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The Evolution of the Investment Banking: from the Pre-crisis to Present time

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Introduction

The aim of the study is to deepen one of the main sectors present in the financial world, namely investment banking, which includes a multitude of different financial activities and agents. When talking about investment banking, the first thing that comes to mind might be that investment banks make profits primarily through investments in various financial instruments; this is partly true, but investment bankers perform a range of other activities, bringing the entire financial system into play. In particular, this department of banking include businesses like allowing mergers and acquisitions among companies (thanks to their high degree of specialization), then also the fundamental function of acting as intermediaries including brokerage and market making, as well as advising companies and individuals on the best way and time in which making a certain investment.

The main objective of the research concerns the financial crisis of 2007-2009, in particular the study tries to answer an extremely complicated and full of variables question: this question is whether it is possible that a new financial crisis similar to that of the last decade can happen again. All this is based on an in-depth analysis of the financial statements of the main investment banks and on their activities that led to the collapse, and also on the degree of awareness of the risks by the supervisory bodies.

It is clear that the addressed subject is of vital importance, not only for those who directly experience the financial world, but also for all other individuals. This is due to the fact that the financial crisis has rapidly moved into an economic crisis, which has had catastrophic consequences for workers, households and companies all over the world. Furthermore, the financial collapse caused a general fear in individuals towards the banking sector, which led to mass withdrawals in the main banks. Obviously, this compromised the proper functioning of the banks that found themselves with less deposits and therefore less liquidity, generating a general collapse of the banking system: it is therefore crucial to have an overview of the risks and the causes that led to the crisis, so as to prevent the latter from occurring again.

In order to have a complete vision of the main protagonists of the crisis, of their activities before, during and after the crisis, the analysis is divided into three main sections, each fundamental to reach the research objective. The first part is an introduction to the world of investment banks and concerns their main specializations and services offered to individuals and companies; this phase is

pivotal in order to understand the way in which the aforementioned banks behaved during the crisis, which would mean how they generated profits and the risks they took. This initial section is preparatory to the second and third part of the work. In fact, in the second chapter we explore the topic of the financial crisis in detail, with particular attention to the role that the investment banks played during it and the activities they used to do; furthermore, we analyse how these activities are connected to the banking sector and how their consequences have moved to the real economy. Finally, the third and last part is the one that allows us to define how investment banks have behaved over the time frame ranging from the pre-crisis period to the post-crisis period, through an analysis of the financial statements and of the main financial ratios that allow us to determine profitability and level of risks. Thanks to this conclusive phase we can see which investment banks have exposed themselves mostly to risk and which have recovered more rapidly after the crisis; furthermore, it will be fundamental to draw hypothesis about possible developments in the financial sector, considering the new regulations implemented by the supervisory institutions and the greater awareness of banks themselves.

Chapter 1 - The Investment Banking

1.1 What is an Investment Bank?

Investment banking is a particular branch of banking devoted to the creation of capital for companies, governments and other entities and to the provision of financial consultancy services to them[1]. Investment banks perform various activities that range from underwriting new debt and equity securities for the different types of corporations to facilitating mergers and acquisitions, and also, for instance, providing help to issuers for what concerns the placement of stock.

We can divide investment banks activities in three main areas: services to companies and governments, services to high-net worth individuals and, finally, market activities.

The first services mainly concern risk management, organizing IPOs (Initial Public Offerings) and advising companies on how to structure a deal if the client is pondering the possibility of a merger, acquisition or a sale; a crucial activity performed by investment banks in this sector is securitization which is, broadly speaking, the process of taking an asset deemed as "illiquid" and transforming it into a security. We will see securitization process in more details later on in the analysis.

For what concerns the second type of services, we firstly have to define what we mean by "high-net worth individuals": they are individuals having a market value of the financial portfolio greater than 1,000,000 €[2]; the financial portfolio includes stocks, bonds, mutual funds and similar, but it does not include real estate properties and other real properties. Since "high-net worth individuals" possess more wealth and more capital than the average person, they have the opportunity to access financial instruments and services that, in most cases, are inapproachable for other people: these services include, for example, a variety of means aimed at protecting and growing assets, or also at providing dedicated financing solutions.

The last area of activities is that concerning market activities: these are divided in brokerage, market making, proprietary trading and, finally, asset management and investment advice. Brokerage is primarily concerned with investment companies as

[1] Source: Investopedia, 2019

[2] More specifically, individuals with a market value between 5,000,000 € and 30,000,000 € are named Very HNWI (High-net worth individuals) and those having a value of the portfolio greater than 30,000,000 € are called Ultra HNWI.

mutual funds, hedge funds and pension funds; market making is a crucial part of the activities of investment banks which is connected with their function of liquidity provider by bid-ask quotations, gaining money on the bid-ask spread. Then we have proprietary trading, which is primarily concerned with money market instruments, such as treasury bills, repurchase agreements, commercial papers, as well different types of bonds (corporate bonds, sovereign bonds, local bonds); a crucial part of proprietary trading consists in the trade of asset-backed securities, such as mortgage-backed securities, and in that of derivatives.

The function of investment advisors and asset managers is offered to financial vehicles like pension funds and mutual funds, as well as to private investors.

Crucial in the analysis of investment banking and its activities is the so-called "Volcker rule", which went into effect on April 1st, 2014. This rule is aimed at protecting bank customers by prohibiting banks from conducting certain types of speculative investments with their own accounts, especially related to short-term proprietary trading of securities and derivatives, and also by limiting their relationship with private equity funds and hedge funds[3]. The Volcker rule does not force banks to stop market making, hedging, trading of government securities: however, banks cannot undertake these activities if, by doing so, they would create financial instability within the U.S. financial system.

Prior to the Volcker rule, which was part of the Dodd-Frank Wall Street Reform and Consumer Protection Act, we have the Glass-Steagall Act, passed by the U.S. congress as part of the Banking Act of 1933. This act is so crucial for the analysis of investment banking because it separated the latter from commercial banking: in fact, prior to the Great Depression, many banks were used to combine both investment banks and commercial banks activities, so they both sold securities and, at the same time, conducted conventional banking activities. The cause that originated the act was the fact that during the Depression 10'000 banks went bankrupt, almost half of which were commercial banks. Roughly speaking, the Glass-Steagall Act prohibited commercial banks from buying or selling securities on behalf of customers: the aim of that was to isolate commercial banks from the high risks connected to securities trade.

Investment banks play a pivotal role as "middlemen" in the buying and selling of companies, as well as intermediaries between a company and investors in the case in which the company wants to issue stocks or bonds. However, there is a fundamental difference between investment banks and stockbrokers: in fact, investment banks

[3] Source: Investopedia, 2019

usually earn income from fees that clients pay, while stockbrokers and dealers gain money from commissions imposed on stock trades.
Generally speaking, investment banks are one of the main supporters in large and complex financial transactions: investment bankers are experts in their field who are familiar with the most recent changes in the investing climate, so that businesses and organizations prefer to ask them for advice in many financial issue, since investment bankers are able to adapt their requests to the present condition of economic affairs.

1.2 Investment banks as financial intermediaries

Investment banks are mostly known for their function of intermediaries in the financial markets. In order to define the role of investment banks in this sector it is useful to point out the difference between brokers and dealers: both securities brokers and dealers trade in secondary markets, that is the market where transactions are on securities that have already been in the market. Brokers perform the function of matching buyers with sellers, and they are paid commissions for that; we can say that brokers act on the behalf of investors in the purchase or sale of securities, so they are defined as "pure intermediaries".
On the other hand, dealers hold inventories of securities and base their business on selling these securities for a slightly higher price than that they paid for them, so they gain money on the spread between the bid price, the price paid for the security in the inventory, and the ask price, that is the price they receive from selling the securities.
Obviously, that of the dealers is a high-risk business because securities do not have a stable price, so it can happen that the dealer buys a security for his inventory that then will drop in price. Brokers, instead, are not so exposed to risk because they just operate as "go-betweens", since they do not hold the securities involved in the transactions.
For what concerns brokerage services, there are three main types of transactions available, that are market orders, limit orders, and short sells.
In the case of market order, the investor instructs the agent to buy or sell the security at the current market price: the risk involved with this type of order is that the price of the security may change after the investor made her decision.
In addition to market orders, we also have limit orders: in this case buy orders set a "maximum acceptable price", and sell orders fix a "minimum acceptable price". Limit orders are set up so that the stock specialist will initiate trade only when the

stock price moves toward the defined target.
Connected to limit order is the so-called "stop loss order", which is for stocks that the investor already owns: through this type of order the broker will hold the stock until a certain price threshold is reached, and then will sell it.
There are two situations connected to this scenario: the first is the situation in which the investor believes that the price of the stock will increase in the future, and in this case he will buy the stock and hold it until the increase occurs, in order to make a profit from the sale. The second kind of situation is that in which the opposite occurs, that is the investor thinks that the stock price will fall.
The solution of this last setting is "short selling": a short seller makes profit if price goes down, so that the trader sells the security and expects to buy it again later at a lower price, making a gain from the difference of prices. However, short selling is a very risky business, since there is the possibility of incurring in a loss[4], in the case in which the prediction of the trader is the wrong one. To summarize, we can say that through market and limit orders the trader can gain from stock price increases, and vice versa for short selling the opposite happens.
The three services we saw above are not the only provided by stockbrokers (and so are part of investment banks business). In fact, stockbrokers allow investors to leave their securities in storage for preservation: in this way, the aforementioned securities are insured against loss[5] by the SIPC, an acronym that stands for "Securities Investor Protection Corporation".
In addition to that, brokers also offer margin credit services: investors use this measure when they are certain that the price of a particular stock is going to increase, but they do not have enough capital to buy the desired amount of stock; in this situation, they can ask for loans to the brokerage house, which performs the function of helping investors in buying securities.
Apart from brokerage, investment banks also perform the pivotal function of market making. This is so important because investors want to have the assurance that they are pursuing a liquid investment, which means that it could be easily and quickly be sold without significant changes in price, if the investor changes his mind. In fact, dealers (another name for market makers) offer the opportunity to make a market in the security at any time: in other words, they ensure that the investor always has the chance to buy or sell a security.
However, the needs of different investors are not always matched, for example in the

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[4] The loss that may be faced by the short seller is potentially unlimited.
[5] The loss we are referring to is that of the securities themselves, not to changes in value of the security.

case in which no investor wants to buy a security that another investor has just sold: in this case, dealers solve the problem by holding securities not yet sold in inventory, until some investor has the necessity of that security.
Related to the market making function, there is the proprietary trading one. Proprietary trading, as we mentioned in the previous paragraph, mainly consists in dealing with complex money market instruments, derivatives and various investment vehicles: this function provides many benefits, both to the investment bank and to clients. Firstly, when the investment bank trades on the behalf of investors, it gains profits in the form of fees payed by clients; secondly, another fundamental benefit is that the financial institution has the opportunity to accumulate a large amount of securities. The latter has the implication of offering a strong advantage to the clients and also benefits the institutions themselves, since it allows them to face with greater confidence some thin markets, where there is a low number of buyers and sellers and so it becomes more strenuous to sell and purchase securities. Finally, proprietary trading is strictly associated to the dealers' function, since it allows investment banks to turn in powerful market makers who provide liquidity on various groups of securities.[6]

1.3 Investment banks as financial advisors

Investment banks intervene whenever a company or corporation wants to issue long-term debt or any equity instrument, in order to raise funds. The function of the investment bank in this sector consists in underwriting the issue: this process requires that the financial institution purchases the issue at a predetermined price and then resell it at a later stage. The process of underwriting branches in a several number of services.
Firstly, we must specify that the vast majority of firms is not directly involved in the issuance of capital market securities. Conversely, investment banks are able to provide advice to companies who are pondering a purchase or sale, since the former participate in securities market daily; for instance, an investment bank may know much better what the current market trends could be, concerning prices and interest rates, and advise to the best option depending on the specific case. Furthermore,

[6] Source of the paragraph: Investopedia, 2019

financial advisors like investment banks use their high level of specialization in this sector to choose the time at which securities should be offered: timing plays a fundamental role, for example, because all firms want to sell stock when they know the highest price will be achieved.

One of the most difficult tasks that an investment banker has to perform concerns at what price the security should be sold: on one side, as we mentioned before, the firm would like to sell the stock and receive the highest possible price. However, investment bankers do not want to overprice the stock, because they usually earn profits by selling the stock at a slightly higher price than the price paid to buy it: so, if the initial price is too high, the investment bank will not be able to resell and it will experience a loss. A typical case in which determining the price is particularly complicated occurs when a firm issues stock for the first time, through a transaction called "Initial Public Offering" (IPO), where the investment bank will have to use all of the skills and specialized competences in order to define the most suitable price.

When the issuing firm and the investment bank can reach a price that satisfies both, the latter can continue to assist with the next step, which consists in making the Securities and Exchange Commission (SEC) records. The SEC was created by the Securities and Exchange Acts of 1933 and 1934 in order to protect investors against fraudulent practices in the market and maintain fair functioning of the securities markets; it was mainly created to help renew investors' confidence following 1929 stock market collapse. The Commission heavily controls the activities of investment banks and, in fact, requires that every issuer of new securities to the general public must file a so-called "registration statement", which contains information about the firm's financial health, competition, general management and experience. A part of the registration statement is made available to investors: this is called "prospectus" and it must be mandatorily given to investors before they can invest in a new security.

The SEC also promote full public disclosure, which is why the firm is required to disclose the future uses of the funds and the assessment of the risk of the securities. Once all of the documents are filed, the investment bank proceeds with the effective underwriting of the issue. Through this process the issuer will sell all of the stock or bond issue to the investment bank at the agreed price; then, in order to earn its fee, the investment banker must now sell this issue to the public at a higher price.

Here is clear the need for an intermediary, explained by asymmetric information: in fact, investment banks are more specialized in this sector and they also know how to exploit financial instruments and information better than investors. For these reasons

is not convenient for investors to spend time in trying to understand which stock they should buy, for instance. Instead, it is much better for investors to rely on the skills and the years of experience of investment banks to acquire information in order to establish how much the firm is worth.

Confidence of clients is crucial for investment banks' business, and so it is in the financial institution interests to report information fairly and accurately, if they want to continue managing investors' deals.

At this stage, the investment bank is taking an enormous risk: nonetheless, there are various ways to reduce this risk, one of which is forming a "syndicate". It consists of a number of investment banking firms who "share" the purchase of the security issue; as a consequence, each firm in the syndicate is then responsible for reselling its portion of the securities. This is a very effective way to distribute the risk among many firms, since it is quite unusual that a single counterpart will manage the trade when large sums of money are involved.

Many investment bankers are joint with brokerage houses of bigger size that have sales offices all over the world. Sales agents will contact customers to understand if they would be inclined to review a prospectus on the new security, with the final goal of fully subscribing the issue, so that the company which is selling is left with no risk or loss. An issue may also be undersubscribed or oversubscribed: in the former case, the sales agents do not succeed at generating enough interest in the security among their customers, while in the latter case there is more demand to buy with respect to supply of securities available.

There is also an alternative to underwriting securities offerings, that is through a "best efforts agreement". This type of underwriting is more favorable for the investment banker because there is no risk of fixing the wrong price for the security and, also, it is not necessary to pursue the task of establishing how much the security should be worth, that would make the investment bank waste a lot of time. In fact, in these types of transaction, the customer asks that the security be traded at a specific price that she chooses; there is also the opportunity of cancelling the offering, in the case in which the security fails to be bought.

Another available method of selling securities is denominated "private placement". The difference with respect to the common process of selling securities is that the range of possible buyers is restricted to a limited number of investors rather than being the public as a whole. This, of course, brings some advantages, one being the fact that the security sold through private placement does not need to be registered with the SEC, as long as some specific conditions hold. Private placement involves

the purchase of very large amount of securities (more common for bonds than stocks) at one time, which is why the usual clients are commercial banks, insurance companies, as well as pension funds and mutual funds.

1.4 Mergers and acquisitions (M&As) in the investment banking

One of the main activities in which investment bankers have been active for a long time is in the field of "Mergers and Acquisitions". Before defining the role of investment banks in this market we must specify the difference between a merger and an acquisition.

A merger consists in a voluntary fusion of two or more existing companies into one new company; usually, the firms that stipulate this type of agreement are very similar in size, market power, type of customers, and in fact at times we may have heard of the term "merger of equals" when talking about mergers. The reasons why two companies should take the decision of merging are manifold, all having the common denominator of benefiting the firms' shareholders: mergers may be undertaken in order to conquer a larger share of a particular market, reduce transaction costs, increase revenues and, as a consequence of decreased costs, also gain more profits.[7]

In an acquisition, instead, one firm takes control of another by purchasing most or all of the other company's shares. We can define the process as "acquisition" when the buying firm obtains more than half of the ownership of the other company. As for mergers, a company may think of acquiring another firm in order to obtain higher market power, reduce costs, or for instance to attain economies of scale and increase cooperative interaction; a company chooses this kind of strategy when it is more profitable to acquire an existing firm's operation than enlarging its own. Acquisitions can be of two typologies: friendly or hostile (takeovers). In the former case, both firms agree that it would be profitable to combine resources, while in the latter case the firm being purchased may disagree and resist. In this last scenario, the acquirer has to purchase enough shares of the target firm to gather a "majority stake".[8]

At this stage, investment bankers come in: they provide services both to acquirers and target firms. On one side, they assist acquiring firms in the identification of attractive companies to purchase, in a process called tender offer, which has the

[7] Source of the paragraph: Investopedia, 2019

[8] Source of the paragraph: Investopedia, 2019

objective of encouraging shareholders to sell their shares. On the other side, target companies may ask for advice to investment bankers in order to minimize the risk of unsought takeovers.

The role of investment banks in mergers and acquisitions market is clearly connected with their role of financial advisors, since in both cases they try to establish how much the businesses involved in the transaction are worth, so their fair value.

Companies want investment banks to supervise the processes of mergers and acquisitions because they deal with complex matters that cannot be performed by unprepared entities, but on the contrary require an extremely high level of specialization and expertise that investment banks can ensure thanks to the experience and training in this sector.

As a result of the credit crisis of 2008 and 2009, most of notable investment companies faced serious difficulties which made mergers and acquisition slow.

The main cause of their problems was that investment banks had purchased and kept in their portfolio mortgage-backed securities: troubles manifested because mortgages were “subprime”, so issued to borrowers with very low credit ratings. At this point, as the market understood that these securities were clearly overpriced given their poor quality, nobody wanted to buy and investment companies continued to hold those securities without being able to sell them.

Secondly, the credit market froze, banks did not trust each other anymore and as a consequence investment banks encountered liquidity shortfalls, since they could not find capital to fund their maturing securities.

In that period many investment banks collapsed: a clear example is that of Lehman Brothers, which was one of the first investment companies to fail, in September 2008. Many other investment banks declared bankruptcy, but thanks to government intervention there was the opportunity to limit the damages and implement a bailout plan, in order to save larger U.S. credit institutions.[9]

[9] Source of the chapter: Mishkin F.S., Eakins S.G., Financial Markets and Institutions, 8th Ed. (Global Edition), Pearson Educational Ltd, Essex, England

Chapter 2 – 2007-2009 financial crisis

2.1 An overview

We can define the financial crisis of 2007-2009 as the greatest expression of the credit crunch which had its beginning in the summer of 2006 and went on for the three following years.

The roots of the crisis go back to the year 2003, when there was a crucial change in the functioning of the American real estate market: in fact, this period was characterized by a substantial increase in the “subprime” mortgage issuance, which are highly risky because they are offered to clients that in normal conditions would not obtain the loan, since not able to provide sufficient guarantees.

In order to fully understand the causes and consequences of the crisis we refer to a timeline which sum up the main stages. At the beginning of 2007, the Californian bank New Century launched a profit-warning, which is always a fearful event for any financial institution; more widely, that was a clear symptom of the incoming financial disaster. Then, in mid-2007 the sub-prime mortgage crisis heavily transferred in the stock market, with the final result that a total of 31 trillion dollars were wasted in stock markets all over the world in March 2009 (Il Sole 24 Ore, 2009). The situation gets worse in February 2008, when the crisis suppressed the first mortgage credit bank, which was then nationalized by the British government, due to excess customer withdrawals. In September 2008 there was one of the most iconic events in the evolution of the crisis, that is the bankruptcy of Lehman Brothers, a major investment bank. Despite that situation, the U.S. government took the decision of not bailing out the bank, with catastrophic consequences in the stock markets. At the end of 2008, the financial crisis soon became also an economic crisis. The main cause was that companies got financial problems, since banks were no more an option for credit, and as a consequence many workers were fired: at this point, even if failed companies were a few, the whole effect was big, because demand and consumption went down also for other companies, in a sort of vicious circle.[10]

In defining the causes of the financial crisis, we can identify four primary factors

[10] Source of the paragraph: “Il Sole 24 Ore” (2009).

which may be deemed as relevant in the beginning and evolution of the credit crunch: the first is the growing Gross Domestic Product (GDP), then we have the decrease in interest rates, also the house prices which was growing and finally, last but not least, the switch to a new banking model[11].

This situation of generous monetary policy, characterized by a low level of interest rate, is explained by the fact that there was a will to support the chance for low income people to buy houses, in order to increase their quality of life; loans were granted more easily, and so there was a growing request (demand) for houses, which made house prices to rise accordingly.

The transition from the model "originate and hold" to the model "originate and distribute" played a fundamental role in building the foundation of the crisis. With the former model, banks limited to issue financial instruments (such as subprime loans) that remained in banks' balance sheet until the end of the asset; instead, with the latter banks issued loans under the assumption that credit will be soon sold in the secondary market to other investors.

Roughly speaking, the global financial crisis was caused by the burst in the housing bubble in the U.S., fuelled by incautious actions in credit granting. This situation was made even more dangerous because of the spread of mortgage loans securitization, which has proven to be riskier than expected.

In order to have a more complete picture of the world situation we make a brief reference to the Italian situation and countermeasures.

In Italy, the impact has been even stronger than in any other European country; however, there have been many factors that saved Italian banks from the catastrophic effects of the financial crisis. Firstly, the priority was given to a traditional model, which focused on the mediation of savings from households to companies and, also, the risk of defaults was limited thanks to the activities of Supervision entities, connected to high caution in granting mortgage loans.[12]

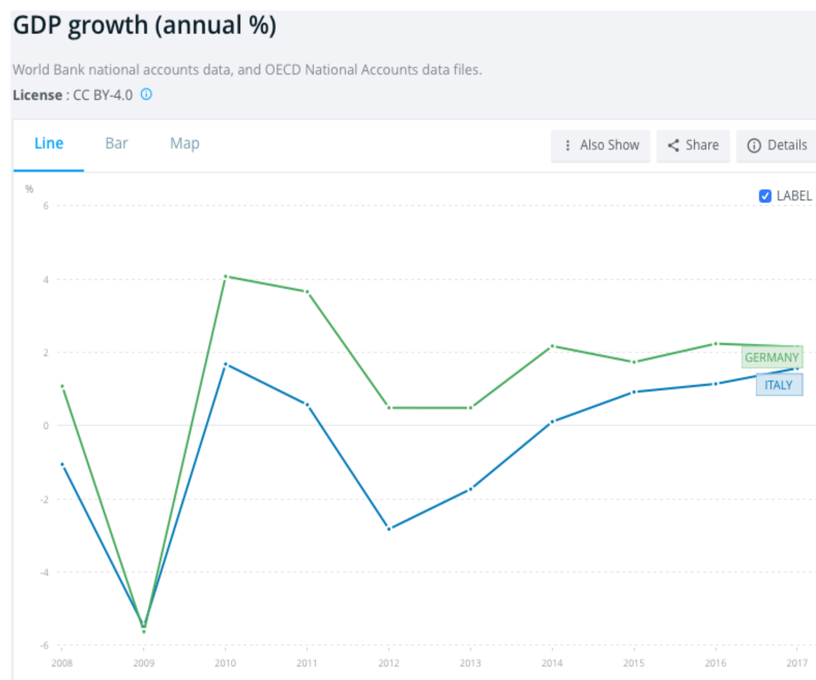
Despite these measures aimed at limiting the damages of the credit crunch, Italy is recovering at a very slow rate, with respect to other major European economies such as Germany. To support this argument, it is sufficient to look at data about GDP decline due to the crisis and subsequent growths: in 2009, which means immediately after the crisis, Germany and Italy have lost 5.6% and 5.5% of GDP respectively and in 2010 the former has recovered 4% and the latter only 1.7 %. In the subsequent years, the gap increased substantially, with the peak seen in

[11] The switch consisted in the change from the model "originate and hold" to the model "originate and distribute".

[12] Source: Lectio magistralis del Governatore della Banca d'Italia Ignazio Visco (2018).

2014, when Germany has grown of 1.6% and Italy lost 0.3% in GDP terms[13].

Figure 2.1: Comparison of GDP growth between Italy and Germany in the period 2008-2017.



Source: The World Bank, http://www.worldbank.org

For what concerns the U.S. framework, the American government did not remain idle to the financial disaster that was overwhelming country's economy. In fact, the Federal reserve decided to implement various special programs aimed at reaching again financial stability and, at the same time, increasing liquidity injections to financial institutions. The measures can be divided into three main categories: the first set regards one of the main functions of every central bank, and so also of Federal Reserve, that is lender of last resort, which gives financial institutions the opportunity of receiving short-term liquidity in case of emergency. A second category concerns also the provision of liquidity, but in this case to borrowers and investors without the intervention of any intermediary, in fundamental markets such as "Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility" (AMLF). Finally, the Federal Reserve also exploits Open Market Operations (OMOs), which are aimed at selling or buying securities by the government in order to increase or shrink the amount of liquidity in the banking system. "*The Federal Reserve facilitates this process and uses this technique to adjust and manipulate the federal funds rate, which is the rate at which banks borrow reserves from one another*" (Investopedia, 2019). So, in particular here, we notice the crucial role of Central Banks of facilitating inter-banks relations and, more in general, monetary

[13] Source of the paragraph: "Il Sole 24 Ore" (2017).

policy. In fact, apart from performing these extra actions, the Federal Reserve continuously pursue the so-called "Dual Mandate", which puts two fundamental objectives in the foreground: maintaining stable prices and trying to reach maximum employment.[14]

2.2 "Subprime" mortgage issuance and monetary policy

As we briefly saw in the previous paragraph, the arisen housing bubble has been one of the main causes that triggered the financial crisis which, at the end, has had a worldwide impact. Before entering in this regard, we define what we mean by the mere wording "subprime client". When we are in the world of loans (and so of mortgages) we know that the cost of money[15] depends on the credit rating of the borrower, which is evaluated through a credit score. Of course, there is a negative correlation between the rating of the borrower and the cost of money, so that a borrower which is able to give more guarantees will have to pay less interests in repaying the mortgage. The credit score is essential in choosing the appropriate clients, and it is defined as a numerical expression, result of the careful analysis of lenders (so banks and financial institution in general), which is based on available information supplied by credit bureaus[16].

As we anticipated before, a credit score represents the creditworthiness of individuals and, usually, has a range between 300 and 850, with a specific classification. That is, borrowers having a score between 300 and 700 are deemed "subprime"; those who have a credit score between 700 and 800 are considered good, while between 800 and 850 we have an excellent score.

When a bank faces the difficult task of screening clients, it is mathematically impossible to avoid the risk of incurring in subprime clients: when this happens there are mainly two options available to banks. The first alternative is not issuing the package of mortgages, but in this situation there will be no profits for the bank, since the balance sheet is empty and no fees earned. The second option is accepting to issue the loan, but at the same time increasing a bit the interest rate, so that the

[14] Source of the paragraph: Board of Governors of the Federal Reserve System (2017)

[15] Cost of money refers to the interests that must be paid in exchange for the borrowing of funds.

[16] *"A credit bureau is an agency that collects and researches individual credit information and sells it for a fee to creditors so they can make a decision on granting loans"*. (Investopedia, 2018)

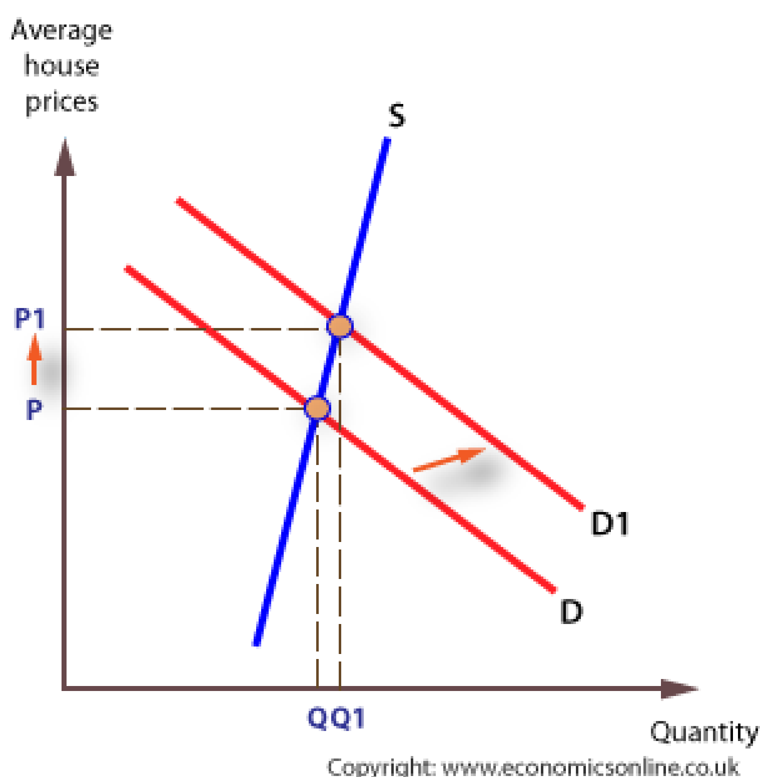
difference in interest rate paid will be enough to cover for bad payers: of course, bad payers will accept these conditions of paying more, since they will never settle the payment.
Clearly the typical issuer of a mortgage is a commercial bank, which usually has in his balance sheet both residential and non-residential mortgages. This happens with the traditional model "originate and hold", through which the loan remains in the bank portfolio until the end. Conversely, with the switch to the banking model "originate and distribute" the originator of the mortgage can collect different mortgages and sell them on the market, through a process called "securitization", in which mortgages take the role of collateral for the issuance of securities then sold on capital markets.
In the years that anticipated the bursting of the financial crisis, banks have constantly gained confidence and it was widespread the opinion for which banks were able to withstand every type of breakdowns, in particular after the so-called "dot-com bubble[17]", after which banks managed to continue their businesses in spite of it.
This overconfidence made banks believe they could perform their activities even with a lower amount of capital available and grant loans to subprime consumers; this also evolved in the underestimation of risks by rating agencies, which have the heavy responsibility of evaluating the financial strength of organizations, and also "*led investors to demand unrealistically low risk premia*". The introduction of two capital requirement regulations significantly reduced the risk of financial crisis, since it forced banks to grant mortgages only to prime clients.[18]
Starting from year 2000 and continuing until 2006, various factors have contributed to the bursting of a real housing bubble: among these conditions we find the huge rise in real estate prices, which was encouraged by the Federal Reserve monetary policy. In fact, following a period of crisis for U.S. system due to the dot-com bubble mentioned above and also to the terrorist attacks of 11 September 2001, the Federal Reserve decided to enter in a period characterized by low interest rates. By doing so, the aim of the U.S.A. central bank is to stimulate more loans (borrowings) by consumers and businesses in order to favour economic recovery, also to help investors to gain more easily a profit from assets trading, and finally to promote the

[17] In the mid-90s, a speculative bubble linked to innovations in the field of informatics led to the Dot-com crisis. This was generated because of a series of factors, the main being utmost investors' confidence, a sharp increase in prices and, finally a collapse of prices caused by an event that destroys expected earnings expectations. (Source:CONSOB)
[18] Source of the paragraph and of the quote: Anjan V. Thakor, The Financial Crisis of 2007–2009: Why Did It Happen and What Did We Learn?, *The Review of Corporate Finance Studies*, Volume 4, Issue 2, September 2015, Pages 155–205

spending of cash in hazardous assets vis-à-vis holding cash. However, even if the goal of the Federal Reserve of creating an economic expansion may be achieved, this kind of "compliant" monetary policy generates dangerous instability in financial markets and in the general economy; that is because the decrease in interest rates does not have its roots in some particularly good financial situations that allowed to do so, but instead it has been created unnaturally only to spur an economic boom. In this way, individuals and organizations have seen the opportunity of undertaking financial choices that would not be feasible in a normal scenario.[19]

The immediate consequence of the decrease in interest rates has been the contemporary drop in the cost of money for the borrowers of funds. This category was widely formed by households that asked for mortgage loans: following this trend, there was a growing demand for housing and, as a consequence, relative prices rose as well.

Figure 2.2: Price response to an increase in demand for housing



Source: Economics Online

As a consequence of lower interest rates, people who want to invest take advantage of this situation, given the moderate mortgage rates, because it will give more profit opportunity than investing in a bank account. The increase in demand will lead the

[19] Source of the paragraph: Forbes, 2018

market to a new equilibrium point, in which we have a higher price level (from P to P1 in the graph above).[20]

Apart from being advantageous for households, this situation also benefited banks and financial institution in general, since they could anyway limit the loss and recover borrowed funds back in case of borrowers' insolvency, through distraint or by selling the property.[21]

However, this situation of financial peacefulness where everyone was better off turned out to be only apparent. In fact, in the first months of 2004 the American economy almost managed to restore its equilibrium, thanks to the countermeasures adopted by the Federal Reserve, that at this point decided to raise again interest rates. This was the dawn of the bursting of the housing bubble: due to higher interest rates, also mortgages rates increased substantially, making it difficult for households to repay the debt. Finally, the demand for mortgages went down and the values of mortgages that could be sold by banks reduced significantly.[22]

2.3 Securitisation process and leverage

The process of securitization is one of the fundamental triggers from which the crisis has built his foundation and was a factor unfortunately too undervalued by financial specialists.

It is useful to start our analysis of securitization and its role in the global financial crisis with its basic definition: "*Securitisation is the procedure in which an issuer designs a marketable financial instrument by merging various financial assets into one pool and then sells this group of repackaged assets to investors*" (Investopedia, 2019).

Roughly speaking, the protagonists of securitisation are assets[23], which play the role of collateral for the issuance of financial securities then sold to investors on capital markets; the aforementioned investors may risk quite a lot in entering in this kind of underwriting, since the profit (or loss) of the investment entirely depends on the financial condition of the mortgage (and, of course, of the borrower who requests the

[20] Source of the paragraph: Economics Online
[21] Source: CONSOB
[22] Source of the paragraph: CONSOB
[23] In the specific case of securitization in the scenario of the 2007-2009 financial crisis, the main assets involved are mortgages.

loan).

Despite the fact that securitization is usually considered as a one of the main factors that provoked the crisis, this is not totally true: in fact, for what concerns securitization, the financial collapse was induced by the improper use of it and by many other financial mistakes.

As a matter of fact, in the paper “The financial crisis and securitization, Journal of Education Culture and Society” of 2010 by Ewa Szabłowska we read that “*the main cause of the crisis in the U.S. was lenders focusing on the securities of credit rather than the financial situation of borrowers. [...] It (securitization) played only an indirect role in the current crisis*”.

Furthermore, securitisation process allows to achieve a higher level of efficiency in financial markets and to decrease substantially costs of services thanks to risk diversification.

There are seven main players involved whenever we speak about securitization: we have “*asset sellers, investors, special purpose vehicles (SPV), insurers, rating agencies, administrators and swap entities*”[24]. As we anticipated in the definition of securitization, the whole proceeding starts with the isolation a specific group of financial assets from a pool of assets; a required condition for this set of assets is that it has to be sufficiently diversified, that means that it should include wide variety of assets, and also large enough. At this point the Special Purpose Vehicle enter the game: in exchange for the selling of assets by the arranger, the SPV issues various types of debt securities, known as Asset-Backed Securities; in this category fall bonds and commercial papers, for instance. These securities are then sold on the market to investors, who can rely on the judgement of rating agencies giving a financial assessment.[25]

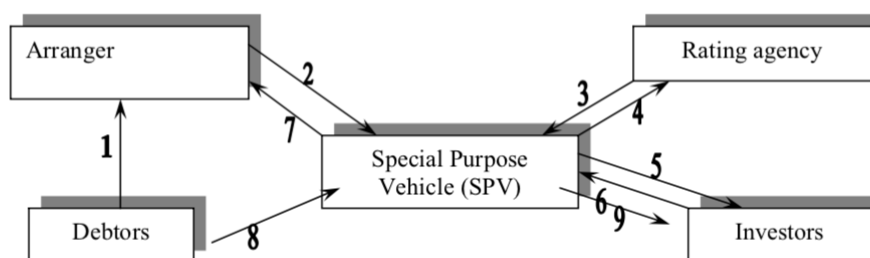
The rating agencies performs a pivotal role, since they guide investors in the choice of the best financial solution to pursue, given the general opaqueness of financial products for unprepared investors. However, at the times immediately preceding the crisis, the judgement of rating agencies were based on models that presented various limitations, due to hypothesis founded on too optimistic scenarios: that was in part caused by the pre-crisis situation of general confidence in the future of banks and of other financial institutions, that pushed rating agencies to exaggerate even not-so-good financial situations.

[24] Source: Szabłowska, Ewa. (2010). The financial crisis and securitization. Journal of Education Culture and Society. 2010

[25] Source of the paragraph: Szabłowska, Ewa. (2010). The financial crisis and securitization. Journal of Education Culture and Society. 2010

One of the main advantages of securitisation is that it enhances liquidity in the market for the assets that are being securitized. Under the case of mortgages, the process starts by the creation of a mortgage by a financial institution (a commercial bank, for instance). The bank plays the role of “originator” and tries to combine different mortgages in a pool: each mortgage is “*backed by claims against the underlying property*” (Investopedia, 2019). At this point, a financial institution like an investment bank issues the mortgage-backed security (MBS) which is then sold in the secondary market to investors. There is also the opportunity of dividing the MBS into many pieces having different level of risk, so that each party can choose the most appropriate deal according to its financial situation and possibilities: for example, pension funds may choose the low-risk part of the MBS since it wants to achieve a constant but safe yield.[26]

Figure 2.3: Main players in securitisation process.



1- debtors commitment e.g. mortgage
2 – trade assets
3 – rating for the securities
4 – rating agency fee
5 – MBS issue
6 – earnings from MBS issue
7 – funds for arranger related to trade assets
8 – repayment by debtors
9 – capital and interest`s repayment (related to MBS)

Source: Szabłowska, Ewa. (2010). The financial crisis and securitization. Journal of Education Culture and Society,2010

As we anticipated in the first paragraph of the chapter, one of the triggers from which the crisis originated has been the switch from the model “originate and hold” to the one “originate and distribute”. This phenomenon starts parallel to the development of securitisation, since with the latter model “*the bank issues the loan and then transfers it to third parties through securitisation, and immediately recover the amount of the loan*” (CONSOB). This was a clear advantage for banks, which always had at their disposal enough capital to finance a high number of mortgages. This situation, added to the increasing confidence gained by banks, lead to increasing loan concessions to

[26] Source of the paragraph: Investopedia, 2019

subprime clients, whose reliability were extremely undervalued. Securitisation endowed banks with a powerful but dangerous instrument: we are talking about leverage, through which banks could earn extremely high profits. However, it is well known that "*high potential returns correspond to high risks*" (CONSOB, 2007); in fact, on one hand banks had the possibility of gaining profits that would be almost impossible otherwise, but on the other hand they had to face the risk of huge losses.[27] This is the reason why an investment bank is much more exposed to financial risk with respect to a commercial bank, and as a consequence the former encounters the opportunity of higher profits than the latter, although both perform crucial activities for the functioning of the economic and financial system.

Leverage takes with it various advantages and disadvantages, the main being that both the profit and the loss are, in a sense, multiplied: so when the investment moves in favour of the financial institution, the latter will perform higher than normal earnings and, on the other hand, in case the investment choice is wrong, the bank will suffer greater losses according to the degree of leverage.[28]

In order to prevent the possibility that a further abuse of leverage occurs, after the tragic experience that contributed to the global financial crisis, the Basel Committee on Banking Supervision (BCBS) established a threshold for leverage ratio within Basel III[29] set of reforms in 2010. The main reason for that has been that banks were used to increase leverage "*while maintaining seemingly strong risk-based capital ratios*" (Bank for International Settlements,2017).[30]

2.4 Contagion in the banking sector

Banks have been primary participants in greatest part of the activities that ultimately led to the large financial crash of 2007-2009.

As expected, the more banks were involved in the mortgage issuance to subprime clients who were not able to repay the debt, the more banks had to face financial troubles due to the low reliability of borrowers and to errors made in credit risk assessment.

Furthermore, banks were also involved in the process of issuing mortgages in order

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[27] Source of the paragraph: CONSOB

[28] Source: Capital.com

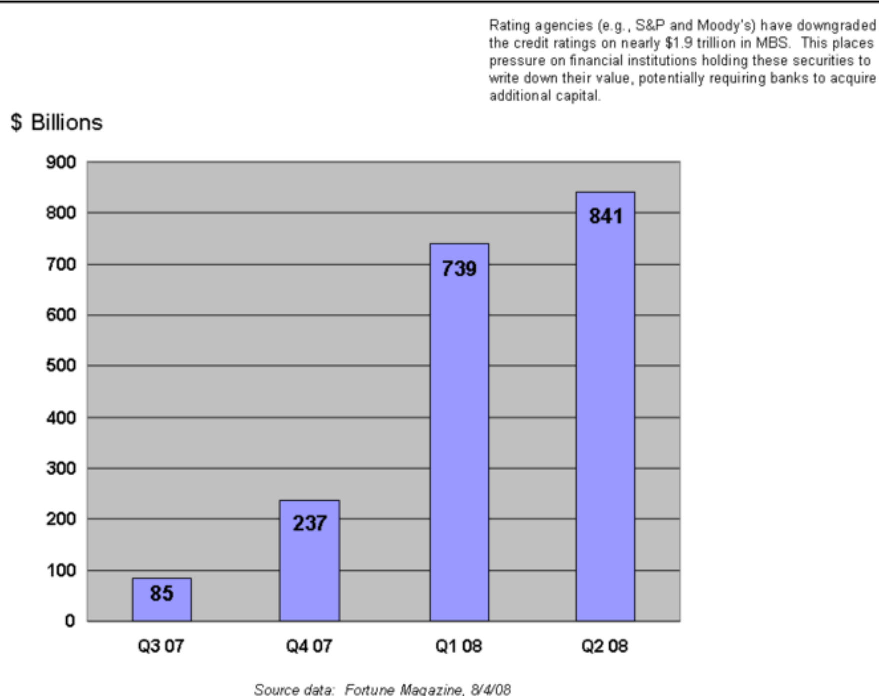
[29] "*Basel III is an international regulatory accord that introduced a set of reforms designed to improve the regulation, supervision and risk management within the banking sector*". (Investopedia,2018)

[30] Source of the paragraph: Bank for International Settlements (BIS), www.bis.org

to "feed" the securitisation process, the former being used as collaterals for securities. At this point of initial bank instability, mortgage-backed securities (MBS) were no more safe investments for investors, due to the acknowledgment of their scarce quality nature.

Indeed, for the entire period of the crisis, rating agencies began a process of lowering the previous judgements by downgrading asset-backed securities: a downgrade is a negative change in the rating of a security which occurs when the analysts think there has been weaknesses in the outlook for the security (Investopedia, 2018).

Figure 2.4: Rating agencies downgrades from the third fiscal quarter of 2007 to the second quarter of 2008.



Source: By Farcaster at English Wikipedia, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=11778086

Naturally, the downgrade mostly hit the financial institutions which hold those low-ranked securities: those banks had to request for new capital in order to maintain capital ratios. This process triggered a vicious circle which "*lowered the net-worth value of the institutions above and beyond the low of value of the downgraded securities*".[31]

As a consequence of the downgrade, the concerned securities became impossible to be sold easily and lost greatest part of their value, pushing Special Purpose Vehicle (SPV) to request banks for liquidity. However, given the widespread trade of this

[31] Source: Wikipedia, https://en.wikipedia.org/wiki/Credit_rating_agencies_and_the_subprime_crisis

type of securities, banks were not able to fulfil all the requests: this was also caused by the fact that credit was no more an option for banks. Indeed, it occurred a sharp reduction in banks' confidence and reliability, simultaneously with a huge increase in interest rates. This situation rapidly translated into a liquidity crisis[32]: "*a company's liquidity is its ability to meet its short-term financial obligations*" (Investopedia, 2017). This means that in this scenario banks faced many difficulties in reaching this goal, and this happens when the value of short-term payments exceeds the value of liquid assets[33]; liquidity risk represents one of the main dangers for which banks go bankrupt, together with solvency risk which is, on the other hand, the risk of not meeting long-term debt obligations.

A situation like the one depicted above has moved many U.S. financial institution on the verge of bankruptcy, avoided thanks to Federal Reserve intervention: in fact, it decided to execute a bailout plan through the so-called TARP, which stands for Troubled Asset Relief Program. The program implied liquidity injections which allowed banks to borrow at almost zero rates, in order to restore the previous equilibrium in the banking sector. However, the TARP did not cover all the financial institutions, some of which did not receive financial aids from the government: the most striking case concerned the investment bank Lehman Brothers, which declared bankruptcy on 15 September 2008. From this point forward, a period of deep financial instability began, both for the magnitude of the financial institution and also, as a consequence, for the connection between Lehman Brothers and other market participants in the U.S. and also abroad; furthermore, fears of counterpart risk by market agents partly offset the countermeasures of Federal Reserve mentioned before, since there has been a sharp liquidity shortage and an increase in the interest rates in the interbank market. As a consequence of the close connection of the interbank market, and to the diffusion of subprime mortgages almost worldwide, the financial instability transferred to Europe: here, the countries that took the stronger bailout measures have been Belgium, Denmark, France, Luxembourg, Sweden, Portugal, Netherlands, Germany and Greece.[34]

2.5 From financial crisis to economic crisis

[32] Source of the paragraph: CONSOB

[33] An asset is defined as liquid if it is "*either immediately accessible or easily converted into usable funds*" (Investopedia, 2019)

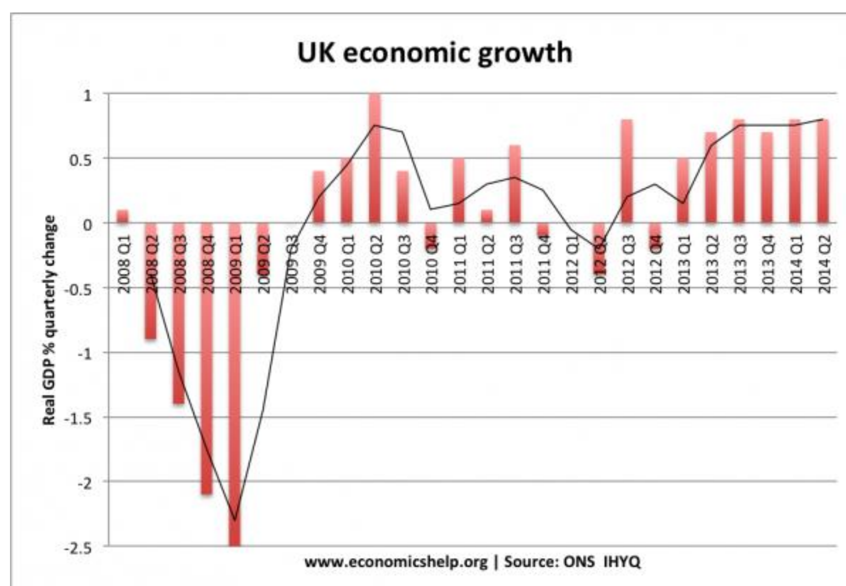
[34] Source of the paragraph: CONSOB

In previous paragraphs we saw how insiders reacted to the pervasive financial crisis which brought down the global market. Now, the focus is looking at the responses from those who "are not part of the game", that means households and companies. In the middle of financial collapse, people did not know which banks were in troubles and which banks were safe through bailout plans, so an attitude of general anxiety prevailed: households started withdrawing their funds from bank accounts, so that financial institutions could not benefit anymore from deposits in order to finance their operations. However, also the money market started to be suspicious and led to endless liquidity crisis.

The difficulties soon turned out to be companies' troubles, who could not find capital to start or make their businesses grow. As a consequence, firms began firing workers since there was not enough liquidity to cover all the expenses: although the number of failed companies was not so high, the effect on the economic environment has been devastating, given that unemployed workers also corresponded to households and they drastically changed their economic behaviour. Indeed, due to the rising unemployment, fired workers reduced their consumption of goods and services, not only of those produced by failing companies, but also of those made by all other firms which received much less demand.

This phenomenon of economic downturn is referred to with the name "Great Recession", which roughly occurred between 2008 and 2013, after the 2007-2009 global financial crisis.

Figure 2.5: Representation of real GDP decrease in the UK in the period 2008-2009. In the following years we notice a very slow recovery.



Source: www.economicshelp.org

As we can partly observe in the graph, the Great Recession has emphasized some

unresolved disputes in the Eurozone countries such as United Kingdom, leading to sharp economic declines and unemployment.[35]

Furthermore, the existence of international trade among countries all over the world caused a general reduction in exports and imports.[36]

[35] Source: Economics Help, 2017. www.economicshelp.org

[36] Source: CONSOB

Chapter 3 - An analysis of the Investment Banking market players

3.1 The main players

As we extensively saw in the previous chapters, the investment banking business involves diversified activities, which are mainly focused on raising capital for individuals and organizations and behaving as intermediaries in delicate financial operations. Despite the high degree of specialization of investment bankers, they can make mistakes in assessing risks and evaluating financial situations, which then lead to financial crisis like the one happened in 2007.

In the preceding chapter we analysed the main activities performed by financial actors that ultimately led to the collapse of the financial and economic system, and among them we also mentioned leverage; the latter has been so dangerous because it incited banks to engage in very risky operations under the expectation of very large profits.

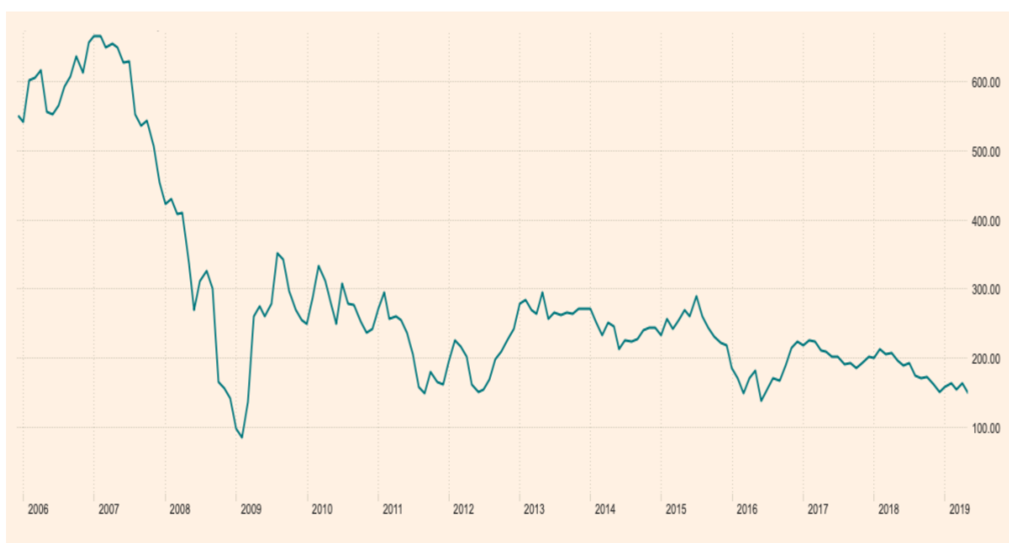
In order to complete the analysis of why financial institutions (investment banks in particular) decided to undertake such a risky type of businesses, we proceed our analysis by examining the major participants which took part in the financial events in the period 2007-2009. In particular, we decided to get into the depth of five of the main investment banking firms, namely Barclays, Citigroup, Goldman Sachs, J.P. Morgan and Morgan Stanley.

Barclays was incorporated in 1896 in London and is defined as one of the main financial services holding company; its activities range from wholesale banking to investment banking, as well as wealth management.[37] One very interesting fact concerns the combination of equity and debt with which the financial institution finances its operations: in fact, nowadays, "*Barclays PLC uses little or no debt in its capital structure*" (Financial Times). From this information we notice that Barclays substantially changed its behaviour during the years, in particular after 2007 financial collapse: in fact, this is confirmed by the words of the Chairman John McFarlane

[37] Source: Financial Times

who, in the annual report of 2018 affirmed "*I am pleased to report that Barclays is in a very different place than it has been since the global financial crisis […] we can now for the first time in the recent past look forward to enhancing shareholder returns and distributions.*"[38]

Figure 3.1: **Barclays** stock price in the period 2006-2019; it is clear the correlation of the financial crisis to the price drop in the time frame 2007-2009.



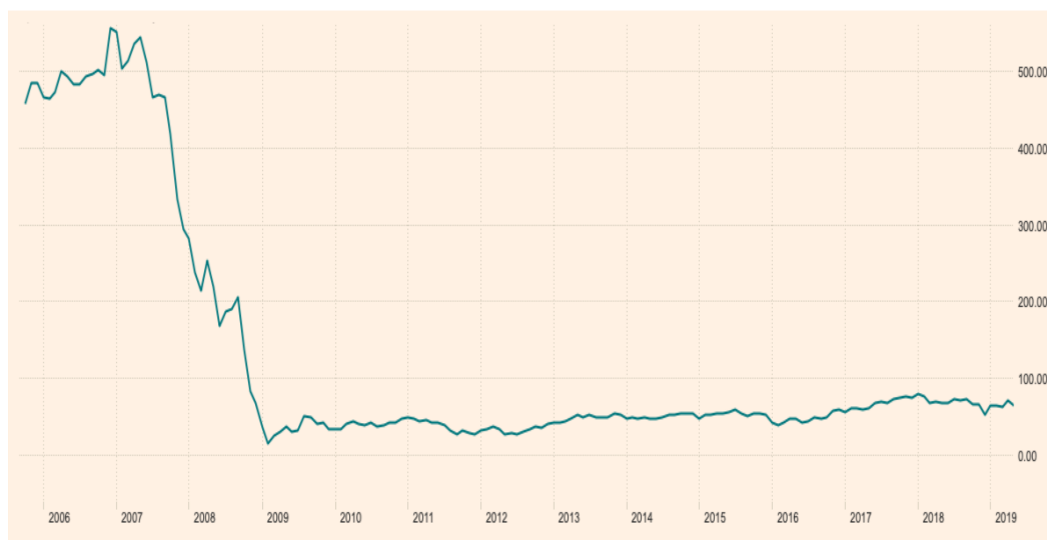
Source: Financial Times

In the list of the leading investment banks we also find Citigroup: its incorporation dates back to 1988 and its main functions include consumer banking and credit, wealth management, securities trading and brokerage, as well as investment and corporate banking. The company's business is organized in two different portions, which are Citicorp and Citi Holdings: in particular, the former acts as the main bank which helps customers and businesses through their wide choice of financial products and services.[39] In the previous chapter we saw how liquidity is extremely important for banks for staying in business and avoiding the risk of financial collapses, since liquidity risk represents one of the main dangers for a bank to go bankrupt. For the aforementioned reasons, in the 2018 Citigroup annual report we read how carefully the bank tries to manage the risk of liquidity shortages: "*Adequate and diverse sources of funding and liquidity are essential to Citi's businesses […] Citi's funding and liquidity objectives are aimed at funding its existing asset base, growing its core businesses, maintaining sufficient liquidity, structured appropriately, so that Citi can operate under a variety*

[38] Source: Chairman's letter, A solid foundation for the future, Barclays Annual Report (2018)
[39] Source of the paragraph: Financial Times

of adverse circumstances."[40]

Figure 3.2: **Citigroup** stock price in the period 2006-2019. The consequences of the financial collapse have not been recovered yet.



Source: Financial Times

We proceed our analysis by examining Goldman Sachs: it was established in 1998 and it is considered as one of the major investment banks in the world, providing a wide set of financial services to individuals, governments and companies. The bank has four main areas of activity, that are investment banking, institutional client services, investing & lending, and investment management; for this reason, the main activities of the company range from advise clients on financial issues to acting as intermediaries in different transactions, as well as giving advice on wealth management matters.[41] In the 2018 letter to shareholders by the actual Goldman Sachs Chief Executive Officer, David M. Solomon, we can extensively notice what the core values of the company are nowadays, so what are the qualities that allowed it to tackle the financial crisis burst and, among all, the CEO stressed the importance of being endowed of high level human capital, capable of facing changes in the financial environment. In fact, we read "*And amidst the most turbulent days of the global financial crisis, it was Lloyd's* (Lloyd Blankfein, former Goldman Sachs CEO) *fortitude and leadership that steadily navigated Goldman Sachs and its people through one of the most difficult episodes in our history."*[42]

[40] Source: Citigroup 2018 Annual Report.

[41] Source of the paragraph: Financial Times

[42] Source: Letter to shareholders, Goldman Sachs Annual Report (2018).

Figure 3.3: Stock price trend for **Goldman Sachs** in the period 2006-2019.

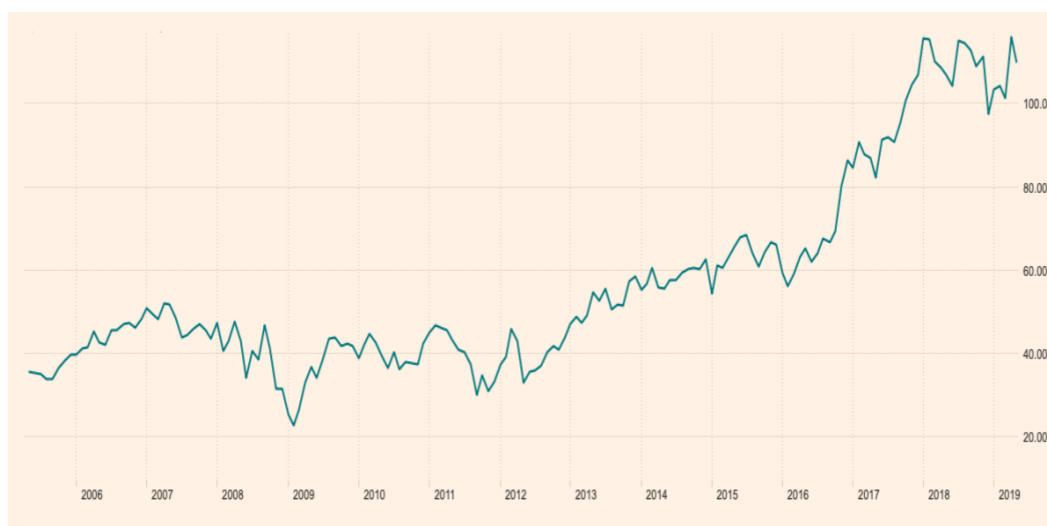
Source: Financial Times

Then, another pillar in the framework of global investment banking is represented by J.P Morgan: the company was incorporated in 1968 and it counts 256,000 employees at his service.[43] J.P. Morgan Chief Executive Officer, Jamie Dimon, in 2018 annual report has communicated its ever-growing self-awareness of the consequences of the financial crisis and of what the company did in order to limit the damages, first of all the acquisition of Bear Stearns. In particular, the CEO identified a series of lessons that the crisis has taught us, so that disasters like the one in 2007-2009 do not happen in the future. Furthermore, the J.P. Morgan Chairman stressed the importance of their core ideology during the period of the crisis, combined with the almost right amount of capital and liquidity, which allowed the company to come out of the breakdown less damaged than other banks. Among the teachings, we find: "*The need for plenty of capital and liquidity, proper underwriting and regulations that are constantly refined, fair and appropriate [...] We entered the crisis with the capital, liquidity, earnings, diversity of businesses, people and a risk management culture that enabled us to avoid most — but, unfortunately, not all — of the issues exposed by the crisis*".[44]

[43] Source: Financial Times

[44] Source: J.P. Morgan Annual Report (2018)

Figure 3.4: Stock price for **J.P. Morgan** in the time interval from 2006 to 2019. Compared to the other companies under analysis, this bank suffered a lower loss in value during the period of the crisis.



Source: Financial Times

Finally, Morgan Stanley represents a fundamental player in investment banking sector: incorporated in 1981, the company has four main sectors of business. These sectors comprise Institutional Securities, Wealth Management and Investment Management: in particular, the first type of services concerns investment banking operations offered to financial institutions, governments and corporations.[45]

In an interview, found in the website Weavee, to Huw van Steenis, who in the period of the article was the managing director in equity research at Morgan Stanley, he made a distinction between the set of regular customers that the company had before the crisis and the one after the crisis. From the manager's point of view we understand the crucial difference between the pre-crisis environment and the post-crisis one, in terms of profits for the investment bank; after a question on how the company's client base has changed due to the consequences of the financial collapse, he stated: "*In the extraordinary market we had running up to 2007, investment banks could focus on a narrow base of clients and still make money. In the environment we're in today, however, you need to have a broad client base, both in terms of geography and industry*."[46]

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[45] Source: Financial Times

[46] Source: Weavee, https://www.weavee.co.uk/articles/investment-banking/commercial-awareness/morgan-stanley-five-years-after-the-financial-crisis-investment-banks-today?utm_source=thegateway

Figure 3.5: **Morgan Stanley** stock market price in the time period 2006-2019.

Source: Financial Times

3.2 The evolution of balance sheets and income statements from 2005 to 2018

Every company owner in the world must use bookkeeping in order to conduct its business. In fact, through accounting, and so through financial statements, a business owner can keep track of all the activities and of the financial performance of the company: in particular, financial statements include the balance sheet, the income statement and the cash flow statement.[47]

In particular, we know that "*A balance sheet is a financial statement that reports a company's assets, liabilities and shareholders' equity at a specific point in time, and provides a basis for computing rates of return and evaluating its capital structure*" (Investopedia, 2019). From this definition we can deduce that the formula for defining the balance sheet is that assets are equal to liabilities added to shareholders' equity, that is to say that to a change in assets must correspond a change either in liabilities or in shareholders' equity.

Both assets and liabilities are divided in two categories, namely "current" and "long-term", depending on if the time frame is lower than one year or not. Among current assets, for instance, we find cash, marketable securities and inventory, while long-term assets include fixed assets and intangible assets. On the other hand, current liabilities represent bank indebtedness, dividends payable and the current portion of

[47] Source: Investopedia, 2019

long-term debt, while long-term liabilities mainly comprise the whole long-term debt. For what concerns shareholders' equity, it represents the funds that belong to the owners of the business, or we can also say that equity is equal to the difference between assets and liabilities.[48]

Regarding the second financial statement mentioned above, we start its analysis by giving a mere definition: "*Also known as the profit and loss statement or the statement of revenue and expense, the income statement primarily focuses on company's revenues and expenses during a particular period*." (Investopedia, 2019). In particular, revenues are divided in operating revenues and non-operating revenues, the former being achieved through core activities and the latter instead through secondary types of business activities; furthermore, to these we also have to sum the so-called gains, which is income earned from other activities. Similarly, we distinguish between expenses from primary activities and expenses from secondary activities, and to these we also add losses. For these reasons, from a mathematical point of view, we calculate net income as the difference between the sum of revenues and gains and the sum of expenses and losses.[49]

In our analysis of the balance sheets and income statements of the five investment banks we will focus on the elements of interest to us; in fact, in the financial statements we find all the information we need in order to analyse how any company behaved during a specific period of time. In particular, we wanted to start the analysis through the comparison of the debt-to-equity ratios across investment banks: we calculate them by dividing a company's total liabilities by its shareholder equity. This relation is crucial since it helps to determine a company's degree of financial leverage, and in the previous chapter we saw how high leverage is connected both to high profits and high risks. Basically, the ratio measures the level to which an institution finances its operations through debt, that is equivalent to say that debt-to-equity ratio indicates the level of a bank indebtedness used to leverage its assets. Having a high debt/equity ratio is connected to high risks for the company, and it means that the company's growth was mostly due to debt instead of own funds.

In the following graphs, we will see that the pre-crisis levels of debt-to-equity ratios were higher than the post-crisis records, and this may be due to the fact that great part of investment banks experienced too much risk in financing its operations during that period.

[48] Source of the paragraph: Investopedia, 2019
[49] Source of the paragraph: Investopedia, 2019

Figure 3.6: Barclays Debt-to-equity ratio in the period 2005-2010, that is before and during the crisis.

Barclays Financial Ratios for Analysis 2005-2019 | BCS

Prices | Financials | Revenue & Profit | Assets & Liabilities | Margins | Price Ratios | Other Ratios | Dividends

Income Statement | Balance Sheet | Cash Flow Statement | Key Financial Ratios

Format: Annual | Search for ticker or company name... | View Annual Reports

Annual Data		11-12-31	2010-12-31	2009-12-31	2008-12-31	2007-12-31	2006-12-31	2005-12-31
Current Ratio		-	-	-	-	-	-	-
Long-term Debt / Capital		0.7034	0.7483	0.7344	0.791	0.8099	0.8202	0.8258
Debt/Equity Ratio		7.6045	9.3328	8.5152	10.5052	13.7855	14.1563	13.9958

Source: Macrotrends

In the table above, we notice how the ratio of long-term debt to equity reached a rate of about 14 in years 2005-2006, so immediately before the burst of the financial crisis. Then, in the middle of the crisis, the ratio started to decrease substantially.

Figure 3.7: This graph reports the debt-to-equity ratio in the years that followed the 2007-2009 financial crisis.

Barclays Financial Ratios for Analysis 2005-2019 | BCS

Prices | Financials | Revenue & Profit | Assets & Liabilities | Margins | Price Ratios | Other Ratios | Dividends

Income Statement | Balance Sheet | Cash Flow Statement | Key Financial Ratios

Format: Annual | Search for ticker or company name... | View Annual Reports

Annual Data		2018-12-31	2017-12-31	2016-12-31	2015-12-31	2014-12-31	2013-12-31	2012-12-:
Current Ratio		-	-	-	-	-	-	
Long-term Debt / Capital		0.8337	0.804	0.7324	0.7347	0.7135	0.7303	0
Debt/Equity Ratio		5.8975	5.2797	3.5002	3.6646	5.0612	6.6208	7

Source: Macrotrends

As we can see in figure 3.7, the debt-to-equity ratio went down even more in the years that followed the crisis, reaching its lowest value at the end of 2016; this may be caused by different factors, such as the greater awareness of the risks taken from excess leverage and also the introduction of Basel III agreements in 2010, in which a fundamental leverage ratio threshold was introduced.

In examining Citigroup, we focus on return on equity, which represents "*how effectively a company rewards its shareholders for their investment*" (Investopedia, 2018); roughly speaking, this indicates that any unit of shareholders' equity will convert in a certain percentage of profits and, of course, the higher this percentage the better is for the company.

Figure 3.8: ROE (return on equity) for Citigroup in the period from 2005 to 2010.

Citigroup Financial Ratios for Analysis 2005-2019 | C

Prices | Financials | Revenue & Profit | Assets & Liabilities | Margins | Price Ratios | Other Ratios | Dividends

Income Statement | Balance Sheet | Cash Flow Statement | Key Financial Ratios

Format: Annual | Search for ticker or company name... | View Annual Reports

Annual Data	11-12-31	2010-12-31	2009-12-31	2008-12-31	2007-12-31	2006-12-31	2005-12-31
Current Ratio	-	-	-	-	-	-	-
Long-term Debt / Capital	0.6431	0.6969	0.7014	0.714	0.7901	0.7066	0.659
Debt/Equity Ratio	3.9115	4.6962	4.6762	5.9531	9.3429	7.3838	5.7575
Gross Margin	-	-	-	-	-	-	-
Operating Margin	-	-	-	-	-	-	-
EBIT Margin	-	-	-	-	-	-	-
EBITDA Margin	-	-	-	-	-	-	-
Pre-Tax Profit Margin	22.3078	21.4699	-18.7815	-292.0781	1.0683	35.6081	38.8744
Net Profit Margin	16.7301	17.2505	-3.8676	-164.106	5.9221	26.8402	32.4766
Asset Turnover	0.0352	0.0321	0.0224	0.0092	0.0276	0.0425	0.0507
Inventory Turnover Ratio	-	-	-	-	-	-	-
Receiveable Turnover	-	-	-	-	-	-	-
Days Sales In Receivables	-	-	-	-	-	-	-
ROE - Return On Equity	6.2183	6.6178	-0.6892	-43.6612	2.5642	17.2171	17.7773

Source: Macrotrends

As we notice in the table above, the company was performing very well in terms of return on equity in the period immediately preceding the crisis, reaching a level of approximately 17; then, with the beginning of the crisis this level dropped dramatically, achieving even a negative profit of -43 at the end of 2008. These losses started to be slowly recovered in the following years after the end of the financial collapse.

Nowadays, these decreases in ROE have not been completely restored to the pre-crisis levels, and this may be due to the fact that investment banks decided to substantially decrease the level of risk of their operations and, by doing so, also profits went down as well.

Figure 3.9: Citigroup level of ROE in the most recent years.

Citigroup Financial Ratios for Analysis 2005-2019 | C

Prices | Financials | Revenue & Profit | Assets & Liabilities | Margins | Price Ratios | Other Ratios | Dividends

Income Statement | Balance Sheet | Cash Flow Statement | Key Financial Ratios

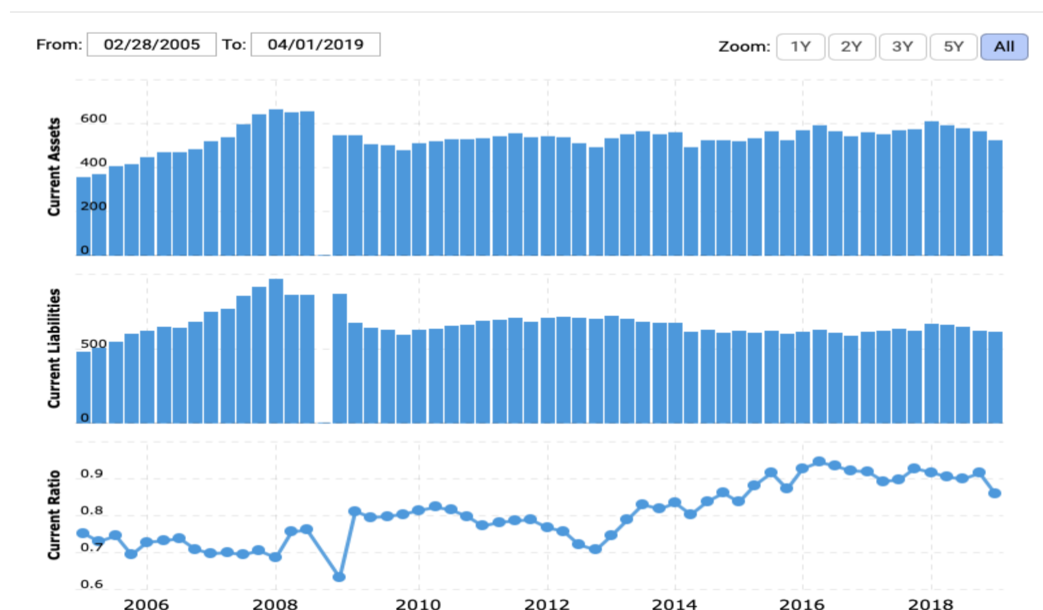
Format: Annual | Search for ticker or company name... | View Annual Reports

Annual Data	2018-12-31	2017-12-31	2016-12-31	2015-12-31	2014-12-31	2013-12-31	2012-12-
Current Ratio	-	-	-	-	-	-	
Long-term Debt / Capital	0.5407	0.54	0.4769	0.4743	0.5131	0.5175	0.5
Debt/Equity Ratio	2.9756	2.7897	2.2895	2.1801	2.8054	2.8736	3.
Gross Margin	-	-	-	-	-	-	
Operating Margin	-	-	-	-	-	-	
EBIT Margin	-	-	-	-	-	-	
EBITDA Margin	-	-	-	-	-	-	
Pre-Tax Profit Margin	35.7939	35.0487	33.5327	35.8519	20.8848	28.6487	13.
Net Profit Margin	25.4534	-12.3928	21.2965	23.4656	9.5012	19.4806	12.
Asset Turnover	0.0342	0.0352	0.0357	0.04	0.0382	0.0368	0.0
Inventory Turnover Ratio	-	-	-	-	-	-	
Receiveable Turnover	-	-	-	-	-	-	
Days Sales In Receivables	-	-	-	-	-	-	
ROE - Return On Equity	10.1269	-3.6328	7.2662	8.4245	3.7291	6.8287	4.

Source: Macrotrends

Figure 3.9 shows us that the return on equity for Citigroup kept almost on similar levels from 2013 to 2016; then, the company experienced a negative value in the following year (2017), for then reaching a level of about 10, which represents the highest post-crisis ROE level, but always lower than the pre-crisis values.
An interesting set of data for the analysis of Goldman Sachs represents the evolution of its current ratio, which is equal to the value of current assets divided by the value of current liabilities, and it is a direct indicator of a company's ability to meet short-term obligations with its liquid assets. As we previously saw, a highly leveraged investment bank is exposed to a very high level of risks which can take to insolvency and so bankruptcy; however, if a company possesses uniform cash flows to repay its debts, it could be anyway deemed as safe, because there is much lower risk of being illiquid and, ultimately, insolvent.[50]
In the graph below we observe the trend of the current ratio for Goldman Sachs in the period 2005-2018, and we understand that it maintained almost constant and in the last few years it has increased by exceeding 0.9 threshold and so almost reaching equality between assets and liabilities, which communicates a general positive trend.

Figure 3.10: Current ratio trend for Goldman Sachs between 2005 and 2018.



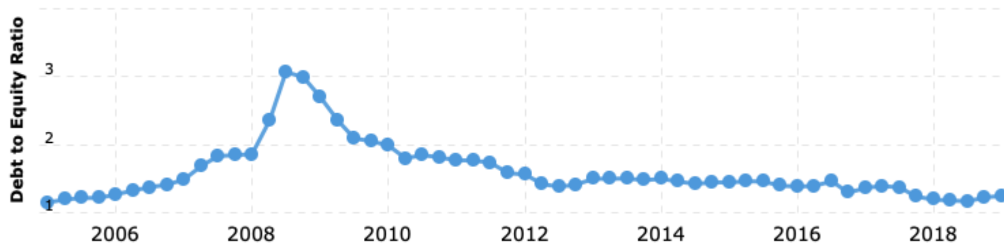
Source: Macrotrends

In the previous paragraph, we perceived that J.P. Morgan tackled the financial crisis with the appropriate measures and quantities of capital and liquidity; in particular, a fundamental weapon that the company used in order to limit the damages of the

[50] Source: Investopedia, 2018

crisis was the right weight given to the risk management sector, which allowed J.P. Morgan to understand that excess leverage was a dangerous business. Indeed, in the table below we notice that the bank had low levels of debt-to-equity ratio both before and during the collapse and, even lower, in the following years.

Figure 3.11: Trend of debt-to-equity ratio for J.P. Morgan from the pre-crisis, so 2005, to the present (2018).



Source: Macrotrends

At the opposite end in terms of degree of financial leverage with respect to J.P. Morgan we find Morgan Stanley: the company had the highest level of debt-to-equity ratio (and so highest leverage) in the pre-crisis period among all the five investment banks analysed. In fact, the value of the ratio reached a peak of 25 at the end of 2006, which means that the level of indebtedness was 25 times higher than the value of shareholders' equity. However, with the impact of the crisis this level had a drop (as for all the other banks that we considered) which was extremely sharp.

Figure 3.12: In the table we notice the heavy decline in debt-to-equity ratio for Morgan Stanley in the crisis period (2007-2009).

Morgan Stanley Financial Ratios for Analysis 2005-2019 | MS

Prices | Financials | Revenue & Profit | Assets & Liabilities | Margins | Price Ratios | Other Ratios | Dividends

Income Statement | Balance Sheet | Cash Flow Statement | Key Financial Ratios

Format: Annual | Search for ticker or company name... | View Annual Reports

Annual Data		09-12-31	2008-12-31	2008-11-30	2007-12-31	2007-11-30	2006-11-30	2005-11-30
Current Ratio		0.822	0.8224	0.7955	-	0.7876	0.7701	0.8128
Long-term Debt / Capital		0.7856	0.7843	0.7628	-	0.8591	0.8039	0.791
Debt/Equity Ratio		9.673	8.7202	8.4167	-	23.7527	25.0299	24.4467

Source: Macrotrends

3.3 The pre-crisis time, the crisis time, and post-crisis: a business comparison

Investment banks, and the whole financial world in general, have changed enormously during the time frame that preceded the global financial crisis arriving to the most recent past. These variations mainly concern the composition of a bank's balance sheet and income statement, so affected both profit and risk levels; in fact, as banks got through the development of the financial crisis, they realized they had to modify many aspects of their operations, so as not to end up in the trap of credit crunch again. In addition to this self-awareness, the financial sector has been crucially helped by international regulatory accords, in particular the set of reforms known as Basel III in 2010, which was developed in order to enhance risk management and supervision of the banking sector by requiring minimum capital requirements and certain leverage ratios. Basel III accords have modified Basel I and Basel II regulations and have also added new rules. In particular, Basel III has modified the Tier 1[51] ratio over risk-adjusted assets, by requiring that it should be greater than 6% instead of 4%; then, it also changed the common equity Tier 1[52] ratio imposing it greater than 4.5% (no more 2%). Furthermore, the set of regulations also introduced a series of new measures, which were aimed at strengthening even more the security of the financial sector. These included a liquidity coverage ratio, equal to high quality liquid assets divided by total net liquidity outflows over 30 days, which must be greater than 100%; as we mentioned before, the agreements also added a leverage ratio, that is Tier 1 over total assets, fixing it greater or equal than 3%; then, there was the introduction of net stable funding ratio[53], which should be greater than 100%; finally, Basel III also included a regulation on Global Systemically Important Financial Institutions (G-SIFIs), meaning that are "*Financial Institutions with failure to meet the obligations to creditors and customers would have significant adverse consequences for the financial system and the broader economy*".

In the years that preceded the crisis, there was a widespread optimistic belief generated by the globalisation of the main world economies, which caused price levels to fall and GDP growth to progress quickly. In this atmosphere of general confidence in the banking system, the fact that banks' business is extremely risky, in particular regarding money lending, has been underestimated: for this reason, the banking sector needs to be regulated by accords like the ones taken after Basel III, and also need to be aware itself about the dangers involved in these activities, trying

[51] "*Tier 1 capital is used to describe the capital adequacy of a bank and refers to core capital that includes equity capital and disclosed reserves*" (Investopedia, 2019)

[52] "*Common Equity Tier 1 (CET1) is a component of Tier 1 capital that consists mostly of common stock held by a bank or other financial institution*" (Investopedia, 2018)

[53] "*The Net Stable Funding Ratio is defined as the amount of available stable funding relative to the amount of required stable funding.*" (Basel Committee on Banking Supervision, 2014)

to minimize them. The investment banking sector has learned many lessons from the 2007-2009 financial collapse and has modified enormously its activities in the following years in two fundamental aspects. First of all, investment banks realized the limits not to be exceeded and the activities in which they should not be involved for the safety of the whole financial system: so we can say that there has been a reversion to the origins of banking, focusing on core businesses and avoiding excess leverage, investing too much in hedge funds, or being involved in securitization process. Secondly, a fundamental change concerned the higher level of regulation of the banking system, through which financial institutions were required to hold an appropriate level of liquidity and capital: this also helped banks to switch their targets to more safe businesses and also gave them the opportunity to better withstand possible financial shocks by increasing the level of available capital.[54]

We take Morgan Stanley as an icon of the effects of the measures taken to counter the financial crisis and save the main global investment banks, and also as an example of how financial institutions of a certain level are able to face and overcome great obstacles such as those imposed by global financial collapse, through changes aimed at restoring soundness and stability of the banking system.

In paragraph 3.2, we noticed that, in the pre-crisis period, Morgan Stanley used to finance many of its operations with debt compared to using shareholders' equity, having a high debt-equity ratio, which translates into a high degree of financial leverage. In 2008, so in the middle of the crisis, this value has decreased by approximately one third compared to the pre-crisis value. Furthermore, from 2007 to 2008, Morgan Stanley market value dropped by 80% and, in order to remain in business, the company received substantial capital injections from different sources: in particular, the Treasury of United States invested $10 billion in equity, "*as part of the $700 billion government bailout for troubled financial institutions*".[55]

In the post-crisis time, Morgan Stanley and many other banks in this sector, have pursued a process of deleveraging, by reducing the debt-to-equity ratio, and so they started to hold much more capital to finance their activities compared to using debt, becoming much more resistant for withstanding financial shocks. Specifically, Morgan Stanley has focused much more on wealth management with respect to other activities, in order to become a leading bank in this sector and also to make its entire business more stable and diverse.[56]

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[54] Source of the paragraph: www.weavee.co.uk

[55] Source of the paragraph: corporatefinanceinstitute.com

[56] Source of the paragraph: www.weavee.co.uk

Figure 3.13: In the table we have a representation of the deleveraging process by Morgan Stanley in the post-crisis time, through a decrease in the debt-to-equity ratio.

Morgan Stanley Financial Ratios for Analysis 2005-2019 | MS

Prices | Financials | Revenue & Profit | Assets & Liabilities | Margins | Price Ratios | Other Ratios | Dividends

Income Statement | Balance Sheet | Cash Flow Statement | Key Financial Ratios

Format: Annual | Search for ticker or company name... | View Annual Reports

Annual Data		2016-12-31	2015-12-31	2014-12-31	2013-12-31	2012-12-31	2011-12-31	2010-12-
Current Ratio		0.7783	0.745	0.7708	0.7661	0.8153	0.8267	0.
Long-term Debt / Capital		0.6823	0.6687	0.6794	0.6899	0.7216	0.7244	0.
Debt/Equity Ratio		4.8654	4.593	5.4831	6.9172	7.4174	6.7724	8.

Source: Macrotrends

As we saw in the previous paragraph, the regulations that have been taken in order to restore financial stability turned out to be extremely effective, since they substantially improved the balance sheets of the five banks considered in the after-crisis period. By looking at the tables, in particular in the last few years, there are no signs of a new possible financial crisis founded on the same mistakes made in the pre-crisis time by banks, who have learned the hard lessons of the crisis at their own expense and are continually trying to maintain the correct levels of capital and liquidity. For their part, regulators must persist in being alert to new possible threats rooted in the vast banking world, through a constant screening of market performance in terms of risks and profits.

Conclusions

This study focused on the investment banking sector and its connection to the most recent global financial crisis. In particular, the objective of the thesis is that of analysing the behaviour of financial actors (i.e. investment bankers in this case) and answering the question of whether a new scenario of financial instability like the one experienced in 2007-2009 could happen again. This matter is of fundamental importance in order to understand if companies and institutions have learned the lessons taught by the terrible consequences of the crisis, both in the financial and in the real economy.

To this end, the study has taken into consideration various indicators of profitability and risk in five of the world's largest investment banks, and their development and their change from the pre-crisis period to the present day have been analysed. As could be expected, both profit and risk levels have been significantly reduced with the looming of the crisis, to then slightly increase in recent years. For example, we analysed the debt-to-equity ratios for Barclays, J.P. Morgan and Morgan Stanley. Barclays peaked at around 14 in 2006 and then reached a level of around 5 in the post-crisis period, so it reduced the level of leverage and shows no signs of increasing it in the following years. Same thing for J.P. Morgan, which maintained low leverage levels even in the pre-crisis and then lower again in the post-crisis period. In the opposite side we have Morgan Stanley, which reached a level of debt-to-equity ratio of 25 in 2006 and then significantly decreased it in the post-crisis, achieving a level of around 4. So, overall, these three banks have faced the crisis in a different way, but they all have one thing in common, that is that they have greatly reduced the level of leverage, and consequently also the level of risk. In the case of Citigroup and Goldman Sachs, we took into consideration the return on equity (ROE) and the current ratio, respectively. Citigroup achieved negative levels of ROE during the period of the crisis, to then recover in the post-crisis period with positive results but always lower than the pre-crisis levels. Instead, Goldman Sachs has maintained a fairly constant level of current ratio (and therefore liquidity) in the period from pre-crisis to post-crisis, and has indeed increased in recent years, achieving a positive trend overall.

We can therefore conclude that, currently, there are no conditions for a new crisis to occur similar to the one that happened in 2007, since banks and supervisory institutions realized the risks of being involved in activities such as, for example, the

securitization process, which can lead to high levels of profit but also to as many high levels of risk. In fact, in all five investment banks considered we noticed lower levels of profits, and therefore lower risks, compared to the period that preceded the crisis, and also a greater level of liquidity, for example for Goldman Sachs. All this is due both to greater self-awareness on the part of financial institutions with regard to the correct levels of risk to be undertaken, and to a severe control by the regulatory bodies, with reference, for example, to the set of rules in the context of Basel III in the 2010, when, among other things, fundamental thresholds for liquidity and leverage that banks must respect have been introduced.

We have therefore understood that the possibility of a new imminent crisis based on past errors is quite remote, since both regulators and banks have taken measures to avoid falling into the trap of undertaking a too high level of risk, since it is possible to obtain reasonable profits also through other financial instruments, such as wealth management.

In any case, this does not completely eliminate the risk of a new crisis based on other factors of instability. In fact, the advance of the financial system's innovation and all the inputs available to financial agents nowadays can easily jeopardize the stability of the financial world. For example, just think of cryptocurrencies, whose greater hypothetical diffusion in the future could cause a strong instability in the current financial system, which would have to face a potentially equally large parallel system. For this reason, it is of fundamental importance that the supervisory institutions concentrate not only on avoiding the mistakes of the past, but also on possible future threats in order to suppress them in the bud, before they cause irreparable damage to the financial system. Moreover, we must take into account the fact that regulators must find a fair compromise, in terms of putting the right limits to the risks that financial institutions can undertake: in fact, excessive restrictions could overly slow down the functions of the banks and cause a degradation of the banking sector, due to the chronic fear of a new imminent crisis. The anxiety of a new fictitious financial collapse must therefore not impede the proper functioning of the interbank market, and this is the most difficult task that regulatory bodies must undertake, in order to achieve the highest possible degree of efficiency.

To conclude, according with the result of the present study we can assert that the financial system as a whole has evolved enormously compared to the last decade, both in terms of activities undertaken by financial agents and risk levels. Risk levels have fallen dramatically in the investment banking sector, at the same time as the decrease in profit levels, so that it is very difficult the occurrence of an impending

crisis based on the same factors that triggered the 2007-2009 crisis. The supervisory bodies have played a leading role in this process and must undertake the even more onerous task of being constantly observant to other possible future threats. If they continue on this path, they will very probably be able to face other dangers too, given the satisfactory results obtained following the 2007 crisis; in any case, what regulators must aspire to is to prevent disasters rather than repair the damage of a potential future crisis, given the experience of the previous global crisis. Only when they have a 360-degree view of all the possible scenarios will it be possible to avoid every possible trap in the variegated financial world, but this would be an almost utopian dream: until then, there will always be a certain risk percentage of a possible new financial crisis, likely based on innovative and unknown risk factors.

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