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Credit rating agencies: history, failures, and a win-lose compensation scheme

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Introduction

Credit rating agencies appeared in financial landscape in the late nineteenth century. Since then, their role has become steadily of increasing importance and the equilibrium in financial markets heavily relies on the soundness of their behaviour. The problem which has been sticked to the rating industry since its birth is the presence of few incumbents and the consequent lack of competition.

Despite the thunderous failure in the context of the 2007-2008 subprime crisis, rating agencies are still a crucial gatekeeper and intermediary in the financial markets. On the one hand, their ratings determine capital requirements for certain institutions and define the classes of assets in which broker-dealers can invest. On the other hand, rating agencies drastically reduce the normal information asymmetries arising in the lender-borrower relationship.

In chapter 1 I go through the process of rating industry's establishment from an historical point of view. I provide a detailed picture of the current conformation of the industry and provide three points of view which try to explain the role of the agencies in financial markets. I conclude the chapter with an historical overview equipped by the reasons for the evolution process which led the rating agencies from the investor-pays to the issuer-pays business model. Chapter 2 begins with an summary of credit rating agencies' failures antecedent relative to the subprime global crisis. The thesis moves forward with the analysis of all institutions, dynamics and causes involved in the 2007-2008 financial crisis. The focus is especially on the failure of rating agencies. The reasons which led to such disaster are extensively and analytically investigated. Chapter 3 opens with the description of the regulations that were implemented in the aftermath of the crisis and the aimed goals. Finally, the thesis is concluded with the illustration of a less intrusive but highly effective compensation structure mechanism. It has the objective of increasing competition in the rating industry both in the short and in the long run. The increase in rivalry among firms will inevitably deliver to the market higher quality ratings.

1. Credit rating agencies

1.1 Economic context, birth, and development of credit rating agencies

"There are two superpowers in the world today in my opinion. There's the United States and there's Moody's Bond Rating Service. The United States can destroy you by dropping bombs, and Moody's can destroy you by downgrading your bonds. And believe me, it's not clear sometimes who's more powerful"[1].

Even if this comparison may seem too strong and not suitable at a first sight, it makes us aware of the real power with which these financial institutions are vested. Before proceeding with an industry analysis, it is important to go through the birth and the evolution of the credit rating agencies (CRAs). After that, it will be easier to understand the causes of their current activities. The appearance of the CRAs is widely regarded as one of the most relevant financial innovation of our century.

During history, the United States of America have always been the crucial centre of the financial world. In fact, our short historical digression begins there.

Despite the first-ever government bond was issued in 1693 by the Bank of England[2], credit rating agencies first appeared in the United States during the late nineteenth century. The reason for the "delayed" appearance on the financial landscape is linear. During the embryonic stage of the bond market, most of the obligations were emitted and granted by the State whose full solvability was

[1] This statement was made by the New York Times' journalist Thomas Friedman, during an interview with Jim Lehrer on 13th February 1996.
[2] The reason for the issuance of this bond was the financing of the war against France. These bonds came in two forms: lottery and annuity.

widely assumed. As a result of this, nobody felt the need of a third party evaluating the risk of repayment of the principal and the instalments.

The global financial system saw some evolutionary steps of financial players that performed the function of precursors of the credit rating agencies: the press specialized in economic and financial topics, investment banks and the credit reporting agencies[3].

The specialized press has been present in the United States of America since the eighteenth century. From the merger of two important editorial groups in 1941 one of the "three sisters"[4] of the rating industry was born, namely Standard & Poor's Global Ratings. Investment banks, performing a role in first person with the investor, risk their reputation and so it is not in their interest to invest in a bond that they think will not repay the principal and instalments.

Through a market evolutionary process, credit rating agencies established themselves in the financial landscape as a development of the credit reporting agencies caused by a market expansion and investors' necessity for additional capital. The expansion we are referring to is the so-called "West expansion" which was started during the first half of the nineteenth century by American federal government. This process led to the territorial shape of the American nation as it is nowadays.

The leading sector of this economic development was the railroad industry which affirmed itself as the main driving force of United States' economy during the period under analysis. Railway companies started to proliferate since the western portion of the country represented an opportunity to build many railroads. These companies needed to raise additional capital on the market and so started to issue huge quantities of bonds. On the one hand those titles were very profitable, but on the other the insolvency risk involved was difficult to evaluate. From this

[3] These entities collected commercial information through their agents and then sold them to investors.
[4] Standard & Poor's Global Ratings, Moody's, and Fitch Ratings.

situation arose one of the most common but serious problem in an economic environment: asymmetric information which leads to uncertainty and distrust between lender and borrower.

The figure of Henry William Poor, an American lawyer and entrepreneur, was crucial for the birth of the credit rating agencies. He became an expert and a leading figure in the market, because of important and successful investment he made in the railway industry. Later, he founded with his son the H.V. and H.W. Poor Co. The company started to operate as a credit reporting agency and was also active in the editorial field. By 1890, it was publishing periodically an updated handbook called *Manual of the railroads of the United States*[5]. It contained information regarding railway companies. The manual became immediately very popular among managers and small investors. In fact, it allowed the readers to monitor closely the growth of a single enterprise. Additionally, investors could autonomously compare the performances of different railroad companies but using only one reliable and revised source[6]. Later, the Poor family founded the Rating Agency Poor Publishing Company in 1916. Subsequently, the merger that took place in 1941 between the Agency and the Standards Statistic Bureau[7], set off the birth of the well-known Standards and Poor's which currently has approximately 40.0 % market share. Nowadays, S&P owns much of its popularity to the S&P 500, the yardstick US stock index listing about one trillion of dollars in assets.

During the two decades following the first publication of the *Manual*, numerous analysts started to specialize in the sector and to issue railroad industry reports. These consisted of statistical and financial details on individual companies.

[5] The first publication of the *Manual* dates to 1868.
[6] The manual contained a stock of information taken by the companies' reports. For example, the number of miles of railroad built or under construction, costs incurred, profits and some useful comparative indexes.
[7] Standards Statistics Bureau was founded in 1906 by Luther Lee Blake who was another pioneer in the business of selling information about the railroad industry.

John Moody collected these details, believing that investors would pay a fee for a service that sorted the mass of information into an easily digestible format. He started to use a range of intuitive symbols[8] which clarified unambiguously and synthetically the quality and the insolvency risk of a given bond. As a result of this brilliant intuition, he published his first rating scheme for bonds in 1909, in a book entitled *Analysis of Railroad Investments* where he assessed the credit quality of 200 railroad companies. In the same year Moody's Investors Service was incorporated in New York: the rating industry as we intend it today was officially born. On the wave of the success obtained by Moody's Investors Service, the rating market started to proliferate. It is in this scenario that the credit rating agencies established themselves in the financial panorama. They started to perform the role of an independent third party carrying out an objective analysis of the titles emitted in the financial market. For a small-medium sized investor it is more convenient (both in terms of time and accuracy of information) to rely on experts with sophisticated tools and experience in assessing risks of financial securities, rather than on his imperfect guess. Through this evaluation, information asymmetries between borrowers and lenders shrank, contributing to the smooth functioning of financial system.

By the mid-1920s, almost 100.0 % of the bonds issued in the US was rated by Moody's Investors Service. Thanks to this, financial players were able to compare different investment opportunities arising in the railway industry. At this point, it is important to stress a striking feature regarding the rating industry: the constant fewness of incumbents. This is a trend which started with the birth of the first CRA and it is still in place nowadays. We will return on this point later.

However, there was not a strong demand for ratings until the market boom of the 1920s. After the market crash of 1929, credit rating industry experienced a period of general decline. Investors

[8] The creditor rating expressed by *Moody's Investors Service* ranges from Aaa (excellent quality, lowest insolvency risk), Aa1, Aa2, Aa3, A1, …, to C (worst quality, usually in a default situation where the chances of recovering both the interest payments and the principal are lacking). The most relevant partition embeds two macro-categories: "investment securities" and "speculative securities"[8] (which currently would be called "junk bonds"). Within each of the two there are more accurate ratings' categories.

were not very willing in purchasing ratings due to a lack of trust in the CRAs which on some occasions performed poorly in anticipating sharp drop in bond values. One shameful case involved the default by Chicago, Rock Island & Pacific Railroad on bonds that were top ranked by all the major agencies. During the 1990s the number of bonds rated by the major CRAs increased radically. By 1997, Moody's was rating 20,000 both public and private issuers and securities worth approximately 5 trillion of dollars. S&P rated 2 trillion of dollars. The quote which begins this paper was not pronounced in 1996 by chance. Moody's market capitalization amounted to more than 15 billion of dollars in 2005. Nowadays, it amounts to 70.88 billion of dollars[9]. Additionally, Moody's enjoyed the highest profit margin among the S&P's 500 for five consecutive years.

A radical change in the relationship between CRAs and the US bond market occurred in the 1930s. Bank regulators were encouraging banks to hold only safe bonds and they issued a set of regulation which culminated in a 1936 decree prohibiting banks from investing in "speculative securities" as determined by "recognized rating manuals". Thus, banks were allowed to hold only bonds that carried an "investment grade". In modern terms, according to the S&P's scale, this would be equivalent to bonds rated BBB or above. Due to this regulation, banks started to be forced to use the judgements performed by the "recognized rating manuals", namely Moody's, S&P, and Fitch. Thus. creditworthiness assessment provided by these third parties conquered the force of law. Additionally, in the following decades, almost all state insurance regulators established minimum capital requirements depending on the quality of the bonds in which companies invested. Intuitively, the source of the ratings was the same group of the three agencies. In 1970s, federal pension regulators realized a similar strategy. The three agencies' crucial role in the financial markets was crystallized by the Security and Exchange Commission in 1975. The SEC, following the pattern of the other regulators, mandated capital requirements for broker-dealers[10] to be proportional to the riskiness of the security portfolios held.

[9] The market capitalization refers to August 14th, 2021.
[10] Broker-dealers include major investment and securities firms.

Consequently, credit ratings were necessary. However, the SEC was concerned about the fact that "recognized rating manuals" could employ too different standards and methodologies to evaluate the creditworthiness of a security. To tackle this potential problem, the SEC established the category of Nationally Recognized Statistical Rating Organization (NRSRO) and immediately grandfathered S&P, Moody's, and Fitch into this category. The SEC established that only the ratings released by NRSROs were valid to determine capital requirements for broker-dealers. Taken together, these regulations meant that CRAs' assessments became of central importance in the financial system. Additionally, many institutions started to depend on these gatekeepers. During the 25 years following the establishment of the NSRSOs category the SEC designated only four additional agencies as NRSROs. However, mergers among Fitch and new entrants caused the number of NRSROs to decline to the original three by year-end 2000.

1.2 Industry overview: a duopoly plus

The competitive environment of the credit rating agencies has not changed substantially since the establishment of the industry. It is not a hasty statement since the rating business has always been in the hands of the usual three players: S&P, Moody's, and Fitch. Those three companies are usually identified as the "three sisters" of the rating industry. This epithet arises from a sustained and absolute supremacy in the competitive arena.

The credit rating industry is highly concentrated. It is an oligopoly. As of 2010, the market shares in the US based on the number of ratings provided are: S&P 42.0%, Moody's 37.0%, Fitch 18.0%, and the other six[11] SEC-designated nationally recognized statistical rating organizations (NRSROs)[12] add up to about 3.0%. Moody's and S&P rate substantially more corporate and ABS

[11] In alphabetical order, the other six NRSROs are A.M. Best Rating Services, DBRS, Egan-Jones Ratings, HR Ratings de Mexico, Japan Credit Rating Agency, and Kroll Bond Rating Agency.

[12] To be considered as a NRSRO, the SEC must deem the agency to be "nationally recognized" in the US and it must produce trustworthy and realistic ratings. Other criteria which are taken in consideration by the SEC are the

than Fitch does. Moreover, S&P and Moody's are sometimes regarded as a duopoly or partner monopoly since the sum of their market shares account for approximately 80%. However, this is an incorrect interpretation. Fitch is not an irrelevant player at all in the industry under scrutiny. The latter rating agency counts on a considerable market share and performs the role of a smaller but is a considerable third competitor. Summarizing what we have just pointed out, we can say that the composition of the rating industry is something between a duopoly and an oligopoly. It is a "duopoly plus"[13]. This description reflects that S&P and Moody's have prominent market segments, but Fitch cannot be overlooked. I found this definition very creative and appropriate, and I want to borrow it for my paper. The competitive situation is quite similar in Europe where the market shares are: S&P 40.0%, Moody's 33.0%, Fitch 18.0%, DBRS 3.0%, and many others which are under the 1.0%.

The credit rating industry was never going to be characterized by a competitive arena with hundredths of small-scale producers. The causes behind the existence of the duopoly plus are mainly barriers to entry such as economies of scale, competitive advantage stemming from experience and brand reputation. Additionally, regulations in the US prevented the new CRAs from entering the credit rating market. In 1975, the Securities and Exchange Commission (SEC) designated Moody's, S&P, and Fitch as Nationally Recognized Statistical Rating Organizations (NRSROs). NRSRO designation became a noteworthy barrier to entry into the bond-rating business for a long time. In fact, the SEC has always been obscure in its designation process. It never disclosed for a long time some formal criteria to be designated as a NRSRO and never provided any explanation for why it chose some agencies and not others. In second place, a strong reputation is necessary attribute to operate successfully in the credit rating market. S&P, Moody's

operational magnitude and the agency's financial resources. Credit ratings provided by NRSROs are employed by the government in several regulatory areas such as the determination of broker-dealers' net capital requirements. Additionally, the ratings issued by NRSROs determine the kind of securities that a money market fund may hold and the investment possibilities for a pension fund. There are rules mandating that certain investors (such as pension funds) can only invest in bonds with high NRSRO ratings.

[13] This term was coined by Robert J. Rhee in 2013.

and Fitch have been incumbents of the industry for a long time. This made it difficult (if not impossible, under current regulation) for new companies with less experience difficult to enter the credit rating industry. It is a matter of fact that smaller CRAs struggle to enlarge their customer base. Issuers usually prefer to have their securities rated by the most appreciated and reliable agencies. The more this pattern is repeated, the more the already dominant firms will become even more influential.

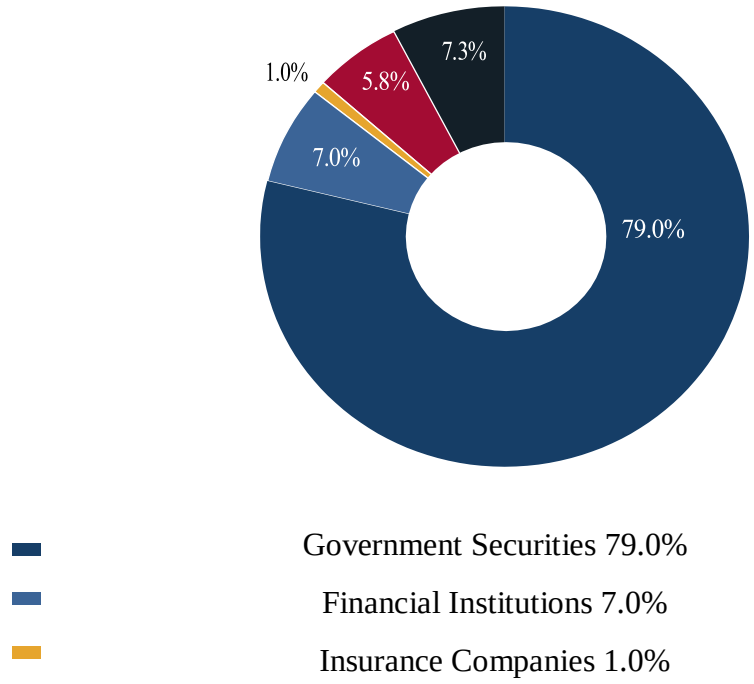
According to the Basel Committee on Banking Supervision, the number of credit rating agencies worldwide is close to 150. The agencies can be divided into three categories:

- National agencies employing statistical models to determine the solvability of the full national market. This type of agency is characteristic of Sweden.
- Agencies that restrict their analysis to given geographical areas. For example, Capital Intelligence deals with ratings of Central and Western Europe.
- Global agencies, supplying their services all over the world. Of course, the "three sisters" belong to this group.

To fully appreciate the level of concentration present in the rating sector, it is interesting to have a look at the underlying tables. These provide simple but meaningful analytical evidence. Chart 1 clarifies the percentages of the outstanding credit ratings attributable to each rating class. To be precise, it is correct to specify that each NRSRO makes its own valuation when deciding the category into which each of its outstanding rating falls. However, despite this small inconsistency that may arise, the picture is crystal-clear. In 2019, the largest proportion of the outstanding aggregate credit ratings fell in the government securities category.

If we consider Chart 1 and Chart 3 at the same time, it is possible to detect immediately the extraordinary level of concentration[14] that characterizes the rating industry. Government securities' ratings account for 79.0% of the total number of credit assessments. As shown on Chart 3, it is also the most concentrated category. When adding the percentages relative to the "three sisters", the result is that 98.7% of all outstanding government ratings are performed by the larger NRSROs. To further support the definition of duopoly "plus", it is appropriate to provide analytical evidence regarding the staffing levels. The "three sisters" employ 5,277 credit analysts (supervisors included), accounting for approximately 81.0% of the total number employed by all the NRSROs. This situation is described in Chart 2.

Chart 1: breakdown of ratings reported as of December 31, 2019



[14] Usually, economists measure the concentration in a given industry through the Herfindahl index, also known as Herfindahl-Hirschman index or HHI. It is computed through a formula which considers the relative market shares of the industry's incumbents. The higher the index, the higher the concentration and the lower the competition. The value of the index ranges between values close to zero and one.

Corporate Issuers 5.8%

Asset-Backed Securities 7.3%

Source: SEC's annual report on NRSROs (2020)

Chart 2: NRSROs' credit analysts and credit analyst supervisors		
NRSRO	Credit analysts (including credit analyst supervisors)	Credit analyst supervisors
AMB	154	55
DBRS	475	110
EJR	23	12
Fitch	1,277	312
HR	52	10
JCR	62	30
KBRA	172	48
MIS	1,732	278
S&P	1,559	119
Total	5,506	974

Source: SEC's annual report on NRSROs (2020)

Chart 3: percentage by rating category of each NRSRO's outstanding credit ratings of the total outstanding credit ratings of all NRSROs as of December 31, 2019						
NRSRO	Financial Institutions	Insurance Companies	Corporate Issuers	Asset-Backed Securities	Government Securities	Total Ratings
AMB	N/R	34.2%	0.8%	0.0%	N/R	0.4%
DBRS	7.1%	0.8%	3.4%	14.3%	1.2%	2.7%
EJR	6.5%	4.2%	5.9%	N/R	N/R	0.8%
Fitch	23.6%	15.7%	16.4%	22.0%	11.0%	13.0%
HR	0.5%	N/R	0.3%	N/R	0.0%	0.1%
JCR	0.6%	0.4%	2.3%	N/R	0.0%	0.2%
KBRA	0.7%	0.5%	0.2%	8.3%	0.0%	0.7%
MIS	23.8%	12.0%	25.9%	31.9%	33.4%	32.0%
S&P	37.2%	32.3%	44.8%	23.6%	54.3%	50.1%

Source: SEC's annual report on NRSROs (2020)

Finally, Chart 4 shows the percentage of aggregate NRSROs' revenues since 2016. Most of the revenue was accounted for by the larger NSRSOs (namely the duopoly plus) and the remainder by the smaller NRSROs. Moody's reported a 6% increase in external revenue when compared to 2018 results. S&P Global Inc. (S&P's parent company) revealed that revenue at S&P rose by 8%

compared to its 2018 performance. In the light of the evidence provided in this chapter, from now on, I will refer to the "three sisters" also with "larger NRSROs".

Chart 4: NRSROs' revenue information: fiscal year percentage of total reportedNRSROs' revenue				
	2019	2018	2017	2016
Larger NRSROs	93.3%	93.5%	94.1%	94.4%
Smaller NRSROs	6.7%	6.5%	5.9%	5.6%
Total	100.0%	100.0%	100.0%	100.0%

Source: SEC's annual report on NRSROs (2020)

1.3 Role of CRAs in the debt market

Credit rating agencies are vital and influential institutions for the global economy. If they had performed accurately, the global financial crisis of 2008-2009 would not have occurred, and the path of world history would have been different. I will examine in depth this point later.

Debt and equity provide for the long-term capital needs of companies. In the second quarter of 2021, the value of transactions on the international debt capital markets[15] amounted to 1,64 trillion of US dollars. Considering the same span of time, the value of traded equity worldwide was 34.8

[15] The securities considered for the purpose of this statistic include, for example, government, municipal, corporate or mortgage bonds.

trillion of US dollars. This ratio of debt to equity is not unexpected but is rooted in corporate finance's academic theories backing the theory that debt, when properly managed, can be value enhancing[16].

CRAs assign a rating to publicly traded bonds. It is a probabilistic valuation of the creditworthiness of the issuer, indicating the probability of default. The bond itself or the issuer is placed on an ordinal scale. The scales employed by the larger NRSROs are very similar. The ratings' organization in decreasing order for the quality is AAA, AA, A, BBB, BB, and so on, with pluses and minuses as well. Credit ratings influence the price at which bonds are issued in the primary markets and traded in the secondary ones. Clearly, the higher the rating, the higher the security value. Consequently, they are a relevant determinant of interest rate (or borrowing cost) which governments, monetary (MFI) and non-monetary financial institutions (NMFI)[17], corporations and insurance companies face in financial markets. Credit ratings are necessary because many financial institutions (such as banks, broker-dealers, insurers, and investment funds) are constrained in the risks that they can assume in the construction of their portfolios. Stated in more technical terms, the moral hazard risk of these institutions is kept under control. Additionally, CRAs claim to provide the market with a long-term prospective rather than an up-to-the-minute assessment, following the policy of "through-the-cycle rating". It implies increasing or reducing the rating not only once but through small steps over time. It has the purpose of keeping rating as stable as possible, thus reducing shocks during the economic cycle. For this reason, CRAs do not drastically change their assessment if temporary changes have occurred in the debtor's financial situation. Consequently, the rating does not reflect the short-run probability of bankruptcy, but the one in the long-run, which better coincides with the investors' interests. There is no doubt that a

[16] This theory arises from the fact that in the United States and in other many countries, it is possible to deduct from taxable income the interest paid on debt.

[17] MFI are ordinary bank. They collect deposits, grant loans trade securities, and have access to the Central Bank. NMFI are investment banks and shadow banks. Both do not have access to the Central Bank. On the one hand, investment banks only trade securities. On the other hand, shadow banks grant loans and trade securities. Shadow banks transform short-tern funds into long-term assets through the process of maturity transformation.

good degree of ratings' stability reduces fluctuations in the bond market and so the frequency with which investors have to adjust their portfolios is reduced. However, stable ratings must not come as a trade-off with exact ratings. During periods of great changes in the financial market, the ratings "lag-behind" the current situation and in cases such as the aforementioned the result can be inadequate. This strategy implies that ratings will always experience a delay in reflecting a creditworthiness decline or improvement.

The sluggishness that characterizes the upgrades and downgrades raises an important question: do the "three sisters" actually provide the market with useful and updated information about the default probabilities of the rated instruments? Thus, which is the role of CRAs in financial markets?

Two standard theories try to explain the role of the CRAs and the reason why they exist. The first one states that rating agencies reduce information asymmetries between issuers and investors, thus solving the "lemon" problem. The second affirms that CRAs reduce the cost of regulation. I will go through them separately and provide an alternative reason of existence which lies in the middle between the two.

The relationship between a lender and a borrower is a power relation. The lender owns something valuable that the borrower needs. Once they enter a contract, it means that the lender trusts the borrower's capacity to repay. In fact, the word "bond" derives from the tie which is established between lender and borrower. As in all kinds of relationships between two individuals, when one party suffers the other suffers as well. Information asymmetries have always been a relevant component of transaction costs throughout history. When a borrower is more informed about its creditworthiness than a creditor does, the creditor will fear that the borrower will agree to conclude the transaction only when the latter is providing the capital too cheaply. As a result of this, the creditor will raise the interest to protect itself from the scenario in which the debtor reveals a "lemon" or more simply a lower quality borrower. The resulting scenario will be an inefficient one. Safe borrowers will refuse to overpay for credit due to their incapacity to prove their quality

(information asymmetry). They will be driven out of the market by higher rates. In an extreme situation only "lemon" borrowers will borrow. Loan granters could collect information about borrower's quality themselves, but this activity would turn out to be exceptionally costly. Moreover, the benefits of the knowledge acquisition may result lower than the acquisition costs, leading to the just described market failure. Additionally, the information about the creditworthiness of a debtor can be acquired by another creditor at an extremely low marginal cost. The fact that another creditor can "free ride" off the valuable information produced by another creditor works as an additional deterrent.

Rating agencies correct this problem by acting as an intermediary between creditor and debtor, producing independent information on the borrower's creditworthiness. CRAs then makes the rating widely and freely available. As an evidence of their value in the financial markets, CRAs stress the correlation over time between their ratings and the likelihoods of insolvency. For example, Moody's in its 2013 annual report proudly stated that the agency's long-term good performance is illustrated by data. The company claimed that over the past 80 years, the financial instruments with lower ratings consistently defaulted at greater rates than those carrying higher rates.

However, this explanation for the reason of existence of rating agencies can be susceptible to some criticism. First, it is not sure that creditworthy borrowers will be driven out of the market. Corporate finance explains the theory of the choice of capital. According to it, the rationales for issuing debt may survive despite the higher cost of debt stemming from information asymmetries. Due diligence, credit history (if debtors are repeated players) and independent analysis can nevertheless reduce the information gap. Unless one is a supporter of the efficient market hypothesis (EMH) in its orthodox form, some degree of information asymmetry will always permeate the debt market. However, it is not established that information asymmetry implies a market exclusively composed by "lemon" borrowers. Additionally, some commentators have

realistically argued that rating agencies do not create new information to the market. In fact, the rating is simply an output from analysis of information which is of public domain.

Another theory holds that rating agencies exist to regulate bond investments performed by financial institutions. As I have already said previously, the Security and Exchange Commission (SEC) delegates some aspects of regulation by conferring rating agencies with the NRSRO status[18]. It works as a license for CRAs, enabling them to regulate portfolios of investments and minimum capital requirements of financial institutions. This argument has substantial basis. Credit ratings are pervasively used in the regulation of investments and financial institutions. An example is the regulation of bank capital. Still another example is the pervasive use of ratings to regulate the liquidity and investment portfolios of insurance companies.

I argue that nor the information asymmetry theory nor the regulatory license theory can fully explain the reason why CRAs have a prominent role in the financial markets. Rating agencies would exist whether or not the government mandates the regulatory use of ratings.

By comparing equity and bond markets it is possible to appreciate a valid alternative reason supporting the existence of CRAs. Bond and equity are both a source of financing for corporations but differ in some ways. On the one hand bonds are generally easier to evaluate than equities. The value of this securities is determined by the creditworthiness of the issuer, instalments payments, principal payments, maturity date, and the interest rate[19]. Debt has a low β[20] and dealing with the risks of debt is simpler since less effort in diversification is necessary to manage a portfolio of debt. On the other hand, equities, are more *sui generis* instruments, granting the claim over the financial residual. Potentially, they have no ceiling on theoretical value. Equities are less

[18] U.S. regulators had long incorporated ratings in various ways, but before 1975, regulators commonly referred only to "recognized ratings manuals." It was only in 1975 that the SEC identified specific firms whose ratings must be used. This designation has been the most significant barrier to entry preventing the industry from assuming a shape different from a duopoly plus.

[19] The most basic or standard version financial instruments (usually options, bonds, futures, and swaps) is called Plain Vanilla. It is the opposite of a structured financial instrument.

[20] β measures the volatility of a given financial instrument (usually a stock) with respect to the overall stock market.

standardized, and this is reflected in the higher variance (implying a higher risk) among their returns. The fact that the credit market is simpler but larger poses a problem of the efficient allocation of research resources. Since equities are more complex financial instruments with greater prospective payoffs, they should involve greater share of the market's research resources on a dollar-for dollar basis. However, the greater volume and number of issuers of fixed income securities[21] implies that the activity of credit analysis would draw a significant portion of the available research resources by investors absent the existence of rating agencies. In fact, the scenario in which single investors (especially the smaller ones) individually collect data and information in order to evaluate the creditworthiness of an issuer, is clearly unrealistic and sub-optimal. The amount of information existing in the credit market is large, and this information must be processed by some specialized institutions. In fact, the industry of securities analysis has been considered as the most pervasive example of market's need for both economies of scale and scope. Even large pure bond investors will find the task of organizing all the globally available information overwhelming. Cooperation among bond investors is not a solution either. It is a matter of fact that competitive advantage of honest investors is good information. In the light of this, problems of coordination with respect to how much research and resources each firm should provide, would arise. This will result in a problem of free riding, leading to efforts to police it and ultimately to a market failure.

The task of CRAs is to provide the market with ratings but this matter of fact does not provide a full explanation for the role of these powerful institutions. Why is their credit analysis essential? The truth is that CRAs are not originators of information. Instead, they are sorters of information. Someone may argue that once all these huge data are systematized through a uniform set of ratings, the result can be considered as a new information at the disposal of the market. I can also agree with this analysis, but my point of view is that CRAs perform the role of information classifiers and not originators. Nevertheless, this question is purely theoretical and not very practical.

[21] I have illustrated both the bond and the equity global markets in the first part of this sub-chapter.

Efficiency in the capital market depends on information. Information sorting promotes price signalling and value detection. On the one hand information sorting bears on transaction cost. On the other, new information bears on value. The sorting function promotes market efficiency which is a condition that does not exist as a state of nature. It is more than reasonable to believe that removing the 5,277 credit analysts employed by the larger NSRSOs would negatively affect market efficiency.

Given that rating agencies cover the entire spectrum of the credit market, no other financial player can replicate this function on this vast scale. As I have stressed, although sorting is crucial to enhance market efficiency, it is a simpler function than investing. Obviously, systemic, or intentional errors, as the ones that worked as sparks in the financial crisis of 2008–2009, are highly problematic and require some public policies in order to guarantee a long-term solution.

1.4 Evolution of CRAs' business model

Initially, since the first days of Moody's Investors Service, CRAs adopted a subscriber-pays business model. It means that agencies were paid by the single investor to rate specific securities. However, during the 1970s the source of revenue changed. Several reasons to explain the change of business model have been proposed. First, newspapers and other news services started to consider ratings as news and to incorporate them in the economic section. This new routine obviated the need for payment by investors. Second, the rating firms feared that the rapid advent of high-speed photocopy machine would allow many investors to free ride by receiving photocopies from their friends. Third, the CRAs may have realized that the financial regulations described in the last paragraph of the subchapter 1.1 implied that bond issuers needed the "blessing" of one or more NRSROs in order to position those securities in the portfolio of regulated financial institutions. Consequently, CRAs though those issuers were willing to pay for this benefit. Fourth, the expansion of the financial markets in the 1960s, after decades of quiet

activity following the Great Depression, and World War II implied that the agencies required more resources to meet the greater volume and complexity of securities. In the early 1970s CRAs switched to an issuer-pays business model which is currently the most common compensation scheme in the rating industry. The issuers started to pay a fee in order to have rated the securities they wanted to market[22].

In the light of all the illustrated reasons, this change of business model towards an opposite one was unavoidable. A common feature of the two business models that I have just briefly illustrated is that both imply a solicited rating as outcome, meaning that judgements or opinions are induced by an interested financial player. While in the first business model the rating is solicited by investors, in the second the evaluation is required by the issuer itself.

The change to the issuer-pays business model opened the door to potential conflicts of interest arising from a mutual linkage surfaced among the CRAs, issuers and investors. In fact, a rating agency might give an inflated rating both to prevent that the issuer takes its business rating to a different agency and to attract new customers. However, CRAs' concern about their long-run reputations kept the conflicts of interest under control during the first three decades of practice with the issuer-pays business model. It is important to highlight two important features of the bond market that helped. First, there were thousands of corporate and government bond issuers, so that the threat of a single customer was not relevant. Stated in more technical terms, the bargaining power of customers was extremely low. Second, corporations and governments whose debt was evaluated were relatively transparent. Consequently, a clear incorrect rating would be quickly spotted by others and would be detrimental to the agency's reputation.

The problem of the conflict of interest started to worsen when CRAs began to provide both consulting and rating services. This means that they rated the same financial instruments that they helped to structure. Subsequently, to increase their revenues and enlarge the business, they started

[22] Nowadays, approximately 90.0% of CRAs' revenues stems from fees paid by issuers.

to rate also more complex and structured products, especially credit derivatives and started to employ complex statistical models to assess the credit risk. Individual and institutional investors, being unable to make valuations about the inherent risk of these extremely articulated products, fully relied on ratings. This inborn attitude boosted the phenomena of rating shopping through which issuers look for the best bargain both in terms of rating and fee. Issuers needed high ratings in order to sell securities and to reduce the cost of their debt. Credit rating is a bilateral process in which CRAs rely on the information provided voluntarily by the issuer. However, the CRAs do not have the power (and probably neither the incentive) to investigate and to require further information. In the light of this, the risk that the issuer may conceal some relevant (and probably negative) information regarding its creditworthiness is concrete.

Rating agency fees depend on the magnitude and complexity of the issue. Concerning corporate debt, the charges range from 3 to 4 basis points[23] of the size of the issue. The minimum amounts vary between 30,000 and 50,000 dollars. Revenues are higher when it comes to structured finance issues, ranging up to 10 basis points. For an additional amount, issuers deliver hypothetical scenarios (such as asset sale, equity repurchase, dividends payment, merger, and so on) to the rating agency. Issuers may want to purchase this service in order to understand how a particular transaction would affect their ratings. Additionally, the larger NRSROs offer risk management services. Although rating agencies claim that fees arising from ancillary services are inadequate, there is evidence supporting the assertion that charges are rising.

2. 2008 global financial crisis: players and issues

[23] One basis point is the hundredth part of 1.0%. It corresponds to the 0.01%.

2.1 First problems

To fully understand the 2008 global financial crisis, it is necessary to consider several players and the interconnections among them. If the causes of the crisis were arranged through a sort of pyramidal organization, mortgage-backed securities[24] (MBS) will occupy the bottom position. The additional events and institutions that have to be regarded as causes (and eventually blamed) are the housing bubble, monetary policy, debt securitization, increase in leverage, and last but not least, CRAs. Their failures considerably strengthened the negative effects of the global financial crisis. Of course, I will focus especially on the CRAs' role, being the subject of my paper.

Over a long period after their establishment in the financial sector, CRAs retained their high authority and assigned relatively appropriate ratings. However, globalization, increase in volatility, financial and technological which have characterised financial markets for thirty years, called into doubt the ratings' exactness.

For example, during the Asian financial crisis which occurred in the late 1990s, the larger CRAs proved too slow to respond to the new market conditions. The most affected countries (namely Thailand, Indonesia, and South Korea) enjoyed an "investment grade" for six months after the beginning of the crisis[25]. The magnitude of subsequent downgrades was too great relatively to the economic conditions. This led to a considerable increase in the cost of debt and worsened the crisis in the above-mentioned countries. In defence of the CRA's behaviour, it is worth specifying that Asian countries were rated for a relatively short period of time, so that the accumulated historical data could not be sufficient to perform a reliable creditworthiness assessment. Secondly, the quality of financial reports in Asian countries was considerably lower than the ones of the developed nations.

[24] Mortgage-backed securities are the most popular type of asset-backed security (ABS). The first MBS was issued in 1968. Subsequently, the MBS market expanded rapidly and by 2010 the cumulative issuance value exceeded 9 trillion of dollars.

[25] Conventionally, the Asian financial crisis started on July 2nd, 1997, when the Thai baht suffered a devaluation.

Another flaw of the CRAs are the bankruptcies of several big corporations in developed countries during the first decade of this century. The first case was Enron in 2001. Media and the Congress noticed that the "three sisters" had maintained investment grade of (BBB-) five days before it declared bankruptcy, even though information about the difficult financial situation had been available months before. Before that moment, the NRSRO system had been one of less well-known features of the federal financial regulation. Enron's bankruptcy clearly exposed CRAs' issuer-pays business model (and the consequent potential conflict of interest) to a wider public view. Additionally, in 2002, the larger CRAs classified Worldcom as "investment grade" two months before its liquidation. In 2003, Parmalat was given the same rating and declared bankruptcy 18 days later. In support of the CRAs' conduct, one could state that in all the three cases there was fraud. The information submitted by the companies was false and reliable data was concealed. This problem was worsened by the fact that, contrary to auditors CRAs do not have the power to examine the accuracy of data or to require further information. They can just rely on the issuer's good faith.

2.2 Securitization, Fed, and government: impact on the housing bubble

The housing bubble was in some sense sponsored by the US government and the Fed. During all the 1990s until 2004 the Fed kept the interest rate low. This led to an abundance of liquidity which enhanced high leverage and greater risk-taking. The accommodating fiscal policy was a response to the crisis of the internet bubble and to the attacks of September 11th, 2001. The low interest rate produced two effects. On the one hand, the demand for mortgage increased, leading to a jump in houses' prices. Furthermore, the growing housing bubble, made mortgage concession apparently almost riskless in the eyes of lending institutions which, in case of borrower's insolvency, could nevertheless recover the amount through foreclosure and resale of the house. On the other hand,

investors (such as pension funds, hedge fund and investment banks) were encouraged to look for instruments offering higher yields. Securitization, which became popular in the US especially during the period 1999-2007, came in handy to meet this need for higher returns embedding higher risks. In fact, this financial process offered the opportunity to turn assets rated below "investment grade" into AAA bonds[26]. Securitization process consisted in pooling some receivables[27] into a trust which is called trust's collateral pool. Usually, the receivables are illiquid assets. The key feature of the securitization process is that not all the securities constructed with the trust's receivables have the same chance of repayment. The different repayment priorities are called "tranches". In other words, through sophisticated modelling the same pool of securities can originate several financial instruments. The more senior securities are the ones which are paid before and get the highest rating. The other securities are paid through a "waterfall" process. These are paid from the funds that remain and are granted lower ratings. Critically, even if none of the receivables is high rated, the pool can issue some AAA or closely rated securities, thanks to diversification principles. One consideration: the cumulative face value of some pooled receivables is one hundred and the receivables are not perfectly positively correlated, surely an amount lower than one hundred will be paid with a considerable degree of confidence. Given the costs (time, legal and rating agency fees) that come with securitization, the holder of an ABS pool trust would perform this process only if he can obtain a positive net present value. Now I will spend some lines to describe more in detail the securitization process and how it turned out to be a profitable business feeding the financial crisis.

Especially, a relevant contributor to the crisis was the massive demand by CDOs for BBB mortgage-backed bonds. Demand for these triple-B bonds fuelled a considerable growth in mortgages. This demand for BBB ABS bond arose from the fact that the bond had high yields.

[26] CRAs rated the different tranches through statistical tools. For example, S&P used CDO Evaluator, Moody utilized CDOROM, and Fitch employed VECTOR.

[27] Receivables are rights to receive payments. The most popular receivables are cash flows deriving from mortgage, credit card, and general loans.

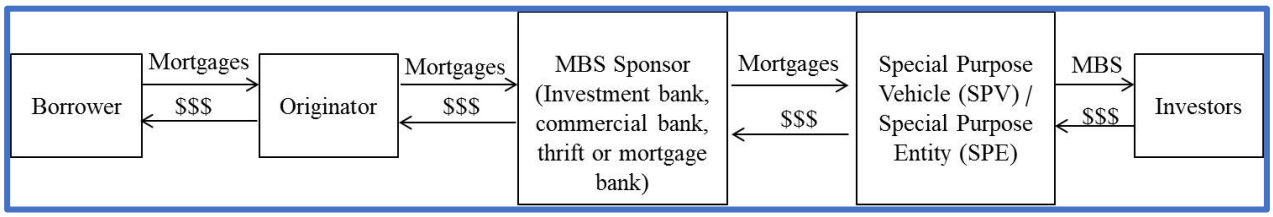
The CDO financed the purchase of the bond by issuing AAA bonds from the pool. Of course, these paid a lower interest than the BBB. This was possible because CRAs assigned AAA ratings to bonds whose creditworthiness was lower. This process was called repackaging and allowed the owners of the pool of receivables to generate a positive net present value.

Additionally, in 1977, the federal government passed the Community Reinvestment Act (CRA). It was enacted in order to "encourage" the lending institutions to increase home ownership in the US. Support for "affordable housing" became a relevant part of local and national politics, incentivized by generous "donations" from Government-Sponsored Enterprises (GSEs)[28] to representatives of the Congress. Fannie Mae, Freddie Mac, and also other financial institutions bought pools of mortgages from the issuers. The receivables were pooled together and the different cash flows deriving from the pool were sold to investors as MBS.

Thanks to the securitization process, the business model of the banks switched from the originate-to-hold (the bank grants the loan and waits some time before getting back the principal plus the interest payment) to the originate-to-distribute (the bank grants the loan and sells it to a third-party through securitization, recovering immediately the lent amount). Through securitization banks could recover in a notably short period of time the amount of the mortgage and grant other loans. Thanks to securitization, financial institutions increased enormously the magnitude of their activities with respect to their capital (financial leverage). They could realize important profits but at a great risk.

[28] GSEs are entities sponsored and backed by the US federal government. Their purpose is to enhance the flow of credit from lending institutions to the real American economy (mainly students, homeowners, farmers). GSEs do not lend money directly to borrowers. In fact, their business consists in guaranteeing third-party loans. Additionally, they purchase loans in the secondary market and perform the securitization process. Fannie Mae and Freddie Mac are two of the most important GSEs.

Chart 5: originate-to-distribute model



Source: Financial Crisis Inquiry Commission, 2010

Chart 5 illustrates the chain of the originate-to-distribute model. Lenders removed the mortgages from the asset side of their balance sheet by selling them prevalently to investment or commercial banks. Many financial institutions (especially banks) set up structured investment vehicles (SIV) or special purpose vehicle (SPV). Their business model consisted in borrowing funds from investors by issuing short-term asset-backed commercial paper and then used the funds collected to purchase trances of CDOs backed by mortgages. If the MBS secured a high rating, then also the asset backed commercial paper could also be high rated, making the borrowing process cheaper. The combination of the possibility to remove mortgages from the balance sheet with market's need for high yield instruments, increased the concession of subprime mortgages[29]. In 2006, subprime mortgages accounted for 13.0% of all outstanding mortgage loans. Additionally, there was another incentive on the side of subprime borrowers. Namely they paid very low rates during the first years (teaser period) and subsequently could refinance the borrowed amount thanks to rising housing prices. We can divide the borrowers in two types. Those who actually lived in the house and believed to have a good deal and those who just were speculating. When the teaser

[29] A subprime mortgage is conceded to clients who have a low credit score and thus cannot have access to a conventional mortgage. Of course, given the level of risk, the interest paid is higher (usually 200-300 basis points above the prevailing prime mortgage rates). Subprime borrowers are often high levered, showing high debt-to-income ratios.

period was over, the mortgage could be refinanced into a new teaser rate period loan. If refinancing was impossible, the speculator could default and walk away.

Summarizing, the point was that mortgage originators did not worry at all about issuing low quality loans. Those loans were immediately sold, securitized, and the risk transferred immediately, given the strong demand of investors for high-yielding instruments.

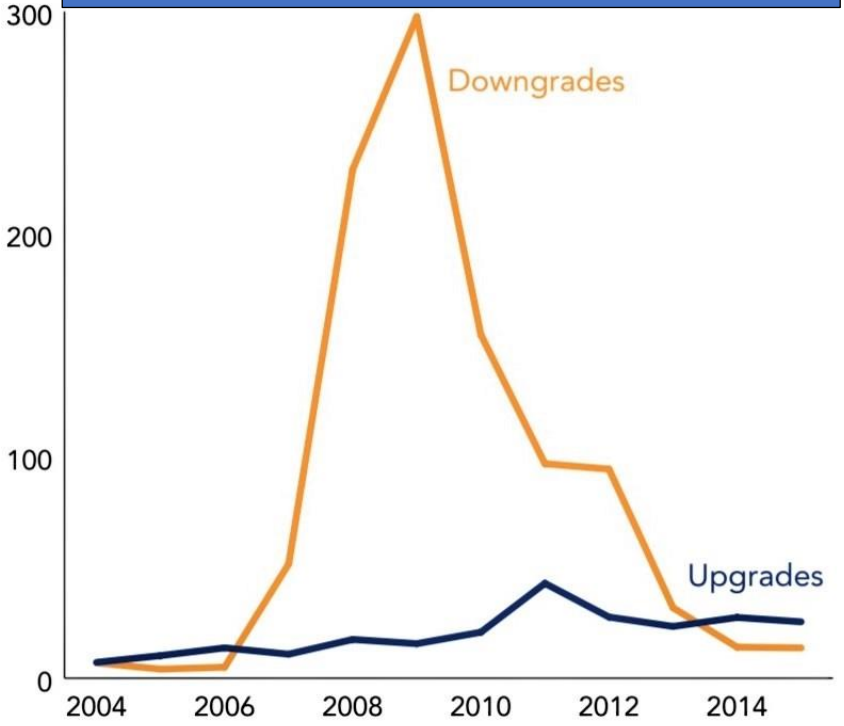
2.3 Failure of CRAs

At the beginning of 2004, the Fed started to raise interest rates in the light of the recovery of the country, to prevent overheating the economy and to keep inflation under control. Mortgages became increasingly more expensive and insolvency situations increased. The demand for houses reduced, prices decreased and the value of the collateral backing the mortgages shrank. The housing bubble burst. When the housing bubble burst, mortgages underpinning the securities started to default, reducing the value of highly rated securities and subsequently the capital cushion of highly leveraged companies. These events created the prerequisites for the financial meltdown.

The most significant (and unfortunately well-known) failure of CRAs is the risk assessment of CDO and MBS. By February 2008, Moody's downgraded at least one tranche of 94.2% of the subprime MBS that it rated. Overall, the rating agency downgraded 53.7% and 39.2% of all of its 2006 and 2007 subprime tranches, respectively. By March 2008, S&P downgraded 44.3% of the subprime tranches it rated between 2005 and 2007. By December 2007, Fitch downgraded roughly 34% of subprime tranches it evaluated between 2006 and 2007. By the beginning of the crisis, worldwide down ratings affected issues amounting to approximately 3 trillion of dollars. Despite the fact that historically AAA securities had less than one hundredth probability of default, more than 90% of the AAA subprime residential mortgage-backed securities (SRMBS) that were rated in the period 2006-2007 were subsequently downgraded to junk status. A 90% error rate is resounding for an industry that rates bond through a broad spectrum of very fine ordinal grades. The financial system had been flooded by toxic instruments. When Lehman Brothers declared

insolvency in September 2008, its official rating was A-. The insurance company AIG carried the same rating (A-) when it was bailed out by the Fed jointly with US Treasury Department. In both cases no fraud, no submission of false information, and no conceal of information was found. Those companies operated transparently, and the deterioration of their balance sheet was not temporary but perpetual. In these cases, CRAs committed some mistakes and engaged in egregiously lax and irresponsible business practices without a doubt. These are substantial changes and correctly raise questions regarding the rating methodologies which were employed by CRAs. The dramatic trend of structured securities' downgrades linked to mortgages is clear in Chart 6.

Chart 6: Rating changes in structured mortgage securities (in thousands)



Source: Bloomberg L.P.

To refresh the importance that CRAs assume in the financial landscape, it is important to recall that Federal regulations provided incentives for broker-dealers to hold debt carrying an investment-grade rating issued by at least two NRSROs. Additionally, for financial stability purposes, some regulated investors are prevented from investing in certain securities which are regarded as too risky. In the light of this, the market players, when determining appropriate investment options, were heavily dependent on the credit ratings assigned to financial instruments including MBSs. For example, money market funds can invest only in AAA rated assets. Pension funds and municipalities have their investments options restricted to investment grade assets. Many of these institutions invested in these assets and soon found out that their balance sheets had a relevant exposure to subprime mortgages. Additionally, according to Basel II regulation, ratings are employed to determine the amount of regulatory that a financial institution must keep for precautionary purposes.

The problem of the over-valuation of the titles and the procedures for the risk classification put in practice by the rating agencies have been under accuse mainly for two reasons. The first has to do with the conflict of interest linked to the issuer-pays model. The second has strictly to do with the rating procedure. I will go through both of them.

First, as I have explained in the sub-chapter 1.4, the adoption of the issuer-pays business model created a situation of conflict of interest and moral hazard in the hearth of the financial system. Issuers saw the possibility of having the rating process carried out by the agency which offered the best valuation. This financial alchemy which established between customers and CRAs turned out to be toxic for the whole financial system. The chain was simple. High ratings facilitated the sale of securities (originated from the trust pool) to institutions seeking relatively high yield from financial instruments that met the minimum rating quality. This helped to fuel the housing bubble.

The rating process was structured as follows. The rating agency informed the CDO trust partners about the procedure it would employ to rate the bonds. It explained the methods, the historical insolvency rates, the prepayment rates, and the recovery rates. CRAs received data from the originators of the mortgages and from the arrangers of the ABS, assuming that due diligence was performed. Additionally, the agencies clearly stated that they did not cross check that information. The rating process had a fixed target in terms of quality of the different "waterfalls". Of course, the higher the percentage of the AAA bonds, the better.

During the rating process simulations or the CDO's "waterfall" are performed in order to investigate the degree of protection of the senior bond tranche in bad scenarios. Through this analysis the amount of credit enhancement (CE) is determined. CE is the amount of loss that the junior tranches can bear without undermining the creditworthiness of the senior tranche. Stated in more statistical terms, the value of credit enhancement represents the threshold of losses such that the probability that the loss is higher than CE is equal to the probability of insolvency of the senior tranche[30]. Intuitively, the lower the credit quality of underlying subprime mortgages[31], the lower will be the credit enhancement for a given tranche. The crucial error was that methods employed for risk assessment were based on historical data. Given the fact that it relied on past performance, it did not reflect the current assets characteristics. Additionally, some relevant potential scenarios such as the growing number of undocumented mortgages and large loan-to-value ratios subprime mortgages were not included. The most relevant wrong assumption employed in the construction of the models, was that the housing market would have continued perpetually its growing process.

It is a matter of fact that if the CRAs had rated the subprime MBS as junk bonds from their issuance, the financial crises would not have occurred. In fact, investors' demand for this structured and high-yielding financial instruments would have collapsed due to regulatory

[30] In this analysis I referred to senior tranche as the one of interest but of course it is possible to rate any tranche of a CDO pool.
[31] Here I refer to subprime mortgages given their central role in the crisis under analysis. Instead of these types of receivables, many others may compose a CDO pool.

constraints on investments. Consequently, the securitization pipeline that fuelled the housing bubble would have broken since banks' originate-to-distribute model would not have found that huge number of mortgages' shoppers. This would have led to a reduction in loans granted.

2.4 Which are the reasons for such a bad job?

Giving triple A ratings to securities of a much lower quality is an activity that cannot be done for long. In an efficient market, securities rated by an agency which is known for performing the business of "rating shopping" are characterized by low liquidity. Consequently, after some time nobody will pay anything for its ratings, high or low. The point is that the rating market is not an efficient one, but it is a duopoly plus. I have explored in detail the rating industry organization in subchapter 1.2. Arrived at this point of the analysis, an elementary but crucial question arises: why would the components of the duopoly "plus" risk their reputation by giving a rating than they knew was warranted? It is necessary to present separately the reasons that led to such failure. Some of them are strictly linked to the actions of CRAs, others involve deep problems of public policy and economics. In this chapter I will present analytically all the causes that originated (both directly and indirectly) the financial crisis. Additionally, through a wider approach, I will exhibit dilemmas affecting the rating industry.

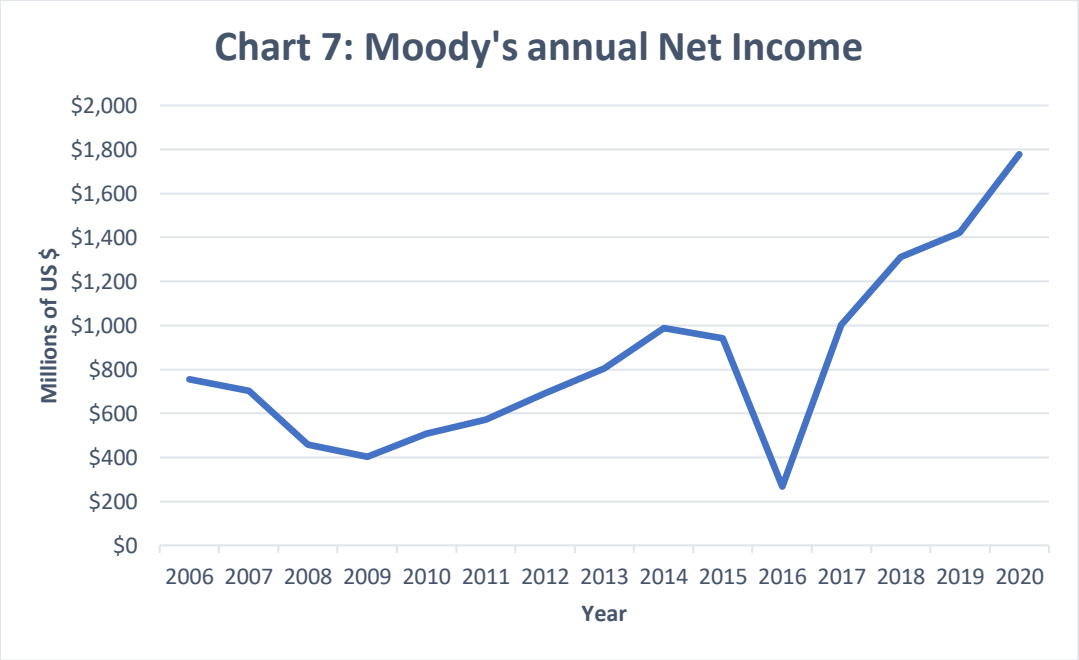
- At this point of the paper, we should be aware of the inherent conflict of interest that permeates the rating industry. The conflict arises from issuer-pays business model. The fact that issuers paid for the ratings was necessary for the credit rating agencies to do as a bad job as they did in the subprime crisis, but probably it was not sufficient. As I have already stressed, the incentive to overrate the quality of financial instruments arose from the possibility of attracting more clients and of not losing current ones. An investment bank that was unsatisfied with an agency's rating on a security had a powerful threat of moving all of its securitization business to a different CRA. This threat was especially

credible in the market for structured products where volume and profit margins were considerably high, and a small number of broker-dealers (CRAs' customers) accounted for almost all the financial instruments being rated. Given the situation, losing a single client would have significantly stressed the profits of a CRA. The rating industry was much more concentrated than their customers. In simple terms, issuers enjoyed stronger bargaining power than CRAs. These reasons pushed a "race to the bottom" as CRAs competed for fees and engagements. This scenario made possible the routine of rating shopping and compromised the objectivity of the ratings. Fortunately, this bias did not arise in the rating process of more conventional products like corporate bonds. In fact, there were thousands of issuers (both corporations and governments) of simple securities. Consequently, each of them had both a limited market power and a low bargaining power.

- Rating industry suffers from a lack of competition as the "three sisters" coexist in a profitable market. Competition is lacking due to three reasons. First, as I pointed out in chapter 1.1, a key feature of the credit rating agency has always been the presence of few incumbents which is the reason for the definition of the duopoly plus introduced in chapter 1.2. The high degree of concentration allows these nominal competitors to put less effort in research than if they were in a true competitive arena, restricting the possibility that investors receive more alternative opinions regarding the same security or corporation. Diversity of risk assessment methods as well as business models is reduced. Additionally, in a context where competition is very low (if not missing), cartel agreements are easily made in order to maintain monopolistically prices as high as possible and to put in practice coordinated strategies for market segmentation. Second, competition is shaped by the industry custom and by some pieces of regulation of obtaining several ratings. In fact, the vast majority of bond issues, corporations, and governments' debt carry multiple ratings. Summarizing, the competition in the industry under analysis can be defined as a "win-win" situation. Third, really good substitutes for credit ratings are not available. Even though, single investors habitually evaluate bonds, regulatory aspect of the rating business is

difficult (if not impossible) to substitute. These three features of the industry ensure a certain degree of sustained business for the incumbents, irrespectively of the outcome's quality.

- As stated in the introduction of this subchapter, in a competitive market, reputational capital usually safeguards a good degree of quality and incentive, but it does not effectively incentivize performance in an industry such as the rating one, where "two firms plus one" dominate the market for a necessary service. Intuitively, one would think that after the failures linked to the financial crisis of 2008-2009, the CRAs would have come out with broken bones. The truth is that the business volume of S&P and Moody's have not suffered in the aftermath of the crisis. This claim is supported by data (see Chart 7). After the crisis, Moody's net income continued to grow constantly: $401 million (2009), $508 million (2010), $570 million (2011), and $692 million (2012). Additionally, CRAs' reputation capital probably does not depend only on lax and imprudent business practices. It consists of a several components such as: records of precedent good performance, availability of suitable resources to provide ratings for the massive debt market and history of the firm. Additionally, economies of scale, sunk costs and reputational "stickiness" are first-mover advantages which favour the more established rating agencies.



Source: Macrotrends report on Moody's Net Income (2021)

- There are two types of barriers that insulate the "three sisters" from competitors: regulatory and natural barriers.

  Regulatory barriers arise mainly from the status of quasi-regulatory bodies that CRAs have earned (especially with the introduction of NSRSOs in 1975) put these institutions at the hearth of the financial system. First, as I have highlighted previously, several categories of financial institutions (such as insurance companies and pension funds) can invest in debt instruments only if they have a rating performed by NSRSO. However, fearing a proliferation of fly-by-night rating agencies only looking for a stable and profitable business (at the expense of quality), the SEC has parsimoniously (and maybe correctly) granted the NRSRO grade. This regulatory approach concretely froze out of the market potential new firms. Secondly, the ratings are employed to establish the different risk weights in order to determine the capital requirements for banks and other financial institutions. Due to these regulatory requirements and investment mandates, many

investors benefited temporarily from inflated ratings. Higher rated securities enabled those investors to hold less capital against these securities, consequently allowing greater risk. Additionally, higher rated securities enabled pension funds to undertake more risk than their mandates required, by investing in higher yielding securities. This made their performance look superior if related to other funds, until the crisis started to spread. Thirdly, when central banks grant refinancing[32] to commercial banks, the latter are required to have collateralized debt securities carrying a minimum credit rating. In the light of these regulations, ratings agencies enjoy a considerable regulatory power. Overall, these regulatory barriers have considerably shielded the duopoly plus structure, suppressed competition among CRAs and downsized the importance of reputation capital[33]. Nominally, these regulatory barriers have been somehow lowered by the SEC's liberalization of the NRSRO license process. It means that now CRAs can apply to the SEC. However, the reality is that the "three sisters" continue to dominate the industry and the pie for new entrants is very limited. Additionally, the change of the credit rating (especially a downgrade) has a considerable impact on the decisions and wealth of many investors. A reason for the bad job that CRAs performed during the crisis under exam, was their mismanagement of the status of quasi-regulatory bodies. Greater power means greater commitment. CRAs probably were aware of the importance of their role but were blinded by huge profits.

Aside from regulatory barriers, newer and smaller firms wishing to establish themselves as relevant players in the rating industry face also natural barriers contributing to structure an uncompetitive environment in the industry. These natural barriers shaping competition are probably even stronger than the SEC's licensing power because they are the result of market dynamics and do not involve the action of a regulator. Larger rating agencies provide coverage of bulk of the global debt market. They sort information and present it

[32] Explain the different types of refinancing

[33] More details about the role of reputation capital are provided in the previous bullet point.

in a digestible and almost uniformed through almost uniformed rating scales. Newer and thus smaller CRAs are disadvantaged because they lack this broad capability. Given their shortage of financial resources, they cannot compete to hire the best professional talents. Finally, in the unusual scenario in which a new incumbent of the rating industry starts to compete fiercely with the "three sisters", the smaller entrant can be easily acquired[34] by one of the larger CRAs through a takeover (friendly or hostile). A proof of the huge market power enjoyed by large rating agencies, if ever necessary, comes from the Oracle of Omaha, namely Warren Buffett. In fact, he declared to have made a substantial investment in Moody's because the rating business was a natural duopoly. He affirmed that this industry configuration granted the incumbents an incredible pricing power and that the most important decision in evaluating a business profitability is pricing power.

- Problems arising from the issuer-pays business model were worsened by the fact that usually CRAs combined rating and consulting services. CRAs became highly involved in the design of MBSs. CRAs consulted with the securitizers about what categories of mortgages (and other kinds of receivables) would secure what quality of ratings for what tranches' sizes. It is clear that the agency could hardly provide an independent assessment of the security's quality. Obviously, for a given pool of mortgages to be securitized, the higher the proportion of highly rated tranches, the higher the profit gained by the securitizers.
- Evaluation of CDOs relied on mathematical models through which it is established the insolvency risk of the different tranches. When a mathematical model is employed to determine the quality of a security, the quality of the final output (the rating) heavily depends on the quality of the input (information). The events of the global financial crisis

[34] Moody's and S&P would defend their competitive position with no doubt. Moody has explicitly stated its strategy in a public statement of 2012. It stated that the company would have continued to make investments to defend and to enhance its core business in an attempt to position the corporation to fully take advantage of market opportunities arising from global debt capital market expansion and increased business spending.

showed that for the proper evaluation of many parameters necessary to determine the quality of ABSs, there was a lack of information, or it was available for only short periods of time. Specifically, the so-called originator risk was not considered. The consequences of this levity were dramatic. The above-mentioned risk arose from loan originators' incentive to deceive the arrangers and CRAs about the true degree of creditworthiness of borrowers. The situation was worsened by the securitization process which enabled the originators to remove rapidly the loan from the balance sheet and consequently to not bear any more the credit risk. Additionally, the scenario where the housing price not only did not continue to rise indefinitely but could instead decline throughout the entire country simultaneously was missed by the "three sisters" and also by some of the most prepared money managers. Finally, the parameters included in the models resulted too optimistic with respect to loans' default rate and the correlation among them in different regions which turned out to be higher.

- For much of their history, rating agencies focused on the analysis of plain vanilla bonds issued by corporations whose capital structure was composed by only equity and capital. Much of this analysis occurred through fundamental analysis of financial statements. In defence of the performance of CRAs, it is appropriate to state that the structured products that they had to rate were highly complex and not well understood. In fact, in the past decades, credit evaluation has become a harder process since instruments have become increasingly more complex due to the advent of structured finance. However, I am not discrediting the rating process of simple bonds. This is a process that, nevertheless, is based on deep balance sheet analysis, history of financial performance and projections (which are the hardest activity). I am just linearly stating that with a greater degree of complexity, the CRAs' task has become progressively difficult.

- CRAs "drank the Kool-Aid"[35]. Securities' downgrades by themselves do not necessarily signal a bad performance by the rating agency. In life as in business, some phenomena that nobody expected at all sometimes happen. For example, if a huge company is suddenly found out to be a giant Ponzi scheme, there is panic, and the result is always bad for financial markets. However, the financial crisis of 2008 is not part of this group of uncommon phenomena. Additionally, CRAs were operating in a situation where they had no prior experience, where they were strongly involved in the securities' design process, and where they were under a substantial financial pressure to give issuers the answers they wanted to hear. Nevertheless, there is evidence that CRAs were rating these intricate securities both too rapidly and approximately.

  The agencies were invaded with an overwhelming volume of new structured finance instruments that they had to rate. One Moody's' analyst recalls that he had to rate an MBS worth one billion in one hour and a half. Another piece of evidence is provided by the experience that Mr. Raiter (a Moody's Investor Service's analyst) had in 2001. He was asked to rate a CDO called "Pinstripe". However, he needed the "collateral tapes", which were the mortgages backing the CDO. When he asked for them, the response he received from Richard Gugliada (the managing director) is incredible. The director stated that Mr. Raiter had to come up with a rating estimate and that was his responsibility to find a method for doing so. The problem was that the "collateral tapes" were essential credit data. Without them, it was like assigning a rate to each of the number of a roulette and rotate it. However, it is not completely surprising that the members of a consolidated duopoly plus such the rating industry acted in such complacent way and did not worry much protecting their long-run reputations.

[35] This expression refers to a person which supports an ill-fated or dangerous idea because of potential copious rewards. The phrase was inspired by events that took place in Jonestown, Guyana, on November 18th, 1978. 909 members of the Peoples Temple (an American religious organization) committed a mass suicide by way of ingesting a lethal drink, spurred by their leader Jim Jones. The reason for this extreme action was the murder of US Congressman Leo Ryan and others in Port Kaituma. This expression usually carries a negative connotation.

- CRAs lack the necessary power to verify information and eventually require additional data in order to provide a rating as reliable as possible. Ratings are based on the information that is provided voluntarily by the issuer who is assumed to act transparently and in good faith. The risk that the issuer conceals some information in order to obtain a higher rating is concrete.
- "Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances." This is what the First Amendment of the Constitution of United States claims. It deserves a mention in the causes leading to the CRAs' failure since it protects the freedom of speech and the press, among others.

  In more than one circumstance, CRAs have successfully used the First Amendment as a shield against liability for issuing the inflated ratings acting in a negligent (if not fraudulent) manner. Courts have found that the role of a CRA is to collect information and to take advantage of them to produce a credit rating. Thus, some courts have defined credit rating agencies as "publishers or journalists" and granted to rating agencies the First Amendment protection. There are some court decisions prior to the global financial crisis which may have incentivized the CRAs' negligence, making them aware of the First Amendment's judicial shield provided in some situations. One of those court decisions is *In re Pan Am Corp.*[36] where the U.S. District Court for the Southern District of New York held that S&P had the right to invoke the journalist's privilege. The court found that S&P had the "requisite newsgathering intent". Accordingly, the CRA should be given the journalist's privilege. Furthermore, the court refused the bankruptcy court's statement that S&P issued ratings primarily for economic gain and, thus, was not entitled to "heightened First Amendment protection". Thus, the court held that Standard & Poor's acted in the role

[36] This litigation took place in 1993.

of a journalist when it gathered information to produce its ratings with the specific intent to use that material to circulate information to the general public and, thus, was entitled to invoke the journalist's privilege.

However, some courts declined to apply the journalist's privilege to CRAs and recognized that the First Amendment does not completely shield every type of publication. For example, the Supreme Court has drawn a distinction between commercial speech from other types of speech and ruled that commercial speech deserves of a different level of protection under the First Amendment. Consequently, the Supreme Court has established two canons of law in this field, namely the doctrine of fully protected speech and the commercial speech doctrine. According to the commercial speech doctrine, the government can counteract commercial speech when it is "false, deceptive, or misleading," or when it turns out to "propose an illegal transaction." In the case of a commercial speech that is not false, deceptive, or misleading and does not involve an illegal transaction, the government may still restrict such speech but only when "a substantial governmental interest" exists and the restrictions "directly advance that interest". The Supreme Court has yet rule out whether speech by a credit rating agency regarding the credit rating of an issuer or issue of securities is fully protected speech or commercial speech. As an ex-post consideration courts and regulators have largely considered credit ratings as opinions and thus have applied the shield of the First Amendment. However, ratings are not pure statements of opinion since there is statistical models are involved in the rating process. Ratings are instead fact-based statements made by business professionals.

- Lastly, the stability of financial markets was damaged also by an implicit collusion between rating agencies and investors. The fact that investors desired overrated securities during the credit rating bubble has been defined by John Coffee as a "sinister danger". Since many institutions are regulated with respect to the degree riskiness of their investments and have to satisfy certain capital requirements, inflated ratings allowed investments in securities which had a yield much higher than that suggested by the rating.

Given this ruinous scenario, incorrectly rated securities proved themselves to be real options which allowed to circumnavigate the spirit of the prudential regulation. Additionally, broker-dealers which pursued this strategy, could boast abnormal returns in the short-run.

It is clear that the CRAs' failure in the context of the global financial crisis arose from two collapses. One at the specific level of the rating agencies themselves and the other at a systemic level. Despite the CRAs' deliberate misbehaviour needs to be condemned without a doubt, it is correct to describe the mitigating circumstances that partially relieve CRAs from their negligence and mistakes.

3. Regulations on CRAs

The set of listed causal factors shows that the credit industry is uniquely problematic and that is sub-optimally organized to deliver to the market highest quality credit ratings. A major illness that affects the rating industry is an insufficient link between incentive and compensation. Given the lack of competition, there is less incentive to innovate and improve the rating techniques even if financial products are becoming increasingly articulated.

3.1 The CRA Reform Act, The Dodd-Frank Wall Street Reform and Consumer Protection Act, and the Rule 17g-5

In the United States and in Europe CRAs were not directly regulated until 2006. Instead, they were indirectly regulated by the SEC and regulators who mandated rules regulating investments and capital maintenance. Since 2006, US Congress has enacted two major statutes that substantially regulate CRAs.

Congress passed the Credit Rating Agency Reform Act, in September 2006. Its purpose was to improve rating quality, protect investors, promote accountability and competition in the rating market after the major CRAs' failure in rating companies such as Enron insolvency. This piece of legislation vested the SEC with regulatory powers such that it could address problems such as conflict of interest, disclosure, and performance monitoring. However, the Congress believed that rating agencies lacked the necessary expertise to regulate the models determining the ratings. Given the SEC's point of view, rating agencies were denied the power to regulate the procedures, or the techniques employed by NRSROs during the rating's determination process. As I have already stress one of the main obstacles for the development of competition in the industry, were the SEC's opaque procedures and criteria for the designation of NRSROs. The Act's aim was to change the NRSRO designation process in order to increase the number of NRSROs and to boost consequently the competition in the industry. Until that time, the designation process was exclusively in the hand of the SEC. With this law, a CRA may seek designation by applying to the SEC. The Act ordered the SEC to stop being a barrier to entry, specified some criteria that the SEC should employ in the NRSROs designation, and insisted on transparency. In early 2010 the number of NRSROs reached ten. Currently, the NRSROs are nine agencies but the duopoly plus structure is intact. Thus, the goal of the CRA Reform Act has not been reached until now.

The regulation process on the CRAs experienced an acceleration after the US subprime mortgage crisis and the global financial crisis. Given the critical context, in 2010 the SEC enacted the Dodd-Frank Wall Street Reform Act which found credit ratings to be systemically important for the stability of the financial system. Its goal was to enhance CRA's potential liability and ratings accuracy. Additionally, it tried to address conflict of interest, reliance on ratings by federal agencies and mandate public disclosure of rating methods. The Dodd Frank Act is composed of four main pillars.

First, a direct attack aimed at reducing the conflict of interest and the consequent practice of rating shopping, is the so-called "Franken Amendment" to the Dodd Frank Act. The name comes from

the Senator Al Franken of Minnesota. The Franken Amendment requires the SEC and the Government Accountability Office (GAO) to analyse the NRSROs' issuer-pays business model and come up with an alternative system in which a rating agency board assigns rating agencies to particular deals based on specific criteria. This is a method that in the long run would consider the agencies' performance. This is what the Franken Amendment requires the SEC to study, word for word: "the feasibility of establishing a system in which a public or private utility or a self-regulatory organization assigns nationally recognized statistical rating organizations to determine the credit ratings of structured finance products." Not surprisingly some incumbents of the securitization industry and most of the CRAs themselves, have aggressively opposed the enactment of the third-party assignment system just described. They supported their position claiming that this scheme is extremely anti-competitive and that a board judgment cannot be regarded as a valid substitute for the efficiency of a market-based system. However, the meltdown that played the role of one of the primers of the global financial crisis revealed that the market pressures surrounding the CRAs revealed detrimental to financial stability and development.

Second, section 939 of Act aims at reducing the power of NRSROs by requiring regulators to eliminate and replace the credit ratings in regulations that set capital requirements against risk-weighted assets and restrict certain assets holdings for financial institutions. Regulators have redrafted most rules relying on NRSROs' ratings and credit ratings have been replaced by three kinds of alternatives: definitions, regulatory models, and third-party classifications. The definitions approach requires financial players to explain their holdings to regulators by proving they satisfy certain definitions, like "An issuer has an adequate capacity to meet financial commitments if the risk of default by the obligor is low and the full and timely repayment of the principal and interest are expected" or "with a remaining maturity of 397 days or less that the fund's board of directors determines presents negligible credit risks to the fund…". This approach has three distinctive features. First, regulators have the right to accept or reject the definitions provided by the entities. Second, regulators provide the guidelines according to which they will

review firm's statements. Finally, if a regulated entity wants to make use of credit ratings, justification for this choice is required. models to determine the capital requirements against securitized instruments. According to the regulatory model, bank regulators provide companies with models to use instead of credit ratings. For instance, federal bank's regulators employ two of them. One model is the Simplified Supervisory Formula Approach (SSFA). It is a formula that includes the different risk weights of the asset backing the securitized product and the percentage of the pool which has been insolvent for at least 90 days. In the formula is also included the tranche's risk relative to other tranches and whether the securitization is a re-securitization. Of course, the latter is riskier. The other model is the gross-up approach. Only smaller banks performing a limited trading activity are allowed to use it. Both the models mandate a minimum risk weight of 20 percent. Third-party classifications approach uses designated non-NRSRO third party to perform risk evaluation and thus set credit capital requirements.

Third, section 939G of the Dodd-Frank Act broadens the legal liability spectrum of CRAs. It exposes CRAs to potential liability under Section 11 of the Securities Act of 1933. Section 933 requires the SEC to account CRAs legally liable, accordingly to the penalty provisions of the Securities Act of 1933, for their ratings to the same extent as if they were registered public accounting firms or security analysts. Accordingly, liability is imposed on CRAs that consciously or deliberately did not perform a reasonable investigation of the rated security.

Fourth, SEC is granted more power to regulate the NRSROs and required to analyse NRSROs at least once a year and to make the findings public. Those As a result, SEC is required to create rules for internal inspections, conflicts of interest, rating performance statistics and transparency. The SEC has drafted these rules and is incorporating them in the annual examination of the NRSROs. Additionally, the Office of Credit Ratings was established and included within the body of the SEC that has the task of overseeing NRSROs. This new agency performs supervisory and monitoring functions. Furthermore, the SEC has the power to remove the NRSRO status for the rating of given classes of securities.

Another important piece of regulation enacted in the aftermath of the subprime financial crisis is the Rule 17g-5 which was promulgated by the SEC in 2009. It requires institutions that are seeking ratings from CRAs for securitized instruments to create a password protected website or cloud-storage in which they must upload all documents, data, and information necessary for the implementation of the highest quality rating process. According to 17g-5, all qualified rating agencies which not requested to rate a given security must be granted the access to the website and to any additional information communicated by the issuer, whether in writing or orally. The reason underpinning this rule is to grant to all the qualified agencies the access to the same set of data, such that also uninvited agencies can issue an unsolicited rating on a debt instrument. The intention was to put in place a deterrent for the phenomenon of rating shopping. However, the reality is that Rule 17g-5 has so far achieved only to increase formalities and constraints on communications between issuers and CRAs during the rating process. Uninvited agencies have not issued any unsolicited ratings until the rule was adopted. The reason is intuitive and extremely economically coherent: no rating agency is willing to invest part of its resources to provide a rating service without receiving any payment for it. Unless a demand for unsolicited ratings arises from the investor's side (which would be the equivalent of a revival of the investor-pays business model) it is very unlikely that rating agencies will produce unsolicited ratings.

3.2 From win-win to a win-lose compensation scheme

The improvements brought by statutory interventions to the rating industry have been incremental and minimal. The fundamental dynamics of the industry have not changed, and the core aspects of the problem are still there: lack of competition, duopoly plus, issuer pays business model, industry custom of multiple ratings and high natural barriers to entry. The regulatory approach has achieved to lower somehow the regulatory barriers, instead. Despite the new pieces of regulation have not radically changed the rating industry conformation, they are functional basis for the successful implementation of my proposal.

I agree that, from an economic point of view, the rating industry is not efficient. It dramatically lacks what can be the means for delivering to the market the best-quality ratings: strong competition. At this point, a consideration about the role of competition is necessary, even if it may apparently clash with what stated until now. In fact, competition can be either good or bad. For example, the SEC has probably granted the NRSRO status parsimoniously because it feared the development of a negative competition among fledging rating agencies which could have devolved a race to the bottom to gain market share. Tough competition is healthy only if it incentivizes a race to excel. Competition is not the goal. It is the means through which the goal (in this case high quality ratings) is achieved.

A radical restructuration of the industry would be nor efficient, nor successful. It would be a too massive intrusion into a multi-billion-dollar industry which has found an equilibrium both in terms of players and dynamic. With a minimal intrusion, the law can create the conditions necessary to stimulate that desired degree of healthy competition. Any kind of reform measure must aim at solving the problem of incentive and compensation. Ratings of poor quality are not the inevitable outcome of a concentrated industry. It is possible to stimulate competition even in an industry where there three major competitors. Consider a simple analogy borrowed from sports. For example, in a football match, competition is usually very fierce even if there are only two competitors. This normal outcome when there is a winner-take-all, zero-sum game. This reasoning holds for every kind of sports or competitive situation articulated in such way. The problem of the industry under analysis is that all the "three sisters" win on a regular basis. To stimulate competition, the game must change, at least in part, from a win-win to a win-lose outcome.

A pay-for-performance compensation mechanism should enhance the competition in the duopoly plus. This incentive-scheme is widely employed in the context of executive compensation. In fact, one of the major problems that corporate governance has to solve is to align executive interests with shareholders' ones. This is done through compensation schemes proportional to the corporation's performance. Also, CRAs' compensation should be made bond to their performance.

As I have already mentioned, this goal can be accomplished through a very soft regulatory intrusion. The marginal adjustment that I propose in this subchapter was first proposed by Robert J. Rhee in 2013 and I tried to enhance it.

First, I will assume that the only participants of the rating market are Moody's, S&P, and Fitch. As a matter of fact, it is a very realistic assumption. Each of the three rating agencies would submit annually the 5% of their accrued revenue which will compose a bonus pool. At annual intervals, the performance of each agency would be statistically evaluated by the SEC (or by an independent agency). The evaluation is based on regulatory disclosure requirements that are already in place. Additionally, to successfully merge my proposal to the model illustrated by Robert J. Rhee, it is necessary that all the three rating agencies start to employ the same rating scale. I do not think that it will be a huge obstacle since the scales are very similar. I propose the employment of S&P's rating scale. However, if this proposed standardization of the rating scale is fiercely opposed by the agencies for history or reputation reasons, there is a solution. It is necessary that each rating level has a perfect equivalent grade in the scales employed by the other two agencies. The financial crisis of 2007-2008 thought us that drastic downgrades are what really hurts the financial equilibrium and not upgrades. In the light of this, for each one-step downgrade of a security or the creditworthiness of a borrower, the rating agency in question is assigned some points. Of course, the points assigned have to be proportional to the value of the security in question and to the importance of the borrower in the financial landscape. An example: a one-step downgrade of a security whose market value is 10 must assign more points to the rating agencies in question rather than the same downgrade but of a security whose market value is 2. The intuition is clear: the downgrade of a security whose market value is higher, has a much heavier market impact. At the end of the annual period, the more points scored, the worse the performance. This score is combined with the analysis based on regulatory disclosure requirements. After evaluation, the best performer is identified, and the bonus pool is assigned according to the winner-take all principle.

Now I will explain how the game works. As I have already pointed out, the contribution of each CRA must be a percentage of revenues and not a common flat contribution. The latter would be an inefficient approach. Each firm differs from another in terms of size and revenues' magnitude in any given year. Consequently, a fixed contribution would not work since its weight relative to the revenue amount would vary for the different agencies, resulting in asymmetric financial effects that would distort further the rating market. However, this would be an almost irrelevant problem if we restrict the competition only between S&P and Moody's which are comparable in scale. But, given that Fitch is a significant player of the duopoly plus (see subchapter 1.2 for a deeper industry analysis), it must be included in our compensation scheme. Now one question can arise: how do we allocate efficiently the bonus pool in the light of the different amounts contributed?

The answer is provided by the compensation scheme. The game is composed by two sub-games: the "main game" and the "side game". On the one hand, the "main game" involves competition between all the "three sisters" and the payoff for the winner is calculated as three times the contribution made by the smallest player. On the other hand, the "secondary game" involves competition between the two larger players only and the payoff is computed as the bonus pool minus the compensation of the first game. Since the "secondary game" involves the two larger players only, the possible contribution is capped at the 5% of revenue of the second-largest player. If this rule is not introduced, the largest player would have more to lose than the second player. This clearly would not be proportional and efficient. An example clarifies the functioning of the game. Assume that 5% of revenue for S&P (S), Moody's (M) and Fitch (F) are respectively 210, 160 and 50[37]. Given that S is the largest player, its contribution is capped at 160, which is the second-largest player contribution. Consequently, the total bonus pool amounts to 370. The allocation is performed according to the following rules: the winner of the "main game" among S,

[37] Even if these are simplified revenues, I held the proportion between the real revenues constant. I took Fitch as a benchmark.

M, and F gets 150. The winner of the "secondary game" between S and M gets 220. Clearly, if either S or M wins the "main game" it receives the whole bonus pool.

Finally, the possibility that the "secondary game" yields a net loss to the winner is theoretically possible and it depends on the smallest player's contribution relative to the ones of the largest two. For example, if the contributions to bonus pool are S=100, M=100, and F=80 and F wins the "main game" and M wins the "secondary game" the net payoffs would be: 240-80= +160 for Fitch, 0-100= -100 for S, and 40-100= -60 for M. However, market data do not really support this scenario. Now I will apply the game to the latest available annual revenue of the "three sisters". In 2020 S&P, Moody's, and Fitch recorded revenues for respectively 7.4, 5.4, and 1.7 billion of dollars. The respective contributions would be 270 million of dollars for the two larger agencies and 85 million of dollars for Fitch. This would lead to a bonus pool of 625 million of dollars. It is not an irrelevant amount of money at all, especially in the eyes of S&P and Moody's which, through a good performance can grab the whole pie. Assuming that Fitch wins the "main game", the payoff will be 255 million of dollars. The winner of the "secondary game" will enjoy a net profit of 100 million of dollars without experiencing a loss. Of course, if in the long-run Fitch will catch up the revenue' magnitude of the two larger agencies (also thanks to this scheme), this approach needs to be adjusted since in this scenario the winner of the "secondary game" almost certainly will experience a net loss. I have come up with a solution. The bonus pool will be constituted by a fee paid by investors of every kind who trade securities rated by the "three sisters". Small investors, broker-dealer institutions, central banks, and governments. The fee will be expressed as a percentage of the trade volume performed by the investor. The percentage has to established in such a way that the total bonus pool will be very close to the one that would arise from the 5% of the larger CRAs' annual revenue. Now it is impossible to establish the proper percentage since I am considering a long-term scenario and the variables to be considered are extensive. The "investor-based" bonus pool will be awarded to the best performing of the "three sisters". I think that investors will not fiercely oppose this proposal because it is in their interest to dispose of the

most reliable rating as possible. Investors experienced the damages created by inflated ratings on their skin and I am sure that want to avoid that in the future.

Additionally, and in parallel with the above illustrated compensation scheme, Robert J. Rhee proposes the implementation of a so-called incubation program for smaller agencies. This proposal is made extremely feasible thanks to the rule 17g-5. Summarizing its content, this piece of law requires that if an issuer provides a CRA the necessary information for the rating process of a structured financial instrument, the same data should be made available also to the uninterested NRSROs. The purpose is to incentivize the production of unsolicited ratings such that competition is increased leading to an increase in the rating quality. The problem is that, as I highlighted in subchapter 3.1, uninterested rating agencies are literally uninterested. It is not a wordplay. It is the reality. They lack the financial incentive: which corporation is willing to employ resources without compensation? None. The incubation program aims at creating this incentive. A smaller CRA that decide to provide the unsolicited rating for a security will bear its own costs arising from security's evaluation process. However, the rating will be evaluated against the ratings provided by S&P, Moody's, and Fitch. In the scenario in which the smaller rating agency outperforms the duopoly plus, it will be paid back the expenses incurred plus a profit based on several factors such as agency's dimension and complexity, rating exactness and complexity of the rated security. The remainder of the bonus pool will be assigned to the winner of the "main game" among the duopoly plus. This potential bonus constitutes a subsidy for the risks undertaken by smaller competitors. Additionally, investors will be provided with higher number of ratings. The market will benefit from multiples creditworthiness' assessments. Finally, the "incubation program" is a good pathway for smaller and newer CRAs to learn, to grow, to improve their reputation, and last but not least, to compete in the rating market even without being engaged by securities' issuers.

Conclusion

Credit rating agencies have been for a long time a relevant player in the financial markets. Initially their role was a peripheral one but with the development of securities, rating agencies established themselves as institutions in the hearth of the financial markets. A determinant contribute for the implementation of this process was provided by the SEC's designation of NRSROs.

The story that holds most appeal as the cause of the 2007-2008 global financial crisis is the one of the conflicts of interest arising from the issuer pays business model and rating agencies have correctly been scorned and vilified for that. With no doubt, this was a crucial factor and coherently I employed much ink for the analysis of this problem. The fact that inflated ratings of structured instruments massively helped fuel an unsustainable mortgage lending and allowed systemically important institutions to take in extreme risks is there for all to see. However, the set of causes and players involved is much more extended as I pointed out in subchapter 2.4. Many institutions and dynamics need to be added to the causal chain picture.

The regulatory response after the crisis arrived mainly with the CRA Reform Act, Dodd-Frank Wall Street Reform and Consumer Protection Act, and the Rule 17g-5. However, the total implementation of all these reforms would be an excessively intrusion in a market that has established for many decades as crucial and useful (despite the failures) in reducing information asymmetries among lenders and borrowers. Additionally, I think that these pieces of regulation lack both harmony and a long-term credibility. I am aware that the rating market is far from perfect but the world itself is an imperfect place. However, I am not stating that those regulation are useless. Rather, I think that they are a very useful basis for the implementation of the proposal explained in the last subchapter.

The main illness from which the rating industry dramatically suffers is a lack of competition which leads the agencies to do not make every possible effort to deliver the best rating to the market. The transition from the win-win to the win-lose compensation scheme is something that can be

achieved with a minimal intrusion and that will foster competition. Contrary to the conventional perception, it is possible to stimulate competition also in an industry composed by only three incumbents. Additionally, in the long run, the interplay between the "incubation program" and rule 17g-5 may guide the transitional process from a duopoly plus to a competitive rating industry.

I have an aphorism pronounced by Mahatma Gandhi hung in front of my desk. "You will never know what the consequences of your actions will be, but if you do not do anything there will not be any result". This is the spirit that has to support the improvement of competition in the rating industry.

Bibliography

- Aigbe P. and Akpojaro J., 2014, "Analysis of Security Issues in Electronic Payment Systems", International Journal of Computer Applications;
- Aliko A., 2011, "La responsabilità delle agenzie di rating da conflitto di interesse", Luissthesis website;
- Bailey D. K., 2020, "The New York Times and Credit Rating Agencies: Indistinguishable under First Amendment Jurisprudence", Denver Law Review;
- Bayar Y., 2014, "Recent Financial Crises and Regulations on the Credit Rating Agencies", Research in World Economy;
- Binici M., Hutchison M. and Weicheng Miao E., 2018, "Are credit rating agencies discredited? Measuring market price effects from agency sovereign debt announcements", Bank for International Settlements;
- Borod R. S. and Bartlam M., 2012, "Rating Agency Reform in the EU and the U.S.", Thomson Reuters;

- Brealey R. A., Myers S. C. and Allen F., 2016, “Principles of Corporate Finance”;
- Coffee J. C., 2010, “Ratings Reform: The Good, The Bad, and The Ugly”, European Corporate Governance Institute;
- CONSOB, 2012, “La crisi finanziaria del 2007-2009”, CONSOB website;
- Crouhy G. M., Jarrow A. R. and Turnbull S. M., 2008, “The Subprime Credit Crisis of 07”, SSRN;
- Dealogic and ICMA, 2021, “Value of deals on the international debt capital markets from 1st quarter 2016 to 2nd quarter 2021”, Statista website;
- Ellis Nan S., Fairchild Lisa M. and D’Souza F., 2012, “Is Imposing Liability on Credit Rating Agencies a Good Idea? Credit Rating Agency Reform in the Aftermath of the Global Financial Crisis”, Stanford Journal of Law, Business & Finance;
- European Security and Markets Authority (ESMA), 2020, “Report on CRA Market Share Calculation”, ESMA website;
- Fitzpatrick T. J. and Sagers C., 2009, “Faith-Based Financial Regulation: a Primer on Oversight of Credit Rating Organizations”, Administrative Law Review;
- Greenspan A., 2010, “The Crisis”, Brookings Papers on Economic Activity;
- Heyford S. C., 2020, “The Risk of Subprime Mortgages by a New Name”, Investopedia website;
- Hill C., 2010, “Why did rating agencies do such a bad job rating subprime securities?”, Scholarship Repository, University of Minnesota Law School;
- IBISWorld, 2021, “Credit Bureaus & Rating Agencies in the US - Market Size 2005–2027”, IBISWorld website;
- Kenton W. and Somer A., 2020, “Community Reinvestment Act (CRA)”, Investopedia website;
- Kenton W., 2020, “Decimalization”, Investopedia website;

- Lamacchia Acito B., 2016, “Agenzie di rating: punti di forza, criticità e regolamentazione”, Luissthesis website;
- Listokin Y. and Taibleson B., 2010, “If You Misrate, Then You Lose: Improving Credit Rating Accuracy Through Incentive Compensation”, Yale Journal on Regulation;
- McConnell J. J. and Stephen A. B., 2011, “The Origins and Evolution of the Market for Mortgage-Backed Securities”, Annual Review of Financial Economics;
- Modigliani F. and Miller M. H., 1963, “Corporate Income Taxes and the Cost of Capital: A Correction”, Am. Economic Review;
- Nästegård E., 2016, “Credit rating agencies and the First Amendment defence in the US”, Nordic & European Company Law;
- Partnoy F., 2001, “The Paradox of Credit Ratings”, University of San Diego School of Law;
- Partnoy F., 2006, “How and Why Credit Rating Agencies Are Not Like Other Gatekeepers”, Legal Studies Research paper Series of University of San Diego School of Law;
- Rafailov D., 2011, “The Failures of Credit Rating Agencies during the Global Financial Crisis – Causes and Possible Solutions”, ResearchGate;
- Rajeev D. and Gordon S., 2021, “Plain Vanilla”, Investopedia website;
- Rhee R. J., 2013, “On Duopoly and Compensation Games in the Credit Rating Industry”, Northwestern University Law Review;
- Rhee R. J., 2015, “Why Credit Rating Agencies Exist”, Review of Banking, Finance and Monetary Economics
- Riddiough T. and Zhu J., 2009, “Shopping, Relationships, and Influence In the Market for Credit Ratings”, ResearchGate;
- Rivlin Alice M. and Soroushian John B., 2017, “Credit rating agency reform is incomplete”, Brookings;

- Security and Exchange Commission, 2020, “Annual Report on Nationally Recognized Statistical Rating Organizations”, SEC official website;
- Segal T. and Kelly R. C., 2020 “Government-Sponsored Enterprise (GSE)”, Investopedia Website;
- Sinclair, Timothy J., 2010, “Credit rating agencies and the global financial crisis”, Econstor;
- Soroushian J., 2016, “Credit Ratings in Financial Regulation: What’s Changed Since the Dodd-Frank Act?”, Office of Financial Research Brief Series;
- Thomas L. F. and Lehrer J., 1996, NewsHour interview, PBS;
- WFE, 2021, “Value of global equity trading worldwide from 1st quarter 2017 to 4th quarter 2020”, Statista website;
- White L. J., 2010, “The Credit Rating Agencies”, Journal of Economic Perspectives;
- Wolfson J. And Crawford C., 2010, “Lessons From The Current Financial Crisis: Should Credit Rating Agencies Be Re-Structured?”, Journal of Business & Economics Research;