The Causes and the Consequences of the 2008 Financial Crisis: An overview with an analysis of the post-crisis banking regulation

Rakic Jovana

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Thessaloniki – Greece
Student Name: Rakic Jovana
SID: 1104180019
Supervisor: Dr. Nikoletta Kleftouri

I hereby declare that the work submitted is mine and that where I have made use of another’s work, I have attributed the source(s) according to the Regulations set in the Student’s Handbook.

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Abstract

This dissertation was written as a part of the MSs in Transnational and European Commercial Law, Banking Law, Arbitration/Mediation at the International Hellenic University.

The reason behind my topic choice is the difference and the importance of the financial system. As it is commonly argued, the financial system represents a heart of the modern market economy. When the system functions well, it allocates resources in a way that boosts the productivity of the economy. However, it is also unstable and fragile and when it falls, the impact spreads through the whole economy.

In the heart of the financial system are banks which have prominent role in functioning of the economy. However, banks are prone to a contagion and domino effect as there is a possibility that many depositors will want their money back at the same time and bank will not be able to repay them, making a panic among depositors and eventually a “bank run”. As banks are highly interconnected and have large and significant exposures to other banks, the failure of one bank can have an impact on the others as well.

The occurrence of crisis in financial system is not unusual and represents norm and not exception. Most crisis usually begin with a bubble where a particular asset rises above the fundamental underlined value. In addition, together with crisis goes excessive accumulation of debt and excessive growth in the supply of credit. This boom usually comes as a consequence of lax supervision, deregulation and loose monetary policy of central banks.

This paper considers causes and consequences of the recent financial crisis as well as the post-crisis regulation which was brought as an answer to the crisis with an aim to prevent future disasters.

In addition, I would also like to acknowledge my supervisor Dr. Nikoletta Kleftouri.

Keywords: financial crisis, deregulation, subprime mortgages, securitisation, reforms

Rakic Jovana
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Introduction

The last financial crisis which startled the global economy represents the most severe financial crisis since the Great Depression. The crisis which began as the subprime crisis in the U.S. shortly after spread to other economies through the combination of direct exposure to subprime assets, global financial imbalances and overall loss of confidence in the financial system. Consequently, the ongoing crisis damaged global economy and triggered worldwide recession.

At the beginning, crisis did not look too differently than previous ones. Namely, many creditors at the same time pursued the return of their asset, the phenomenon known as “bank run”. However, the difference was that this crisis was focused on “shadow banking system” and there was an enormous asymmetry of information as general public was not aware nor did understand the complex transactions and institutions.1

The germs of the crisis can be found in free-market fundamentalism in which reforms loosen banking regulation established after the Great Depression. During this time, banks found a way to evade the remaining rules and the shadow banking system was growing outside of the regulatory oversight. In the environment of low interest rate and lax regulation, the financial institutions embraced securitisation. The securitisation was not an innovation of this period as it was existing for many years before. However, it flourished in this environment. The shift from the “originate to hold” to “originate to distribute” model transferred the risk from bank to a third party, which led to loosen credit standards and indifference to perform a due diligence. In addition, banks created a compensation schemes, such as bonuses, which were encouraging the excessive risk taking.

One important factor of this crisis was the international interconnection. In particular, the big crises have one common characteristic: they do not respect national boundaries. In particular, they can begin anywhere and spread globally as problems of one country can surface elsewhere or problems of one country can spread through channels such as commodities, currencies, derivatives and trade.2 Moreover, Central Banks around the world followed the trend and had loosen easy-money policy which fostered many housing bubbles and they all showed the same appetite for risk and took plenty of leverage, investing in financial innovations.

When the problems started building up to the breaking point, the governments found themselves in a difficulty as many institutions were too big to fail or to interconnected to fail as their bankruptcy would lead to problems in larger economy. In order to prevent the collapse of financial system, central banks and governments all over the

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world provided a financial support in the form of capital infusion, asset purchase programs, guarantees or liquidity assistance. As a consequence, trillions of dollars were spent on the bail out of the financial sector all over the world.
1. The roots of the crisis

The roots of this crisis can be found in the prior regulatory framework, low interest rate policy, the appetite of Asian central banks for debt securities and an overall feeling that the boom and bust cycles are left in the past and that economy will only experience growth.

1.1 Deregulation

The financial deregulation represents one of the key factors which set the path to the crisis. Namely, crisis brought into focus inadequacy of financial regulation at both national and global level as it created an environment in which mortgage lending was expanding and risk was increasing.

The number of regulated bodies are responsible for regulation of financial sector and is stated as one of the most regulated sectors. Therefore, the failure came as a surprise as especially after the Great Depression regulators were dedicated to build strong international prudential standards. One of the reasons could be the fact that banking regulation is different than other kinds of regulations. For instance, in the antitrust there is a mutual agreement that a problem is monopoly and its necessary to regulate it. However, when it comes to banking regulation things are different. In this case there is no a mutual agreement on which problem should be solved. Is it panic, contagion, or value of assets? Furthermore, at that time, many believed that there is no a problem to be tackled.

The aftermath of every crisis goes hand in hand with regulatory reforms and contemplation of what should be done in order to prevent another crisis. The Great Depression, the mother of all financial crisis, was not exception. After the almost financial death experience, radical reforms were brought internationally. The aim of these reforms was to ensure stability of financial sector, support growth and prevent another disaster.

In the United States was brought the Glass-Steagall Act of 1933 which established a division “firewall” between commercial and investment banking and gave the Federal Reserve the power to regulate bank reserves. Hence, the intermediary function of dealing with corporate shares and bonds was reserved for investment banks while deposit banks were prohibited from underwriting and placing corporate stocks and bonds and from holding speculative assets. Therefore, the commercial bank loans were to meet mainly short-term financing needs while investments banks were able to manage the long-term financing needs. Moreover, Regulation Q put limits on deposit interest rates in order to limit excessive competition among banks and to ensure low loan rates. Furthermore, the Securities Acts of 1933 regulated the security market and

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created the Securities and Exchange Commission (SEC) which role was to regulate a secondary market.\(^4\)

However, the implementation of the new regulation can have benefits and drawbacks. The benefit is clearly that it can prevent future crises. However, the strict regulation can also prevent a financial system of doing its own task of allocating resources were needed, decelerating growth and efficiency. Hence, in 1960s and 1970s through series of events it was made clear that there were needed changes and financial liberalization. Particularly was important when economy entered in the period of stagnation with increasing rate of inflation which was followed with the collapse of the Bretton Woods international financial system. This system was depending on a stable rate of inflation as banks could tolerate low interest rates and finance long-term loans with short term deposits without high risk of maturity mismatch as long as the inflation stayed in check.\(^5\) However, increasing inflation pushed real interest rates down and lowered the profitability of commercial banks.

Furthermore, since 1960s there was an expansion of a merger trend. However, the Glass-Steagall Act was keeping commercial banks away from this tendency. Thus, when the huge conglomerates started searching abroad for markets, US commercial banks started moving abroad in order to meet these conglomerates’ requirements. Also, increasement of price of oil in 1970s gave opportunity for the countries which produced oil to “recycle” the vast amount of “petrodollars” through banks in Europe and United States.\(^6\) Hence, the success of the industrial firms and the increased power of the financial institutions created a push toward deregulation.

The first part of the deregulation wave brought that the interest rate controls were abolished in 1980. Furthermore, in 1999 was brought the Financial Modernization Act which allowed diversification of financial activities by financial institutions. In addition, the 1933 Glass-Steagall Act, which was separating the work of commercial and investment banks, was repealed in 1999 by the Graham-Leach-Bliley Act. The Commodity Futures Modernization Act, brought in 2000, left credit default swaps (CDS) and equity default swaps (EDS) unregulated. Moreover, the amendment to the Employee Retirement Income Security Act from 2000 gave a permission for pensions to buy mortgage-backed securities and asset-backed securities, which consequently


increased the demand for securitized assets. Taxes on the finance capital were also reduced on the new pension and investment funds in order to create motivations for small investors’ participation. In 2004 the U.S. Securities and Exchange Commission (SEC) brought a special ruling for five largest investment banks in the United States to reduce their capital reserves which gave them the opportunity to become even more leveraged enterprises and to increase the pool of assets under their control. Moreover, these banks could alone assess and analyze their own riskiness by using computer models. Consequently, they were able to in few years jointly control $4 trillion in financial assets but with relatively little net quality.7

Across the ocean, European Union had partly harmonized legislation framework for financial regulation. The European Union had adopted Directives covering banks such as the first Capital Requirement Directive from 2006. In this period, however, Directives were more dominant than Regulations. Regulations, which are directly implemented without a need for national transpositions, were exceptions in period prior to 2007.8

During this period, Member States still had a considerable autonomy when it comes to regulating financial policies. Moreover, the implementation of rules whether they were brought independently or through transposition of EU Directive was the responsibility of national authorities such as banking and insurance supervisors and securities regulators but with a pattern of institutional architecture and regulatory enforcement differing from country to country.9

1.1.1 The role of the Basel Accord

The first attempt to regulate the banking system internationally was the Basel Accord. The Basel Committee on the banking supervision was established in 1974 with an aim to come up with better ways to regulate and supervise banking system. The first Basel Capital Accord was released to banks in 1988 and required from them to differentiate between different classes of assets they held in order to assess the risk posed by holding them. Therefore, the necessary capital that bank had to hold was depending on this risk assessment and were required to maintain minimum 8 % of their risk-weighted assets. However, banks found a way to hide a risk that Basel I did not anticipate by securitizing assets which gave them the opportunity to have a stability on the balance sheet which, in reality, they did not have.10

Therefore, in 2006 was brought the second version of the Basel accord known as Basel II. The new framework was based on three pillars: minimum capital requirement, supervisory review and market discipline. Also, it gave more technical guidelines on how to weight the relative risk of various assets and suggested methods of calculation. Moreover, it broadened the definition of risk including some other perils such as the likelihood that the asset’s price will fall in the open market. Furthermore, it urged regulators to have more aggressively approach when it comes to monitoring compliance with capital requirements.

However, the Basel Accord had serious flaws. Firstly, it was not implemented in the USA during subprime blooming nor did apply to non-bank lenders, investment banks or rating agencies. Also, the Basel Accord, even though tried to standardize capital requirements, contributed to the housing bubble. In particular, the Basel legitimized the SIVs by allowing them to be considered separate from the balance sheet of the bank that operated them. Moreover, it also encouraged banks to hold securities backed by residential mortgages, including subprime mortgages. The reason behind this lays in the basic rule in the Basel Accord which states that the capital which bank needs to hold is depending on the risk weight of assets and, as in many countries there was a low record of loss of residential mortgages it gave a lower risk weight to securities backed by mortgages relative to other types of assets.

Financial regulation of this period was not equipped to see the risk. Financial supervisors were too occupied with the formal banking sector that did not foresee the excessive buildup of a risk in the shadow banking system. On the one hand there was an increase of integrated global financial system while on the other hand there was still a strong impact of national institutions to the institutional governance. Moreover, regulation failed to consider the risk of interaction between regulated and unregulated institutions and markets.

The national regulators interpreted Basel I in such a way that it allowed banks to hold hundreds of billions of dollars of securities and fund them with short-term commercial papers without needing to commit much of their capital. Hence, the Basel II was brought which required off balance sheet risk to be brought into bank’s account. However, it let the banks to apply their own models of risk weighting and decide alone how large their capital buffer should be. Basel II placed accents on self-regulation, disclosure and transparency. Both Basel Accords treasured the principle of “home country rules”. Therefore, banks from lax

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areas of supervision were free to operate according to their domestic norms in American and European markets.\textsuperscript{15} It is argued that there are three crucial failures in the then existing banking regulation. Firstly, regulation was more focus on how to limit individual bank’s risk in insolation from the risk of the financial system as whole. Secondly, it did not have good answer for cyclical adjustments. The problem was that because long periods of low goods and services inflation underestimated risk and reduced the statistical measure of risk which ultimately brought to the excessive risk taking and bubbles. Thirdly, existed regulations were not enforced in an effective manner and many were on the voluntary base and were not implemented in all countries.\textsuperscript{16}

\subsection*{1.2 The Great Moderation}

The years prior to the crisis are named by leading academics and commentators as the period of Great Moderation. This period refers to the decline in macroeconomic volatility over the last 25 years, after the crises in 1970s and 1980s.\textsuperscript{17} This period can be sum up as a period of low inflation, economic growth and mild recession. Notably, Great Moderation was not only the U.S phenomenon as it was occurring at the same time in many other advanced economies.

In the post war period, the world would experience boom and bust cycles. Namely, economies would experience high growth (the boom) with which would also come inflation. After inflation the economies would slow down and sometime go to recession (the bust). It seemed as this business cycles cannot be put in permanent control.

The basic foundation for the Great Moderation were reduced inflation and establishment of basic price stability. The economists have proposed three possible reasons behind this phenomenon: structural changes in the economy, improved economic policies and good luck.\textsuperscript{18} For structural changes it was referred to the use of computers in order to get more accurate business decision, increased openness to trade and shift toward services and advances in the financial system. Moreover, it was stressed the improved economic policy which helped to overcome the large boom and bust cycles which were happening in the past.

There was a common thought that the boom and bust cycles are over and that the economy is now experiencing stability and growth. Furthermore, there was decline of prices globally. In particular, the prices of commodities, energy and manufactured

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\textsuperscript{15} Kolb W. Robert. (2010). Lessons from the Financial Crisis (Robert W. Kolb Series) [eBook]. Hoboken, New Jersey: John Wiley & Sons, Inc;
\end{flushright}
goods fell, while the asset price was rising. Due to financial innovation and deregulation, banks started exploring into, until then non-traditional area for banks, real estate lending.\textsuperscript{19}

Financial institutions were encouraged to take riskier investments as they believed that there will not be any economic downturn. Also, during this period there was a growth of complex financial derivatives such as credit default swaps. This period brought an underestimation of a risk and belief that the prices will only rise and that the low levels of macroeconomic volatility will only continue which was a great factor in the build-up to the crisis.\textsuperscript{20}

### 1.3 The Asian Financial Crisis

One of the important factors which contributed to the global financial crisis were the global imbalances. Global imbalances refer primarily to excessive saving by surplus countries, especially by China and excessive consumption by deficit countries, led by USA.\textsuperscript{21}

In 1997 many Asian countries, such as South Korea, Indonesia and Thailand, were faced with serious economic difficulties. Therefore, in seeking for help they turned to the IMF. However, in order to provide them with financial assistance, the IMF imposed harsh policies on Asian countries and asked them to raise their interest rates and cut government spending. The possible reason behind is that Asian economy at that time was not as important as today and did not have an effective mechanism to protest and argue.\textsuperscript{22} Consequently, Asian countries realized that they need to become economically independent in order not to ask again IMF for the help in the future crisis. In order to become economically independent, they started accumulating trillions of dollars of assets.\textsuperscript{23} This led to the capital flows from emerging economies to advanced economies. Consequently, countries which issued the preferred reserve currency experienced capital inflow. As the preference for dollar reserves were coming from Asia, the net capital inflows from Asia to the US grown rapidly and this phenomenon which is related to the asset price inflation in the USA, is known as the “savings glut”.\textsuperscript{24}

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One of the ways these reserves could be invest is in firms’ equity. However, it was not easy for Asian countries, especially for China, to buy companies so they started investing in debt instruments. They bought large amounts of Treasuries, Fannie and Freddie mortgage-backed securities and other debt instruments. Consequently, the large supply of debt facilitated to drive down lending standards in order to guarantee that there was enough demand for debt from house buyers and other borrowers.\(^{25}\) Hence, capital inflows from Asia caused an indirect influence on the US mortgage market. In the period before crisis, the USA have experienced the absorption of foreign capital which drove down the cost of credit, making loans cheap.\(^{26}\) Consequently, the accessibility of credit in the US led to a housing construction boom and enabled debt-financed consumer spending.\(^{27}\)

### 1.4 Dot-Com Bust and Low Interest Rates

After the collapse of the technology stock bubble, also known as dot-com bust, Federal Reserve and other central banks adopted the policy of low interest rates. In order to avoid a recession, the Federal Reserve cut interest rates to a level of one percent making interest rate much lower than in the previous 20 years when was followed the Taylor rule.\(^{28}\) The USA was not the only country with low interest rates and house bubble. In many other countries interest rate was also low. It is argued that the housing booms were the largest in the countries which deviated the most from the Taylor rule and that within the Europe the deviations from the rule vary in size due to the inflation and output data which vary from country to country. For instance, the country which experienced the highest house bubble was Spain because of the largest deviation from the rule which dates back in 1992, while the country with the smallest bubble was Austria as it had the smallest changes in house investment as a share of GDP.\(^{29}\) Consequently, deviation from the Taylor rule is correlated with increasement of asset prices and there are argues that this deviation was related to higher house demand. As the prices of houses rose, many people were motivated to borrow at one percent and buy houses going up at much higher rate. Namely, low interest rate policy drove down the cost of wholesale funding which was an important factor in increasement of credit

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However, the wholesale funding is prone to instability and being information sensitive during crisis it made the financial system more vulnerable as well.

1.5 From Originate-to-Hold to Originate-to-Distribute Model

In the past, banks traditionally would raise funds, screen borrowers and then lend money to the approved borrowers. In the case of borrower default the bank would have to bear losses. Therefore, it was a good encouragement for a bank to be careful and thoroughly examine potential borrowers. Also, mortgages were held by the banks so if there were some problems in that area such as unemployment or decrease of housing prices it would be concentrated in the banks which are in that area where the problems are occurring.

However, things started to change in 1932 and 1938 when were founded the Federal Home Loan Banks (FHLBs) and the Federal National Mortgage Association (“Fannie Mae”).\(^{31}\) The aim was to add liquidity to the home mortgage market to facilitate home sales. Consequently, the home ownership rate increased from 43.6 percent in 1940 to 61.9 percent in 1960.\(^ {32}\) However, it seemed as not enough and further incentives were made. In 1970 was established the Federal Home Loan Mortgage Corporation (“Freddie Mac”) with an aim to make loans and loans guarantees and to create a market for mortgage-backed securities. What would happen is that the Freddie Mac would purchase mortgages and pool them and then sell MBSs to investors. This reduced the risk associated with the purchase of MBSs and motivated investors to hold them. The new method of mortgage finance was born.

The U.S. Department of Housing and Urban Development had in mind the affordable housing and set an annual target for extending loans for low or moderate-income housing. After 1992, Fannie Mae and Freddie Mac were required to purchase affordable mortgages from banks, the mortgages that did not pass the usual creditworthiness requirement for loans. It created a demand and creation of market in subprime mortgages and mortgage-backed securities. Together with innovations came the competition and shortly after private sector also became involved in the MBS market. However, the difference is that the private sector subprime mortgages were not carrying the same implicit government guarantee which is provided to the loans issued by GSEs.\(^ {33}\)


Hence, the pool of mortgages and MBS increased rapidly and became a significant element in investment portfolios. It allowed bubble in mortgage market to be built on a housing bubble. Investors wanted to hold these relatively safe assets instead of government securities. For instance, pension funds, hedge funds, insurance companies they all held MBS instead of government securities. In particular, bundling and insuring mortgages can be profitable when the house price is rising. Due to the risk-premium effect, they were more profitable to hold than prime mortgages because there is a reduction of a risk through insurance and diversification.\(^3\)

As a consequence, the mortgage system had drastically changed. Instead of banks holding the mortgage as it was in a traditional “originate-to-hold model” now the bank would originate them and start selling them to be securitized. The process known as “originate-to-distribute model”. Also, the originators were paid based on the number of mortgages they approved so they were encouraged to approve as many mortgages possible.

Consequently, the new originate-to-distribute model deteriorated the quality of mortgages. The banks were not anymore motivated to use their screening and monitoring methods. This model allowed them to benefit from the origination fees without bearing the credit risk of borrowers. If the secondary market was functioning well, they were able to pass those loans to a third party.\(^4\)


2. Subprime Mortgages and Securitisation

The rise of house prices together with financial innovations gave opportunity for riskier borrowers to become customers for mortgage lenders. Together with these innovations came innovations in process of securitisation which enabled vast number of subprime borrowers.

2.1 The Rise of Subprime Mortgages

After the Great Depression, the government wanted to enable a strong encouragement for lenders to give loans to low-income borrowers. However, through history many of the individuals which wanted to own a house did not meet the needed requirements. Many factors were the reason behind this, such as discrimination based on race, area or region or community-based redlining where a bank rejects someone due to the region or neighborhood where they live. Therefore, by the expansion of the subprime mortgages, individuals which before were not exceeding requirements were now able to fulfill their dream. Hence, besides prime mortgages, now there were also subprime mortgages which were given to the riskier borrowers.

However, the question that arises is why innovations happened in housing market? Firstly, the housing market represents a particular importance due to its size and connection to the other markets. Secondly, in the environment of the saving glut, financers desired an investment that was as safe as Treasury Bonds but with a return that was not quite as trivial. Consequently, there were established a number of mortgage programs with an aim to alleviate some of the costs of the house buying, making mortgage loans available to the riskier borrowers.

So, who were the subprime borrowers? The term subprime borrowers was used for borrowers “who do not qualify as for prime interest rates because they exhibit one or more of the following characteristics: weakened credit histories typically characterized by payment delinquencies, previous charge-offs, judgments or bankruptcies; low credit scores; high debt-burden ratios; or high loan-to-value ratios”. Moreover, they also can be identified by other characteristics, such as low interest rate at the beginning as a teaser rate that will later on, in couple of years or months, change to an adjustable rate.

The Regulation represented one of the factors of the growth of the subprime mortgages. First of all, the Community Reinvestment Act did not cover most subprime mortgages. Moreover, due to the Alternative Mortgage Transaction Parity Act of 1982,

lenders were able to offer adjustable rate mortgages. In addition, the Tax Reform Act from 1986 definite that the interest paid on the residential mortgages remained the only consumer loans where the interest paid is tax deductible.\textsuperscript{38} Furthermore, the growth of securitization of subprime mortgage products helped expansion of the subprime market through converting future income streams into immediate and liquid funds which were then used as a capital to fund more home finance. Consequently, the percentage of subprime loans comparing to other mortgages increased from 8\% in 2003 to 20\% in 2006. Also, much of it was funded by securitization: approximately 75\% of the $600 billion of mortgages originated were securitized.\textsuperscript{39}

The demand for home loans affected the already loosen lending standards which just detreated even more, creating many murky types of loans. For instance, banks expanded their use to the “no-documentation loan” known also as NINJA loans which stands for “no income, no job, no assets” loans. That meant that a potential borrower did not need to state income or assets in order to qualify for a loan. Moreover, this situation created a “liar’s loans” which meant that borrowers started lying about their finance in order to get the house they could not actually afford. This was possible for them as no one bothered to verify their claims.\textsuperscript{40}

One of the problems in this chain was an information asymmetry. The relationship between the brokers and loan originators was exploiting the information asymmetry as the borrowers did not have the full understanding of the origination fees and mortgage insurance costs that would be assessed against them. They had an optimistic view of the housing market and did not have the full picture of the adjustable rate mortgages and mortgage options. In addition, problem was that many of those borrowers were relying on the refinancing for loan repayment. Hence, loans were given with a belief that due to the house appreciation, the mortgagor will be able to refinance to a lower rate mortgage. However, as the housing prices fell, the borrowers were not able to refinance. Instead, they defaulted.\textsuperscript{41}

### 2.2 Process of Securitisation

Even though, there had been many factors which contributed to this financial crisis, the process of securitization is thought as the one of the greatest ones in the terms of


structural causes. It is widely argued that a securitization weakened the underwriting because the loan originators were not anymore motivated to collect information about likelihood of a borrower default. Moreover, this process encouraged participants to take riskier actions and rating agencies to overrate bundles. The securitization was not an invention of the 21st century. This process was already existed and was used in 1980s when the subprime lenders which were concentrated in Orange County, California, discovered that they could sell their subprime loans to Wall Street investors through selling the securities based on pools of those subprime loans. These lenders were known as “hard money” lenders which were requiring low loan-to-value ratios. Consequently, when the Wall Street found out about these types of lenders, they became conventional.  

Hence, when the Wall Street discovered the way to securitize subprime loans, the real boom of subprime started. Moreover, the investors also became interested when they found out that these AAA-rated securities backed by subprime mortgage provide them with a greater return comparing with other investments rated equally. The spiraling trend began.

Therefore, how exactly was securitization working? In particular, the loans, which were before held by originator until they are repaid are now pooled and claims on their cash flows are sold to investors all around the world as bonds which are secured by mortgages. The bonds are known as residential mortgage-backed securities (RMBS) and asset-backed securities (ABS). Hence, if the pool is consisted of the residential mortgages then they will be called residential mortgage-backed securities. When credit card debt or other types of consumer debt are pooled than it is called asset-backed securities (ABS).

The mortgage banker originates the mortgage loan in the ordinary banking course. Then, when the enough block of mortgages is originated, the banker initiates process of securitization by selling or transferring the mortgagees to a special entity-Special Purpose vehicle (SPV). This Vehicle can be a trust, a corporation or a partnership which is set up by a mortgage broker or an investment bank with an aim to purchase this mortgages and act as a channel for the mortgage payment flows. By moving the mortgages to the SPV, banks were moving the risk exposure from their balance sheet. Importantly, with a less risk on the balance sheet, the originator is subject to a lower capital requirement.

At the beginning, the MBS were only carrying the prepayment risk, the risk of early, unscheduled return of principal on a fixed-income security. Due to their long maturities, the mortgages are prone to this kind of a risk. Hence, if interest rates decline and borrower pays off his loan before maturity, the investor would not receive the anticipated stream of income at the agreed upon interest rate and will suffer significant losses. In order to overcome this, the collateralized mortgage obligations, generally known as collateralized debt obligations (CDO) were created. They allocated the cash flows of the MBS into the tranches so that the investor who preferred a short-
term security could buy an early tranche while the one who is willing to take more risk will prefer the later pay tranches.\textsuperscript{44}

Typically, these securities are divided in tranches which order depends on terms of priority of payment. Therefore, the claims of the most senior tranche of securities are paid in full before the next tranche receives any payments. This system reminds of a waterfall as cash is spilling down into an empty bucket. \textsuperscript{45} Hence, when the most senior tranche is payed completely and that bucket is full then the excess cash spills to the next most senior tranche and so on until either there are no more cash flows, or the bucket of the most junior tranche is filled. There are three basic levels of tranches. The senior tranche is at the top and it’s the safest one as it first gets the payment in the waterfall, but it offered the lowest interest rate. In the middle by safeness and return was a mezzanine tranche. At the bottom was the equity tranche as it is the first tranche to get hit by losses, however if everything goes well, it will get the highest returns.\textsuperscript{46}

The important role here has the Rating Agency. The Rating Agency is supposed to rate these resulting securities. The securitization is set up in order that the majority of resulting securities would be rated AAA. Consequently, in usual securitization process approximately 80% of residential mortgage-backed securities would be rated AAA, 10% AA, 5% A and 5% BBB+ or lower.\textsuperscript{47}

Moreover, in order to get higher rating score securities will get some type of credit enhancement. This credit enhancement can come from the asset itself or from some external source. For instance, from an asset itself it can include subordination of different tranches to higher rated tranches and overcollateralizing the asset pool. As for external source, the SPV can buy a surety bond or a letter of credit from a financial institution.\textsuperscript{48} In addition, one important source of credit enhancement is the credit default swaps which are issued by the insurance companies. Therefore, if the issuer failed to make a principal or interest payments, the insurance company would.

Thus, what were incentives of banks for selling these pools to investors? One of the main reasons is that they receive an immediate funds for originating the new loans. Secondly, they move a risk to investors, Thirdly, CDOs give banks a new and more products to sell as a new financial innovation which gives them a comparative advantage.


One of the problems in this process is a compensation. In the process of securitization payment was based on the quantity of the sold loans rather than on a quality and many actors were motivated to give higher ratings and originate as much loans as possible. The originator was not anymore motivated to monitor credit-granting process. This represents a principal-agent problem which occurs when the motivations of the originator are not aligned with those of the entity that holds loans. Therefore, in order to get higher compensation they are motivated to buy as much loans they can, even if they are of a bad quality. This can lead to casual and indifferent investigation of the quality of mortgages that a company is buying. Consequently, the securitization lowered the standard of loans, weakened the underwriting and create an information asymmetry. In particular, through these processes’ securities were far removed from the initial subprime mortgages, making it impossible for investor to track the CDO securities to the subprime mortgages that initially created their value. What was left for them is to rely on the rating grade and Rating Agencies.

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3. Risk Management and Mismanagement

After the crisis, the question which was continuously asked is whether the bust could be predicted. Key points, which are argued to be major weaknesses in risk assessment are the misleading ratings from rating agencies, the simple risk models which were not design for a complexity of a structured finance, inaccurate data and short-term financing with a little consideration for liquidity risk.51

3.1 The Role of Rating Agencies

Rating agencies play one of the crucial roles in the financial markets. Investors depend on them and expect them to be independent and objective. Hence, the rating agencies act as gatekeepers and investors and regulators are relying on them to provide objective, timely and accurate financial information.52 However, the rating agencies’ practice during the financial crisis deteriorated this trust bond. The Rating Agencies played an important role in the process of securitization. Namely, after the securities are being pooled together and trenched it is necessary to rate each tranche and that is when the rating agencies step in. Their aim is to rate these securities by whether they will meet the payment and performance obligations.53 This process was argued to be objective and meticulous. Therefore, the logical question that comes up is why agencies failed to assess the risk properly. One of the main reasons is that the issuer was paying the rating. This situation created a conflict of interest between obtaining issuer business and objective rating. Moreover, it was argued that it was difficult to even gain access to the necessary loan information in order to calculate the rating. Managers were pressuring for a credit estimate but without giving any loan documentation.54 Furthermore, the regulators also failed to impose penalties for incorrect ratings and did not have adequate oversight of their business. The CRA became so dominant that it was too difficult to penalize them in that moment. For instance, the Big Three agencies

(Moody’s, S&P and Fitch) dominated the USA market and rated 98 percent of the asset-backed securities which were issued in the States.\textsuperscript{55} Moreover, it was not unusual for a securitizer to hire a rating agency first as a consultant in order to give them directions on how to create securities that will be high rated and then the same agency to rate them.\textsuperscript{56}

On the other side, the investors relied on those ratings. It is argued that the reason behind this is that the high ratings are attractive for investors because when the bubble burst that good rating will provide corporate officers an excuse for a bad decisions and poorly executed risk management procedures.\textsuperscript{57}

### 3.2 Failures of Risk Management

There are argues that the policy makers were already in 2006 trying to warn about the weaknesses in the financial system. However, it seems like no one was listening. They were too busy pooling assets, structuring CDOs and selling them to investors in the environment of low interest rates and volatility. It appears that the risk measurement models failed and underestimated risk. Firstly, the investors relied completely on the rating made by rating agency. Investors decided to invest in these complex structures because they were promising a higher yield than traditional assets such Treasury and corporate bonds with the same rating grade. However, investors had less information about the quality of this assets than the originator. The problem was that the rated CDOs were CDO-squareds as the underlying pools of assets in this CDOs were not constituted from the individual mortgages but instead it was composed from the subprime mortgage backed securities that were tranches of individual subprime mortgages.\textsuperscript{58} Moreover, rating agencies use the Monte Carlo-type stimulations to stimulate cash flows and correlated defaults of the assets and allocate the cash flows to the various tranches according to the waterfall which produces an expected loss for each tranche.\textsuperscript{59} The problem is that it cannot be used the same rating scale for bonds and for structured products. The corporate bonds are mainly exposed to the idiosyncratic risks which are risks specific


to the firm, the quality of their management and position of the company in the industry. On the other hand, the tranches of the CDOs carry systematic risk which is not a factor for individual company’s risk.

In the originate to distribute model, banks were moving away from their balance sheet the assets to the structured investment vehicle (SIV). Their purpose was to fund the purchase of the, primarily long-term assets with the short-term asset-backed commercial paper and some medium-term notes and capital. In this environment, the liquidity risk arises because there is a need to refinance due to the maturity mismatch between assets and liabilities. 60

Moreover, the financial firms alone were taking excessive risk. The bonus culture among the bankers created an incentive that the higher risk you take, the greater profitability will be and with that comes the higher compensation. However, excessive risk has systematic consequences and goes beyond personal wealth and one sector.

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4. The beginning of an end

The crisis started from the innovations related with a real state sector. The reason why was this sector so important is firstly the size of this sector and its connections with other sectors. Secondly, the health of this sector represents an indicator of the health of economy at large and is constituted as one of the bedrocks of the social and economic system. From a sociological aspect, it is believed that home ownership promotes community-based values, nurture respect for law and order and it flourish the stability of the system. From the economical point of view, the steady appreciation of home values can provide the basis for an increase in consumption which is the driving force in the economy of the USA.61

The crisis was triggered in mid of 2007 by deflation of the US housing boom. The housing prices started to fall for the first time in more than a decade. This was the first significant decline of the housing prices in the postwar period and was much faster than in previous recessions. According to the Case-Shiller index, the housing prices had reached their peak in 2006 and then dropped by approximately 18 percent in the next two years.62

Due to its economic and social factor, the burst of the housing bubble influenced the private consumption, increased unemployment and mortgage defaults. Because the asset value of a house was less than the value of the mortgage, the delinquencies rate grew. Furthermore, the issuers of the mortgages did not have enough reserves so risk of default of insurers rose. The value of the credit-backed security fell as the potential buyers were asking for higher risk premiums. Moreover, this could not be solved by borrowing, as the stock prices of insurers fell how their losses accumulated, and they could not raise new money by selling stock or borrowing supported by the value of the equity capital.63

In the summer of 2007, it was clear the full scale of financial fallout. The first moment which shaken the market confidence was when the BNP Paribas, the France’s most prominent bank, announced that its freezing three of their funds. The explanation was that “the complete evaporation of liquidity in certain market segments of the U.S. securitization market had made it impossible to value certain assets fairly regardless of their quality or credit rating”.64 This meant that as there was not a valuation, the assets could not be used as collateral and without a collateral there is no a funding. Hence,

stress on the inter banking lending increased and all the banks were in problem regardless of their exposure to the real estate sector. Consequently, in September one of the largest Britain’s mortgage lenders, Northern Rock failed. The Northern Rock did not have a high exposure to the subprime mortgages in the USA so the reason why it failed were not loans on its balance sheet, it was the way of its funding, depending on the wholesale funding. The problem was that it sourced its funding from the markets heavily used by banks that did.65

Shortly after, the panic spread from the individual banks to the whole system. During a spring and summer of 2008, the haircuts on bilateral repo took a severe step up across the board, for all asset classes and for all parties.66 The real consequences started to appear. The real business activity was stumbling on the both sides of the Atlantic and soon it was spread to the households and nonfinancial corporations. Firstly, the decline of the house prices reduced personal wealth. Moreover, as demand fell, so did employment and production. For instance, Germany suffered a 34 percent fall in exports between the second quarter of 2008 and 2009, which was the strongest economic shock since its foundation in 1949. Moreover, the oil prices fell by more than 76 percent which caused destruction with the budgets of the petrostates such as Saudi Arabia, Dubai and Kuwait. It is estimated that around 27 million to 40 million of people had lost their jobs.67

What made this crisis so severe was the interconnection on the global level. The World Trade organization collected the data of 104 countries and every single of them experienced a decline in imports and exports.68

4.1 Shock and Initial Reactions

Every country in which the crisis occurred had to take some combination of mechanisms. There were four mechanisms for the intervention: 1. Loans to banks 2. Recapitalization 3. Asset purchase 4. State guarantees for banks deposits, bank debts or balance sheet.69

Not all the countries answered the same on the crisis, nor did they have the same resources. For instance, in the Ireland and Iceland, the crisis took over the whole country. On the other hand, some countries, such as Switzerland handled the situation

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better and survived intact. Also, banks in Australia, Canada and Sweden fared better and did not need a government support. Some other countries, such as Germany, France, UK tried to handle the crisis with the organizational and financial solutions, proposing common European response to the crisis. When it comes to the USA, it had the most capacities to stop the financial crisis. Importantly, in September of 2007, the Fannie Mae and Freddie Mac were placed under conservatorships and were nationalized. This was supposed to be a message to the bondholders that the Fannie Mae and Freddie Mac will not fail.  

The cumulation came on, the now famous weekend, the 13 and 14 of September. The Lehman Brothers were looking to find a buyer. One of the last solutions was that the Bank of America buys the Lehman, however it bought Merrill Lynch instead. Finally, last hope was the British bank, Barclays. However, the purchase was stopped from the very top. The reason why was that the London did not want to “import the America’s cancer”. The argument made to justify the fall of Lehman Brothers was that the ending of uncertainty could calm the markets. However, it happened totally opposite. The investors all over the world were worried about the risk and it became difficult for banks to raise capital through deposits and shares. The US government was forced to decide. The Treasury stepped in with the $700 billion bailout while the Federal Reserve bought $1.75 trillion in MBS directly. The Emergency Economic Stabilization Act proposed by Henry Paulson was passed in 2008 and it created the Troubled Asset Relief Program (TARP) to purchase bad assets from financial institutions. While the USA concentrated toward the recapitalization, the Europe was struggling to have a common approach toward the situation. There was a lot of denial and assumptions that the crisis is far away in the USA and that it is not a threat for the Europe. There was an argument that the Europe could get with only national solutions. However, crisis had a sever aftermath in the Europe. Together with a liquidity freeze came the burst of housing bubbles. The governments of these countries needed to provide support to the banks which were offering these services. In addition, fiscal stimulus programs were brought to support the real sector. However, in three countries, Greece, Ireland and Portugal fiscal impact was

overwhelming and the European sovereign debt crisis erupted which put monetary integration into crisis.\textsuperscript{74}

Therefore, it was not a surprise that the initial reaction to the crisis was shock, denial and inconsistency. In some countries, such as England, the Bank of England until the collapse of the Northern Rock was knocking on the door, was refusing to provide the liquidity to the struggling banks, stating that it can provoke the question of moral hazard.\textsuperscript{75}

As it can be seen, governments in both advanced and developing countries were trying to avoid catastrophic depression through different mechanisms. However, not all countries felt the effects of the US recession by the end of 2008. In particular, China has managed to keep their economy growing in 2009 which was supported by stimulus package of authorities. Also, India was also able to resist thanks to strong domestic demand.\textsuperscript{76}


5. Post-Crisis Regulation

The post-crisis reform response has had three aims. Firstly, to reduce the probability of failing of any larger financial institution. Secondly, to limit the harmful spillovers to the broader economy and thirdly, to reduce the risk that taxpayers would absorb loses in a potential future crisis. In order to prevent the fall of large institutions, the capital and liquidity requirements are increased while in order to prevent a spillovers, the new tools were created with an aim to manage the institutional failure.

Before crisis, banks did not have enough loss-absorbing common equity. Heightened capital regulation represents the single most important regulatory reform. In particular, it is argued that it is crucial for the banks to have enough of cushion of equity capital. Firstly, with a cushion, banks will be the ones who will absorb the losses in crisis instead of taxpayers. Secondly, it can also help to reduce distortions connected with the too-big-to-fail problem. Thirdly, with the heightened capital requirements banks will be able to survive with large losses without failing which can bring the broader economy into crisis.

Economists argue that reforms put a light burden on the banks since they are shifting their funding from debt capital to the equity capital. What is important is that the risk is shifted from the debtholders to the shareholders and leaves the total amount of bank risk unchanged.

5.1 The USA response - the Dodd-Frank Act

As a response to the crisis, in the USA in 2010 was brought the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act). The Title I of the Act created the Financial Stability Oversight Council (FSOC) which granted it the authority to designate systematically important non-bank financial companies and is aimed toward enhanced prudential regulatory regime for certain large bank holding companies and the non-financial companies. The Title II created the Orderly Liquidation Authority

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(OLA) for resolution regime available outside of the Bankruptcy Code for systematically important financial institutions. 80

Also, the largest banks, which failure can impose a problem for the broaden economy, are required to have a higher capital standard than smaller banks due to the Global Systematically Important Bank surcharge.

There were a lot of failures when it comes to assessing the risk, estimating the grade of the loans and overall the failure of the risk management. These failures motivated the stress-testing and the capital planning in the largest banks. Hence, Federal Reserve’s annual Comprehensive Capital Analysis and Review (CCAR) exercise is designed with an aim to assess whether the largest banks in the USA would have enough of capital to continue lending to households and companies in the situation of economic downturn. Moreover, it also assesses whether banks have robust forward-looking plans for rebuilding capital if there were significant losses. These annual stress tests represent one of the most useful regulatory reforms after the crisis which helps the risk-based capital framework to be more dynamic and forward-looking. 81 Moreover, many executives of the banks have acknowledged that the annual Fed stress testing have made their firms better at managing the risk. 82

Before crisis, the shadow banking, where the financial activities were happening outside of traditional regulated banks, was growing. “Regulatory migration” is a term which describes the tendency of the financial institution to flow to the areas where the financial regulation is the lightest. Under the Dodd-Frank act, the Financial Stability Oversight Council (FSOC) is responsible for monitoring systematic risk and migration across jurisdictions. Also, the FSOC played a crucial role when it comes to money market mutual funds. Namely, before the crisis, the mutual funds were offering a saving product, which was similar to the bank checking deposit, meaning that it was promised that if you invest one dollar in a mutual funds, you could always withdraw the same amount almost immediately. The problem was that they were not as secure as the checking deposits and were not subject to the liquidity and capital regulations as banks were. Therefore, the FSOC pushed the SEC to reform the regulation for the mutual funds. Hence, now the institutional shares of mutual funds cannot promise the fixed one dollar to the investors. 83

In addition, prior to the crisis, there were not the proper tools for the resolution of the financial institutions. Especially a problem was with bigger institutions, as it was proven in the case of the Lehman Brothers, which failure influenced the broader economy. After the crisis, three new policies were brought, especially for large financial institutions: The Orderly Liquidation Authority created under the Title II of the Dodd-Frank act, the FDIC’s Single point of Entry resolution strategy and the Federal Reserve’s Total loss absorbing capacity. The aim is to ensure that the stockholder and long-term debtors will bear the losses and not the taxpayers and to solve the too big to fail problem. Moreover, it will help the firms to fail in the orderly way that maintains normal operations while the firms go through the reorganization and prevent the spillovers to the wider economy.\textsuperscript{84}

5.2 The EU institutional reforms-De Larosière Report and creation of Banking Union

The macroprudential tools such as capital and liquidity requirements were brought in order to improve resilience of the banks and to prevent spillovers. Furthermore, two other above-mentioned aims were achieved through the macroprudential regulation and bank crisis management policies, with instruments such as anticyclical capital requirements, higher capital standards for global systematic institutions and bank recovery and resolution policies.\textsuperscript{85} The initial reaction on the European Union level was in the October 2008, when the European Commission introduced proposals for amendments to the CRD which was brought in 2006, known as CRD II. Through this, it was applied more onerous capital requirements to asset securitisation. Moreover, it was introduced the “supervisory colleges” for voluntary coordination of oversight and proposal for a limited harmonized deposit scheme after the Irish situation.\textsuperscript{86} Furthermore, the proposals

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were continued for credit rating agencies, hedge funds and private equity investors. Also, there were new amendments to the CRD, now known as CRD IV.\textsuperscript{87} De Larosière Report was tailored in 2009 against a challenging backdrop of crisis and recession with three essential steps against any future collapse: a new regulatory agenda, stronger coordinated supervision and effective crisis management procedures. Firstly, it was created a European System of Financial Supervision (ESFS) with a purpose to ensure the supervision of the Union’s financial system. It is consisted of three European Supervisory Authorities: European Banking Authority, the European Securities and Market Authority and European Insurance and Occupational Pensions Authority. In these authorities are participating national supervisors who will be able to issue Regulatory and Implementing Technical Standards and non-binding guidelines and recommendations. Moreover, the European Systematic Board was proposed as a Board which will monitor macro-prudential issues and make recommendations which will be hosted by the ECB.

As the crisis evolved into Eurozone debt crisis, it was necessary for further reforms in order to break a cycle between banks and national finance. Consequently, in June 2012, it was agreed to create a Banking Union, completing the monetary and economic union and allowing the centralized application of EU rules for banks in the Euro area as well as for non-Euro Member States that would like to join. The new regulatory framework with common rules is set out in the “single rulebook” and is foundation of Banking Union. In particular, the most important are the capital requirements set in the Capital Requirements Directive (“CRD IV”) and the Capital Requirements Regulation (“CRR”). Moreover, if a bank suffers financial difficulties, common rules had been set up to recover or resolve a bank. This framework can be found in the Directive on Bank Recovery and Resolution (“BRRD”). Also, common rules will ensure that all EU retail customers are guaranteed that their deposits up to 100,000 euros per depositor are protected at all times in the EU.\textsuperscript{88}


6. Basel III

In 2010, the Basel Committee published proposals for the new Basel, known as Basel III. The aim was to higher capital requirements, introducing a new additional capital requirement known as the capital conversation buffer and countercyclical capital requirement, the introduction of the liquidity coverage ratio and net stable ratio, leverage requirement and counterparty risk capital requirements. The reasons behind these new proposals can be found in the actions taken during and before crisis. In particular, during a crisis, not all countries answered the same to the situation. Some countries were able to inject high capital while some countries were not able to offer that kind of a support. Therefore, with a higher capital requirement, all banks would be on the same level of the playing field and some banks will not be punished in that respect comparing with others.89

To begin with, there are two main capital components: Tier 1 and Tier 2 capital. The Tier 1 capital is “going concern capital” as it absorbs losses without a need for a bank liquidation. The Tier 1 is composed of the common equity Tier 1 which includes the instruments such as common shares, stock surplus and retained earnings that do not have a maturity date, do not require any reimbursement and do not have an obligation to distribute dividends. Also, in Tier 1 is the additional Tier 1 which is different than common equity one as on the condition of approval of the supervisor, it may be callable by the issuers, even if only after the minimum five years. Tier 2 is “gone concern capital” that means that it can absorb losses if the bank goes to liquidation and stops to operate. It includes only one type of the instruments-the issued and paid-in debt instruments which must be subordinated to depositors and general creditors of the banks, have a minimum of five years of maturity, have no credit sensitive dividend feature and can also be callable as the additional tier 1. Together the Tier 1 and Tier 2 must be equal to the at least 8% of the bank’s risk weighted assets and they represent a total capital. These two Tiers are designed as to absorb losses before any public intervention.90

From the 1st of January 2013, the new Tiers issued after that day, have to have a provision where they are written off or converted into common equity upon the situation of a trigger event. The reason behind this is to protect the taxpayers and focus contribution of the banking industry itself in resolving crisis, hence the capital


Also, in Basel III were introduced two new tools to solve the problem of procyclicality. The first one is the capital conversation buffer that is a 2.5% common equity capital cushion and together with the original 4.5 % represents a 7% of minimum requirement for the common equity. If a bank does not have the minimum capital requirements it will be limited in the distribution of earnings. Hence, the higher gap is, the more onerous limits are. The advantage of this buffer is that during bad times, this capital cushion will bear the losses without the need for a bank to stop with their activities. It is automatic, and it does not depend on the supervisors’ discretion and does not leave any uncertainty to the market.\footnote{Sironi Andrea. (2018). The evolution of banking regulation since the crisis: a critical assessment, Working paper N.103. Universita Bocconi: Baffi Carefin, Center for Applied Research on International Markets, Banking, Finance, and Regulation. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3304672&download=yes}

The second tool is countercyclical capital buffer. It is consisted of the additional capital requirements which is raising when the credit supply is above the trend and falls during phases of credit reductions. Therefore, “credit institutions and investment firms should calculate their institution-specific buffers as weighted average of the countercyclical buffer rates that apply in the country where their credit exposures are located. Every Member State should therefore designate an authority responsible for the quarterly setting of the countercyclical buffer rate for exposures detected in that Member States. That buffer rate should take into account the growth of credit levels and changes to the ratio of credit to GDP in that Member State and any other variables relevant to the risk to stability of financial system”.\footnote{Directive 2013/36/EU of the European Parliament and of the Council on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC. Recital 81.} It is imposed on the discretionary basis by the national supervisors in the case of excessive credit growth. The aim is to protect the banking system from excessive credit growth which can have an impact to the systematic risk.

Also, it specified the minimum leverage ratio which aims to constrain excess leverage in banking system. It is important as it complements the risk-weighted capital requirements by providing a safety guard against unsustainable levels of leverage.\footnote{Basel Committee on Banking Supervision. (2017). High-Level summary of Basel III reforms. Bank for International Settlements. Available from: https://www.bis.org/bcbs/publ/d424_hlsummary.pdf} The Basel III also addressed the interconnection of financial institutions and systematic risk. Namely, there were brought new tools as higher capital requirements for inter-financial sector exposures and specific requirements for global systematically
important banks. There were introduced more onerous requirements for the global systematically important banks (G-SIBs). Those are the banks which can cause a systemic risk in the financial system and are perceived to be too big to fail. In order to assess which bank is a global systematic bank, the Basel Committee had developed a certain methodology. The factors are whether a bank has a cross-jurisdictional activity, the size, interconnectedness with other institutions, the substitutability and offer of infrastructure services and its complexity measured by the volume of trading, the amount of illiquid and complex assets and the volume of trading in over the counter derivatives. Banks are then allocated in the five buckets, depending on their final score. The additional capital requirement that is in the form of common equity Tier 1 capital ranging from 1% to 3.5%.95

Further important changes are for liquidity regulation. Before the crisis, banks would finance long-term, illiquid assets with the short-term debt deposits, creating the maturity transformation. When these short-term creditors withdrew their funding, the excessive maturity transformation created a risk of “bank run” scenarios. In the situation where the creditors are withdrawing their funding, it can be difficult for a bank as it needs to sell its illiquid assets prematurely at the first-sale price. Hence, the Basel III regulated the “liquidity requirements” which are limiting the maturity transformation. The new requirements are the Net Stable Funding Ratio which is designed to address liquidity mismatches, covering the whole balance sheet and motivating banks to use stable sources of funding. Second one is the Liquidity Coverage Ratio which requires banks to have sufficient high-liquidity assets to withstand a 30-day stressed funding scenarios.96

Also, it introduced the increaseable in capital requirements for the counterparty risk exposures in over the counter derivatives. Banks are now required to apply new standardized approach for measuring the exposure and higher capital for inter-financial sector exposures.97

Moreover, Pillar 2 aims at strengthening some of the points which were battered during crisis such as the enhanced risk-management of off-balance sheet exposures and securitisation activities, compensation practices, valuation practices, stress testing, accounting standards and corporate governance. For securitisation, it reduced the reliance on the external ratings, increased requirements for riskier exposures and limited the number of approaches for calculating capital charges.98

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6.1 The Basel IV

In 2017, the Basel Committee introduced several revisions to the existing Basel Accord, known as Basel IV. The new revision will become effective in January of 2022. The key element is revised standardized approach for credit risk which aims to enhance robustness and sensitivity of this approach. Moreover, it constrains the use of internal model approach. Hence, the advanced internally model approaches have been removed for exposures of large and mid-sized financial institutions and the use of the IRB approach will be limited to low-default portfolios. Furthermore, its revised capital charge for credit value adjustment for derivatives exposures by removing the possibility for banks to use internal models for estimating CVA. Also, it altered approach for operational risk which will be determined based on a measure of bank’s income and a measure of a bank’s historical losses. In addition, it introduced additional leverage requirement for the global systematically important banks which will take the form of a Tier 1 capital buffer set at 50% of a G-SIB’s risk-weighted capital buffer. Finally, it will replace the existing output floor from Basel II with a more risk sensitive floor which will ensure that the bank’s risk weighted assets which are generated by the internal models do not fall below a predefined minimum of the value of RWA (72.5%). It will become effective from 2022 and until 2027 it will gradually increase. By this, it will stop the capital benefits that a bank may have using internal models. However, it will not be effective for the USA banks as they are already subject to the 100% floor under the Dodd-Frank Act.

6.2 The Recovery and Resolution Tools

One of the aims of the post-crisis banking resolution is to prevent the spillovers on the other financial institutions in case of a crisis and to prevent the need for taxpayers to bear the losses. Therefore, the new tools were introduced where not only are equity holders bearing the loss but also bank’s creditors. Hence, it has been shifted from the bail-out to the bail-in framework.
These new tools are the part of the more general bank recovery and resolution framework which were introduced both at the international level by the Financial Stability Board and The Basel Committee and at the European level by European Commission. One of the tools which were introduced is the requirement for the banks to hold a minimum amount of the loss absorbing liabilities which can be written down or converted into equity in case of bank solvency crisis. Hence, the Financial Stability Board have brought the requirement for the global systematically important banks

which should increase the loss absorbing capacity in scenario of solvency crisis. This
requirement is introduced in the form of Total Loss Absorbing Capacity (TLAC). 101 Also,
the Basel Committee has developed the methodology for identifying G-SIBS according
to their impact of bank’s failure on the financial system. 102 The aim is that if G-SIBs fail,
have enough capacity to ensure an orderly resolution without an effect to the financial
stability or taxpayers. The TLAC will be implemented in two phases. The first one is a
three-year transitional period which started in January 2019 and will end in December
2021. The second phase will start in January 2022. TLAC must be consisted of the
instruments which can be written off or converted into equity and those are capital
instruments (CET1, AT1 and T2) and subordinated and senior debt. Some instruments,
such as deposits, covered bonds, derivatives are excluded.
Moreover, external TLAC requirements apply to resolution entities which can be bank
holding or operating companies while internal TLAC applies to material sub-groups or
individual subsidiaries within the group which will help the losses to flow to the
resolution entities.
In addition, through the Bank Recovery and Resolution Directive (BRRD) in Europe was
brought the additional loss absorbing capacity requirement in the form of minimum
requirement of own funds and eligible liabilities (MREL). Hence, banks are required to
maintain the sufficient amount of financial resources capable to absorb losses and
recapitalize the institution. Differently then TLAC, it is set individually for each bank
and is applied to all banks in the EU while the TLAC is applied for G-SIBs. The MREL
requirement is composed of: 1. a loss absorption amount which should be equal to the
total capital requirement (Pillar 1 and 2) and its capital buffers 2. a recapitalization
amount which is equal to the bank’s total capital requirement and the 3. a market
confidence charge which is based on a discretionary basis by the national resolution
authority. 103
One important point related to TLAC and MREL is the issuing entity. In the single point
of entry, resolution powers are applied to one resolution entity while in the multiple
point of entry there are more than one resolution entity.
To conclude, the new tools are important as they will affect market discipline.
Undoubtedly, the bail outs which occurred during crisis had deteriorated the market
discipline and now shifting to the bail in mechanisms will constrain banks of taking high
risks.

assessment, Working paper N.103. University Bocconi: Baffi Carefin, Center for
assessment, Working paper N.103. University Bocconi: Baffi Carefin, Center for
6.3 **Critical Assessment**

After it was brought, the Basel III was subject to several critics. Overall, many were disappointed as some of the planned reforms were less onerous in the final version. Firstly, it is argued that the new Accord did not superseded the previous one and instead it introduced changes alongside. Namely, the Basel III does not change the risk weighting, as it does not require banks to hold more capital against specific exposures. In addition, the countercyclical capital buffer also appears as controversial tool. Firstly, it is argued that it is not fair that this tool does not only affect the banks which are more aggressively increasing their lending but also all the banks which are lending to borrowers located in a particular country in the same way. Hence, even the more prudent and conservative banks will be punished by this requirement and will suffer due to behavior of more aggressive banks.\(^\text{104}\) Secondly, this buffer is based on borrower’s nationality and not on the banks which is in contrast with the need to control the financial leverage during economic growth. Hence, it should be controlled on the level of the banking group as there is where the leverage increases or decreases. Therefore, this can provoke many incentives for multinationals groups which could easily avoid it by raising funds through their subsidiaries which are located in countries where buffer does not apply and then to channel those funds to operating companies which are located in countries where the buffer applies.\(^\text{105}\) Furthermore, even though Basel III did improve some aspects of capital management it did not solve the main problems of risk weighting approach in capital requirement calculation. Moreover, it was criticized that risk modeling only focusses on a single global risk factor(one-size-fits-all) instead of local factors.\(^\text{106}\) And as it was obvious, the crisis started locally and then expanded globally.

Furthermore, one of the questions is whether the Basel requirements are costly for banks? The introduction of stricter capital and liquidity requirements affected the ability of banks to generate an adequate return on their equity which can lead to loosing shareholder and overall sustainability.\(^\text{107}\) In the recent study by McKinsey was


estimated the compliance costs of Basel. For instance, for one mid-sized European bank, these are put up to 200 full-time jobs. Moreover, given that Europe has around 350 banks with a total asset over 1 billion euros means 70,000 new full jobs in order to comply with Basel requirements.\textsuperscript{108}

Also, there are critics when it comes to TLAC and MREL as they impose a requirement to issue subordinated liabilities that can be bailed out in times of crisis. However, the cost of these additional funds can vary significantly across countries and create competitive biases, especially for G-SIBs which are operating in different countries where cost of funding can also be different. Hence, it creates incentives for G-SIBs to move to the countries where the cost of funding is the lowest or to set up a holding company.\textsuperscript{109}


Conclusion

The crisis revealed several flaws in the institutional structures, regulation and supervisory system of the financial system. The effect of the crisis has weighted heavily on the economic growth, financial stability and bank performance in many jurisdictions. Consequently, the fall of the mortgage market had produced a widespread deficiency of liquidity and credit and affected many borrowers, taxpayers and overall working class. Hence, regulators were confronted with highly leveraged banks, opacity of balance sheet and excessive risk taking.

As can be seen from above, the decades prior to the crisis had an important effect. Insufficient capital rules, the procyclicality of banking regulations and the inadequate treatment of the over the counter derivative transactions set a pace for the subprime bubble and securitisation.

After the initial shock and bail-outs, the necessary changes were needed to be made. In the USA was brought the Dodd-Frank Act while the EU was turned toward structural changes and strengthening of monetary policy. Hence, regulators responded to the crisis by reforming the global prudential framework and enhancing prudential supervision. The aim is to increase bank’s resilience through stronger capital and liquidity buffers. Also, through the recovery and resolution reforms goal is to reduce the possibility that the failure of banks has a spillover on the broader economy and taxpayers.

These reforms significantly increased capital requirement, introduced new liquidity and leverage requirements, reduced the possibility for banks to use their own internal models and increased requirement in terms of loss absorbing capacity of major banks.
Bibliography


