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**The role of credit rating agencies in 2008/2009 global
financial crisis**

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Prohlášení

Prohlašuji, že jsem diplomovou práci vypracovala samostatně a použila pouze uvedené prameny a literaturu.

V Praze dne 18.5.2010

Petra Andrlíková

Poděkování

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The role of credit rating agencies in 2008/2009 global financial crisis

Abstract:

This bachelor thesis aims at the role of rating agencies in the pending economic turmoil. It explains main functions of credit rating agencies (CRAs) with the relation to the 2008/2009 global financial crisis. Furthermore, it describes the proposals and solutions to the current situation on financial markets adopted by regulatory institution in the European Union and the United States, as well as the responses of CRAs on the proposed and adopted regulation. In particular, the work suggests the level of coverage of current amendments in order to prevent such failure in the future. Moreover, the thesis discusses possible solutions and improvements of the CRA business model.

Role ratingových agentur v globální finanční krizi 2008/2009

Abstrakt:

Cílem této práce je zhodnotit roli ratingových agentur ve stávající finanční krizi, která propukla v roce 2008/2009. Práce podává základní informace o historii ratingových agentur, jejich historii a významu ratingu na finančních trzích. Hlavním cílem je shrnutí navrhnovaných a přijatých opatření regulačními institucemi v Evropské Unii a Spojených Státech. Závěr práce se zabývá kvalitou a úrovní současné regulace ratingových agentur s ohledem na budoucí stabilitu ve sféře finančnictví. Práce také rozebírá možné návrhy na vylepšení stávajícího modelu ratingových agentur.

Table of contents

INTRODUCTION	1
CHAPTER 1 GENERAL INFORMATION	2
1.1 CRAS	2
1.1.3 The function of CRAs	4
1.1.4 Credit rating	5
1.2 COLLATERAL DEBT OBLIGATIONS BACKED BY STRUCTURED FINANCE ASSETS (SF CDOs)	6
1.2.1 Tranching	8
1.2.2 SF CDOs categories	9
1.2.3 Moody's Approach to Rating SF CDOs	12
CHAPTER 2 THE ROLE OF CRAS IN 2008/2009 GLOBAL FINANCIAL CRISIS	17
2.1 CONFLICT OF INTEREST	17
2.2 TRANSPARENCY OF RATING METHODOLOGIES	18
2.3 STRUCTURED FINANCE COMPLEXITY	19
2.4 DISCLOSURE OF RATING PROCESS	21
2.5 IMPERFECT COMPETITION	22
2.6 VARIATIONS AMONG CRAS INTERNAL AUDIT PROCESSES	23
2.7 MONITORING OF RATINGS	24
2.8 HUMAN RESOURCES	25
CHAPTER 3 REGULATION OF CRAS	27
3.1 ORGANIZATIONAL, CORPORATE REQUIREMENTS	27
3.2 CONFLICT OF INTEREST	28
3.3 QUALITY OF RATINGS	30
3.4 COMMUNICATION WITH THE MARKET	31
3.5 RECORD KEEPING OBLIGATIONS	31
3.6 OTHER MALPRACTICE	31
3.7 DISCLOSURES AND TRANSPARENCY	32
3.8 OTHER PERIODIC DISCLOSURE	33
3.9 STANDARDS FOR PRESENTATION OF RATINGS	33
CHAPTER 4 REGULATION RESPONSES OF CRAS	35
4.1. MOODY'S	35
4.2. S&P	37
4.3. FITCH	38
CHAPTER 5 SUMMARY OF CRAS REGULATION	40
CONCLUSION	43

List of Figures

Figure 1: Issuer-pays model of CRAs 5

Figure 2: Composition of SF CDOs in 2003 7

Figure 3: Example of tranching into a Synthetic CDO 9

Figure 4: Cash SF CDO 9

Figure 5: Unfunded Synthetic SF CDO..... 10

Figure 6: Hybrid SF CDO..... 11

Figure 7: Simplification of the model process 12

Figure 8: Relevant aspects for determining the ratings for each tranche of a SF CDO 14

Figure 9: Example of the CDO waterfall cash-flow 14

Figure 10: The proportion of Upgrades / Downgrades in structured products in the 3 largest CRAs..... 20

Figure 11: US ABS Issuance, 1996 – 2009; Composition of US ABS issued in 2007..... 23

Figure 12: US First Lien Subprime Cumulative Losses..... 24

Figure 13: Balance of credit rating changes, 2010..... 25

Figure 14: Percentage Change Comparison from 2002 vs. 2003 – 2007 in SF CDO Revenue, Rated Deals, and Rating Staff, in three large CRAs 26

List of Tables

Table 1: International long-term credit ratings letter scale of the three biggest CRAs 6

Table 2: The conflict of interest incentives 17

Table 3: Largest CRAs global structured finance 1 year transition rates..... 20

Table 4: Number of credit ratings issued by NRSROs in 2008..... 22

Table 5: Organizational, corporate requirements 27

Table 6: Conflict of interest..... 29

Table 7: Quality of ratings 30

Table 8: Communication with the market..... 31

Table 9: Record keeping obligations 31

Table 10: Other malpractice 32

Table 11: Disclosures and transparency..... 32

Table 12: Other periodic disclosure 33

Table 13: Standards for presentation of ratings 33

Table 14: The level of CRAs regulation 40

List of Definitions

Definition 1: Credit rating agency	2
Definition 2: Credit rating.....	5
Definition 3: Collateral debt obligation.....	7

List of Abbreviations

ABS	Asset backed security
CDO	Collateral debt obligation
CDS	Credit default swap
CESR	The Committee of European Securities Regulators
CMBS	Mortgage backed security
CRA	Credit rating agency
DP	Default probability
EL	Expected loss
ESME	European Securities Markets Expert Group, European Commission
MBS	Mortgage backed security
NRSRO	Nationally recognized statistical rating organization
REIT	Real estate investment trust
RR	Recovery rate
S&P	Standard & Poor's Corporation
SEC	US Securities and Exchange Commission
SF	Structured finance
SF CDO	Collateral debt obligation backed by structured finance assets
RMBS	Residential mortgage backed security
SPV	Special purpose entities

INTRODUCTION

The current economic turmoil has revealed significant defections of financial markets. One of the frequently discussed causation of the 2008/2009 financial crisis was the flawed attainment of credit rating agencies (CRAs) in credit risk assessment. The main purpose of this thesis is to enlist the factual aberrances of CRAs that have supposedly led to financial turmoil.

Chapter 1 examines the fundamentals of the CRAs sphere of business. The initiation of the rating industry is dated to the beginning of 19th century a since then; CRAs have played a relevant role on financial markets as a provider of inaccessible information. Furthermore, the three biggest CRAs: Moody's, S&P and Fitch are mentioned as the most important players on the CRAs market, with more than 99 % market share. The general part farther depicts the basis of structured finance products, since the majority of the rating deficiencies emerged in this area. For better apprehension of following chapters, Chapter 1 illustrates the modeling process of assigning rating to a structured finance product used by one of the three biggest CRAs.

Chapter 2 introduces the particular issues how CRAs contributed to the financial crisis. The evidence is subtracted mainly from the research reports elaborated by the regulatory institutions of the European Union and the United States.

Chapter 3 depicts the CRAs regulation at full length. The regulation subject matter is divided into specific parts that deal with problems encountered in 2008/2009 financial crisis. The European Union and the United States CRAs regulation proposals are thereafter compared and evaluated in elaborate detail. For the completeness of apprehension, Chapter 4 inscribes the CRAs' responses and adjustment conceptions on current regulation.

It is evident that the current system is not self-sufficient and requisite adaptations have to be made. In the conclusion of the thesis, the current CRAs regulation will be evaluated in terms of problems coverage discovered by the financial crisis.

Chapter 1 GENERAL INFORMATION

1.1 CRAs

The first part of Chapter 1 defines the basic key terms of CRAs for the purpose of the thesis. It gives us a conception about the definition, function, and history of CRAs, as well as the reason of the importance of the CRAs existence.

1.1.1 Definition of a CRA

Definition 1: Credit rating agency

A credit rating agency is a company that issues credit ratings for certain type of instruments. It provides investors with evaluations of an investment's credit risk. The issuer of an instrument being rated usually pays credit rating agencies to receive the credit rating.¹

Most frequently, the issuers of such instruments are companies, special purpose vehicles (SPV), state and local governments, non-profit organizations, or national governments issuing debts tradable on a secondary market. The credit rating assessment is based on the issuer's credit worthiness, or the ability to repay the debt. The higher the credit rating from a CRA, the less probable is the potential default of an instrument.

1.1.2 History of CRAs

The creation of the first rating agency is dated to 1909 when John Moody started to assess the value of U.S. railroads bonds by giving the first credit ratings in history.

After 1850, the railroad corporations became larger and started to expand into new areas with few local banks and investors willing to finance their projects. To eliminate the problem of financing U.S. railroads, a huge market of bonded debt of railroad corporations has been settled. It grew so fast that it was manifold larger than any other financial market in the world in the beginning of the twentieth century. This is the reason why railroads were the first subject matter to receive credit ratings.

The growth in sales of other corporate bonds also asked for more information about its debtors. Banks played the most important role in generating the reputation of corporate borrowers in investors' perception because of their inside information from the role of direct

¹ The business model of CRAs will be discussed in part 1.1.3 The function of CRAs.

lenders and bond underwriters. This information asymmetry between the bank as creditor and the bond investor lasted until the full disclosure of 1933 and 1934 Securities Acts, which gave the bond investor the same access to information as the bank creditors had. The primary role of rating agency was to smooth down such asymmetry and improve the efficiency of capital markets.

Throughout almost one century of rating history, there have been three most important world credit rating agencies: Moody's Investor Service, Standard & Poor's and Fitch Ratings.

Moody's Investor Service

In 1909, John Moody published a manual for investors interested in railroad industry entitled *Moody's Analyses of Railroad Investment*. He outlined the analytic principles used to assess a railroad's operation, management, and finance.

Moody's Investor Service is the oldest rating agency ensued in 1914. The same year, John Moody expanded the rating areas into bonds issued by US cities and other municipalities. In the 1920s, Moody's rated almost 100% of the US bond market. In the 1970s, the Moody's rating field was enlarged of the commercial paper market and bank deposits, and the practice of charging issuers as well as investors for ratings services has been initiated.

At the present time, Moody's Investor Service is a subsidiary company of Moody's Corporation (NYSE:MCO). Moody's Investor Service is one of the biggest providers of credit ratings, research and risk analysis. It covers and issues ratings of more than 110 sovereign nations, 13,000 corporate issuers, 26,000 public finance issuers and 109,000 structured finance obligations. Moody's Investor Service has approximately 40% share on the world market of ratings.

Standard & Poor's Corporation

Henry Varnum Poor's publication *History of the Railroads and Canals of the United States* (1860) was the first major attempt at compiling a comprehensive account about the US railroads, later replaced by Henry William Poor's *Manual of the Railroads of the United States* in 1868. The Manual was updated annually to keep current information about companies' progress over time.

In 1906, the Standard Statistics Bureau was formed to provide previously unavailable financial information on US companies. Standard Statistics assigns debt ratings to corporate bonds, with sovereign debt ratings since 1916. In 1944, Poor's Publishing and Standard Statistics

have merged into the Standard & Poor's Corporation. Recently, it is a division of McGraw-Hill that concerns of the financial services. Standard & Poor's Corporation is one of the CRAs that started to rate various types of financial instruments.

Standard & Poor's Corporation is also well-known for their stock market indexes; the US-based S&P 500, the Australian S&P/ASX 200, the Canadian S&P/TSX, the Italian S&P/MIB and the India's S&P CNX Nifty.

The share of the rating market is assessed similarly to 40% as Moody's Investor Service.

Fitch Ratings

The third biggest CRA is headquartered in New York and London. It has over 50 offices worldwide. Fitch Ratings builds their global expertise on local experience in over 150 countries. It often serves as an alternative for Moody's and S&P's ratings. The share on the market is circa 16%.

At the present time, there are around 70 CRAs worldwide.² Beyond the three biggest CRAs mentioned above, there are e.g. local agencies in Japan and Canada or niche ratings agencies such as AM Best in insurance in the United States.

1.1.3 The function of CRAs

Credit rating agencies are primarily the providers of **independent** credit opinions through issuing the ratings that are used by investors, borrowers, issuers and governments. Ratings also frequently play an important role in regulatory supervision.

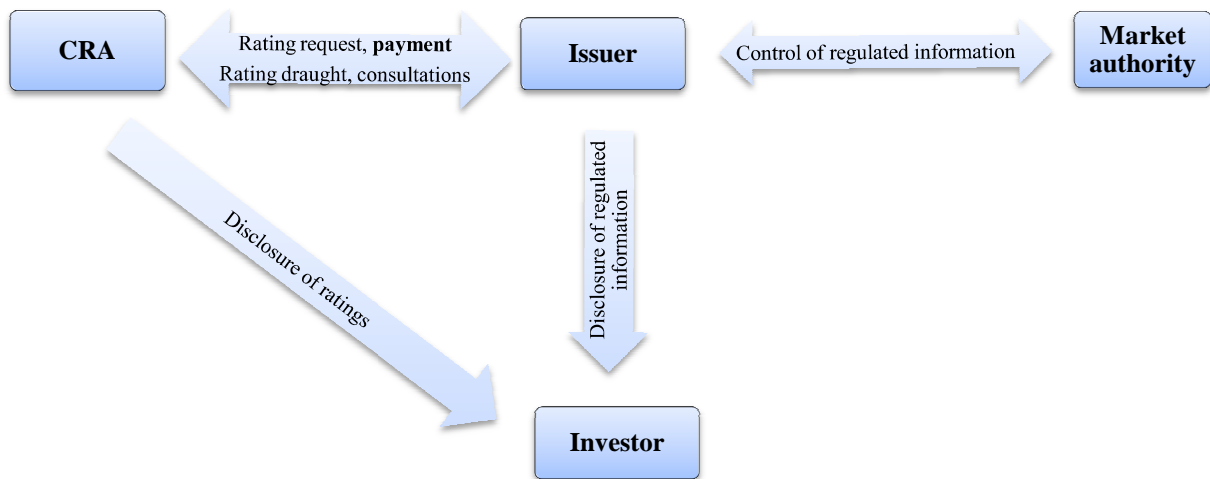
Business models of CRAs

All of the three biggest CRAs mentioned above work under the **“issuer-pays” model** described below. Their ratings are publicly available free of charge on their websites.³

² http://www.defaultrisk.com/rating_agencies.htm, (22nd February 2010)

³ See www.modys.com, www.standardandpoors.com, www.fitchratings.com

Figure 1: Issuer-pays model of CRAs



Source: Fabié, V. (2010), Author

The vast majority of published ratings ensue from the “investor-pays” model. The basic structure of this model is that the issuer pays for the evaluation of the probability of default of his financial product. First of all, the CRA suggest the rating draught which is the matter of further consultations. The rating draught is the primordial outline of the future aspect of the credit rating assigned to a particular product. The issuer can subsequently consider the purchase of the credit rating evaluation. Market authority primarily stands as the provider of regulations and rules about the disclosure of information. The potential conflict of interest and the possibility of “ratings shopping” under the “issuer-pays” model will be discussed later in Chapter 3: The role of CRAs in 2008 financial crisis.

There exist also alternative types of business models known as **“investor-pays” models**. Their releases are available only to parties who have subscribed to the rating service. They represent only a slight fraction of total amount of ratings issued worldwide; hence for the purpose of this thesis let assume that the CRA defined earlier works under the “issuer-pays” model.

1.1.4 Credit rating

Definition 2: Credit rating

Credit rating is an estimate of the credit risk of default of a potential borrower. Credit rating is the product of CRAs. CRAs have to subsume all available information in their output. The exact definition differs by the concrete rating agency; S&P and Fitch define the term credit rating as the assessment of the probability of default of an object being rated, whilst Moody’s indicate their ratings as the product of probability of default and the loss given default.

Videlicet, credit rating constitutes a measure of credit risk, which is most frequently represented by a letter scale.

Table 1: International long-term credit ratings letter scale of the three biggest CRAs

Moody's	S & P	Fitch	
Aaa	AAA	AAA	Investment grade
Aa	AA	AA	
A	A	A	
Baa	BBB	BB	
Ba	BB	BB	Non-investment grade
B	B	B	
Caa	CCC	CCC	
Ca	CC	CC	
C	C	C	
	D	D	

Source: Author, Moody's, S&P, Fitch

Credit ratings are categorized according to the length of maturity or destination of the target market. The scale of the international long-term ratings is shown in Table 1.

The meanings of ratings are the same for all rated categories products. It means that the probability of default of a corporate bond rated AAA should have the same probability of default as the structured financial product rated AAA. The consequential defections of this fact will be examined later.

It is important to note that the rating is not an absolute prediction of future default. The ratings are mainly derived from their historical experience of defaults and do not forecast their future behavior. This is one of the most broadened misapprehensions between the CRA and the investor. Investor usually does not have enough knowledge and resources to make a better research about the future market situation; therefore the credit rating is the only information that shapes his decision.

1.2 Collateral debt obligations backed by structured finance assets (SF CDOs)

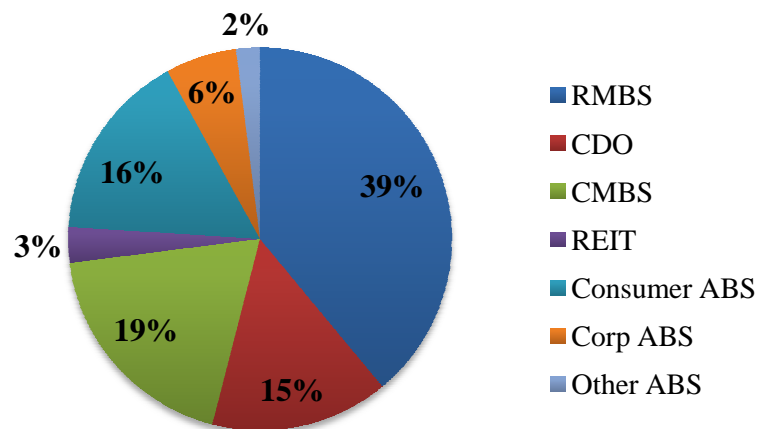
In second part of the general introduction, the fundamentals of the SF CDOs are explained. It is important to define the elements of structured finance for better understanding of

the future parts of this work concerning the regulation policy and the role of CRAs in 2008/2009 global financial crisis. In the end of this chapter, we will examine the process of rating of SF CDOs used by one of the biggest CRAs.

Definition 3: Collateral debt obligation

Collateral debt obligation backed by structured finance assets is a financial instrument that aggregates different types of structured finance products, e.g. asset backed securities (ABS), residential mortgage backed securities (RMBS), commercial mortgage backed securities (CMBS), real estate investment trusts (REITs), or other CDOs, into one product or pool.

Figure 2: Composition of SF CDOs in 2003



Source: JPMS, IFR Markets, MCM, S&P, Fitch, Moody's

CDOs are the “engine” of **asset securitization**. The term asset securitization is elicited from the fact that the financial instruments aggregated in a pool are securities, as referred in Definition 3. For further information about the definition and history of asset securitization, see the US Department of Treasury (1996).

To better understand the basis of SF CDOs, we will examine the main differences between the corporate and structured debt. Information is withdrawn from the ESME (2008).

Corporate debt

The corporate debt is usually underlined by one asset. Mostly, there is a direct linkage between the CRA and the management with specialized experts to almost all the industries. The expert has the useful knowledge to assess business and financial risk. If possibility of default

arises, the direct linkage between the CRA and company management can assist in remedy actions.

Structured finance debt

The loan obligations do not come from a single asset but are a combination of products mentioned in Figure 4. There are at least two stages of debt in structured finance. The first stage is the individual borrower's level of debt and the second stage is the issuer's of a CDO level of debt. Furthermore, the already existing CDOs can be transfer into a new ones called CDO-squared. This is the possible third level of debt of a newly originated instrument. The remedies of managements in case of a slump are limited, because the assets do not come from one origin.

In comparison with the corporate debt, where the rating anticipates whether the corporate will default or not, the structured finance rating designates the probable total level of defaults and losses of the assets in the pool.

The greatest advantage of structured finance product is that the investor can diversify the portfolio by investing in different tranches of the pools. On the other side, the diversification of multiple securities may raise the concentration risk since the assets are correlated. This aspect of the risk evaluation was highly underestimated by CRAs.

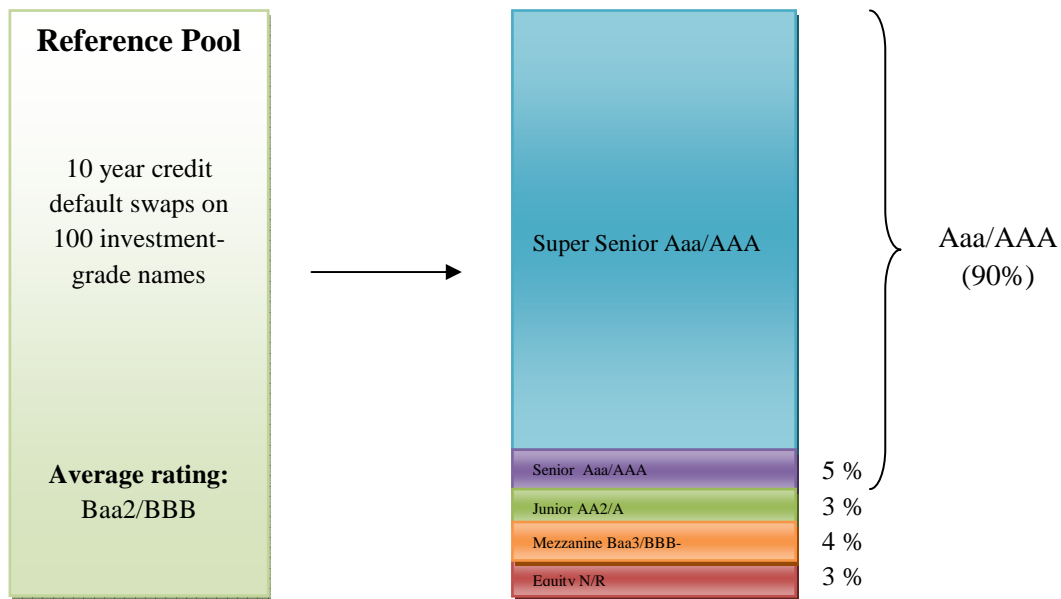
There is a high level of complexity in the rating of the structured finance products, compared to corporate debt, there are more variables required to be taken into account. This fact demands an eminent knowledge of CRAs analysts and extremely well-elaborated rating models.

1.2.1 Tranching

Most of CDOs are structured by "tranching". Fabozzi and Goodman (2001) define the process as follows:

"The securities issued by the CDO are tranching into rated and unrated classes. The rating of each class is primarily determined through the priority of interest in the cash flows generated by the collateral. The senior notes are typically rated AAA to A (...) and have the highest priority on cash flows. The mezzanine classes are typically rated BBB to B (...) and have a claim on cash flows that is subordinate to the senior notes. The subordinated notes/equity of the CDO are generally unrated and are the residual of the transaction."

Figure 3: Example of tranching into a Synthetic CDO



Source: Financial Service Authority (2007), Author

1.2.2 SF CDOs categories

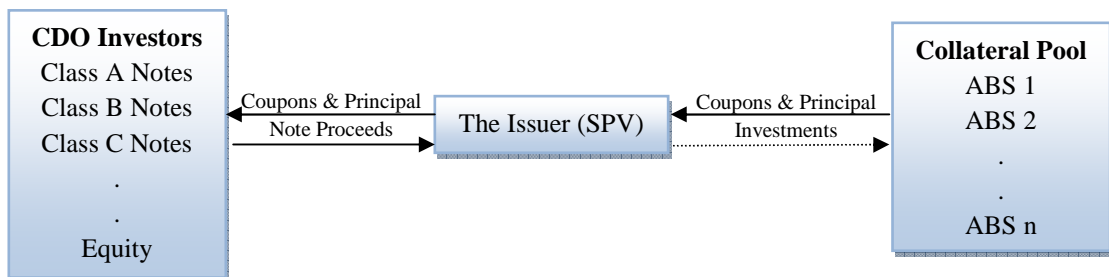
There are different types of classifications of CDOs. For the purpose of modeling and valuation, we will discuss mostly two different classes of SF CDOS. Firstly, CDOs categorized by its assets' acquisition and secondly CDOs categorized by the status of portfolio of a certain CDO.

Categories by Assets' acquisition

Cash SF CDOs

The structure of cash CDO is composed by a portfolio of cash assets, e.g. corporate bonds, asset backed securities (ABS), mortgage backed securities (MBS) et al. The issuer of a CDO is a specific legal entity called "special-purpose vehicle" (SPV). The SPV directly owns the underlying assets.

Figure 4: Cash SF CDO



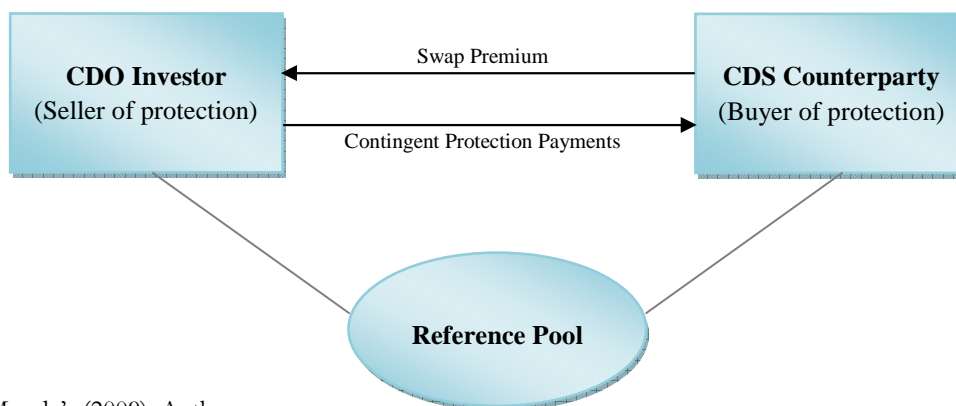
Source: Moody's (2009), Author

Synthetic SF CDOs

On the other hand a synthetic CDO issuer does not own the underlying assets. CDO issuer (SPV) buys a “credit default swap”⁴ of a pool of fixed assets, which is a derivatives instrument tradable on market. CDO investor plays a role of a credit protection seller and receives periodic cash payments, or **premiums**, in exchange for assuming the risk of loss on a specific asset, if it experiences a default or any other credit event.

Credit event is a subject of previous agreement of every CDO. The agreement or the contract between the protection seller and the protection buyer defines not only the condition of a credit event, but also the level of compensation from protection seller to buyer in case of a credit event.

Figure 5: Unfunded Synthetic SF CDO



Source: Moody's (2009), Author

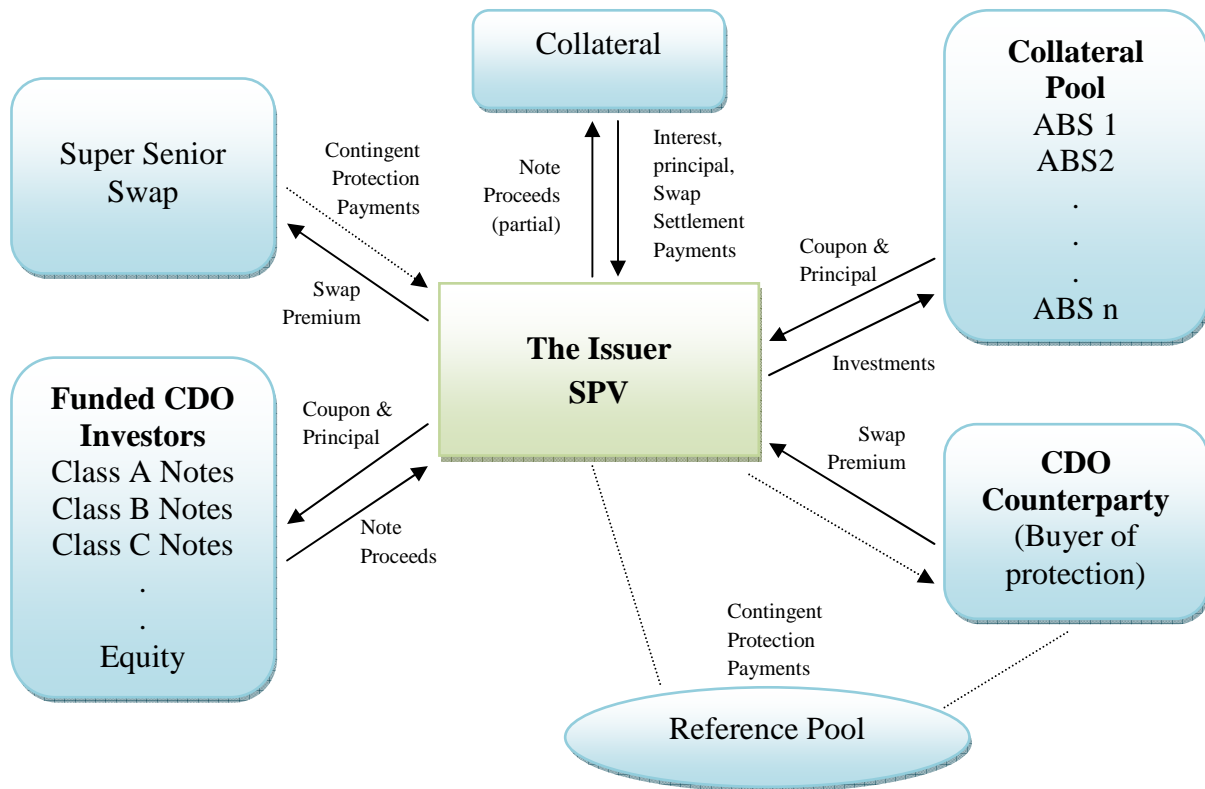
In Synthetic CDOs, the liabilities can be unfunded, see the Figure 5, or funded. When CDOs liabilities are unfunded, it means that the CDO does not receive money from the assets themselves but strictly from the periodical premiums. More often, the CDOs are partially funded by primordial payment to lessen the high risky junior tranches.

Hybrid SF CDOs

The third group of CDOs discerned by assets' acquisition is the hybrid SF CDOs. A hybrid CDO is an intermediate between the cash and synthetic CDO. They can contain a mixture of cash, synthetic assets, or funded and unfunded liabilities.

⁴ Credit default swaps are explained in detail in the book: *The Structured Credit Handbook* by Arvind Rajan, Glen McDermott, Ratul Roy.

Figure 6: Hybrid SF CDO



Source: Moody's (2009), Author

Categories by the status of CDO portfolio

There are two types of CDOs in this category:

Static CDOs

The structure of a static CDO does not change throughout its whole existence. The modeling of risk evaluation is therefore based on current composition of the pool of assets.

Managed CDOs

Differently, the CDO manager of a managed CDO can decide to buy or sell a certain asset. The manager has to follow specific rules defined in the CDO Indenture. The CDO Indenture is a special term defined by Moody's analyst. It is a relevant contract for US transactions, it defines the transaction parameters. The practices and terms may differ through regions and CRAs.

The model for risk evaluation is based on assumptions located in the Indenture. After the expiration of the reinvestment period, the model gets back to the roots of the static CDO. Managed CDOs are less transparent and command higher administrative costs.

1.2.3 Moody’s Approach to Rating SF CDOs

This part of Chapter 2 analyzes the Moody’s Approach to Rating SF CDOs. Most of the information contained in this part is extracted from the material: Moody’s Investors Service (2009). The document is currently available on the Moody’s website⁵.

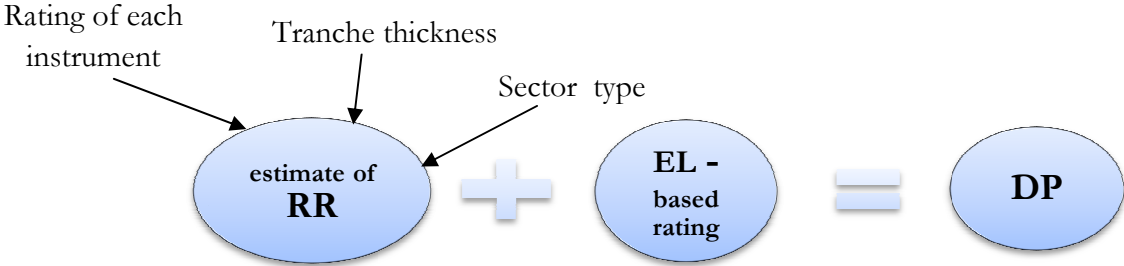
The output of the model used by Moody’s analyst is only a modeled ranking. It does not have to match the final credit rating. The modeled ranking is a subject to discussion by rating committee. Members of rating committee consider all quantitative and qualitative aspects concerning the object being rated and their verdict may differ from the modeled output.

Model Inputs

The elemental variables are: **recovery rate**, which is the fraction of the lender’s claim that is recovered after default through the liquidation of collateral assets. According to Seidler, Jakubík and Horváth (2009): “A lender’s **expected loss** is the product of the probability of default, the credit exposure at the time of default and the loss given default.”

The default probability is calculated from the estimated recovery rate and the expected loss-based rating.

Figure 7: Simplification of the model process



Source: Author

Glossary of terms:

- RR..... recovery rate
- EL..... expected loss
- DP default probability.

⁵ <http://www.moodys.com>, (dated to 27th February 2010).

Recovery rate

The unadjusted recovery rate assessment differentiates by the categories of instruments. There are six collateral categories with recovery rate assumptions, see the Appendix 1. The mean recovery rate is positively correlated with the rating of the instrument and the proportion of the transaction capital structure. The higher the ratings are of the aggregated instruments, the higher is the assumed mean recovery rate. The recovery rate is a subject of certain volatility; hence a standard deviation for each SF asset is defined. The recovery timing starts readily after the default event. It is assumed that the recovery rate follows Beta distribution⁶.

The standard deviation (StdDev) is a function of assumed mean recovery rate:

$$StdDev = \sqrt{RRmean \cdot (1 - RRmean)} \cdot 70\% .$$

Correlation between recoveries

Moody's presumes that recoveries are correlated with each other. The correlation of 10% between all pairs of securities is primarily assumed, based on Gaussian copula calculations. However, the assumption can be adjusted according to the market situation.

Default probability

The unadjusted default probability is calculated hereby: $DP = \frac{EL}{1 - RR}$, where EL is the idealized expected loss illustrated in Appendix 2.

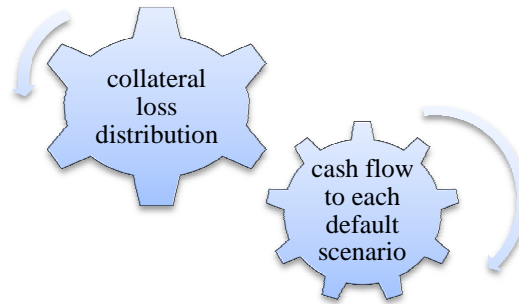
Since the FS CDOs are sensitive to credit performance of underlying assets, there are further adjustments to the default probability, which depend on the type of assets, region of issuance and current ratings. These conditions are defined as "resecuritization stress factors".

Determining the credit rating for each tranche

The determining of the credit rating for each tranche is a sophisticated process which uses in its calculations the default probabilities and the recovery rates defined above. The process contains two steps:

⁶ Beta distribution is a multi-purpose function which can simulate different shapes of probability density curves. In Beta distribution, there are two free parameters $\alpha_{1,2}, \alpha_{1,2} \geq 0$. The Beta distribution is commonly used for binomial proportions in Bayesian analysis.

Figure 8: Relevant aspects for determining the ratings for each tranche of a SF CDO



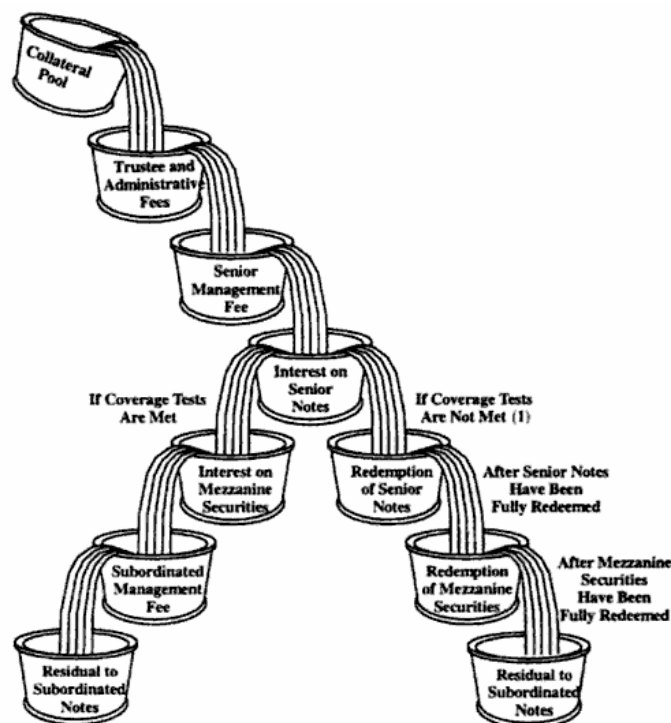
Source: Author

Once both the collateral loss distribution and corresponding cash flow to each default scenario are estimated, the expected loss for each tranche can be calculated. Finally, the EL for all tranches are compared, benchmarked and the rating is modeled.

Collateral loss distribution

The collateral loss distribution relies on the structure of the CDO, especially on the structure of payments. In other words, the collateral loss distribution varies by the different level of complexity of the CDO “waterfall”.

Figure 9: Example of the CDO waterfall cash-flow



Source: Fabozzi, F., Goodman, L. (2001)

Moody’s applies two different models used for CDOs with and without waterfalls. Cash and hybrid SF CDOs do have waterfalls, while synthetic SF CDOs do not have to have waterfalls and are subjects to further analysis of their complexity.

CDOs without waterfalls

Monte Carlo simulations are used in program CDOROM™ to define the loss distribution of underlying assets.

Managed CDOs with waterfalls

In this case, the Correlated Binomial Expansion Technique (CBET) is employed. CBET is an alternation of previous version BET which did not count with the correlation of assets. Therefore, the CBET is better adapted to large numbers of assets. The CBET simulation is also a part of the CDOROM. For additional information, see the paperwork Moody's Investors Service (2009).

This division of CDOs by the cash-flow structure is important for the EL calculation. There are variant approaches for different classes of CDOs:

i. Managed CDOs with waterfall

The formula for expected loss for the managed CDOs with waterfall is: $EL = \sum_{j=0}^D P_j L_j$,

P_j is the probability that j scenario will occur, P_j is given by CBET,

D is the number of possible scenarios,

L_j is the percentage loss to the tranche in scenario j . L_j relies on promised present values and

present values of scenarios: $L_j = \max(0, \frac{PV_{promised} - PV_j}{PV_{promised}})$.

ii. CDOs with simple waterfall

This situation is simulated by Monte Carlo processes, where the likelihood of each scenario is the same, hence the formula is: $EL = \frac{1}{N} \sum_{j=0}^N L_j$, N is the number of possible scenarios

and $L_j = \max(0, \frac{Tranche_{notional} - PV_j}{Tranche_{notional}})$. The current present value is the current swap rate plus the

promised spread on the tranche based on its remaining maturity. $Tranche_{notional}$ is the percentage notional of the capital structure.

Modeled Rating

By following the instructions above, we obtained the expected loss distribution for each tranche of a CDO. From this information we are farther able to create the modeled rating. The EL represents the “weighted average life” or WAL.

The rating is the proposal or modeled rating based on the Idealized Loss Rate depicted in Appendix 2. Generally, the higher the rating issued by a CRA the lower should be the differences and violations among the particular ELs for each scenario and each tranche of a SF CDO.

Henceforward, let’s concentrate on the main aspect of this work, the actual role of CRAs in 2008/2009 global financial crisis.

Chapter 2 THE ROLE OF CRAs IN 2008/2009 GLOBAL FINANCIAL CRISIS

In chapter 2, we get to the main point of the thesis, the theoretical and empirical evidence of the role of CRAs in 2008/2009 global financial crisis. There are several categories of potential affairs how CRAs contributed to the economic disconcertion. High volume of information is subtracted from the research reports of European and American regulatory institutions: European Commission, European Securities Markets Expert Group (ESME) and US Securities and Exchange Commission (SEC).

2.1 Conflict of interest

Under the issuer-pays-model, the fact that CRAs are paid by issuers rather by investors forms a danger of a conflict of interest. The conflict of interest, particularly for the case of CRAs, is a situation when a CRA regarding its own income and existence may assess a credit rating higher than it would be objectively assessed without the presence conflict of interest.

CRAs cannot ensure that they are not influenced by their commercial objectives in the rating judgments. The dialogue between the CRA and the investor plays an important role in the rating process. The level of complexity of structured finance demands of higher level of dialogue and likewise it is more probable that the impression of a conflict of interest is created. In accordance with ESME (2008), it is actually observed that the dialogue is often replaced by advisory, since CRAs' income depends on the future flows of its new ratings. SEC (2008) noticed that CRAs may also determine higher ratings for certain class of issuers to retain and attract more businesses in this class.

Recent investigations of the leading CRAs regarding their role in 2008 financial crisis have acknowledged that CRAs unsatisfactorily managed the potential conflicts of interest.⁷

The main deficiencies are compiled herein.

Table 2: The conflict of interest incentives

**Design of a SF
CDO**

The arranger of a SF CDO is usually also the designer of the deal with a CRA. Compared to non-structured assets rating deal, he has higher feasibility to create the SF CDO structure to obtain a higher rating and an opportunity to choose among several different CRAs.

⁷ Information withdrawn from July 2008 Staff Report, ESME Report

The arrangers' influence	The high concentration of arrangers' with strong influence on CRAs rating assessment has significantly contributed to enhance the favorable background for conflict of interest.
The arrangers' requirements	In order to minimize the costs of the debt of a specific pool of assets of a SF CDO, the arrangers required alleviated conditions for obtaining a high rating, e.g. by reducing the credit enhancement levels.
CRAs incentives	The high profit margins from SF CDOs ratings influenced the CRAs to comply the arrangers' claims. ⁸ There was no possibility to validate the work of CRAs analysts because of the lack of monitoring of the rating process.

Source: Author's comments

The adopted regulations and arrangements to preclude the potential conflicts of interest will be subsequently explicated in Chapter 3.

2.2 Transparency of rating methodologies

According to both documents, ESME (2008) and SEC (2008), it is evident that CRAs had not provided sufficient information about their methodologies and its assumptions. Furthermore, the exact knowledge of rating process was not the priority of an investor.

Despite the fact that CRAs have recently started to publish large amounts of new information on their websites about rating methodologies, this information is still served in a way that does not facilitate the investors a clear understanding of its meaning.

The lack of transparency could have led to incomplete fulfillment of the rating process plan. Whilst the structured finance rating started to become a significant part of the CRAs staff's scope of employment, the staff might have not stick to ordered processes and issued high ratings as on an "endless bar".

Secondly, the low transparency and high complexity of structured finance products could have led to the **rating shopping**. We observe the rating shopping behavior, when the issuer hires more CRAs to estimate their future rating (the ratings draughts) and seeks the one that offers the most favorable ratings among all of the proposed.

Numerous distinct research papers have concerned with the rating shopping matters. The evidence of shopping in rating industry is described by Becker and Milbourn (2008) on the example from the early to mid 1990s, when CRAs with lower requirements for methodologies and credit enhancements of their ratings continued to increase their market share. Another

⁸ The revenues of CRAs from SF CDOs ratings increased from 2002 to 2006 by 200 – 800% , as adduced in SEC (2008).

opinion by Schwarcz (2002) is that the short term incentives from the lowered requirements are overbalanced by the long term goal of CRAs, which is the maintaining its reputation.

Skreta and Veldkamp (2008) explain that for simple assets the ratings among the CRAs are similar, hence the incentive to shop the ratings is low. While for compound structured finance securities, the ratings may differ enough to increase the incentive of investors to shop the ratings. Hereinafter, there are some arguments about the existence of rating shopping and its connection with assets' complexity.

Former chief of Moody's, Tom McGuire, on the existence of rating shopping:

“The banks pay only if [the ratings agency] delivers the desired rating. . . . If Moody's and a client bank do not see eye-to-eye, the bank can either tweak the numbers or try its luck with a competitor like S&P, a process known as ratings shopping.”⁹

Mark Adelson, Director of structured finance research at Nomura Securities, explains the possibility of rating differentiation among structured finance assets:

“The complexity of a typical securitization is far above that of traditional bonds. It is above the level at which the creation of the methodology can rely solely on mathematical manipulations. Despite the outward simplicity of credit ratings, the inherent complexity of credit risk in many securitizations means that reasonable professionals starting with the same facts can reasonably reach different conclusions.”¹⁰

Further critique of rating methodologies used by CRAs is described in Christiansen et al. (2004).

2.3 Structured finance complexity

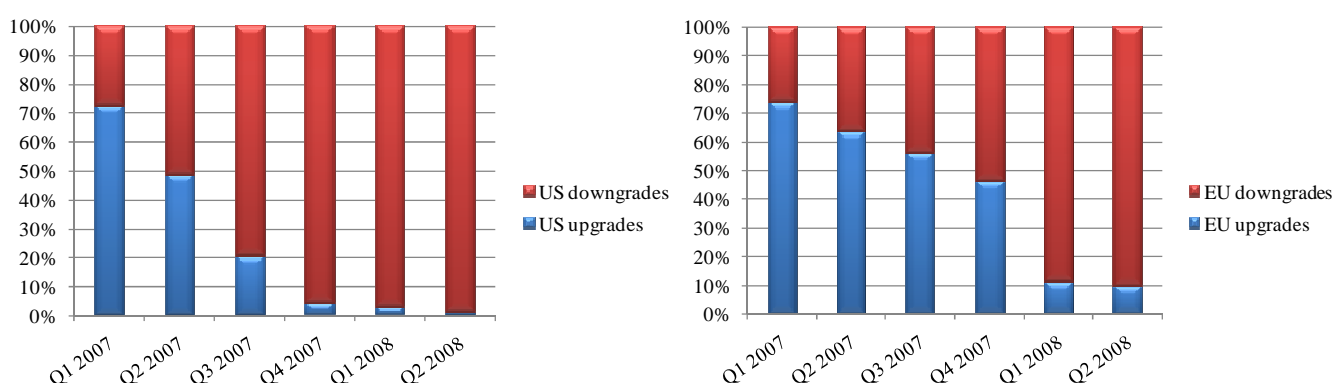
The volumes of SF CDOs and the revenues from their ratings have increased significantly since 2002. From the complex essence of structured products, SF CDOS are more volatile and weaker predictors of future developments than single name securities. Fender, Tarashev and Zhu (2008) describe the differences between the SF CDOs and corporate products in detail.

⁹ Quote from New York Times Magazine, Triple-A-Failure, April 27, 2008

¹⁰ Testimony before the Committee on Financial Services, U.S. House of Representatives, September 27, 2007

Nevertheless, CRAs have frequently used the same rating scale for structured and traditional products. It caused that many investors were confused about the correct interpretation of the “safety” of rated products. The same letter scale brought an impression that an AAA-rated SF CDO is as safe as an AAA-rated single name security. CRAs have argued that they use the same rating scale because the probability of default is similar across all the assets underlying the AAA-rated SF CDO and the AAA-rated single name security. The earlier models of SF CDO rating did not take the correlation of assets into account. The correlation of assets creates higher probability of supremely high or low losses.

Figure 10: The proportion of Upgrades / Downgrades in structured products in the 3 largest CRAs



Source: European Securitization Forum, Securitization Data Report Q2: 2008; Author

The variables that influence the assets correlation are trading prices, migration of ratings, and defaults. Because of the short existence of SF CDOs, the default history had almost no effect on correlation. The underestimation of mutual correlations is visible from Figures 10 and Table 3.

Table 3: Largest CRAs global structured finance 1 year transition rates

%	2007			2008		
	Downgrade	Upgrade	Stable	Downgrade	Upgrade	Stable
AAA	1.0	N/A	99.0	23.4	N/A	76.6
AA	4.4	3.5	92.1	34.9	1.8	63.3
A	11.3	4.2	83.9	36.9	2.1	61.0
BBB	20.2	2.9	77.0	40.2	1.0	58.1
BB	21.0	2.3	76.6	44.8	1.7	53.9
B	11.1	1.8	87.1	55.5	1.3	43.5
CCC	34.9	0.7	32.7	78.5	1.0	21.4

Source: Financial Services Authority (2009), Author

2.4 Disclosure of rating process

The imperfect disclosure of rating process is elaborated in detail in SEC (2008). We will summarize the main points of the SEC research. Consecutive findings are predominantly grounded on the email communication among CRAs' staff members.

To begin pledging the deficiencies of rating disclosures, we can mention the fact that **the significant rating criteria were not always disclosed**. In SEC (2008), the subject matter of an email from an analytical manager to an issuer/banker is revealed. It is cited that: “[N]ot all our criteria is published. [F]or example, we have no published criteria on hybrid deals, which doesn't mean that we have no criteria.”¹¹ Furthermore, one innominate senior analytical manager expressed that documenting all the criteria for the flexible and subjective structured finance ratings would be enormously compound and lengthy that it would require a lot more man-hours available. Another proof of lack of diligence in disclosing the rating processes is the statement of fact that one CRA released a “criteria report”, which comprised practices and operations no longer being used by this particular CRA. Notwithstanding, this agency have incontinently adjusted its internal audit to correct the inconsistency.

Hereafter, **CRAs complemented “out of model adjustments” in their rating assessments and did not fully document its reasoning**. In some cases, the deviation from quantitative models using another model or different loss level was approved by rating committee, but frequently there was no evidence on the rationale of the model adjustments.

The practices for ratings of different classes of instruments were not accurately specified in any of the inspected CRAs. The full documentation provided by CRAs was usually only examining the general process ideally suitable for all the classes of rated products. Without the full documentation, it is not only hard to certify that all the rating process have followed the CRAs policies and commanded procedures, but it has also a negative impact on overall efficiency of CRAs' activities. Likewise the practices for identifying the errors in models or methodologies were not defined by CRAs. The missing components of the procedures were e.g. parameters of monitoring, coordinates of investigation, features of errors adjustments.

CRAs are not required to verify the information presented to them by the instrument issuers. Furthermore, CRAs do not have to examine the level of diligence of a requester of rating. Every CRA states that its rating does not guarantee the accuracy, completeness, or timeliness of information described in the rating.

¹¹ Summary Report, p. 13

Griffin and Tang (2009) state in the abstract of their paperwork:

“Analyzing 916 CDOs issued from January 1997 to December 2007, we find that direct outputs from a rating agency model are more straightforward and accurate than actual ratings assigned to CDOs. Actual sizes of AAA rated tranches are on average 12.1% larger than implied by the rating agency model. These adjustments to the rating agency model are difficult to explain by possible determinants but exhibit a clear pattern of low model-implied AAA CDOs receiving larger adjustments. CDOs with larger adjustments experience worse subsequent performance. Moreover, prior to April 1, 2007, 91.2% of AAA rated notes only comply with the credit rating agency’s own AA default rate standard. Had the credit rating agency followed its model and default standards AAA rated tranches would on average have been rated BBB, resulting in a 20.1% lower valuation.”

In conclusion, CRAs lacked to provide sufficient information about the rating procedures, adjustments, rationales of model deviations, committee actions and decisions, and participants in the process.

2.5 Imperfect competition

One way how to measure the concentration of firms on the market and market competition is using the Herfindahl-Hirschmann Index (HHI). It measures the size of firms in relationship to the industry, which indicates the competition among them.

Formula:
$$HHI = \sum_{i=1}^N s_i^2,$$

where s_i is the market share of i firm (%), and N is the number of firms in the market. The HHI scale is from 0 to 10,000, where zero shows large number of firms with similar sizes, close to the perfect competition. The SEC (2008) states that the CRAs market’s HHI is 3,347, which is equivalent for three same sized firms (10,000/3,347). Therefore we can assume that CRA market has the oligopolistic structure with three market players.

Table 4: Number of credit ratings issued by NRSROs in 2008

NRSRO	Financial Institutions	Insurance Companies	Corporate Issuers	Asset-Backed Securities	Government, Municipal & Sovereign	Total Ratings
A.M. Best	3	6009	2710	54	0	8776
DBRS	18040	110	7080	7470	10560	43260
EJR	62	46	803	14	9	934
Fitch	83649	4797	14757	77480	491264	671947
JCR	155	31	544	71	71	872
LACE	18000	100	2000	0	300	20400
Moody’s	84773	6277	31126	109261	880880	1112317

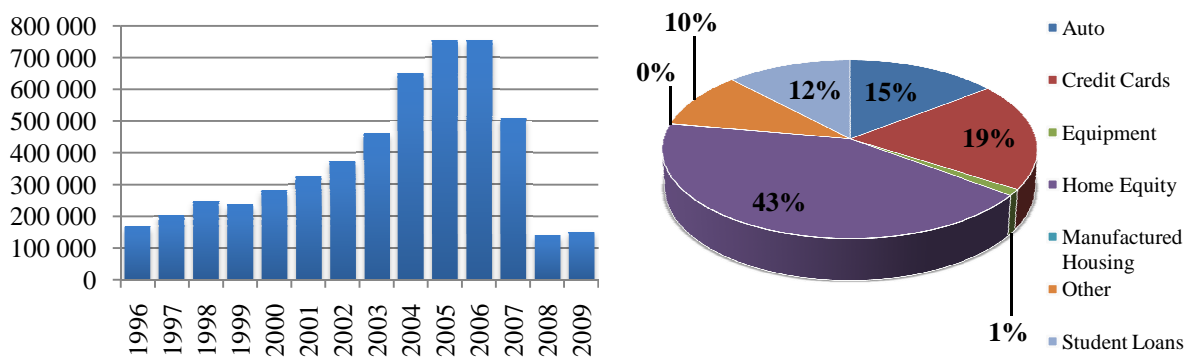
R&I	100	32	600	210	100	1042
Realpoint	0	0	0	9200	0	9200
S&P	47300	6600	26900	198200	976000	1255000
Total	252082	24002	86520	401960	2359184	3123748
HHI	2686	2467	2636	3550	3539	3347

Source: SEC Sept. 2009, p. 9, Author

As shown in Table 4, three CRAs: Fitch, Moody’s and S&P cover approximately 97% of the total ratings of NRSROs in all categories. This fact also proves that CRA market can be described as oligopolistic market.

The potential problem of the CRA imperfect competition is the reduced conservatism applied on structured finance ratings. CRAs might have biased the output ratings in order to keep the increasing inflow of new commissions for structured finance ratings. The structured products have become a substantial part of CRAs income during the last few years.

Figure 11: US ABS Issuance, 1996 – 2009; Composition of US ABS issued in 2007



Source: Thomson Reuters, SIFMA, Author

The increased competition on the CRA market would undoubtedly lead to higher differentiation especially in new alternative business models that would better satisfy the investors’ needs. Furthermore, the identification of subprime crisis could have been managed sooner, in more coherent way and with better communication to public.

According to ESME (2008), the oligopolistic structure of CRA market has had a negative impact on the quality of ratings.

2.6 Variations among CRAs internal audit processes

Internal audits serve as an internal control to verify whether the firm’s employees are following the firm’s rules, policies and procedures. Internal audits examine various aspects of organization’s operations and prepare special reports and recommendation to management. The

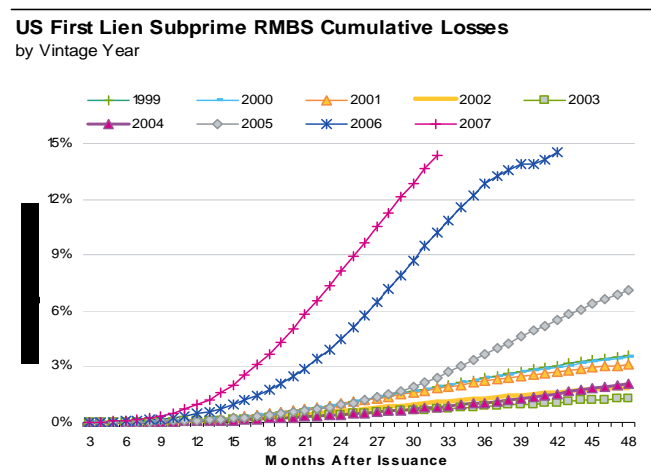
SEC research analysts reviewed the internal audits of all the CRAs on US market, regarding especially the SF CDOs area.

The CRAs internal audits varied significantly in scope and extension of its performance. In one large CRA, the internal audits of SF CDOs appeared to be frivolous. In the audit’s review, there was only a one-page check list of the completeness of deal files. The CRA evidenced only four examples of recommendations committed to management with no examples of consequent response. Another CRA’s internal audit pointed out lack of adherence to rating committee guidelines and primarily the abortion of management to review and adjust the models for future uses.

2.7 Monitoring of ratings

A fundamental part of rating process is monitoring the rated product through its life time to adjust to potential conflicts, which might affect its rating evaluation. The careful monitoring has to decide whether the rating should upgrade, downgrade or remain the same. CRAs have issued many high graded investment ratings to assure investors about a quality of subprime products and did not manage to adapt their ratings to early fluctuations on the subprime RMBS market, as depicted in Figure 12.

Figure 12: US First Lien Subprime Cumulative Losses

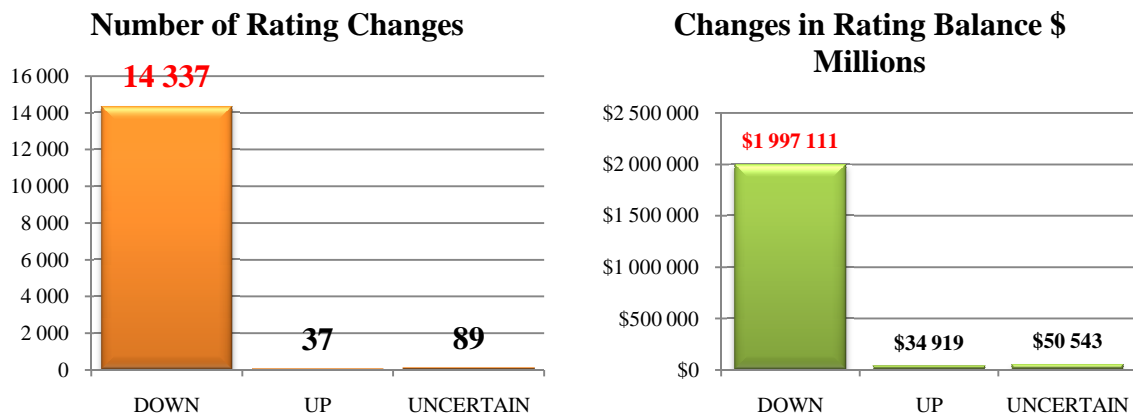


Source: Moody’s (2010)

The following Figure 13 illustrates the enforced downgrade adjustments to majority of credit ratings due to inadequate appreciation. It also proves that CRAs did not observe the situation on the markets sufficiently enough and gave low importance to previous performance of ratings. The research of CRA market has affirmed **the timeliness of rating surveillance.**

Löffler (2003) refers, why rating agencies are slow in reaction to new information. Cheng and Nemtiu (2008) investigate whether and how CRAs respond to the pressure and criticism for their ratings' lack of timeliness.

Figure 13: Balance of credit rating changes, 2010



Source: Moody's (2010), Author

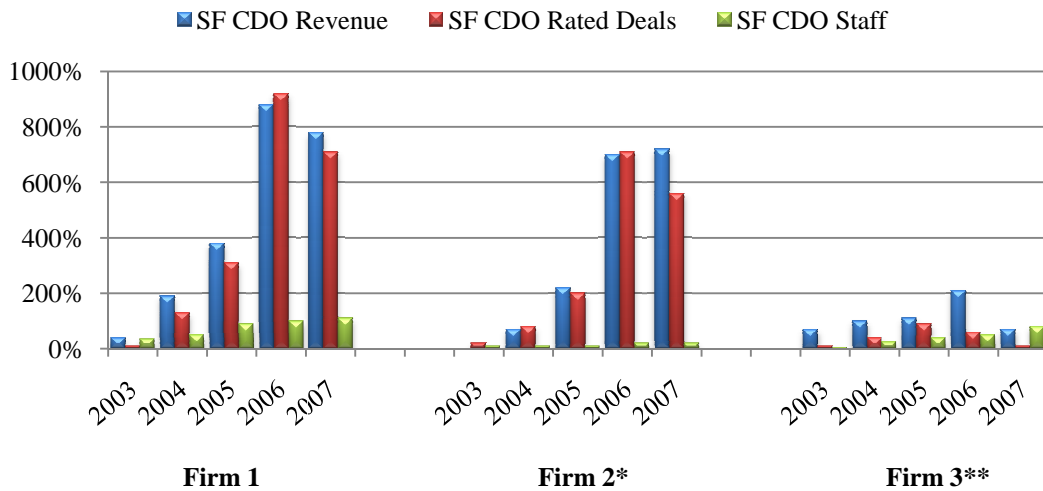
One of the main reasons of the lacked monitoring was assuredly **the absence of CRA staff**. Furthermore, CRAs have shown poor documentation of monitoring process (in periodic reports, or exception reports), which signifies that the monitoring was not well-managed. Two of the surveyed agencies do not actually have any internal written procedures, which the monitoring staff should follow while modifying the SF CDOs ratings.

2.8 Human resources

The substantially increasing complexity and number of deals of structured finance products requires corresponding accrual in staff number. Arising from Figure 14, it is obvious that CRAs did not hire enough of new analysts to cover the extension of work in sufficient manner.

Due to the rising complexity in SF CDOs products that were rated, demanding for extended knowledge of models and the use of credit default swaps, it would have required even higher increase in man-hours. Consequently for the sake of time pressure, CRAs analysts became less conservative in their rating assessments.

Figure 14: Percentage Change Comparison from 2002 vs. 2003 – 2007 in SF CDO Revenue, Rated Deals, and Rating Staff, in three large CRAs



Source: Summary Report, p. 11, Author

* Firm 2 did not provide 2002 SF CDO revenue data. Therefore, the SF CDO revenue percentage change is based upon the 2003 balance as opposed to 2002.

** Firm 3 provided 9 months of SF CDO revenue for 2006. Therefore, 12 months of estimated 2006 revenue was extrapolated for CDO multiplying 9 months of revenue by 1.3.

Following email from an analytical staff member to another analytical staff member can be viewed as a forecast of future collapse on financial markets. In the email, the staff member expresses himself that the CRA he is working for is creating an “even bigger monster” – the CDO market: “Let’s hope we are all wealthy and retired by the time this house of cards falters.”¹²

Onward email proves the time press exposed to CRA staff members: “[t]ensions are high. Just too much work, not enough people, pressure from company, quite a bit of turnover and no coordination of the non-deal ‘stuff’ they want us and our staff to do.”¹³

CRA analysts specializing in SF CDOs rating were expected to work long hours a day. In actual fact, they worked even longer, more than 60 hours per week and were still short on resources. The work pressure had led to many resignations. CRAs struggled to provide the analyst teams with new members and their sufficient training.

¹² For sources of the email communication, see the Summary Report of SEC.

¹³ For sources of the email communication, see the Summary Report of SEC.

Chapter 3 REGULATION OF CRAs

Henceforward, we will depict the ongoing regulation of CRA markets. The individual parts of European and American regulation of CRA markets is divided into number of tables. In subsequent parts of the thesis, the efficiency and integrity of the regulation will be discussed.

Before we start analyzing the concrete steps of CRAs regulation, it is important to define new terms, which came into existence jointly with the current regulation. In United States, every CRA has to be registered as the **Nationally recognized statistical rating organization (NRSRO)**, otherwise it will not be allowed to share the US CRA market. The system of NRSROs was created to improve the situation on CRA market and eliminate the problems listed in Chapter 2.

In the European Union, the CRAs also have to be registered, yet no special term has been determined. The supervision of CRAs (NRSROs in US) is secured by The Committee of European Securities Regulators in EU and The U.S. Securities and Exchange Commission (SEC).

The following tables are transformations of information provided by regulation institutions, Commission of the European Communities (2008) and SEC (2008), (2009). The main purpose of this part of the paper is to enlist the component steps in CRAs regulation. The tables are appended by author's annotations.

3.1 Organizational, corporate requirements

The first table gives us a summary about the general frame of the regulation. It is based on better monitoring of rating processes and adjustments. It should also improve the role of internal audit within the scope of agencies. New surveillance positions have been originated to oversee the work of CRAs.

Table 5: Organizational, corporate requirements

	EU rules *	US rules **
Requirement for registration	Yes.	Yes. The registered agency gains a new status of NRSRO.
Supervision by the competent authority	The Committee of European Securities Regulators (CESR)	U.S. Securities and Exchange Commission (SEC)
Internal functions	Develop the CRA rating policy, monitor compliance with internal procedures and processes for the rating activity, and review the feasibility of providing ratings for new instrument.	Review disclosure of the ratings process and the methodologies used to rate RMBS and CDOs to ensure full compliance with SEC rules. NRSROs should review whether

	Review methodologies, models and significant changes to methodologies and models. This function is independent of the rating activities.	<p>policies governing the timing of disclosure of a significant change to a process or methodology are reasonably designed to comply with applicable SEC disclosure requirements.</p> <p>Determine whether written policies and procedures used to determine credit ratings for RMBS and CDOs are fully documented.</p> <p>Review current policies and practices for documenting the credit ratings process and the identities of RMBS and CDO ratings analysts and committee members.</p> <p>Determine if adequate resources are devoted to surveillance of outstanding RMBS and CDO ratings.</p>
Special functions	A new function on rating policy for some members the board to monitor development of the rating policy, effectiveness of the rating internal quality systems, compliance and governance processes.	Review whether internal audit functions, particularly in the RMBS and CDO ratings areas, is adequate and whether they provide for proper management follow-up.
Whistle blowing	A mechanism for anonymous reporting of irregularities by staff.	×

After elaborate research has been conducted, it is unambiguous that CRAs did not manage the disclosure of rating procedures and practices with CRAs competently. Hence, the cardinal frame of the overall regulation is concentrated on developing the monitoring of CRA industry, as well as reviewing their models and methodologies publicly available to investors. Notwithstanding, the usefulness and effectiveness of these arrangements will be approved only in the course of time.

3.2 Conflict of interest

Conflict of interest is one of the most discussed causation of CRAs failure in 2008 financial crisis. CRAs had to adopt various standards, e.g. every CRA has to disclose all the information about communication with an entity that brings more than a certain percentage of revenues of a CRA. Furthermore, CRA staff cannot offer a rating if having any share in the rated company, which could affect the staff disinterestedness.

All of the newly adopted regulations to preclude the conflict of interest are extended in Table 6.

Table 6: Conflict of interest

	EU rules *	US rules **
General policy	CRAs have to ensure that conflicts of interest (existing, potential) will not affect ratings. Conflicts of interest to be: identified and either eliminated or properly managed and disclosed.	Review practices, policies and procedures for mitigating and managing the "issuer pays" conflict of interest. Review policies and procedures for managing the securities ownership conflict of interest to determine whether these policies are reasonably designed to ensure that employees' personal trading is appropriate and in compliance with applicable requirements.
Disclosure when	5 % or more revenue from 1 entity.	10 % or more revenue from 1 entity. If an NRSRO is hired by arrangers to perform credit ratings for structured finance products, it has to disclose to other NRSROs (and only other NRSROs) the deals for which they were in the process of determining such credit ratings.
Prohibition of offering / continuing rating when	Analyst or person approving ratings has direct ownership in the rated entity. Analyst or person approving ratings is a member of supervisory or management board of the rated entity. CRA associated with the rated entity.	An NRSRO issues a rating where the NRSRO or a person associated with NRSRO has made recommendations as to structuring the same products that it rates. Anyone at an NRSRO who has responsibility for participating in determining credit ratings or for developing or approving procedures or methodologies used for determining credit ratings from negotiating the fee paid for a rating.
Provision of consulting / advisory	Prohibited.	Prohibited.
Rating staff prohibited to	Engage in fees negotiations. Engage in any transactions in instruments related to the rated entity. Handle any confidential information (incl. unpublished ratings). Receive any gifts from the rated entity. Look-back reviews of ratings after an analyst has left to work for the rated entity.	Engage in fees negotiations. Receive any gifts from the rated entity.
Rules concerning the staff	Names and job titles of all analysts and supervisors.	It has to be disclosed: The total number of credit analysts.

<p>Appropriate rotation mechanism which should provide for a gradual change in analytical teams and credit rating committees.</p> <p>Max. 4 years on the same client, cooling-off 2 years minimum.</p>	<p>The total number of credit analyst supervisors.</p> <p>A general description of the minimum required qualifications of the credit analysts, including education level and work experience (if applicable, distinguish between junior, mid, and senior level credit analysts).</p> <p>A general description of the minimum required qualifications of the credit analyst supervisors, including education level and work experience.</p>
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All of the various directives are well-founded. The only question that remains is whether it countervails or not. The conflict of interest can never be fully excised under the issuer-pays business model.

3.3 Quality of ratings

In Chapter 2, we have understated that the monitoring within CRAs was not correctly working and that the CRAs lacked on timeliness of their rating responses on current situations on financial markets. From now on, CRAs do not only have to regularly monitor and adjust their ratings but they are also required to withdraw the existing ratings if robust data sufficient for rating enouncement is missing, especially in structured finance sphere of business.

Table 7: Quality of ratings

	EU rules *	US rules **
General policy	<p>CRAs to use methodologies that are rigorous, systematic, continuous, and may be validated based on historical experience. Applied consistently by analysts.</p> <p>CRAs to ensure that methodologies, models and key ratings assumptions are up-to-date and subject to comprehensive review.</p>	<p>The goal of further enhancing the utility of NRSRO disclosure to investors, strengthening the integrity of the ratings process, and more effectively addressing the potential for conflicts of interest inherent in the ratings process for structured finance products.</p>
Duty to re-rate	<p>CRAs to rerate all rating following changes in methodologies, models, assumptions.</p>	<p>Disclosure of CRA’s practice (CRAs to disclose if they apply retroactively model changes to existing ratings).</p>
Monitoring activity	<p>CRAs have to monitor and update the rating on an on-going basis.</p> <p>CRAs have to disclose monitoring frequency.</p>	<p>Disclose of CRA’s practice (duty to disclose monitoring frequency).</p>

Limits to rating activity	CRAs not to issue ratings / withdraw existing rating when: lack of robust data; a new structure which raises serious doubts; disability to assess creditworthiness.	Limitations in structured finance ratings.
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3.4 Communication with the market

As denoted several times before, the downfall of world financial markets was largely induced by the structured finance complexity. Investors have little chance to understand the conformation of structured finance products and obviously even smaller chance to apprehend the risks of underlying assets. To lessen this information asymmetry, fractional regulation has been done. To help investors to distinguish the essence of the rated financial instrument, presumably letters “SF” will be added after every rating assigned for structured finance product.

However, it still does not assure the complete comprehension of the risk difference between the single name security and the SF CDO.

Table 8: Communication with the market

	EU rules *	US rules **
Different rating categories (symbols) for structured and traditional debt	Either using different symbols or attaching each time a report on the differences between a structured and traditional rating.	Requiring that NRSROs differentiate ratings for structured products from ratings for corporate and municipal securities and/or publish measures of the uncertainty or potential volatility associated with ratings.

3.5 Record keeping obligations

To guarantee the possibility of retroactive scrutiny, internal records of all the actions of CRAs will be kept from now on. The importance of the regulation results from the fact that after the turmoil 2008/2009 on financial markets; no one was de facto able to revise the CRAs aberrances because of the absence of records from past periods.

Table 9: Record keeping obligations

	EU rules *	US rules **
Internal records	Kept for at least 5 years (including records of analysts’ dialogue with the rated entity).	Kept for at least 3 years

3.6 Other malpractice

John, Lynch and Puri (2003) define the notching practice as the conditioning of the credit rating based on the recovery rate in the event of default; see the simplification of rating model process in Figure 8.

Table 10: Other malpractice

	EU rules *	US rules **
Prohibition of the notching practice	Adopted.	Adopted.

3.7 Disclosures and transparency

In Table 7, numerous arrangements to enhance the disclosure of CRAs documents are listed.

Table 11: Disclosures and transparency

	EU measure *	US measure **
Continuous disclosures	<p>Methodologies, models and key assumptions in use. Any material modifications to methodologies and key assumptions.</p> <p>Potential and existing conflicts of interest.</p> <p>Definition of an ancillary service.</p> <p>General nature of compensation arrangements.</p> <p>Information about rating staff numbers and allocation to different functions.</p> <p>Other internal policies, significant for users of ratings e.g. policy on distribution of ratings.</p>	<p>Require NRSROs to make publicly available in Extensible Business Reporting Language ("XBRL") format a random sample of 10% of their issuer-paid credit ratings and their histories for each class of issuer-paid credit rating for which the NRSRO is registered and has issued 500 or more ratings.</p> <p>Require disclosure whether and how assessments of the quality of originators of assets underlying a structured product play a part in the determination of credit ratings.</p> <p>Frequency of credit ratings reviews, whether different models are used for ratings surveillance than for initial ratings; and whether changes made to models are applied retroactively to existing ratings.</p>
Annual transparency report	<p>Agencies to provide a yearly report (publicly available) outlining its organizational arrangements, policies and practices with regard to rating activity and its quality and compliance aspects.</p> <p>Such report to describe:</p> <p>Legal structure and ownership (including significant direct and indirect shareholdings).</p> <p>Description of the internal quality system.</p> <p>Information about rating staff numbers and allocation to different functions.</p> <p>Description of record keeping policy.</p> <p>Outcome of the annual internal review of</p>	<p>Require NRSRO to make an annual report of the number of ratings actions they took in each rating category.</p> <p>Such report to describe:</p> <p>Revenue from determining and maintaining credit ratings.</p> <p>Revenue from subscribers.</p> <p>Revenue from granting licenses or rights to publish credit ratings; and</p> <p>Revenue from all other services and products offered by the credit rating agency (include descriptions of any major sources of revenue).</p>

<p>independence compliance.</p> <p>Financial information on revenue from rating fees and non-rating revenue.</p> <p>Management and analyst rotation policy.</p>

Henceforward, investors and regulatory institutions will be able to acquire information from the **“Annual transparency report”**. The content of this report varies in US and EU. The US annual report of CRAs is based primarily on recognizing the revenues in each rating category. Whilst in the EU, CRAs have to include information about the legal structure and ownership, the product of the internal audits, as well as the revenues from rating fees and non-rating revenues.

3.8 Other periodic disclosure

Table 12: Other periodic disclosure

	EU rules *	US rules **
Historical performance data	Default and transition studies to be put in a central repository managed by CESR.	Envisaged as disclosure on website. 1, 3, 10 year horizon required for each rating category. Methods used for calculation to be publicly explained.

Albeit the regulation specifies that the methods used for calculation have to be publicly explained, the extent of the clarification is not prescribed sufficiently. Without this additional information, CRAs might interpret the explanation deficiently to cover the investors’ needs.

3.9 Standards for presentation of ratings

The last but not least category of directives deals with the standards of the credit ratings. Especially for structured finance ratings, all the processes used by CRA analysts must be disclosed as far as every single investor will be able revise the rating. Moody’s have actually started implementing this criterion by adding its models in use for structured finance on its website.¹⁴

Table 13: Standards for presentation of ratings

	EU rules *	US rules **
Basis standards	<p>Name and job title of analyst.</p> <p>All substantial sources and whether CRA discussed draft rating with the rated entity.</p> <p>Methodology, methodology version, any deviations explained.</p>	<p>Additionally:</p> <p>Requiring that structured finance rating methodologies, including the models and assumptions underlying the models, be disclosed in full so users can replicate ratings.</p> <p>Requiring independent analysis and</p>

¹⁴ www.moody’s.com, the excel file CDOROMv2.5™ available on Moody’s website.

<p>Rating meaning, definition or default and recovery, risk warnings (sensitivity analysis and what-if scenarios). Best case and worst case ratings.</p> <p>Limitations of the rating including the CRA’s statement whether it is satisfied with the information quality and if it verified the information in any way.</p> <p>Whether rating was unsolicited.</p> <p>For structured finance ratings, information about any loss and cash-flow analysis performed.</p> <p>For structured finance ratings, CRA’s statement if it has sufficient knowledge of due diligence processes at the underlying assets level (and outcome of any analysis performed).</p>	<p>validation of NRSRO models for structured finance ratings and publishing the results of the independent review.</p> <p>Requiring NRSROs to disclose the type of information they review about the assets underlying a structured finance product (e.g., individual loan level information), including the extent to which they pierce layers of a structure to review information about the assets that are the fundamental source of payment streams (e.g., looking through the RMBS underlying a CDO to review information about the mortgage loans underlying the RMBS). Some have suggested that NRSROs be prohibited from rating a structure if they do not pierce all layers of the structure and review information about the ultimate assets.</p>
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* The content of Regulation (EC) No 1060/2009 of the European Parliament and of the Council of 16 September 2009 on credit rating agencies.

** Final rule amendments adopted in December 2008.

Source of the tables presented in Chapter 3: Commission of the European Communities (2008), Author.

Chapter 4 REGULATION RESPONSES OF CRAs

Chapter 4 gathers the impressions of the three biggest CRAs (Moody's, S&P and Fitch) from the current CRAs regulation. On behalf of completeness of this thesis, it is important to compose opinions from both sides, not only from the regulatory institutions but also from the point of view of the CRAs.

4.1. Moody's

❖ *Comments to the Securities and Exchange Commission (SEC) on the proposed amendments to rules ("Proposed rules")*

Moody's completely agrees with the SEC regulation objectives, but considers the concrete steps of proposed rules as antagonistic. In the official response letter of Moody's addressed to SEC, following quotation is mentioned several times: **"Commission rules should address the causes, rather than the symptoms, of potential over-reliance on ratings."** Moody's points out that CRAs play limited role on financial markets (a narrow niche in the information industry). Investors have to be aware of this fact and have the cognizance of the matter of credit ratings. Credit ratings are not indicators of price, level of liquidity, or recommendations to buy, sell or hold securities.¹⁵ Investors should use the ratings only as amplifying information on relative credit risk to specify their opinions based on publicly available information. However, the evidence that credit ratings announcements frequently influence the equity prices is underlined in Micu, Remolona, and Wooldridge (2005).

In Moody's opinion, CRAs should not be used as a substitute for disclosure of essential information to investors. Particularly, in the structured finance area, Moody's suggest and urge the SEC to amend **the disclosure regime for registered offering of structured finance products**. Under this system, issuers would have to provide sufficient information about credit and other risks as well as the structures of their issued instruments, and investors would have enlarged resources of information to establish their own outlook.

Furthermore, Moody's states that the proposed rules are unlikely to improve investors understanding of ratings. It recommends especially enhancing the feasibility of CRAs internet

¹⁵ Author's annotation: This misinterpretation of credit ratings is very frequent, especially in SF CDOs industry.

sites and strict following of The IOSCO Code of Conduct Fundamentals for Credit Rating Agencies (“IOSCO Code”), adopted in 2004.¹⁶

Moody’s accords to prohibit anyone who participates in determining or monitoring credit ratings or developing or approving rating procedures from negotiating the ratings fees. However, it mentions that **the disclosure of fees would undermine the enabling acts established to promote independence of credit rating analysis**. It would provide the CRAs customers with such commercial information than ever before and assuredly lead to higher incentives of rating shopping.

❖ *Comments to the Committee of European Securities Regulators’ consultation paper on the EU regulation on Credit rating agencies (“The regulation”)*

The following remarks on EU regulation proposals and adopted amendments are abstracted from the formal response to the CESR consultation paper where Moody’s was asked multiple questions about issuable parts of the regulation.

Moody’s eluded the fact that the obligations for CRAs within the proposed regulation exceed the scope of the intention of The regulation. Thereunto, The EU Commission proposes in the consultation paper: “If the registered CRA has an office in the country in which the rated issuer/assets is/are listed, this is the issuing CRA.” Moody’s points out that it yields several problems, e.g. the issuer can be listed and traded on various exchanges and therefore, if the place of listing is the eminent factor to determine the CRA to issue a rating, it would contribute to the material risk of multiple places of listing (primary listing, secondary listing, etc.).

In the letter of response, Moody’s does not reflect any opinions about the designed orders made e.g. to prevent the conflict of interest of any kind, or on publishing and reviewing the procedures and methodologies of CRAs. We can accordingly assume that it does not have any objection, nor discredit in this field. In terms of human resources matters, Moody’s is counter to the requirement to identify the number of rating committee members by reason that it suggests a fixed rating committee. The more meaningful information to disclose is the number of leading analysts, giving the information about their rank/seniority, type of rating analyst and type of credit rating produced or monitored.

¹⁶ The IOSCO Code contains measures to improve the quality of ratings, integrity, independence and transparency of CRAs. All of the three biggest CRAs have incorporated the IOSCO Code in their own codes.

4.2. S&P

❖ *Comments to the Securities and Exchange Commission (SEC) on the proposed amendments to rules (“Proposed rules”)*

The statement of S&P is addressed to summarize the topics of SEC’s April 15, 2009 “Roundtable to Examine Oversight of Credit Rating Agencies”. It is concerning about the importance of credit ratings on capital markets and the need to restore investor’s confidence in CRAs ratings; steps taken by S&P to increase such confidence; the role of regulation in this matter of interest; and last but not least it also understates the positive and negative aspects of CRAs business models.

Despite the poor performance of ratings on structured finance products issued in 2005 – 2007 period, ratings have always played essential role across the whole spectrum of financial markets. S&P believes that their credit analyses are having the same value to the market now as they have had over the decades. Nevertheless, S&P initiated many steps to enhance the rating process and promote confidence. The concrete steps are consistent with the content of the current regulation of CRAs.

In the matter of the regulation, S&P conveys that any regulatory approach should include **“end-to-end solutions”**. In other words, it has to cover all the aspects and problems enrolled in 2008/2009 global financial crisis to extend a systematic way for their superior functioning. In the concrete question of structured finance area, regulation should include rules about the origination of this sort of pooled assets, its structuring and underwriting. Another important factor influencing the quality of credit rating is **the reliability and accuracy of information provided to CRAs**. It is the obligation of the corporations, mortgage originators, underwriters, and others who assign for rating of their instruments, to provide meaningful and correct information to CRAs. In the opinion of S&P, the reviewing of that information and verifying it should also be a part of regulatory approach.

International consistency is another crucial condition of decisive regulation, since the ratings are issued and used globally. It is due to provide common language for credit analyzing risk.

To discuss the business models of CRAs, S&P supposes that each of the possible models have its strengths and weaknesses in relation to their quality. The qualities are: transparency, independence, consistence, coverage and scrutiny.

The issuer-pays model is most likely to provide the highest level of transparency from the possible models. Investor-pays model is limited to be visible only to subscribers and significantly decrease the volume of information available to the marketplace. Lack of independence or possibility of conflict of interest can be found in any type of business model of CRAs, as well as the consistence or quality of a rating that does not depend primarily on the type of business model, but rather on the CRA itself. In issuer-pays model, the ratings are covered only if there is sufficient demand of customers. Therefore, CRAs working under this kind of model concentrate more on sectional industries. Hence, in terms of coverage, CRAs likewise attain the highest levels. The scrutiny and surveillance of the rating process is an important concernment regardless on the type of the business model.

❖ *Comments to the Committee of European Securities Regulators' consultation paper on the EU regulation on Credit rating agencies ("The regulation")*

The publicly available comments of S&P on the CESR Consultation Paper on the CRA's Central Repository as published by CESR on 9 July, 2009 are only widely decomposing details of the regulation structure. There is no considerable disaccord with the proposals of regulation.

4.3. Fitch

❖ *Comments to the Securities and Exchange Commission (SEC) on the proposed amendments to rules ("Proposed rules")*

Fitch official response to SEC proposed amendments likewise deliver number of ameliorations and adjustments. Fitch states that adhering to all of the nominated policies, procedures, or methodologies are purposeful. E.g. the regulation should not play a role of financial audit, which is made by other institutions independent of a CRA. Further recommendation relates to the general report made by one officer, who can hardly cover all the issues around a CRA, especially for the CRA with global business. It is inevitable that this officer will have to rely on work of his team analysts. Fitch suggests that all the participants are listed in the report with their work positions and contributions.

Fitch farther believes that such extensive disclosure comprised in the regulation proposal is counterproductive for the investors and it will not be of practical value. Instead of this broad disclosure, Fitch proposes another rule under which the CRAs would prepare single revenue report for each person or entity that it received money from to issue or maintain an outstanding credit rating. The system made by the Commission is unnecessarily complicated. For investors,

the information about which entities paid the most to CRAs (in aggregate numbers) would be more valuable.

❖ *Comments on the announced EU regulation on CRAs*

Fitch has released a brief response on the announced EU regulation on CRAs. Fitch states that there are certain requirements for further clarification of the concrete rules comprised in the EU regulation, e.g. the form and type of disclosure required for structured finance transactions data and expected types of data quality checks of the CRAs. It has to be done in order to prevent the loss of analytical expertise, which might lead to deterioration of quality of credit ratings. Notwithstanding, Fitch does not comment any other particular issue.

Chapter 5 SUMMARY OF CRAs REGULATION

We will demonstrate the efficiency of the current CRAs regulation on the following table, which evaluates the level of current CRAs regulation.

Table 14: The level of CRAs regulation

Problems encountered in 2008 financial crisis	The level of proceedings towards its elimination		
	<i>HIGH</i>	<i>LOW</i>	<i>DEFICIENT</i>
Conflict of interest	✓		
Transparency of rating methodologies	✓		
Structured finance complexity		✓	
Disclosure of rating process	✓		
Imperfect competition			✓
Variations among CRAs internal audit processes		✓	
Monitoring of ratings		✓	
Human resources		✓	

The column of high levels of proceedings towards the eliminations of problems encountered in 2008 financial crisis connected with the CRAs represents areas, where regulation serves multiple upgraded approaches converged to successful abolition of future inconveniences. Issues denoted as having a low level of proceedings towards its elimination hold certain part in current regulation; however the fundamentals of the issue are not well prevented. Terminally, the deficient level of proceedings the elimination of a problem assign that the regulation does not deal with the particular problem anyway. Hereinafter, the concrete enlistment of problems encountered in 2008/2009 global financial crisis will be discussed in detail.

➤ **Conflict of interest**

In Chapter 3, we have mentioned various amendments that were adopted in order to banish the potential conflict of interest. In spite of the fact that the existence of conflict of interest can never be completed, in opinion of the author, the current regulation has provided extensive adaptations to lessen this possibility. It has brought strict rules on revenues disclosures from certain types of entities, as well as various prohibitions on staff behavior. Therefore, it is well-founded to classify the part of the regulation concerning the conflict of interest as efficacious.

➤ **Transparency of rating methodologies**

The transparency of rating methodologies has been likewise enhanced substantially. The question that remains is whether the information available about the rating methodologies is clear enough to facilitate the understanding of investors. CRAs presently expose plenty of information on the exact processes made within the credit rating assessment; hence the level of proceedings towards the elimination of the transparency is due to be high. However, it separately does not solve the problem of providing transparent information accessible for investors.

➤ **Structured finance complexity**

As was mentioned a few lines above, the problem of complexity of CRAs operations and transactions (especially with structured finance products) is not satisfyingly managed. There have been certain attempts to improve the situation, e.g. through different specification of ratings of structured finance instruments, yet for adequate accomplishments and improvements in these issues, the regulation would have to cover more agents involved on financial markets. As the CRAs have proposed, the regulation should command the disclosure regime for registered offering of structured finance products, which would provide vast amounts of information in so far that the investor can create its own impression about the product. It is better-founded to be the issuer of the SF product, who discloses such information because CRAs have only information gained from the issuers and this information might not be complete.

➤ **Disclosure of rating process**

The largest partition of the adopted governing control enquires into directives of disclosures in almost any sphere of business of CRAs. On one hand, the investor has access to variety of information indeed; nevertheless, as denoted above, it does not solve the general problem of comprehensive understanding of credit rating.

➤ **Imperfect competition**

There are no measures comprised in the CRAs regulation that would deal with the problem of imperfect competition analyzed in Chapter 2. Hence, the level is assigned as deficient.

➤ **Variations among CRAs internal audit processes**

Substantive part of CRAs responses on the adopted rules referred to the lack of consistency not only in terms of internal audit processes, but also in different ranges. Although the regulation proposes the practices of internal audits, it is not well-specified and consistent among CRAs.

➤ **Monitoring of ratings**

The regulation commands the CRAs to monitor and update the rating on an on-going basis. CRAs have to provide information about the frequency of monitoring. The practice only has to be disclosed, but no directives have been made within the scope of the regulation. Therefore, the author assumes that the regulation deals with the monitoring problem inefficiently and the part of monitoring should be matter of future adjustments.

➤ **Human resources**

There from the proposed and adopted regulation, every CRA has to specify the exact number of its analysts and other employees. It would be beneficial if the supervising institutions (CESR and SEC) inspect on this number and execute in convenient actions in case of insufficient employment. Otherwise, the disclosure of the number of CRAs staff does not have a high value.

CONCLUSION

At present, we can easily conclude that widely not all the problems have been solved by the regulation. Structured finance products are very complex financial instruments. They have to be carefully evaluated since investors usually do not have enough knowledge and instruments to make their own risk assessments. Albeit the current CRAs regulation exerts effort to eliminate the information asymmetry and provide the investors with additional information to enable them to conduct their own research, the objective of success is still boundless.

Structured finance products have a complex framework of the underlying assets. CRAs are dependent on issuers of the structured finance products to provide them with necessary information about the particular framework the CRAs analysts require for rating assessment. It is usually not in command of CRAs to verify the correctness of this information. Therefore, it is well-recommended to establish a new system dealing with the excessive complexity of financial instruments, e.g. the disclosure regime for registered offering of structured finance products proposed by the CRAs.

As discussed in the thesis, we perceive that various sectors of CRAs industry still need further modifications. The problem of imperfect competition can probably be solved only in the course of time, once society start to demand more market players. For the sake of the substantive reputation of CRAs, it is presently beyond possibility for a new CRA company to compete with the three biggest CRAs. The faultily integration of internal audit processes is a need for further concernment of next regulation proposals. It is in command of the regulatory institutions to entrench consistent rules about the audit processes. The further estate of monitoring and human resources issues are also objects for other enquiries in order to bring enhanced solutions, especially in terms of the supervision on the rigid adherence to adopted amendments. Apart from the modifications mentioned before, the business model of CRAs should deflect from the issuer-pays-model, considering the fact that the conflict of interest can never be fully obviated within a frame of such business model.

It is important to point out that the main problems are not the aberrances recently made by CRAs, but the rationale of the system allowing it. The US business framework is such disengaged that it consents any unprecedented financial product to subsist without any guidelines. It had to cost large amounts of money however, to start to concern about the financial markets redemption. Yet, the current steps toward a new system are still unsatisfactory and we can only anticipate the future occurrences.

APPENDIX

Appendix 1: Moody's Recovery Rate Assumptions For SF CDO Collateral Categories

ABS Theoretical Recovery Rate

Cat 1. Diversified Securities *

Tranche as % of capital structure		Aaa	Aa	A	Baa	Ba	B
Min % (exc)	Max %						
70.0%	100.0%	85.0%	80.0%	70.0%	60.0%	50.0%	40.0%
10.0%	70.0%	75.0%	70.0%	60.0%	50.0%	40.0%	30.0%
0.0%	10.0%	70.0%	65.0%	55.0%	45.0%	35.0%	25.0%

*This table is in the process of being revised. New parameters will be announced shortly. Meanwhile, Moody's analysts test various recovery rate stresses (that could be as low as 0%) for the various Structured Finance Obligations.

Cat 2. Residential Securities*

Tranche as % of capital structure		Aaa	Aa	A	Baa	Ba	B
Min % (exc)	Max %						
70.0%	100.0%	85.0%	80.0%	65.0%	55.0%	45.0%	30.0%
10.0%	70.0%	75.0%	70.0%	55.0%	45.0%	35.0%	25.0%
5.0%	10.0%	65.0%	55.0%	45.0%	40.0%	30.0%	20.0%
2.0%	5.0%	55.0%	45.0%	40.0%	35.0%	25.0%	15.0%
0.0%	2.0%	45.0%	35.0%	30.0%	25.0%	15.0%	10.0%

*This table is in the process of being revised. New parameters will be announced shortly. Meanwhile, Moody's analysts test various recovery rate stresses (that could be as low as 0%) for the various Structured Finance Obligations.

Cat 3. Undiversified Securities*

Tranche as % of capital structure		Aaa	Aa	A	Baa	Ba	B
Min % (exc)	Max %						
70.0%	100.0%	85.0%	80.0%	65.0%	55.0%	45.0%	30.0%
10.0%	70.0%	75.0%	70.0%	55.0%	45.0%	35.0%	25.0%
5.0%	10.0%	65.0%	55.0%	45.0%	35.0%	25.0%	15.0%
2.0%	5.0%	55.0%	45.0%	35.0%	30.0%	20.0%	10.0%
0.0%	2.0%	45.0%	35.0%	25.0%	20.0%	10.0%	5.0%

*This table is in the process of being revised. New parameters will be announced shortly. Meanwhile, Moody's analysts test various recovery rate stresses (that could be as low as 0%) for the various Structured Finance Obligations.

Cat 4. Low Diversity CDO*

Tranche as % of capital structure		Aaa	Aa	A	Baa	Ba	B
Min % (exc)	Max %						
70.0%	100.0%	80.0%	75.0%	60.0%	50.0%	45.0%	30.0%
10.0%	70.0%	70.0%	60.0%	55.0%	45.0%	35.0%	25.0%
5.0%	10.0%	60.0%	50.0%	45.0%	35.0%	25.0%	15.0%
2.0%	5.0%	50.0%	40.0%	35.0%	30.0%	20.0%	10.0%
0.0%	2.0%	30.0%	25.0%	20.0%	15.0%	7.0%	4.0%

*This table is in the process of being revised. New parameters will be announced shortly. Meanwhile, Moody's analysts test various recovery rate stresses (that could be as low as 0%) for the various Structured Finance Obligations.

Cat 5. High Diversity CDO*

Tranche as % of capital structure		Aaa	Aa	A	Baa	Ba	B
Min % (exc)	Max %						
70.0%	100.0%	85.0%	80.0%	65.0%	55.0%	45.0%	30.0%
10.0%	70.0%	75.0%	70.0%	60.0%	50.0%	40.0%	25.0%
5.0%	10.0%	65.0%	55.0%	50.0%	40.0%	30.0%	20.0%
2.0%	5.0%	55.0%	45.0%	40.0%	35.0%	25.0%	10.0%
0.0%	2.0%	45.0%	35.0%	30.0%	25.0%	10.0%	5.0%

*This table is in the process of being revised. New parameters will be announced shortly. Meanwhile, Moody's analysts test various recovery rate stresses (that could be as low as 0%) for the various Structured Finance Obligations.

Cat 6. REIT

Rating difference between obligation and SU

RR

+2 or more	60.0%
+1	50.0%
0	45.0%
-1	40.0%
-2	30.0%
-3 or less	15.0%
Obligation = C/Ca	25.0%

The recoveries are modeled using a Beta Distribution with standard deviation given by the formula

$$\text{StdDev} = \text{sqrt} (\text{RR mean} * (1 - \text{RR Mean})) * 70\%$$

Appendix 3: Benchmark for rating based on Moody's Idealized Expected Loss Rates

Rating Factor	Rating	Year 0	1	2	3	4	5	6	7	8	9	10	
1	1	Aaa	0.0000%	0.00003%	0.0001%	0.0004%	0.0016%	0.0016%	0.0022%	0.0029%	0.0036%	0.0045%	0.0055%
2	10	Aa1	0.0000%	0.00031%	0.0017%	0.0055%	0.0116%	0.0171%	0.0231%	0.0297%	0.0369%	0.0451%	0.0550%
3	20	Aa2	0.0000%	0.00075%	0.0044%	0.0143%	0.0259%	0.0374%	0.0490%	0.0611%	0.0743%	0.0902%	0.1100%
4	40	Aa3	0.0000%	0.00166%	0.0105%	0.0325%	0.0556%	0.0781%	0.1007%	0.1249%	0.1496%	0.1799%	0.2200%
5	70	A1	0.0000%	0.00320%	0.0204%	0.0644%	0.1040%	0.1436%	0.1815%	0.2233%	0.2640%	0.3152%	0.3850%
6	120	A2	0.0000%	0.00598%	0.0385%	0.1221%	0.1898%	0.2569%	0.3207%	0.3905%	0.4560%	0.5401%	0.6600%
7	180	A3	0.0000%	0.02137%	0.0825%	0.1980%	0.2970%	0.4015%	0.5005%	0.6105%	0.7150%	0.8360%	0.9900%
8	260	Baa1	0.0000%	0.04950%	0.1540%	0.3080%	0.4565%	0.6050%	0.7535%	0.9185%	1.0835%	1.2485%	1.4300%
9	360	Baa2	0.0000%	0.09350%	0.2585%	0.4565%	0.6600%	0.8690%	1.0835%	1.3255%	1.5675%	1.7820%	1.9800%
10	610	Baa3	0.0000%	0.23100%	0.5775%	0.9405%	1.3090%	1.6775%	2.0350%	2.3815%	2.7335%	3.0635%	3.3550%
11	940	Ba1	0.0000%	0.4785%	1.1110%	1.7215%	2.3100%	2.9040%	3.4375%	3.8830%	4.3395%	4.7795%	5.1700%
12	1350	Ba2	0.0000%	0.8580%	1.9085%	2.8490%	3.7400%	4.6255%	5.3735%	5.8850%	6.4130%	6.9575%	7.4250%
13	1766	Ba3	0.0000%	1.5455%	3.0305%	4.3285%	5.3845%	6.5230%	7.4195%	8.0410%	8.6405%	9.1905%	9.7130%
14	2220	B1	0.0000%	2.5740%	4.6090%	6.3690%	7.6175%	8.8660%	9.8395%	10.5215%	11.1265%	11.6820%	12.2100%
15	2720	B2	0.0000%	3.9380%	6.4185%	8.5525%	9.9715%	11.3905%	12.4575%	13.2055%	13.8325%	14.4210%	14.9600%
16	3490	B3	0.0000%	6.3910%	9.1355%	11.5665%	13.2220%	14.8775%	16.0600%	17.0500%	17.9190%	18.5790%	19.1950%
17	4770	Caa1	0.0000%	9.5599%	12.7788%	15.7512%	17.8634%	19.9726%	21.4317%	22.7620%	24.0113%	25.1195%	26.2350%
18	6500	Caa2	0.0000%	14.3000%	17.8750%	21.4500%	24.1340%	26.8125%	28.6000%	30.3875%	32.1750%	33.9625%	35.7500%
19	8070	Caa3	0.0000%	28.0446%	31.3548%	34.3475%	36.4331%	38.4017%	39.6611%	40.8817%	42.0669%	43.2196%	44.3850%
20	10000	Ca	0.0000%	55.0000%	55.0000%	55.0000%	55.0000%	55.0000%	55.0000%	55.0000%	55.0000%	55.0000%	55.0000%
21	10000	C	0.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%

Appendix 4: Moody's CDOROMv2.5™

MOODY'S CDOROMv2.5™

Choose Fields ... Inputs in ... Information-only inputs have GRAY background cdorom@moody's.com Version: CDOROMv2.5 2009-04-03

1. Transaction Information

Deal Type: Synthetic CDO

As-Of Date: 3.4.2009

Maturity (years or Date): 5

Swap Rate: 0.00%

Run Simulation

Import Export Clean Inputs Email to Monitoring

3. Monte Carlo Parameters

Nb Simulations: 1 000 000

View/Modify Correlation Matrix

Simulation Time: 0h 0m 9s

4. CREDIT EVENT DEFINITIONS

Enabled: TRUE

Please define either a Region, Country, sector, Country, sector, Region, sector, seniority, Region, sector, OrgNumber or Entity Name

Credit Event Type	Haltcut Applied	
	IG	NIG
North America Corp-MR	5.00%	10.00%
Europe Corp-MMR	5.00%	10.00%
Asia Corp-OR+MHO	5.00%	15.00%
	0.00%	0.00%
	0.00%	0.00%
South Africa Corp-OR+OA	25.00%	15.00%
Japan Corp-OR	12.50%	15.00%
Australia Corp-MR	5.00%	10.00%
New Zealand Corp-MR	5.00%	10.00%
Central America Corp-OR+OA	25.00%	15.00%
South America Corp-OR+OA	25.00%	15.00%

Note: NO stress applies to Bankruptcy; Failure to pay; Reputation Moratorium Sov only: NO stress applies to Obligation Acceleration

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