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How Credit Rating Agencies influence the Stock Markets
Event Study

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Master thesis in fulfilment of MSc. in Finance

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October 2012

ABSTRACT

This study attempts to find whether rating agencies still have an impact on the stock market after the subprime crisis of 2008. I examine the abnormal returns surrounding the rating changes and outlooks, on the firms present in Standard & Poor's 500 stock Index.

The analysis goes partially along with previous literature. Initial rating opinions (outlooks) have much more impact than credit ratings, being clear a dominance of downside information significance over the upside one.

Also in line with previous findings, Moody's is the rating agency with the biggest impact on the American stock market, followed by Standard and Poor's, leaving Fitch almost irrelevant.

In addition, this study points out that rating agencies do not have such big impact on markets like before the 2008 crises, nonetheless they still influence a part of investors when taking their investment decisions otherwise no reaction would be noticed in the stocks' abnormal returns.

I analyze as well if it is possible to have continuous gains when investing upon credit rating announcements in the medium term and conclude that upon diversification an investing strategy can be used when one successfully predicts the rating change. However for outlooks our analysis is not conclusive.

Keywords: Credit Ratings, Event Studies, Abnormal Returns, Efficient Market Theory.

JEL: G14, G11

RESUMO

Este estudo tem como objectivo concluir se as agências de *rating* de crédito ainda têm um impacto significativo sobre o mercado de acções depois da crise do *subprime* de 2008. Para tal, observo os retornos anormais próximo da data em que se deram as mudanças de *ratings* e de *outlooks* nas empresas pertencentes ao Índice de acções Standard and Poor's 500.

A minha análise vai em parte de encontro aos estudos anteriores.

As primeiras opiniões publicadas pelas agências de *rating* (*outlooks*) têm muito mais impacto nas acções que os *ratings* por si só. Sendo que existe uma clara permanência e acentuação das opiniões negativas em relação às positivas.

Também de acordo com artigos publicados anteriormente, a agência Moody's é a agência com mais impacto sobre o mercado de acções Americano, seguida pela Standard and Poor's, sendo a Fitch quase irrelevante.

É possível concluir também que estas agências, hoje em dia não têm um impacto tão significativo no Mercado como antes da crise de 2008, contudo ainda influenciam uma parte dos investidores quando estes tomam as suas decisões de investimento. Caso contrário não existiria impacto nos retornos anormais.

Analiso, por último também a possibilidade de poderem ser gerados ganhos contínuos ao longo do tempo quando adoptando uma estratégia de investimento que segue os ratings de crédito num médio prazo. Concluindo que com suficiente diversificação e uma antecipação da mudança de rating é possível obter ganhos contínuos durante um certo espaço de tempo. No entanto sobre os *outlooks*, a análise não é conclusiva.

Palavras-chave: Classificação de Risco de Crédito, Estudo de eventos, Retornos Anormais, Teoria da eficiência de Mercado.

JEL: G14, G11

ACKNOWLEDGEMENTS

I am truly indebted with a set of people which without them, this thesis was not possible to complete.

So I would like to thank initially to Professor Szabolcs Sebestyén, who agreed to be my supervisor just three months before the delivery and was always available for discussions and comments, as well as Professor João Pedro Pereira who guided me in the first steps of this study.

I am very grateful to all that, one way or another, gave their comments or opinions, like Gonçalo Aguiar, Inês Pereira, Hélder Albuquerque, Maria Lara and Clara Pestana.

A special acknowledgement to Triin Heinsoo, whom besides her comments always gave me unconditional encouragement to deliver this thesis.

A specially thanks to my Mother and Inês for their patience, especially in the final weeks before delivery.

Ending I would like to thank ISCTE Business School which prepared me in the last six years for the rest of my life, and to my parents who always encourage me to study and granted me the level of instruction I currently benefit.

To all a sincere, thank you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS INDEX

AR – Average Returns

AAR – Average Abnormal Returns

CAR – Cumulative Abnormal Returns

CAAR – Cumulative Average Abnormal Returns

CDS – Credit Default Swap

CRA – Credit Rating Agency

FFJR – Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. (1969)

LB – Lehman Brothers Holdings Inc.

S&P 500 – Standard & Poors 500 Stock Index

US – United States

USD – United States Dollar

COMMONLY USED NOTATIONS

AR_{it} – Abnormal return for the *i*'th stock in day *t*;

L – Length of the estimation window;

N – Number of firms in the sample;

R_{it} – Return of the *i*'th stock for time *t*;

R_{mt}– Market return in time *t*;

$\bar{R}_m$– Mean market return for the estimation window;

α_i – Intercept term of the market model;

β_i – Regression coefficient for the market returns;

$\hat{\alpha}_i and\ \hat{\beta}_i$ – Estimated regression coefficients of the market model;

ε_{it} – Error term or regression residual;

σ_ε^2 – Variance of the *i*'th stock residuals;

$\sigma^2(AR_{it})$ – Conditional Variance of AR_{it} ;

AAR_t – Average abnormal returns;

$CAR_i\ (t_1, t_2, \dots t_x)$ – Cumulative abnormal returns;

$CAAR_t\ (t_1, t_2, \dots t_x)$ – Cumulative average abnormal returns

$Var(x)$ – Variance of an "*x*" variable;

Θ – t-test result.

EXECUTIVE SUMMARY

This study attempts to find whether rating agencies still have an impact in the stock market after the subprime crisis of 2008.

For that event study methodology is used. This method became a wide spread technique, developed in various studies since the late sixties.

The thesis structure has eleven chapters beginning with the basic concepts and assumptions, developing our methodology and finally reaching a set of conclusions.

After the introduction, in the second chapter, one will find an overview of the efficient market hypothesis literature and some remarks. Efficient market hypothesis is what leads us the basis of the event study methodology. When one tries to find whether specific information influence the market, he will try to see the impact in the stock returns.

Here efficient market hypothesis will be fruitful for us, because to have an impact from rating agencies' announcements on stock prices, the market has to be efficient to some extent.

Following this, a brief presentation of how the credit rating business works is given, for the reader to assess what conflicts of interests are present in the activity of credit rating agencies, and why these are important.

A description of how rating agencies influenced the subprime crises of 2008 is also provided as well as the outcomes that such influences had on credibility of the credit rating agencies after 2008.

A review of literature is provided considering the primordial of the event study methodology, until the nowadays articles that provide studies about different kinds of securities and kinds of credit rating agency announcements.

In this section I conclude that in general for all the security types analyzed, the trends are the same. Such as a predominance of downtrend significance of abnormal returns and stronger impact on security markets made by credit watches, leaving credit rating changes less relevant. This is explained by the amount of new information credit watches provide.

After, I explain in the data selection, which tests were completed in order to exclude some firms out of the sample and why this specific time frame and event window were chosen.

The chapter "Methodology" demonstrates how to use event study methodology and what the steps have to be taken to apply it.

Finally getting to results, it can be observed that my analysis goes partially along with previous literature. Initial rating opinions (outlooks) have much more impact than credit ratings, being clear a dominance of downside information significance over the upside one. It is also regarded a permanence of significant average abnormal returns in the pre-event window, concerning the negative credit announcements, which leads me to believe that market, is already assimilating information, prior to the announcement.

These facts that were also obtained in previous studies lead us to the conclusion that the American stock market may be semi strongly efficient, yet further studies in the subject are needed.

Following the previous analysis, the sample is divided between the different rating agencies that were analyzed. According with previous findings, Moody's is the rating agency with the most impact in the American stock market, followed by Standard and Poor's, being Fitch almost irrelevant.

It may be concluded that rating agencies do not have such big impact on markets like before the 2008 crises, nonetheless they are still used by a part of investors to take their investment decisions otherwise no reaction would be noticed in the stocks' abnormal returns.

I also analyze whether it is possible to have continuous gains by investing upon a credit rating announcement in a medium time frame and conclude that upon diversification an investing strategy can be used when successfully predicting the rating changes, yet for outlooks, the analysis is not conclusive.

In sum conclusions point to an impact from credit rating agencies (especially Moody's) on the stock markets' abnormal returns. However this impact seems less significant when compared with previous subprime crisis literature. Nevertheless agencies may influence the stock market and thus conflicts of interested might be implicit, when a client's stock value is harmed by an announcement of an agency.

SUMÁRIO EXECUTIVO

Este estudo tem como objectivo compreender se as agências de rating de crédito ainda têm um impacto significativo sobre o mercado de acções, depois da crise do *subprime* em 2008. Para tal é necessário utilizar a metodologia do estudo de eventos. Este método é amplamente usado em várias áreas da ciência e tem vindo a ser aplicado na área financeira desde os finais dos anos sessenta.

Por conseguinte, esta tese está estruturada em onze capítulos, tendo como início os conceitos básicos da teoria, passando pelo processo de recolha de dados, definição da metodologia e finalmente as conclusões obtidas.

No segundo capítulo é possível encontrar uma pequena revisão de estudos anteriores sobre a teoria da eficiência de mercado assim como alguns comentários de como esta se relaciona com este estudo. A teoria da eficiência de mercado é a base da metodologia do estudo de eventos. Assim, para observar se o mercado é eficiente, é necessário ver se existe uma reacção deste a uma determinada informação disponível publicamente. Se o mercado não for eficiente, não será possível observar tal impacto.

Em seguida, é feita uma pequena apresentação de como funciona o negócio dos ratings de crédito, para que o leitor perceba quais os conflitos de interesse que podem advir desta actividade.

É feita uma breve descrição do papel das agências de rating durante a crise do subprime em 2008, assim como o impacto desta na credibilidade dessas agências.

É, também, apresentada uma revisão de literatura considerando os primórdios da metodologia de estudo de eventos até aos dias de hoje que, por sua vez, já consideram uma variedade muito maior de produtos financeiros e opiniões de rating de crédito.

Nesta secção concluo que, em geral, para todos os produtos financeiros analisados, a tendência é a mesma. Existe uma predominância do impacto de opiniões negativas nos retornos anormais e um impacto fortíssimo dos *credit whatches* em relação às mudanças de *rating*. Isto é explicado pelo carácter de novidade de informação dos *credit whatches*.

Explicito no capítulo da selecção de dados quais os testes feitos para excluir algumas empresas da amostra e qual será o intervalo em que evento será analisado assim como o intervalo de cálculo de resultados.

O capitulo "Methodology" descreve como usar a metodologia dos estudo de eventos e quais os passos para a adoptar.

Por fim, na conclusão, é possível observar que a análise vai em parte ao encontro de estudos anteriores. As primeiras opiniões publicadas pelas agências de *rating* (*outlooks*) têm muito mais impacto nas acções que os *ratings* por si só, sendo que existe uma clara permanência e acentuação das opiniões negativas em relação às positivas.

Estes factos levam a crer que o mercado americano é até certo ponto eficiente, no entanto, mais estudos são necessários para concluir tal afirmação.

De acordo com artigos publicados anteriormente a amostra é dividida pelas três principais agências de rating americanas, sendo a Moody's a agência com mais impacto sobre o mercado de acções americano, seguida pela Standard and Poor's deixando a Fitch quase irrelevante.

É possível concluir, ainda, que estas agências, hoje em dia, não têm um impacto tão significativo no mercado como antes da crise de 2008. Contudo, ainda influenciam uma parte dos investidores quando estes tomam as suas decisões de investimento. Caso contrário não existiria impacto nos retornos anormais.

Analiso também a possibilidade de poderem ser gerados ganhos contínuos ao longo do tempo quando adoptada uma estratégia de investimento que segue os *ratings* de crédito num médio prazo. Concluindo que com suficiente diversificação e uma antecipação da mudança de rating é possível obter ganhos contínuos durante um certo espaço de tempo. No entanto, sobre os *outlooks* a análise não é conclusiva.

Em suma, as conclusões apontam para um impacto das agências de *rating* de crédito (especialmente a Moody's) nos retornos anormais do mercado das acções. Contudo, este impacto parece menor quando comparado com a literatura dos estudos de evento em relação a *ratings* de crédito anteriores à crise de 2008. No entanto, as agências ainda podem ser factores de influência no mercado das acções levantando possíveis conflitos de interesses.

1. Introduction

In the aftermath of subprime crises of 2008 started in U.S., and consequent dispersion throughout several sectors and countries, much attention by the media and policymakers has turned on credit rating agencies (CRAs).

The misleading information provided to the markets, by these agencies led trash assets to be sold as safe investments for investors, which eventually saw their assets devalue in steeping rates. Following such event, security markets got hit extremely bad, causing many equities to reach downside historical prices.

This overselling of stocks that led investors to opt for more secure security markets, made very large scale volatility observations for a six months period. Subsequently, after this time frame, equity markets stabilized relatively, however, can the fundamentals to invest before the crises still be employed after it?

Research over impacts of credit rating announcements on the stock prices is vast and in many of the cases concludes that opinions issued by CRAs have influence to the stock markets (eg.: Norden and Weber, 2004; Dichev and Piotroski, 2001). To have impact over the stock market, an announcement must bring new information in order for the investor to react.

The question is whether one still can conclude that credit rating announcements have an impact over stock price behavior. Or instead, the market does not consider anymore that new information is brought to the public when these opinions are issued.

In order to find a conclusion to these issue I make use of the event study methodology, which is developed since the late sixties, and has seen much progress ever since.

A common event study methodology approach is followed in this study to conclude whether impacts on stock prices can still be seen upon credit rating announcements.

This study will analyze two types of credit rating announcements and find which is more relevant to the market. Firstly the outlooks will be studied, in order that a conclusion may be taken of whether investors act upon recent information introduced in the market. For a second analysis, I will use the credit rating changes and see if these still represent new information introduced in the market.

Independently on the findings this study may get from the analysis over credit rating announcements, I will also evaluate the impacts of different CRAs.

An analysis over three rating agencies will be performed in order to access which of them may have more impact, (if any) over the stock markets. Therefore conclude, if actually credit rating announcements can create a trend in equity stocks, which of the agencies will have a bigger responsibility for this change.

Another question this topic may arise is whether investors can take advantage of the credit rating announcements to earn continuous gains over a period of time.

Pinches and Singleton(1978) state that bond credit rating change is not a good lead to act upon for an investment strategy, since the market has already discounted the information prior to the rating. Nonetheless, one can put the rating outlook to the test.

An attempt to assess this premise is performed in the end of this study where two investment strategies are tested, one concerning outlook announcements and the other, credit rating announcements.

2. Efficient Market Hypothesis

Efficient Market Hypothesis (EMH) also known as "theory of random walks", (Jensen, 1978), is a concept developed over the years in various studies in the economic and financial area concerning behavior of security markets. This concept, as Jensen states in 1978, "…progressed from the state of a curiosity taken seriously by only a few scientists in the economics and finance communities, to that of a dominant paradigm in finance and the basis of an emerging revolution in macroeconomics...".

Even though the first mention about EMH was made by Fama (1970), defining three types of efficient market hypothesis. Many like LeRoy (1989), among others defend that the first references about the concept were made by Roberts (1959).

None the less, EMH states that the market absorbs all the information available publicly to adjust the security prices to their optimum level, meaning the market is perfect, if it is "efficient". So in theory, what market efficiency tells us is that, by setting the prices at a given time instant *t*, the market uses all accessible information to evaluate the combined distribution of prices at *t*+1, as stated by Fama in 1976.

Over the years there have been many developments over market efficiency, namely different forms of the last one defended by Rubinstein (1975), Beaver (1981) or Fama (1970) and subsequently defended in 1976. The latter one is highly regarded and became a market standard by providing basis for other articles testing market efficiency. In this case, new information introduced into the market through Credit Rating Agency actions. Fama thus defines three common forms of EMH, which are usually evidenced are:

1. The week form where security prices cannot be predicted based on prices from past observations. The analysis of historical prices if, used to explore positive returns, as an investment strategy, will not provide any gains. Therefore technical analysis will not produce in an expected manner excess returns,

although some forms of fundamental analysis may. There should be no patterns in general security behavior and prices shall follow a random walk process[1].

2. Within semi strong form of efficiency it is distinguished that security prices react almost instantly to newly introduced information in the market. Such that, no positive returns can be obtained using that information. So if the market reaction to previously unknown information is not being instantaneous, it means that investors are acting upon information in a biased and inefficient behavior.
3. The strong form of efficient market hypothesis, show that all information is observable on stock prices. This includes both public and inside information. So in order for strong form efficiency to exist, there must be a market where investors cannot earn positive consistent earnings during a long period of time. Independently of the amount of research or information an investor may have access to.

The semi strong form of market efficiency will be used in this study since we want to test whether public available information will be reflected in the market.

However, one should focus on the fact that Efficient Market Hypothesis has been contested and tested over the years by many studies. Therefore one should not assume beforehand that credit rating agencies will have any sort of impact in the stock prices of the analyzed companies.

In fact many studies find that bond and stock markets are not semi strongly efficient concerning new information introduced by credit rating agencies. Moreover, there are even some studies pointing to the fact that efficient market hypothesis acceptance should be reviewed like Ball (1978), Jensen (1978) or LeRoy (1976) that contest Fama's assertiveness regarding the EMH and what it implies to the market.

LeRoy states, that Fama's statements over Efficient Market Hypothesis, namely that investment according to publicly available information should have an excess value of zero.

[1] Random walk process is the theory that securities have random and unpredictable behaviour. This theory defends that it is impossible to outperform the market without assuming additional risk.

And thus that to calculate expected value in *t*+1, all is needed is the price in *t*. *t* being, a "stationary" variable. This, states LeRoy, should not be taken by, as non-questionable facts.

"Famas's difficulty with the theoretical implementation of the notion of an efficient capital market becomes compounded in his discussion of the problem of nonstationarity"

LeRoy (1976: 140)

Nevertheless Fama (1991), twenty years after his first article on the theme, approaches the subject of market efficient hypothesis in a new way, where he revises some of the literature in market efficient hypothesis.

He concludes that variation in expected returns rather than relying on simple EMH also relies on future impacts in the market derived of two reasons. One is new technology and the other is taste, which may affect "consumption, investment and expected returns" (Fama 1991: 1610). He states that the only way to predict market behavior would be by developing a model that isolates taste and new technology introduction.

The rough market efficiency hypothesis tells us that market will react to all information it has, and that the stock price will follow whatever information it receives, nevertheless there are costs to react to that information and nowadays we know that crude market efficiency hypothesis is surely false (Fama, 1991).

Concerning the credit rating announcements, this study checks more than just if the market is efficient, it analyses also if it actually reacts to rating information. In this case one will be able to conclude if rating actions represent newly introduced information to the market, more than testing EMH on its own.

Like Brown and Warner (1980) stated, Event studies are "(…) a direct test of market efficiency", by analyzing the behavior of information over the market.

In case of a rating change, it is likely that stock returns have already assimilated some of the information present in the market, at least if this one is efficient. Thus in case the change was already identified by the market, the modification in rating reflects

only what the market as already observed. In that case no significant impact on returns can be observed.

In truth, this market assessment of new information prior to the rating may also be introduced by CRAs themselves when they announce credit outlooks[1] or credit watches[2]. Due to this fact, this study will assess if an evaluation of the actual change in the credit outlook of a firm, has more impact on stock returns than change in rating. To distinguish if the firstly entered information in the market has more impact on its development, or instead if the market takes into account the actual definitive rating action as the one that actually is new information to the market.

A comparison of the performance of the returns around the announcement dates will be calculated as one can observe further in the study.

. This implies an influence over the security prices by the rating agencies anyway, thus one should be concerned to what extent the information surrounding a credit rating change is caused by financial assessment of the evaluated firm or due to other CRA actions.

The impact of CRA over various security markets is relatively acknowledged by previous literature. What this study sets to measure is how much this influence is still observable nowadays after the subprime crises and thus if market is efficient regarding credit rating announcements.

[1] Credit outlook is an opinion given by the credit rating agency, over the strategy and market conditions of a determinate firm.

[2] Credit watch happens when the credit rating agency sets the firm under evaluation to change its debt grading.

Regarding EMH upon Credit Rating Announcements we will have the following concept:

Figure 2.1: Outcomes of EMH testing in Credit Rating Announcements

Source: Author's analysis
**This scenarios may happen at the same time if market information is not completely assimilated until the event date.*

3. The Credit Rating Business

The CRAs provide information to the market concerning firms' credit performance in order to assess ability to pay short and long term debt. This information may have implications in a variety of matters in the firm, although most of them are regarding debt purchase.

This industry is usually based on one of two business models. First all the agencies used a "subscriber-based" business model. This model does not deliver for free or give unrestricted access to its ratings, but instead creates a network of subscribers that pay for the information and the credit rating analysis. The fees paid by the subscribers would represent the majority of the agencies' income.

Nowadays this model is still used by smaller rating agencies, and it is believed to have less conflict of interest than the second model used by large and medium sized credit rating agencies, which is the "issuer-based" model.

In this model most of the income comes from payments made by issuers, nevertheless there are still some subscribers that receive more extensive reports or analysis about an issuer, however the majority of the information is publicly available for free.

The supporters of this second model state that this one is better since if Credit Rating Agencies relied only on subscriptions for income, most of the bonds would stay unrated because subscribers' interests are not extended to smaller issuances or issuers.

The proponents of the first model argue that the "issuer-based model" represents a clear conflict of interests since the issuers are the income source of the agency, and the credit rating agency will be directly depending on the companies it rates. However, there are also conflicts of interest in the first model. In the case there are large portions of income coming from a small group of subscribers. Subsequently the agency may be pressured to take rating actions according to these subscribers' investment decisions.

In the credit rating business, conflict of interests is a regarded issue. An issue, which may be extended to the stock market, and not just the bond markets.

While these agencies are very criticized by their conduct or by the lack of legal measures to regulate the said conflict of interests. The truth is that they still provide publicly information to the market, (if we are talking about the issuer-based companies) which the average investor cannot calculate for lack of knowledge, time or effort. This in the end will result in a better investment decision for the investors, if one considers these ratings accurate.

All in all the CRAs' ratings influence lots of investment decisions, and if they influence them, they might influence the market.

The credit rating announcements can be of various types and concerning different types of issuances.

Credit rating agencies can give three types of opinions:

- ***The rating itself***, Credit rating Upgrade or Downgrade;
- ***The credit outlook***, when the agency is giving an opinion about the trend of the debt situation of the firm;
- ***The credit rating watch***, when the Rating agency is revising the firm and it is very likely that the rating will change.

These announcements will most likely have different impacts on security prices depending on how well they represent new information to the market. In this study, the effort goes to analyze the impact from outlooks and credit rating changes. Credit rating watches will not be observed since the sample would be rather small.

4. The 2008 Crisis and this Study

The 2008 crisis, also known as subprime[1] crisis, that brought instability and no confidence to equity markets, had its beginning in the mortgage housing credit markets and its derivatives.

This crisis was the result of a continued paced run of bad lending over a wide period of time where documentation and guaranties were becoming lower in mortgage lending and the demand of mortgage-backed securities was increasing.

"…rise and fall of the subprime mortgage market follows a classic lending boom-bust scenario, in which unsustainable growth leads to the collapse of the market."

(Demyanyk and Hemert, 2008: 1849)

This demand originated an increased mortgage lending and a decrease of the lending spreads, leading to a lending boom shown by Mian and Sufi (2008), in their study. This lending boom led to an increase in house prices that had a peak in 2006, and from then on, it began to decline, which with higher interest rates and adjustable-rate mortgages became to increase monthly payments, increasing mortgage delinquencies[2]. This reality was enough to predict the future crash in 2008.

Mortgage backed securities including subprime mortgages, which were sold as a high yield and value derivative products like credit default swaps (CDS), by banks and other financial institutions, lost most of their value. These financial firms, usually banks, lost a big stake of their capital, such that some went bankrupt. The most known example is *Lehman Brothers Holdings Inc.* (LB). To note that LB until the day it filed for bankruptcy, had a Moody's rating of A2, a Standard and Poor's rating of A and a

[1] Subprime lending is to give loans to people that may have difficulty paying them back. These loans usually have higher interest rates and more conditioning obligations for the credit buyer to compensate the higher risk.

[2] Mortgage delinquencies occur when the credit owner does not pay its mortgage.

Fitch rating of A+, all of them, low credit risk grades as one can observe by the description on Table 4.1.

Favourable ratings from these three CRAs were crucial to successfully sell mortgage backed securities, including subprime. This was an important underpinning for the house price rising bubble that "exploded" in 2008 after two years of house price fall leading to increase in default rates, (Lawrence, 2010).

Table 4.1: Rating grades and meanings from the three major US Credit Rating Agencies

S&P	Fitch	Moody's	Description
AAA	AAA	Aaa	Highest quality, subject to the lowest level of credit risk.
AA	AA	Aa	High quality and are subject to very low credit risk.
A	A	A	Upper-medium grade, subject to low credit risk.
BBB	BBB	Baa	Medium-grade, subject to moderate credit risk and as such may possess certain speculative characteristics.
BB	BB	Ba	Speculative and are subject to substantial credit risk.
B	B	B	Speculative and subject to high credit risk.
CCC	CCC	Caa	Speculative of poor standing and subject to very high credit risk
CC	CC	Ca	Highly speculative and likely to default, with some prospect of recovery of principal and interest.
C	C	C*	Vulnerable to default, with little prospect for recovery of principal or interest, but still paying obligations.
D	D		Defaulted obligations/ Bankruptcy

Source: Author's analysis based on publicly available information
**Moody's lowest rating that seizes bankrupt entities and entities in default or in risk of.*

Investors reduced the purchases of this kind of products and other securities due to decline in lending capacity and willingness of private sector to support lending. This led

to a decrease in economic growth, mostly in United States and Europe, thus a huge impact on overall global equity sectors.

This impact was mostly on the value of stock prices. Since company growth was predicted to be negative due to cut on lending capacity of the banks. Investors being risk averse started to sell their shares due to market stagnation. This ultimately led to a huge decline of stock prices all around the globe.

Investors started looking for safer steady income instead of high yielded, high risk securities, turning mostly to commodities, treasury bonds or Foreign Currency Exchange, leaving equity markets with no liquidity, no volume, low market to book values, an increase in the bid-ask spreads, which means more costly trades and consequently a decrease in market depth[1].

To aggravate this, due to cut in funding liquidity investors that remained equity oriented started to place more selling orders than buying orders creating a market imbalance (Chiu et al., 2012).

This is where we head off, an historical low in stock prices, credit rating agencies with damaged credibility and doubtable rating accuracy, extremely adverse investors with absolutely no intention to invest in high risk profiles, with extreme liquidity constrains and apprehensive about using misleading information.

This may have an important impact of investment decisions concerning credit ratings, which leads us to a question:

- Are investors still influenced by CRAs to make investment decisions?

Studies trying to measure this problem are numerous. Nevertheless most of them are pre-debt crises. Therefore what this thesis aims to, is compare a variety of different companies, all from Standard and Poor's 500 Index, that had a rating announcement in the last three years.

Hence one will be able to conclude when observing this study's results, by analyzing the market reaction from the ratings and the outlooks, whether CRAs' actions still

[1] Market Depth is a concept behind market liquidity and volume, which is the capacity of the market to receive large bid and ask orders without profound change in price and consequently high volatility in the prices.

represent an impact on the stock prices and thus, if credit rating information can still be a guidance to investment decisions. Since each stock is priced by the market and one might observe changes in periods around times of rating activity.

Though, this means it is likely that a different result will arise comparing to previous literature, and that our contemporary equity market situation is considerably different regarding general security reactions. Namely, because the problematic of influence, credit rating has in our markets is widely discussed and criticized.

Thus it is important to have in mind that credit rating actions still might have influence in the market behavior.

So developing our work from these two pillars, this study will attempt to conclude what kind of influence and how well the markets react to rating actions after the beginning of the crisis in September of 2008.

5. Event Study History

"The event study methodology has, in fact, become the standard method of measuring security price reaction to some announcement or event."

Binder (1998: 111)

Over the years there have been many studies trying to use the event study method to find the influence of a determined announcement to the price change of a security no matter if it is a bond, stock or spread in the case of credit default swaps (CDS). Event studies try to find this evidence before, during and after an event, in the case of this study, a credit rating announcement.

Various studies apply event study methodology to subjects connected with debt rating, no matter of its nature.

One can say that Fama, Fisher, Jensen and Roll (FFJR) (1969), belong to the group of pioneers in this kind of study. In 1969 they published in "International Economic Review" a study pointing to the remarkable market efficiency observed when stock splits occurred.

They were successfully able to determine that stock splits have a significant impact over the stock returns almost immediately after they are announced. Thus they were also able to conclude that there is no way to use stocks splits to increase one's expected returns unless one has inside information.

This study had remarkable coverage and nowadays is a must see for any event study methodology research as stated by Binder (1998: 111), "An often heard statement in economics and finance is that any article which is cited ten or more times a year for ten years is a classic. Even by this standard, the paper by Fama, Fisher, Jensen and Roll (1969), which introduced the event study methodology, stands out in the academic profession."

The earliest studies about this matter, considering credit rating changes were made in the seventies concerning both stock prices and bond prices, of course the last ones being much more related to credit rating events (eg., Katz, 1974; Grier and Katz, 1976; Winstein, 1977).

Lately there have been many other studies concerning this subject, in comparison with the old studies, now they also take into account another financial instrument, CDS (eg.: Hull et al., 2004; Norden and Weber ,2004; Micu et al., 2006). This subject is still of contemporary concern and is still far from an ultimate conclusion.

However, in the case of this study, it can occur that this change is already reflected in the market and if that is so, the rating agencies are not giving new information to the market, but instead the market has already absorbed it and credit rating announcements will not have influence over the market's abnormal returns. Pinches and Singleton, already in 1978 concluded that bond rating changes did not bring new information to the market, so that the market had already assimilated the new information to bond and stock prices, thus that there was no significant price movement after the event date. By having the information of rating change fully reflected over the market, less than one month after the rating announcement just like FFJR have concluded.

So in the case of a credit rating announcement one can say that an event study will actually observe if the new information is actually being given to the market and if this reacts assuming efficient market hypothesis.

5.1. Bonds

Nevertheless, one cannot regard all the securities as having the same behavior to credit ratings. While stocks can react much more to publicly available information as result of high liquidity levels and market exposure, bonds do not have such behavior. Instead they are not market efficient and as stated by Katz (1974: 558) "…bond investors appear to rely primarily on the pronouncements of the rating agencies as determinants of bond value...". So in the case of bond markets on the contrary of stocks, the market will assimilate the information after the change in rating activity and not before. This may also be true because credit rating changes are an opinion issued

directly over the ability of the company to assure its debt and so the bonds, not having a direct connection with the stock behavior.

However even inside the same security type we will have different average behaviors. There are several studies that analyze, as I also intend to do, the difference between upgrades and downgrades, with some curious findings. Like Glascock et al. (1987) or Followill and Martell (1997), that found a clear evidence that stock market predicts the bond rating changes in the case of downgrades, but surprisingly not upgrades, and that remarkably after the date of announcement of downgrade, the returns actually start to be positive after a negative trend until the day of the event.

In their findings Glascock et al. also found that upgrades have no immediate effect on abnormal stock returns, but that there is a negative trend some time after the event date.

This poses us some questions on how the investors react to rating changes and on what are they based to make their investment decisions.

5.2. Stocks

Concerning the stock market where investor's behavior is slightly different from the fixed income market, as one can observe in Hand et al. (1992) article where they conclude that bond and stock markets have different reactions on Average abnormal returns when considering Credit rating changes.

Goh and Ederington (1993) study, where they analyze downgrades' influence on stock market is the first study dividing different types of rating changes, though, they state that these are divided in two groups and that they (the downgrades), "…cannot be treated as homogeneous…".

The first group of downgrades is acknowledge as one having negative implications for stock holders and is a negative grading caused by the deterioration in an entity financial prospects. The second group is acknowledged as having positive implications for stock holders, and this one is caused by an increase in leverage.

Their findings are that, the first group of downgrades has a negative impact on equity markets because most likely the stock prices will lose value.

Conversely they find that the second does not have a significant impact on the latest. Thus we can assume that Glascock's et al. findings about downgrades maybe be related with the second group of downgrades shaped by Goh and Ederington. Although one can assume these results are not comparable due to being relative to different security types.

Even though one can find these results satisfactory, newly introduced studies may make these studies seem too narrow given that they just observe short term impact on security returns or abnormal returns.

There are also studies evidencing the stock behavior and abnormal returns behavior over the long term, and these do not have the same results we just regarded, Dichev and Piotroski (2001) found, analyzing long terms returns, that downgrades have superior impact on security abnormal returns than upgrades.

The upgrades do not show significant abnormal returns over the time period. However in the 27 years analyzed, downgrades tend to have a negative impact of 10 to 14 percent after one year of the rating change, which may tempt us to assume that downgrades are a good predictor of stock's abnormal returns poor behavior. Being the investors able to act upon that and use such event as an investment strategy.

5.3. Studies over more than one type of Security

As we regarded before in Goh's and Ederington (1993), downgrades may not be homogeneous, and one can observe that by the simple fact rating agencies do not treat them as homogeneous, that is why they do have several grades divided by different levels of rating, being this a no exception rule for the major CRAs. Hite and Warga (1997) event study over bond markets suggests precisely a difference between two types of ratings inside both upgrades and downgrades, they study the difference in impact for an upgrade(downgrade) to(from) an investment grade from(to) a non-investment grade and a change in rating inside the same investment area.

Their results contradict to some extent the ones obtained by Katz in 1974, concerning the downgrades.

While in the upgrades they notice a considering positive effect in a rating to investment grade, they do not find conclusive results over the other upgrades. On the other hand, the downgrades that consider a change to a non-investment grade, in the six months period before the rating, have a clear negative trend, which is accompanied by a downtrend in the month of the rating change.

This, however, analyzing Katz's (1974) study, which states the clear non efficiency of bond markets and obvious reaction upon rating changes just after the event date, contra poses a clear difference in bond abnormal returns concerning the times these are observed.

Which suggests that either this differences are a result form the distinction Hite and Warga (1997) make between different types of downgrades and upgrades, or it might be assumed that investors in the time sample from Hite and Warga (1997) that goes from 1985 to 1995 are clearly better informed than the ones in Katz's (1974) sample ranging from 1966 to 1972. Being the ones from Hite and Warga (1997) sample able to predict the change in rating and consequently diminishing the reaction from the market to rating changes, in the general market.

Yet, one item is analyzed in most of bonds and some stocks analysis event studies, which is the clear stress on downgrades events that usually leads to panic and greater impact on negative abnormal returns, studies like, Hite and Warga (1997), and Steiner and Heinke (2001), that develop this idea. However, by the latest we can analyze that this is a fact which is equal among all the types of bonds, since the analysis provided by Steiner and Heinke is over the German bond market, and thus we can conclude that this is not specifically imputable to firms but imputable to government bonds as well.

Another recurrent analysis I intend to develop in this study is the comparison between CRAs. This is quite ordinary among last decades' event studies, and most of them conclude that in general Moody's has a greater influence on the markets than other rating agencies. Hite and Warga (1997) state for instance the largely significant effect of downgrades to non-investment grade accredited by Moody's comparing to the ones given by Standard and Poor's in the bonds market, although they provide analogous type of services and give similar information and analysis to the market, in this case to the debs markets.

The importance of the market current situation is also relevant for the event study method when applied to change in ratings. Some literature results we previously analyzed concluded that when we are talking about downgrades, the market predicts the phenomena and this has a negative impact on the returns until the actual event date or announcement date, Glasscock et al. (1987), the reason why this happens was probably evidenced by Followill and Martell (1997) in more recent times.

Followill's and Martell (1997) event study concentrates on isolate the rating changes from other rating agencies ratings and from credit outlooks given prior to the rating change. In this process they also analyze the impact of outlooks over the stock market and what changes may come from that.

Rating changes announced after a credit outlook or another credit rating, usually do not give new market information, which most of the time leads to the fact that rating changes do not have an effect over the stock returns.

On the contrary strong impact over the stock returns is observed after an outlook or credit review as it is to expect. Since the rating agency is giving new information to the market, it is normal that it will most likely have great influence on the market and as Followill and Martell state "…rating agency review announcements for downgrades have substantial informational value as evidenced by their significant impact on share value.". Nevertheless there are studies pointing the contrary like Hand et al. (1992) that found an inverse trend from the rest of the studies we have analyzed when using non contaminated data[1], meaning that when there is an event and information discount from the sample from information not related to the bond rating, and just the influence of the change in rating or credit watch list, is analyzed, the upgrades are actually more relevant for abnormal returns than downgrades.

This contradicts all the studies I have analyzed and so leads to the question:

Should we rely on simple abnormal returns surrounding the event?

[1] Non contaminated data is the result of deducting possible misleading information from the abnormal returns when one is studying the impact of a specific event. Methodology of how to calculate this deduction is not concise throughout literature, thus different authors use different methods.

To answer this question one should have in mind that when analyzing the abnormal returns for credit rating changes, one is probably analyzing other public information as well. Many studies already consider the discount from public available information over the abnormal returns of securities. These studies are the most recent and have their initials in the nineties.

This information surrounding rating events will probably not be one hundred percent connected with the rating events and so from Pinches and Singleton (1978), the use of uncontaminated data was widely used and defended. However this method became obsolete and other recent studies, using CDS started to exclude just other rating events besides overall information. In fact, on most of the available papers and studies, specifically the ones that concentrate on CRAs actions, it is hard to find data that is not contaminated by other information, or even by other rating announcements (Norden and Weber, 2004).

Some defend that a rating action is only the reaction of the agency to other publicly available information. Thus this should be connected to other events outside the rating agency's reach which are fundamental to the rating change and thus important to calculate whether the rating influences the market or not.

As a result in order to have full understanding of the rating process, one must know whether the information available in the market is enough to predict the rating change. If one diminishes the weight of public available information over the abnormal returns, one risks himself of not having conclusive data, or at least, data representing the market adjustment.

For example Hand et al. (1992) find some inconstancies over their results over non contaminated data, and even a reverse effect over the usual risk averse trend of greater negative returns upon downgrade changes, "if anything, they reverse, that is, there is a greater absolute effect for the upgrades than downgrades" (Hand et al., 1992: 752).

Also Galil and Soffer (2011) conclude that the current practice of using uncontaminated samples leads to underestimation of results, thus they use a new approach.

They assess public and private information before the event, and then adjust the CDS spreads in the days preceding the event assuming the flow of information is stationary during the days of analysis.

Like this they are able to identify the market response to rating actions alone without the influence of external information factors, like media or earnings announcements.

In conclusion, much diverse literature has been developed over the last decades, and event study methodology is a method that has been improved over the years, with different ideas and calculations.

To test market efficient hypothesis is something of utter importance and that is always needed to study the impact of some information over diverse securities. Subjects, securities and even methodologies change, but event study methodology is always an asset to study information impacts. As it as been since its beginning in 1969 with FFJR.

Table 5.1: Main Event Studies about Credit Rating Agency impact since Fama, Fisher, Jensen and Roll (1969)

Study	Variable analyzed	Asset	Sample	Event window	Results
Fama, Fisher, Jensen and Roll (1969)	Abnormal returns	Stock	940 Stock Splits, monthly data	(-29,30), 60 months	Immediate market response to stock split.
Katz (1974)	Monthly yield changes	Bonds	115 bonds, monthly data	(-12,5), 18 months	No anticipation prior to rating change, market adjustment after 6-10 weeks.
Grier and Katz (1976)	Bond returns	Bonds	96 bonds, monthly returns	(-4,3), 8 months	There is a significant period of adjustment after the rating change.
Weinstein (1977)	Abnormal returns	Bonds	412 bonds (bond issuance)	(-6,7), 14 months	Under pricing in the beginning of bond issuance.
Pinches and Singleton (1978)	Abnormal returns	Stock	207 firm monthly returns	(-30,12), 43 months	Market predicts credit rating changes 15-18 months before the rating.
Griffin and Sanvicente (1982)	Abnormal returns	Stock	180 rating changes, monthly returns	(-11,1), 13 months	Market adjustment after rating changes, mostly for downgrades.
Holthausen and Leftwich (1986)	Abnormal returns	Stock	1014 rating changes, 256 credit outlooks, daily returns	(-300, 60), 361 days	Clear negative abnormal returns in the 2 days window after the event. No significant observations for upgrades. Clear abnormal returns impact on both up and down side for S&P rating watchlists.
Glascock et al. (1987)	Abnormal returns	Stock	162 ratings, daily returns	(-90,90), 181 days	Market is slow assimilating rating information.
Wansley et al. (1992)	Abnormal returns	Bonds	351 bonds	(-12,12), 25 weeks	No difference in prices resulting from credit outlooks. Relevant downgrade negative price trend. Upgrades not conclusive.
Hand, Holthausen and Leftwich (1992)	Returns	Stock and Bond	1100 rating changes, 250 credit outlooks	Depends on asset	Upgrades have more impact in bond returns than in stock returns. Downgrades experience no bond excess returns with no contaminated samples. However the same is not true for stocks. Credit watchlist have an impact on non contaminated abnormal bond and stock returns.

Study	Variable analyzed	Asset	Sample	Event window	Results
Goh and Ederington (1993)	Abnormal returns	Stock		(-30,30), 61 days	Rating Changes cannot be considered homogeneous. Downgrades are negative just due to financial deterioration and not leverage increase.
Hite and Warga (1997)	Abnormal returns	Bonds	1200 rating changes	(-12,12), 25 months	Change in ratings to and from different levels of investment grade has more impact in abnormal returns. Having the downgrades more relevance in this fact.
Followill and Martell (1997)	Abnormal returns	Stock	64 reviews, daily returns	(-5,5), 11 days	Rating announcements preceded by rating reviews or other agency's rating do not have impact on abnormal returns. Rating reviews bring new information to the market influencing the abnormal returns.
Dichev and Piotroski (2001)	Abnormal returns	Stock	4727 rating changes, daily returns	Data from 1970 to 1997	For upgrades there are no reliable abnormal returns, downgrades with substantial negative abnormal returns in the year after the downgrade.
Steiner and Heinke (2001)	Abnormal returns	Bonds	546 rating changes, 182 watch lists	(-180, 180), 361 days	Overreaction over negative rating changes. Different reactions across different types of bonds. All ratings are announced during price adjustment windows which may hide some of the real impact of ratings.
Hull et al. (2004)	CDS Spreads	CDS	Rating changes, reviews	(-90, 10),	Results for positive rating events are less significant. Reviews for downgrade have more relevant negative impacts than negative outlooks and rating downgrades.
Norden and Weber (2004)	Abnormal returns and CDS spreads	Stocks and CDS	Rating changes	(-90,90), 181 days	Negative ratings a predicted by both markets. Significant abnormal performance around event date for downgrades but not for upgrades. Rating reviews are predicted by the market whereas Rating changes decline evenly before downgrade.
Galil and Soffer (2011)	CDS Spreads	CDS	Rating changes, reviews	(-90,90), 181 days	CDS market responds to all kinds of Rating announcements. Rating changes have lesser market response than reviews. Downgrades preceded by other rating announcements are insignificant.

Source: Based on Norden and Weber (2004) table, with Author's analysis, additions and cuts from the articles analyzed found under column "Study".

6. Data

To best test the nowadays market situation we will use companies from the Standard and Poor's 500 stock Index (S&P500) that had a credit rating announcement after January 2010, with the earliest samples starting in March 2009, when the market stabilized and the panic in the markets reduced after six months of high volatility.

This study will only analyze rating changes and credit rating outlooks, and not watch list changes, since the sample for the time frame used one would be rather small.

I will use only S&P 500 companies' data because these firms have a bigger reaction to announcement changes due to their market exposure. Since S&P 500 firms are the ones with biggest capitalization in US, it may be considered that they will have more exposure to new information than small capped firms, and thus that they are market standards. Since US market is the one with most trading volume in the globe, meaning investors will automatically respond when there is new information entering the market. This will induce a bigger standard deviation and thus a higher variance in the abnormal returns, meaning residuals.

The analysis of the sample starts in March 2009, since the fall of LB in 15 of September 2008 until March of 2009, the volatility in the security markets was out of control, so no real observation in terms of analyzing any market data related with change in credit ratings would be actually possible without being deeply related with the overall market conditions. The S&P 500 reached its lowest level since 1996 and since all analyzed companies are from this index, a stability and average growth time would be more suitable for our calculations.

This is explained by two reasons. First it was needed to have observations that were as far as possible from time with hyper volatility markets, in the end of 2008, beginning of 2009. Secondly because to have unbiased information it is necessary, as most as possible, to observe rating actions based on the firms' performance and individual concerns, and not on overall economic environment or global crisis. Since this will lead

to excess of information in the market that will not allow the isolation of specific credit rating impact on the market.

Figure 6.1: Standard and Poor's 500 Stock Index Volatility Performances Tracker in the last 5 years

Source: Yahoo Finance

Values in USD.

Further the time of sample is from this date (October 20, 2008), a more stable market and individually "firm centered"[1] credit rating information will make possible a more precise analysis. As it is observable from Figure 6.1, "normal" volatility times reappeared in April 2009 which coincided with S&P 500 lowest value in 13 years. After this historical low, a more stable market is set to analyze and withdraw conclusions to this study.

Yet it is impossible to disregard the possibly different results one may have due to present market conditions, even though there is no hyper volatility, it can be observed in today's market, a stagnation and aggravated risk averse behavior, comparing with prior studies that analyzed usually bigger time frames in an equity "friendly" environment while growth and stability were predicted.

As we saw before, subprime changed deeply investors' actions when trading equity, which may be reflected in our analysis.

[1] Meaning that credit ratings can be changed due to macro economic factors, and factors specifically applicable to the company.

After analyzing all Standard and Poor's 500 companies, and having obtained our sample of companies that were credit rated or had a credit outlook. The sample possible to assemble was of 93 companies from 130 that had a credit outlook between January 2010 and July 2012, and 265 from 271 that had a credit rating change amid the same dates, at least more than fifteen months after the fall of LB in 15th of September 2008.

Table 6.1: Firms' Sample distributed by Years and type of Credit Rating Announcements

	Outlooks			Ratings		
Year	NEG	POS	Total	Downgrade	Upgrade	Total
2010	2	5	7	31	46	77
2011	13	16	29	36	76	112
2012*	58	33	91	27	55	82
Total	**75**	**55**	**130**	**94**	**177**	**271**

Source: Author's analysis from Bloomberg data base.

**The sample concerning 2012, dates just until July.*

Considering companies, with more than one rating during the time period, I wanted to steer clear of overlapping returns. This would not have an effect on abnormal returns since the sample is considerable, but it is to avoid clustering problems so the analysis would not have biased information.

Also possible problematic regressions were excluded namely, heteroscedastic regressions and autocorrelated residuals. These impending problems of abnormal return estimators that are not independent or do not have identical variance could seriously mislead us in our study. However, cross sectional autocorrelation and heteroscedasticity, especially between firms from the same market sector, could still be a problem and introduce bias problems as stated by Collins and Dent (1984) and Bernard (1987).

Similar to previous literature we also tried to protect our sample from non-related credit rating information. Some specific companies, which had relevant information mirrored in their stock returns could bias our analysis. This information was quite

diverse and included items like mergers and acquisitions, dividend information, quarter news or CEO succession, among others.

So for final samples, there are 30 negative credit outlooks, 28 positive credit outlooks, 69 credit rating downgrades and 148 credit rating upgrades.

A time frame of 310 observations was considered for every sample, 249 before the event, and 60 after the event, considering the event date only one day. Similarly to MacKinley (1997) which uses a pre-event estimation window of 250, however a bigger post-event window was needed to see what was the reaction of the market for the analysis concerning the tenth chapter.

From this data, credit outlooks were divided in "positive" and "negative", credit rating changes in "upgrades" and "downgrades". We analyzed and compare the average abnormal returns and calculated their relevance, repeating the procedure to the cumulative abnormal returns.

Data used are all publicly available daily data, and the prices are all closing prices from each day according to Bloomberg data.

The data from 30 days before the day of event (the day of rating), and 30 days after it was analyzed, being the event window of 61 days. It was decided for this timeframe since a bigger window would return less significant results as I had the chance to confirm for myself in an experiment I made with -90 to 40 days. Studies with big samples like Holthausen and Leftwich (1986) were not as conclusive as studies with smaller samples like Goh and Ederington (1997), Followill and Martell (1997) or Hite and Warga (1997).

Daily data was preferred, as proposed by commonly acknowledged event study literature (e.g. Brown and Warner (1985), Holthausen and Leftwich (1986), Glascock et al. (1987), Fama (1991), Goh and Ederington (1993), MacKinlay (1997), Norden and Weber (2004) and Khotari and Warner (2006)).

For 265 companies that form the rating changes sample, the third order autocorrelation was tested and excluding from the sample with Breusch Godfrey test's result, a total number of thirteen firms that had autocorrelated residuals.

With the White heteroscedasticity test the segregation was of seventeen firms that had significantly different variances from the market index.

The Outlooks sample was tested as well and with the same tests there were excluded nine companies due to autocorrelation and thirteen due to heteroscedasticity.

The ratings to be studied will be both from Standard and Poor's, Fitch and Moody's because as analyzed in other papers, the three rating agencies that can mostly influence the market are these, meaning that they rate more companies, and their ratings actually introduce information into the market as proved in other studies. They are the most used in other papers, Followill and Martel (1997), Norden and Weber, (2004), Galil and Sofer, (2011). However, we have to check if this behavior is still noticeable after the subprime crisis.

This study focus its analysis only on long term credit ratings, because they are considered to be more representative of the financial conditions of the company and its future guarantee. Thus considered to have more impact in the market reaction. Besides, as it was stated before, we are using only one rating for each company over the time of study so we would not incur in overlapping, consequently if short term was also analyzed the risk of having overlapping returns would increase considerably.

In the end we will not have a problem with overlapping the information. The only issue that can occur is to include the same returns in both samples, if credit outlooks have the same time frame as some of the actual ratings of the companies. Yet this should not be a problem, for the reason that we will compare the overall behavior of the market due to the credit rating, and then due to the market outlook. Which means it will not actually be needed to calculate average abnormal returns with overlapping data from the same company. Like this not having to overcome the difficulty faced by prior researchers that in most cases have to individually access on every firm they are using, if they have overlapping returns.

Anyway this does not represent a notorious problem because of two reasons:

Firstly because as most of the event studies show, the abnormal returns due to the event, are mostly expected on the event time around the day zero. Since this study analyses 310 days of observations and changes are expected mostly between the 30 days after and the 30 days before the event, the overlapping will not constitute such a

concerning problem. Though as Norden and Weber, (2004) also stated, the rejection of samples with overlapping returns would create a sample with mostly smaller firms and number of events. So it would compromise the size of the sample and the most important market information from big samples, creating a study not representative of the market.

Secondly, because the number of overlapping event windows is small the only time the same days are used for more than one analysis is when credit rating outlooks are considered. This will not represent a problem to this study, since it analyses outlooks and credit rating changes separately.

7. Methodology

Event study methodology is based on the efficient market hypothesis (Fama, Fisher, Jensen and Roll 1969) that capital markets are efficient mechanisms to process information available on firms. The logic underlying the hypothesis is the belief that investors in capital markets process publicly available information on firm activities to assess their impact, not just on current performance but also the performance of the firm in future periods.

When additional information over the companies' activities or market information influencing the company becomes publicly available, it then may influence the firm's stock price. That might affect a firm's present and future earnings. The stock price changes relatively rapidly to reflect the current assessment of the value of the firm. The strong point of the method is the fact that it captures the overall assessment by a large number of investors of the discounted value of current and future firm performance attributable to individual events, which are reflected in the stock price and the market value of the firm.

The event study methodology provides researchers with a powerful technique to explore the strength of the link between rating actions and the creation of value for the firm (McWilliams and Siegel 1997). This methodology is well accepted and has been used in a variety of management research to study the effect on the economic value of firm actions (Dos Santos, Pfeffers and Mauer 1993), corporate acquisitions (Chatterjee 1986), CEO succession (Davidson,Worrell, and Dutia 1993), joint venture formations (Koh and Venkatraman 1991), celebrity endorsements (Agrawal and Kamakura 1995), and new product introductions (Chaney, Devinney, and Winer 1991).

Using event study methodology one has to analyze the outcomes of CRA action in the stock market. So, I analyzed firms' abnormal returns during the event period to assess whether they are influenced by credit rating activities, or not.

This study links credit rating activities with the market returns to evaluate the payoff to investors from information they might have beforehand of the market or during the event window. Evaluating changes geared by the rating agencies can be an extremely complex task however event study methodology is an excellent tool used and improved over the years by many different studies.

Here I used the more conventional approach restated by MacKinlay (1997), but not disregarding other important articles for our analysis like Collins and Dent (1984), Patell (1976), Brown and Warner (1985), Boehmer et al. (1991) or Cowan and Sergeant (1996) which all examined test statistics with null hypothesis being the average abnormal return equal to zero.

Apart of the credit rating changes, an event study over the outlooks will be performed as well, in order to conclude whether the latest are more relevant to investor's decisions than credit ratings per se.

In truth many studies point to the fact that credit ratings following outlooks and credit watches are not nearly as representative of abnormal returns as rating changes that occur without market anticipation (eg.: Followill and Martell, 1997; Norden and Weber, 2004).

On the other hand, with this study, we also want to evaluate the impact the outlooks have by themselves on stock prices and conclude not only if it is due to their existence that ratings became less relevant but also to conclude if there is an immediate market impact caused by the outlooks alone.

7.1. Abnormal Returns

"… the abnormal returns are the result of the announcement and not some other random event occurring on the same day. The strength of the method is linked to the improbability of random events across different firms on different days…"

(Submarini and Walden, 1999: 188)

Having in mind this study is measuring an effect caused by an external entity in the returns of the shareholders. The focus goes to the abnormal returns, meaning the residuals arising from the consensus estimates of the large number of investors in the

capital markets, on the expected future benefits or prejudices associated with Credit rating agencies announcements. Also, since consensus of the market, regarding the credit grading tends to be that this is a trustable accurate tool, investors will try to create value from information they possess, from firms, in future periods, and they would react positively or negatively to announcements by agencies, whether these were downgrades or upgrades. This would be reflected in a positive or negative abnormal stock market return, around the date of the new rating announcement.

An abnormal return is thus a risk-adjusted return in excess of the average stock market return. Consequently, this measure provides unique means to associate the impact of a specific action by the rating agency on the firms' stock expected return in future periods.

7.2. Measurement of Abnormal Returns

A variety of information can be used to discover if abnormal returns are influenced by credit rating changes, like different test statistics developed over the years.

But the most important is also to discover when those changes happened, highlighting the need to check when more significant abnormal returns are observed. Alongside this, the study investigates how fast the market reacts to the change in rating, and if it reacts before the announcing of the change in rating.

To perform this task, a regression of the returns of all the companies in the study is needed, to perceive what their distribution over time is. One can observe several returns spikes, but by using Market Model with the Ordinary Least squares Method (OLS)[1] and regressing the equity returns against the market standard we will find the abnormal returns in comparison with overall market conditions.

[1] Some literature defends the use of other methodologies concerning parametric tests (eg.: Collins and Dent (1984), Chandra and Balachandran (1992) , Karafiath(1994)). However the convional literature defends the use of OLS (eg.: MacKinlay (1997), Lee and Varela (1997)). This study will thus follow a conventional approach.

It was possible to calculate abnormal returns by using Capital Asset Pricing Model (CAPM) or Average returns. Although, the sample would be much more biased or the market conditions, would not be reflected in the sample.

The market model was recommended and used by most of the event studies literature FFJR (1969), Brown & Warner (1980,1985) or more recent studies like Norden and Weber (2004). This study will use the benchmark to conclude the results intended to obtain, rather than other simpler models like Constant mean return model or market adjusted returns model, CAPM, or other more complicated models like control portfolio method, or multifactor models that have little more interest over market model (MacKinlay, 1997) or as stated by Loughran and Ritter (2000), when evidencing that such methods have little power to test EMH. Since its sampling performance is less irregular than other methods like simple standard deviation or variance, by averaging cross sectional firms from both downgrades and upgrades, we are hoping to succeed in having a broader overview of the market in terms of prediction and answer to the credit ratings.

Thus using market model and our sample of daily stock returns, the parameter to estimate, (daily returns) will be the following for each stock *i* that we have present in the S&P 500 companies sample:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

Where,

R_{it} - Return of the *i*-th stock for period *t* which is calculated arithmetically;

R_{mt} - Return of the market during day *t*, which in this case is the return of S&P 500, the index that best represents the US stock market and from which all the companies we use in the study are;

α_i - Intercept value so it represents the value of the return of the stock when the market has no return;

β_i - Regression coefficient for every change in the market, so is the change in the stock for every market change;

ε_{it} – The expected residual or abnormal return expected for stock *i* in day *t*, also known as "Error", which is expected to be zero, $E(\varepsilon_{it}) = 0$.

Using OLS we will estimate the values of the parameters to calculate the expected returns, in order to have an estimation equation:

$$R_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt} + \hat{\varepsilon}_{it} \quad (2)$$

Where,

$\hat{\alpha}_i$, $\hat{\beta}_i$ and $\hat{\varepsilon}_{it}$ are the estimated values of α_i, β_i, and ε_{it} respectively.

One can say that the estimated error, ε_{it}, also known as regression residual are abnormal returns (AR_{it}) and that these will represent the actual changes in the stock price behaviour comparing to the average returns of the company and the benchmark. In this sense, according to MacKinlay (1997), we will estimate the abnormal returns by rearranging the equation (**2**):

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \quad (3)$$

As Binder (1998) stated, "This method removes the effects of economy wide factors from the return on *i*'s stock, leaving the portion of the return attributable to firm specific information", in this case the credit rating or rating outlook.

The AR_{it}, under the null hypothesis are assumed to have mean equal to zero and follow a normal distribution, where its conditional mean variance, as suggested by Judge et al. (1988: 170) will be:

$$\sigma^2(AR_{it}) = \sigma_\varepsilon^2 \left[1 + \frac{1}{L} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{t=1}^{L}(R_{mt} - \bar{R}_m)^2}\right] \quad (4)$$

Where,

σ_{ε}^{2} - Variance of the residual from the estimation model;

$\bar{R}_{m}$ - Mean market return during the sample interval;

L - The length of the estimation interval.

One can conclude that the conditional variance of each observation has two components.

The σ_{ε}^{2} disturbance variance is the variance of the regression residuals of each single stock, thus it is the same for all the observations for each company observed, and the second component of the equation is the additional variance caused by the sampling error in α_i and β_i estimations.

MacKinlay warns that sampling error is common in all event observations and may lead to serial correlation of AR regardless of the detail that disturbances are independent throughout sample time.

In truth, as size of the estimation window L grows, the sampling error tends to be zero, hence the bigger the sample, the more stable the variance $\sigma^{2}(AR_{it})$ gets through time.

Nevertheless in (**4**) the method used, is defined by Judge et al. (1988: 170), used also by Submarini and Walden (1999:199), which defers slightly from the ones presented by McWilliams and Siegal (1997: 628) and MacKinlay (1997: 27) producing to some extent different standard deviations though, not affecting the conclusions of the tests.

The null hypothesis states that abnormal returns have conditional mean and variance equal to zero. So if we have a test where the null hypothesis is observed for all the observations, it means the event as no effect on company's stock returns. This conclusion can be applied to any period within the event window and not just the event date. This is also valid for the rejection of the null hypothesis, when AR's are statistically different from zero.

The null hypothesis is confirmed when for any given observation on the event window is:

$$AR_{it} \sim N\left(0, \sigma^2(AR_{it})\right) \tag{5}$$

One can notice that, when the firms' stock return is very different from the expected market return, the standard error of the abnormal returns will naturally be greater.

Thus the standard deviation also depends on the estimation interval, therefore longer estimation intervals will naturally lead to smaller standard deviations as also stated by Submarini and Walden (1999).

In order to calculate the overall market behavior, rating actions have in the stock markets, we need to compute the Average abnormal returns (AAR). They will explain what will be the market average abnormal return for each day in the length L of the sample. Like this a very important item in our study because we will be able to assess within a time frame what is the average behavior of a stock price upon a rating change.

The average abnormal return is given us by the following equation:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{6}$$

Where N is the number of firms in the sample that has an asymptotically variance of AAR_t equal to:

$$Var(AAR_t) = \frac{1}{N}\sum_{i=1}^{N} \sigma_{\varepsilon i} \tag{7}$$

It is also important to have in mind the Cumulative abnormal returns (CAR) that will subsequently lead us to the cumulative average abnormal returns (CAAR).

The CAR is calculated by aggregating over time the abnormal returns of a determined subject of the sample, meaning company. It is practical to find the abnormal return trend of that company. For example, if the CAR is increasing in absolute value as the time passes, the returns are clearly being positive and we can probably conclude that

there was relevant and good information flowing into the market for that specific company. However, if we have a straight line, it probably means, not much information is relevant to that company during that time frame. The calculation of CAR is given by the simple accumulated sum of the abnormal returns over time:

$$CAR_i\,(t_1, t_2, \dots t_x) = \sum_{t=t_1}^{t_x} AR_i(t_1, t_2, \dots t_x) \tag{8}$$

From where one can deduce the asymptotical variance:

$$\sigma_i^2(t_1, t_2, \dots t_x) = (t_x - \ t_1 + 1)\sigma_{\varepsilon_i}^2 \tag{9}$$

The distribution of the CAR under the null hypothesis is:

$$CAR_i\,(t_1, t_2, \dots t_x) \sim N\big(0, \sigma^2(t_1, t_2, \dots t_x)\big) \tag{10}$$

Thus the CAR will not be of much use for us, because we are not trying to capture the behavior of a credit rating action in a single company but in the market.

We are trying to find the average change for companies that have credit rating information entering the market on the event date. And for that we will need to aggregate information, which we can do with CAAR, by simply averaging the CAR of each company. Alternatively we can employ a more used method among event study research articles, by summing the average abnormal returns from each period *L*, in order to obtain the evolution of the abnormal returns over time caused by that specific event or other that may be accidentally included in the sample:

$$CAAR_t\,(t_1, t_2, \dots t_x) = \sum_{t=t_1}^{t_x} AAR_t(t_1, t_2, \dots t_x) \tag{11}$$

This could also be achieved with:

$$CAAR_t\,(t_1, t_2, \dots t_x) = \frac{1}{N}\sum_{t=t_1}^{t_x} CAR_i(t_1, t_2, \dots t_x) \tag{12}$$

CAAR has a variance based on the variance of the AAR, as well as computation of CAR, we need to sum the variations of the cumulative AARs.

Given any interval in the event window, we will have:

$$Var(CAAR_t\,(t_1, t_2, \dots t_x)) = \sum_{t=t_1}^{t_x} Var(AAR_t\,) \tag{13}$$

Or,

$$Var(CAAR\,(\mathrm{t_1}, \mathrm{t_2}, \dots \mathrm{t_x}) = \frac{1}{\mathrm{N}^2}\sum_{\mathrm{t=t_1}}^{\mathrm{t_x}} \sigma_{\mathrm{i}}^2(\mathrm{t_1}, \mathrm{t_2}, \dots \mathrm{t_x}) \tag{14}$$

CAAR should follow a distribution under the null hypothesis where abnormal returns are zero equal to:

$$CAAR_i\,(t_1, t_2, \dots t_x) \sim N\left(0, Var\big(CAAR(t_1, t_2, \dots t_x)\big)\right) \tag{15}$$

Following the event methodology, the results of our findings must be tested and we must define our hypothesis in order to access whether our results make sense.

Concerning Average abnormal returns or average residuals we can consider the following hypothesis:

H0 - Average abnormal returns (AAR) or average residuals for all events at period *t* are equal to zero.

H1 - Average abnormal returns (AAR) or average residuals for all events at period *t* are different than zero.

Which we will test according to previous literature on the matter that MacKinley (1997) called "basic approach":

$$\theta_1 = \frac{\mathrm{AAR_t}}{\sqrt{(\mathrm{Var(AAR_t)})}} \sim \mathrm{N}(0,1) \tag{16}$$

Regarding the Cumulative Average Abnormal Returns, similar hypothesis will be taken according to standard procedure:

H0 – Cumulative Average daily abnormal returns ($\mathrm{CAAR}(t_1, t_2, \dots t_x)$) between day t_1 and day t_x, for all events are equal to zero.

H1– Cumulative Average daily abnormal returns ($\mathrm{CAAR}(t_1, t_2, \dots t_x)$) between day$t_1$ and day t_x, for all events are not equal to zero.

We test this by the following method similar to AAR:

$$\theta_2 = \frac{CAAR(t_1, t_2, \dots t_x)}{\sqrt{(Var(CAAR(t_1, t_2, \dots t_x)))}} \sim N(0,1) \tag{17}$$

Now we will test both this tests for every daily period *t*, and access if there was market anticipation, reaction, or the market simply did not react to credit rating changes or credit rating outlooks.

8. Results

According to the results, there is little difference in the residuals during normal market activity and when there is a credit rating event, however interesting cases of clear market anticipation and some market reaction can be observed.

Stable outlooks were ignored, because they were a very small irrelevant sample, they would not represent new information, and in case of any relevance, this would be contradictive because stable outlooks can come from positive or negative ones, biasing the information.

A event window ranging -30 and 30 was used, in accordance with Goh and Ederington (1993), to detect market anticipation and late response to the event.

Table 8.1: Average Abnormal Returns and Cumulative Average Abnormal Returns for both Negative and Positive Credit Rating Outlooks

	Negative Outlooks				Positive Outlooks			
Event window	**AAR**	**t-test**	**CAAR**	**t-test**	**AAR**	**t-test**	**CAAR**	**t-test**
-30	-0,16%	-0,56	-0,16%	-0,56	0,22%	0,84	0,22%	0,84
-29	-0,39%	-1,38	-0,54%	-1,37	-0,30%	-1,13	-0,08%	-0,20
-28	-0,54%	-1,91	-1,08%	**-2,22***	0,06%	0,24	-0,01%	-0,03
-27	-0,17%	-0,61	-1,25%	**-2,22***	-0,57%	**-2,15***	-0,59%	-1,10
-26	-0,24%	-0,87	-1,49%	**-2,38***	0,25%	0,92	-0,34%	-0,57
-25	-0,59%	**-2,10***	-2,08%	**-3,03***	-0,25%	-0,93	-0,59%	-0,90
-24	0,58%	**2,07***	-1,50%	**-2,02***	0,41%	1,55	-0,18%	-0,25
-23	0,57%	**2,05***	-0,92%	-1,16	-0,04%	-0,17	-0,22%	-0,29
-22	-0,84%	**-3,00****	-1,77%	**-2,10***	0,15%	0,56	-0,07%	-0,09
-21	0,51%	1,80	-1,26%	-1,42	0,02%	0,06	-0,05%	-0,06
-20	0,10%	0,34	-1,16%	-1,25	0,67%	**2,51***	0,61%	0,70
-19	-0,31%	-1,10	-1,47%	-1,52	-0,13%	-0,47	0,49%	0,53
-18	0,17%	0,62	-1,30%	-1,28	0,39%	1,47	0,88%	0,92
-17	-0,13%	-0,45	-1,43%	-1,36	0,07%	0,27	0,95%	0,96
-16	0,04%	0,14	-1,38%	-1,27	0,30%	1,14	1,26%	1,22
-15	0,25%	0,87	-1,14%	-1,02	0,47%	1,79	1,73%	1,63
-14	0,08%	0,29	-1,06%	-0,92	-0,45%	-1,69	1,28%	1,17
-13	-0,73%	**-2,59****	-1,79%	-1,50	-0,31%	-1,15	0,97%	0,86
-12	0,09%	0,31	-1,70%	-1,39	-0,04%	-0,15	0,93%	0,81
-11	0,36%	1,27	-1,34%	-1,07	0,09%	0,34	1,02%	0,86

	Negative Outlooks				Positive Outlooks			
Event window	**AAR**	**t-test**	**CAAR**	**t-test**	**AAR**	**t-test**	**CAAR**	**t-test**
-10	-0,14%	-0,51	-1,48%	-1,15	0,14%	0,53	1,16%	0,96
-9	-0,16%	-0,57	-1,64%	-1,25	-0,28%	-1,06	0,88%	0,71
-8	0,08%	0,28	-1,56%	-1,16	-0,29%	-1,11	0,59%	0,46
-7	0,10%	0,35	-1,47%	-1,07	0,02%	0,08	0,61%	0,47
-6	-0,95%	**-3,37****	-2,41%	-1,72	0,31%	1,16	0,92%	0,69
-5	0,22%	0,79	-2,19%	-1,53	-0,09%	-0,34	0,83%	0,61
-4	-0,50%	-1,79	-2,69%	-1,85	-0,04%	-0,16	0,79%	0,57
-3	-0,58%	**-2,07***	-3,27%	-2,20	-0,14%	-0,54	0,64%	0,46
-2	0,53%	1,88	-2,75%	-1,82	0,38%	1,44	1,02%	0,72
-1	0,40%	1,41	-2,35%	-1,53	0,32%	1,19	1,34%	0,92
0	-0,62%	**-2,21***	-2,97%	-1,90	0,25%	0,95	1,60%	1,08
1	0,46%	1,64	-2,51%	-1,58	0,03%	0,10	1,62%	1,08
2	0,05%	0,16	-2,46%	-1,53	-0,01%	-0,04	1,61%	1,05
3	-0,16%	-0,58	-2,62%	-1,60	-0,21%	-0,78	1,40%	0,91
4	0,26%	0,91	-2,37%	-1,43	-0,12%	-0,45	1,29%	0,82
5	-0,10%	-0,37	-2,47%	-1,47	-0,32%	-1,20	0,97%	0,60
6	-0,48%	-1,71	-2,95%	-1,73	0,08%	0,32	1,05%	0,65
7	-0,11%	-0,40	-3,07%	-1,77	-0,09%	-0,34	0,96%	0,58
8	-0,16%	-0,56	-3,22%	-1,84	-0,01%	-0,03	0,95%	0,57
9	-0,07%	-0,25	-3,29%	-1,85	-0,24%	-0,91	0,71%	0,42
10	-0,30%	-1,08	-3,60%	-0,56	-0,63%	**-2,38***	0,08%	0,04
11	0,09%	0,34	-3,50%	-1,92	0,19%	0,71	0,26%	0,15
12	0,17%	0,62	-3,33%	-1,81	0,07%	0,26	0,33%	0,19
13	-0,45%	-1,61	-3,78%	**-2,03***	0,06%	0,24	0,40%	0,22
14	-0,12%	-0,43	-3,90%	**-2,07***	0,24%	0,92	0,64%	0,36
15	0,23%	0,82	-3,67%	-1,93	-0,31%	-1,15	0,34%	0,19
16	0,14%	0,48	-3,54%	-1,84	0,10%	0,37	0,43%	0,24
17	0,05%	0,16	-3,49%	-1,79	0,06%	0,22	0,49%	0,27
18	-0,14%	-0,49	-3,63%	-1,85	0,21%	0,80	0,70%	0,38
19	-0,23%	-0,81	-3,86%	-1,94	-0,44%	-1,65	0,26%	0,14
20	-0,11%	-0,40	-3,97%	**-1,98***	0,27%	1,01	0,53%	0,28
21	0,38%	1,35	-3,59%	-1,77	-0,48%	-1,80	0,05%	0,03
22	0,24%	0,87	-3,35%	-1,64	-0,21%	-0,79	-0,16%	-0,08
23	-0,35%	-1,26	-3,70%	-1,79	-0,31%	-1,15	-0,46%	-0,24
24	-0,52%	-1,83	-4,21%	**-2,02***	0,41%	1,55	-0,05%	-0,03
25	0,08%	0,30	-4,13%	**-1,97***	-0,18%	-0,67	-0,23%	-0,11
26	-0,04%	-0,13	-4,17%	**-1,97***	-0,08%	-0,29	-0,30%	-0,15
27	-0,07%	-0,24	-4,23%	**-1,98***	-0,31%	-1,18	-0,62%	-0,30
28	0,33%	1,17	-3,91%	-1,81	0,33%	1,25	-0,29%	-0,14
29	-0,16%	-0,57	-4,07%	-1,87	0,14%	0,53	-0,14%	-0,07
30	-0,15%	-0,54	-4,22%	-1,92	-0,12%	-0,44	-0,26%	-0,13

Source: Author's analysis.

AAR and CAAR from -30 to 30 days, in %.

*Bold t-tests represent the statistically significant rejections of H0. * with a 5% confidence level.*

*** with a 1% confidence level.*

The table above represents the 30 observations before credit outlooks and 30 observations after credit outlook change.

Positive outlooks results are at best disappointing. There is a clear negative trend, after the event date with a statistically significant negative abnormal return at day 10. They are mostly inconclusive, as usually are upside trend events.

Regarding the negative outlooks, we see a clear negative trend in the behavior of AAR. A strong market volatility can be observed in the AAR between [-25;.-22] with significant positive and negative returns, which suggests that new information is entering the market. There is a significant negative observation in day -3 and we can see that market reaction was significantly negative on the event by -0,63 %.

When analyzing CAAR, we observe also a notable negative anticipation by the market from -28 to -22 and a negative reaction spread out after the event date.

These results are consistent with the ones found on previous literature that significant abnormal performance is expected around down trend events while positive rating events have an insignificant reaction. This can be observed in many articles with a variety of securities, with a variety of Credit Rating actions. For example Norden and Weber (2004) results when analyzing rating reviews found that CAAR has a similar behavior when predicting these events while Hull et al. (2004) extracted an analogous conclusion for the CDS markets. Hand et al. (1992) obtained also comparable results for bond and stock prices, even though market conditions at the time were considerably different. Nevertheless, Wansley et al.(1992) in the same year concluded differently and presented results that credit watch list additions do not represent new information to the market and thus do not influence abnormal returns for bond markets.

These results suggest that at least in terms of negative credit outlooks, one can regard the market as efficient. Outlooks can probably be considered for investment strategies or for portfolio adjustments.

What may leaves us with the notion that these will be relevant in the long term to correct the market until there is an actually credit rating change. Followill and Martell (1997) advocate that credit rating changes preceded by Rating reviews rarely have such big impact like ratings given without previous information introduced in the market.

Table 8.2: Average Abnormal Returns and Cumulative Average Abnormal Returns for both Credit Rating Downgrades and Credit Rating Upgrades

	Downgrades				Upgrades			
Event window	**AAR**	**t-test**	**CAAR**	**t-test**	**AAR**	**t-test**	**CAAR**	**t-test**
-30	-0,06%	-0,36	-0,06%	-0,36	-0,04%	-0,17	-0,04%	-0,32
-29	0,16%	0,95	0,10%	0,42	-0,06%	-0,25	-0,10%	-0,56
-28	-0,29%	-1,73	-0,19%	**-3,43****	0,00%	0,00	-0,10%	-0,45
-27	0,13%	0,79	-0,06%	**-2,58****	-0,02%	-0,07	-0,11%	-0,46
-26	0,13%	0,78	0,07%	-1,96	0,10%	0,43	-0,01%	-0,05
-25	-0,03%	-0,18	0,04%	-1,86	0,11%	0,48	0,10%	0,32
-24	-0,05%	-0,30	-0,01%	-1,83	-0,09%	-0,38	0,01%	0,03
-23	0,25%	1,50	0,24%	-1,19	-0,04%	-0,16	-0,03%	-0,08
-22	0,10%	0,59	0,34%	-0,92	-0,08%	-0,36	-0,11%	-0,30
-21	0,02%	0,12	0,36%	0,68	0,28%	1,20	0,17%	0,42
-20	0,06%	0,35	0,42%	0,76	-0,19%	-0,83	-0,03%	-0,06
-19	0,00%	0,03	0,43%	0,73	-0,10%	-0,44	-0,13%	-0,30
-18	-0,04%	-0,27	0,38%	0,63	0,19%	0,84	0,06%	0,15
-17	-0,28%	-1,65	0,11%	0,17	-0,08%	-0,37	-0,02%	-0,04
-16	-0,34%	**-2,05***	-0,24%	-0,37	-0,02%	-0,09	-0,04%	-0,09
-15	0,20%	1,19	-0,04%	-0,06	0,03%	0,14	-0,01%	-0,02
-14	-0,04%	-0,23	-0,08%	-0,11	0,02%	0,07	0,01%	0,01
-13	-0,19%	-1,13	-0,27%	-0,38	0,20%	0,88	0,21%	0,40
-12	0,43%	**2,54***	0,16%	0,22	0,07%	0,31	0,28%	0,52
-11	0,04%	0,26	0,20%	0,27	-0,07%	-0,31	0,21%	0,38
-10	-0,35%	**-2,06***	-0,14%	-0,19	-0,08%	-0,34	0,13%	0,23
-9	0,04%	0,23	-0,10%	-0,13	-0,23%	-0,99	-0,10%	-0,17
-8	0,35%	**2,11***	0,25%	0,31	0,07%	0,29	-0,56%	-0,95
-7	0,22%	1,33	0,47%	0,57	-0,16%	-0,71	-0,73%	-1,20
-6	-0,03%	-0,19	0,44%	0,52	0,09%	0,38	-0,64%	-1,03
-5	0,26%	1,54	0,70%	0,82	0,12%	0,52	-0,52%	-0,82
-4	0,13%	0,81	0,83%	0,96	-0,12%	-0,50	-0,64%	-0,99
-3	0,00%	-0,01	0,83%	0,94	-0,10%	-0,41	-0,73%	-1,12
-2	0,16%	0,94	0,99%	1,10	0,01%	0,05	-0,72%	-1,08
-1	0,28%	1,64	1,26%	1,38	0,11%	0,48	-0,61%	-0,90
0	-0,11%	-0,64	1,16%	1,24	0,07%	0,28	-0,54%	-0,79
1	-0,18%	-1,09	0,97%	1,03	-0,05%	-0,21	-0,59%	-0,85
2	-0,23%	-1,37	0,74%	0,77	-0,23%	-1,00	-0,82%	-1,16
3	0,27%	1,61	1,01%	1,04	-0,13%	-0,56	-0,95%	-1,32
4	0,13%	0,75	1,14%	1,15	-0,10%	-0,43	-1,05%	-1,44
5	0,31%	1,87	1,45%	1,45	0,16%	0,71	-0,89%	-1,20
6	0,06%	0,35	1,51%	1,48	-0,09%	-0,41	-0,98%	-1,31
7	-0,09%	-0,56	1,42%	1,37	-0,25%	-1,09	-1,23%	-1,62
8	0,05%	0,29	1,47%	1,40	0,06%	0,27	-1,17%	-1,52
9	0,02%	0,12	1,49%	1,40	-0,02%	-0,09	-1,19%	-1,52
10	0,01%	0,07	1,50%	1,40	-0,16%	-0,70	-1,35%	-1,71
11	-0,12%	-0,70	1,38%	1,27	0,06%	0,28	-1,29%	-1,61
12	-0,19%	-1,11	1,20%	1,09	-0,08%	-0,35	-1,37%	-1,69

	Downgrades				Upgrades			
Event window	**AAR**	**t-test**	**CAAR**	**t-test**	**AAR**	**t-test**	**CAAR**	**t-test**
13	-0,03%	-0,19	1,16%	1,05	0,01%	0,03	-1,36%	-1,66
14	0,03%	0,15	1,19%	1,06	-0,18%	-0,76	-1,54%	-1,85
15	-0,13%	-0,79	1,06%	0,93	-0,04%	-0,18	-1,58%	-1,89
16	-0,03%	-0,21	1,02%	0,89	-0,04%	-0,17	-1,62%	-1,91
17	0,05%	0,31	1,07%	0,93	0,00%	-0,02	-1,62%	-1,90
18	0,26%	1,53	1,33%	1,13	0,07%	0,31	-1,55%	-1,79
19	0,00%	0,02	1,33%	1,13	-0,07%	-0,29	-1,62%	-1,85
20	-0,12%	-0,71	1,21%	1,02	0,06%	0,26	-1,56%	-1,77
21	0,16%	0,93	1,37%	1,14	0,03%	0,14	-1,53%	-1,71
22	0,02%	0,11	1,39%	1,14	-0,15%	-0,63	-1,67%	-1,86
23	0,03%	0,18	1,42%	1,15	-0,10%	-0,45	-1,78%	-1,95
24	0,27%	1,61	1,69%	1,36	-0,18%	-0,76	-1,95%	**-2,12***
25	-0,02%	-0,11	1,67%	1,33	-0,04%	-0,17	-1,99%	**-2,15***
26	-0,13%	-0,79	1,54%	1,22	0,00%	-0,01	-1,99%	**-2,13***
27	0,05%	0,31	1,59%	1,25	-0,12%	-0,53	-2,12%	**-2,24***
28	-0,06%	-0,37	1,53%	1,19	0,03%	0,15	-2,08%	**-2,19***
29	0,09%	0,51	1,62%	1,25	-0,02%	-0,09	-2,10%	**-2,19***
30	-0,01%	-0,03	1,61%	1,23	-0,01%	-0,04	-2,11%	**-2,18***

Source: Author's analysis.

AAR and CAAR from -30 to 30 days, in %.

*Bold t-tests represent the statistically significant rejections of H0. * with a 5% confidence level.*

*** with a 1% confidence level.*

There is a clear and significant market movement concerning credit rating downgrades. Upgrades have no significant values other than a clear negative trend after the event date, especially observable in CAAR values. This is consistent with the results of previous studies.

Downgrades have contradicting information regarding the significant returns prior to events. On the 10^{th} and 16^{th} days before the event, the returns are significantly negative; however, on the 8^{th} and 12^{th} days prior to the event there are positive significant returns which suggests market information prior to the rating change, like outlooks or credit watches.

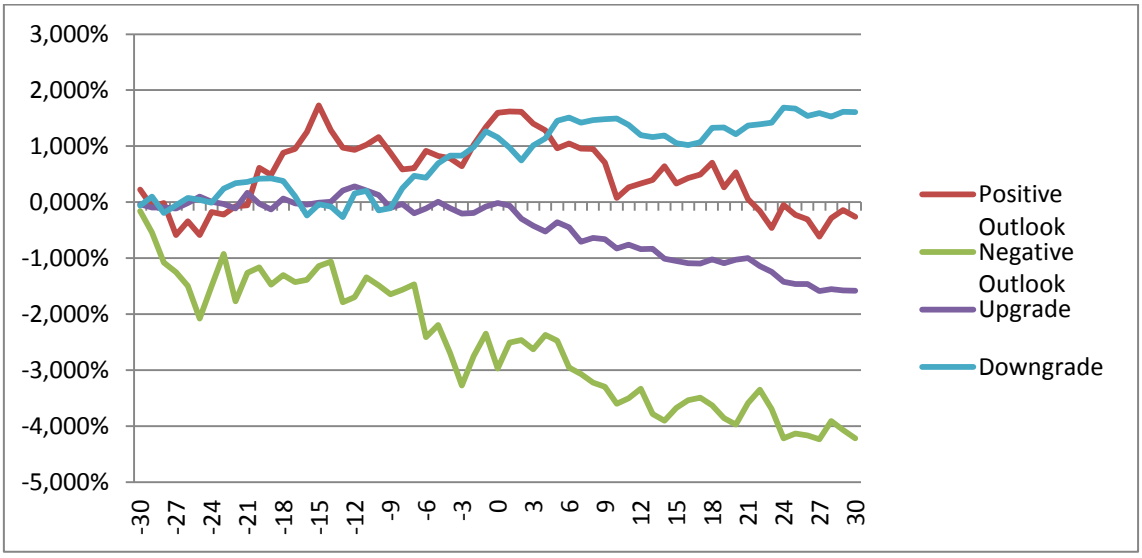
Regarding the market reaction to the event, there are some negative AAR's, however there are no statistically significant abnormal returns with significant CAAR's which suggests that Followill and Martell were right when mentioned that credit ratings changes do not affect the market if they are preceded by any other kind of market information.

This type of results is not new, the fact that information previous to ratings will make these unnoticed in the market regarding that they are "no news", has been defended along in some studies. This supports previous literature which concludes that rating agencies tend to act when information is already reflected in the market.

However, this has been changing with time, and more recent are the studies, the more noticeable is this subject.

For example, Wansley et al. (1992) did not find evidence of such thing in the bond markets, even though they tested it. However, Followill and Martell from their study in 1997 with stock returns concluded that ratings do not have as much impacts as reviews for downgrades, and that usually when the first are followed by the second, these are not noticeable. This was supported by further studies like Hull et al. (2004) in the CDS markets and Norden and Weber (2004) in both CDS and stock markets.

Figure 8.1: Cumulative Average Abnormal Returns for all Credit Rating Actions analyzed



Source: Author's analysis.

CAAR from -30 to 30 days, in %.

Regarding Figure 8.1 one can observe the behavior over the event window from the different credit rating actions that were analyzed by this study. The impacts, negative

outlooks have on the market, are clear, which jointly with significant *t-test* values show us that there is indeed a market influence caused by the CRA in this matter.

In addition, it is possible to observe the clear negative trend prior to negative credit outlooks which imply that market predicts to some extent these outlooks. This is probably caused by investors' analysis of the company due to financial deterioration and increased leverage mentioning Goh's and Ederington (1993) hypothesis for credit downgrade reasons. The hypothesis of strong market efficiency and market information leakage is not likely for two reasons. First, when a company issues new debt, it is usually a public act and thus information will be automatically impacting the market. Secondly, even if there was market leakage concerning the negative outlook, the information of poor performance would be already reflected in the market and thus that is why we observe a clear market negative trend before the event date.

As stated before, other rating actions are quite inconclusive; however, this goes conformably with the previous literature, considering positive credit rating actions. Previous studies all point for either completely inconclusive data for positive credit rating actions, (eg.: Hand et al. (1992), Dichev and Piotroski (2001), Norden and Weber (2004)), or a small negative trend after event date, Glascock et al. (1987).

Considering the negative outlooks, we have four significant AARs suggesting some market volatility pre event date window. Nonetheless, a conclusion is hard to deduct since on event days -16 and -10 we observe negative significant values, while in days -12 and -8 a positive AAR is observable.

Since event studies use different models, it would be interesting to cross check our results with other methodologies. Consequently the same tests were conducted taking into account other two different models considering rating changes and outlook analysis. These were prepared according to the definitions given by Brown and Warner (1985).

Firstly the market adjusted model was used, and it only considers the firms' returns and market's returns. So logically we have:

$$AR_{it} = R_{it} - R_{mt} \tag{18}$$

The second model used to cross check the data, was the mean adjusted model, and it follows the following distribution:

$$AR_{it} = R_{it} - \bar{R}_i \tag{19}$$

Where,

$\bar{R}_i$ – is the arithmetic mean of the *i*'th stock returns over the estimation window.

The results using these models were extremely similar to the ones using market model. In fact the only slight difference was the more significant values in some observations when analysing the positive outlooks for market adjusted model.

8.1. Limitations of the Results

This study intends to find whether the stock market, namely the biggest firms in US (S&P 500), is efficient concerning Credit Rating information. Following the presentation of our results, it is important to mention some issues that might affect the veracity of our results. These issues are related to limitations to the event study methodology in general, and with this study in specific:

- Hindsight bias or survival bias, i.e. prediction of future results of a study based on past performance of similar events and its likelihood to produce determined outcomes;
- Sample size can be an issue to conclude something that can be extrapolated for a bigger population. In our case, our smaller sample of 58 Outlooks, can be considered small. However, it goes in line with previous studies with small samples, (eg.:Followill and Martell (1997) and Glascock et al. (1987)).
- The fact that here is no model consensus concerning the event study methodology. In this study the market model was used because is the literature standard for this kind of study.

- Also the calculation of variance differs from study to study which can lead to different conclusions regarding our study. However according to Submarini and Walden (1999, p. 199) this should not be an issue.
- There is also a discussion regarding the use of parametric tests against the use of non-parametric ones. In our case a parametric *t-test* was used as in most of event study literature.
- There can be some statistical problems concerning the data, especially daily data. However, some of the samples that had these problems were excluded in our sample. Nonetheless Binder (1998) stats about this problems that "…potential problems with daily returns are unimportant or easily corrected in the standard event study...".
- Data selection criteria could be a problem considering that we included samples just after March of 2009, of course this will influence our results and by choosing other time frame results would be different.

9. Agency differences

In this chapter we are going to evidence some agency differences that were noticeable by analyzing the abnormal returns of the market around event dates when a credit rating action is given by a specific credit rating agency.

The impact on the market of different rating agencies is different, which is proved by several pieces of previous literature (eg.: Norden and Weber (2004)).

Several authors find differences in rating agencies across the market, which suggests some rating agencies have more influence over investors than others.

This piece of information tells us that some agencies may have bigger influence over market prices, than others.

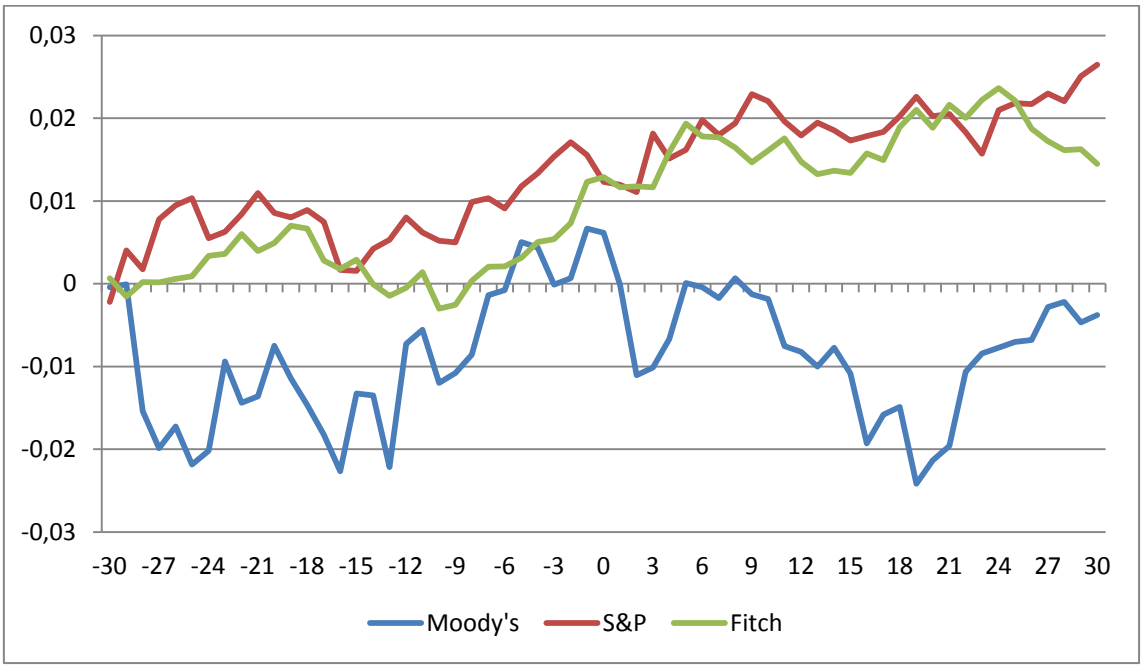
As seen before, clear market impact is proven in the negative outlooks, and although positive outlooks and ratings do not have such an influence in nowadays market, a negative outlook or credit watch is the only needed aspect to influence the market and introduce new influencing information.

Like this it is interesting to analyze which will be the agency with most influence in the stock prices.

From CAAR, in the next figure, we can clearly conclude that Moody's is the one that most influences the market, or at least the one that has more impact in the market**.**

This can have two reasons. Either investors believe Moody's produces better analysis and is more credible in terms of credit ratings. Or Moody's is on the vanguard of new information introduced in the market. Thus other Rating Agencies do not represent such big impact. Since, when they downgrade the company, the stocks have already reflected the deteriorations of the performance of the company or its environment.

Figure 9.1: Cumulative Average Abnormal Returns for all Credit Rating Downgrades analyzed accordingly to Agency



Source: Author's analysis.

CAAR from -30 to 30 days, in %

Nevertheless this contradicts some findings from Holthausen and Leftwich(1986) and Hite and Warga (1997) which found equal stock price reaction from Standard and Poor's and Moody's, in fact there is no reason to believe this results would be different. Nonetheless, that is the result of our analysis.

Table 9.1: Average Abnormal Returns and Cumulative Average Abnormal Returns for both Credit Rating Downgrades and Credit Rating Upgrades

	Moody's			S&P			Fitch		
	AAR	T	P-val	AAR	T	P-val	AAR	T	P-val
-30	-0,04%	-0,10	92%	-0,22%	-0,81	42%	0,07%	0,27	79%
-29	0,04%	0,08	93%	0,62%	2,30	**2%**	-0,22%	-0,90	37%
-28	-1,53%	-3,49	**0%**	-0,23%	-0,85	39%	0,17%	0,71	48%
-27	-0,45%	-1,03	30%	0,61%	2,24	**2%**	0,00%	-0,01	99%
-26	0,26%	0,60	55%	0,17%	0,62	53%	0,04%	0,18	86%
-25	-0,46%	-1,05	29%	0,08%	0,31	76%	0,03%	0,12	90%
-24	0,17%	0,38	70%	-0,48%	-1,79	7%	0,25%	1,01	31%
-23	1,08%	2,46	**1%**	0,08%	0,29	77%	0,02%	0,09	93%
-22	-0,50%	-1,14	25%	0,21%	0,78	43%	0,24%	0,97	33%
-21	0,08%	0,18	86%	0,26%	0,95	34%	-0,20%	-0,82	41%
-20	0,61%	1,40	16%	-0,24%	-0,88	38%	0,10%	0,39	70%
-19	-0,39%	-0,90	37%	-0,05%	-0,20	84%	0,21%	0,85	39%
-18	-0,32%	-0,74	46%	0,09%	0,32	75%	-0,04%	-0,15	88%
-17	-0,36%	-0,82	41%	-0,14%	-0,53	60%	-0,39%	-1,57	12%
-16	-0,44%	-1,01	31%	-0,58%	-2,15	**3%**	-0,10%	-0,41	68%
-15	0,94%	2,15	**3%**	-0,01%	-0,03	97%	0,11%	0,45	65%
-14	-0,02%	-0,05	96%	0,27%	0,99	32%	-0,30%	-1,20	23%
-13	-0,87%	-1,99	**5%**	0,11%	0,40	69%	-0,14%	-0,57	57%
-12	1,49%	3,40	**0%**	0,27%	1,00	32%	0,10%	0,39	69%
-11	0,17%	0,39	70%	-0,18%	-0,68	50%	0,19%	0,77	44%
-10	-0,64%	-1,47	14%	-0,10%	-0,37	71%	-0,44%	-1,78	8%
-9	0,12%	0,28	78%	-0,02%	-0,07	95%	0,04%	0,17	86%
-8	0,22%	0,50	62%	0,49%	1,80	7%	0,29%	1,18	24%
-7	0,72%	1,65	10%	0,05%	0,17	87%	0,17%	0,69	49%
-6	0,06%	0,14	89%	-0,12%	-0,46	65%	0,00%	0,01	99%
-5	0,58%	1,32	19%	0,27%	0,99	32%	0,11%	0,43	67%
-4	-0,06%	-0,15	88%	0,16%	0,58	56%	0,19%	0,77	44%
-3	-0,45%	-1,03	30%	0,20%	0,75	45%	0,03%	0,13	90%
-2	0,08%	0,18	86%	0,17%	0,64	52%	0,19%	0,79	43%
-1	0,60%	1,37	17%	-0,15%	-0,57	57%	0,50%	2,02	**4%**
0	-0,05%	-0,11	91%	-0,32%	-1,20	23%	0,06%	0,23	82%
1	-0,63%	-1,44	15%	-0,04%	-0,14	89%	-0,12%	-0,50	62%
2	-1,09%	-2,50	**1%**	-0,09%	-0,32	75%	0,01%	0,05	96%
3	0,09%	0,21	83%	0,71%	2,62	**1%**	-0,01%	-0,06	95%
4	0,34%	0,79	43%	-0,30%	-1,11	27%	0,43%	1,73	8%
5	0,68%	1,55	12%	0,10%	0,38	71%	0,34%	1,39	16%
6	-0,05%	-0,12	90%	0,36%	1,33	18%	-0,15%	-0,63	53%
7	-0,13%	-0,29	77%	-0,18%	-0,66	51%	-0,01%	-0,04	97%

	Moody's			S&P			Fitch		
	AAR	**T**	**P-val**	**AAR**	**T**	**P-val**	**AAR**	**T**	**P-val**
8	0,24%	0,54	59%	0,14%	0,53	60%	-0,12%	-0,50	62%
9	-0,19%	-0,44	66%	0,35%	1,30	19%	-0,18%	-0,73	47%
10	-0,06%	-0,14	89%	-0,09%	-0,32	75%	0,15%	0,59	56%
11	-0,57%	-1,30	19%	-0,24%	-0,89	37%	0,14%	0,59	56%
12	-0,07%	-0,16	87%	-0,17%	-0,64	52%	-0,28%	-1,14	25%
13	-0,18%	-0,41	68%	0,16%	0,57	57%	-0,15%	-0,61	54%
14	0,23%	0,52	60%	-0,09%	-0,34	73%	0,04%	0,16	87%
15	-0,31%	-0,72	47%	-0,12%	-0,46	65%	-0,03%	-0,10	92%
16	-0,84%	-1,93	5%	0,05%	0,19	85%	0,24%	0,96	34%
17	0,35%	0,80	42%	0,05%	0,19	85%	-0,08%	-0,32	75%
18	0,09%	0,21	83%	0,19%	0,70	48%	0,40%	1,62	11%
19	-0,93%	-2,13	**3%**	0,24%	0,87	38%	0,21%	0,84	40%
20	0,28%	0,64	52%	-0,24%	-0,88	38%	-0,21%	-0,87	39%
21	0,18%	0,41	68%	0,03%	0,10	92%	0,28%	1,12	26%
22	0,90%	2,05	**4%**	-0,22%	-0,82	41%	-0,16%	-0,63	53%
23	0,22%	0,50	62%	-0,26%	-0,96	34%	0,22%	0,87	38%
24	0,07%	0,16	88%	0,52%	1,94	5%	0,14%	0,58	56%
25	0,07%	0,16	88%	0,09%	0,32	75%	-0,15%	-0,60	55%
26	0,03%	0,06	95%	-0,01%	-0,05	96%	-0,34%	-1,38	17%
27	0,40%	0,91	36%	0,13%	0,47	64%	-0,15%	-0,62	53%
28	0,06%	0,14	89%	-0,09%	-0,35	73%	-0,11%	-0,44	66%
29	-0,25%	-0,56	57%	0,31%	1,13	26%	0,01%	0,05	96%
30	0,09%	0,21	84%	0,14%	0,51	61%	-0,18%	-0,72	47%

Source: Author's analysis.

AAR -30 to 30 days, in %.

Even though, one cannot say S&P's ratings have so much impact like the ones from Moody's, it is clear by their average abnormal returns, that there is some impact. Namely, prior to rating event and three days after it. However, no comparison can be made with Moody's results.

These results prove the clear market anticipation consistent with previous studies where impact is noticeable in average stock returns prior to the event date. This also proves that some information entering the market prior to the rating change exists, namely outlooks, reviews or simple financial condition deterioration.

For Fitch one can see a significant abnormal return on day -1 one with a five percent significance level which per se does not lead to any conclusions, especially since it represents an average abnormal positive return.

The only conclusion possible to extort over Fitch Downgrades impact on abnormal returns is that they don't have an impact, and they smoothed our conclusions over Rating Changes in general.

In conclusion one can say that to some extent our results from Fitch and Standard and Poor's were biasing our Credit Rating Downgrade analysis concerning our Moody's sample. In fact previous studies just use Moody's data bases with some success, (eg.: Followill and Martell (1997)).

It would be also a good idea to compare the other Credit Rating Action we had significant results in. The Negative outlooks, however it would be certain to achieve biased results since we possess a relatively small sample. The division between rating agencies would make the samples even smaller, having Fitch for example representing just five firms, which would provide us with clear inconclusive data and impossible sample results extrapolation to the overall population of credit rating outlooks.

10. Investment strategies

Can we use credit rating information to fulfill an investment strategy?

To answer this question a small analysis will be put together that will provide information of two possible investment strategies that could make an investor successfully profit from a rating action.

Depending on if one is analyzing rating changes or outlooks, the approach would be different. However, having always in mind that negative trend changes are always more influencing than positive changes.

At this point results shown are for a portfolio sizing the samples we demonstrated previously, nevertheless it is important to mention that this strategy would work only based on diversification, given that for some companies the Credit Rating may not represent a good representation of its financial health and thus the risk spreading is essential.

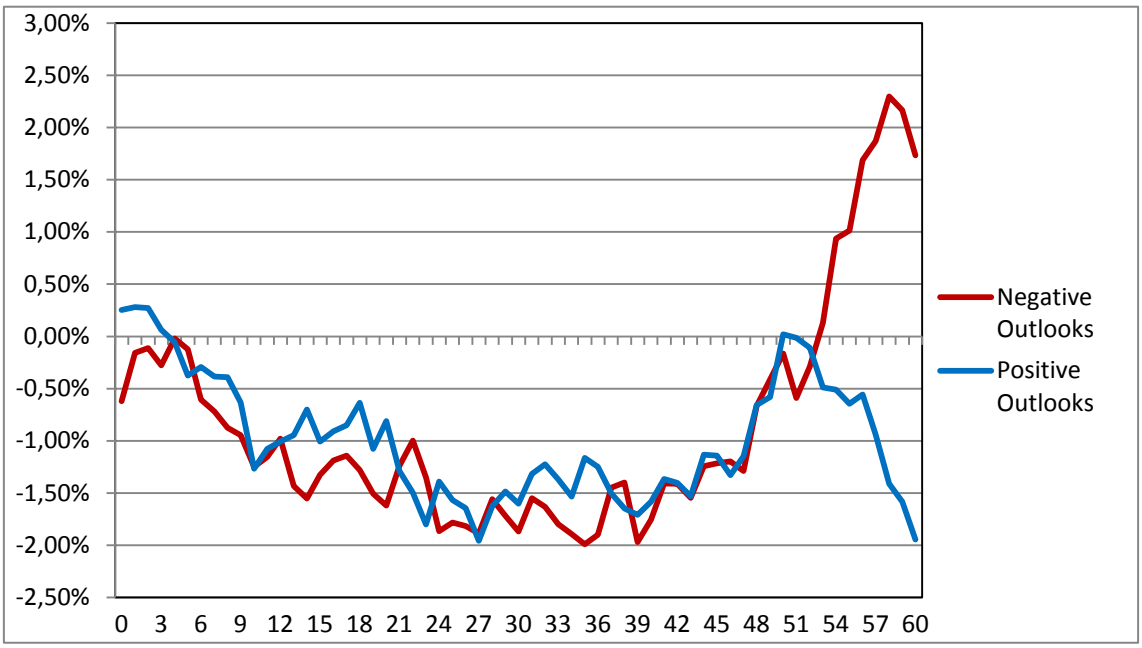
At this juncture semi strong market information will be considered, not including information leakage and inside information.

Assuming that for credit outlooks, no information to the market was provided before and investors would act upon notice of change in credit outlook, we will analyze CAAR starting from day 0.

Concerning the rating changes, an assumption as been taken, some information had already been introduced in the market. As usually is, like mentioned earlier, on my analysis to firm outlooks.

Also credit watches or simple leakage to the market of firms' financial situation can contribute to market anticipation. Assuming an investment day for day -60 until the end of our estimation window, we will estimate CAAR and see if this strategy would give us conclusive results.

Figure 10.1: Cumulative Average Abnormal Returns for Credit Rating Outlooks, starting from day 0 – Investment strategy



Source: Author's analysis.

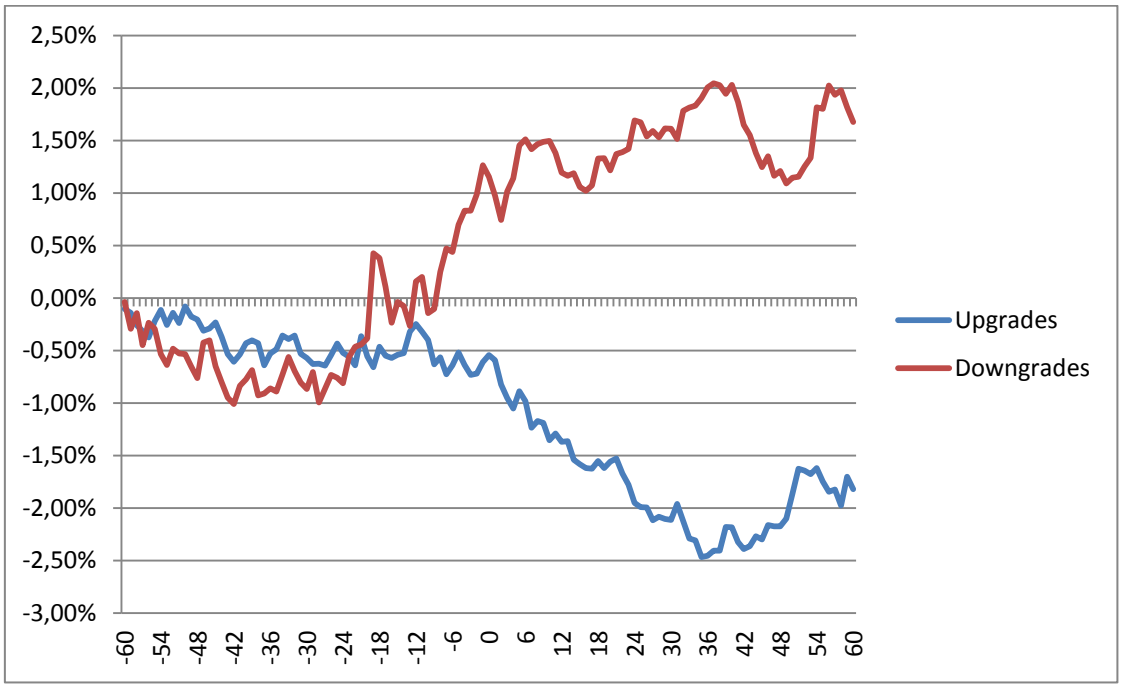
CAAR from 0 to 60 days, in %.

As one can observe from the outlooks chart, both outlooks represent completely different trends in the gap [50-60] after the event. Until this dates both of them reach an underperformance of 2%. After it, positive outlooks have a negative trend and negative outlooks have an uptrend, which is quite curious concerning it is contrary information as one might expect.

Nonetheless, this is also seen in the study of Glascock et al.(1987) for observations in day 60 and 70, but for credit rating changes, which leads us to the conclusion that a pattern might exist in this behaviour.

Thus one cannot conclude if an investment strategy could be made out of the credit rating outlooks. Anyway if there should be a consistent gain for the investor, it should be for downgrades, which have a more consistent behaviour over the sample.

Figure 10.2: Cumulative Average Abnormal Returns for Credit Ratings, starting from day -60 – Investment strategy



Source: Author's analysis.

CAAR from -60 to 60 days, in %.

Considering the rating changes, interesting conclusions can be deducted from the results.

Firstly, like Glascock et al. (1987) we found a reversal in the residuals. Meaning that similarly to their study we found that for downgrades the event date represents the end of a "negative drift", as for upgrades there is a "significant downturn" in the abnormal returns shortly after the grading. However, his reversal is on publication date, ours is on day -13 for both Downgrades and Upgrades, which suggests some kind of information event, regarding rating changes, takes place 13 days before a rating change.

Secondly a curious fact of mirroring occurs concerning CAARs. This suggests that investors try to exploit possible gains around rating activity and that after 50 days a trend to contradict the market occurs. This may be caused by position closing, delayed information or any other factor.

Regarding investment strategies we can conclude that acting upon outlook for a broad number of companies can lead to gains on negative outlooks in a 50+ range of

days after outlook. However our sample is small as well as the time frame, thus further analysis on this subject is needed.

Concerning rating changes, if one is able to predict them at least 24 to 10 days before the announcement, by publicly available information, there are good chances for successful investment and continuous gains.

Nevertheless since both strategies would need a elevated value of diversification, transaction costs could overpass the gains, thus an extended analysis of this costs would have to be assessed.

11. Conclusion

It was my objective to observe "How do rating agencies influence the stock markets", in the nowadays complex market situation. After the subprime crises evident in 2008, but which signs were noticeable since 2006, the financial markets became different, more risk averse, and less liquid. This in particular influenced equity markets in a way that the conclusions stressed out by previous event studies over security markets may change to some extent.

Adding the fact that credit rating agencies nowadays, have a bigger exposure to media, given their doubted credibility, result of the subprime crisis where assets and firms had credit ratings that clearly were misleading for anyone interested in entities' credit performance.

To some extent our study corroborates previous studies' analysis, namely the big impact of downside credit rating actions, and the relative unresponsive market to positive credit ratings.

The downtrend outlooks have huge impact on stock's average abnormal returns, even dough they are predicted by the market, it is clear that some investors rely on them to take investment decisions, and thus that they believe the ratings are truthful to some extent.

However in terms of credit ratings per see, even when downgrades are analyzed, the negative impacts are quite smoothed, which as indicated, had a direct relation with the different CRAs.

As it was observed, Moody's ratings have a huge market impact on average abnormal returns, when compared with other rating agencies. One could say this just happens to credit ratings, though, it is probably also true for credit rating outlooks. Yet, this study cannot conclude about outlooks since from the 30 firms in our sample, only five were opinioned by Fitch ratings. Anyway our credit rating analysis is enough to lead us to the conclusion that this CRA is most likely not a market mover.

This study is able to prove that CRAs indeed represent an enormous influencing factor over the equity markets in certain conditions, even after huge market discredit during the subprime crisis.

However, one can be certain that the credit rating announcements are not the only influence on the stock prices considering firm performance, especially concerning the positive side changes. Yet, it is surely deductable that when a downside trend rating occurs the stock price tends to fall with a bigger slope than before, which will represent an impact from the agency in the market.

Thus, the idea of using credit rating information, to structure an equity investment strategy. This implies assumptions of portfolio diversification and medium term investment. Further analysis, mainly a bigger sample is needed to conclude something about outlooks. On the other hand credit rating changes have potential to give continually gains if one is able to predict them.

In the end, one is able to see significant clues that lead us to the conclusion found already by many articles which say ratings do not bring new information. The literature is full of examples where changes start in the first observations of the pre-event window, thus we conclude alongside other studies, that part of the credit caused impact on stock market is already there when the credit rating announcement is published.

However, the risk averse investor introduces panic in the market revealing more significant average abnormal returns in the negative announcements, which goes along with most of previous literature (eg.: Galil and Soffer, 2010; Steiner and Heinke, 2001).

As a result one may believe that previous subprime market rating reactions still persist, however with smother trends than before. And although a noticeable market impact can be observed in Downgrades concerning Moody's investors' services. This is smaller than the ones viewed by studies prior to the subprime crises (eg.: Hite and Warga (1997)).

This is a very important issue because it proves previous assumptions that even though market reflects a firm's financial performances before rating action, this rating action may trigger, in case of downside action, an escalade of successive bad performance which can influence the stock price simply by fear effect of over selling by the investors.

A conflict of interest is implicit here when the client stock value is influenced by actions of an agency.

This adds a huge amount of responsibility over rating announcements and leads to a power beyond simple audit.

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13. Annexes

The following tables represent our credit outlooks sample. We did not introduce the tables concerning the downgrades and upgrades sample due to size constrainments.

Annex A – Negative Outlooks Sample

Negative Outlooks					
Constituent Name	**Ticker**	**Business**	**Event Date**	**Agency**	**RSQ***
Allstate Corp	ALL	Financials	08-11-2011	Moody's	0,65
Apache Corp	APA	Energy	24-01-2012	Fitch	0,70
Assurant Inc	AIZ	Financials	01-03-2011	Moody's	0,47
Bank of America Corp	BAC	Financials	21-06-2012	Moody's	0,59
Bristol-Myers Squibb	BMY	Health Care	03-07-2012	Moody's	0,37
Citigroup Inc	C	Financials	21-06-2012	Moody's	0,72
Clorox Co	CLX	C. Staples**	26-06-2012	S&P	0,25
Computer Sciences	CSC	IT	22-05-2012	Fitch	0,42
Eaton Corp	ETN	Industrials	21-05-2012	S&P	0,75
EQT Corporation	EQT	Energy	20-03-2012	Fitch	0,51
FirstEnergy Corp	FE	Utilities	24-05-2012	Fitch	0,43
Genworth Financial Inc	GNW	Financials	07-05-2012	AMBest	0,51
Goldman Sachs Group Inc	GS	Financials	21-06-2012	Moody's	0,62
Hospira, Inc	HSP	Health Care	26-10-2011	Moody's	0,25
Illinois Tool Works Inc	ITW	Industrials	11-06-2012	Moody's	0,75
JP Morgan Chase & Co	JPM	Financials	21-06-2012	Moody's	0,65
Kellogg Co	K	C. Staples	01-05-2012	Fitch	0,25
Legg Mason Inc	LM	Financials	13-12-2011	Moody's	0,77
Lockheed Martin	LMT	Industrials	08-06-2012	Fitch	0,51
Medtronic Inc	MDT	Health Care	15-06-2011	S&P	0,48
Nucor Corp	NUE	Materials	18-11-2010	S&P	0,56
Owens-Illinois Inc	OI	Industrials	03-08-2011	S&P	0,55
PepsiCo Inc	PEP	C. Staples	09-02-2012	Moody's	0,35
PerkinElmer Inc	PKI	Health Care	21-10-2011	Moody's	0,55
Rockwell Collins	COL	Industrials	25-06-2012	Moody's	0,56
Bank of New York Mellon Corp	BK	Financials	08-03-2012	Moody's	0,68
United States Steel Corp	X	Materials	29-06-2012	S&P	0,60
VF Corp	VFC	C. Discretionary***	30-04-2012	Moody's	0,50
Watson Pharmaceuticals	WPI	Health Care	25-04-2012	S&P	0,29
Western Union Co	WU	IT	06-07-2011	Moody's	0,58

Source: Author's analysis.

Annex B – Positive Outlooks Sample

Positive Outlooks					
Constituent Name	**Ticker**	**Business**	**Event Date**	**Agency**	**RSQ***
Allegheny Technologies Inc	ATI	Materials	03-02-2012	S&P	0,67
AmerisourceBergen Corp	ABC	Health Care	15-12-2010	Fitch	0,29
Amphenol Corp A	APH	Industrials	23-07-2010	S&P	0,62
Biogen I12 Inc	BIIB	Health Care	16-08-2011	Moody's	0,29
Boston Scientific Corp	BSX	Health Care	23-06-2011	Moody's	0,39
CareFusion Corp.	CFN	Health Care	16-02-2012	S&P	0,59
Cigna Corporation	CI	Health Care	09-05-2012	S&P	0,60
CMS Energy Corp	CMS	Utilities	18-05-2012	S&P	0,54
Corning Inc	GLW	IT	14-02-2012	S&P	0,55
CSX Corp	CSX	Industrials	27-04-2012	S&P	0,64
Cummins Inc	CMI	Industrials	18-11-2011	Moody's	0,70
CVS Caremark Corp.	CVS	C. Staples	31-05-2012	Moody's	0,54
Dow Chemical	DOW	Materials	31-05-2011	Moody's	0,71
DTE Energy Co	DTE	Utilities	27-02-2012	Moody's	0,61
Fidelity National Information	FIS	IT	10-04-2012	S&P	0,65
Fifth Third Bancorp (OH)	FITB	Financials	09-12-2011	Fitch	0,66
Freeport McMoRan Coppeer & Gold	FCX	Materials	08-02-2012	Moody's	0,62
Host Hotels & Resorts Inc	HST	Financials	10-05-2012	S&P	0,75
Interpublic Group Cos	IPG	C. Discretionary	28-02-2012	S&P	0,56
Jabil Circuit Inc	JBL	IT	30-11-2011	S&P	0,58
Mastercard Inc A	MA	Financials	03-02-2012	S&P	0,51
Pall Corp	PLL	Industrials	19-12-2011	S&P	0,60
Pioneer Natural Resources	PXD	Materials	08-03-2012	Fitch	0,60
ProLogis, Inc	PLD	Financials	23-02-2012	Fitch	0,70
Reynolds American Inc	RAI	C. Staples	13-09-2011	Moody's	0,39
Ross Stores Inc	ROST	C. Discretionary	18-06-2012	S&P	0,37
Time Warner Inc	TWX	C. Discretionary	08-04-2011	Fitch	0,54
Wisconsin Energy Corp	WEC	Utilities	07-06-2012	Fitch	0,51

Source: Author's analysis.

**R squared of the firm in relation with the market.*

*** Consumer Staples.*

**** Consumer Discretionary.*