating the risk perception linked to the Sovereign Debt market.

2.5 Crises inside the crisis

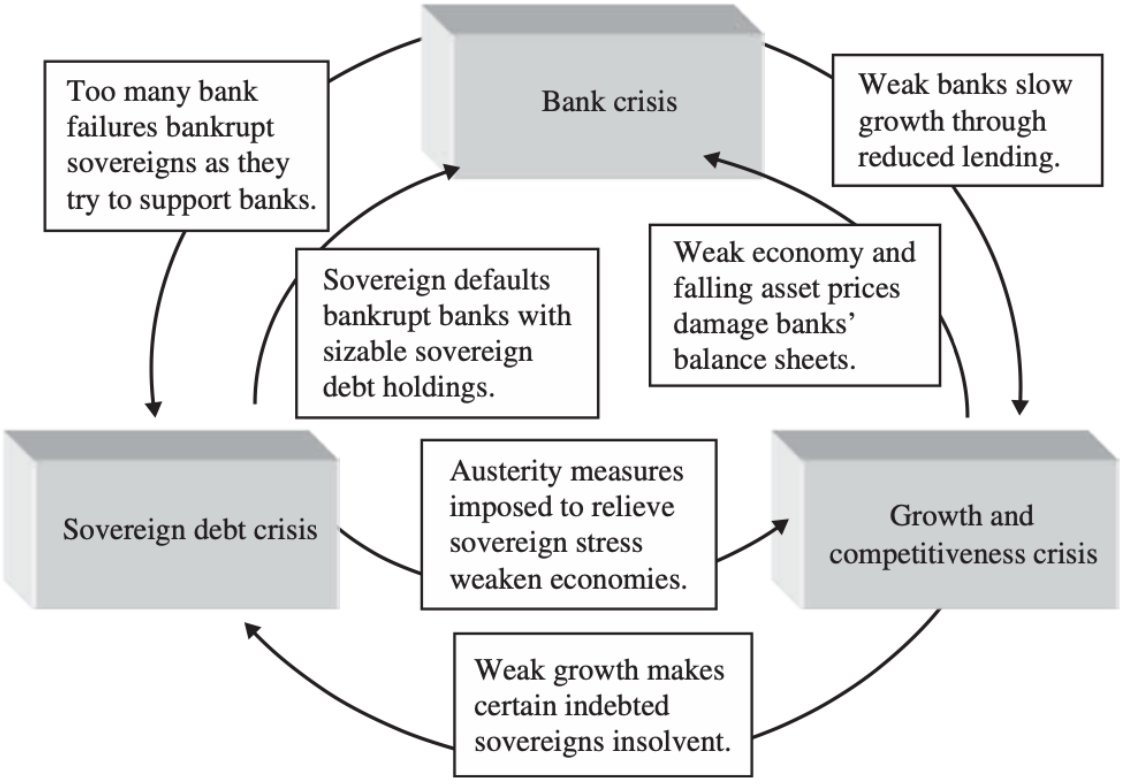
2.5.1 Interconnections

Let's now analyze the interconnection and the reasons of the three different crises inside the euro area before taking into analysis the Italian situation.

The key concept is that in the attempt to offset the effects of the crisis, every of the three different key aspects must be addressed. If one of the three may not be solved it will influence the results of the other two and vice versa.

To explain the interconnection of the three crises it would be useful to use a graphical representation, which explain also how one crisis influenced the others.

FIGURE 17



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[40] Jay C. Shambaugh (2012). The Euro's three crises. Brookings Papers on Economic Activity, 2012, vol. 43, issue 1 (Spring), 157-231

In fact, the original banking crisis and the bailout season stressed the fiscal policies of Governments whom were under a great stress. This stress mixed with the “no bailout” rules changed the risk perception of the Sovereign debt by the investors whom required higher yield.

Higher yield meant higher Government cost for financing, and lower bond prices, since national banks were the major purchaser of government bond, they incurred in major devaluation of their government investment, worsening their balance sheets and their financial position. At the same time the financial policies of different government forced the European Union to “ask” for austerity measure which means lower stimulus to the real economy. The mix between lower credit line made by national banks, lower stimulus from Governments weakened national markets. This step is the transmission to the real economy of the financial crisis. Weaker economies mean lower people wealth and so more and more default on banks’ balance sheets. Here it is our vitious circulus, made up by several conjunctures both imposed, and both happened.

Differently from the American case, the growth crisis, at least in the very first stages, has been underestimated. The measures taken by ECB of a massive liquidity injection has been the first step in the right direction, but a broader solution was needed.

Now that it is clear the coexistence of the three different crises, I can go deeper on the first one, the European Banking crisis.

2.5.2 European Banking Crisis

In fact, European banking sector size is considerable, let's think about a relative size by comparing it to the U.S banking system. European banking total asset size represent the 300% with respect to GDP, while U.S banking total asset size only 100%[41].

This difference is originated from the economic characteristic of those two different zones, in fact in Europe, companies relies much more on banks financing than in US in which the capital market are easier to be directly reached. Since the European economy is heavily based on the banking financing the importance for the Economy of the banking sector increases.

Another important fact is the relative size of the different commercial banks to their national economy level. If we consider in fact the total asset value of European Banks, it is roughly the same of the American banks. But since U.S GDP is much higher than the single European countries GDP it means that the European banks are much larger with respect to their home economies than the American ones.

We can take as example the ING bank, which is located in Netherlands, and even if it is smaller than lot of other commercial banks both in US and Europe, considering Dutch GDP which is more or less one-twentieth of the U.S GDP, it is enormous compared to its home economy.

If we take the asset value of ING it exceeds the GDP of Netherland, meanwhile in the U.S no asset of any banks is greater than one-eighth of U.S GDP.

Moreover, European banks are very international in their operation (see McGuire and von Peter 2009, Shin 2012) which could explain in part why European Banks are so big with respect to their home country GDP.

The dispersion of European Bank makes also difficult a stricter national regulation and supervision.

By their structure, banks' balance sheet sees a very short-term liabilities, such as deposits, opposed to long-term oriented asset, such loans (and lot more), this structure of banks leave them potentially undefended by a bank run[42].

[41] United States data only takes into consideration commercial banks, without considering Money market funds, commercial papers, and other non-banks financial institutions.

[42] A bank run (also known as a run on the bank) occurs when many clients withdraw their money from a bank, because they believe the bank may cease to function soon. In other words, it is when, in a fractional-reserve banking system (where banks normally only keep a small proportion of their assets as cash), numerous customers withdraw cash from deposit accounts with a

Bank run are potentially a problem also for banks with relative strong financial position, in fact since the presence of asymmetric information, owners of deposits are not sure about the solvency of their bank, and in a crisis situation they are incentivize to require back their money from the bank to protect themselves from a potential default of the financial intuition.

A bank can occur into both a liquidity and a solvency crisis, as we saw in the previous chapter, the difference between the two is small. In a liquidity crisis, as happen both in Europe and U.S, Central banks stepped in as last resort lender, since the market was unwilling to borrow money in the very early stage of the crisis.

In the case that central banks would not have stepped in, those banks probably would have been insolvent, and the losses should have been carried by their equity investors, and by their creditors. Here it is the importance of capital, mostly core tier 1, in absorbing losses, and a capital injection in a crisis as a cushion against losses.

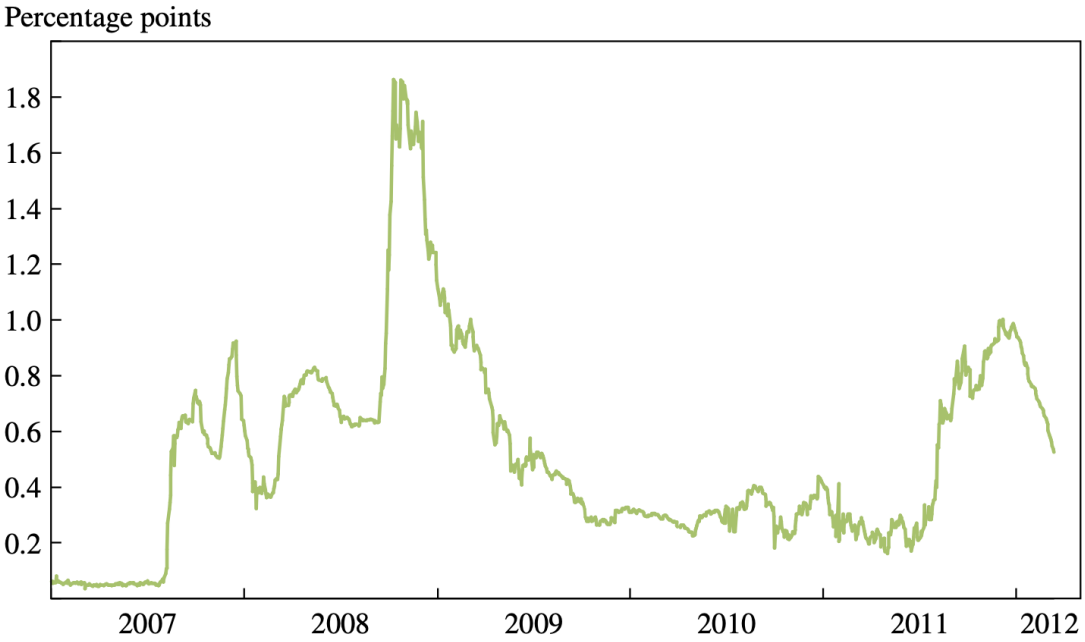
However, even if the institutions of the European Union were developing, the capital could flow freely inside the euro area and the economies were more and more interconnected, the regulatory power was still at national level and so there was the capital level requirement. For sure the introduction of the European Banking authority centralized some functions meanwhile other still was on a national level, for example fiscal policies.

As we can see from the plot below, as the crisis were spreading it was increasingly difficult for banks to fund themselves due to the growing uncertainty.

financial institution at the same time because they believe that the financial institution is, or might become, insolvent; Wikipedia, Bank Run, page 1.

FIGURE 18

EURIBOR-EONIA Swap Spread,[a] January 2007–March 2012



Source: European Banking Federation.

a. Difference between the 3-month euro interbank offered rate (EURIBOR), the interest rate at which euro interbank 3-month deposits are offered by one prime bank to another prime bank within the euro area, and the EONIA swap index. An EONIA swap is an interest rate swap transaction in which one party agrees to pay interest at a fixed rate to another party in exchange for receiving interest at a floating rate based on EONIA (the euro overnight interest average).

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The wealth of the financial system and the degree of credit availability can be checked by the spread between the interest rate that banks charges once another and a safe interest rate. Since we are looking at the Euro area, our reference spread is the one between the euro overnight index average swap rate (EONIA)[44] and the European interbank offering rate (EURIBOR). If we now look at the dynamics of the spread, it rose during 2007 but its peak is during 2008 like the us situation. Meanwhile during the sovereign debt crisis, which probably involved more the periphery than the whole system it was still high but not at his maximum. In this situation it was clear that the financial system was in a liquidity shortage, the last resort liquidity lenders, the

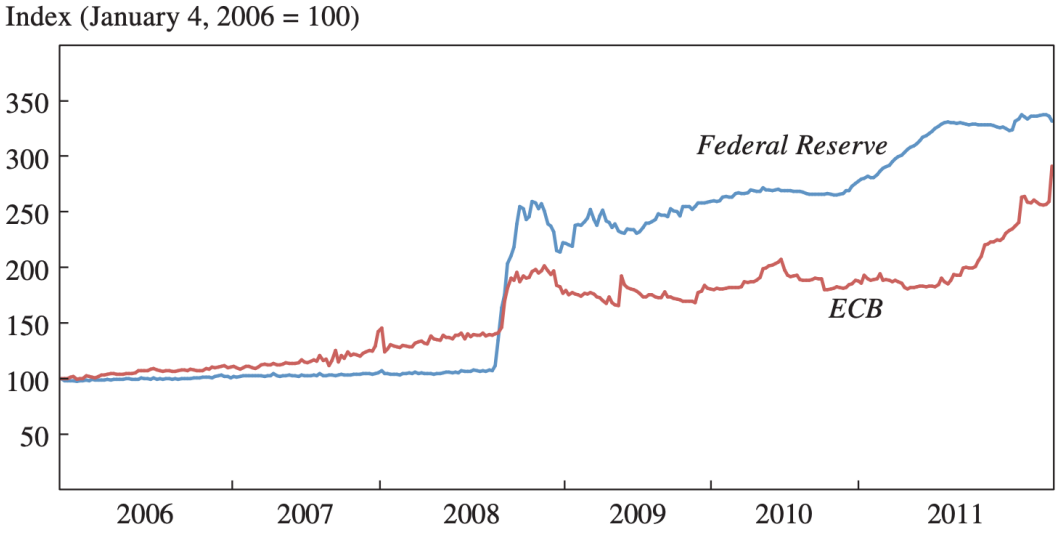
[43] Jay C. Shambaugh (2012) . The Euro's three crises. Brookings Papers on Economic Activity, 2012, vol. 43, issue 1 (Spring), 157-231

[44] Euro Overnight index average, is the reference average interest rate in the overnight interbanking financing operations

central banks, undertook several actions to restore the liquidity into the system. Central banks has been able trough lot of different monetary policy to give again credit to the banking system, first they cut interest rate, then they increased the size of their balance sheets and their loans to the system, finally since the needs of dollar financing (as stated in the previous paragraph) they introduced the "liquidity swaps" which was an agreement between the FED and the ECB. Analyzing the response of central banks in term of balance sheet expansion, FED moved the first steps earlier than ECB as we can see from their balance sheet evolution, probably it's due to the evolution of the crisis, which started in the U.S before its transmission to the European banking system. Moreover, and maybe more important the increase is different, in fact FED increased its balance sheet by 210% while ECB by 39%. Of course, the response of the two central banks has been different because the two crises was different. However, it is probable that the faster recover of the U.S system it's also due to the stronger intervention of the FED from the first step of the crisis. From the finding of the previous chapter about TARP, we also know that the idea of massive state intervention can help in calming down the markets, probably we can say that also the size of the intervention can help in making this action more consistent with the investors expectation.

FIGURE 19

Balance Sheets of the Federal Reserve and the European Central Bank, January 2006–March 2012



Sources: Board of Governors of the Federal Reserve System and European Central Bank. [45]

[45] Jay C. Shambaugh (2012) . The Euro's three crises. Brookings Papers on Economic Activity, 2012, vol. 43, issue 1 (Spring), 157-231

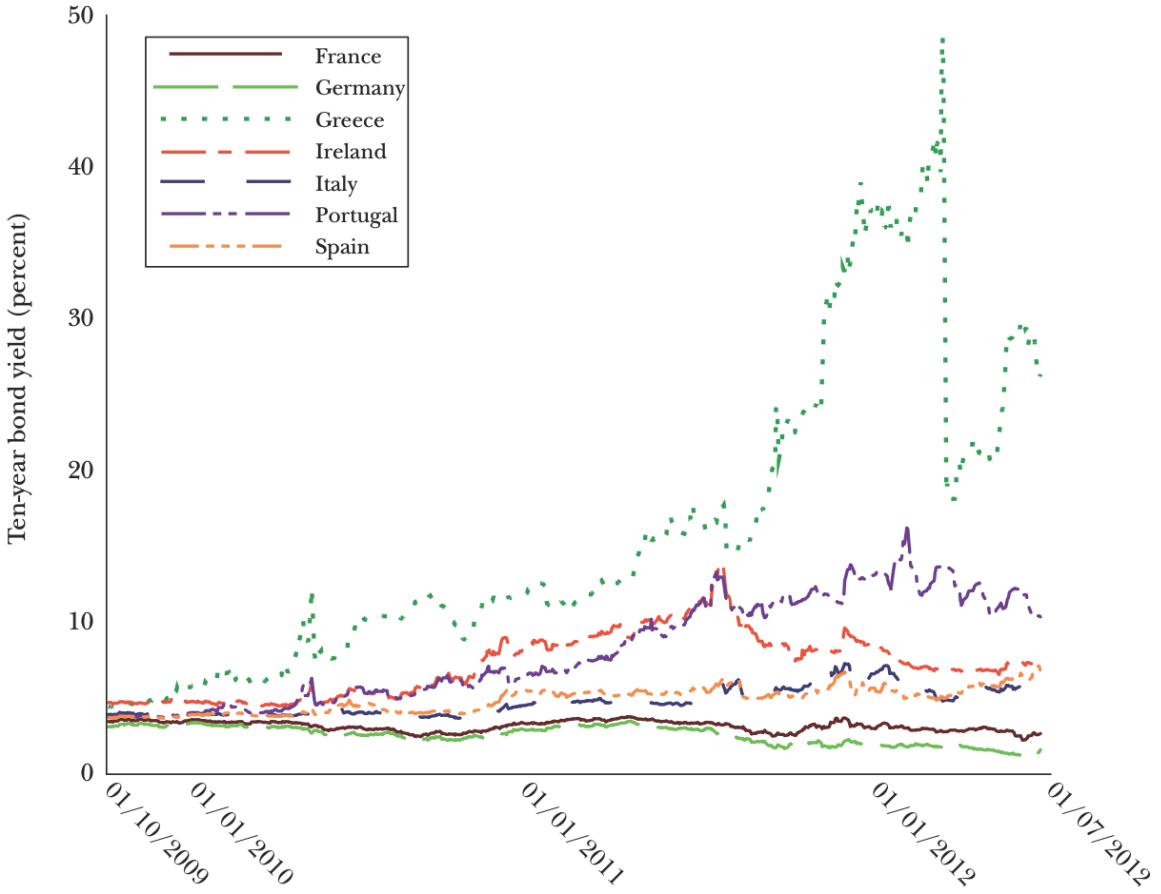
After its modest intervention, the first wave of European crisis calmed down as we see from the EURIBOR-EONIA spread or at least the liquidity shortage was solved.

May we can say that the asset expansion was enough for the shock at that time to avoid a financial collapse, but it did not avoid the solvency problem verified few months later.

This is probably due to all the reasons we analyzed before as well as the national level regulation, the fiscal effort of countries to bailout during the same period of time and the asymmetry of the shock.

FIGURE 20

Yields on Ten-Year Sovereign Bonds, October 2009 to June 2012
(percent)



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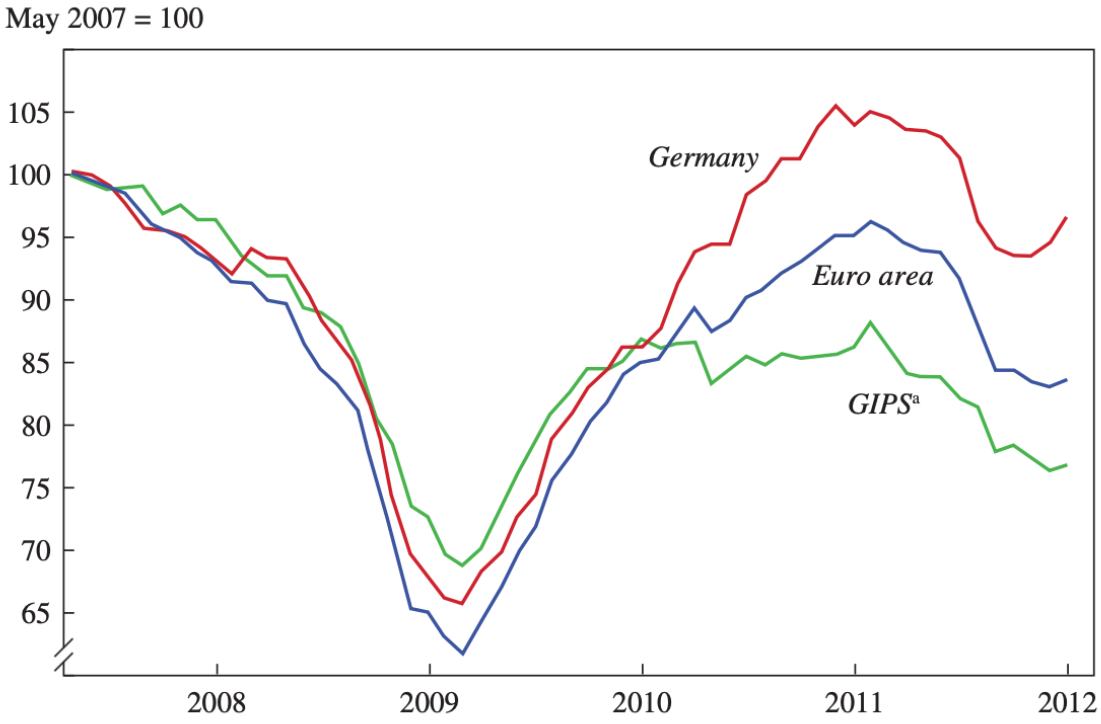
[46] Jay C. Shambaugh (2012) . The Euro's three crises. Brookings Papers on Economic Activity, 2012, vol. 43, issue 1 (Spring), 157-231

The liquidity crisis at the time was offset, but as we said shock in the Euro area has been asymmetrical. In fact, Eurozone came out the initial crisis during 2009, and for some time it seemed as the faster recoveries zone in the World. But it was clear that growth was much different country by country, and since growth was different also expectation about the country's recovery were different, as we can easily see from the sentiment analysis. Germany Sentiment has been lower than the GIPS countries from 2007 to 2009, then from 2009 we can see a reversal in which Germany increased steadily, even due to its work law which was designed to face situation of fast changes. For what concerns GIPS countries, from 2009 they started to assist to a slower growth, and then a recession, mainly due to the fiscal austerity imposed by the European Union. As has been well noted by Paul Krugman[47] "when monetary policy isn't available, changes in government spending move the economy in the same direction"

FIGURE 21

Economic Sentiment in the Euro Area, Germany, and the GIPS, May 2007–January 2012



Source: European Commission.
a. Unweighted average for Greece, Italy, Portugal, and Spain. (Ireland is omitted because data are not consistently available.)

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[47] Paul R. Krugman, "AusterityandGrowth." The Conscience of a Liberal weblog, New York Times, February 18 (krugman.blogs.nytimes. com/2012/02/18/austerity-and-growth/).
[48] Jay C. Shambaugh (2012) . The Euro's three crises. Brookings Papers on Economic Activity, 2012, vol. 43, issue 1 (Spring), 157-231

Which means in this period of crisis, the austerity policy contributed to the recession that followed, austerity was needed in order to calm down the markets and to restore confidence, but it is now clear that it also contributed to the slowdown of the Eurozone periphery.

This thesis is sustained form the nature of debt sustainability, in fact if we look at the fundamental equation of debt:

$$\partial D_t = (r_t - g_t) * D_t + primary$$

D is the ratio between debt and GDP, g is the growth rate, r is the nominal interest rate, and primary represent the budget deficit scaled to GDP (noninterest). The idea is that t year Debt scaled to GDP is equal to the former year plus interest and new borrowing (beyond interest accrued) to which we must subtract the growth level of GDP that balance the Debt.

Now, when the interest rate paid on the debt is greater than the rate at which economy grows, debt to GDP will grow, even if the country was in balance before. What is important to underline is that also the converse situation holds, if the rate at which economy grows is greater than the interest paid by the country to finance itself the Debt to GDP will shrink.

The bigger is the outstanding debt Stock, the more the country must keep attention to the growth rate and the interest rate.

Let's take an example to better understand the effect of growth and interest rate, let's imagine a country in which the debt is 100% of GDP, and trying to have a better fiscal policy it cuts the government spending. That country will face a greater Debt to GDP ratio if the (r-g) will be at least 1, the greater this multiplier, the greater the Debt to GDP growth.

Obviously, the exact impact to the ratio depends on the starting level of interest and growth, and interest rate also responds positively to budget cuts. If the fiscal policy is permanent and there is the possibility of an impact on growth only for the initial year, then during the next years the cuts will improve the DEBT to GDP ratio.

That means austerity policy can be used by Countries that are growing, because the growth of the economy will offset the cost of Debt and will allow the countries to reduce its Debt to GDP ratio.

Now we have clear in mind the situation in Europe, the interconnection of the crises, the intervention of the ECB and the effect of fiscal austerity on the economy, let's analyze the way thought which Italy entered the equity capital of private company in the MPS and UniCredit Cases trying to sustain financial system without worsening the fiscal situation of the country.

Chapter 3:

3.1 Italian Experience

3.1.1 First reaction to the crisis

The official transmission of the Global Financial crisis to Italy coincided with the bankruptcy of Lehman Brothers. Before that date, in Italy the financial crisis was sustained quite well, Housing market was not collapsing, banking sector had a very limited exposition to toxic assets in their balance sheet, Sovereign Debt market was not an issue at the time and even if growth was not very high it was still positive.

Main reasons why Italy suffered less than other countries in the early stages have been explained by the International Monetary Fund. Some of the main reasons are the intermediary system based on a close client relationship; the adequate deposit protection system and the wide range of bank offices which insured to the Italian banks a stable source of funding to the families.

With respect to the first European Banks, the first 5 Italian banking group were characterized by a major incidence on the active both on customer loans both on deposit to ordinary clients (non-banking customer loans).

To June 2008, the uses represented in average the 65% of the active versus a European average of 43%; deposit were 36% of the assets versus a European average of 33%.

Another factor linked to the one we just saw, is the low incidence to the Italian banking sector balance sheets of the toxic asset, until the third trimester of 2008, banks did not show evidence of relevant exposition, they showed devaluation substantially lower than the European peers.

Moreover, Italian private debt was much lower than the one observed by other countries hit by the financial crisis. For non-financial enterprises leverage was lower as well, the ratio between financial debt and revenues was 75% versus 87% of European average.

For family's financial debt represented 49% of their available income, versus 90% of the euro area and the 150% of UK/US.

Banking profit in the first months of 2008 was still positive and the total capital ratio of the Italian banking system was 10,4% versus the requirement of 8%.

Few Larger institutes had troubles with derivatives stipulated in Italy, but Government was able to face the situation.

The Bank of Italy after October 2008 started checking Liquidity of the banking institution on a weekly basis, in fact the turmoil on the market the difficult access to the credit made liquidity risk concrete. Moreover, during the same month Italian supervisory system made a systemic analysis about the exposition to toxic assets both MBS and CDO in the subprime and Alt-A market.

The real problems for the Italian economy begun when the interbank loan market slowed down. The refusal of banks to lend each other's due to the lack of liquidity and the asymmetrical information.

Together with actions taken by ECB also the Italian Government tried to put in place an action plan to support national banks, mainly because banks, to restore liquidity, limited their credit to clients and this is the exact transmission mechanism which let Italy join the international crisis.

It is consistent the thesis that the severe recession of the Italian banking system was mainly driven by the double recession that hit our country, from 2007 onward. For sure the duration of the crisis has been amplified by the low competitive level of our economy when the crisis hit.

Let's start from the concept at the basis of our banking system crisis, once the crisis hit the national economy, in conjunction with the credit crunch, lot of families and businesses were no more able to repay their loans. Non-performing loans and other suffering credits tripled from 2007 to 2015.

The growth of NPL stock in the banking system was also due to the time needed to require the credit back through lawsuits, which is consistently longer than the European average. The sufferance of the banking sector was not due to a low degree of surveillance but from the worst economic recession of the republican history.

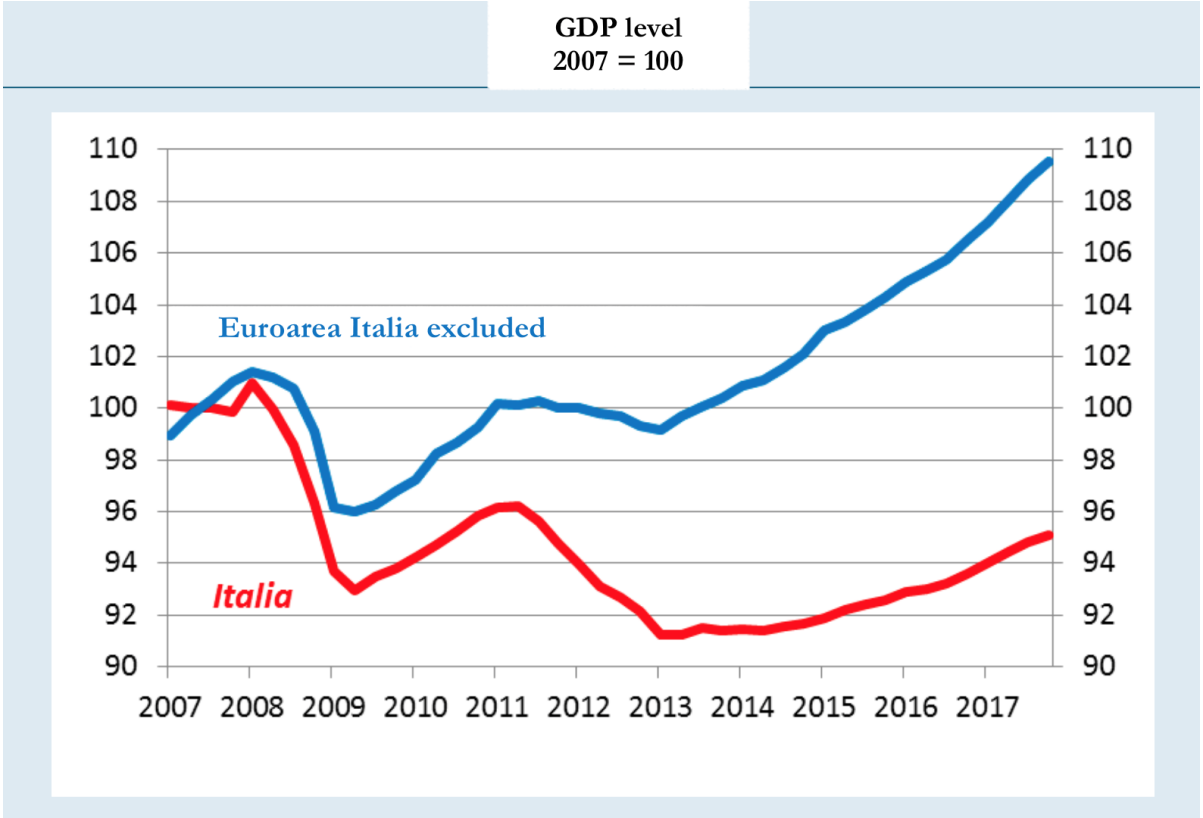
The management of problematic situations has been even harder due to the drastic changes in the regulation about surveillance, state aid, baking resolution during those years. At the same time the macroeconomic conditions and the liquidity shortage made a hard task to sell the suffering banks on the markets.

After the massive intervention of public funds in Europe, but not in Italy, the new regulation made harder to use public funds to sustain financial institutions.

In such a new and different contest, the response to the crisis of 2010 has been slower and modest, but the Italian banking system showed a resilience that the more did not expect.

Even if the banking sector has been quite resilient, the crisis hit the Italian economy in a more severe way with respect to other European countries, in fact the GDP contracted by 8 points from the first quarter of 2008 to the second quarter of 2009 versus the 5 points of euro Area.

FIGURE 22



Source Bank of Italy

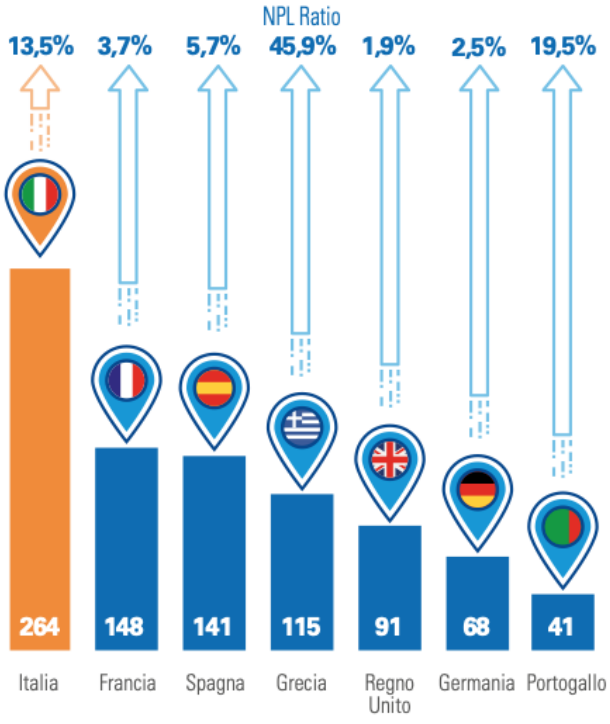
But as I said at the beginning of the chapter, the banking sector resisted better than in other countries, in which several bailouts were required to save significant financial institutions.

In fact, the direct impact on the GDP of bailouts has been the 48% in Ireland, 11% in Germany, 7% in Belgium and Nederland but only the 0,2% in Italy.

The strong recovery that took place in Europe mid of 2009 was stopped by the Sovereign Debt crisis of 2010, when the real Greece condition emerged. The reaction to this last crisis has been slower than the reaction to the global financial crisis, also due to the lack of a well-defined and efficient European governance. In this second phase of the crisis Italy was hit even worse than the first one, in fact Italy lost 5% of its GDP from 2011 to 2013 versus only 1% of the Euro area. This double crisis was tougher than the Great recession of 1930, in total 1 million jobs was lost, Investments were down 30% and debt to GDP reached 130%, the former was essentially because of the multiplier.

In less than three years the second recession determined a new worsening condition of the banking loans, this increase was particularly high for businesses which reached the 10%. This situation was common in every sector, the stock of NPL kept growing, and did not decreased as it would have been if the economic recovery had taken place. During 2007 the stock of NPL was €65b, during 2015 was €341b approximately 5 times bigger. Making a comparison with others European countries makes evident how bad the situation was for the banking system, the NPL ratio was 13,5% vs 2,5% in Germany, 3,7% in France and 1,9% of UK, but the most concerning data was the higher NPL stock in Europe.

FIGURE 23



[49]

[49] NPL Stock and NPL ratio for Europe countries, source KPMG, Data 2016:2017, expressed in billion euros

Inside the stock of NPL almost €90b was insolvent, and in front of this amount banks had €85b real guarantee and €40b of personal guarantee.

The link between the economic cycle and the stock of NPL is crucial, in fact, several studies[50] showed that the deterioration of the credit is mainly due to the unfavorable macroeconomics conditions.

With reference to NPL, of which we have more consistent data from 1991 to 2007, the relationship with their flow, the unemployment rate, the growth of the GDP, houses prices and Operating margin of companies allows to explain nearly 90% of the new NPL from 2008 to 2016.

Which means that the two main center of Italian crisis has been related mainly to Fiscal policy and stimulus to the economy.

To the NPL stock growth also he period required to require and acquire a credit back in Italy the average is 1120 days, almost three years, meanwhile in France slightly more than 1 year.

This mean that the fastness of France banking system to dispose those impaired assed its triple than the Italian one.

FIGURE 24

Italy	France	Germany	Spain	UK
1120	395	499	510	437

[51]

If the Italian recovery time would have been in line with the European average, the ratio between the NPL and the total loans would have been the half of what it is today[52].

Another important point to the stock of NPL was the low development of a secondary market for those assets, and the discount required by the funds operating in this domain, also due to the long recovery time, is high around 20%[53]

[50] The origin of Italian NPL's, Paolo Angeli, bank of Italy
[51] elaborazioni Ufficio Studi KPMG Advisory su dati Banca Mondiale 'Doing Business 2018'
[52] Cfr. il riquadro: "La relazione tra i tempi di recupero dei crediti e la consistenza delle sofferenze registrate in bilancio dalle banche", in Banca d'Italia, Rapporto sulla stabilità finanziaria, 5, aprile 2013. Cfr. anche M. Marcucci, A. Pischedda e V. Profeta, "The changes of the Italian insolvency and foreclosure regulation adopted in 2015", Banca d'Italia, Note di stabilità finanziaria e vigilanza, 2, 2015.
[53] https://www.bancaditalia.it/pubblicazioni/note-stabilita/2016-0003/n3-note-stabilita-finanziaria.pdf quanto valgono i crediti deteriorati

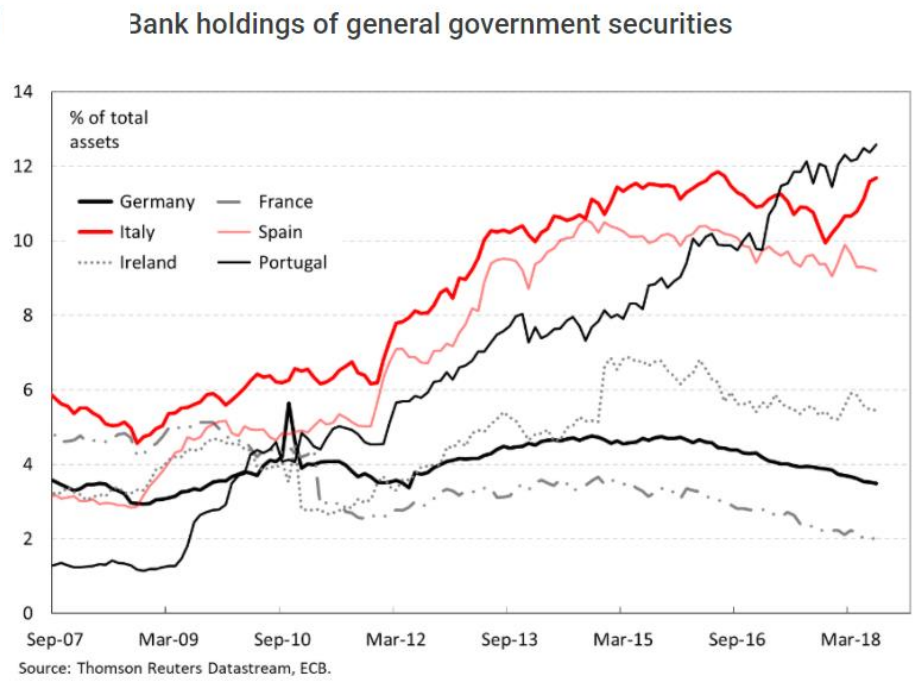
3.2 Peculiarities of Italian Banking system

I would like to underline some few more peculiarities of the Italian Banking system during the period from early 2000's to 2018.

In fact, trying to understand the reasons behind the deepness of the Italian crisis It is crucial to compare the Italian banking exposure to Government securities versus the European countries, If we see the trend from the plot below, Italy it the second country for percentage exposure after Portugal had a slightly higher exposure, but if we see what countries had the higher exposure we can see that there were the ones that were hit the most by the crisis.

It means that the banks supported their countries purchasing their bond, but that also meant a higher exposure to sovereign risk in double link, both due to the securities in the balance sheets, both for the negative economic cycle affecting credit quality.

FIGURE 25



[54]

Now it is also interesting to see how did the Italian Banks reacted to the crisis in terms of credit to the economy, and it does not show significant differences to between categories but a

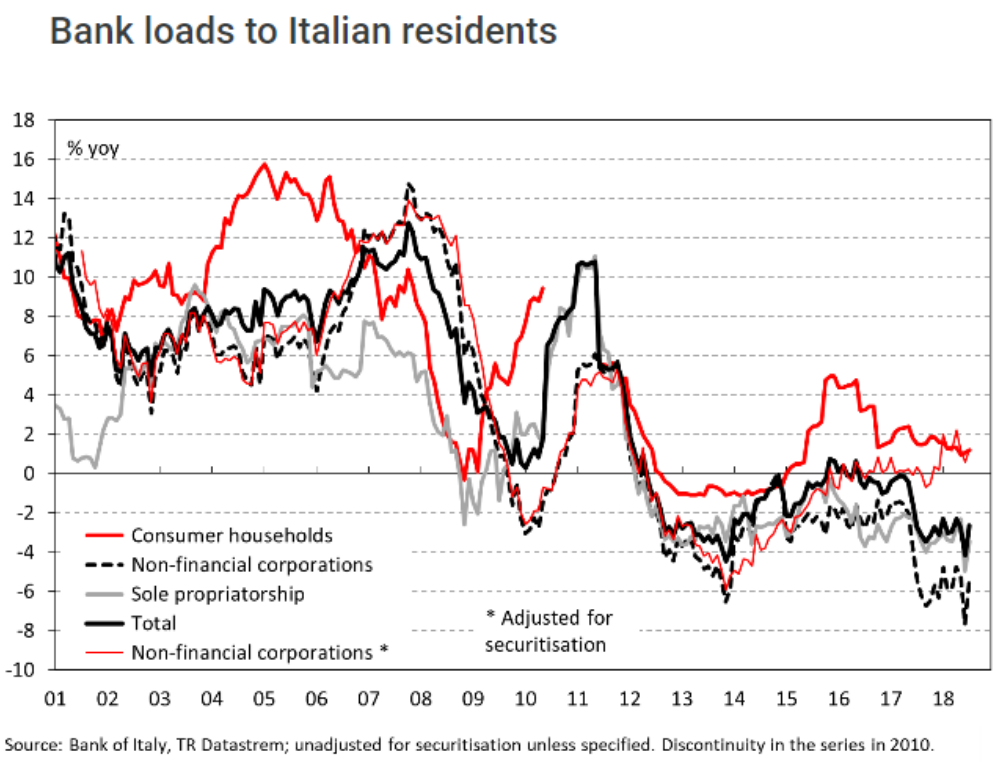
[54] Codogno, Monti (2018), Italy under the spotlight of another financial crisis, LSE blog, Sep 29th 2018

common down trend, that meant the transmission to the real economy through the banking system of the overall financial crisis.

Unfortunately, this is another double link also in this section, in fact, if the credit to the economy decrease and most important the credit to the business and the families decrease, that are the categories that showed the higher percentage of default.

The economy keeps slowing down, and if the recession gets worse, it means higher impact of NPL's on the banks' balance sheets, this is another viscous circle that happened in the Italian economy and that involved the wide banking system.

FIGURE 26



Source: Bank of Italy, TR Datastrem; unadjusted for securitisation unless specified. Discontinuity in the series in 2010.

[55]

Now in order to discuss the picture of the Italian Banks to, later, speak about MPS, I am going to briefly analyze the supervisory system during the double crisis that hit Italian economy.

[55] Codogno, Monti (2018), Italy under the spotlight of another financial crisis, LSE blog, Sep 29th 2018

3.3 Supervisory during the double crisis

During the global financial crisis Bank of Italy has been active on more sides to answer to the challenges of the times. From 2007 liquidity check became constant and stricter, with the incentive of buying product that could have been used as guarantee in the refinancing program from Europe.

After 2011 and the sovereign debt crisis the control became more and more frequent, and at the end of the year a government law stated the possibility to the State to guarantee bond emitted from Bank.

From 2012, when the NPL problem was clear, a surveillance on such loans were started. At this point of time, the situation was warring but still manageable, at that time the ratio of NPL was roughly 7%.

It was clear that another recession would have increased the credit risk, and in fact, in the second half of the year, due to a low adequacy to the covering rate[56] on NPL's, Bank of Italy started a wide eye inspection to verify the adequacy of devaluation. To the banks which shown an inadequate covering fast changes were asked.

This intervention has been a key point for the adequacy level of Italian banking system, this surveillance in conjunction with the Single Supervisory mechanism[57] helped rising the covering rate over the European average.

Economic recession has been worse than expected, and the recovery has been lighter than hoped. Npl's kept deteriorating until they eroded the 100% of banks results from operation.

In that phase there was several negative conjunctures, first it was harder for the State to intervene in private companies, and even more into banks, secondly the high amount of the

[56] The rato between rectificaion of value and the nominal value of loans

[57] The Single Supervisory Mechanism (SSM) refers to the system of banking supervision in Europe. It comprises the ECB and the national supervisory authorities of the participating countries.
The main aims of European banking supervision are to: ensure the safety and soundness of the European banking system, increase financial integration and stability, ensure consistent supervision
European banking supervision is one of the two pillars of the EU banking union, along with the Single Resolution Mechanism.

losses made almost impossible to recur to the markets in order to sell the banks to other more solid banks.

During the summer of that year The European Commission released a communication about the introduction of stricter rules on State aid to the banking system, with the aim of increasing stability of the financial system.

The most relevant introduction was the well-known *Burden Sharing* which is the rules that allow state intervention only after the shareholders and the subordinated bondholders shared the losses. During 2015 the Commission wanted to clarify that also the use of the FITD[58] was considered a state aid, even if the funds of the FITD was risen by the banking industry.

Later, during 2016, the new regulation about banking became effective. The *Bank recovery and resolution directive* also known as BRRD is fundamental in understanding the Italian reaction to the second wave of banking crisis.

In fact, the BRRD provided just two ways of intervention into a banking crisis and only after an officer declared the institution in a situation of "distress or risk of distress".

The first one is the *Liquidation* which is the closing of the bank's activity in accordance to the National law, and that still must respect the discipline of State aid.

The second one is the *Resolution* that allows the bank to keep operating but it is only allowed when the institution is judged as of "public interest".

Resolution is important also for the *bail-in* procedure. The *bail-in* is the procedure through which the losses are first of all covered by the shareholders and bondholders, if the initial capital is not enough, also the recapitalization of the institute is on charge of them, and as last resort even deposit owner for the part of their deposit which is greater than 100K€.

The utilization of *Single Resolution Mechanism* and the *Single Resolution Fund* (financed by the banks of the member countries of the Banking Union) is allowed only when funds raised with the *bail-in* are not enough.

Whilst, a bank is solvent but after a *stress testing* it shows a capital imbalance which threat financial stability, member countries can intervene with a *precautional recapitalization,* considered as State aid but coherent with European rules.

[58] Fondo interbancario tutela dei depositi, https://www.fitd.it/

In this case it is required to apply the *Burden Sharing*[59] and to build up a restructuring plan in collaboration between the Government and the European Commission.

So, banking crises has been faced with the available tools, trying to choose each time the best solution for the economy, the clients and the financial stability. Between 2011 and 2015 thirty-six banks have been posed under extraordinal administration.

In 17 cases in which there were not the chance of selling them in the markets (they represented 0,2% of the total active of the Italian Banking system) have been liquidated without repercussion on the deposit owner and the bondholders.

During November 2015 (before the implementation of *bail in* but after the implementation of the BRRD) there have been liquidated four local banks that represented 1% of total banking system assets.

For those banks *burden sharing* has been applied together with the National resolution funds[60].

The European Commission, the European central bank, the SSM, the SRM together with the Italian minister of economy, the four banks[61] have been sold to two significantly important medium-big banks at a negative price and depauperated of the NPL's.

After two years, European Commission decided that the private funds would not have been enough for Veneto Banca and the Banca Popolare di Vicenza as stated by the BRRD.

In fact, privates' funds were not enough to cover the estimated probable losses in the next future, therefore there were not possible to proceeds with a precautional recapitalization as the one made for MPS that I will specify better in the next paragraph.

SSM declared as consequence that the two banks were in distress or at risk of distress, and since the SRB declared that the two banks were not of public interest they have been liquidated at June 2017.

[59] Burden Sharing is a procedure of the BRRD, UE 2014/59, it must be applied in the distress of a banking institution.
[60] National Resolution fund is a fund established during 2015 in Italy, and it helps the Bank of Italy to achieve its resolution objective.
[61] Cassa di Risparmio di Ferrara, Banca delle Marche, Cassa di Risparmio della Provincia di Chieti e Banca Popolare dell'Etruria e del Lazio.

A liquidation of all the assets separately would have been too risky for the uncovered passive and it could have led to a credit recall for hundreds of thousands of families and small size enterprises.

Moreover, it could have been also a huge risk for the employee of the banks. Therefore, the Italian Government decided to sell in block with a transparent and open selling the active and the passive of the banks without the NPL's.

European Commission, to have the smoother liquidation possible and to have a solution of continuity of the banking activities, allowed a public aid to the acquirer which was Intesa Sanpaolo.

The State aid was first needed to cover the capital needs generated by the acquisition process and then to contribute to the restructuring cost, as well for other cases, this help came after the *burden sharing* procedure.

In the cases in which burden sharing has involved subordinated obligation subscripted by retail investor there have been provided recovery mechanism, at specific conditions such as the acquiring date prior June 2014 (BRRD approbation).

The total amount of obligation (retail investor) for the four-bank liquidated during 2015 has been estimated at €350 million. The FITD gave to the ones that made the request a total amount of €180 million.

The National authority anti-corruption (ANAC) received 1700 requests for a total value of €80m.

Whilst, Shareholders had the major losses, like what happen to other shareholders of other public banks in Italy and in the rest of the world. During the years of the crisis in fact, the banking sector for the advanced economies lose roughly the 80% of the 2007 value.

If we compare the losses to the GDP, in Italy they have been much lower than in other countries such as UK, Ireland or Spain, in that cases often it has been a case of mala gestio and fraudulent behaviors.

Probably the stricter surveillance mad in Italy and the banking law help Italian system to preserve its stability and a final cost for the state much lower than other countries, in fact at the end of 2017 the impact of banking aid was around 1,3% of GDP versus an European average of 5%.

In Italy losses linked to the banking sector have been in the major part sustained by the intermediaries themselves in conjunction with their shareholders. Even considering a worsened condition of some shareholders, the total capital CET1 (2017) was 13,8% of RWA versus the 8% of 2008.

Probably the problem of the NPL's could have been addressed faster and with a stronger state intervention considering that at the end of 2011 the net sufferance NPL's (the part easier to sell) was around 2,9% of the total loans but question of this kind will be addressed in the final consideration of this thesis.

The situation of 2011 changed suddenly, the crisis fulfilled the NPL's growth and the sufferance reached the 4% at the end of 2013, reaching its maximum during 2015 with the 4,8%.

But luckily the alleviated turmoil in the Sovereign debt market lightened the tenson on the public finances and probably this was the perfect moment to design a stronger state aid, which has been blocked by the European Commission even if it was strongly suggested by the Bank of Italy.

Of course, we can say that the banking reaction to the NPL's situation should have been faster, in fact probably the intermediaries should have managed the NPL's in an active way, trying to sell them to the markets or by implementing more efficient recovery activities.

Only ex post, bank of Italy after inspective finding understood that the actions done to solve the situation was insufficient and that the Banks did not have the right information tools about the NPL's and that they used inefficient recovery activities mainly based on law suits that as we saw it's one of the slowest of the Eurozone.

After those important finding Bank of Italy undertook revelations ad hoc about sufferance with the aim of acquiring useful information for surveillance and to help intermediaries to adequate their data bases.

After almost two years from this program, the banks finally had every tool in order to understand and manage the NPL's, now they could decide whether to sell it on the market or keep it in the balance sheets, no more asymmetric information that could pull down prices for those illiquid assets.

Even due to the complexity of the new European procedures, time occurred to the management of the situation and the solution of the crises have been too long.

The governance must be quicker and more efficient, also to avoid that, with the passing of time the active of the banking system would lose much of their values.

Tring to figure out the total amount used by the Italian Government during 2017, with attention to MPS preventive recapitalization and the liquidation of Banca Popolare di Vicenza and Veneto Banca.

Following the studies of Eurostat[62] the impact on the Public debt has been of euro11,2b of which euro 4,8b linked to the transfer to Intesa Sanpaolo and 6,4b with the reclassification of the passive and the liquidation of the two banks.

The company that bought the credit of the liquidated banks reached good performances with the one of Banco di Napoli and it will operate with patience and trying to reach the best return.

The operations made until 2017 increased the account deficit expectation of that year of around 0,3% of the GDP versus the former expectations.

[62] Commissione europea, *Italy – Recording of the winding down of Banca Popolare di Vicenza S.p.A. and Veneto Banca S.p.A.*, 31 marzo 2018

3.4 Monte dei paschi di Siena

3.4.1 Origins and reaction to the crisis

The origins of the Monte dei paschi di Siena crisis are multiple but two of the initial and most relevant events have been probably the acquisition of Antonveneta during 2007 and a bad quality of the credit given to the public.

In fact, to acquire Antonveneta from Banco Santander the price was set to euros €9b, even if Antonveneta faced hard times before the acquisition, it was evaluated at the time €6.6b.

Bank of Italy approved the transaction at the condition of some recapitalization strategies to strengthen the capital position.

Monte dei paschi di Siena in order to raise the money and the capital for this operation put in place four different actions:

1) Right issue €4.9b
2) New emission of shares €1b directly subscripted by JP Morgan
3) Bond emission of €2b with 10 years maturity
4) Loan financing given by a pool of banks €1b, to be repaid in 365 days with the selling of non-strategic assets.

During the month of April 2008, the Consob approved both the right issue of €4.9b and both the €2b subordinated obligation. Moreover, as required by the vigilance authorities MPS disclosed also the main risk factors in the operation in which there was also the group debt of Antonveneta versus ABN AMRO Bank N.V of €7,9b, and the high level of the goodwill that was €7,1b plus the book value of €2,9b, for a total purchase price of €10b.

It is important to underline also the timing of the acquisition, in fact after few months from the date of the acquisition the U.S banking system collapsed, and as we said the transmission to Eurozone consisted mainly in a quasi-credit crunch.

Another peculiar fact about this acquisition relies on the new emission of shares to JP Morgan also known as “FRESH”. In fact, JP Morgan collocated, for the same amount of €1b, a convertible (in MPS shares) bond called “FRESH” (Floating Rate Equity-linked Subordinated Hybrid) emitted by the Luxemburg branch of the New York Bank.

MPS had the usufruct of the shares subscripted by JP Morgan situation that implied a series of payment at the condition of the generation of profit from MPS.

The overall operation was based on the payment from MPS to JPM that from the Bank of New York would have gone to the FRESH Bondholders.

So JPM formally shareholders of MPS and BoNY were just intermediaries of financial flow to bondholders, obviously remunerated. But after the revision of the contract by Bank of Italy it was no more considered *core capital* because the characteristic of the operation was more similar to the structure of debt than the one of equity capital, and so MPS and JPM modified the usufruct contract.

The modifications of the agreement required the approval from the Bondholders, and in the bondholders, meeting made in march 2009, MPS made an agreement with Bank of New York in which essentially the modification of FRESH agreement was cancelled, this deal was hidden to the Surveillance authorities.

The consequence of this agreement was that the capital subscribed could not be computed into the core capital, therefore without the "shares" underling the FRESH the capital of MPS was 7,8% which is lower than vigilance requirement of 8%.

During the findings of the Bank of Italy there was underlined a huge exposure to *repurchase agreement* on long-term BTP that market conditions require high liquidity margin, the situation of the bank was judged potentially critic.

In the half-year public revision of MPS the appraisal vigilance capital was over 9%, but we now know it was lower, that's why of the CONSOB sanction for informative manipulation.

In the share capital of MPS there was Fondazione MPS which had subscribed the 58% of right issue and it bought also the 49% of the FRESH securities without initial disburse, trough TROR derivatives contract which transferred the risk of those securities on Fondazione MPS.

Fondazione MPS renegotiated those contracts a June 2012 and became the owner of FRESH securities for € 490m, those transactions has been made without a public disclosure and so without letting the public know the real participation into the MPS share capital.

(During 2013 both Fondazione MPS and MPS has been sanctioned by the CONSOB due to the lack of disclosure and wrong disclosure to the public.)

During 2008 Monte dei paschi di Siena also used the two possibilities given by the Italian government of the fiscal credit and the Tremonti bond[63].

Tremonti bond are relevant not only for their amount of €1,9b but also because for their structure and their characteristics the *core tier 1* capital increased from 5,1% to 6,5%, Italian government was able to sustain the banking system without entering directly into the share capital.

By the half of 2010 it was clear that MPS needed an additional recapitalization, in fact, Bank of Italy formally informed the bank of that need in August, the only concern was about the amount of the recapitalization. The amount had to take into consideration the necessity to better facing the stress tests and the heavily exposition to Sovereign Risk since MPS had roughly €25b of Italian Government bond in its balance sheets.

The total of Italian bond owned by MPS was high also compared to the *tier 1 capital* in fact, the incidence on that capital was of 210% versus an Italian Banks average on FTSI MIB of 134% and the Unicredit one of 89%.

Moreover, those securities were classified by MPS as Asset for Sale, and for this reason each year they had to be evaluated at the fair value, possible devaluation would affected directly net capital, only during 2010 the negative impact on capital has been of € -845m, and the condition during 2011 would have worsened.

The liquidity concerns where mainly driven by the elevated volatility and two major *repo* operations on Government bond, the first one with Deutsche Bank and the second one with Nomura for a notional value of €5b with their risk profile not totally considered.

About the *repo* contracts MPS disclose that the ratio behind their subscription was to sustain the banks *carry trade*[64] and to implement a medium level risk-return profile for the bank.

[63] D.l 20/11/2008 n 195 art. 12

[64] Carry trade is the financial practice to borrow money in country and in a currency with lower interest rate and then convert the currency into another in which the interest rate is higher in order to repay the debt and making a profit.

When the Sovereign debt crisis hit Italy harder during 2011, the liquidity condition of MPS worsened, the spread where rising and so where the MPS troubles given its exposition. The need of a capital increase was urgent as it was the concern about the potential losses and devaluations.

The need of a recapitalization was satisfied the same year (2011), with a right issue of €2,1b, an overall of 99,91% of right exercised and only the 0,01% of the option sold to the market.

Fondazione MPS and Axa Group, as announced in the prospectus, respected their commitment of the new share's subscription.

The conversion ratio was 18 new shares for each 25 owned and standing to the analysis of Goldman Sachs the capital increase should have raise the *core tier 1* from 6,4% to 8,5%.

The main goal of the recapitalization ,as stated in the prospectus[65] of the operation, was to create the condition to repay the Tremonti bond in their total amount of €1,9b , to anticipate the stricter capital rules that Basilea III would have required once implemented, and to have a wider protection versus potential losses.

But even after the recapitalization Bank of Italy during the autumn of 2011 was forced to lend liquid securities to MPS allowing the bank to finance itself on the market with repurchase agreement.

But later, the same year, MPS published its annual financials, through which became clear the seriousness of the situation, and now become much clearer the impact of the Antonveneta acquisition in the MPS crisis.

In fact, just from the Antonveneta acquisition Goodwill MPS disclosed a devaluation of €4.3b, to which they did add a devaluation of € 1,3b for NPL's.

For what concerns also the Italian Sovereign debt, the galloping spread caused an important devaluation of the fair value of such securities with an impact of €3,7b in the profitability.

Moreover, taking count of the losses in the Income statement the total Gross profitability position of MPS was – €10b, meanwhile the net profitability alleviated by the positive impact of taxes was the enormous amount of €8,2b.

[65] https://www.gruppomps.it/static/upload/archivio/896/Prospetto_informativo.pdf

During the same year, just few months after the recapitalization, the situation changed dramatically. The losses and the devaluation had a huge impact in MPS, in fact during September 2011 EBA started a target stress testing which finished at December 2011.

Whilst on the MPS disclosure the *core tier 1* capital was computed without considering the devaluation on the Sovereign debt, reporting a value of 11% (higher than the vigilance authority requirement of 9%).

EBA instead considered the devaluation disclosing that MPS had the need of an additional recapitalization of around €3,3b by June 2012 in order to reach the 9% target.

Right after this request from the EBA, MPS presented to Bank of Italy an action plan to reach the target set for the capital before the deadline, but it had to wait until the 26th of June 2012, date in which MPS presented its Industrial plan 2012-2015.

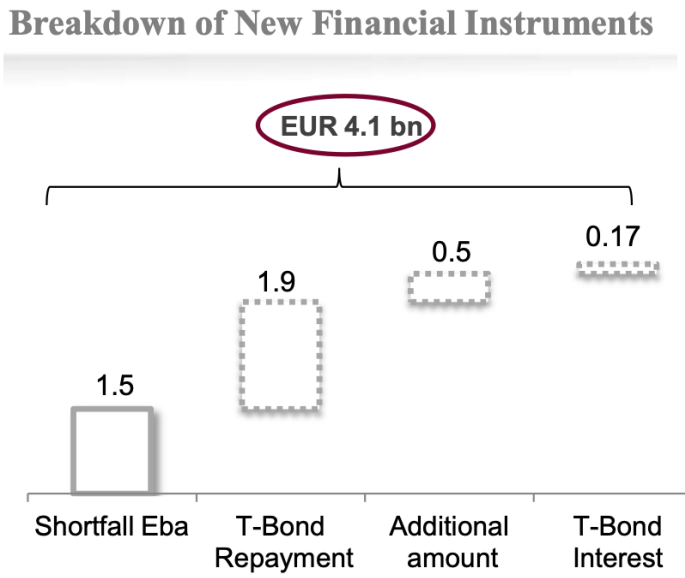
The main tool MPS used to increase its core tier 1 capital has been the "Monti Bond" defined as "new financial instrument" of government capitalization.

On the 26th of June 2012 the Board of the Bank approved the Industrial plan 2012-2015 that was focused on the strengthening of the bank capital, as required and suggested by the ECB. The Monti bonds identified as the right tool could be classified as Common Equity Tier 1, and therefore they were perfect for the MPS situation.

Moreover, the Board analyzed the performance of the year after 30th of September stated that the overall need to cover the capital needs was €3,9b.

The total amount of the Monti Bond, emitted by MPS at February 2013, was €4.071b and as we can see from the table below MPS used the Monti Bonds also known as "new financial instruments" to repay the former Tremonti Bond, and their interest for €2b, to cover the EBA shortfall for €1,5b and an additional buffer of €500m to strengthen the capital buffer.

FIGURE 27



[66]

The introduction of those instrument was considered equal to "state aid" and therefore it had to be accepted by the European Commission.

November 2013 has been the turning date for MPS and the MEF, since the European Commission approved the Italian state aid to MPS considered in line with the EU rules, the Monti Bond was emitted.

The structure of the Monti bond was similar to the one of the Tremonti Bond, and in line with the banking rescues made in Spain and in the United Kingdom. Those Bonds were subordinated hybrid instruments convertible in shares that was emitted by Monte dei Paschi di Siena and that has been totally subscribed by the Italian Treasury, their first aim was to strengthen the *core tier 1* of the bank.

They were hybrid instrument because they had both the characteristics of bond and equity, as suggested by the European Commission they allowed the issuer not to pay interest on the subordinated loans emitted before the Monti bonds and in the absence of profit or for the part not covered by profit to repay the interest with shares at market value with a 30% discount to terp.

[66] Source consolidated balance sheets report MPS

They were perpetual instrument because they didn't have maturity, the interest requested by the Italian government was 9% per year for the first year and an additional 0,5% every two year from 2014 until a maximum of 15%.

The payment conditions were a deferred payment on the 1st of July each year that could be either payed in cash or in newly issued ordinary shares.

Redemption 100% until 2015 and every two year a +5% until a maximum of 160%.

FIGURE 28

Monti bonds technicalities	
Instruments	Bonds, which can be converted into ordinary shares (30% discount to TERP) ; accounted in CT1 capital
Subscription price	At par
Expiry	Perpetual (if not converted)
Interests	Interest of 9.0% on the nominal value (and then +0.5% every two years from 2014, until a maximum of 15%).
Payment conditions	Deferred payment – paid on 1 July each year Interest payable in: cash up to the operating result for the year; newly issued ordinary shares
Redemption	100% until 2015 and then +5% every two years, until a maximum of 160%

67

MPS has been faster than expected in repaying the Monti Bonds, in fact only one year after MPS launched a new capital increase of an overall total of €5b, this additional capital was used in part to repay the NSF (€3b) and in part to increase its capital ratios.

The Aucap was done in the form of right issue for a total of 4,99 billion of shares of which 116m of right were exercised with a 99,85% of subscription.

MPS offered in the stock market the unexercised rights which was sold integrally in the first day of trading the 1st of July 2014.

The Capital Increase was made in such a short time of period following the Comprehensive Assessment, in fact, looking to the start of the Single Supervisory Mechanism the ECB launched a health check on the banking system.

[67] Source consolidated balance sheets report MPS

The Comprehensive Assessment, that could be done ad hoc or under regular interval, consists in two main components:

1) The asset quality review (AQR) to enhance transparency regarding banks' exposures, including as regards the adequacy of asset and collateral valuations and related provisions
2) A stress test, performed in close cooperation with the European Banking Authority (EBA) – to test the resilience of banks' balance sheets
3) The results of the stress testing activities plus the Asset quality review had as aim to understand if in an adverse scenario the best quality capital of the banks *CET1* was adequate to offset the riskiness of the assets.

Official results of the *CE* were published the 26th of October 2014 and it was made considering the right issue capital consolidation made during the year. MPS evidenced an additional capital need, reconducted mainly to the results of the stress test, of a total amount of €2,1b from the minimum of the 5% RWA.

The overall deficit of €4,25b was reduced thanking to operation made during the year 2014, in fact, the recapitalization size was increased of €2,1b to have an additional capital buffer functional to potentially negatives impact given by the *CE* and to respect the aim of the 2014-2018 industrial plan.

Unfortunately, the far-sighted vision of a potential adverse scenario forecasted by MPS has not been enough to cover the additional capital requirement, another step had to be made.

The next step made by MPS was another right issue the following year, trying to respect the capital adequacy required by the ECB and the EBA. The offering, officially announced and approved by the Board the 16th of April 2015, was of €3b with a subscription price of €1,17.

The ratio of new shares to old shares was 10 to 1, with a discount to TERP of 38,9% computed on the price of the stock the day of the approval.

The recapitalization of the bank during 2015 included also the final repayment of the Monti Bond for a total of €1b. Moreover, based on the offering 117.997 shares was given to the Italian Treasury to repay the interest of the NSF, this amount corresponded to the 4% of MPS capital. This has been the turning point in the recent history of Italian Banking and MPS, because it stated the transition of the Government from bondholder to a formal shareholder of the bank.

It is important to underline that the repayment of the Monti bond has been made much before the formal deadline agreed with the European Commission that was 2017. The ECB in the meantime decided to take a direct surveillance on the banks and asked to MPS to respect from 2015 onward a CET1 ratio of 10,2%, moreover, it asked also four different action points:

1) No dividend payments
2) To face actively the high incidence of NPL's on the total loans
3) Strengthen the internal process inherent to the internal capital distribution
4) Create a more structured and adequate strategy for liquidity and funding

Few times later, the Italian Treasury officially disclose that it did not want to be a shareholder of the bank for a long period of time and its aim to sell the shares when the market condition would make it profitable. We now know the history has been much different, however the contract also implied a lock-up clause of 180 days from the 1st July of 2015.

Even if the recapitalization plan has been structured in an excellent way, in terms of frequency of recapitalization, amount of recapitalization and reaction of shareholders to the right issues, the situation of MPS worsened again.

The NPL stock kept growing, it was 14,7% during 2011, 31,7% during 2014 and 34,5% during 2016 versus an Italian Banking system average with the same date of 11,2%, 17,7%, 18,1% and 17,3%.

It is true that the percentage of NPL was much lower but the trend was similar, this is consistent with the hypothesis that the main factor of stress to the banking system has been the double economic recession rather than the Global financial crisis or the Sovereign Debt crisis.

In fact by 2015 the spread situation was overcame, but the Monte dei Paschi di Siena crisis was not, the fact that NPL's kept growing with a majority of default in the Small and Medium businesses it is an evidence of the Italian Economic troubles that infected the banking balance sheets.

During 2016, another wide European stress test was made[68] on the banking system, 51 institutes were analyzed, this time without doing an Asset quality review but focusing only in the ST, since this test was made with the main purpose of assessing the needs of a precautional recapitalization.

In fact, the BRRD does not require the AQR to understand the need of such a recapitalization that are available "to address capital shortfall established in the national, Union or SSM-wide stress tests, asset quality review or equivalent exercises conducted by the ECB, EBA or national Authorities"[69]

The scenario supposed by the ECB and the EBA was a conjunctural recession from 2016 to 2018 with a shrink in the GDP of -1,2% first year, -1,35% second year and a slightly positive last year with 0,7%.

The deterioration form the baseline scenario was of a cumulated 7,1% a huge downturn in the economic activities, the principal aim of this exercise was to assess the capacity of the European Banking system CET1 to absorb losses and still be in a strong capital position.

In order to understand the position of MPS, EU banking system had a weighted average of 13,2% CET1 ratio as of end 2015, and since December 2013 the total increases of CET1 capital has been roughly €180b for the 51 banks in the analysis.

The result of the ST in the adverse scenario clearly show the strengthening of the CET1 capital ratio in the European banking system, in fact the forecast in the adverse prediction shows a fall in the CET1 ratio of 380bps (in the weighted average of the banks taken in consideration) but still at 9,4% which is consistently higher than before the recapitalization strategies.

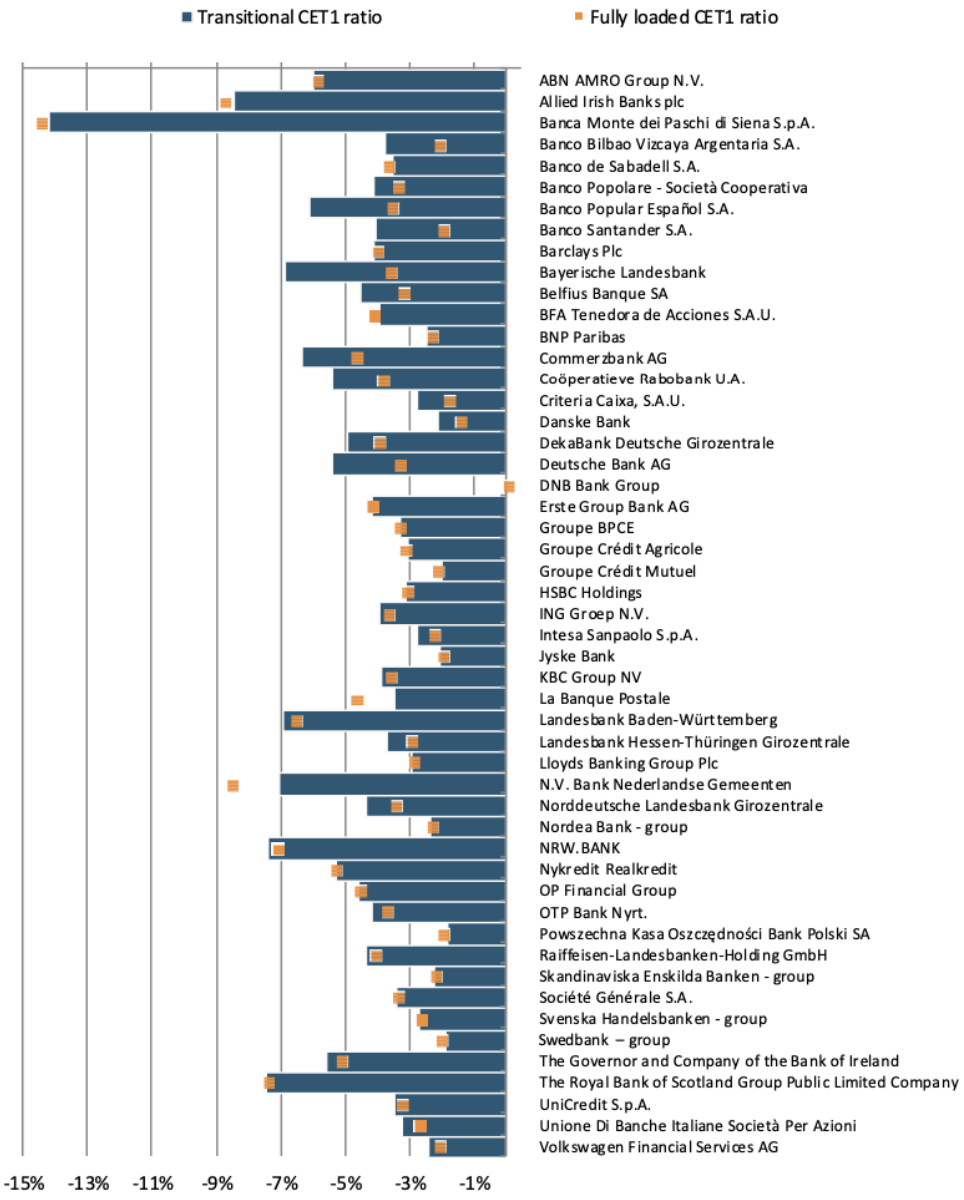
Mostly the losses are due to the capital depletion in the order of €269b and obviously those type of losses were going to affect the most banks with high stock of NPL such as MPS.

Moreover, the EBA and ECB published also the effect on the capital of each bank in the sample, the bank mostly hit in the adverse scenario in term of CET1 was MPS, which would have lost 15% of the capital in the case of an economic recession.

[68] https://www.eba.europa.eu/sites/default/documents/files/documents/10180/1532819/e5fe6caf-8a52-4879-a694-d17a45f24c8c/2016-EU-wide-stress-test-Results.pdf?retry=1
[69] Article 32(4) BRRD

FIGURE 29

Impact on CET1 capital ratio from 2015 to 2018 in the adverse scenario by bank in alphabetical order



[70]That's the main reason why BCE asked MPS a sound solution to the bank problems, so the Italian oldest financial Institution elaborated a plan in which It should have sold the entire portfolio of NPL's plus a requalification of the credit portfolio. In order to also respond to the

BCE request in the plan of MPS was also scheduled a €5b additional recapitalization, and the plan was authorized by BCE in the month of November.

Unfortunately, the project could not be completed, MPS did not find all the resources on the market also due to the missing of an *anchor investor* with a leading function.

It also true that the time given to MPS to find the right resources was not a lot and when the Management of the bank asked prorogating of the deadline the answer has been negative due to worries about liquidity and capital position of MPS.

However, the 23rd of December 2016 Italian Government approved the D.L n. 237/2016 with the aim of restoring confidence inside the markets and the banking system, one of the important action made by the State was the Guarantee on the new emission passive of the banking system.

But the most important, at least for the MPS case, was the possibility to participate in the Share capital of the banks as stated by the BRRD with the precautional recapitalization and with respect of the state aid rules.

The same day of the announce, Monte dei Paschi di Siena asked for the extraordinary liquidity program such as the ELA, and it disclosed the intention of the bank to ask for the intervention of the State in a precautional recapitalization as the D.L 237.

The amount of the precautional recapitalization asked to MPS and Italian Government after the stress test was identified by the BCE for a total of €8,8b, of which €2,5b to have a *total capital ratio* of 11,5% and6,3b to be in line with the CET1 requirement taking into consideration the eventual losses of the tress test.

The difference from the "plan Charles" €5b private recapitalization and the €8,8b asked by the ECB is mainly due to the purpose of the two actions. In fact the €5b would have been used to cover the cost of the NPL's selling (€3b) and additional €2b to rise the covering interest rate for probable sufferance on loans, those two measures would have been made mainly to reduce the credit risk of MPS.

[70] Source European Strees test 2016, https://www.eba.europa.eu/risk-analysis-and-data/eu-wide-stress-testing/2016

Different it's the case of the precautional recapitalization under the BRRD, which face a deep economic downturn in order to preserve financial stability, the nature of the intervention is extraordinary and temporary, and it's made under the condition of the bank solvency.

The precautional recapitalization could happen only after the subordinary bond are converted into shares, so only after the Burden Sharing took place.

In this situation the total disbursement of the Italian Government has been €4,6b because of the total €8,8b €4,2b was covered by the burden sharing procedure.

The 30th of December MPS also presented to the MEF, ECB and Bank of Italy a restructuring plan that included the disposal of NPL's thought a structured process.

The final plan has been approved by MPS the 26th of June 2017 and it envisaged the substantial balanced budget by 2018 and a profit by 2019 but the most important part the selling agreement with the Fondo Atlante of which I'll talk later on.

The European Commission finally approved the State aid for Italy the 4th of July 2017, with a intervention cap of €5,4b of which €3,9b for the capital increase and €1,5b for the retail investor subjected to the Burden sharing partial reimbursement, the total Equity stake of the Italian Government was 68%.

3.4.2 Fondo Atlante

One of the requisites of the state aid to MPS has been the active manage of the NPL's, MPS achieved this goal also thanks to the newly establish Fondo Atlante.

The Fondo Atlatnte is an Alternative investment fund, substantially it is a private fund created under the stimulus of the Italian Government and the first Italian banks. The definition given by the MEF is:

Fondo Atlante "is a private-sector initiative set up by an independent funds management company that sources capital from financial institutions (banks, insurance companies and foundations that invest on a voluntary basis)."

It is important to underline that however one of the subrisceber of the fund has been Cassa Depoisiti e Prestiti, which is a substantially state-owned fund (85% owned by the Italian Treasy) and trough which several investments in the territory are made.

The main purposes of the fondo Atlante was:

1) To ensure that the capital increase of the Italian banking system would be successfully, acting as a back-stop facility[71]

2) To start the setup of a market for NPL's, in fact the funds available to the funds would not be enough to sustain the whole banking system NPl's, since that FA would focus on *junior* tranches of securitization vehicles, acting as a sort of leverage for the more senior tranches for which there is already interest and marketability.

3) To offer investor a good medium long-term return, based on the performances and the recovery of NPL's, this potential good performance could be reflected on better stability and economic growth prospects.

   Now, it is interesting to understand the set-up of the operation for the Fondo Atlante and MPS transaction, in fact, in order to sell the portfolio of credit MPS created a Special Purpose vehicle called Siena NPL 2018 s.r.l to which MPS gave a credit portfolio with a Gross Book Value of €24,5b.

   The price of such a credit portfolio has been the 20,58% of the GBV, that correspond to €5b. The purchase price has been paid to MPS, partially with the cash flow that would have been of the SPV relatively to the credit portfolio after the cut-off date (€548m) and for the other €4,5b trough the emission of other securities by the SPV.

   The securities were the following:

   1) Senior tranche A1 €2.683,5m

   2) Senior tranche A2 €412,1m

   3) Mezzanine tranche €847m

   4) Junior tranche €565m

[71] Acting as a back stop mean being the last rest purchaser in a security offering for the unsubscribed portion of shares.

The 22nd December 2017 MPS made an agreement for the selling to Fondo Atlante thought the Quaestio Capital SGR S.p.A the 95% of the mezzanine tranche for roughly €800m that became effective by the 9th Jan 2018.

MPS requested the "GACS" [72] on its Senior tranche A1, but it had to gain the rating *investment grade* by two different rating agencies. During May 2018 the *senior notes* have been restructured together creating a unique class, that allowed the three rating agencies to give the investment grade to this instrument.

Following the restructuring of the classes the new structure was:

1) Senior A tranche €2.918m rating A3 Moody's, the outstanding amount at 31st dicember 2018 was €2.752

2) Mezzanine B €847,6m (95% owned by Fondo Atlante)

3) Junior 565m

The Securitization process finished with the concession from the MEF of the state guarantee on the senior tranche "GACS".

Subsequently MPS placed the Senior tranches to the market, with particular attention to the Institutional investors, for all the duration of the securitization MPS had the right to keep an economic interest of 5% on the notional value of each class, also known as *retention rule.*

If the return of the junior tranche sold to the Fondo Atlante would have exceed the 12% MPS subscribed also an earn out of the 50% to the extra profit.

Another important step ahead made by MPS was achieved through the following project:

1) "Progetto Merlino" which consisted into the cession of a *unsecured non performing* and *consumer credit* portfolio of €2,4b, the selling was divided by cluster of credit and the type of the exposition.

[72] "Garanzia sulla cartolarizzazione delle sofferenze" it was a state guarantee with the aim of facilitating the selling process for NPL's, the guarantee was on the senior notes trying to boost the after-market for junior tranches.

2) “Progetto Morgana” based on *leasing* non-performing for €900m

3) “Progetto alfa 2” for unlikely to pay portfolio for €400m

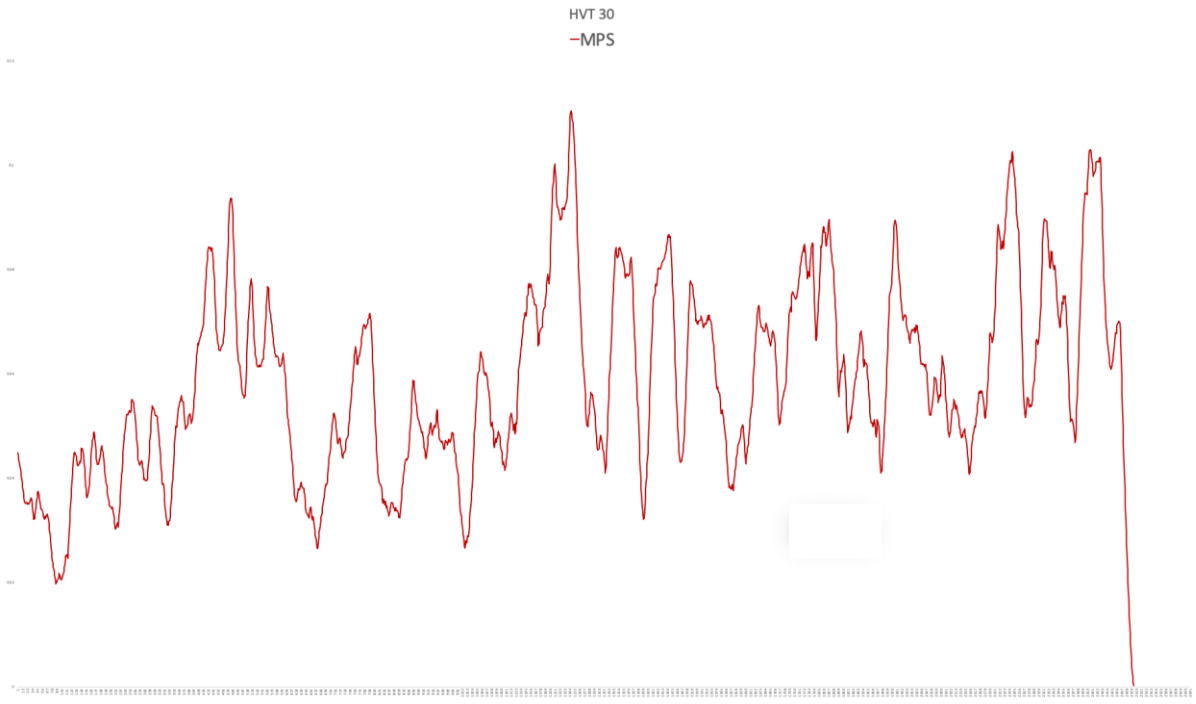
The NPL ratio following those main actions was 17,2% during 2018 with a decrease of 18,5% with respect to 2017, following the commitment of MPS in front of both the ECB, the MEF and the European commission, achieving results better than expected in term of performances.

The last State intervention, the deconsolidation of the NPL and the restructuring plan singed the stop of the MPS 10 years long crisis and stated also a new framework for those banks in trouble but still solvent.

3.4.3 Historical volatility analysis

Now I am going to analyze the different effect of the various action took by the government and by MPS on the HVT 30days as I did for the American experience.

FIGURE 29



Historical average volatility MPS, personal computation

As we can see from the Historical average volatility 30days for MPS, does not show any clear trend, in the sense that to each action taken by MPS, for example their recapitalization, It helped the institute to reduce volatility for a while, but the information to the market, the failed stress test, the growing concerns about the NPL portfolios raised the volatility again.

What is important to underline is that, without a clear injection of capital as we saw for the American experience, agents in the market are not willing to trust into the soundness of the institution, a more direct impact as the one that could be given by the precautional recapitalization that we cannot analyze since the alt of trading for a considerable amount of time has the potential of restoring confidence in the market. Moreover, as we saw during the chapter, the European project *in fieri*, the changes in the surveillance, the new rules and the new tools available in the banking sector, given the situation of MPS did not allowed a calm down in the stock volatility.

For sure what I can say is that, what really drove the long crisis of Mps has been the raising stock of NPL, because even if the AFS devaluation hit hard MPS balance sheets, it has been overcame by the bank and we can see that the HVT kept rising even after the Sovereign debt crisis calmed down.

The Acquisition of Antonveneta and the derivatives operations also had an impact, but I can make a similar comment of the exposure to the Italian BTP, so that the devaluation hit the balance sheets, but in the absence of NPL's growing stock it would have been overcame by the recapitalizations made during the years.

Landing back to the Government intervention into private company we can use the VSTOXX [73] index to understand its effect on volatility, it shows the effect of an early reaction into the markets by the different countries, see bailout season in Germany, Ireland, Belgium and the other countries that needed an early capital injection

[73] which is the European index for volatility (like the VIX but for Eurozone)

FIGURE 30

[74]

In fact, the crisis was offset in term of financial stability quite smoothly, we see a peak during 2009 but then a constant decrease until a new high for the Sovereign Debt Crisis.

The pattern of such a crisis is much different, also for the worries about the soundness of the European Monetary Union and the impossibilities of blocking the prancing crisis. It seems reasonable to say that the capital in the share capital of private companies from the state reduce the volatility in the market, and that, if the purpose of the action is restoring confidence, this is probably one of the best tool to use.

[74] VSTOXX source The Wall street journal

Conclusions and the possible future role of CDP

It is not easy to compare such different situations as the Italian experience and the American one. First, the crises were different, the U.S crisis was born from financial institutions and then transmitted to the real economy.

The securitization process increased banks' ability to lend more and at the same time to shift the risk away from their balance sheets. Securitization itself was not the problem, but the underling was. In fact, banks started lending to people that in normal situation would not have been considered qualified borrower, the subprime and NINJA raised also due to the moral hazard of the lender.

The problem was not evident at the time also because the raising housing price index helped households to get more mortgages to pay the older ones since their properties increased in value.

But once the housing price plunged the default rate as well as the foreclosure rate increased, and as a cascade effect first the MBS's then the CDO's and the CDO's squared started losing value.

The asset which seemed safe and of which the senior tranches were graded triple A by rating agencies started defaulting and the financial institutions were hit very hard, their balance sheets lost lot of their value, their share price felt down and the interbank credit market crunched.

The Italian one could be considered the way opposite, the crisis was born due to a fiscal imbalances of the Government, then through sovereign bond it was transmitted to the Italian banking system, as bank needed liquidity they allocated the funds to liquid and safe assets, limiting their credit emission to the economy.

This credit crunch hit the Italian economy and led to a high level of loans default, both from families and both from businesses this situation affected banks' balance sheets creating a self-perpetuating vicious circle

Moreover a huge difference and probably the most important one, is the regulation in which the countries operate, US has their own currency and therefore they can choose the best monetary policy but way more important the Government is subjected to its own rule, meanwhile Italy have to respect communitarian law that could, in several cases, not be the best solution possible.

In fact, the fast reaction of United States to the financial crisis injecting capital into private but listed companies was possible also thanking to the U.S *governance*.

Even if Italy at the early stage of financial crisis did not need a direct intervention into private companies, it was needed later on, obviously the sovereign debt crisis would have made it harder, but once the crisis calmed down Italy could have stepped in into the share capital trying to avoid a broader collapse. Probably a faster governance and an easier state intervention when needed could have increased the ability of the Italian government to give credit to the economy, limiting the NPL's stock growth.

The differences of the two intervention are evident, U.S had the chance from the beginning to buy preferred equity, meanwhile Italy started with the Tremonti Bond, then the Monti Bond and only in the end, five years later the beginning of the distressed situation, it stepped in with the precautional recapitalization of MPS.

I can say that, for what concerns the aim of stabilizing the market, the better instrument is the preferred equity purchase.

In the different cases in which we analyzed the historical volatility, it plunged after the State capital injection. The Vix index and the VSTOXX index followed the same path after the intervention, this is a clear evidence of the market positive reaction to state participation into share capital of private companies.

Probably the reason is that the default risk of an institution in which the major shareholder is the government goes near to zero, therefore the confidence about the future increases.

Moreover if the intervention concerns the banking system it helps to increase the credit to the real economy which increase the probability of a GDP growth in the period after a crisis, consider that the GDP growth of US in 2010 has been 2,6%[75] with just two year contraction (2008-2009).

However, Italian Government in order to buy an equity stake of a private company must still meet European condition and communitarian law.

[75] https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=US

A possible way through which the government could both be compliant with European law and both step into the share capital of private companies could be to use the tool of Cassa Depositi e prestiti.

Cassa depositi e prestiti is a S.p.A of which the major shareholder is the MEF with a 70% stake, the remaining 30% is owned by roughly 60 entities from the banking system.

Since the formal separation of CDP from the public administration with the listing on Italian stock exchange in 2003, Cassa has two main activities:

1) "Gestione separata" which are the activities of financing public investments
2) "Gestione ordinaria" which are the activities not concerning public investment and so that are not formally guaranteed by the Government

Fundraising activities of CDP for the "gestione separata" are mainly done with postal savings which are guaranteed by the State likewise the Italian Government Bond, moreover CDP can emit Covered bonds.

Obviously for investment made under the "gestione separata" there are stricter requirement, but with the "gestione ordinaria", therefore not guaranteed by the State, CDP can be compliant with the European law for state aid.

If we look back at the MPS case, Cassa depositi e prestiti was one of the major investors in the Fondo Atlante, which means that it helped the banking system to be alleviated by the NPL's stock.

At the same time, for what concerns the American experience a similar solution was found with the PPIP, which as underlined in the first chapter is the Public Private Investment Program.

This program, which concerned toxic asset purchase, provided a loan activity up to 85% of the asset values to private institutions.

Moreover, for the remaining 15%, for each dollar invested by the private investors the Government would have invested an equal amount.

Probably this could be the right path to follow in this difficult post pandemic times, using the tools of Cassa depositi e prestiti in conjunction with a pool of private investors, acting as Private Equity funds (activity already done by CDP).

This action could be useful for two different purposes, the injection of capital into private companies, so a stimulus to the economy, and a potential positive return for CDP and therefore for its shareholders.

This possible intervention could be done also for listed companies, which would have the power to reduce volatility during troubled times and financial turmoil.

This program would be in line with the finding of my thesis, because it would allow a capital injection and therefore a sort of stabilization effect of the stock prices, restoring confidence and promoting the economy, which as I underlined in the previous chapter has been the major issue in the Italian double crises.

This topic is even more important now a days after the news of the European funds given to the Italian government which I hope will be used as a great stimulus to the economy trying to break a stagnation period that has been way too long.

In this special occasion I am confident about Italian possibilities of a recovery and a new stimulus plan thanking to the chance of a Professor Draghi government which, as we saw in the last few days, is a beacon of hope for us all, who better than him able to manage those funds and restore credibility to our country?

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Summary

Financial crisis started slowly from a housing boom which suddenly ended into a housing bust when prices plunged after they reached a peak during 2007. During this unprecedent development of real estate market, and given the high level of interest rates, financial institutions increased the amount of lending trough asset backed securities, or, to be more accurate, Mortgage backed securities since the underlying assets were pool of mortgages. This type of structured securities helped the financial system to increase their credit power and to boost the economy. The lender switched the default risk of the borrower to a SPV and then to the market, in order to use the proceeds of the selling to lend more money.

Those type of securities were divided in three tranches Senior Mezzanine and Junior. The payments of the different tranches were structured in order to grade the senior tranche as triple A, relying on the idea that mortgages defaults were independent one to another and so that the default risk of the entire MBS was quite low. This is generally true, but this moment of extreme confidence led to moral hazard by lenders which started to give more and more mortgages to people who did not have the right credit score: those borrowers were also known as subprime.

Once the housing price felt and Mortgages default rate increased, those type of securities became riskier and less liquid loosing lot of their value, a major issue for the biggest financial institution who had millions of MBS and CDO into their balance sheets. When the credit score of MBS has been cut by rating agencies and the default rate increased financial institutions occurred into huge losses.

This uncertain situation reduced the ability of banks to access private liquidity, which in several situation could become threatening.

It took only a few before first SIFI's faced hard times, September 2008 showed the U.S government takeover of Fannie Mae and Freddie Mac which officially started the U.S "bailout" season due to the distress of major financial lenders. Few weeks later Lehman brothers field bankruptcy. This event that signed the history of Merchant banks and finance, probably was more a political choice rather than a financial one. The government let Lehman fail to remember

to the financial system that no one – as stated by Andrew R. Sorkin – was really "too big to fail".

Meanwhile AIG one of the biggest Insurance company was able to keep going with its business only thanks to a $85 billion loan form the Federal Reserve.

A major issue in this situation was the lack of trust in financial institutions which reduced the number of transaction and the ability of financial firm to access credit market and so to meet liquidity needs.

This turmoil in the financial market was first driven by the uncertainty about the future and then by the fact that nobody really knew the MBS and CDO exposure of market participant making almost everyone an unreliable counterparty. In this situation, the US Government with the Federal reserve and the department of the treasury started working out on the EESA "Emergency economic stabilization act" which has been amended the 3rd October 2008.

There was more than one possible opportunity to recover the financial system, one of the first idea was to purchase mortgage related toxic assets thus reducing the general uncertainty and at the same time depurating banks' balance sheets. However, in order to recover the stability in the financial system, EESA act established the TARP ("troubled assets relief program").

This program allocated half of its firing power to the CPP ("Capital Purchase program"), a program that directly added capital into banks' balance sheet through the purchase of preferred Shares. Under Tarp other programs were built, as AGP ("Asset Guarantee program") and TIP ("targeted Investment program"). Those were built to reduce the turbulences in the financial markets and at the same time trying to avoid a darker crisis.

At this point in time, the issue of the mortgage related toxic asset still remained, so the TARP also included the Public-Private Investment program PPIP, with the aim of valuing and removing those toxic assets from the balances sheets of heavily exposed financial institution, probably the TARP that was more similar to the TARP first draft.

The overall volume of the program should have reached an amount of $700 billion but once United States reached out how to reduce the uncertainty in the financial system, the focus of the Congress switched to regulatory changes. This led to the creation of "Dodd-Frank act", which amended TARP authority reducing the total amount to $475 billion.

The TARP action window to purchase new instruments or making new contracts expired the 3rd October 2010, leaving the Treasury with the only goal of maximizing taxpayers' "wealth".

The Capital Purchase program "CPP" has been the first program set out, with the aim just mentioned; the only question was how to add direct capital into banks.

In fact, under Section 2 of the Tarp Act, the program first aim was to "restore liquidity and stability to the financial system of the United states" in conjunction with four more points:

1) Protects home values, college funds, retirement account and life savings

2) Preserves homeownership and promote jobs and economic growth

3) Maximizes the overall returns to the taxpayers of the unites states

4) Provides accountability for the exercise of such authority

If we consider these four goals, we can understand why buying troubled mortgage backed securities was not a suitable option. It would have put "preserves homeownership" and "maximizes the overall return" one against the other. Moreover, it would have been hard to value a fair price for those securities, potentially a huge problem both in the acquisition phase and in the selling one.

To try to get all four goals together, the Treasury figured out the best plan was to buy preferred shares with a set dividend payment and a grating of warrants. The dividends payment was set at a rate of 5% that after five years of payment would have rose to 9% permanently until the repayment.

For what concerns S-Corp Banks there was a different dividend rate. It was 7.7% and after five years it would have rose to 13.8% until the repayment. By the end of 2008 CPP had 214 participants banks and $172.5 Billion shares outstanding.

Obama administration and the 11th Congress modified the initial structure of CPP. They thought to allow banks to get an anticipated repayment without any financial penalty, as one of the initial clauses prevented the withdrawal from the program for three years. Even if Tarp programs have been useful for banks in the moment of difficulty, some of the restriction on

compensation led the participant banks starting repaying Treasury funds e of intervention, the TARP worked out on the solvency of the Financial system.

It is also important to underline that there was some restriction on the early repayment, to avoid another financial distress scenario. One of the major requirements was to make stress-tests to check the adequacy of the capital levels. Only the banks that got good performances on the tests could get the chance of the early repayment.

The ones who did not get satisfactory results had to raise more capital, or directly injected by the Government through Capital Assistance Program or by a private placement. No disbursement has been made by CAP program.

Citigroup in conjunction with the Treasury decided to convert its preferred shares into common shares, to meet the street test capital requirements. Since, as said before, one of the goals of the TARP program was to maximize taxpayer's wealth, it is crucial to observe the origin of the possible profit and losses on the CPP program.

Starting from the profit, they would have been mainly driven by the dividend's payments, the capital gain from the selling process and the warrants got from the recipients. On the other hands the losses could be generated by the failure in repaying the amount committed by the Treasury.

Analysing more in deep the proceeds from the warrants, Treasury did no used them to purchase common shares, but Treasury allowed those company to buy back their warrants directly in conjunction with the repayment of preferred shares. To get a fair price of selling, once used option pricing theory with assumption on interest rates and prices, Treasury sold this warrant through an auction process, if not able to find an agreement with the institution. The total Cash back of the Bank Support Program is $275.6 billion from a total disbursement of $245.1 but it would be reductive to tell that taxpayers and the treasury got a profit from this program, since we are not counting the risk undertook by the Treasury and the times value of the money, we are just evaluating the nominal profit.

Once the CPP has been implemented it included a $25 billion investment cap but since there were some financial companies that still needed help, the Targeted Investment Program has been designed. The TIP has been used to purchase preferred Equity in Citigroup and Bank of America, for a total of $40 billion. The major goal of the TIP was to stabilize those two systematically important financial institutions to avoid a broader disruption of financial markets. During 2009

both Citigroup and Bank of America repaid their investments, considering the warrants and the dividends this program got a total of $4.4 billion gain for taxpayers.

The Asset Guarantee program established by section 102 of EESA supplied Government aid to Bank of America and Citigroup. AGP supported the value of several assets held by those two institutions by an agreement of loss absorption on those assets.

This program has been developed and run by the Department of Treasury in conjunction with Federal Reserve and FDIC.

The main goal of the AGP was to restore confidence in the financial markets and as stated in the section 102, "strengthen the economy and protect American jobs, savings, and retirement security"

Once the program has been closed the taxpayers got roughly $3 billion returns.

Since AGP and TIP programs were mainly designed for Citigroup and Bank of America, I would like to make a more complex analysis of those two interventions.

On November 23, 2008 has been announced the intervention in Citigroup even if it was already a CPP $25 billion recipient. This additional intervention, made in conjunction by the Treasury, the Federal reserve and FDIC, consisted in a $20 billion-dollar preferred equity purchase (TIP) plus the guarantee of $306 billion of assets, which later was reduced to $301 billion on January 16, 2009 when the deal of AGP was finalized.

In order to enter AGP and to guarantee its assets, Citigroup paid a fee of $4 billion preferred securities with an 8% dividend rate plus warrants (given for both transactions).

Later, to be precise on February 27, 2009 Treasury and Citigroup agreed to convert the $25 billion CPP preferred stock into common equity and to remove the warrants taken under the Capital purchase program. Due to this transaction, through which U.S government owned roughly 33% of Citigroup common equity (7.7M shares), the Treasury priority in the event of liquidation worsened whilst the potential upside reward increased. In fact, if the preferred equity could be redeemed only at par no matter the stock performances, this was not the case of common equity. For what concerns Citi, the common equity increased its capital ratios and alleviated the company for the dividend payments. In December 2009, another step forward was made. Citigroup and the treasury agreed to repay the $20 billion preferred equity stake and to eliminate the Asset guarantee program.

In this deal, the Treasury wrote off $1.8 billion of the $4 billion warrants fee of TIP and AGP transaction. Under the asset guarantee program, no funds were been disbursed. The treasury started selling its stake in Citigroup in April 2010. The selling process was divided in tranches, 4.1 million shares sold by September 2010 and by December 2010 all the 7.7 million shares were sold. Average selling price has been $4.14 per share versus the conversion price of $3.25 per share with a gain for the Treasury of roughly $6.9 billion accounted at CPP gains. The profit from interest and dividend and from the selling of remaining preferred equity has been respectively $2.9 billion and $2.2 billion. So, the total nominal gain from the Citigroup intervention has been $12.1 billion.

For what concerns Bank of America, On January 16, 2009 a massive intervention was announced by the Fed, the Treasury and the FDIC, even after the injection of $25 billion under the CPP program (for which the Treasury got with a $30,79 strike price warrants for 121,792,790 shares).

This additional intervention made under Targeted Investment program consisted in a $20 billion preferred equity purchase by the "government" in front of warrants for 150,375,940 shares at $13,30 strike and $118 billion of guarantees under the asset Guarantee program, the major part of them acquired after the merger with Merrill Lynch. The guarantee fee was a $4 billion preferred equity with an 8% dividend rate plus a $2,4 stock worth warrants.

Even if the announcement was being made, a final deal was never reached, after a period of 8 months Bank of America announced that it would not be part of the Asset Guarantee program and that it signed a $425 million termination fee with the Treasury.

On December 2009 Bank of America repurchased the $45 billion preferred stock raised under the CPP and Tip program, meanwhile the warrants raised for the intervention were sold during an auction in March 2010 that generated $1.6 billion.

Now I am going to start the analysis on the stabilization process of the HVT 30 days. As shown by the visual representation the historical volatility during the time windows from early September 2008 until March 2009 shown a high level of uncertainty for the following stocks:

1) Citigroup
2) Bank of America
3) JP Morgan
4) Goldman Sachs

5) Wells Fargo
6) Morgan Stanley

If we compare the timeline we studied before, we can easily see that the day after the disclosure of the Department of Treasury in which Tarp Funds has been announced the volatility plunged. Which means that even without a lot of information, just the intention of the Government to intervene into the market with a massive action helped to restore confidence and to reduce volatility.

After a first visual understanding of the HVT plot, I performed a correlation analysis between the historical average volatility of the six stocks trying to understand if the positive shocks of the Government disclosure were correlated between different companies.

The results are shown in the table 9. It's relevant that quite all the correlation is over 0,9 which means that market reaction has been the same in all the different companies which operates in the banking sector, no matter the individual situation.

Most important is to underline that if there is a high degree of correlation it means that the positive shock given by the speech of Hank Paulson the 14th October 2008 has been symmetric for the whole banking sector.

It is important to underline that all the companies in my analysis have been recipient of CPP program, that corroborate the thesis of a symmetric shock since they have been exposed to similar intervention.

The 14th of October is the announcement of the CPP, which let me think that in a period of crises (in this specific case a liquidity/solvency crises), the idea that the Government would purchase preferred equity from financial institution is able to stabilize the market.

Probably the idea that the Government will be potentially exposed to the default risk of such great companies let the market think that Treasury will be fully committed to not let this happen.

The main difference between those stocks has been the level of volatility, in which the specific company current situation influenced market confidence.

	Citi	*Bac*	*Jpm*	*GS*	*WFC*	*MS*
Citi	1,000	0,922	0,930	0,882	0,906	0,782
Bac	0,922	1,000	0,960	0,852	0,977	0,784
Jpm	0,930	0,960	1,000	0,919	0,946	0,846
Gs	0,882	0,852	0,919	1,000	0,810	0,934
WFC	0,906	0,977	0,946	0,810	1,000	0,713
MS	0,782	0,784	0,846	0,934	0,713	1,000

FIGURE 9

The Highest level of HVT has been 292, reached by Morgan Stanley, it makes sense, since the situation MS had during the financial crises.

Morgan Stanley lost over 80% of its market value during the period from 2007 until 2008, mainly because his entrance inside the Credit Default Swap market and due to its prime brokerage activities as Bloomberg news reported, moreover MS has been the company that draw more water from the well of Fed, $107 billion to fund its daily activities. It's not a case that the second drawer of funds from the Fed has been Ctigroup $99,5 billion, which in fact show the second higher HVT of 272 reached on 23rd March 2009.

As stated before, Citigroup has been one of the hardest hit Financial institution, so it also means the HVT is a consistent tool in order to understand which companies are facing hard times.

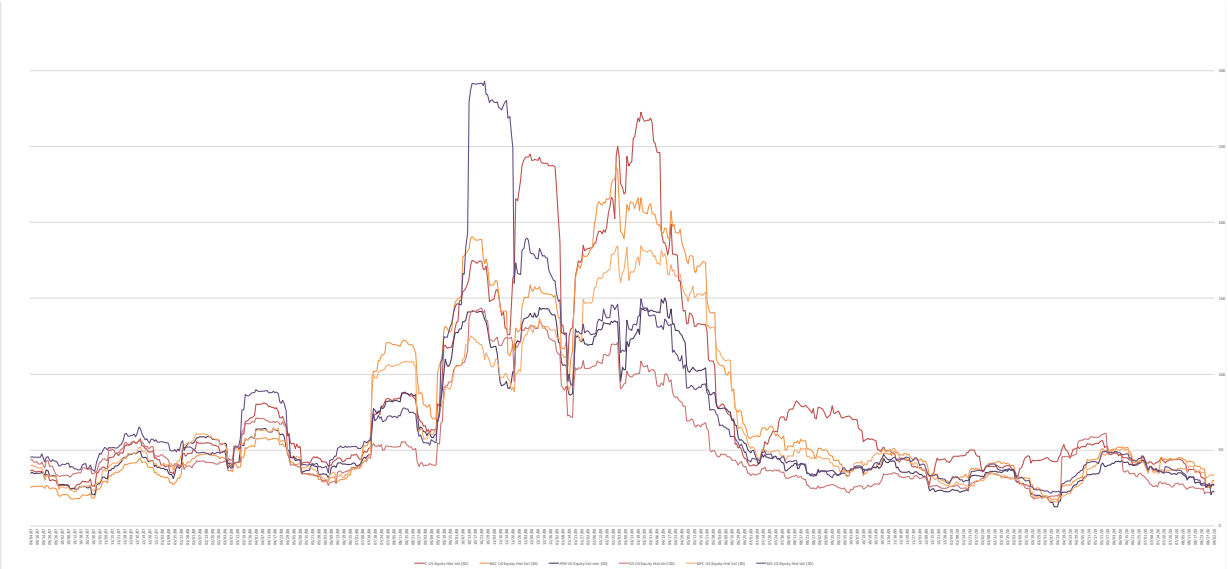
If we go deeper in the analysis, we see that the spike of HVT of Citigroup has been reached during November 20th, 2008, exactly one week later the disclosure of the 12th of November.

In this press conference the Treasury announced it was not going to purchase toxic assets from the banking sector.

Markets reacted badly to this decision fearing a deterioration of the MBS market and so of banks position. In fact, if looking at the Vix index we see a second spike during the month of November, lower than the peak of October but still very high. That means the markets expected a Government intervention directly into banks' balance sheet purchasing toxic asset from the most exposed banking institutions. Third company in the HVT ranking is Bank of America, mostly because it has been involved into the acquisition of Merrill Lynch, due to this situation, and being

one of the most important financial institutions, BofA had to take lot of funding from both TARP and the Fed programs.

FIGURE 10



If we analyze the S&P500 with the same tool, we got indeed similar results. Indeed, we see a spike in the HVT during the month of October 2008. A second peak during the month of November after the press release of 12nd of November.

Finally, a stabilization after the disclosure of AGP and TIP programs made by the treasury on the 24th of November.

In fact, these last two programs were designed both to inject capital and both to guarantee toxic related assets, which is consistent with the idea that the market probably needed a government participation into the toxic assets market, directly or indirectly.

The time through which the historical volatility stabilized is greater than the one we saw with the VIX index, simply because HV represent the mean of the 30 days before. It is a lagged backward-looking measure, meanwhile the VIX index is a forward-looking measure.

So even if lagged, the results of the analysis look consistent.

FIGURE 11

Historical average volatility S&P500

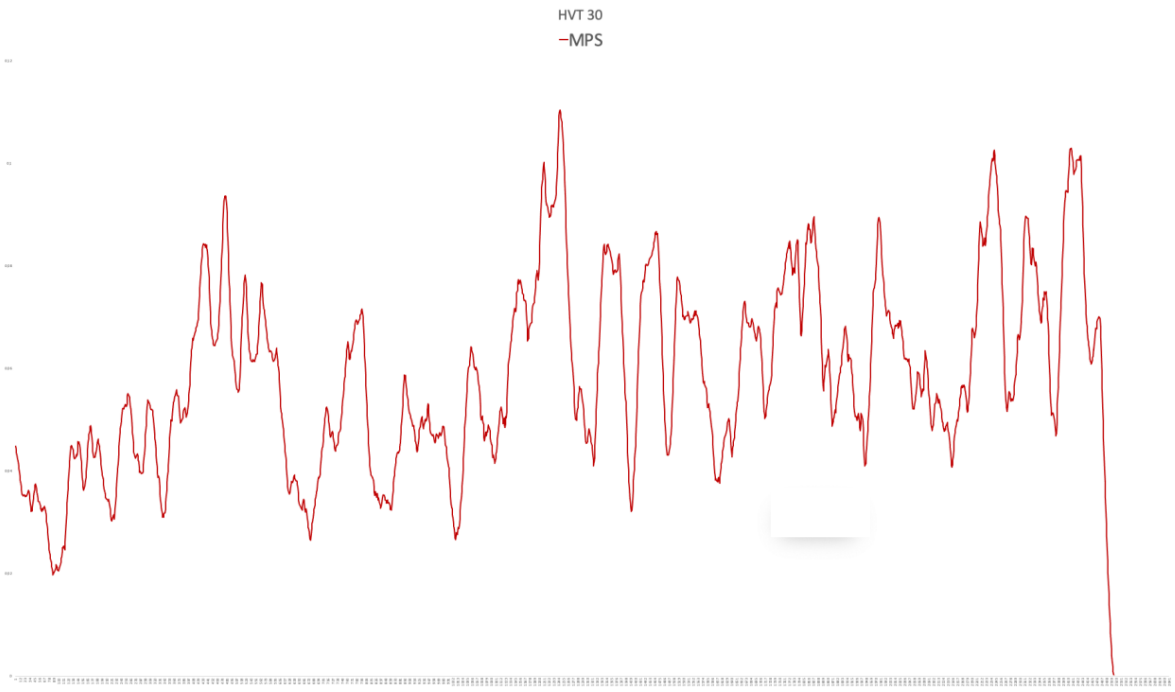
If we compare all the different indicators, we used to understand the effectiveness of U.S Gov measures we get the same results. The day after the speech of Hank Paulson the volatility in the market felt, reaching a lower level.

After the speech of the 12 November the volatility, both historical and implied, increased since the Treasury was not going to purchase toxic related assets.

The second moment in which confidence was restored has been after the conference of the 24th of November in which it was clear that the Government would never let happen a financial collapse, and it would do whatever it could took to recover the economy and the financial system, even guarantee toxic related asset and inject additional liquidity into banks' balance sheets.

The Italian banking crisis was born by the double recession that hit the country from 2008. In fact, the Italian banking system were overall solid before the first economic recession, and the following Italian Sovereign debt crises, which put under pressure Italian Banks, and therefore the lending to the real economy. Less credit to the economy, mixed with austerity rules and therefore less chances of growth and higher default rate for families and businesses. This high amount of Nonperforming loans hit the banking sector, and in several cases led to the default of the financial institution. Monte dei paschi di Siena was one of the more hit banks, and it was helped by the Government in different ways, trhough the use of hybrid instruments such as the Monti bond, trough the Fondo Atlante to be alleviated by the NPL's stock, and eventually by the precautional recapitalization, therefore the Italian Government purchasing an equity stake. Now I am going to analyze the different effect of the various action took by the Italian government and by Monte dei Paschi di Siena on the HVT 30days as I did for the American experience.

FIGURE 29



Historical average volatility MPS, personal computation

As we can see from the Historical average volatility 30days for MPS, does not show any clear trend, in the sense that to each action taken by MPS, for example their recapitalization, It helped the institute to reduce volatility for a while, but the information to the market, the failed stress test, the growing concerns about the NPL portfolios raised the volatility again.

What is important to underline is that, without a clear injection of capital as we saw for the American experience, agents in the market are not willing to trust into the soundness of the institution, a more direct impact as the one that could be given by the precautional recapitalization, that we cannot analyze since the alt of trading for a considerable amount of time, has the potential of restoring confidence in the market.

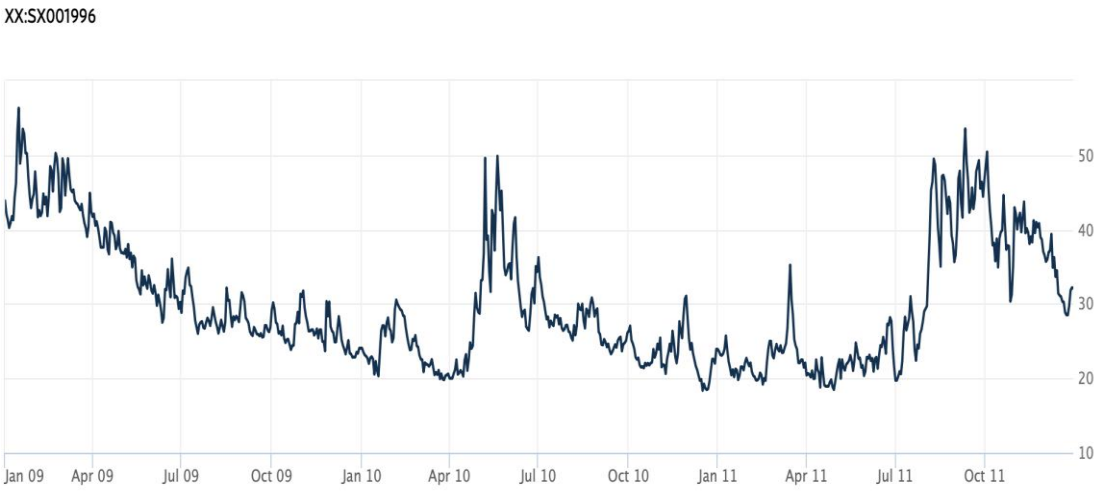
Moreover, as we saw during the chapter, the European project *in fieri*, the changes in the surveillance, the new rules and the new tools available in the banking sector, given the situation of MPS did not allowed a calm down in the stock volatility.

For sure what I can say is that, what really drove the long crisis of Mps has been the raising stock of NPL, because even if the AFS devaluation hit hard MPS balance sheets, it has been overcame by the bank and we can see that the HVT kept rising even after the Sovereign debt crisis calmed down.

The Acquisition of Antonveneta and the derivatives operations also had an impact, but I can make a similar comment of the exposure to the Italian BTP. And therefore, that the devaluation hit the balance sheets, but in the absence of NPL's growing stock it would have been overcame by the recapitalizations made during the years.

Landing back to the Government intervention into private company we can use the VSTOXX index to understand its effect on volatility, it shows the effect of an early reaction into the markets by the different countries, see bailout season in Germany, Ireland, Belgium and the other countries that needed an early capital injection in the overall European volatility.

FIGURE 30



In fact, the crisis was offset in term of financial stability quite smoothly, we see a peak during 2009 but then a constant decrease until a new high for the Sovereign Debt Crisis.

The pattern of such a crisis is much different, also for the worries about the soundness of the European Monetary Union and the impossibilities of blocking the prancing crisis. It seems reasonable to say that a step in the share capital of private companies from the state reduce the volatility in the market. Therefore, if the purpose of the action is restoring confidence, this is probably one of the best tools to use.

It is not easy to compare such different situations as the Italian experience and the American one. First, the crises were different, the U.S crisis was born from financial institutions and then transmitted to the real economy.

The securitization process increased banks' ability to lend more and at the same time to shift the risk away from their balance sheets. Securitization itself was not the problem, but the underling was. In fact, banks started lending to people that in normal situation would not have been considered qualified borrower, the subprime and NINJA raised also due to the moral hazard of the lender.

The problem was not evident at the time also because the raising housing price index helped households to get more mortgages to pay the older ones since their properties increased in value. But once the housing price plunged the default rate as well as the foreclosure rate increased,

and as a cascade effect first the MBS's then the CDO's and the CDO's squared started losing value.

The asset which seemed safe and of which the senior tranches were graded triple A by rating agencies started defaulting and the financial institutions were hit very hard, their balance sheets lost lot of their value, their share price felt down and the interbank credit market crunched.

The Italian one could be considered the way opposite, the crisis was born due to a fiscal imbalances of the Government, then through sovereign bond it was transmitted to the Italian banking system, as bank needed liquidity they allocated the funds to liquid and safe assets, limiting their credit emission to the economy.

This credit crunch hit the Italian economy and led to a high level of loans default, both from families and both from businesses this situation affected banks' balance sheets creating a self-perpetuating vicious circle.

Moreover a huge difference and probably the most important one, is the regulation in which the countries operate, US has their own currency and therefore they can choose the best monetary policy but way more important the Government is subjected to its own rule, meanwhile Italy have to respect communitarian law that, in several cases, could not be the best solution possible.

In fact, the fast reaction of United States to the financial crisis injecting capital into private and listed companies was possible also thanking to the U.S *governance*.

Even if Italy at the early stage of financial crisis did not need a direct intervention into private companies, it was needed later on, obviously the sovereign debt crisis would have made it harder, but once the crisis calmed down Italy could have stepped in into the share capital trying to avoid a broader collapse. Probably a faster governance and an easier state intervention when needed could have increased the ability of the Italian government to give credit to the economy, limiting the NPL's stock growth.

The differences of the two intervention are evident, U.S had the chance from the beginning to buy preferred equity, meanwhile Italy started with the Tremonti Bond, then the Monti Bond and only in the end, five years later the beginning of the distressed situation, it stepped in with the precautional recapitalization of MPS.

I can say that, for what concerns the aim of stabilizing the market, the better instrument is the preferred equity purchase.

In the different cases in which we analyzed the historical volatility, it plunged after the State capital injection. The Vix index and the VSTOXX index followed the same path after the intervention, this is a clear evidence of the market positive reaction to state participation into share capital of private companies.

Probably the reason is that the default risk of an institution in which the major shareholder is the government goes near to zero, therefore the confidence about the future increases.

Moreover if the intervention concerns the banking system it helps to increase the credit to the real economy which increase the probability of a GDP growth in the period after a crisis, consider that the GDP growth of US in 2010 has been 2,6% with just two year contraction (2008-2009).

However, Italian Government in order to buy an equity stake of a private company must still meet European condition and communitarian law.

A possible way through which the government could both be compliant with European law and both step into the share capital of private companies could be to use the tool of Cassa Depositi e prestiti.

Cassa depositi e prestiti is a S.p.A of which the major shareholder is the MEF with a 70% stake, the remaining 30% is owned by roughly 60 entities from the banking system.

Since the formal separation of CDP from the public administration with the listing on Italian stock exchange in 2003, Cassa has two main activities:

1) "Gestione separata" which are the activities of financing public investments
2) "Gestione ordinaria" which are the activities not concerning public investment and so that are not formally guaranteed by the Government

Fundraising activities of CDP for the "gestione separata" are mainly done with postal savings which are guaranteed by the State likewise the Italian Government Bond, moreover CDP can emit Covered bonds.

Obviously for investment made under the "gestione separata" there are stricter requirement, but with the "gestione ordinaria", therefore not guaranteed by the State, CDP can be compliant with the European law for state aid with less requirements.

If we look back at the MPS case, Cassa depositi e prestiti was one of the major investors in the Fondo Atlante, which means that it helped the banking system to be alleviated by the NPL's stock.

At the same time, for what concerns the American experience a similar solution was found with the PPIP, which as underlined in the first chapter is the Public Private Investment Program.

This program, which concerned toxic asset purchase, provided a loan activity up to 85% of the asset values to private institutions.

Moreover, for the remaining 15%, for each dollar invested by the private investors the Government would have invested an equal amount.

Probably this could be the right path to follow in this difficult post pandemic times, using the tools of Cassa depositi e prestiti in conjunction with a pool of private investors, acting as Private Equity funds (activity already done by CDP).

This action could be useful for two different purposes, the injection of capital into private companies, so a stimulus to the economy, and a potential positive return for CDP and therefore for its shareholders.

This possible intervention could be done also for listed companies, which would have the power to reduce volatility during troubled times and financial turmoil.

This program would be in line with the finding of my thesis, because it would allow a capital injection and therefore a sort of stabilization effect of the stock prices, restoring confidence and promoting the economy, which as I underlined in the previous chapter has been the major issue in the Italian double crises.

This topic is even more important now a days after the news of the European funds given to the Italian government which I hope will be used as a great stimulus to the economy trying to break a stagnation period that has been way too long.

In this special occasion I am confident about Italian possibilities of a recovery and a new stimulus plan thanking to the chance of a Professor Draghi government which, as we saw in the last few days, is a beacon of hope for us all, who better than him able to manage those funds and restore credibility to our country?