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The new bank regulations and the crisis (a focus on Basel III)

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Anno accademico 2013-2014

To my beautiful family,

To my friends,

To Stefania and Marco

My mind, my heart and my soul is grateful for what you gave to me Grannie.

Executive Summary

The aim of this thesis is that to introduce the new bank regulations, which have followed the last financial crisis. More precisely, as the regulatory effort has been extensive, this paper is focused on Basel III, which, with respect to the previous Basel I and Basel II, has introduced important novelties as far as capital and liquidity requirement are concerned. The thesis will be organized as follows:

First, chapter one will provide a narrative of world crisis with a particular attention on its causes and effects.

Second, chapter two will be entirely devoted to Basel I and II, their main features and their main caveats, which led to the introduction of Basel III.

Finally, chapter three will be devoted to Basel III.

The inspiration of this thesis comes from a topic that I enjoyed during the second year of my undergraduate program.

Indeed, I have studied the new bank regulations in my Financial markets and intermediaries course and I have been attracted by the way, in which regulators were able to reform banking regulation spurred by the last financial crisis. I believe that this was a decisive step given the key-role played by banks in the financial sector. Indeed, it is well known that banks allow for an efficient allocation of money by transferring funds from households/corporates in surplus to households/corporates in deficit. Without them, no financial transactions could be performed or better they could be performed at higher costs for this reason the word financial "intermediaries" has been assigned to banks: they are entities that act as the middleman between two parties in a financial transaction.[1]

[1] http://www.investopedia.com/terms/f/financialintermediary.asp

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Introduction

It would be incorrect to sustain that bank regulation is not fundamental and that even without any specific and strict rules, banks are able to handle their risks.

What history (e.g. the crisis of Banca Romana in 1880, one of the Italian central banks, or that of Credito Mobiliare and Banca Generale) has proven is that there is no market of credit without regulation. The Banca Romana was the first case of Italian credit crunch. It, indeed, was one of the oldest Italian major banks, which had the duty of issuing money. Back after the Italian unification in the 19th century, the peninsula had six central banks among which the Banca Romana and, when its major banks felt involved in the crisis concerning the real estate sector, this financial intermediary collapsed. The reasons of its failure were mainly political- financial following an excessive amount of investments in the property sector and a transfer of capital to Rome and Naples.

Credit crunch is what can be defined as "the process of disintermediation- a decline in savings-type deposits at banks and savings and loans that result in a decline in bank lending.[2]" Under this condition interest rate and the availability of credit have no relationship or better credit does not depend on the rise of interest rate. Different definition, from the Investopedia website, adds that credit crunch "drives up the price of debt products for borrowers"[3]

With the recent development of financial intermediaries such as banks, to name the most important one, credit agencies started a real fight to survive and to gain profits over their

[2] Kliesen Kevin L.,Tatom John A,(1992) " The recent credit crunch: The neglected dimensions"

[3] http://www.investopedia.com/terms/c/creditcrunch.asp

transactions and, sometimes, they appeal to irregular and risky transactions not to let the market crash.

In this way, the financial system found itself in managing even more risky operations at a more complex level. In these circumstances, it has become of vital importance the need of a real coordination of the bank regulation, with the aim to establish control systems able to guarantee a stability in the financial system. The beginning of this coordination was in 1988 with the introduction of Basel the 1988 agreement or I.

Basel I has been the first attempt, which tried to fix an international standard on which it has been possible to measure the suitability of property.

After this agreement other two proposals were made (Basel II and III), but before analyzing in depth the bank regulations in themselves, it is relevant to introduce the last financial crisis which began in 2007 as subprime crisis in the USA, propagated to Europe as state sovereign crisis and that has contributed to dampen dramatically the world economy and to spur a new regulatory effort of the financial sector.

CHAPTER ONE

1.1 Definition of crisis and world context

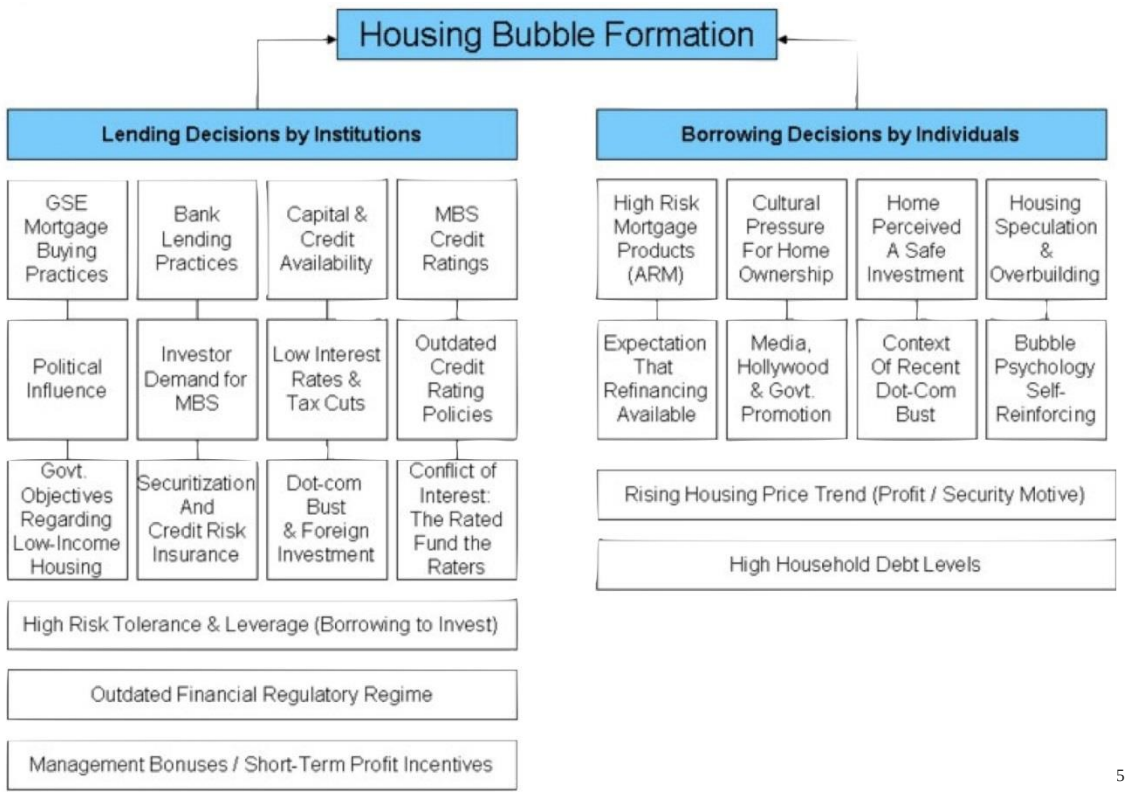
The recent financial crisis has expanded from the United States to the rest of the world, from an American crisis it has become an international one, the crisis of the private debt turned into a public debt crisis, the financial crisis and the real estate crisis slowly expanded to the industrial and labor sector. "*When the United States sneezes the whole world gets the flu."* This quote from the twentieth century has never reflected the economic situation as well as in these last years, given that the European economies have been now experiencing the worst crisis, which started in a country at million miles away. The crisis has come! It may be seen and touched but it is very difficult to be understood.

In a nutshell the root of crisis in USA was that the American economy turned into a debt economy, many households asked for a mortgage and, as the interest rates increased, low income ones refinanced their previous loan getting engaged with another one. Larger was the number of the of NINJA[4] families in the economic bigger was the group of people who could obtain "subprime mortgages".

[4] No income and no jobs

1.1.2 How it began and what were the causes: subprime crisis in the US and the bubble

Subprime mortgages were one of the main causes of the crisis together with the housing bubble burst. They not only grow from an historical 8% to a 20%, but their majority was an adjustable-rate mortgages or better, obligations that did not have a fixed interest rate. During the phase in which the value of the real estate assets in the USA increased, also their prices rose feeding the speculative bubble. Furthermore, other factors contributed to weaken the financial system. One of these was ignoring the role the shadow banking system was playing. Indeed investment banks and hedge funds were using off-balance sheet assets such as derivatives and securitizations masking the real risk of obligations.



[5]

Figure 1: Housing bubble formation in the USA

[5] http://www.everydaypropertyinvesting.com/usa-property-cashflow-and-growth-in-the-usa/

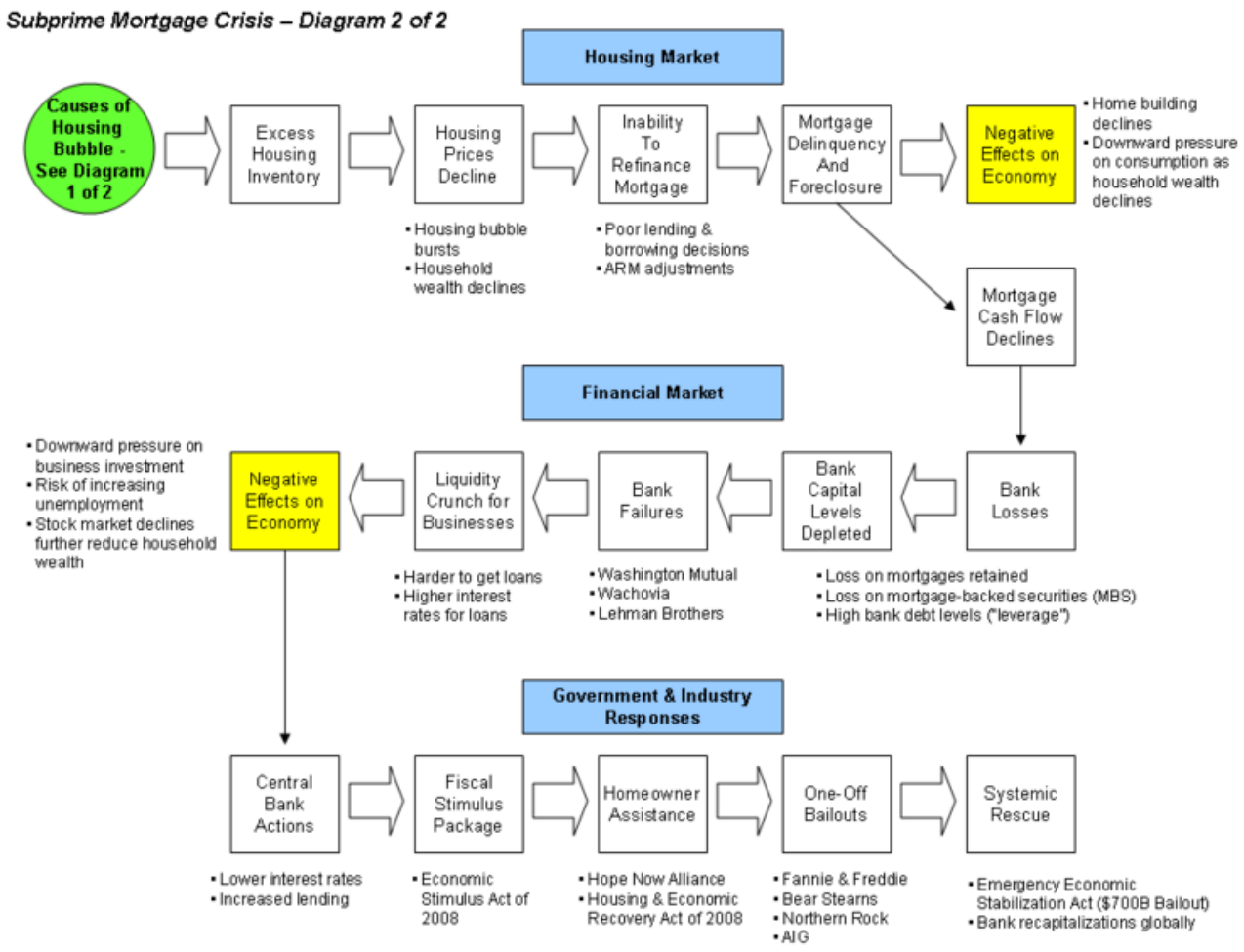


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Figure 2: Causes of the housing bubble and consequences on housing, financial markets

The shadow banking system,[7] hedge funds and investment banks, intensified its activity in the mid -2007 and started to affect the money market in an adverse way through the public and private sector. As these intermediaries act as commercial banks, they actually sold off balance sheet obligations such as repurchase agreements (Repos) and used derivatives as a tool for engaging in excessive risky activities. As a matter of fact, the American government contributed with bailouts in order to save some important institutions and banks. Even though,

[6] http://en.wikipedia.org/wiki/Subprime_mortgage_crisis

[7] Shadow banking system is the definition attributed to intermediaries, which are not bank per se but provide services, which are very similar to those banks offer.

the shadow banking system had become essential as the commercial banks were, it was subject to different regulations: an example is the debt burden it had which, in the majority of cases, was not a sufficient cushion to absorb loan defaults.

As the conditions in the shadow banking system worsened, it became one of the causes of the last economic crisis joint with the diffusion of the subprime mortgages and the bursting of the housing bubble. Indeed, homeowners were unable to pay back their mortgages due to speculation and predatory lending.[8] Furthermore, subprime mortgages' aggregated risk was calculated with a statistical assumption based on the Gaussian copula[9], which underestimated the correlation in the default risk of mortgages, and mortgage related securities.

Moral hazard was at the basis of the subprime lending approach. In this framework moral hazard was simply the risk of engaging in an obligation with a party that did not give its assets and liabilities information and it may not repay the loan back.

[8] The situation in which lenders engage in risky and not fair operations during a loan process

[9] Formula used in statistics to model correlation among random variables. It was utilized by Wall Street to measure subprime mortgages' risk.

[10]

Figure 3: a subprime lender in the USA

Creditors, using the so-called subprime mortgages (Mortgage-backed-securities and Collateralized-debt obligations) where they gave loans to ex post unsolvable borrowers as the image above shows. The high volume of lending provided has contributed to keep interest rate low for the first years then dramatically increase it the following periods. Hence, there was a boom of concession of loans without bank taking care of the effective capability of repayment of [11]borrowers.

On the other hand, borrowers were convinced that they could refinance easily their mortgages in the following years in order to maintain the same low interest rate, without taking into consideration the risks involved in this operation.

Mortgages worked in a risky way as well: during the initial period, only interest was paid while the principal was paid later.

[10] https://www.flickr.com/photos/thetruthabout/2681354792/
[11] http://www.everydaypropertyinvesting.com/usa-property-cashflow-and-growth-in-the-usa/

It seemed that everyone was in a good financial position: construction firms, real estate brokers, bank intermediaries, building materials producers and consumers, as they would have become for their first time owners of a house. . But imbalances started to involve tax-payers' money with the involvement of government sponsored enterprises (GSE), among them Fannie Mae and Freddie Mac, which decided to buy and guarantee mortgages and mortgage backed securities (MBS) to almost all the American population.

Freddie Mac provided residential mortgage loans and mortgage-related securities, which it financed by issuing mortgage-related securities, debt securities and equity securities.[12]

GSE contributed to the subprime lending but they were not the first supplier of risky and affordable obligations.

[13]

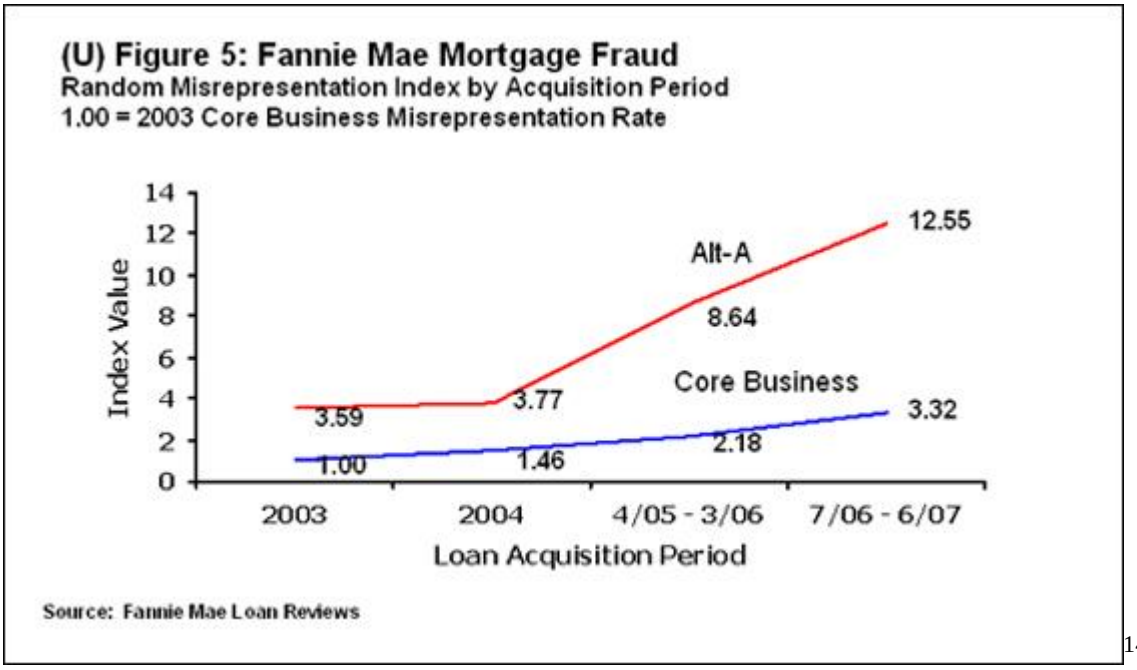
Figure 4: Fannie Mae and Freddie Mac during the crisis

As this image suggests, Fannie Mae and Freddie Mac where perceived as a man and a woman who were suffering the crisis, as it can be seen by the pain they are showing on their faces.

[12] http://www.sec.gov/answers/mortgagesecurities.htm
[13] http://www.huffingtonpost.com/andy-ostroy/fannie-and-freddies-fuzzy_b_183276.html

Only the famous personification of Uncle Sam, portrayed intentionally smaller than the other two individuals, could partially save the nation with his big, but vain efforts.

What really contributed to the crisis were Alt-A loans firstly traded by Fannie Mae and Freddie Mac; indeed even though these obligations were in the A group ratings they were riskier that an A type loan.



[14]

Figure 5: graph showing the increase of alt-A loans with respect to other loans

From that time onwards, there was a situation of financial system contagion: no one knew the exact quality of debts in circulation and which institution was more exposed to them; hence, banks did not want to finance each other transactions, thereby freezing the interbank market. Unfortunately, in order to finance these debts, which were becoming bigger than it has been foreseen, American banks established some products packages guaranteed on real estates, and then they transfer them to other financial institutions all around the world (insurance companies, private investor and investment funds).

[14] http://www.fbi.gov/stats-services/publications/mortgage-fraud-2007

1.2 The role of assets securitization

The speed at which distress in the banking sector propagated was in part due to the asset securitization, a process by which a company clubs its different financial assets/debts to form a consolidated financial instrument which is issued to investors,[15]which was a trend already present the banking sector before the financial crisis. Securitization comprehended not only asset -backed securities but also mortgages. What the banks did was different creations of several portfolios in which they pooled corporate bonds, real estate bonds, credit card bonds and car bonds. At the same time, banks created independent legal entities called Structured Investment Vehicles (SIV), which had the task of buying different kinds of securitization removed from the balance sheets of ordinary banks.

Portfolios were over diversified by creating Collateralized Debt Obligations (CDOs) which were then divided in tranches and sold to different investors to lower the risk of the portfolio per se and to divide it into different categories.

Moreover, the SIV funded the purchase of these assets by lending short -term obligations in the money market. These off balance sheet activities were considered liquid and solvent. In particular, under Basel II a bank was able to assign no right weights, assigned to exposures removed from the balance sheet and sold to third parties. Since securitized products consisted on different loans which have low historical correlation, they were given the highest possible credit ratings even when, in reality, they were riskier than other obligations.

[15]http://economictimes.indiatimes.com/definition/securitization

Fall from grace

Global CDO ratings transitions, 2009

% of total in initial ratings category

Initial rating \ Final rating	AAA	AA	A	BBB	BB	B	CCC	<CC
AAA	46.9	11.8	12.5	13.1	5.7	2.3	4.2	3.7
AA	0.2	37.2	7.8	13.9	13.6	7.1	9.0	11.3
A	0.3	0.1	25.9	10.6	14.8	10.2	8.1	30.1
BBB	0.0	0.1	0.1	23.6	14.2	19.6	12.7	29.6
BB	0.0	0.0	0.2	0.2	17.9	31.5	20.6	29.6
B	0.0	0.0	0.0	0.0	0.2	20.1	28.1	51.6
CCC	0.0	0.0	0.0	0.0	0.0	0.4	34.4	65.3

Source: Fitch [16]

Figure 6: CDO ratings

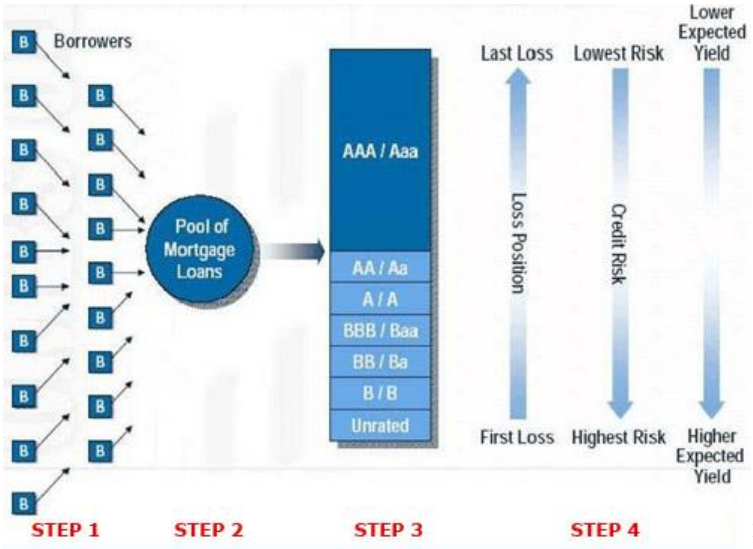
Global rating agencies, Standard and Poor 500 and Moody, were able to classify obligations from AAA loans, considered as the less likely to default; to CCC ones, which were later, named "junk" loans.

[16] http://economics21.org/commentary/dangerous-combination-financial-innovation-suppression-market-forces

1.3 Credit Default Swaps

Asset-backed securities tranches, which were highly risky and but had very low prices, were used by investment banks in order to develop another security called collateralized debt obligation (CDO). These tranches were defined as "mezzanine" and did not belong to the triple A obligations (See Image on the previous page). They were used to create new ones rated as triple A. CDO were derivatives categorized as funded ones which means that the credit risk party or better the "protection seller" pays an initial sum which is then used to settle any possible and potential credit event.[17]

On the other hand, unfunded credit derivatives exist: they are a real contract with two counterparties and each party has the duty to follow and respect what is written in the contract. The most famous type of unfunded credit derivatives is called credit default swaps.



[18]

Figure 7: the process of CDOs

[17] Credit Suisse,(2011) "A guide to credit Events and auctions"

[18] http://www.urbandigs.com/2007/08

Credit default swaps (CDS) are financial derivatives useful to protect and hedge debt holders and any kind of speculators from risk of default. In the recent financial crisis, CDS's volume increased from February 2008 to November 2008. Important insurance companies as American International Group (AIG) and Ambac, to name a few, were the ones, which suffered a rating downgrade because the spread of mortgage defaults increased their potential exposure to CDS losses. AIG then at the end of 2008 obtained a government bailout.

In 2007, the property prices in USA decreased due many losses on mortgages and mortgage related products. Investors who bought CDOs experienced heavy losses and this affected not only other investors but also investment banks and hedge funds. Also, the credit rating agency realized that the way they were rating CDOs was wrong and they had to lower what they had assigned to these financial products. The money market was the one, which suffered the most from this incorrect valuation models.

Further, the complex design of CDOs and SPVs did not show who was exposed to risk and who was exposed to losses. This led to some banks, insurance groups and institutions failure, which is better explained in the next paragraph.

[19]

[20]

Figure 8 and 9: AIG perception during the crisis

1.4 The collapse of the "too big to fail": from the USA to Europe

As previously stated, the stress of the whole market system became evident in 2007 when sizable losses became public. In February 2007, HSBC, one of the most important world banks, reported its losses making them public. After only two months, companies which sold mortgage and mortgage- backed securities were bankrupt mainly because they made profit on the sale of their obligations and not on their interest.

MBS were sold also to SIV and hedge funds and, when the bubble burst inducing the house price to fall and the subprime market defaults increased, the value MBS had decreased notably. At this point only two solutions were available to improve the status of the financial

[19] http://www.walletblog.com/2009/03/aig-needs-to-go-into-prepackaged-bankruptcy/
[20] http://www.theipinionsjournal.com/2009/3/

system, was either SIV tried to make mortgages more appealing decreasing their risk or they had to indemnify all the investors who incurred a loss. This procedure was a kind of margin call which induced even Bear Stearns, “a too big to fail” entity, and BNP Paribas, a famous French investment bank to collapse in 2007.

Bear and Stearns before its failure had a leverage of 33, which was over the average, and more than 300 billion of liabilities. Only some Asian and Middle East sovereign wealth funds were able to provide capital to this investment bank, to Merill Lynch and Morgan Stanley.[21]

"Bear Stearns's collapse was not the result of any actions or decisions unique to Bear Stearns. Instead, it was due to overwhelming market forces that Bear Stearns, as the smallest of the independent investment banks, could not resist,"[22]

The peak of crisis was in September 2008 when other entities ended up being either buyout or bailout. Fannie Mae and Freddie Mac (see the previous section) were taken over by the federal government, Lehman Brothers bank collapsed, the Bank of America bought Merrill Lynch, AIG lost all its capital through its MBS protection operations, and American taxpayers were forced to pay its debts in a bailout.

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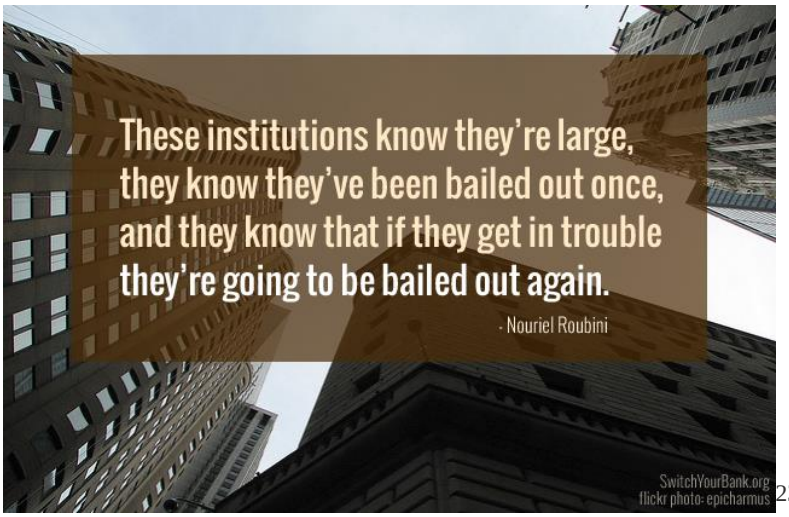
21 Gysi H., Kindler M., Dobbins M., (2010), “Chronology of the Financial Crisis”

22 Johnson F., Corkery M., (2010), “Former Bear Stearns CEO: Leverage Was Too High”



[23]

Figure 10: Nouriel Roubini, American economist, consideration of too big to fail institutions

1.5 Eurozone crisis

"Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough,"

"To the extent that the size of the sovereign premia (borrowing costs) hamper the functioning of the monetary policy transmission channels, they come within our mandate."

When asked what probability he would assign to the euro zone having the same number of members it has today in two years, he added: "I don't venture into speculations about things like changes in the treaty. The treaty was meant to have the number of countries that we see today, so frankly I can't really estimate the probability of that."

"We think the euro is irreversible."[24]

[23] http://www.toobighasfailed.org/too-big-to-fail/

[24]http://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html

In 2009 what was supposed to be an American crisis reached the Eurozone.[25] The Eurozone, or more easily all the European countries that have adopted the euro, is still in crisis today and is still experiencing 3% of deficit over the total national GDP.[26] In some periods of the crisis, deficit and debt were not able to stay in the Maastricht treaty margin of 60% of GDP for debt and 3% of GDP for deficit. The Maastricht treaty stipulated in 1992 signed by the European Union had the aim of limiting deficit and debt levels. During the crisis, all the sovereigns tried to *Enronise*,[27] or better to mask, their level of debt and deficit engaging in off balance sheet operations, modifying accounting transactions and buying derivatives to increase their credit.

[25] Clarke S.,Dailey C.,(2010), "The Eurozone crisis",CIVITAS

[26] http://www.nytimes.com/2014/04/24/business/international/euro-zone-deficit-hits-target-for-first-time-since-2008.html?_r=0

[27] Enron is an American company, which offers different services based mainly on energy. It is well known for its accounting fraud in 2001.

Country	January 2011	July 2013	Change
Greece	37,4	61,5	24,1
Croatia	36,2	55,4	19,2
Cyprus	19,0	37,9	18,9
Spain	43,9	56,1	12,2
Italy	28,5	39,5	11,0
Portugal	26,6	37,4	10,8
Slovenia	17,0	23,9	6,9
Luxembourg	14,4	19,2	4,8
Belgium	20,0	24,6	4,6
Netherlands	7,8	11,5	3,7
France	23,2	26,0	2,8
Hungary	26,1	28,2	2,1
Poland	24,5	26,1	1,6
Czech Republic	16,8	18,3	1,5
Slovakia	33,5	34,6	1,1
Austria	8,1	9,2	1,1
United Kingdom	20,3	21,1	0,8
Bulgaria	24,4	25,1	0,7
Sweden	22,5	23,1	0,6
Romania	23,1	23,1	0,0
Finland	20,4	19,8	-0,6
Ireland	29,4	28,6	-0,8
Germany	9,1	7,7	-1,4
Denmark	14,1	11,9	-2,2
Malta	13,7	10,6	-3,1
Estonia	20,8	15,2	-5,6
Lithuania	33,1	23,1	-10,0
Latvia	32,2	19,8	-12,4

[28]

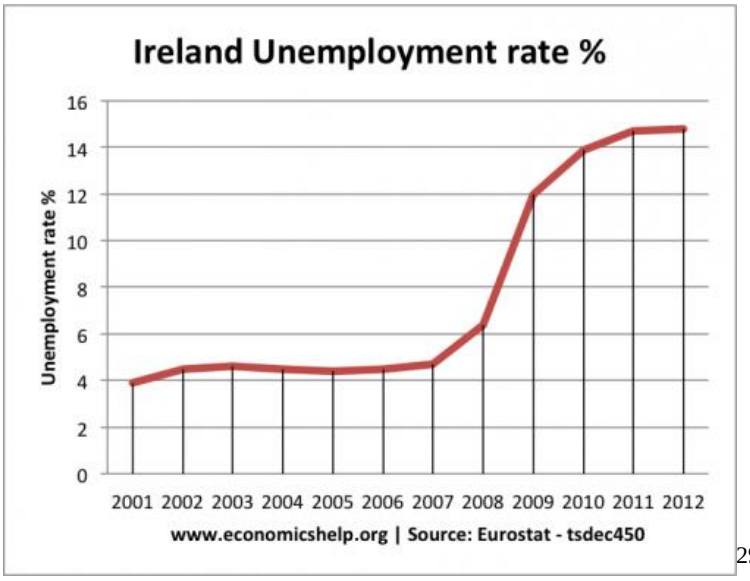
Figure 11: Eurostat estimations of European unemployment during the crisis

As in the USA in 2007, European countries needed the assistance of their National bank, the European Central Bank, to help them refinance and pay their governments debts. Europe was, and still is, characterized by an unequally distributed income and slow economic growth. Furthermore, to further worsen the situation, the European banks were under capital and had important liquidity and debt problems. The European commission, the International Monetary Fund and the European Central bank decided to form the "Troika": a committee able to monitor and co-ordinate the crisis in the European countries, which were more

[28] http://ernstseconomyforyou.blogspot.it/2013/09/how-credit-crisis-became-youth.html

affected by this event. The sovereign crisis became even more deep in the late 2009 when European governments kept rising their debts which were caused by the real estate bubble (see part 1.1) and bailouts (see part 1.3). The ECB, despite creating bailout programs, lowered interest rate and to give as much loans as it could.

The first country hit by the crisis was Ireland whose banks had financed the real estate bubble in the last years. The six banks on which Ireland rely the most lost more than 100 billion euros in loans, which were then considered as "junk". The result was an increase in unemployment and a deficit, probably the highest in the history of the Eurozone, of 32%.



[29]

Figure 12: Irish unemployment rate during the crisis

As the country's credit rating falling and debt rising, the Irish government asked the EU and IMF for help obtaining a bailout. Ireland has always been in line with the other European countries except in 1990s when some factors as favorable demographics, a well-educated workforce, high productivity and a business friendly environment with low corporate tax

[29] http://www.economicshelp.org/blog/7344/economics/irish-economy-summary/

lacked.[30] Even though a small economic boom reached Ireland at the beginning of the 2000s, it lasted only until 2007 when revenues from taxes declined, lending between banks decreased and unemployment rose again but this time more than in 1990s. Only a programme launched by the EU and the IMF was able to partially save Ireland. It was based on constructing a financial strategy able to build a new but smaller banking sector, on a consolidation of fiscal type where all public finances follow the same path reaching the medium/long term and on a strong plan on which competitiveness and growth were at the core.

Greece, for example, contributed to crisis due to its pension and public sector wage laws. The Eurozone is only a union as far as currency is concerned but each country has different tax and pension rules. Indeed, the Eurozone is not a fiscal union and European leaders were not able to prevent disaster in Greece. In 2010, the Greek government asked a 45 billion loan from the EU and the IMF. Greek's default was considered as BB+ or junk. A second loan was necessary to prevent further disaster but in March 2012, Greece defaulted on its debt.

The German bank IKB was the first of the row to approach a failure and then to be rescued by a bailout by its owners.

The western governments decide to finance their credit institutions. Here is one other important point: banks, which will maintain their past years profits are saved, while losses will be given to contributors through an explosion of the public debt. The crisis has followed a series of evolutions: the American crisis is now a world crisis, the debt crisis is now a public debt crisis, the financial crisis and that of the real estate has become an industrial and labor one.

The first countries hit were the weakest, as a virus does with people who have a weak immune system. The second nation to contract the virus was Greece and it became public how it

[30] http://ec.europa.eu/ireland/key-eu-policy-areas/economy/irelands-economic-crisis/index_en.htm

changed and falsify its economic data to satisfy Maastricht parameters and to enter the Euro. Previously Ireland, once a European country with the highest GDP and with the highest concentration of American multinationals. As a domino effect, also, Spain was hit by the burst of the speculative bubble and its apparently rich real estate market, and then Portugal affected by its slow economic growth compared to in European members. Lastly, the sovereign crisis hit Italy, which was characterized by its high level of public debt and by its policy makers who had difficulties in ratifying reforms to spur economic growth.

Following these episodes, the situation has become even more complicated due to the presence of a vicious circle between the policies implemented by governments in Europe and the very same consequences of these policies. In particular, fiscal consolidation aimed at reducing public debt and implemented by European governments has produced recessionary effects. The consequence was a fall in GDP, a fall in tax revenues and a slow-down in economic activity, which quickly propagated to the European banking system.

In this year this "Debtors' trap" has led to concerns for the investors who tried to sell their obligations and shares of the bank sector involved. It is clear that in order to stop this negative spiral some particular political decisions were needed. And this is what policy makers tried to put into actions over these last years even though further effort is probably needed.

At the early stages of the crisis, the most industrialized countries reacted with non-coordinated actions not to make their financial institutions collapse. What followed should have been a global reaction to a global crisis but it was not so.

In particular, the need of more severe norms was urgent and new policies were required to ban some banks behaviors to prevent another crisis.

In this way the Federal Reserve has reduced the official rates and it started to take part into an action of purchasing "toxic" obligations and shares for several thousand of millions of

dollars, at the same time Obama administration has introduced recovery program for loaners in trouble in the automobile sector, private sector and more in general of unemployed people.

In Europe, several governments started to fall due to the crisis, and the European financial stability fund has been taken into account as far as refinancing debt is concerned; the European governance reform started to be active with the aim of coordinating income statements politics between every member. At the same time, the European Central Bank has intensified the purchase of government bonds in the security market program and it launched a three-year liquidity injection program in order to increase solvency in the bank system.

CHAPTER 2

2 Basel one and two

Despite the last economic crisis, the financial market is continually changing and improving its agreements between banks and customers which are more easily defined as contracts. Contracts are one of the important element of a financial system if they do not default. As stated in the previous chapter, contracts face different problems such as moral hazard and adverse selection. Relationships between clients and financial enterprises and intermediaries is simply a pledge to pay a specific amount of money in a given date with a certain interest rate for the service offered. Unfortunately, it is very difficult to categorize a client if respect or do not respect the obligation. What it is even harder to specify is the amount of risk each transaction has. In the light of this, banks and other intermediaries decided to have a minimum capital requirement to sustain unexpected risk and not to leave a contract default. Capital requirement is simply an amount of money needed to sustain several risks in several periods.

As risk is difficult to manage and to quantify, it has been even more hard to find some regulations that enstabilish the amount of capital each bank has to have, which criterion to use and the methods that lead to a sensible conclusion.

The best approach used was the one discussed in the Basel committees in 1988,2004 and 2009 during the financial crisis.

2.1 Basel I

Basel I was the first agreement enstabilished in 1988 where all central banks decided to set a minimum capital requirement for commercial and investment banks. This accord was stipulated in Basel, Switzerland by the Basel Committee on banking supervision (BCBS). Basel I was enforced in 1992 by the G-10 . Even though this agreement was revolutionary, it other two Accords had to be ratified between 1988 to 2009 in order to improve Basel I framework and solve for its shortcoming.

The initial approach adopted by the Basel commitee was focusing on credit risk and on the way asset risk was measured as just in the USA only from 1965 to 1981 there has been eight big bank failures.[31] In those times banks lend and borrow without any limit so that they faced problems of savings. Summarizing Basel I was introduced to :

1. Improve the way the banking system was working by strenghten its stability
2. Built and maintain a solid international inter bank relationship by abolishing inequality among any kind of bank.
3. Enstabilish a capital requirement (then called ratio)

The 1988 Accord requires banks to have "regulatory capital" amounting to at least 8%

Of total risk-weighted assets:

CR= RC and it is equal to

$$CR = \sum Ai \times wi \geq 8\%$$

- CR = capital ratio;

[31] http://www.investopedia.com/articles/07/baselcapitalaccord.asp

- RC = regulatory capital;
- Ai =sum of i-th assets
- wi = risk weight of the i-th asset[32] and a possibility of default of 0 or 1 which occurs during time t where T can be between 0 and infinity.

2.1.1Weighted risk assets

Basel I focuses on two tiers:

Tier one, which is the main one, comprehends the issues of stock and shares and all the reserves that can work as a cushion in case of future default. (Declared reserves). Tier 2 instead is useful to support the first one and act as a supplement. It includes other capital gain such as gain from extra investments and long or short-term debts. As stated before credit risk called risk-weighted asset (RWA) has to be at least 8% of the total bank risk. RWA comprehends on and off balance sheet operations. Examples of off balance sheet transactions are derivatives and commodities.

[32] Resti A., Sironi A.,(2007) "Risk Management and Shareholders' value in Banking, Southern Gate, Chichester" , John Wiley & Sons Ltd, The Atrium

Risk Weight	Asset Class
0%	Cash and gold held in the bank. Obligation on OECD governments and U.S. treasuries.
20%	Claims on OECD banks. Securities issued by U.S. government agencies. Claims on municipalities.
50%	Residential mortgages.
100%	All other claims such as corporate bonds, less-developed countries' debt, claims on non-OECD banks, equities, real estate, plant and equipment.

Source: Michael K. Ong "Internal Credit Risk Models, Capital Allocation and Performance Measurement" (1999)

33

Figure 14: table showing the RWA in Basel I

As the figure suggests, these are the RWA according to Basel I in the balance sheet. Bonds are classified as 100% risky. If we take for example a bond of 100 euros, we know that our RWA is 8% * 100= 8 euros.

Tier one of capital ratio is simply capital of tier one divided by total RWA.

In the following table, an actual example is provided about how capital ratio is calculated. Ceteris paribus, RWAs determine if a bank is less or more risky.

	Amount	Amount
Item	Less risk	More risk
Total Assets	100	100
Cash	10	10
Treasuries	40	0
Mortgages	50	90
RWAs	75	90
Capital/RWA Ratio	13%	11%

Figure 15: table showing an example of how credit risk calculated

[33] Source Michael K ong Internal credit risk models, capital allocation and performance measurement" 1999

As the table suggests assets are ranked 100% risky but each of these has a different rage of risk. Cash is considered one of the less risky for its liquidity followed by treasuries, which can be not risky if they belong to the government. Mortgages are considered very risky as discussed in chapter one.

2.1.2Caveats of Basel I

Even though Basel I was a revolutionary agreement, which brought several improvements, it had caveats as well. Its main pitfalls were mainly five:

1. Its risk associated with different kind of transaction ranged from a 0% to a 100%. A too wide interval and differentiate only into four groups. (0%, 20%, 50%, 100%)
2. Even though 8% of RWA is sufficient to prevent a bank from default, it does not take into account the origin of the change in default risk.
3. All capital has the same risk regardless of the maturity.
4. It assumes only one kind of risk so a unique market which is not true

2.2 Basel II

Basel II is the second agreement of 2004 created to provide some improvements to Basel I. Always issued by the BCBS, this accord comprehended not only capital but also operational and related to the market requirements. This new international

standard aimed at stipulating a set of rules where both risk and capital played an important role. As any bank engages in a more risky transaction, the greater the amount of capital has to save in order to protect its solvency. From a political point of view, Basel II was difficult to implement since it has been introduced during the financial crisis even though it has been ratified before. Basel II aims were:

- Quantify credit, operational and market risk
- Reduce regulatory arbitrage[34]
- Increase disclosure

Taking into account the first bullet point, it has been very difficult to measure risk. In the light of this, credit risk has two different methods to be quantified: the first one is the traditional one used in Basel I calculating RWA which has to be greater or equal to 8%; the second one is a new approach is internal ratings-Based (IRB). The IRB is a method has the objective of increasing the risk sensitivity of a portfolio of assets and its risk management. The IRB is able to use internal measures to calculate risk and the probability of default. To estimate the IRB several variables are needed in order to proceed:

1. Probability of default (PD)
2. Maturity (M)
3. Exposure at default (EAD)
4. Loss given default (LGD)

The IRB approach is divided into foundation and advanced method. In the first case, the bank has to calculate by itself the PD while it has all the other variables. In the second case, the intermediary has to calculate all the parameters internally.

[34] Situation where companies take advantage of loopholes in order to avoid unprofitable regulations. http://www.businessdictionary.com/definition/regulatory-arbitrage.html#ixzz3FVeBIVPv

The easiest model used to measure capital ratio was the Merton model (1974) with uses credit risk to relate capital structure.[35] To explain better the concept, it is useful to revise some accounting essentials. In order to prepare a financial balance sheet, it is very important to make a distinction between what is credit and what is debt.

Consolidated balance sheet of Barclays, RBS/NatWest Lloyd/HBOS, HSBC (53.7%) and Nationwide BS

All assets and liabilities shown gross

Assets	£ billion	£ billion	*Notes*
Fixed assets	95		
Loans to customers	2,232		*A*
Securities for sale	1,073		*B*
Loans to other banks	239		*C*
Derivatives	1,142		*D*
Other trade assets	97		
Cash at Bank of England	197		*E*
Deferred tax asset	20	5,095	*F*
Liabilities			
Customer deposits	-1,869		
Derivatives	-1,156		*D*
Other trade liabilities	-620		
Tax liabilities	-5	-3,650	*F*
Total net assets		1,445	
Financed by/ownership			
Loans from other banks	360		*C*
Bonds	836		*B, E*
Shareholders' funds	249	1,445	

[36]

Figure 13: balance sheet of a bank

As the image suggests, every balance sheet is well divided into equity and debt. On the right-end side, there are liabilities and equity in form of stocks or shares. On the left end side instead, there are assets of long and short term. Let's suppose that debt is a bond or any other obligation to be paid back in a specific time t. In assets value is more than the debt to be

[35] White A.,Nelken I., Hull J.,(2004) University of Toronto, "Merton's Model, Credit Risk, and Volatility Skews"
[36] http://markwadsworth.blogspot.it/2010/10/shadow-banking-system-and-off-balance.html

repaid, the firm is not in default, as shareholders receive the asset residual value that is higher than the actual assets' value. When the firm defaults, shareholders gets nothing.

Let's define E equity AT assets at time T

ET = max [AT – D, 0] [37]
This formula is very similar to this $\max\{S_T - K, 0\}$[38], which is that of a call option.
Rearranging and finding E volatility, we have:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{N}(r_i - \bar{r})^2}{N-1}}$$

Where: N = number of observations

$\bar{r}$ = mean return

r_i = return at period i

[39]

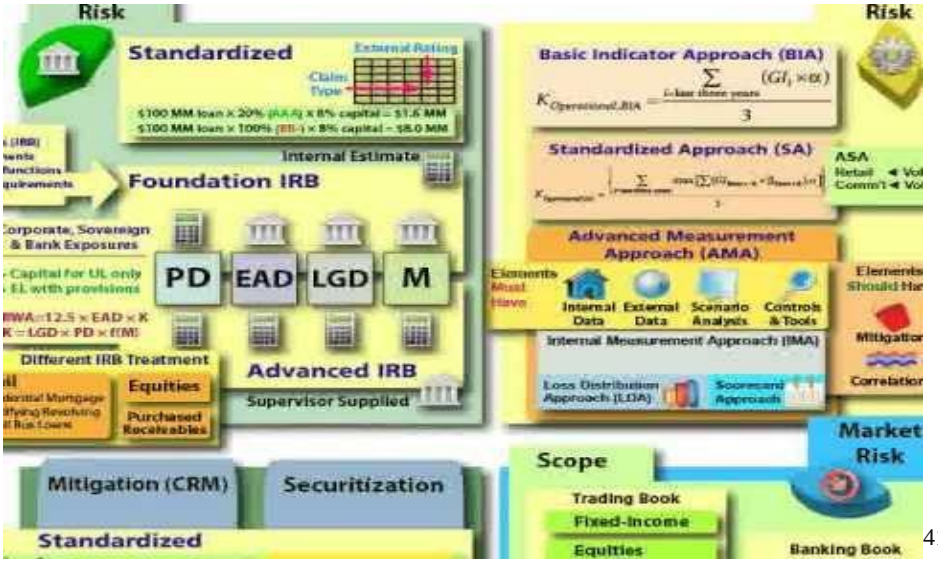
Figure 14: the equity's volatility formula

σ is the volatility of the asset value, and r is the risk-free rate of interest, both of which

Are assumed constant[40].

[37] White A.,Nelken I., Hull J.,(2004) University of Toronto, "Merton's Model, Credit Risk, and Volatility Skews"
[38] White A.,Nelken I., Hull J.,(2004) University of Toronto, "Merton's Model, Credit Risk, and Volatility Skews"

[39] http://www.optionseducation.org/tools/faq/technical_information.html
[40] White A.,Nelken I., Hull J.,(2004) University of Toronto, "Merton's Model, Credit Risk, and Volatility Skews"



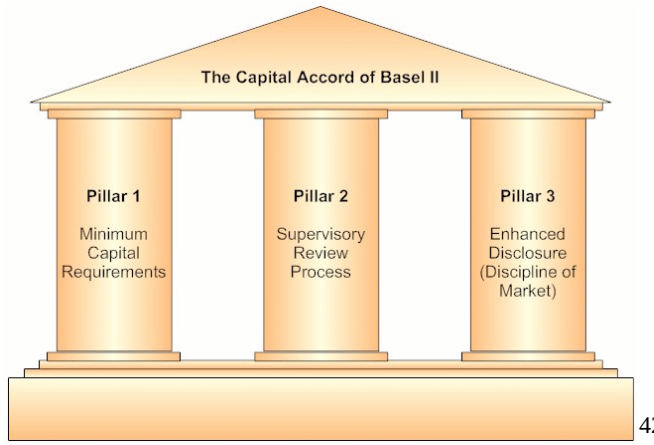
[41]

Figure 15: different approaches to measure risk

2.2.1 Basel II Pillars

Differently from Basel I, Basel II is based on three pillars which focuses on minimum capital requirements, supervisory review process and market discipline. As when building a house, it has to have a solid base with solid bricks in order to support risk and co related problems.

[41] http://www.youtube.com/watch?v=o2kGYUP7Vro



[42]

Figure 16: Basel II pillars

2.2.2 Minimum capital requirements for market, operational and credit risk

Minimum capital is the key pillar of the whole Accord. As previously stated, banks have to hold capital against at least 8% of assets[43]. Differently from Basel I, this new framework adopted a new formula to calculate the solvency ratio. If before was simply regulatory capital divided by, the weighted risk now becomes:

$$\frac{Regulatory\ capital}{RWAcr + RWAmk + RWAop} \geq 8\%$$

Where:

- cr is credit risk
- Mk is market risk
- Op is operational risk

[42] http://www.noweco.com/risk/riske14.htm
[43] Nowak R. A., (2011), Duke University, Durham, North Carolina "How effective is global financial regulation?"

The main goal of this change in the denominator was to better calibrate capital requirements.[44] Three methods to calculate credit risk were available:

- A standardized model where weights are given by rating agencies
- A model in which weights are multiplied by the assets
- A more sophisticated model such as IRB

In 2009 with Basel 2.5, the approach to calculate market risk was updated. In 1996 for the first time, market risk was defined through the Market risk amendment and then incorporated to the Basel II framework. This kind of risk comprehends risk of losses in and off balance sheet positions when the market interest rate changes and therefore prices change. It includes foreign exchange and commodities risk as well. Market risk can be measured through two methods. These are the standardized one and other internal and more sophisticated approach such as the Var and the stress test. The use of one method rather than the other depends on the nature of the market risk if it is either general or specific (aimed at specific issuers of securities). The last type of risk present in the first pillar of Basel II is the operational one, which is related to the risk of loss deriving from internal processes failure concerning systems, structures, external events and people. There are three methods to measure and monitor operational risk:

1. The basic indication approach which has to be on average 15% of the gross income
2. The standardized approach which is calculated on the basis of ten business line
3. The advanced measurement approach based on internal parameters and models

[45]

Figure 17: all three risks under Basel II and Basel 2.5

2.2.3 Pillar two Supervision

In order to make the financial system work properly, an intensive supervision is needed to control and monitor if banks and other intermediaries follow the rules. That is what the supervisory review process does. Furthermore, this pillar stresses the fact that banks have to possess an amount to capital proportionate to their risk in order to be in a strong position.

Supervisors must interfere to prevent any insolvency by banks (insolvency occurs when a bank falls below the minimum capital requirements) but not through a PCA[46] action.

[45] http://www.investopedia.com/articles/07/basel2.asp

[46] Prompt corrective action: American law which permits to penalize banks which deteriorate their capital ratio standards

2.2.4 Market discipline: the third pillar

Market discipline, instead, is what tries to intensify risk disclosure. As risk under this Accord is classified into credit, market and operational, the idea under the classic model changes. Transparency is the nucleus of this pillar together with disclosure of any data both quantitative and qualitative. Disclosure are needed twice a year and follow very strict rules.

CHAPTER THREE

3 Why a new agreement was essential: the introduction of Basel III

"There are **many factors** that led to the buildup of the **crisis**. At the top of the list is **excess liquidity**, resulting in too much credit and weak underwriting standards. The vulnerability of the banking sector to this buildup of risk in the system was primarily due to **excess leverage, too little capital of insufficient quality, and inadequate liquidity buffers**".[47]

The last financial crisis brought many limitations in Basel II and this led to the creation of new bank regulations under the so-called Basel III.

The second Basel accord had some pitfalls such as:

1. The capital required in this agreement has proven to be not enough during the financial crisis
2. One of the main methods to calculate risk, the standardized approach strongly relied on the credit agencies, which proved not to be reliable during the 2000s crisis.
3. Basel II was able to exacerbate credit cycles: it is known that a bank requires more capital when it faces a situation of default. The opposite happened under Basel II.
4. Basel II did not focus on the absence of liquidity

The Basel Committee on Bank Supervision (BCBS) has introduced Basel III in 2010-2011 and it was planned to get into force by 2015. As Basel II, this new agreement has been created in order to promote a more flexible and stable banking sector and to set a new international

[47] Basel Committee on Banking Supervision, "Basel III and financial stability",http://www.bis.org/speeches/sp101109a.htm

framework for liquidity risk measurement. The real goal of this new accord is to absorb shocks arising from financial and economic stress, whatever the source, thus

reducing the risk of spillover from the financial sector to the real economy.[48]

3.1 The bank regulatory Framework according to Basel III

In the light on this, the BCBS focused on three main goals, which included:

1. Improvements of quality and increase in the quantity of capital
2. Strengthen risk coverage
3. Introduce liquidity requirements

Starting from Tier one of the Basel framework, a new definition of capital was introduced leaving aside all the possible inconsistencies previously created in Basel I and II. Capital is mainly composed by equity and banks need it as a "key stone" of their structure.

What the crisis showed was a situation in which the main losses related to credit came from retained earnings, which belonged to common equity.

In the light of this, Tier one, under the new accord, comprehends common shares, retained earnings and other additional capital, which does not have maturity and coupons. Innovative capital instruments were phased out if they were less than 15% of the capital base. Tier one instruments were harmonized while Tier II eliminated.[49]Moreover, the quality of capital lacked during the crisis and this leads the Basel committee to introduce new minimum requirement such as:

[48] Wan-Chien Chiua, Juan Ignacio Peñaa, and Chih-Wei Wang a* ,(2013), Industry Characteristics and Financial Risk Spillovers

[49] Basel Committee on Banking Supervision, (2010), "Basel III: A global regulatory framework for more resilient banks and banking systems", rev June 2011

- Common equity[50] had to be 4.5% over the total RWA (an increase of 2.5% with respect to the previous model introduced in 2004)
- Capital under Tier I was increased from 4% to 6% over the total RWA
- Total capital under Tier I and II was fixed at 8%

Another shortcoming of Basel II, which negatively affected capital, was the procyclical shocks in banking system (mainly negative) which were able destabilize the financial market. In order to eliminate this problem, Basel III introduced the so called "conservation buffer" which was a part of common equity, more precisely 2.5% of total RWA, that had to be held as a cushion for eventual crisis.

Capital Requirement Changes from Basel II to Basel III

Requirements	Basel II	Basel III
Total Capital	8%	8%
Core Tier 1	2%	4.50%
Tier 1	4%	6%
Core Tier 1 Implementation: 3.5% by Jan 1st 2013, 4% by Jan 1st 2013, and 4.5% by Jan 1st 2015		

[51]

Figure 18: table showing differences in capital ratio between Basel II and III

The committee during 2010-2011 introduced several reforms to the international regulatory framework. These new reforms not only enhance the macro bank situation but also the micro: from an individual example to a system wide one with procyclicality of risk.

[50] Sum of common shares issued by the bank, retained earnings, stock surplus and other accumulated income
[51] http://www.qbreview.org/coco-bonds-growing-popularity/

3.1.1 Strengthen risk coverage

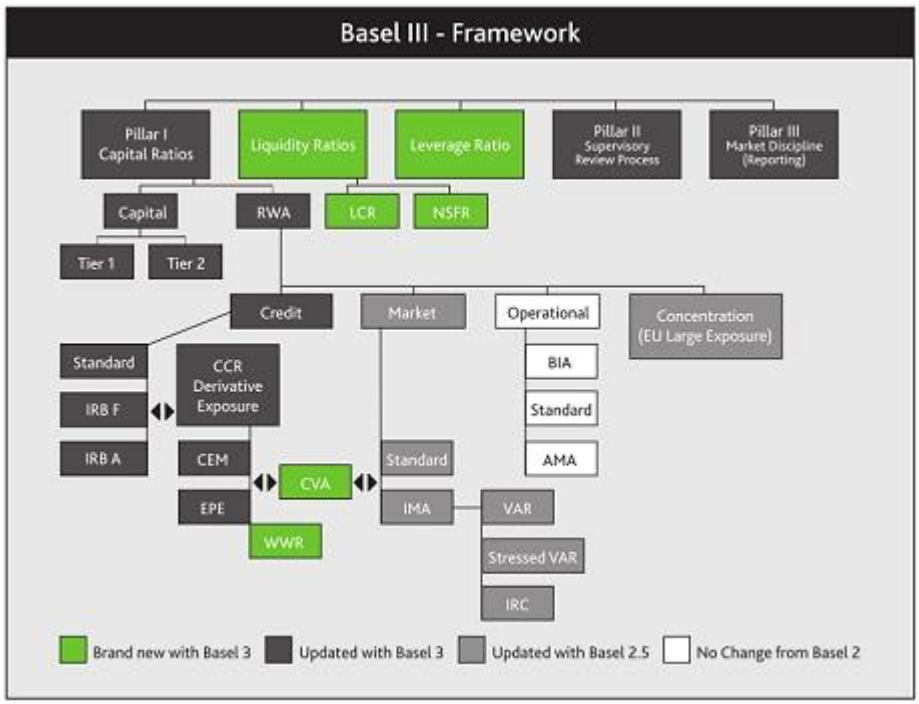
Strenghten risk coverage

As previously discussed I chapter one, during the financial crisis many off balance sheet activities such those involving derivatives exposed the whole banking system to failure in managing risk and encouraged the creation of leverage. In the new framework of Basel III an entire new concept which ensures a risk coverage was introduced. As a result, banks regulation were enanched and credit analyses were introduced to control the process of securitization. (See chapter one)Futhermore, the new document introduced by the BCBS, mentioned the strengthening of capital requirements for counterparty credit exposures arising from banks' derivatives, repos and securing financial activities.[52]

Introduction of leverage ratio

The high level of leverage was one of the features of crisis not only of the last financial one. During the most severe part of the crisis, the bank system was forced by the market to reduce their rate of leverage so that it could help decrasing asset prices, increase capital and expand the availability of credit. This new consideration was introduced for the first time in Basel III under an integration of pillar I.

[52] Basel Committee on Banking Supervision, (2010), "Basel III: A global regulatory framework for more resilient banks and banking systems", rev June 2011



[53]

Figure 19: an overview of Basel III framework

Leverage ratio was calculated as:

$$\text{Basel III Leverage Ratio} = \frac{\text{Tier 1 Capital}}{\text{Exposure Measure}}$$ [54]

Figure 20: equation of Basel III leverage ratio

The Federal Reserve Bank decided that leverage ratio had to be 6% for SIFI and 5% of insurance companies.

[53] http://causalcapital.blogspot.it/2011/07/caveat-emptor-basel-iii-conferences-and.html
[54] http://blog.usbasel3.com/slr-basel3-leverage-comparison/

3.1.2 Reduction of procyclicality

As stated before, procyclicality was another factor that badly influenced the crisis. The Committee decided to set some goals:

1. Decrease the level of procyclicality in the minimum capital requirement (From Basel I so 1988 to Basel III 2011) See Basel II and LGD.
2. Encourage anylisis and studies on future provisions
3. Create a "buffer"

3.1.3 Introduction of liquidity pillar

The liquidity pillar was a brand new pillar that firstly appeared in Basel III. Under liquidity ratio banks had to possess a quantity of liquid assets to cover Net Cah flows.[55]These assets are defined as High Quality Liquid Assets(HQLA) which can be turned into cash easily and can survive a 30 day stress in the banking system. The liquidity coverage ratio is one of the "internationally harmonized liquidity standards". During the last financial crisis, some banks and other institutions even though they possessed a good ration of capital they were not able to manage liquidity. The banking system went under a severe stress where, from a situation of excess of fundings, it now faced a moment in which liquidity evaporated. In 2008, the BCBS decided to publish *"Principles for Sound Liquidity Risk Management"* and right after introduce two minimum standards which later were used to achieve:

1. The development of the Liquidity Coverage Ratio (LCR)- Useful in a short horizon time
2. The development of Net Stabel Funding Ratio (NSFR)- useful in a long horizon time

[55] Calculated for a future 30 days

The LCR has the role of ensuring that every bank has the right amount of liquid assets in order to sustain its Net Cash Flows.Differently from the classical Net Cash Flow, this net cash flow is calculated by subtracting the inflows to the 75% of total cash outflows from the cash outflows. Cash outflows are divided into retail deposits which are placed by n individual and are divided into stable(with a run off rate of 3%),not stable(with a run off rate of 10%) and less stable deposits (with a run off rate of 10%). Whenever a bank is not able to categorize an asset, it is highly recommended to group this asset in the "less stable" category. Moreover, cash outflows can have a unsecured or a secure nature.

Unsecured wholesale funding run off are liabilities raised from legal entities and they have the special feature of not being collateraized. This kind of outflow is callable and it is divided into:

1. Unsecured outflows generated by small business
2. Operational deposits provided by management activities
3. Unsecured outflows by CB,non financial corporates entities and sovereigns

Secured funding run off is defined as liabilities which are collateralized. A list of the main typoligies are shown in the following table:

	ASF	RSF
100%	capital	assets encumbered for ≥12M
	borrowing ≥ 12M	net derivatives receivables
		other assets
95%	stable retail/SME deposits ≥ 12M	
90%	less stable retail/SME deposits < 12M	
85%		loans to non-financials ≥12M & RW ≤35%
		non-HQLA securities
		physical traded commodities
65%		residential mortgages ≥12M & RW ≤35%
		other loans not to financials ≥12M
50%	corporate deposits < 12M	LCR Level 2B assets
	public sector lending < 12M	HQLA encumbered for 6-12M
	other lending 6-12M	loans to supervised banks 6-12M
		operational deposits with ASFF = 50%
		non-HQLA assets < 12M
		loans to non-bank financials < 12M
		loans to non-financial corporates < 12M
		retail loans < 12M
		SME loans < 12M
		public sector loans < 12M
15%		LCR Level 2A assets
5%		LCR Level 1 assets
		irrevocable/conditionally-revocable credit & liquidity facilities
0%	open	cash
	other lending	central bank reserves
	net derivatives receivables	interbank lending < 6M

56

Figure 21: main liabilities which are part of the security funding run off

Cash inflows are mainly contractual inflows for which every bank has no reason to expect a default within the 30 day time horizon.[57] As calculated before, in order to ensure that a minimum level of HQLA is present, the total amount of inflows that can balance outflows has to be 75%of the total outflows. Cash inlows are:

1. Almost every kind of secured lending
2. Committed facilities
3. Other inflows by counterparts
4. Small business inflows

[56] http://icmacentre.wordpress.com/2014/04/24/an-introduction-to-the-nsfr-for-repo-dealers-in-a-rush/

[57] Basel Committee on Banking Supervision, (2013), Basel III: The liquidity Coverage Ratio and liquidity risk monitoring tools

5. Other wholesales inflows

Taking into account all the possible events that had occurred during the crisis, this new scenario includes:

- Situations in which the credit rating is downgraded
- Situations in which there is an increase in collateral calls and funding haircuts
- Situations in which a loss of deposits and unsecured wholesale funding are present

The LCR will be introduced in January 2015 and its starting minimum requirement will be 60% and its final desired percentage would be 100% by 2019.[58]

$$LCR = \frac{Stock\ of\ HQLA}{Total\ net\ cash\ outflows} \geq 100\%$$

Where each HQLA must :

1. Be listed on a exchange
2. Low risk
3. Be lowed correlated with any other risky asset
4. Have low volatility
5. Have be traded in an active market before

All assets in the stock have to be unencumbered which means free of legal,regulatory,contractual or other restrictions on the ability of the bank to liquidate,sell,transfer,oo assign the asset.[59]

The stock of HQLA comprehends both Level one(with no limit) and Level two assets(40% of the stock with 15% of Level 2B assets included).

Level one	Level two
Limited to coins and banknotes	Marketable securities
Reserves in the CB	Corporate debt securities

[58] Basel Committee on Banking Supervision, (2013), Basel III: The liquidity Coverage Ratio and liquidity risk monitoring tools

[59] Basel Committee on Banking Supervision, (2013), Basel III: The liquidity Coverage Ratio and liquidity risk monitoring tools

The BCBS also added that during period of stress the bank itself has to use all its HQLA and even falling below the minimum. Together with this new consideration, supervisor also had in mind several other observations:

Supervisors have to be aware of what is happening inside each bank and be ready to intervene if necessary.
Every supervisors response has to be personally designed for each bank in terms of duration and magnitude.
Asses the nature of any shock which involves liquidity.
If appropriate, supervisors could decide to engage prompt actions to decrease a bank's liquidity risk.

The NSFR is the ratio between the available amount of stable funding and the required amount of stable funding which as to be equal or greater than 100%. What the ratio reflects is a balance between liabilities and liquidity of assets.

Available stable funding(ASF) is calculated by taking into account stability of the source of funding of an institution. ASF is able to divide liabilities into five categories which respectively receive 100%, 95%, 90%,50% and 0% ASF factor.

The first group, liabilities which receive a 100% ASF factor, are total regulatory capital (with the exception of Tier II instruments with residual maturity of less than one year)[60]and secured and unsecured borrowings.

The second group comprehend stable deposits both with no maturity or with an end term while the category with 90% ASF factor is composed by less stable deposits. (See the LCR paragraph)

The last two groups, respectively 50% and 0% of ASF factor which respectively comprehend funding with a left maturity of less than a year, operational deposits and other fundings. While in the 0% category there are liabilities with a residual time of 6 months of maturity,no maturity liabilities(With the exception of deferred tax liabilities) and derivatives payables.

[60] Basel Committee on Banking Supervision, (2013), Basel III: The liquidity Coverage Ratio and liquidity risk monitoring tools

In the NSFR ratio at the denominator there is the required amount of stable funding which is composed by:

1. Encumered assets
2. Financial transactions which are classified as secured

    - Assets with 0% RSF factor
    - Assets with 5%RSF factor
    - Assets with 15%RSF factor
    - Assets with 50%RSF factor
    - Assets with 65%RSF factor
    - Assets with 85%RSF factor
    - Assets with 100%RSF factor

3. Off-balance sheet exposures

3 .1.4Basel III and the SIFIs

BCBS, despite introducing Basel III, also dedicated a section in the last accord targeted to Sistemically important financial institutions.[61] Even tough there is no single approach to prevent global financial failure, the regulatory community suggested:

1. To increase the cushion which absorbs of the going concern loss
2. Improve framework which dealt with resolution and global recovery

The best methodology used to detect and show what produce negative externatilities is based on a indicator measurement approach.[62] Every indicator reflect:

- Cross jurisdictional activity (20%) : every four months each bank report its activities (both foreign and local claims included)

[61] They can be insurance companies, banks or any other entity whose failure can lead to a financial crisis.
[62] Basel Committee on Banking Supervision, (2011), "Global systemically important banks: Assessment methodology and the additional loss absorbency requirement"

- The actual size of each bank (20%): The bigger the bank, the harder for its activities to be replaced by other banks
- How each bank is connected to the other and its current position (20%)

A bank's systemic impact is likely to be positively related to its interconnectedness vis-à-vis other financial institutions. [63]

A key method is used to calculate interconnectedness. This is called Wholesale funding ratio:

$$\frac{Total\ liabilities - retail\ funding}{total\ iabilities}$$

- Uniqueness of their categories (20%)
- The complexity of their activities (20%)[64]

In order to calculate an indicator each bank has to:

$$\frac{Individual\ Bank\ Amount}{Aggregate\ amount\ of\ banks} \times banks'weight$$

A second approach to calculate negative externalities is present: the Bucketing approach.

The BCBS divides into "buckets" SIFIs according to their scores obtained in the indicator based approach. In 2011 this approach was tested in a group of 73 banks of which only 27 were considered as "important" ones. The threshold of every bucket should be equal in term of scores. In oreder to preserve soundess and stability, the supervisory judgement, after valuing the scores obtained by banks, decided to base its rules on four pillars:

- The judgemental adjustement threshold must be high
- The actual judgement should take into account impacts in a global prospect

[63] Basel Committee on Banking Supervision, (2011), "Global systemically important banks: Assessment methodology and the additional loss absorbency requirement"
[64] Relative weight

- The judgemental overlay should comprise well-documented and verifiable quantitative as well as qualitative information. [65]

[65] Basel Committee on Banking Supervision, (2011), "Global systemically important banks: Assessment methodology and the additional loss absorbency requirement"

CONCLUSION

After a period of systemic recession, as the one which took place in the last years, it has been clear that a new and solid bank regulation was needed. It would be too simply to detect all the possible causes of the last financial crisis, but what was of vital importance and not present was a strong bank resilience. Unfortunately, no market is able to auto- equilibrate and regulations are essential. On the other hand, Basel II shows that a regulation alone is not able to help the economy to reach a situation of equilibrium. At this point did Basel III fail in their intent to improve Basel II?

Of course Basel III has strenghten one of the pillar of Basel II trying to build a new approach towards liquity requirements. As my thesis suggests, especially in the last chapter, Basel III has been ratified to improve the economic situation and to prevent another crisis. Even though only some aspects of the economy were taken into account such as liquidity, it does not mean that Basel III was a failure. In the light of this, other measures have to be taken such as:

1. A constant revision of what has been stated in the past agreements
2. A more rigid control of investment risk
3. A well running capital allocation by banks
4. Improvements in risk manage
5. Enhance transparency and supervision

Where all these measures have to be used for all banks, no matter if they are to big and too important to follow strict rules. It is clear that professors, economists and experts have different opions of Basel III and its effectiveness. On one hand there are the ones who strongly believe that its implementation will worsen the economy while other are in favor of this new agreement.

"The problem is that while Basel II was a bold experiment which took a decade to put together and which even then never really got implemented, Basel III was much more of a rush job, and therefore could not be a soup-to-nuts reimagining of what a global macro prudential regulatory regime should look like. Even if that were a good idea."[66]

It is too early to state and to predict what will bring Basel III and which group of experts was right. Continuosly changing environment and research are needed to predict future situation with right measures.

An economist is an expert who will know tomorrow the things he predicted yesterday did not happen today.

Laurence J. Peter (1919-1988)

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