Aalto University
School of Business

Do Credit Rating Announcements Have Informational Value?: European Evidence

Finance

Master's thesis

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Department of Finance
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Abstract
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DO CREDIT RATING ANNOUNCEMENTS HAVE INFORMATIONAL VALUE?

OBJECTIVES OF THE STUDY

The main objectives of this thesis are to study how the stock prices of European companies that experience a rating change behave around the announcement day and to what extent the observed abnormal returns can be attributed to the rating announcement itself rather than contaminating information. I will also be studying the effect of sample-selection criteria on the results since the use of uncontaminated samples may lead to underestimating the market response. I will also present additional analysis about factors that affect the market response.

DATA AND METHODOLOGY

The credit rating data consists of issuer-specific long-term ratings by S&P, Moody´s and Fitch between January 2000 and December 2011 for companies that belong to seven major European indices. Stock market reactions to rating changes are studied by calculating mean cumulative abnormal returns (MCARs) for different time periods inside [-25,+25] day window around the announcement day. I use three different samples, all built using different criteria, to examine the effect of sample-selection criteria on the results. The information content of a rating, controlling for other sources of information, is measured by calculating the difference between CARs of [-4,-2] and [-1,+1] windows.

RESULTS

When studying the combined samples I find no market response during the announcement period [-1,+1] using the uncontaminated sample. When using the clustering sample there is a statistically significant market reaction to downgrades but not for upgrades. The results of the unconditional sample suggest that the market reacts to both announcements but the reaction to upgrades remains weakly significant. However, when examining the informational content of the announcement itself it seems that downgrades suffer more from contaminating news from other sources of information and the announcement itself explains smaller proportion of the market reaction than in the case of upgrades.

The results of my additional analysis suggest that multiple notch actions lead to stronger market reactions than single notch actions and that single notch actions are more heavily anticipated. Also the level of original rating seems to affect the market reaction as companies that are initially rated below investment grade experience stronger market reactions than investment grade companies. When studying each of the seven markets separately the results vary significantly. For example a reaction to downgrades but not to upgrades can be observed when using UK data and vice versa when using Nordic data.

Keywords

Credit rating, stock market response, rating announcement

Aalto-yliopiston kauppakorkeakoulu
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ONKO LUOTTOLUOKITUSILMOITUKSILLA INFORMAATIOARVOA?

TUTKIMUKSEN TAVOITTEET

Tutkimuksen päätavoitteet ovat tutkia miten eurooppalaisten yritysten, jotka kokevat luottoluokituksen muutoksen, osakekurssit käyttäytyvät ilmoituspäivän ympärillä sekä kuinka suuri osa ylituotoista on selitettävissä ilmoituksella luokituksen muutoksesta verrattuna muista lähteistä tulevaan informaatioon. Tutkin myös miten kriteerit, joita käytetään otoksen rakentamiseen, vaikuttavat tuloksiin. Edellä mainittujen lisäksi, teen myös tarkempaa analyysia tekijöistä, jotka vaikuttavat markkinareaktioon.

AINEISTO JA TUTKIMUSMENETELMÄT

Luottoluokitusaineisto koostuu yrityskohtaisten, pitkän aikavälin luokitusten muutoksista, jotka S&P, Moody´s ja Fitch ovat tehneet tammikuun 2000 ja joulukuun 2011 välisenä aikana koskien yrityksiä, jotka kuuluvat seitsemään eri eurooppalaiseen indeksiin. Osakemarkkinoiden reaktiota ilmoituksiin tutkitaan laskemalla kumulatiiviset ylituotot eri ajanjaksoille [-25,+25] aikaikkunan sisällä. Käytän kolmea eri otosta, jotka on rakennettu eri kriteereitä käyttämällä muiden ilmoitusten ajallisen läheisyyden perusteella, tutkiakseni eri tavalla rakennettujen otosten vaikutusta tuloksiin. Luottoluokitusilmoituksen informaatioarvoa tutkiakseni lasken kumulatiiviset ylituotot ajanjaksoille [-4,-2] ja [-1,+1], joiden erotus toimii mittarina siitä, kuinka suuri osa markkinareaktiosta on seurausta ilmoituksesta.

TULOKSET

Tutkiessani koko aineistoa yhdessä en löytänyt saastumattomalla otoksella markkinareaktiota ilmoitusajanjaksolla [-1,+1]. Kun laajensin otosta kasaantuviin ilmoituksiin, löysin markkinareaktion luokituksen laskemiseen, mutta en nostamiseen liittyviin ilmoituksiin. Käyttäessäni ehdotonta otosta, jossa kaikki havainnot ovat mukana markkinat reagoivat sekä luokituksen nostamiseen että laskemiseen liittyviin ilmoituksiin, mutta reaktio nostamiseen on tällöinkin ainoastaan heikosti merkittävä. Ilmoituksen informaatioarvoa koskien tutkimustulokseni osoittavat, että luokituksen laskuun liittyvät ilmoitukset kärsivät saastumisesta enemmän, ja näin ollen ilmoitus selittää suhteellisesti pienemmän osan markkinoiden reaktiosta kuin luokituksen nostoon liittyvät ilmoitukset.

Tarkemman analyysini tulokset osoittavat, että muutokset, joissa luokitus muuttuu useamman kuin yhden tason johtavat voimakkaampaan markkinareaktioon kuin yhden tason muutokset. Yhden tason muutokset näyttävät myös olevan vahvemmin ennakoituja markkinoilla. Myös alkuperäinen luokituksen taso näyttää vaikuttavan markkinareaktioon, sillä huonomman luokituksen omaavien yritysten osakkeet reagoivat vahvemmin luokituksen muutoksiin. Yksittäisiä maita erikseen tutkittaessa tulokset vaihtelevat suuresti. Esimerkiksi Englantilaisella aineistolla suoritettu analyysi osoittaa, että markkinat reagoivat luokituksen laskuun mutta eivät nostamiseen, kun taas pohjoismaissa asia on päinvastoin.

AVAINSANAT

Luottoluokitus, osakemarkkinoiden reaktio, luottoluokitusilmoitus

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1. Introduction

"Finland has to do everything in its power to maintain triple-A rating to secure low cost funding" (Jyrki Katainen, Kauppalehti, 2012). A sentence like this, which emphasizes the importance of maintaining a rating, has become very common during the last few years and it has been used by political leaders as well as corporate leaders. The ongoing crisis has made credit ratings a topic of special interest. Countries and companies (as well as investors) are more concerned about ratings than ever before.

Credit rating agencies (CRAs) have existed for a century and they have always been important information intermediaries but never have they had as much influence as today. Their effect on the markets has grown rapidly especially during the last decades, not least due to their increasing role in regulation around the world. They naturally play a key role in diminishing the negative effects of asymmetric information but now they also have a significant direct effect on the actions of many institutions through regulation.

At the moment the CRAs have gained much attention and media coverage due to their role in the recent financial crisis. Most of this criticism is related to, or at least a consequence of the inaccurate ratings on structured finance products. Due to their weak performance related to structured products the CRA´s ability to perform their task has been questioned as well as the increasing use of ratings in regulation.

The fact that rating agencies are a relevant topic and their business has been questioned makes them even more interesting topic to study at the moment. Their growing influence and the criticism towards it makes it interesting to study what kind of effect they actually have had during the past few years and if their inflated reputation has had any effect on the market response to their actions.

1.1 Motivation

As I familiarized myself with the subject, I noticed that despite the fact that there are numerous studies about market response to credit rating announcements surprisingly few studies have used data outside the U.S. and even fewer have used European data. Most of these studies concentrate on a single market. The studies offer different results as some of them support the findings of the

US studies and some find partially contradicting results. Also the fact that different studies have used different criteria to construct an uncontaminated sample may play a part in the variation in the results. Some studies have excluded all observations that are preceded or followed by another rating action within a month whereas others have used a period of only three days (t-1 to t+1). According to Galil and Soffer (2011) the use of uncontaminated samples may lead to underestimation of the market response and therefore the different criteria used may affect the results. Therefore it is interesting to study this topic using a big sample that includes multiple countries during the same time period.

The above mentioned issues may cause some variation in the results but it is also likely that the fundamental differences between the U.S. and European markets lead to different results. European economies are mostly more bank driven than U.S. economy in which bonds have higher importance. This difference leads to a situation where credit ratings may play a more important role in the U.S.. An exception is the UK which is closer to the U.S. in this matter. This might explain why the results from UK (Barron et al., 1997) are more similar to the U.S. findings than the results from other countries, for example Sweden (Li et al., 2004).

The research of market response to credit rating announcements can be divided into three periods. During the first period in the 1970s the bond market response was studied (e.g. Grier and Katz (1974). These were the first market response studies in this field. In the late 1970s the emphasis shifted from bond response to stock market response. From 1978 onwards the studies concentrated mainly on stock market response (e.g. Griffin and Sanvincante (1985) and Hand, Holthausen and Leftwich (1992)). The third period began in the early 2000s as the focus of the studies shifted to credit default swap markets (e.g. Micu et al. (2005) and Galil and Soffer (2011)). Therefore most of the recent researchers have studied CDS market response and their new methodological innovations have not been used to calculate stock market response. I think it is necessary to study the stock market response using these improvements in methodology since as Galil and Soffer (2011) point out, the results on stock market reaction have differed from the results on CDS market response. They point out that CDS prices represent the direct price of risk whereas stock prices also reflect agency conflicts. Also the noise in stock prices and the speculative nature of CDS market may lead to differing results.

The researchers have not been unanimous regarding the information content of credit ratings. Different approaches to take other sources of information (contamination) into account have been used but there is still no clear consensus on the subject. Gali and Soffer (2011) introduced a new approach in their CDS response study which might help defining also the stock market response to the announcement itself instead of other information.

1.2 Research objectives

Researchers agree that there is a significant negative stock price reaction related to downgrades and no significant reaction related to upgrades in the U.S. markets. Evidence from other parts of the world, including Europe, is more mixed but it has to be remembered that the different construction of the uncontaminated sample may cause at least part of the differences and small sample sizes (usually less than 100 observations total) may reduce statistical significance. Therefore, I am studying the stock price reactions in the European markets using a sample that includes many countries and is thus larger (500 observations in the smallest group and 100 in the biggest) than in any of the previous studies and utilizes same criteria for sample selection for each country to see if the results are consistent with the past studies that used U.S. data. Thus, my research question is:

1) Do the stocks of upgraded/downgraded European companies experience abnormal returns around the announcement day?

I will also analyze the results in more depth using a set of different subsamples. The information content of the rating announcement itself has been questioned even in the U.S. studies that show clear stock price reaction. It is argued that other sources of information may be the cause of the reaction instead of the announcement. Galil and Soffer (2011) introduced a new method to control for other sources of information in their CDS market study but this method has not been used in a stock market response study. As there are differences between the two markets and their reported responses, I will use this method in my study to examine the extent to which the stock market response is related to the announcement. The idea of the method is to compare the abnormal returns between [-4,-2] and [-1,+1] windows. Basic assumption in this model is that information flow is constant between -4 and +1 and thus the abnormal returns during [-1,+1] are seen as the market reaction to the announcement whereas the abnormal returns during [-4,-2] are

caused by contaminating information. Therefore, a significant positive (negative) difference between the cumulative abnormal returns indicates a market reaction to an upgrade (downgrade) announcement.

Galil and Soffer (2011) also point out that the use of "uncontaminated" sample may lead to underestimation of the market´s response. According to them, using uncontaminated sample may lead to selection bias as uncontaminated events may reflect insignificant economic developments. As the previous studies have all used "uncontaminated" samples I will also use unconditional sample as well as a "clustering" sample to see how the results differ. Different samples are described in more detail in the data section.

1.2 Contribution

First, the contribution of this study relates to its sample. European markets have gotten very little attention among credit rating studies and the few studies that have utilized European data have yielded partly different results. In this paper I will use a big, recent sample of European companies from many countries. This will eliminate the effect of differing criteria used for constructing the uncontaminated sample. There has been only one researcher that used the same approach before (Kivikataja, 2008). Therefore, it is of interest to compare my results to his findings.

Second, as the latest studies have focused on CDS market response, the stock market response studies have not enjoyed the latest methodological innovations. These innovations can help shedding light to the aspects of stock market responses that researchers are not unanimous about. I will use new methodology introduced by researchers studying CDS markets to address the questions that still remain unanswered. I will be controlling for other sources of information in a way that is new to stock market response studies to be able to identify the reaction that can be related directly to the announcement. I will also analyze the effect that differing sample selection criteria have on the results. As previous studies have used a variety of criteria to construct uncontaminated samples, it is possible that the differing results might partly be explained by the variation in the used criteria. This is also a new approach to studying stock market reactions to credit ratings.

1.3 Limitations of the study

The main limitation in this study is related to the sample selection. As my sample consists of companies that are listed on main European indices they tend to be big and well performing and the amount of low-rated companies is low compared to high-rated companies. Based on the findings of previous studies this may affect the results as the market reaction has been found depend among other things on the initial rating of the company (e.g. Avramov et al., 2007). This issue is addressed in the analysis section and taken into account when analyzing the results.

1.4 Structure of the study

The rest of this paper is organized as follows. In Chapter 2 I will provide the necessary background information of this topic. Chapter 3 provides an overview of the related literature and in chapter 4 I present my hypotheses. Chapter 5 introduces my data and used methodology and chapter 6 presents my empirical findings. Chapter 7 summarizes and concludes.

2. Background information

In this section I will first write about the reasons why credit rating industry exists. Then I will go through the development of the industry and at the end of this section I will concentrate on the present situation.

2.1 The role of credit rating agencies

There is sound logic behind the existence of the credit rating industry. This logic stems from the basics of finance. In every situation the players in the market should have sufficient information about the counterparty to base their decisions on. Functional markets rely on the fact that decisions are rational. Without sufficient information it is difficult if not impossible to make rational and well-grounded decisions. If the necessary information for making these decisions was not available it would contradict the assumption of rational behavior. Some market participants might even leave the market if they did not have the tools for proper decision making.

In this case the information means the creditworthiness of the company issuing debt, not only at the moment but also in the long run. Big institutional investors may be able to come up with this information themselves and therefore their need for specialized rating agencies is not as major. Nevertheless, the effort of obtaining this information themselves would be time consuming and costly also for them. The existence of the rating agencies also reduces the total amount of work substantially as the information is available to all market participants which removes the duplication of work. Otherwise all lenders would be forced to carry out the same information digging and analysis process.

As opposed to big institutional investors smaller and less informed investors might not even possess the ability to come up with the information themselves. They may not have either the necessary skills or the resources for the process. This would leave them with two choices. Either they could make uninformed decisions or in the absence of sufficient information they would not participate in the market. Either way, the presence of rating agencies allows them to make better informed decision.

Rating agencies also have a benefit for the smallest private investors who do not directly participate in the bond markets but invest in funds that do. As Randall & Gautam (2003) suggest, rating agencies help police conflicts of interest between asset managers and their clients since

asset managers might be tempted to invest in higher risk securities than investors would approve. Using credit ratings in forming investment policies can limit the risk while the monitoring costs stay low.

Along with greater acceptance in the marketplace, ratings have also been more widely used since their introduction. Even financial regulators have used them for many purposes. The regulatory demand of credit ratings has been ever growing since the introduction of the concept.

One widely used expression that one can find in many studies is that rating agencies help piercing the fog of asymmetric information. This saying highlights the important role of rating agencies as they provide same important information to every market participant thus diminishing the negative consequences resulting from asymmetric information. By doing this they improve the efficiency of capital markets and open doors to new market participants.

2.2 Development of the credit rating industry

The first steps of credit ratings were taken in the United States. In the 19th century the investing class was growing and desired more information about many new securities. Especially the expansion of railroads required more capital than the banks were able or willing to provide and they began raising capital through corporate bonds. This development created demand for better and cheaper information. The first one to answer this demand was Henry Varnum Poor who wrote *The Manual of the Railroads of the United States* containing operating and financial statistics in 1868. This can be seen as the first step towards credit ratings (Gautam and Randall, 2003).

It was John Moody who developed the idea further and issued the first actual credit ratings in 1909. This was when the credit rating industry was born. These ratings concerned mostly railroad bonds. The industry started developing soon after this. Poor´s publishing company was founded in 1916, Standard Statistics Company in 1922 (these two merged in 1941 to form S&P) and Fitch Publishing Company in 1924.

As opposed to the situation today, in the early stage of the industry the ratings were sold to investors. In other words the rating agencies received their revenues from the investors rather than the rated companies. Before 1930s there was no regulation that required companies to issue standardized financial statements and therefore there was clearly a demand for this kind of business.

After a publication was published, it was easy to copy and distribute it. Therefore, the revenues created by rating agencies were not sufficient, especially as the demand for more comprehensive and faster service increased. To overcome this problem, rating agencies started charging the rated companies for ratings. Fitch and Moody´s were the first ones to start charging the issuers in 1970. S&P followed a few years later.

The 1970´s offered the perfect circumstances for a new kind of payment system. During the 60´s investors did not know or care much about credit risk. The default of Penn Central during the 1970´s recession was a wake-up call for investors who after that refused to roll over commercial papers of many companies. This meant liquidity crisis and default for many of the companies. These events lead issuers to actively seek credit ratings in order to reassure nervous investors. As the demand for their services by the issuer side rose sharply the rating agencies realized that they could start charging fees from the issuers (Cantor and Packer, 1994).

The new payment structure brought up one significant consideration. One can wonder if the fact that agencies are paid by the same companies that they rate would cause some problems. Of course the reliability of the ratings is a major concern. This reliability could be disrupted if agencies would assign higher ratings to keep issuers pleased or even give higher ratings for higher fees. Luckily the rating industry relies heavily on trust and reputation. As Cantor and Packer (1994) say, the rating agencies have an overriding incentive to maintain a reputation of high-quality, accurate ratings. With every rating the agency puts its own reputation on the line. If an agency were to be considered untrustworthy, it would not be of any use for the issuing companies. In addition to losing its reputation, a rating agency might also face very costly legal actions following an inaccurate rating.

Another major event also took place in the 1970´s. This event has shaped the industry from the 70s till today and still does. In 1975 the SEC imposed regulatory restrictions on the supply of ratings (created a regulatory barrier to entry) for the first time as the term Nationally Recognized Statistical Rating Organization (NRSRO) was introduced. NRSRO´s were the only companies to be considered in the regulatory use of ratings. Initially SEC gave the title NRSRO to S&P, Moody´s and Fitch. This decision by SEC has had influence on the fact that the number of rating agencies has remained small through years.

According to Dittrich (2007), the development of the rating industry can be roughly divided into three stages. First stage lasted from the birth of the industry in 1909 till the 1930s. This was a stage of fast growth. In 1940s through 1960s weak demand, few defaults and healthy economy meant tougher times for rating agencies. Another phase of fast growth started in the 70s and has lasted until today.

2.3 Credit rating industry today

As stated earlier, the number of rating agencies has remained small over the years. The nature of the industry has been and is oligopolistic. One big factor in this has always been government regulation which has made entry to the market very difficult. However, another important reason is with no doubt the fact that the business relies so heavily on trust and reputation. There is no better way to assure investors and other parties of the quality of ratings than a good track record. This would make it very difficult for new entrants to gain a foothold in the markets where the biggest companies have been present for about a century even if the regulation was not so tight. The field of credit ratings has also seen many mergers and acquisitions which, in addition to the two reasons mentioned above, has also played a role in keeping the number of agencies low.

Even though there are more NRSROs today, SEC recognizes ten as of 2010, the market is dominated by three major companies, S&P, Moody´s and Fitch, the three original NRSROs. The combined market share of two biggest, S&P and Moody´s, is 80%. When we add Fitch to the group the combined market share is 95%. One could say the nature of the industry is even duopolistic despite the fact that Fitch is counted as one of the three major agencies. S&P and Moody´s have been big players and dominated the industry for a long time whereas Fitch has only been gaining substantial prominence in the last decade.

Despite the grown number of NRSROs, the three major companies remain the only global players that have not specialized in any particular products. The rest are small players that have specialized either geographically or on a certain product category. The following table will list all companies and their business focus.

Table 1. US NRSROs

Name	Primary focus
Standard & Poor's Ratings Services	Global
Moody's Investor Service, Inc.	Global
Fitch Inc.	Global
Dominion Bond Rating Service (DBRS) Ltd	Canada
A.M. Best Company, Inc.	Insurance
Egan-Jones Rating Company	US
Japan Credit Rating Agency, Ltd	Japan
LACE Financial Corp.	Financial
Rating and Investment Information, Inc.	Japan
Realpoint LLC	Structured finance

Source: Bank of England, 2012

Standard & Poor´s was formed in 1941 when Standard Statistics and Poor´s Publishing Company merged. Since then it has grown to be the biggest rating agency in the world. It was acquired in the 1960s and has been part of the McGraw-Hill companies since then. Ratings Services is only a part of the Standard and Poor´s financial information services. The other two divisions are S&P Indices and S&P Capital IQ. Standard & Poor´s Ratings Services is the world´s leading rating agency. Assigns ratings globally to a wide variety of securities and entities.(Standard & Poor´s, 2012)

Moody´s was spun off by Dun & Bradstreet in 2000 and is currently a freestanding company. Moody´s Corporation is the parent company of Moody´s Investor Service and Moody´s Analytics. Moody´s Investor Service provides credit ratings and research covering debt instruments and securities. The firm´s ratings and analysis cover more than 11 000 corporate issuers. Assigns ratings globally to a wide variety of securities and entities. (Moody´s, 2012)

Fitch Ratings, the smallest of the big three rating agencies, is a part of the Fitch Group along with Fitch Solutions. Fitch Group is a majority-owned subsidiary of FIMALAC. Assigns ratings globally to a wide variety of securities and entities. (Fitch, 2012)

2.4 Drawbacks with ratings

One major problem since the introduction of the present payment system in the 1970s has of course been the fact that agencies are paid by the same companies they rate. This increases the risk of agency conflicts as rating agencies may be tempted to assign higher ratings in exchange for higher fees. On the other hand maintaining their reputation is of course vital for the rating agencies since the losses faced in the long run as a result for bad ratings might be considerable and offset the short-term gains. This reputational factor has considerable value as protection against the agency conflicts but does not take the risk away.

Another source of risk is the temptation that the rating agencies have to attract more business by assigning higher ratings. It is only natural that an issuer will minimize its costs and choose to obtain its rating from the agency that assigns highest rating. Therefore, an agency can make itself look more appealing to issuers by assigning more favorable ratings in general. This of course does not work in the long run if investors learn that the ratings of a certain issuer are systematically too high. The same reputational factor also relates to this problem as described above.

Not all problems in the industry relate to the choices that the agencies can make. There are also other sources of problems. One problem arises from the actions of the issuers. When a company is unhappy with a rating it does not have to disclose the rating. It can choose to apply for a rating from another rating agency and disclose the one that is more favorable. This is called shopping for ratings. Issuers can easily shop for ratings because normally a rating agency only gets paid if the rating is issued which minimizes the downside for the issuers. A situation when shopping is especially harmful is when credit ratings are used as a substitute for adequate disclosure requirements.

During the recent crisis also the methodological issues and model risk have attracted attention. However, this is related to rating complex structured products. The ratings of corporations have remained pretty stable whereas the ratings of structured products have seen massive downgrading in recent years. The rating of complex products is much different and more difficult than rating straight debt. Therefore, agencies have received criticism about the use of similar methodology in both categories. (Bank of England, 2011)

One major concern is related to the wide use of ratings in regulation. Many institutions have restrictions about the securities they can own regarding their credit rating. These restrictions state that the institution can own only securities that have a credit rating above a certain threshold. In case of banks their capital requirements can depend on the rating of their counterparties. As this is the case, it is noted by Adams et. al (1999) that one concern is that when a company is downgraded to non-investment grade during a crisis, some institutional investors might face higher capital charges or be forced to sell the company´s securities. This would also limit the funding available to the downgraded company and/or lead to higher borrowing costs

2.5 Rating-based regulation

The wider use of ratings in regulation was introduced in the 1970s. After that it has only grown in importance. Today ratings are an integral part of financial regulation worldwide. The importance of CRAs grew recently as Basel II took effect from 2007. Basel II incorporated credit ratings into the capital requirements of banks. This is an example of rating-based regulation which aims to protect against systematic risk. By imposing risk limits using credit ratings the state creates a system which is easy to monitor and prevents too much risk from building up in the system and thus promotes stability.

In his paper Dittrich (2007) identifies four reasons why credit ratings are ideal to be used for regulatory purposes.

1. Credit ratings have proven efficient in their high correlation between risk categories and default rates

2. Credit ratings are readily available at no direct cost to all market participants

3. The need for continued detailed oversight can be kept at minimum by matching market recognition and regulatory recognition of rating agencies

4. Ratings are based on reputation and thoroughness, an ideal instrument to increase confidence

Adams et al. (1999) divide rating-based regulation into three categories. The first category, which has seen most use, is placing investment restrictions on regulated institutions. These restrictions prohibit the institutions to invest in unrated or low-rated securities. One example of such

regulated institutions is pension funds. Second category is using credit ratings to set capital requirements on financial institutions. Basel II is one example of this kind of regulation as according to it, credit ratings are used to assess weights on different assets when calculating required capital. In the third category ratings are used to define disclosure and issuance requirements. Higher rating may lead to less legislative obligations. Stock exchanges in U.S. and Europe also impose rating requirements that have to be fulfilled in order for an issuer to be listed.

As Dittrich (2007) points out, the effect of rating-based regulation on the rating agencies is twofold. On the other hand it increases demand and on the other hand it potentially restricts supply through official recognition. The extensive use of ratings in regulation and potential problems that may rise from it also emphasize the importance of stability, which CRAs have listed as one of the attributes of ratings.

2.6 Ratings

It is often pointed out in the academic literature that ratings are not buy or sell recommendations. Ratings are assigned to signal the default probabilities of rated companies. The risk is expressed in relative rank order. According to their characteristics; companies are assigned a symbol, which represents a group. Inside every group these characteristics are broadly the same and hence the default probabilities are roughly the same. Every rating contains both quantitative and qualitative data in order to achieve the most accurate result.

Baklanova (2009) lists attributes related to ratings that agencies themselves use to explain the widespread use. These attributes are:

- Independent: Investors may or may not agree with a specific rating opinion, but in general, it is believed to be unbiased towards any particular set of interests
- Forward-looking: Through their historical default studies rating agencies demonstrated that the ratings serve as reliable indicators of relative ability of bond issuers to honor their payment obligations upon maturity of the bonds
- Stable: Ratings are meant to be driven by fundamentals of the issuing entity and not much affected by economic cycles

- Simple, easy to understand: Letter symbols arranged in an alphabetical order are intuitively understood

- Broad coverage: Credit rating agencies with global outreach assign ratings to hundreds and thousands of issuers in different countries. In addition, multiple asset classes and types of instruments are covered by rating services, which, in theory, allows for direct comparison of relative creditworthiness of different types of financial instruments

Different companies use different set of symbols to indicate the assigned rating. However, the differences between companies are small and it is quite easy to see the link between the different symbols. As can be seen from the table below, the scales are very similar. The first letter is the same with every company in every notch/symbol. It is only the following part of the symbol that is different. Some companies have chosen to use letters as well as plus/minus signs whereas some companies use letters and numbers.

Table 2. Long-term issuer-specific rating classes

	Agency		**Description**	
S&P	Fitch	Moody´s		
AAA	AAA	Aaa	Prime	
AA+	AA+	Aa1	High grade	
AA	AA	Aa2		
AA-	AA-	Aa3		INVESTMENT GRADE
A+	A+	A1	High quality, very low risk	
A	A	A2		
A-	A-	A3		
BBB+	BBB+	Baa1	low risk	
BBB	BBB	Baa2		
BBB-	BBB-	Baa3		
BB+	BB+	Ba1	Speculative,substantial risk	
BB	BB	Ba2		
BB-	BB-	Ba3		
B+	B+	B1	Highly speculative, high risk	
B	B	B2		
B-	B-	B3		
CCC+	CCC	Caa1	Very high risk	SPECULATIVE GRADE
CCC	CCC	Caa2		
CCC-	CCC	Caa3		
CC	CC	Ca	Extremely speculative	
C	C	C	In default, little prospect of recovery	
D	D		In default	

As can be seen, the ratings have been divided into two large categories. The separation between these two is the most visible and the most used threshold. Many regulations that utilize credit ratings set the restriction by terms of investment- vs. speculative grade. This is the case whether the regulation is about capital ratios or investment restrictions. A finer allocation has also been made into smaller categories that include three symbols at most. However, these sub-categories can rarely be seen in everyday language and writings as opposed to the, lately quite often used, term junk-bond which is used to describe speculative grade.

Ratings can be of various different types. First of all there are long-term and short-term ratings. There are also issue-specific and issuer-specific ratings. In this thesis I will concentrate on the issuer-specific long-term ratings.

Along a rating, an outlook is also assigned. Outlook is used to express the opinion regarding the likely direction of a rating in over the medium term. The outlook related to a rating can be positive, negative, stable or developing. Developing outlook means that the future of a rating is contingent upon a certain event. (Moody´s, 2012)

In addition to the actual ratings, CRAs also publish watchlistings. A company is put on a watch list when its rating is under review for possible change in the short-term. The change that is being considered can be possible upgrade, possible downgrade or the direction of the possible change can be uncertain. When a rating has been upgraded, downgraded or confirmed the issuer is removed from the watchlist. (Moody´s, 2012)

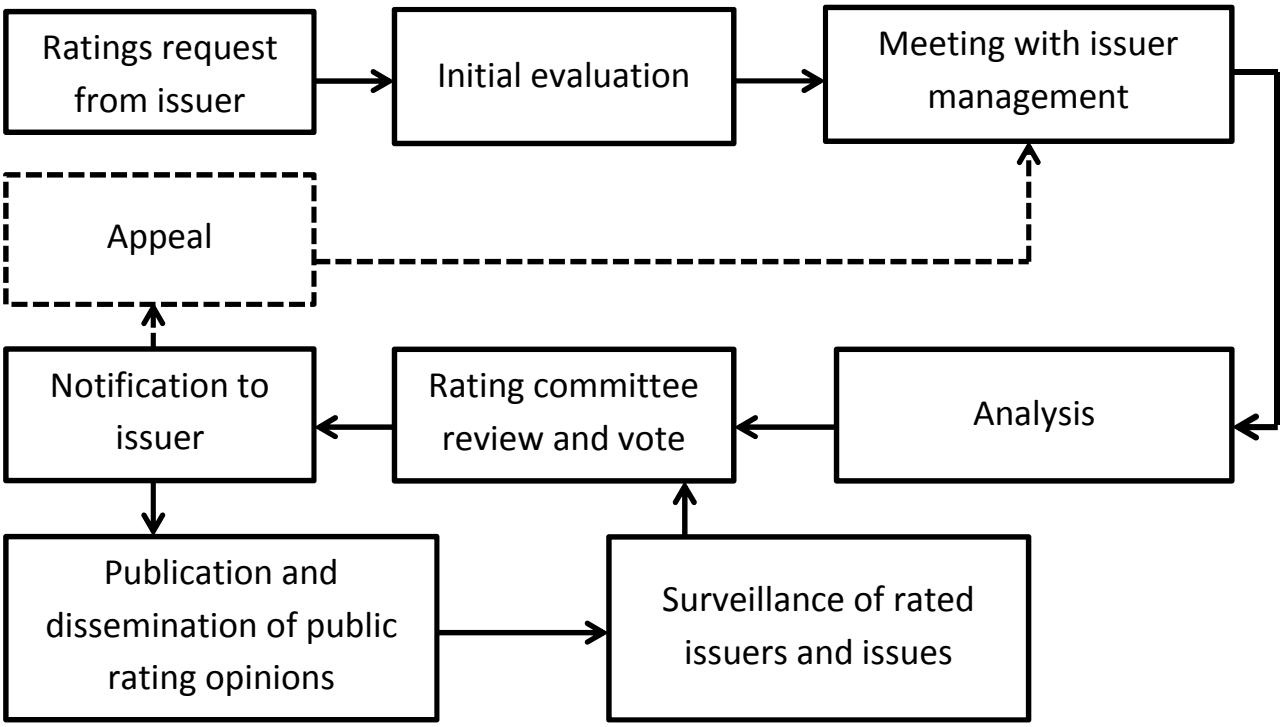
2.7 Rating process

Some companies issue both unsolicited and solicited ratings. Solicited ratings are far more common and some companies only assign them. Therefore, I will first describe the rating process as it goes with solicited ratings. At the end of this chapter I will write about unsolicited ratings. There are some differences between the rating processes of different CRAs but the overall structure among the three biggest is very similar. Therefore, I will only walk you through the process of S&P as it is described in their website.

The rating process starts when an issuer applies for a rating. After that the issuer will deliver a wide array of documents at which point the initial analysis will begin. After the initial analysis the analysts will meet the management of the issuing company and they will discuss the analysis and

information that will affect the result. At these meetings the management of the issuer gives additional information to the analysts, some of which might be confidential and will be treated as such. Based on all this information the analysis will be completed. The result will then be presented to the rating committee which will review the analysis and vote on the rating. After a rating is established it will be disclosed to the issuer. The issuer will have a chance to appeal at this point. If an appeal is made, a new meeting with the management is arranged and the issuer will have a chance to present new information that might affect the rating. Based on this new information, further analysis will be conducted and the rating committee will vote again, the issuer is notified and the rating will be published. After the rating is published the CRA will conduct surveillance on the issuer and take action when needed (upgrade/downgrade etc.).

Figure 1. Rating process



Source: S&P, 2012

The unsolicited ratings do not start with the request from the issuer. These ratings are published by the CRAs without a payment by the issuer. Not all agencies publish ratings that are not requested and paid for but some choose to do it. The downside with the ratings as far as the issuer is concerned is that they will not have the chance to meet the analysts and present information to them. Cantor and Packer (1994) point out that Moody´s and S&P receive fees for ratings they

would have issued anyway since the issuers want the opportunity provided by the formal rating process to put their best case before the agencies.

2.8 Ratings and the financial crisis

The recent financial crisis has brought up criticism about whether the agencies meet the attributes they claim their ratings have. One source of this is the massive downgrading of ratings related to residential mortgage-backed securities and collateralized debt obligations in 2007 and 2008. All three major companies downgraded their ratings at unprecedented levels. As of 2008 Moody´s had downgraded at least one tranche of 94,2% of the RMBS issues it had rated in 2006 and S&P had downgraded 44,3% of the subprime tranches it had rated between the first quarter of 2005 and the third quarter of 2007. Although Fitch made least downgrades it also had to downgrade a large proportion of its ratings, 34% of the subprime tranches it had rated in 2006 and the first quarter of 2007. (Baklanova, 2009)

These actions brought up the question about the stability, accuracy and forward-looking nature of the ratings. As Baklanova (2009) notes, ratings were downgraded after the credit quality of the securities had deteriorated. All three companies also downgraded simultaneously which raises questions about the independent nature of the ratings.

However, what I think is worth noting is the fact that the massive downgrades that created most criticism concerned mostly structured products. It has been clear that the mismatch between the credit ratings of structured financial products and their true risks has been one factor leading to the recent financial crisis. However, the critics often do not always take into account the accuracy of the ratings of corporations but they criticize all operations of the agencies based on their failures related to structured products.

Also another source of criticism has risen as the recent crisis has lasted. As Europe´s struggle has continued the rating agencies have been blamed for making the situation worse by downgrading ratings and thus making the situation more difficult for companies and countries that were already in distress. One claim has been that the agencies have been too eager to downgrade ratings and by their actions created a cliff effect which has deepened the crisis i.e. their ratings have become a self-fulfilling prophesy (Bank of England, 2012).

3. Literature review

In this section I will present the findings of previous research. There are many studies that have been done around credit ratings. Clearly most of the studies have focused on stock or bond market response. There is also a new type of credit rating studies that has only been around for less than ten years, in which the researchers study the reaction of Credit Default Swap (CDS) markets. Since there are major differences among the fundamentals of past studies I will write about the different kinds of studies in separate subsections.

There are two important theories related to understanding the findings of previous literature and analyzing my results. The information asymmetry and signaling hypothesis (IASH) claims that rating agencies have access to non-public information and thus rating actions can be seen as signals of true financial condition/future earnings of an issuer. Thus, excess returns should be in the same direction as the rating change. The wealth redistribution hypothesis (WRH) on the other hand takes into account the reasons behind the rating change and agency conflicts between bondholders and stockholders. According to WRH not all upgrades (downgrades) are good (bad) news to stockholders. For example, if a downgrade is a result of riskier investments stock prices go up as wealth is transferred from bondholders to stockholders.

I will write about different kinds of studies in chronological order. Since the bond price reaction studies were the first ones, I will write about them first. After that I will move on to stock market response studies. As the CDS studies represent the latest trend in the field of rating announcement studies I will write about them in the last subsection.

3.1 Bond market response

The first credit rating studies that did not aim to measure the ability of rating agencies to predict defaults, but rather the information content of rating changes, examined how bond markets react to rating changes. The first ones to expand the scope of rating studies to the reactions of the markets were S. Katz and P. Grier. Katz (1974) reported that there was no anticipation in the bond markets before a rating change and that the complete price adjustment took 6-10 weeks.

In the next paper studying bond market response, Katz and Grier (1976), found evidence that supported some of the previous findings. Their results showed that there was a lag in the price

adjustment process. However, they reported that in different industries there are different levels of anticipation before the announcement, some significant and some not.

3.2 Stock market response

3.2.1 Studies using U.S. data

The first ones to study how the stock market reacts to rating changes were Pinches and Singleton (1978). They also took contamination into account. Their sample consisted of rating changes which had many conditions that had to be met in order for the rating change to be accepted in the sample (to avoid contamination). Their findings suggested that rating changes were reactive by nature and that investors had already discounted the changes in financial and operating conditions before the rating changed. This was the case with both upgrades and downgrades. Therefore they argue that the information content of rating changes is very small.

Griffin and Sanvincente (1982) took a new approach in their study as they concentrated on the eleven months preceding the announcement and the month of the announcement. They also introduced new methodology as they used portfolio approach to control for nonevent factors. They reported results that were consistent with the proposition that bond downgrades convey new information to common stockholders. They found that the negative response was significant and robust even when using many different approaches to calculating the abnormal returns i.e. the results did not depend on the methodology used. For upgrades they did not find support for the information content hypothesis, as the price adjustments were statistically insignificant in the month of the announcement. The upgraded firms did however experience positive abnormal returns during the preceding eleven months. The authors say that even though common stock prices seem to adjust to the change in bond rating, the competing explanation that upgraded firms have been doing better than normal and vice versa for downgraded firms, cannot be ruled out. They also identified two things that need to be taken into account when examining the results. First, information correlated with but not produced by the rating process may be confounding the results. Second, since neither the control nor the “event” samples were chosen randomly, a selection bias could be adding further contamination.

Holthausen and Leftwich (1985) had many contributions in their study. First, they used daily price data whereas the previous studies had used monthly data. They eliminated observations that had

concurrent disclosures in the period of the press release date. Third, they investigated potential sources of cross-sectional variation in the price impact. Fourth, they examined the price reactions of watchlist additions. They also studied if the the effect of the announcement varies when a rating change is within a class vs. across classes. Within a class rating change refers to a situation where the rating takes place within gradations of a major class (from AA+ to AA etc.) and across classes when the major class changes (from AA- to A+ etc.) Their primary focus was on the two-day announcement period, but they also calculated abnormal performance between days -300 and +60. They explained their focus by saying that it is difficult to draw inferences from the behavior of security returns prior to a rating change. They argue that a price response on the announcement of a rating change is evidence that agencies provide some information not already incorporated in security price. Their sample was collected from the years 1977-1982 and included 1014 rating changes by Moody´s and Standard & Poor´s.

Holthausen and Leftwich (1985) found that there is a statistically and economically significant price reaction to downgrades both before and during the announcement period. Most of the reaction took place before the announcement as the cumulative abnormal returns during days -300 to -1 was around -16 (within class) to -21 (across class) percent. During days 0 and +1 the abnormal return was -0,26 (within class) and -2,66 (across class) percent. This suggests that most of the information is already taken into account before the announcement. For upgrades they did not find a significant price reaction on the announcement day, however during the preceding 300 trading days they reported cumulative abnormal returns of +12 (within class) to +15 (across class) percent. Their results were in line with the findings of Griffin and Sanvincente (1982).

Holthausen and Leftwitch (1985) offered two possible reasons for the differences in the price reactions between upgrades and downgrades. First, the loss function of the rating agency may not be symmetric and consequently upgrades may not be as timely as downgrades. Second, management´s incentives to reveal information may not be symmetric. They point out that as Chambers and Penman (1984) report, on average good news are “early” and bad news are “late”. Therefore good news are discounted in the prices earlier than bad news.

Hand, Holthausen and Leftwich (1992) also used daily data in their study. They also used the same time period in sample selection that Holthausen and Leftwich had used in their 1985 study which was from 1977-1982 and their sample included 1 133 rating changes by Moody´s and Standard &

Poor´s. In this study the time window that is examined is only two days (day 0 and day +1) which is much shorter than in any previous study. Their findings suggest that there are statistically significant negative excess returns related to downgrades but the results do not show strong support for the positive effect related to upgrades. The reported downgrade-related excess returns vary substantially when examining investment grade and below investment grade stocks separately. For investment grade stocks the excess return is -0,83% and for the below investment grade stocks -4,22%. The combined sample shows excess return of -1,52%.

Avranov, Chordia, Jostova and Philipov (2007) have clearly the largest sample among the studies that utilize U.S. data. Their sample includes 3 578 companies listed on NASDAQ, NYSE and AMEX and S&P´s rating actions considering them between July 1985 and December 2003. The emphasis in their work is on studying the differences in excess returns between high credit risk stocks and low credit risk stocks. In order to study this difference they divided their sample into deciles based on their rating. They report that the credit rating level is negatively related to the cross section of stock returns. They write that the considerable stock price drop following rating downgrades is apparent among low quality stocks whereas high quality firms often realize even positive returns around downgrades. The average return for the lowest rated stocks in the month after the downgrade is -5,64% when for the highest rated stocks it is 0,16%. Also a significant difference in the returns around rating announcements between investment grade and high-yield firms was reported which indicates that non-investment grade companies suffer more from financial distress than investment grade firms. The results also show that the negative effect of downgrades is bigger during hard times and many downgrades.

Avranov, Chordia, Jostova and Philipov (2007) offer some explanations for the differences between the effects. They examine industry adjusted operating and financial performance and find out that for low rated firms the figures are far worse than for high rated stocks around rating downgrades. Also the negative earnings surprises as well as negative analyst revisions are more substantial for the low rated stocks. These combines suggest that the markets do not anticipate the subsequent deterioration in the fundamental performance of low rated firms. The authors also point out that institutional selling exacerbates the price decline among low quality stocks as it is most likely driven by the poor fundamental performance and fiduciary responsibilities that limit investment in poor quality stocks.

3.2.2 Studies using other than U.S. data

Since part of my contribution is using European data which has gotten surprisingly little attention (as all other markets than America), I will write about the studies that have been done with data from outside the U.S. in this separate sub-section. As can be seen the sample sizes are far smaller than in the studies utilizing U.S. data and therefore their explanatory power is reduced. This is also one reason why I think there is need for more studies.

Matolcsy and Lianto (1995) were the first ones to use other than U.S. data. They studied the effect of rating changes in the Australian markets. Their sample included 62 companies and 72 rating announcements, 34 upgrades and 38 downgrades between years 1982 and 1991. They also introduced a methodology by which they recognized the information content of unexpected accounting income numbers and studied the incremental effect of rating announcements. Their results, which were calculated using weekly rather than daily data, supported the findings of previous literature as they found that downgrades have additional information content whereas upgrades do not. The authors also pointed out two possible reasons behind these findings. First, as suggested by Holthausen and Leftwich (1985), good news travel fast compared to bad news. Second, equity holders are more concerned with a downgrade than upgrade.

Barron, Clare and Thomas (1997) used UK data in their study. At the time, as they stated in the paper, their study was unique in considering the impact of credit rating and CreditWatch changes for both long and short-term using daily data for a non-US market. Their results show that rating agencies do provide information to the capital market in the UK. They reported significant excess stock returns related to downgrades (negative effect) and positive CreditWatch announcements (positive effect). The average excess return related to downgrades was reported to be -3,67% on the announcement day. The findings about the CreditWatch announcement effect did not support the findings that US researchers had reported. However, in this paper the authors had only two observations of positive CreditWatch and thus persuasive inference is impossible. Negative CreditWatch announcements did not have a clear effect.

Richards and Deddouche (2003) had a very different setting as they studied the reaction of emerging market bank stocks around the time of rating changes. Their sample included 49 different banks in 15 countries and 219 rating changes. However, they as many rating actions regarding the same bank took place close to each other they formed a “clean” sample that

included 15 upgrades and 43 downgrades that occurred with no rating change in the previous 35 weeks. Richards and Deddouche (2003) reported that during the 35 week period prior to the rating upgrades showed cumulative abnormal returns of -1 percent whereas downgrades showed an average of -13 percent cumulative abnormal returns over the same period. When downgrades are divided into two groups based on whether they occurred before or after the start of the Asian crisis the results are -20% (after) and -7% (before). They suggest that this may represent evidence that the agencies were slower than usual in their actions in the case of the initial downgrades that followed the onset of the Asian crisis.

When examining the announcement and post-announcement periods Richards and Deddouche (2003) found very surprising results. They found negative abnormal returns following upgrades and positive abnormal returns following downgrades. The authors do, however, point out that the negative abnormal returns during the 35 weeks before downgrades are substantial compared to the announcement window effects, which might suggest that the market is efficient and has already incorporated into prices the bad news that rating agencies eventually act upon.

Elayan, Hsu and Meyer (2003) published another study during the same year. Their focus was on the rating announcement effects in New Zealand. Their results were contradicting to previous research as they found significant positive market reactions related to positive CreditWatch and upgrades. They also found negative CreditWatch and downgrades to be accompanied by significant negative effects. The excess returns for downgrades during the two day period [-1,0] was reported to be -2,28%. The authors argue that their findings can be explained by the fact that in a small and possibly neglected market the information provided by CRAs conveys value to investors as the information asymmetries are bigger.

Li, Visaltanachoti and Kesayan (2004) were the first ones to study Nordic markets. They studied rating actions in Sweden and their sample included 83 credit rating announcements between February 1992 and February 2003. They found upgrades to result in significant positive stock price reaction, more specifically, 5,36% during t+1 to t+10 and 5,39% during t+1 to t+20. After downgrades they did not find a significant effect which, as they point out, indicates that the market had already anticipated the information provided by the rating agencies. These results are very interesting since they contradict previous findings as well as the researcher´s anticipation. Also their results on the abnormal returns after outlook announcements were surprising. They

observed significant negative CAARs before a positive outlook and economically but not statistically significant positive CAARs after a negative outlook announcement. In their analysis of the results they state that investors overlooked the positive credit information (positive outlook) and were still pessimistic about the future returns while in the case of negative outlook they had already realized the negative outlooks before the announcement but they overreacted and the positive returns after the announcement were just the correction of their overreaction.

Li, Visaltanachoti and Charoenwong (2004) also published a similar study in the same years as the above mentioned Swedish study. This time the paper concentrated on announcement effects in the Irish stock market. Their sample data was collected for the period of July 1993 to June 2003 and included 112 rating announcements. They found that new rating assignments do not have informational value since the effect is small and insignificant. Negative CreditWatch resulted in negative abnormal returns on the two-day event window that were statistically significant at the 10% level but no significant effect for a longer window. Positive CreditWatch announcements did not result in any significant effect. Also the results on rating changes were consistent with most previous literature as upgrades did not result in statistically significant effect while downgrades were followed by statistically significant negative effect (over -10%) during the two-day event window [-1,0] (the effect was economically but not statistically significant during the three day window [-1,+1]).

Kivikataja (2008) studied seven major European markets in his master´s thesis. His data included rating changes from 1990 to 2007. His findings suggest that downgrades do result in a significant market response whereas there is no clear market reaction to upgrades. The excess return related to downgrades was -0,6% during the two day window [0,+1] When analyzing the markets separately he found that the market reactions in different countries are mostly similar but vary somewhat.

3.2.3 Studying the direction of the effect

There is also a different approach to the stock market´s response to rating actions. In this approach the researchers study what kind of effect the underlying reason of a downgrade have on the market´s response. Goh and Ederington (1993) argue that, while previous studies have found that the average market reaction to downgrades is negative and significant, this reaction should not be expected for all downgrades. They point out two reasons for this assumption. First, some

rating changes are anticipated by market participants. Second, downgrades because of an anticipated move to transfer wealth from bondholders to stockholders should be good news for stockholders. According to them, a downgrade resulting from an anticipated increase in leverage which will transfer wealth from bondholders to stockholders, is a good example of a situation which should have a negative effect on bond prices but a positive effect on stock prices.

Goh and Ederington (1993) also discuss the previous findings which indicate that upgrades do not have a significant effect on stock prices. Based on their theory explained above, they suggest that if some upgrades are due to anticipated increase in earnings and others to anticipated declines in leverage, both positive and negative stock price reactions will be observed, and the average reaction may be insignificant.

Goh and Ederington (1993) had an uncontaminated sample of 428 ratings (243 downgrades and 185 upgrades) taking place between 1984 and 1986. To test their theory they divided their sample into three categories based on the reason for the rating change. Group 1 consists of 138 downgrades and 157 upgrades due to improvement or deterioration in the firm´s earnings, cash flow, "financial prospects" and/or performance. Group 2 includes 64 downgrades and 7 upgrades driven by actions or decisions that result in a change in the firm´s leverage. Group 3 includes 41 downgrades and 21 upgrades that are classified as miscellaneous or no reason given. The results support their hypothesis that the reaction to a downgrade is conditioned by the reason behind it. They found that the announcement period CARs were negative for all groups but only the reactions to group 1 downgrades were sizable and significant.

Abad-Romero and Roble-Fernandez (2006) also found support for the wealth redistribution hypothesis in their study on the stock reaction in Spanish market. Their results are very inconsistent with previous studies as they reported no reaction to downgrades and significant negative excess returns for upgraded firms around the announcement day.

3.2.4 CDS market response

Hull et al. (2004) were the first ones to study the effect of rating actions on the credit default swap spreads. Their sample consisted of rating announcements by Moody´s between January 1998 and May 2002. The number of quotes in their study totaled to 233 620. Their findings suggest that reviews for downgrades contain significant information whereas negative outlooks and

downgrades do not. The results for positive rating events were even less significant than for downgrades. They also found that over 40% of all negative actions came from the top quartile of CDS spreads which would imply that rating actions lag the CDS market.

Micu et al. (2006) had a considerably bigger sample than any study before. Their sample was global and covered the period from January 2001 to March 2005 and the raw data included almost 800 issuers and more than 6000 rating announcements. Their final sample included as much as 439 issuers and 2014 rating announcements. The authors report that there is evidence that all types of rating announcements have a significant impact on CDS prices and thus contain pricing relevant information. However, they also find that much of the price adjustment takes place before the rating action.

Galil and Soffer (2011) were the first ones to study the CDS market response after controlling for other sources of information. They argued that there are two methodological drawbacks in using uncontaminated samples. First, when using information released in a single journal at the time of the announcement as a proxy for contamination (for example Pinches and Singleton (1978) used articles in the Wall Street Journal) one actually creates a pseudo uncontaminated sample since there are also other sources of information. This may lead to overestimating the market response since other sources of information are omitted. Second, when including only announcements that are not preceded or followed by other announcements one drops out the announcements that have more informational value since the clustering of announcements signals more significant underlying news. This leads to underestimating the market response.

They found that market responds to all rating announcements, both upgrades (positive reaction) and downgrades (negative reaction). Market reaction to downgrades was stronger that market reaction to upgrades. When studying their arguments considering the problems related to uncontaminated samples they found support for their hypotheses. First, they found that the clustering of rating events does signal more significant underlying news since both clustering (rating actions followed but not preceded by other announcements) and unconditional samples showed stronger market response. Thus, they concluded that the use of uncontaminated samples may lead to underestimating the market response. Second, they used their own approach, similar to “difference in difference” method to study the information content of the rating itself. They

used the difference in returns between [-4,-2] and [-1,+1] to measure the extent to which market reacts to the rating itself.

Their findings suggest that the market does react to the rating announcement itself instead of contaminating information. As bad news tend to cluster more than good news, the flow of negative information is more concentrated and the contribution of each provider is small, whereas in the case of positive information there is less clustering and the contribution of each provider is bigger. Thus, they found that in the case of upgrades, even though the market reaction is smaller, the informational contribution of the rating announcement is relatively bigger. In other words, contamination explains a larger proportion of the overall market response around upgrades than around upgrades.

4. Hypotheses

In this section I will present my hypotheses and the reasoning behind them. My hypotheses are derived from the literature presented in previous chapters. H2 and H3 have been studied using CDS data but due to the differences in stock markets and CDS markets I will be studying them here to find out if they hold for stock price reactions as well. Galil and Soffer (2011) identify the fact that CDS´s reflect the direct price of risk whereas stock prices include also noise and agency conflicts as one reason behind the different effects.

My first hypothesis is based on the findings of most previous studies and the controlling theory related to stock market response studies in this field, the IASH. While some parts of the previous findings are mixed, downgrades have offered similar results in most studies and are related to negative abnormal returns. Upgrades have produced more mixed results but the most common finding is that there is no significant reaction. Previous studies have presented many reasons for the asymmetry of the effects. A company has a natural incentive to announce positive information as quickly as possible whereas bad news travel slower. Also the investors might be more concerned with downgrades than upgrades. I will test the first hypothesis using a traditional uncontaminated sample for the comparability of my results. Thus, my first hypothesis is:

H1: Significant negative excess returns can be observed around downgrade announcements but no significant excess returns can be observed around upgrade announcements.

Galil and Soffer (2011) state that when a rating action is followed by other rating actions it signals that the underlying economic news is more significant and when there are no following actions the news is less significant. Therefore, if a rating action is followed by other rating actions its effect should be more significant. However, this has not been studied using stock price data. The sample that I will use to test this effect excludes rating changes that are preceded by other rating changes within 3 months but includes the ones that are followed by other changes. Therefore, my second hypothesis is:

H2: The stock market reactions are stronger when the rating action is followed by additional actions.

Even though the informational content of rating announcements themselves is a debated subject, most of the researchers agree that they do have informational value. Galil and Soffer (2011) found

support for this when studying CDS markets with a new methodology. Based on these findings and the fact that rating agencies have access to non-public information, possess expert judgment and are specialists in processing financing data, my third hypothesis is:

H3: The stock market reacts to rating announcement itself even after controlling for other sources of information.

5. Data and Methodology

In this chapter I will present the data and the methodology used in this study. I will start by writing about the data set in general and then move on to descriptive statistics. The last part of this chapter will concentrate on the used methodology.

5.1 Data

In my sample I used companies from seven major European markets. The companies that I chose to use are listed in each country´s main index and the indices are FTSE100, CAC40, DAX30, OMXN40, FTSE MIB (S&P MIB prior to June 2009), IBEX35 and AEX25. The use of these indices is based on the fact that their market value is between 50% to up to 85% of the whole stock market value in each country and thus can be viewed to give a reliable view of the whole country´s market. My sample includes rating actions taking place from 2000 to 2011.

I will divide the sample into different categories when analyzing the abnormal returns. The unconditional sample will include all the rating announcements. The uncontaminated group will exclude all rating announcements that were preceded or followed by another rating action within 3 months i.e. they will be the only rating actions within 6 months. Following Galil and Soffer (2011) I will also form a third category (that has not been studied in the stock market response literature before) in order to test H2. This category will include rating announcements that were followed by other rating actions within 3 months and not preceded by other rating actions within 3 months.

Initially the unconditional sample consisted of 1462 observations which represent all ratings assigned for the companies of the seven indices during the years 2000 through 2011. Not every observation could be taken even into the unconditional sample. Many of the observations were new ratings instead of rating changes and therefore were eliminated. Also during the data gathering process some observations had to be excluded due to lack of sufficient data. There are 1008 rating changes that could be included in my final unconditional sample, 704 downgrades and 304 upgrades. A more thorough overview of the different samples is provided in the descriptive statistics section.

The announcement day (day 0) is considered to be the day the rating was made effective, except for the rating changes that took place outside normal trading days, for which day 0 is considered to be the next trading day. Data for the dates of the rating changes and detailed information about

the actions was gathered from Bloomberg database. Price data was then gathered using Thomson One Banker.

5.2 Descriptive statistics

This section gives a more detailed view of the data used in this study. I will show how the number of observations changes when we use different samples, how the rating changes are distributed over time, how the rating changes are distributed between rating agencies, distribution of the observations between different markets and distribution between different magnitudes of changes.

5.2.1 Distribution of observations over time

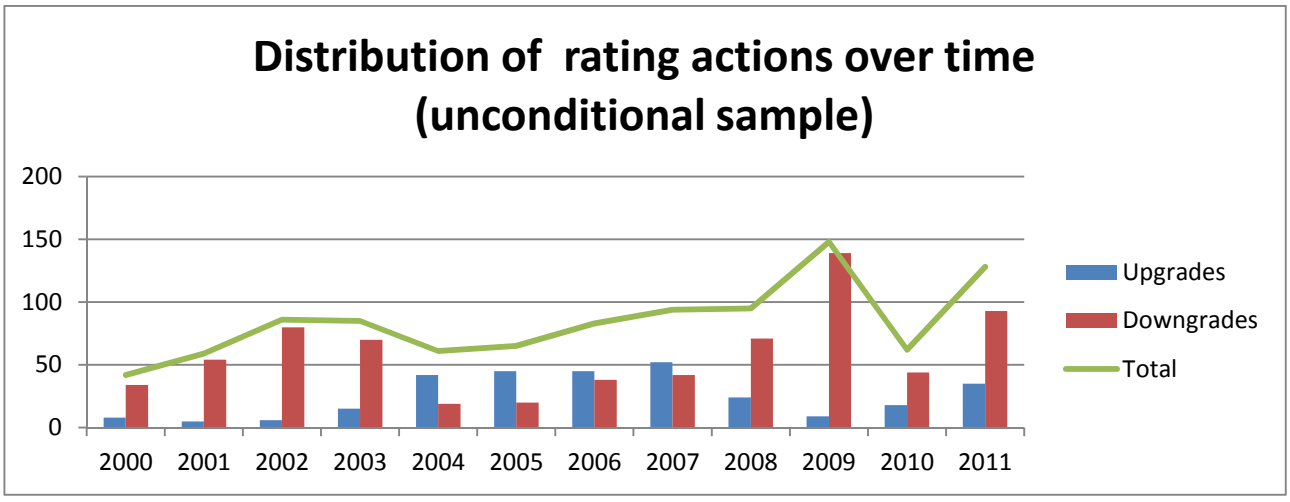
This section is based on the unconditional sample. Table 3 shows the distribution of rating changes over time. As can be seen when looking at the figures, downgrades are more common during most years. This is not surprising considering the economic conditions during the observation period. Worth noting is that rating agencies seem to be more willing to issue a downgrade during bad times than an upgrade during good times. Therefore, the total amount of rating actions moves generally in the same direction as the amount of downgrades, and during difficult years (when downgrades account for most rating actions) the difference between the number of upgrades and downgrades is larger than during good years (when the number of upgrades exceeds that of downgrades). Therefore, the total amount of rating changes tends to reach its highs during difficult times which in this case are early 2000s, 2009 and 2011. The table clearly shows this relation as the proportions of downgrades (of total downgrades) during those years are always at the highest levels.

Table 3. Distribution of observations over time

Year	Upgrades	% of total	Downgrades	% of total	Total	% of total
2000	8	2,63 %	34	4,83 %	42	4,17 %
2001	5	1,64 %	54	7,67 %	59	5,85 %
2002	6	1,97 %	80	11,36 %	86	8,53 %
2003	15	4,93 %	70	9,94 %	85	8,43 %
2004	42	13,82 %	19	2,70 %	61	6,05 %
2005	45	14,80 %	20	2,84 %	65	6,45 %
2006	45	14,80 %	38	5,40 %	83	8,23 %
2007	52	17,11 %	42	5,97 %	94	9,33 %
2008	24	7,89 %	71	10,09 %	95	9,42 %
2009	9	2,96 %	139	19,74 %	148	14,68 %
2010	18	5,92 %	44	6,25 %	62	6,15 %
2011	35	11,51 %	93	13,21 %	128	12,70 %
Total	304	1	704	1	1008	1

I believe that figure 2 shows the above mentioned relation in the clearest way possible. One can see that the line (total rating actions) follows the movements of the red columns (downgrades) and thus the total amount of ratings seems to be very cyclical in nature.

Figure 2. Distribution of rating actions over time (unconditional sample).



5.2.2 Distribution of rating changes between markets

Table 4 shows how the observations in the uncontaminated sample are divided between the seven stock exchanges examined in this thesis. FTSE100 seems to account for more than fifth of the observations, which is natural since it includes clearly most companies of the seven indices. Also the smallest portion being AEX is not surprising due to the small size of the index. It can also

be seen that I have the same problem that previous researchers have faced, since the number of observations in a single stock exchange is frustratingly small.

When the proportion of upgrades/downgrades is examined on the exchange level the ratio in most countries is close to the ratio of the whole sample (30% upgrades, 70% downgrades). Biggest exceptions are AEX (47% upgrades) and FTSEMIB (21% upgrades). The rest are fairly close to 30%.

Table 4. The distribution of rating actions between stock exchanges

Stock exchange	Upgrades	% of total	Downgrades	% ot total	All actions	% of total
AEX (Netherlands)	39	12,83 %	44	6,25 %	83	8,23 %
CAC (France)	60	19,74 %	119	16,90 %	179	17,76 %
DAX (Germany)	46	15,13 %	105	14,91 %	151	14,98 %
FTSE (England)	55	18,09 %	168	23,86 %	223	22,12 %
FTSEMIB (Italy)	23	7,57 %	86	12,22 %	109	10,81 %
IBEX (Spain)	31	10,20 %	82	11,65 %	113	11,21 %
OMXN (Nordic Countries)	50	16,45 %	100	14,20 %	150	14,88 %
Total	304	100,00 %	704	100,00 %	1008	100,00 %

5.2.3 Distribution of rating changes across sample types

Table 5 shows how the number of observations varies as different sample types are compared. When using the clustering sample instead of the unconditional the effect on the sample size depends on the country that is being examined. Most countries experience a drop of round 25% in the sample size, which is consistent with the effect on the whole sample. However, OMXN and IBEX companies seem to be experiencing more clustering as the reduction in sample size is around 34% for both indices. The same effect can be seen when examining the uncontaminated sample. The reduction compared to unconditional samples is around 55 % whereas for most other indices it is around 40%. Italy falls between these two values as within FTSEMIB companies the reduction is around 44%.

Table 5. Number of observations in different sample types

Stock exchange	Unconditional	Clustering	% of unconditional	Uncontaminated	% of unconditional
AEX (Netherlands)	83	62	74,70 %	50	60,24 %
CAC (France)	179	139	77,65 %	110	61,45 %
DAX (Germany)	151	118	78,15 %	91	60,26 %
FTSE (England)	223	174	78,03 %	139	62,33 %
FTSEMIB (Italy)	109	81	74,31 %	61	55,96 %
IBEX (Spain)	113	75	66,37 %	50	44,25 %
OMXN (Nordic Countries)	150	99	66,00 %	70	46,67 %
Total	1008	748	74,21 %	571	56,65 %

5.2.4 Distribution of rating changes across rating agencies

Table 6 shows how the rating changes are distributed between rating agencies. The amount of Moody´s rating changes is surprising considering the fact that Moody´s and S&P have a combined market share of 80% in the credit rating industry. In my samples S&P represents roughly half of the observations whereas Moody´s share of the observations is between 14% and 21% depending on the sample and Fitch´s rating actions account for up to around 30% of each of the samples.

It looks like Moody´s also lags the other agencies more often than the other way around as it is the one to lose most observations when clustering sample is being used instead of unconditional. S&P on the other hand seems to be leading the other agencies in most cases as its share of the observations grows when the clustering sample is used.

Table 6. Distribution of observations across agencies

	Unconditional		Clustering		Uncontaminated	
CRA	Upgrades	Downgrades	Upgrades	Downgrades	Upgrades	Downgrades
S&P	49,67 %	49,72 %	50,82 %	53,17 %	51,23 %	54,89 %
Moody´s	20,39 %	18,89 %	17,62 %	16,87 %	16,26 %	14,40 %
Fitch	29,93 %	31,39 %	31,56 %	29,96 %	32,51 %	30,71 %
Total	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %

5.2.5 Magnitude of the change

In table 7 you can see how the rating changes are distributed based on the notches moved on the rating scale. Rating agencies list stability as one of the key attributes of ratings. The distribution seems to support this claim as over 83% of the downgrades and over 87% of the upgrades are single notch. This can be seen as a signal that the agencies have valued the company right in the past and are timely, i.e. the agencies react immediately instead of waiting for a major change in credit quality to take place. Even with the extremely difficult times of late 2000s being in the observation period, only less than 2% of the rating changes were more than two notches.

Table 7. Distribution of observations between different magnitudes

Notches	Downgrades	%	Upgrades	%	Total	%
1	586	83,36 %	267	87,54 %	853	84,62 %
2	93	13,23 %	28	9,18 %	121	12,00 %
3	14	1,99 %	1	0,33 %	15	1,49 %
4	6	0,85 %	3	0,98 %	9	0,89 %
5	1	0,14 %	2	0,66 %	3	0,30 %
from 6 to 15	3	0,43 %	4	1,31 %	7	0,69 %
Total	703	100 %	305	100 %	1008	100 %

5.3 Methodology

In this chapter I will describe the methodology used in this study. First, I will go through the event study methodology and then I will move on to the regression methodology used to take cross sectional dependence into account.

5.3.1 Event Study

As many of the previous studies (e.g. Hand, Holthausen and Leftwich (1992) and Barron, Clare and Thomas (1997)), I will use the market model to calculate the abnormal returns around rating announcements. For calculating the market model parameters I will use an estimation period of day -160 to day -30. A regression of stock returns on the market returns over the estimation period will be used to obtain the parameters. As the market return, I will use the return of the

index that the stock is a part of (when examining French companies the market return will be the return of CAC40 and so on). The equation of the market model is as follows:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

Where $R_{i,t}$ is the return of the stock i on day t, $R_{m,t}$ is the market return on day t, $\varepsilon_{i,t}$ is a random error and α_i and β_i are the parameters obtained via the regression over the estimation period using ordinary least squares method.

Abnormal returns (AR) are calculated as the difference between actual daily stock return and the expected daily stock return. After having the daily abnormal returns for each event I can calculate the mean abnormal returns (MAR) by averaging the sum of every event over the number of events in the sample. In this study I am interested in cumulative abnormal returns (CAR) which are calculated by adding abnormal returns of an event over an interval. The mean cumulative abnormal returns (MCAR) can then be calculated for a time window by averaging the sum of CARs over the sample group for the time window. To test the statistical significance of the results I will use the t-test and sign test. As most previous researchers (eg. Galil and Soffer, 2011 and Li et al., 2004), I will base my conclusions primarily on the non-parametric sign test as it is more reliable than the t-test due to the skewed distribution of the MCAR.

I will report the abnormal returns over the period of [-25,25] which is divided into different intervals, the announcement period being [-1,1] (following e.g. Galil and Soffer, 2011 and Li et al., 2004) using uncontaminated, clustering and unconditional samples. Days 0 and +1 will also be reported separately. I will present the findings for all the time periods in the tables but due to the research objective of this study, I will concentrate mainly on the announcement period returns in my analysis. Based on these figures I will compare my results to the findings in previous literature. I will also use the results of the different samples to test H2.

In order to test H3 I will use the same approach as Galil and Soffer (2011) used in their CDS market response study. The assumption is that the flow of private and public information is stationary between days -4 to +1. I will calculate the abnormal returns for two time windows between those days. The pre-announcement window is three days from -4 to -2 and the announcement window is from -1 to +1. The former represents the level of contamination surrounding the announcement and the latter represents the market´s behavior surrounding the announcement. This way I am

able to calculate the market´s response to the announcement after controlling for other sources of information (contamination) by calculating the difference between them. In the form of equation:

$$\Delta = MCAR_{-1,+1} - MCAR_{-4,-2}$$

A significant positive Δ indicates market´s response to upgrades, whereas a significant negative Δ indicates market´s response to downgrades.

To test the statistical significance of the results I will use the t-test and sign test. I will base my conclusions primarily on the non-parametric sign test as it is more reliable than the t-test due to the skewed distribution of the MCAR.

5.3.2 Cross-Sectional Regression Analysis

I address the problem of cross-sectional dependence by running multivariate regressions. The regression will be run for downgrades and upgrades separately. The regression formula is:

$$MCAR = \alpha + \beta_1 \log(MV) + \beta_2 \log(BM) + \beta_3 CL + \beta_4 WL$$

The dependent variable is the MCAR during a certain period. CL is a dummy variable which is equal to 1 if the rating changes within class and 0 if the rating changes across class. WL is a dummy variable that is 1 if the rating change was preceded by a placement on the watchlist and 0 otherwise. Log(MV) is used to control size and log(BM) is used to control book-to-market ratio.

The level of asymmetric information is expected to be related to firm size. Information about larger firms is easier to obtain and thus it is harder for investors to anticipate changes considering smaller firms. Therefore, I am expecting that market reaction to smaller firms is stronger (coefficient is expected to be negative when running the regression for upgrades and positive when running the regression for downgrades).

Companies with higher book-to-market ratio have lower performance expectations in the market than low book-to-market companies i.e. the markets have a more solid faith in the future prospects of low book-to-market companies. Thus, I expect that higher book-to-market ratio is linked to stronger market reaction (coefficient is expected to be positive when running regression for upgrades and negative when running regression for downgrades).

Market reaction is expected to be weaker when rating is changed within class (e.g. from AA+ to AA) than when rating is changed across class (e.g. from AA to A+). If a rating is preceded by placement on watchlist, the market reaction is expected to be smaller as there is more anticipation among investors. Thus, I expect that the coefficients for CL and WL are negative in the regression of upgrades and positive in the regression of downgrades.

6 Results

In this chapter I will present the findings of my analysis. First, I will write about the results considering the whole sample. Afterwards I will present additional analysis by dividing the sample into different subgroups.

6.1 Stock price movements around the announcement day

In this section I will present the results of my analysis using three different sample types: uncontaminated, clustering and unconditional. Based on these results I can see whether my first and second hypotheses are correct.

The first findings that I present are gained by using the uncontaminated sample approach. As can be seen from table 8 the results among this sample do not fully support my first hypothesis and most previous findings. The abnormal returns during the whole event window for downgrades are small in magnitude and not statistically significant, opposed to my expectations. The only time window that has any significance is the announcement period but only at 10% level which is not enough to say that there is a reaction. It would seem that when using an uncontaminated sample, that only includes rating actions that are the only ones within six months, downgrades do not have informational value. Galil and Soffer (2011) did point out that excluding clustering events leads to underestimation of market reaction. The effect of the used sample type will be shown later in this section.

For upgrades the results were more like expected since there is no significant reaction in the three day window from day -1 to +1. There are no significant abnormal returns in any of the reported periods during the event window and thus it seems that upgrades do not provide new information to the markets either when examining the uncontaminated sample

Table 8. Market reaction - Uncontaminated sample

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model. The uncontaminated sample excludes all rating announcements that are preceded or followed by other announcements within three months in each direction.

Downgrades	[-25,-5]	[-4,-2]	[-1,+1]	0	1	[+2,+25]
MCAR	0,058 %	0,022 %	-0,247 %	0,008 %	-0,129 %	0,164 %
t-stat	0,477	0,091	-1,466	0,063	-1,036	0,223
z-stat	0,052	0,157	-1,623	**-1,931***	-0,052	-0,366
Upgrades	[-25,-5]	[-4,-2]	[-1,+1]	0	1	[+2,+25]
MCAR	-0,690 %	-0,087 %	0,284 %	0,142 %	0,142 %	-0,483 %
t-stat	-1,011	-0,342	1,222	1,201	0,753	-0,72
z-stat	-1,614	-0,070	1,193	0,772	0,772	-1,053

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

When interpreting the results in table 8 it is important to take into account that the criteria that is used to construct the uncontaminated sample differs between studies. My approach was quite strict as I excluded all rating actions that were preceded or followed by other rating actions within three months. Therefore, the rating actions in this sample were the only ones within a six month period (-3 months to +3 months) and many observations that would have been included in most previous studies have been excluded.

Many of the previous studies have not been as strict. For example Li et al. (2004) only excluded announcements when there were concurrent announcements during a three day interval from day -1 to day +1. Barron, Clare and Thomas (1997) used an interval of 60 days (day -30 to day +30). My results differed from the findings of these studies.

Next I will present my findings when using the “clustering” sample. In this sample I have included all the rating actions from the uncontaminated sample and, in addition to that, also the actions that were followed but not preceded by other actions during a three month period i.e. my time interval used for screening companies for the sample changes from no other action during [-3 months, +3 months] period to no other action during [-3 months, 0] period.

Table 9. Market reaction - Clustering sample

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model. The "clustering" sample excludes all rating announcements that are preceded by other announcements within three months.

Downgrades		[-25,-5]	[-4,-2]	[-1,1]	0	1	[+2,+25]
	MCAR	-0,666 %	-0,082 %	-0,641 %	-0,240 %	-0,273 %	0,255 %
	t-stat	-1,430	-0,406	**-2,689*** **	**-1,952***	**-1,918***	0,342
	z-stat	-1,434	-0,358	**-1,703***	**-2,868*** **	-1,165	0,448
Upgrades		[-25 - -5]	[-4 - -2]	[-1 - +1]	0	1	[+2,+25]
	MCAR	-0,758 %	0,102 %	0,555 %	0,126 %	0,180 %	-0,363 %
	t-stat	-1,195	0,542	**2,361****	1,194	1,096	-0,622
	z-stat	**-2,433****	0,256	1,280	0,384	0,768	-1,024

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Table 9 shows that using the "clustering" sample instead of the uncontaminated sample has a big effect on the results. As this sample is closer to most of the previous studies considering which observations are included in the final sample, also the results are more similar.

Now the results are as expected and consistent with most previous studies considering downgrades. The MCAR for the announcement period [-1,1] is -0,641% and statistically significant at 1% level according to t-test and 10% level according to sign test. Day 0 MAR is -0,240% and z-statistic indicates it is significant at 1% level (10% with t-test). The economic significance of the MCAR is less than in previous studies but this is understandable due to the fact that my sample includes many countries and some studies have found that there is no effect related to downgrades in some of them (Li et al., 2004, Sweden) whereas others have found significant effects in others (Barron et al., 1997, UK). For example, Barron et al. (1997) reported negative abnormal returns of over -3% for the announcement day and Li et al. (2004) even over -10%. However, my results are close to those of Kivikataja (2008) who found a negative effect of -0,6% during the two day window [0,+1] for the combined sample.

Also, the fact that my sample includes more rating actions where the initial rating is in the investment grade (94%) than those with non-investment grade initial rating (6%) makes the results

for the whole sample less economically significant due to the fact that the stock price effect is related to the quality of the firm. This will be shown later in this chapter. Avranov et al. (2007) showed that highest ranking companies experience even positive abnormal returns after a downgrade.

Also for the upgrades the "clustering" sample provides results that are more consistent with my expectations since the announcement period returns are not significant whereas the MCAR for the pre-announcement period [-25,-5] is -0,758% and statistically significant at 1% level according to sign test. This is consistent with the general theory that good news are considered to travel faster and thus the price adjustment should begin before the announcement. Also the wealth distribution hypothesis seems to hold for upgrades since the MCAR is negative, i.e. the underlying actions are seen to transfer wealth from stockholders to bondholders. The announcement period MCAR is significant according to t-test but as the sign test is the primary basis for conclusions and it shows no statistical significance I conclude that the market does no react to the announcement itself.

The pre-event window MCARs are more significant both economically and statistically in the clustering sample. This indicates that the level of contamination is higher, i.e. the news about the reasons behind the rating change reach the market before the rating announcement itself. This might indicate that clustering events signal more significant underlying news since the market reaction begins earlier i.e. there has been more coverage and information flow to the market from other sources of information.

Rating agencies seem to have informational contribution via downgrades whereas the informational content of upgrades is not significant. Thus, my overall results from the "clustering" sample are consistent with most previous studies and my first hypothesis.

Even when using the "clustering" sample, I excluded observations that would have been included in most previous studies. Therefore, I will do one more analysis with the whole sample. This time I will not exclude any observations based on whether there are other rating actions taking place close to them. This sample is close to most previous studies as far as the criteria for sample selection are considered, especially the one used by Li et al. (2004) as they only excluded actions that had coinciding actions within a three day period [-1,+1].

Table 10. Market reaction - Unconditional sample

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model. The unconditional sample does not exclude any observations based on the proximity of other rating announcements.

Downgrades		[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
	MCAR	-0,619 %	-0,169 %	-0,783 %	-0,207 %	-0,355 %	1,493 %
	t-stat	-1,267	-0,942	**-3,532*** **	**-1,903***	**-2,729*** **	**2,136** **
	z-stat	-0,948	-0,114	-1,555	**-2,202** **	**-2,050** **	**1,935***
Upgrades		[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
	MCAR	-1,213 %	-0,125 %	0,666 %	0,183 %	0,311 %	-1,000 %
	t-stat	**-1,969** **	-0,618	**2,600*** **	1,428	**2,064** **	**-1,697***
	z-stat	**-2,982*** **	0,115	**1,835***	0,688	**1,950***	-1,606

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

The results in table 10 seem to support my first hypothesis. For downgrades the MAR for days 0 and 1 are -0,207% and -0,355% respectively and both statistically significant at 5% level using the sign test and 10% and 1% levels respectively using t-test. It can, thus, be said that there is a clear market reaction to the announcement. Interestingly the post-announcement period MCAR is positive although not highly statistically significant. It seems that first there is an overreaction which is then followed by a price reversal process.

For upgrades the [-25,-5] pre-announcement period MCAR is -1,213% and sign test show statistical significance at 1% level. It is the only time interval for which MCAR has high statistical significance. The stock prices clearly start to adjust to the information before the announcement. However, now the MCAR for the announcement period is also statistically significant but only at the 10% level according to sign test. The underlying news that result in the upgrade seem to be bad news for the stockholders (according to wealth distribution hypothesis) since the pre-announcement returns are negative.

Based on the results presented in this section, it is clear that the choice of the sample determines whether there is support for my first hypothesis. As I have explained the use of uncontaminated sample, especially as strict as mine, leads to excluding the rating changes that are driven by more significant underlying news and thus under estimates market response. Therefore, I believe that

conclusions regarding H1 should be based on the clustering sample. It does not unnecessarily exclude observations but does not include the ones that might be contaminated by preceding announcements. Thus, I conclude that the results support my first hypothesis that there is a market reaction to downgrade announcements but not for upgrade announcements.

The magnitude of the abnormal returns is smaller in my sample than in most previous studies. This is the case with all three sample types that I used. Like I explained before, the fact that I have combined seven different markets into one sample may be one reason behind this. This is supported by the fact that my results are close to those of Kivikataja (2008), who also used a sample including these markets.

My second hypothesis is strongly supported by the results since adding the rating actions that are followed but not preceded by other actions into the sample clearly leads to stronger reported market reaction. The magnitude as well as statistical significance is bigger in the clustering sample. The same effect can be observed when moving further to the unconditional sample which includes all the rating actions in the observed period. This finding is consistent with the findings of Galil and Soffer (2011). As they pointed out it seems that clustering of events indicates more significant underlying economic news which is the reason behind stronger market reaction. They also wrote that the use of uncontaminated samples leads to underestimation of market response due to this fact.

Because of the above mentioned observation and the fact that my uncontaminated sample was constructed using much stricter criteria that lead to the exclusion of more events than in most previous studies I believe that my uncontaminated sample is not the best starting point when deciding whether there is a market response to rating actions or when comparing my results to the results of previous studies. Instead the latter two samples give a better view of the subject and are closer to previous studies when considering the sample construction. Therefore, I think it is rather safe to say that I have found support also for my first hypothesis.

6.2 Information content of the announcement

In this section I will present my results from analyzing the extent to which the market reaction can be attributed to the rating announcement instead of other sources of information. The analysis has been carried out for the same set of samples as the above analysis. Methodologically this section follows Galil and Soffer (2011). The idea is to subtract the MCAR during [-4,-2] from the MCAR during [-1,1]. The latter is the amount of the market reaction that is caused by the rating announcement and the former is considered as contamination by other sources of information.

Table 11 shows that when using the uncontaminated sample there are no statistically significant results. The MCAR has no statistical significance for either of the time periods being compared either.

The results are very interesting when examining the clustering and unconditional samples as the results for downgrades indicate that there is no statistically significant difference between the pre-announcement and announcement period MCARs. One factor that might affect the results is that the MCAR during the announcement period is not significant but rather the MAR of the individual days 0 and 1. Therefore comparing the insignificant MCAR of [-1,1] may underestimate the results. T-tests would suggest that there is a significant difference but as the z-statistics are insignificant there is not enough support for the third hypothesis.

Also the results for upgrades are surprising since the MCAR is not significant for the announcement period except in the unconditional sample (and that is also significant only at the 10% level) according to the sign test. However, Δ is significant at 5% level in both clustering and unconditional samples when using sign test.

Table 11. Information content of the announcement

Δ represents the market reaction that can be attributed to the rating announcement and is calculated as the difference between MCARs during [-1,1] and [-4,-2]. The MCAR during [-4,-2] represents contamination caused by other sources of information and MCAR during [-1,1] market reaction to the announcement.

Downgrades	Uncontaminated	Clustering	Unconditional
MCAR			
[-4,-2]	0,022 %	-0,082 %	-0,169 %
t-stat	0,091	-0,407	-0,942
%-positive	50,41 %	49,20 %	49,78 %
z-stat	0,157	-0,358	-0,114
MCAR			
[-1,1]	-0,247 %	-0,641 %	-0,783 %
t-stat	-1,466	**-2,689*** **	**-3,533*** **
%-positive	45,75 %	46,18 %	47,05 %
z-stat	-1,623	**-1,703***	-1,555
Δ	-0,270 %	-0,559 %	-0,615 %
t-stat	-0,843	**-2,053** **	**-2,092** **
%-positive	47,40 %	50,83 %	48,27 %
z-stat	-0,995	-0,409	-0,948

Upgrades	Uncontaminated	Clustering	Unconditional
MCAR			
[-4,-2]	-0,196 %	0,102 %	-0,125 %
t-stat	-0,873	0,543	-0,619
%-positive	49,75 %	50,82 %	50,33 %
z-stat	-0,070	0,256	0,115
MCAR			
[-1,1]	0,284 %	0,555 %	0,666 %
t-stat	1,222	**2,362** **	**2,601*** **
%-positive	54,19 %	54,10 %	55,26 %
z-stat	1,193	1,280	**1,835***
Δ	0,480 %	0,453 %	0,791 %
t-stat	1,448	**1,648***	**2,475** **
%-positive	54,19 %	56,97 %	56,25 %
z-stat	1,193	**2,177** **	**2,179** **

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

As conclusions are based on the sign test rather than t-test the results suggest that downgrades are on average contaminated and thus the market reaction cannot be attributed solely to the rating announcement despite the fact that the pre-announcement period MCAR is not statistically significant whereas the abnormal returns during the announcement period are. On the other hand there seems to be very little contamination related to upgrades. However the announcement period MCAR is not significant for upgrades as the significant price adjustment takes place during the [-25,-5] window.

These results are partly similar to what Galil and Soffer (2011) found. They found that the market reaction is related to the rating announcement rather than other sources of information for both upgrades and downgrades. They also found that even though market reaction to negative news is stronger the residual contribution of a single negative rating announcement may be insignificant as bad news have a higher tendency to cluster. However, even though the market reaction around upgrades is smaller they are more infrequent and positive news have lower tendency to cluster and therefore the residual contribution of a single positive rating announcement is still significant.

The results of this analysis do not give sufficient support to my third hypothesis when downgrades are examined. When t-test is used the results are supportive but as conclusions should primarily be based on non-parametric tests due to the skewed distribution of the MCARs this is not enough to say that I have found support. However, the results indicate that, despite the small overall market reaction, upgrades do have informational value and that a significant proportion of the market reaction is a result of the announcement itself.

6.3 Cross-Sectional Regression

Table 12 shows the results of the regression model for both upgrades and downgrades. I have run the regression for MCARs of four different time periods which are [-4,-2], [-1,1], [0] and [1]. I have included [-4,-2] period due to my findings regarding H3 that are presented earlier in this chapter which suggest that the MCAR in [-1,1] window is not statistically significantly different from the MCAR during [-4,-2] and thus the market reaction begins already during [-4,-2] due to other sources of information.

The upper part of the table shows results for downgrades for different time periods and the lower part shows results for upgrades for the same time periods. Worth noting is that the R^2 figures are small which is not uncommon in this type of studies and that the highest values can be found in the [-4,-2] period for downgrades and [1] for upgrades. Naturally the F-statistics are also the highest in those same periods and they show that the model is significant at 1% level during [-4,-2] and at 5% level during [0] for downgrades. For upgrades the F-statistics show significance at 5% level during [-1,1] and [0] and at 1% level during [1].

Upper part of table 12 shows that the coefficient of Log(MV) which represents size is statistically significant only when examining day 0 and even then only barely on the 10% level. Thus, it seems that size does not have a significant effect on the market response for downgrades. The sign of the coefficient is positive as expected in all other periods than day 1. The coefficient for book-to-market ratio is significant in [-4,-2] at 1% level and day 0 at 5% level. During other periods there is no statistical significance. The sign of the coefficient is positive opposed to expectation in [-4,-2] window thus indicating a weaker reaction among high book-to-market companies. However, on day 0 the sign of the coefficient is negative as expected, indicating a stronger reaction among high book-to-market companies.

The results for the coefficient for CL are interesting as its sign is negative in every period, which indicates a stronger reaction for within class rating changes, though it is only statistically significant in [-4,-2] window. The results for WL coefficient are also puzzling. It is statistically significant in two time windows, [-4,-2] (1% level) and day 1 (5% level). Its sign is positive as expected in [-4,-2] window indicating a weaker response when a rating is preceded by placement on watchlist. However, its sign is negative opposed to expectations for day 1 indicating stronger reaction for ratings preceded by placement on watchlist.

Table 12. Cross-sectional regression

This table shows the results of of the cross-sectional regression for upgrades and downgrades. Log(MV) is the natural logarithm of market value, Log(BM) is the natural logarithm of book-to-market ratio, CL is a dummy variable that equals one if the rating changes within class and 0 if the rating changes across class, WL is a dummy variable that equals 1 if the rating change was preceded by a placement on a watchlist and 0 otherwise. T-values of the coefficients are presented in parentheses and R^2 and F-values of the mode at the bottom of each section.

Downgrades	[-4,-2]	[-1,1]	[0]	[1]
intercept	-0,02508	-0,04116	-0,03710	0,02138
	(-0,687)	(-1,012)	**(-1,758)***	(1,042)
Log(MV)	0,00170	0,00170	0,00212	-0,00133
	(0,764)	(0,931)	**(1,646)***	(-1,062)
Log(BM)	0,00589	-0,00232	-0,00330	-0,00139
	(2,582)***	(-0,912)	**(-2,502)****	(-1,085)
CL	-0,01040	-0,00035	-0,00169	-0,00078
	(-2,080)**	(-0,062)	(-0,584)	(-0,277)
WL	0,01722	-0,00866	0,00064	-0,00618
	(3,382)***	(-1,528)	(0,219)	**(-2,161)****
R^2(%)	6,082	1,210	3,445	1,897
F-stat	5,408***	1,023	2,979**	1,615

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Upgrades	[-4,-2]	[-1,1]	[0]	[1]
intercept	-0,01054	0,11218	0,05799	0,06527
	(-0,288)	**(2,77)*****	**(2,567)****	**(2,485)****
Log(MV)	0,00091	-0,00626	-0,00349	-0,00386
	(0,418)	**(-2,608)*****	**(-2,599)*****	**(-2,472)****
Log(BM)	0,00205	0,00463	0,00147	0,00491
	(0,936)	**(1,917)***	(1,091)	**(3,126)*****
CL	-0,00223	-0,00588	0,00499	0,00134
	(-0,501)	(-1,195)	**(1,814)***	(0,417)
WL	0,00172	0,00211	0,00030	0,00909
	(0,294)	(0,325)	(0,084)	**(2,158)****
R^2(%)	0,874	7,747	7,924	13,569
F-stat	0,357	3,401**	3,485**	6,358***

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Lower part of table 12 shows that there are no statistically significant coefficients in the [-4,-2] window when examining upgrades. Unlike when examining downgrades, the coefficient for Log(MV) is statistically significant in all other time windows. The sign of the coefficient is negative as expected indicating that the market reaction is weaker among bigger companies. The coefficient for book-to-market is significant during [-1,1] at 10% level and day 1 at 1% level. The sign of the coefficient is positive and thus in line with expectations, indicating a stronger reaction for companies with higher book-to-market ratio.

As in the case of downgrades, the results for CL are surprising also when examining upgrades. The coefficient is positive indicating a stronger reaction to within class ratings than across class ratings. However, it is only significant in day 0 and only at the 10% level. The coefficient of WL is significant only in day 1 (5% level) and it also has an unexpected sign as it is positive indicating a stronger reaction to upgrades that are preceded by placement on watchlist.

6.4 Additional Analysis

Now I have reported my main findings that were used to evaluate my hypotheses. In this section I will present the findings of some further analysis. The aim is to find different factors that drive the market reaction. This is done by dividing the sample into subgroups and analyzing how the results differ based on how the sample is divided. Due to the reasons explained earlier in this chapter, I will be using "clustering" sample in the rest of the analyses.

6.4.1. Magnitude of the change

First, I will test if the market reaction is connected to the number of notches moved on the rating scale. I will do this by dividing the sample into two categories. First category includes rating changes that are one notch in magnitude. Second category includes rating changes that are two or more notches in magnitude. Unfortunately the amount of observations in which the change is more than two notches is very small (around 15% in all samples) and therefore I am unable to divide the sample further into more subsamples.

I am expecting a stronger reaction to rating actions in the group where the change has been at least 2 notches. As the rationale behind this expectation is the assumption that a bigger change in the rating acts as a signal of more significant underlying economic news which should result as stronger reaction.

Table 13. Magnitude of the rating change

Table shows MCARs for different periods and related t-statistics and percentage of positive observations for different groups of companies. Group 1 consists of single notch rating actions and group 2 consists of multiple notch rating actions.

Downgrades		[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
Category 1	MCAR	-0,868 %	-0,168 %	-0,612 %	-0,210 %	-0,279 %	0,142 %
	t-stat	-1,741	-0,785	**-2,325****	-1,613	**-1,735***	1,292
	%-positive	45,20 %	48,95 %	46,84 %	43,56 %	48,01 %	47,78 %
	z-stat	**-1,984****	-0,436	-1,307	**-2,662*****	-0,823	-0,919
Category 2	MCAR	0,631 %	0,437 %	-0,802 %	-0,611 %	-0,283 %	0,088 %
	t-stat	0,495	0,750	-1,500	**-2,138****	-1,184	0,321
	%-positive	56,94 %	51,39 %	43,06 %	41,00 %	42,00 %	51,39 %
	z-stat	1,179	0,236	-1,179	-1,179	-1,414	0,236
Statistical difference		-0,1730	0,4329	**-2,3716****	**-2,6140*****	**-1,9504***	0,7782
Upgrades		[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
Category 1	MCAR	-0,800 %	0,093 %	0,447 %	0,089 %	0,103 %	-0,202 %
	t-stat	-1,174	0,471	**1,803***	0,802	0,589	-0,324
	%-positive	39,73 %	50,00 %	53,13 %	50,45 %	50,00 %	48,66 %
	z-stat	**-3,074*****	0,000	0,935	0,134	0,000	-0,401
Category 2	MCAR	-0,285 %	0,197 %	1,758 %	0,539 %	1,038 %	-2,165 %
	t-stat	-0,218	0,345	**2,660*****	1,642	**2,822*****	-1,610
	%-positive	70,00 %	60,00 %	65,00 %	60,00 %	80,00 %	25,00 %
	z-stat	**1,789***	0,894	1,342	0,894	**2,683*****	**-2,236****
Statistical difference		-0,736	0,481	**3,124*****	**1,813***	**2,802*****	-1,597

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

The results in table 13 are partly consistent with my expectations. For downgrades the results are against my expectations since the MCAR during [-1,1] is -0.612% for the single notch downgrades and significant at the 5% level using t-test whereas the effect related to multiple notch downgrades is bigger economically but it is not statistically significant even at the 10% level. The sign test does not show any significance for either group. For day 0 MCAR in group 1 seems to be significant at 1% level using sign test but not significant in group 2. This is surprising but there is one possible explanation for this finding. The number of observations in the multiple notch group is only 20 whereas the number of single notch downgrades is 484. The ratio of negative observations in the multiple notch group (59%) is bigger than the same ratio in the single notch group (56,4%). However, due to the significantly smaller group this is not enough to yield a

significant score from the sign test. The direction of the change in MCAR is as I expected as multiple notch actions resulted in higher negative excess returns.

For the upgrades my expectation seems to be holding. MCAR for single notch upgrades during the announcement period is 0,447% and significant only at the 10% level using t-test and not significant using sign test whereas the MCAR for multiple notch upgrades is 1.758% which is significant at 1% level using t-test but not significant using sign test. Day 1 MCAR is however most supporting considering the expectations as MCAR rises from 0,103% to 1,038% when examining group 2 instead of group 1. The results for group 2 are also significant at 1% level according to both tests. Anticipation is also much stronger for single notch upgrades and statistically significant at 1% level (sign test). This indicates that a multiple notch upgrade is seen as a sign of more significant underlying changes than a single notch upgrade.

When looking at the table it can be seen that the results in my "clustering" sample in section 6.1 were driven by category 1 of this analysis. I was expecting this as more than 83% of the downgrades and 87% of the upgrades were single notch.

6.4.2 Initial Rating

The level of the initial rating is an important factor in how the market reacts to a rating announcement. Avramov et al. (200) found that the highest ranking companies may experience even positive abnormal returns after a downgrade. In addition to the big difference between realized abnormal returns of the highest ranking and lowest ranking companies there was also an especially substantial difference in the returns when examining investment grade and non-investment grade companies separately. Also Hand, Holtahausen and Leftwich 1992 reported that the excess returns are stronger for below investment grade companies. It is assumed that non-investment grade companies experience larger costs of financial distress and thus the more significant effect related to rating changes. Therefore, I am expecting to find results that are more significant economically and statistically for lower rated companies.

I have divided the sample into two categories based on the initial rating, the categories being 1=AAA/AA/A/BBB, 2=BB/B/CCC/CC/C/D. Category 1 includes companies that are initially rated as investment grade and category 2 companies that are rated as non-investment grade. In this analysis I used the clustering sample. The results are presented in table 14.

Table 14. Initial rating

Table shows MCARs and related t-statistics and percentage of positive observations for different groups of companies. Group 1 consists of investment grade companies (BBB- or above) and group 2 consists of non-investment grade companies (BB+ or below). Statistical significance-row indicates whether the abnormal returns of the groups differ statistically.

Downgrades		[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
Group 1	MCAR	-0,758 %	0,025 %	-0,426 %	-0,187 %	-0,211 %	0,251 %
	t-stat	-1,672	0,125	**-1,680***	-1,254	-1,449	0,344
	%-positive	46,40 %	50,00 %	47,46 %	43,28 %	51,26 %	51,48 %
	z-stat	-1,565	0,000	-1,105	**-2,074****	0,389	0,644
Group 2	MCAR	-0,324 %	-1,795 %	-2,028 %	-0,666 %	-1,033 %	1,110 %
	t-stat	-0,104	-1,473	**-2,480****	-1,331	-1,807	0,244
	%-positive	50,00 %	36,67 %	33,33 %	28,57 %	38,10 %	46,67 %
	z-stat	0	-1,461	**-1,826***	**-2,777*****	-1,543	-0,365
Statistical difference		-0,137	1,474	**1,871***	-1,634	**-2,109****	-0,186
Upgrades		[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
Group 1	MCAR	-0,713 %	0,068 %	0,332 %	0,038 %	0,215 %	-0,779 %
	t-stat	-0,979	0,331	1,403	0,384	1,240	-1,177
	%-positive	41,29 %	50,75 %	53,73 %	50,42 %	52,12 %	44,28 %
	z-stat	**-2,469****	0,212	1,058	0,130	0,651	-1,622
Group 2	MCAR	-0,966 %	0,259 %	1,596 %	0,688 %	0,650 %	1,583 %
	t-stat	-0,824	0,561	**2,187****	1,486	**2,099****	1,400
	%-positive	46,51 %	51,16 %	55,81 %	56,72 %	67,16 %	58,14 %
	z-stat	-0,457	0,152	0,762	1,100	**2,810*****	1,067
Statistical difference		0,183	-0,378	**-1,647***	1,534	**2,440****	**-1,803***

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

My results show that there is a clear difference in the market reaction when an investment grade and a non-investment grade company are compared. This holds for both upgrades and downgrades. Avramov et al. (2007) did not study upgrades but my results on downgrades are consistent with their finding that lower rated firms experience more negative abnormal returns related to downgrades than higher rated firms. This difference cannot be explained for example by the difference in the magnitude of the rating changes since there is only a slight difference in the average amount of notches a rating is changed when the two groups are compared. The average change in a rating is 1,20 for group 1 downgrades and 1,41 for group 2 downgrades. The figures are 1,07 notches for group 1 upgrades and 1,28 notches for group 2 upgrades.

For downgrades MAR for day 0 is statistically significant at 5% level in group 1 and 1% level in group 2 according to sign test. Also the difference in economic significance is notable as the MCAR is -0,187% in group 1 and -0,666% in group 2. Also the MCAR for the announcement period [-1,1] is significant at 10% level in group 2 when sign test is used (5% level with t-test) whereas the is no statistical significance in group 1 using sign test and only at 10% level using t-test. Again, one significant reason behind the small statistical significance in group 2 is the small amount of observations (30 observations in group 2 against the 474 in group 1) considering that the ratio of negative observations in group 2 is 66%. Also the difference in economic significance during the announcement window is substantial as the MCAR is around -0,4% for investment grade companies and around -2% for non-investment grade companies.

It is clear that low rated companies suffer more from a downgrade. One possible reason behind this is institutional selling, triggered by the downgrade due to the limitations set upon them regarding the rating of the securities they can hold in their portfolio.

For upgrades the only statistically significant MCAR is for the period [-25,-5] in group 1. When examining group 2 the pre-announcement period MCAR is no longer statistically significant, but the day 1 MAR is significant at 1% level using sign test and 5% level using t-test. This would indicate that for the investment grade companies upgrades are anticipated and price adjustment takes place before the announcement, whereas for non-investment grade companies the upgrades are not anticipated and market reacts immediately to the new information. Also the post announcement MCAR is positive and economically but not statistically significant for group 2 whereas it is negative for group 1 (not statistically significant either).

One possible explanation behind the results for upgrades is that investors are more skeptical about good news when they are related to low rated companies. This would indicate that an upgrade is seen as confirmation of the news and that the confirmation is only needed when the company is rated below investment grade. The results also show that whereas low rated companies suffer more from a downgrade they also benefit more from an upgrade.

6.4.3 Country Specific Analysis

Next I will present the results of the analysis done for each market separately. The countries are the same as Kivikataja (2008) studied in his thesis so it is interesting to compare my results to his as he is the only one to have studied Europe so widely before. One major methodological difference arises when comparing the results as he reported statistical significance based on t-test whereas I used sign test as a basis for my analysis.

Netherlands - AEX

Table 15 presents the results for Netherlands (AEX). The results for AEX companies do not indicate a significant market reaction to the rating announcement itself. For the upgrades there are no statistically significant abnormal returns during any of the examined time periods. This is consistent with the results of Kivikataja (2008).

When examining downgrades there is an interesting observation to be made. The MCAR for the announcement period is positive but not statistically significant but the pre-announcement period [-25,-5] MCAR is -2.663% and significant on the 1% level according to the z-statistic. This is against most previous findings as it suggests that market reaction takes place before the rating, i.e. the rating is late and does not contain information that is new and useful to the market. Also the strong price reversal in the post-announcement period is surprising but it is not statistically significant. This is partly consistent with Kivikataja´s (2008) findings. He also found that the excess returns in the pre-announcement window are significant. However, he did not report a similar price reversal process in the post-announcement period and he found significant abnormal returns also during the announcement window.

My results suggest that the information asymmetries might be smaller when AEX companies are considered since rating actions are not seen as informational. These results must however be analyzed with caution due to the small amount of observations. There were only 28 upgrades and 34 downgrades in the AEX sample.

Table 15. Netherlands (AEX)

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model.

Downgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-2,663 %	-0,514 %	0,829 %	0,487 %	0,486 %	2,273 %
t-stat	-1,260	-0,501	1,033	1,142	1,278	0,968
%-positive	20,59 %	44,12 %	61,76 %	61,76 %	55,88 %	61,76 %
z-stat	**-3,429*** **	-0,685	1,371	1,371	0,685	1,371

Upgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-1,351 %	0,550 %	0,126 %	0,421 %	-0,293 %	-1,455 %
t-stat	-1,017	1,213	0,220	1,487	-0,944	-1,045
%-positive	35,71 %	50,00 %	53,57 %	57,14 %	50,00 %	46,43 %
z-stat	-1,511	0	0,377	0,755	0	-0,377

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

In figure 3 the MCAR around downgrades is of very interesting shape and the MCAR for the whole event window [-25,25] is close to 0. However, the only part that is statistically significant is the -2,663% abnormal return during [-25,-5]. The MCAR of upgrades fluctuates mostly around 0% and is not statistically significant during any time period.

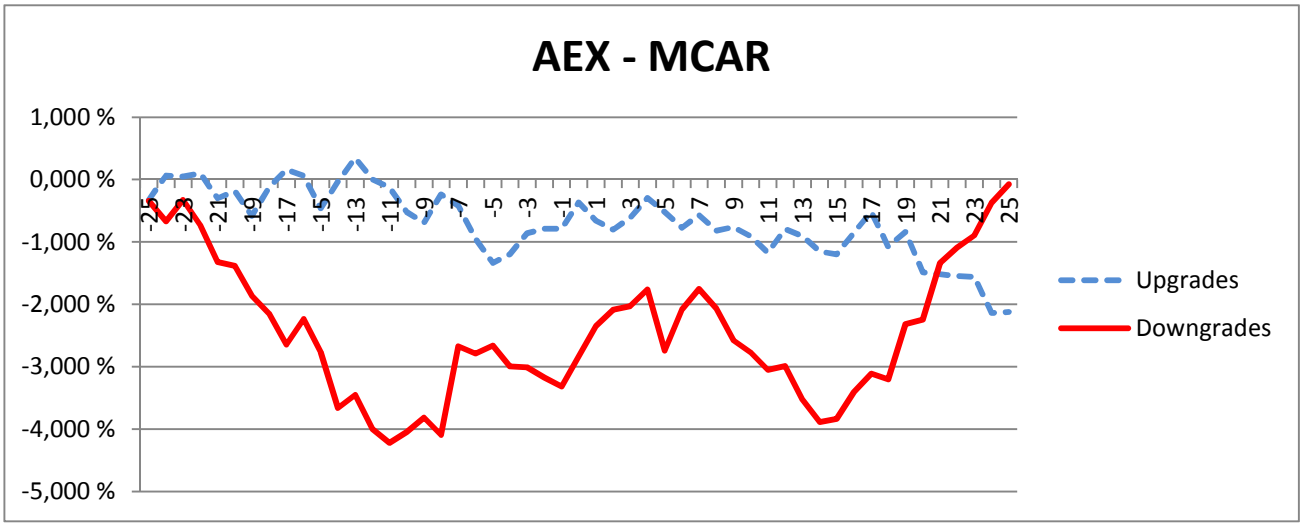


Figure 3. Netherlands (AEX)

France – CAC

The results for the companies listed in CAC40 are presented in table 16. These results are also somewhat surprising. For downgrades there is a market reaction of -1,511% on the announcement day and it is significant on the 5% level according to t-test and 10% level according to z-test which indicates a weak market reaction to the announcement. However, most of the reaction takes place during the [-25,-5] interval as the MCAR is almost double at -2,859% and significant on 5% level according to both tests. This indicates that the new information is taken into account before the announcement. Despite these findings the most interesting result was the abnormal returns during the post-announcement period. Figure 4 shows that the MCAR starts to sharply rise immediately after the announcement period. The post announcement MCAR is the most significant of the periods both economically (nearly 4%) and statistically (at 1% level). One possible reason behind this effect is that over 94% of the observations are investment grade companies and as Avramov et at. (2007) found, highest rated companies can experience positive returns after a downgrade.

The results for upgrades are in line with the general expectations that upgrades do not add value. There is no period during which MCAR is positive and statistically significant. The t-statistic indicates that the announcement period MCAR is significant at the 5% level but as the non-parametric tests act as a basis for the analysis this is not enough to say that there is a market reaction.

These findings are fairly consistent with the findings of Kivikataja (2008). His findings were very similar, the differences regarding downgrades being that my results show more economic significance in all time windows and that he found statistically significant excess returns also during the announcement period.

Table 16. France (CAC40)

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model.

Downgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-2,859 %	-0,036 %	-0,414 %	-1,511%	-0,443%	3,980 %
t-stat	**-2,428****	-0,071	-0,599	**-2,345****	-0,815	**2,378****
%-positive	38,89 %	51,11 %	52,22%	41,11%	54,44%	64,44 %
z-stat	**-2,108****	0,210	0,421	**-1,686***	0,843	**2,740*****
Upgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-0,902 %	0,965 %	1,129 %	0,670 %	-0,054 %	-1,800 %
t-stat	-0,579	**2,177****	**2,194****	**2,390****	-0,166	-1,232
%-positive	44,90 %	61,22 %	61,22 %	61,22 %	51,02 %	38,78 %
z-stat	-0,714	1,571	1,571	1,571	0,142	-1,571

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Figure 4 shows the unexpected behavior of the MCAR for the downgrades in the post-announcement window. The line drawn by upgrade-MCAR is, again, more like expected.

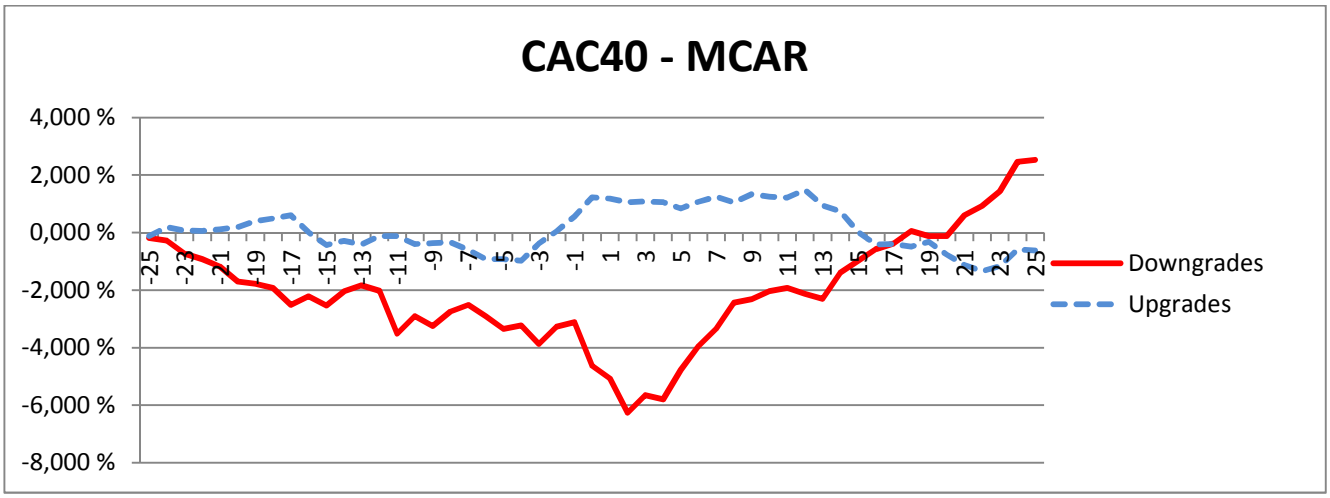


Figure 4. France (CAC)

Germany – DAX

Table 17 presents my results for companies listed in DAX30 index. Again the results are surprising. The only period during which MCAR is significant for the downgrades is the pre-announcement period of [-25,-5] which is 1,083% and significant at the 5% level according to z-statistic. T-statistic does not show any statistical significance. This finding suggests that also in Germany markets do not react upon a rating downgrade but the price adjustment takes place before the announcement. The wealth distribution hypothesis seems to be holding here i.e. on average the underlying news/actions are such that are seen to be transferring wealth from bondholders to stockholders since the MCAR before (and after even though not statistically significantly) is positive.

The results for upgrades are fairly similar as for the above presented countries. There is a slight difference as now the announcement period MCAR is significant at 10% level according to the z-statistic (not significant t-statistic). However, this is not enough to conclude that there is a market reaction to upgrades.

Kivikataja (2008) showed results that were more consistent with previous findings as he reported significant negative abnormal returns for the announcement period for downgrades and positive pre-announcement window excess returns for upgrades.

Table 17. Germany (DAX)

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model.

Downgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	1,083 %	0,319 %	0,287 %	0,174 %	0,142 %	1,784 %
t-stat	1,065	0,978	0,845	0,806	0,664	1,371
%-positive	61,45 %	54,22 %	56,63 %	50,60 %	50,60 %	55,42 %
z-stat	**2,085****	0,768	1,207	0,109	0,109	0,987

Upgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	0,058 %	0,452 %	-0,282 %	-0,147 %	-0,015 %	0,616 %
t-stat	0,026	0,973	-0,607	-0,708	-0,038	0,375
%-positive	51,43 %	60,00 %	34,29 %	40,00 %	34,29 %	51,43 %
z-stat	0,169	1,183	**-1,859***	-1,183	**-1,859***	0,169

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Figure 5 shows how the MCAR for downgrades is steadily rising throughout the whole event window, indicating that the wealth distribution hypothesis is supported and that there is no clear reaction during the announcement period. Upgrades fluctuate up and down and no time window is statistically highly significant.

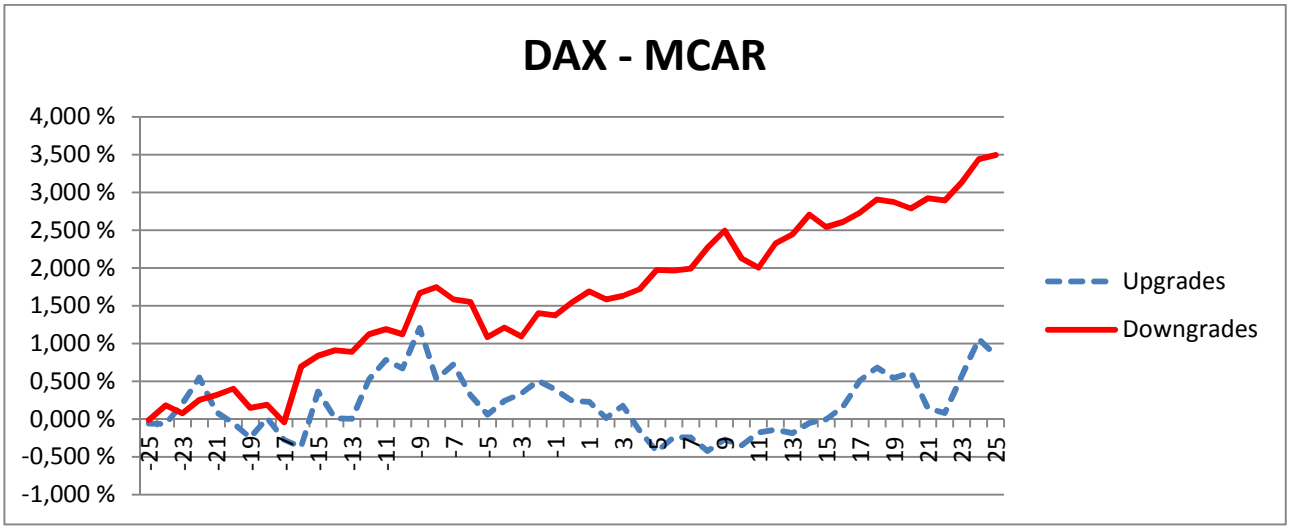


Figure 5. Germany (DAX)

Italy – FTSEMIB

Table 18 shows the results for the companies listed in Italy´s FTSEMIB exchange. The markets in Italy seem to be reacting to rating announcements more like the U.S. markets and how the majority of researchers are expecting. For downgrades the MCAR during the pre-announcement period is positive but not statistically significant according to z-score as the ratio of positive to negative observations is close to 50/50. During the announcement period [-1,1] there is a negative reaction (-0,349%) which is significant on the 5% level according to the z-statistic. The announcement period reaction is strongest on the announcement day itself, the MAR being -0,242% and significant at the 1% level. Also the post-announcement period abnormal returns are statistically significant at the 1% level as well as big in economic sense as the MCAR during [2,25] is -7,986%. The fact that abnormal returns are statistically highly significant during the announcement day indicates that rating announcements do add value to the market in Italy. However, it seems that markets do not fully incorporate this new information into prices immediately.

Italian data also indicates that there is a reaction to upgrades as well. The only statistically significant MCAR using z-statistic is during the announcement period (0,577% at 5% level). As the pre- and post-announcement period returns are insignificant it seems that rating agencies provide valuable information to the marketplace in the form of both upgrades and downgrades.

Kivikataja´s (2008) findings suggest that the Italian markets react to rating announcements very differently from other countries. He found negative abnormal returns for upgrades throughout the whole event window excluding positive insignificant announcement period return. He explained this by the fact that most of the observations took place during the sub-prime crisis and declining markets. For downgrades he found highly significant positive reaction during the announcement window which he explained by the high number of bank´s downgrades and their highly significant positive announcement period return.

Table 18. Italy (FTSEMIB)

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model.

Downgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-2,257 %	0,005 %	-0,349 %	-0,242 %	0,193 %	-7,986 %
t-stat	**-1,734***	0,007	-0,550	-0,589	0,569	**-2,108****
%-positive	48,33 %	45,00 %	36,67 %	30,00 %	46,67 %	33,33 %
z-stat	-0,258	-0,775	**-2,066****	**-3,098*****	-0,516	**-2,582*****
Upgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	2,186 %	-0,061 %	0,577 %	0,217 %	0,351 %	-1,317 %
t-stat	0,850	-0,119	0,868	0,674	0,665	-1,027
%-positive	47,62 %	57,14 %	71,43 %	61,90 %	71,43 %	42,86 %
z-stat	-0,218	0,655	**1,964****	1,091	**1,964****	-0,655

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Figure 6 shows that it takes days before the price adjusts after a downgrade and that clearly most of the price adjustment takes place 2-3 weeks after the announcement. For upgrades the only statistically significant time window is the announcement period even though the magnitude of the excess returns is small compared to pre-announcement window.

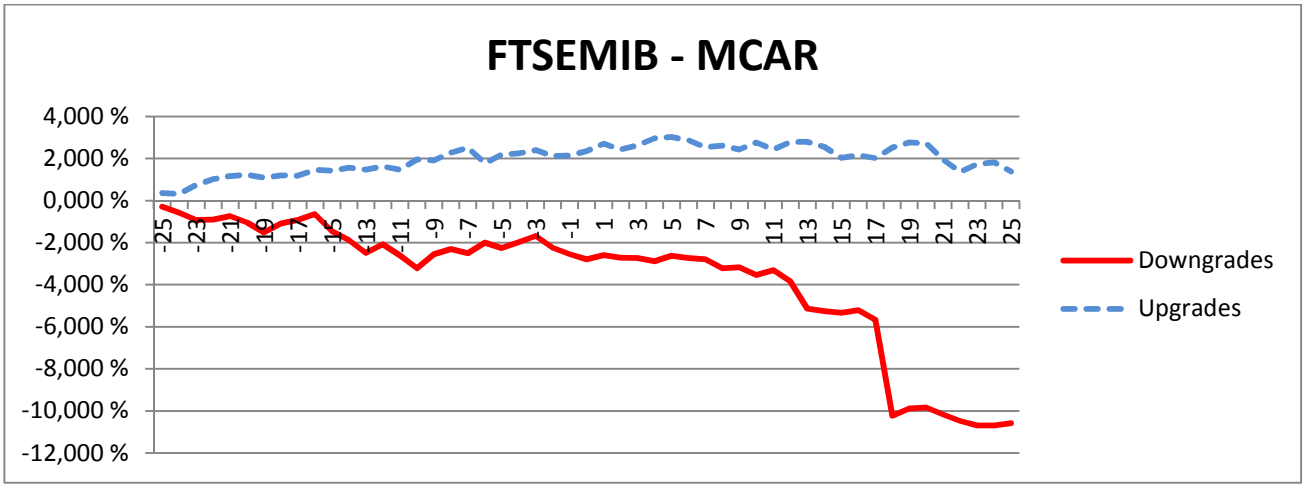


Figure 6. Italy (FTSEMIB)

England – FTSE

The UK market is one of the European markets that have been studied before also by others than Kivikataja (2008). My findings are presented in table 19. As Barron et al. (1997) I also find support for the results presented by U.S. studies. There is a clear market reaction to downgrades as the announcement period MCAR is -1,689% and using z-statistic it is significant at 1% level (t-stat significant at 5% level). CARs for days 0 and 1 are -0,325% and 0,970% respectively and both significant at 5% level using z-statistic. Pre-announcement MCARs are insignificant. Post-announcement MCAR is significant at 10% level and less than half the MCAR of announcement period.

Upgrades do not result in significant announcement period MCAR in England either. Pre-announcement abnormal returns are significant ([-25,-5] at 5% and [-4,-2] at 10% level) which indicates that the information flows to the market before the announcement, as is expected with upgrades. The pre-announcement abnormal returns are negative (opposed to previous findings) which indicates that wealth distribution hypothesis holds for this sample i.e. on average the events leading to the upgrade are seen to transfer wealth from stockholders to bondholders.

These findings are consistent with those of Kivikataja (2008). The pattern of the excess returns in the event window is very similar to what he reported for both types of announcements. The main difference is that my results show no statistically significant anticipation related to downgrades.

Table 19. England (FTSE)

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model.

Downgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-0,727 %	0,115 %	-1,689 %	-0,325 %	-0,970 %	-0,713 %
t-stat	-0,810	0,266	**-2,522****	-1,379	**-2,042****	-0,683
%-positive	45,53 %	52,03 %	37,40 %	39,34 %	38,52 %	41,46 %
z-stat	-0,992	0,451	**-2,795*****	**-2,354****	**-2,535****	**-1,894***

Upgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-2,853 %	-0,732 %	0,383 %	-0,270 %	0,659 %	-0,138 %
t-stat	**-2,650*****	**-2,313****	0,723	-1,081	1,248	-0,162
%-positive	35,29 %	37,25 %	43,14 %	43,14 %	50,98 %	43,14 %
z-stat	**-2,100****	**-1,820***	-0,980	-0,980	0,140	-0,980

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Figure 7 shows how the MCAR for upgrades and downgrades evolve surprisingly similarly during the event window. Also the difference can clearly be seen as the MCAR for upgrades starts to fall well before the announcement period whereas the MCAR for downgrades falls sharply around the announcement day.

This figure demonstrates how the difference between the flow of good news and bad news has been seen to affect the market response to rating actions. Even though both announcements are seen as bad news to stockholders in this case, the market reacts to downgrades only during the announcement period as good news tend to flow into markets earlier than bad news. As can be seen from the figure, on average both upgrades and downgrades were seen as bad news for stockholders in the observations included in this sample.

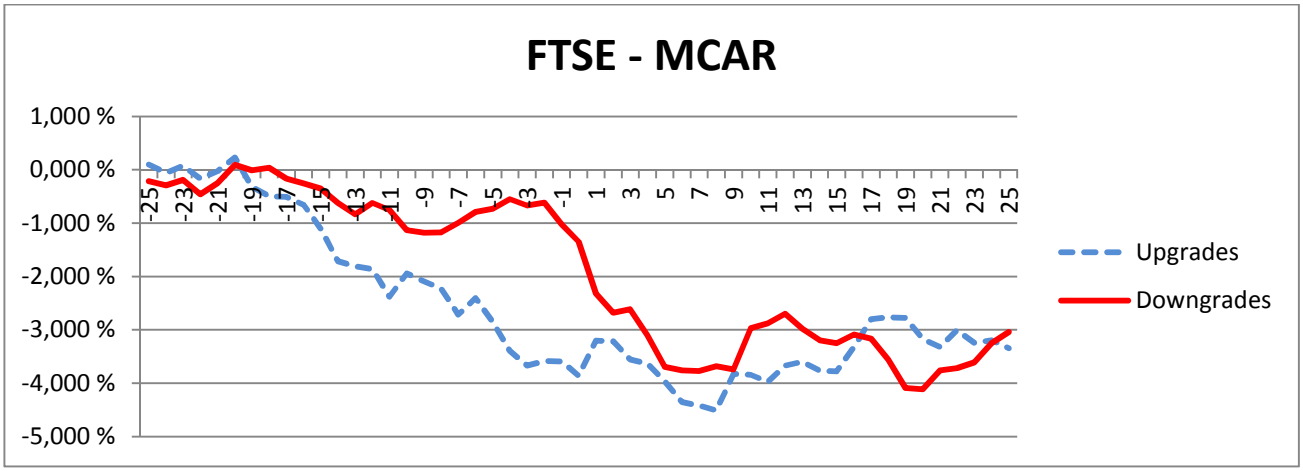


Figure 7. England (FTSE)

Spain – IBEX

Table 20 shows the results for companies that are listed in the IBEX index. These results are similar to those yielded by my FTSEMIB and FTSE100 samples. All in all these results are completely in line with the general expectations and theories.

The abnormal returns for downgrades are heavily concentrated around the announcement day. The only statistically significant MCAR is during the period [-1,1] which is -0,810% and significant at the 5% level according to z-statistic. This indicates that in Spain a downgrade is seen to have more informational value than in many other countries studied in this paper.

For upgrades I find no significant abnormal returns during any time interval in the event window. The abnormal returns are economically significant but as they bounce up and down and lack statistical significance one cannot say that there is a reaction.

My results are fairly similar to those of Kivikataja (2008). He found fairly insignificant abnormal returns for upgrades throughout the event window. He did, however, find significant abnormal returns for downgrades also during the pre- and post-announcement windows.

Table 20. Spain (IBEX)

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model.

Downgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	0,116 %	0,172 %	-0,810 %	-0,003 %	-0,463 %	-1,065 %
t-stat	0,076	0,441	-1,644	-0,014	**-1,739***	-0,572
%-positive	50,00 %	51,79 %	33,93 %	44,64 %	41,07 %	50,00 %
z-stat	0,000	0,267	**-2,405****	-0,802	-1,336	0,000

Upgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	-1,797 %	1,018 %	1,015 %	0,020 %	0,182 %	-1,904 %
t-stat	-0,886	1,305	0,619	0,063	0,268	-0,611
%-positive	42,11 %	52,63 %	52,63 %	57,89 %	57,89 %	68,42 %
z-stat	-0,688	0,229	0,229	0,688	0,688	1,606

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

Figure 8 shows that the abnormal returns for downgrades are evolve as expected whereas the cumulative abnormal returns for upgrades jump up and down. A sharp rise in the MCAR around the announcement day can be observed in figure 8 but as there is no statistical significance no conclusions can be made.

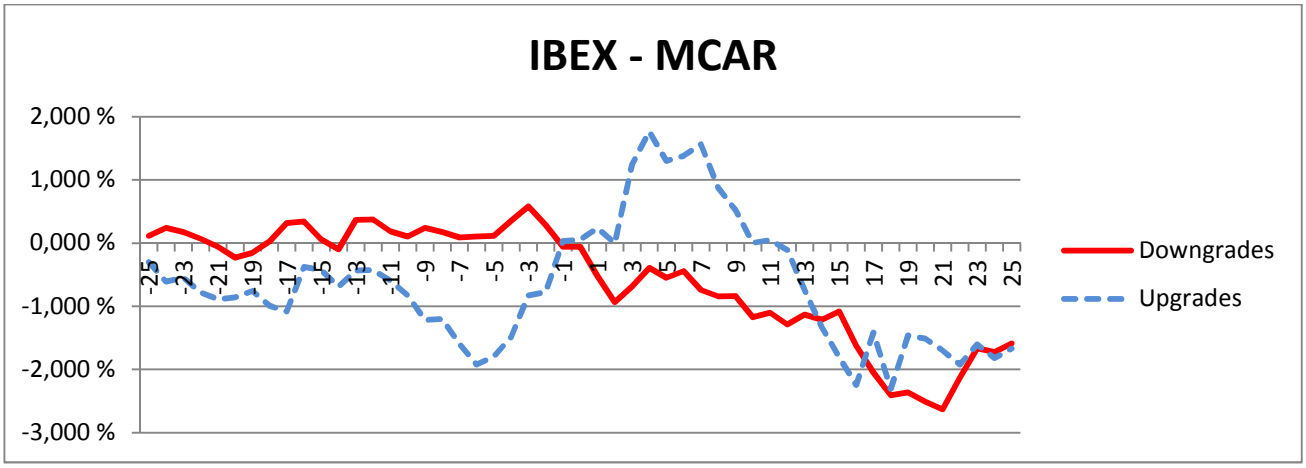


Figure 8. Spain (IBEX)

Nordic countries – OMXN

As table 21 shows my results differ from the findings that Li et al. (2004) reported using Swedish data. For downgrades there is no period during the event window for which the MCAR would be significant using the z-statistic. Even though the post-announcement period MCAR is highly positive, no conclusions can be made due to lack of statistical significance.

For upgrades the only statistically significant MCAR is during the announcement window (0,865% at 5% level). The pre- and post-announcement period MCARs are also positive but lack statistical significance. It seems that in the Nordic countries upgrades are seen to provide new information and are reacted upon. That is where my results differ from those of Li et al. (2004) since they found significant positive abnormal returns for the post-announcement period up until day +20 and negative abnormal returns (not statistically significant) during the announcement period.

Table 21. Nordic countries (OMXN)

The mean cumulative abnormal returns (MCARs) over specified horizons with the day of the rating announcement being day 0. Returns are calculated as the difference between the actual return of a stock minus the expected return that is estimated using the market model.

Downgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	0,557 %	-1,189 %	0,621 %	-0,483 %	0,351 %	3,050 %
t-stat	0,367	**-2,035****	1,042	-1,141	1,081	1,542
%-positive	48,28 %	39,66 %	58,62 %	50,00 %	55,17 %	58,62 %
z-stat	-0,263	-1,576	1,313	0,000	0,788	1,313

Upgrades	[-25,-5]	[-4,-2]	[-1,1]	0	1	[2,25]
MCAR	0,705 %	-0,840 %	0,865 %	0,001 %	0,263 %	2,190 %
t-stat	0,497	-1,526	**2,131****	0,003	1,205	1,393
%-positive	41,46 %	43,90 %	68,29 %	46,34 %	60,98 %	48,78 %
z-stat	-1,093	-0,781	**2,343****	-0,469	1,406	-0,156

*, ** and *** refer to the significance level at 10%, 5% and 1% respectively

When looking at figure 9 you can see that the MCAR for upgrades starts its upwards trend around the announcement day as it makes a jump and then continues climbing i.e. the announcement period can be seen in the curve. On the other hand the MCAR for downgrades bounces up and down even though it rises to the same level as the MCAR for upgrades at the end of the event window.

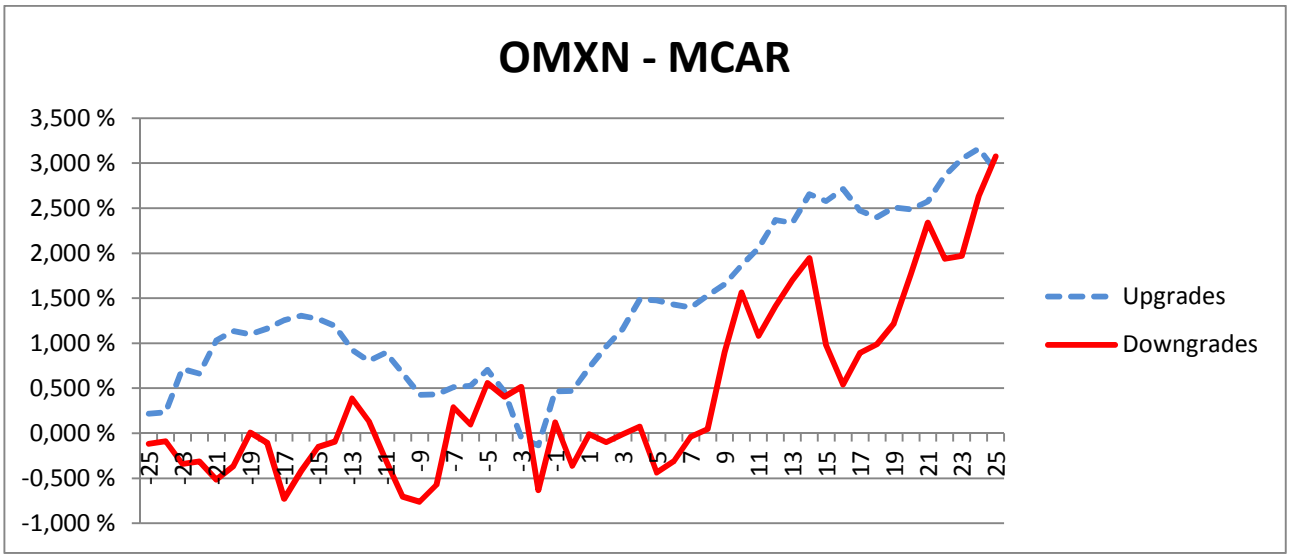


Figure 9. Nordic countries (OMXN)

7 Summary and conclusions

In this thesis I studied the behavior of a company´s stock price around the day on which a credit rating agency announced a change in the long-term, issuer-specific credit rating of the company. The rating changes are made by the three biggest rating agencies S&P, Moody´s and Fitch. My sample included companies from seven major European indices and events between January 2000 and December 2011. Despite the interesting results that non-US studies have offered the majority of the studies in this field have utilized US data and so this paper concentrates on the much less studied geographical area which has produced more mixed results in past studies. The methodology used to study the abnormal returns is traditional event study methodology which is commonly used in similar studies.

This paper is the first one to study the effect of different sample construction criteria on the results when studying the stock market effect to rating announcements and this way analyses possible underestimation that results from using uncontaminated samples. This is a question that Galil and Soffer (2011) raised in their CDS market response study. I was also able to study whether clustering rating announcements carry more informational value using the differently constructed samples. As most previous studies concentrate on a single market and the criteria used to build the uncontaminated samples differ between the studies, a straightforward comparison of the results may be somewhat misleading. I do not have that problem since I have used the same criteria to construct the samples for each country. I also studied the extent to which the market reaction can be attributed to the rating itself by comparing the announcement period [-1,+1] abnormal returns (reaction to the announcement) to the abnormal returns immediately before the announcement period [-4,-2] (reaction to contaminating information). The reasoning behind this method is to be able to control for contamination in a more efficient way and differentiate between the reaction to the announcement itself and the reaction to other sources of information.

The uncontaminated sample was constructed by excluding all observation that were followed or preceded by other rating announcement within a three month period (-3 months, +3months). The clustering sample excluded observations that were preceded by other rating announcements within three months (-3 months, 0). The unconditional sample included all observations. In

previous studies the criteria used to build the uncontaminated sample has not been as strict (e.g. Li et al., 2004 used a three day interval of [-1,+1]). Therefore, when analyzing and comparing my results to previous findings the clustering sample was used due to the underestimation related to unconditional samples and the criteria used by previous researchers.

My results suggest that when using the uncontaminated sample there is no significant market reaction to either upgrades or downgrades. However, when using the clustering sample, the results are as expected and there is a negative reaction to downgrades. The MAR for the announcement day is -0,240% and significant at 1% level. The MCAR for the three day announcement window [-1,+1] is -0,641% but only significant at 10% level. There is also no anticipation for downgrades. Upgrades are anticipated as the pre-announcement window [-25,+25] MCAR is -0,758% and significant at 5% level. This is the only statistically significant time period in the event window. The negative MCAR indicates that the wealth redistribution hypothesis holds for the upgrades, i.e. the actions/events leading to the upgrade are bad news for stockholders and good news for bondholders. The economic significance of my results is smaller than in most previous studies that have found market reactions, however my sample combines many countries and not all of them show similar reactions to rating announcements. I believe this is the primary reason behind the smaller abnormal returns as my results are very well in line with those of Kivikataja (2008) who also found announcement period returns of around -0,6% for downgrades.

When using the third sample, the unconditional sample, the results are similar to the ones obtained by using the clustering sample, however the reactions are stronger. For downgrades the day 0 and day 1 MARs are -0,207% and -0,355% respectively, both significant at 5% level. For upgrades the pre-announcement window [-25,-5] MCAR is -1,213% significant at 1% level. Another difference is that there is a reaction also to the upgrades during the announcement window, although it is statistically significant only at the 10% level. These findings support the assumption about the underestimation related to uncontaminated samples. It seems that the clustering of announcements acts as a signal of more significant underlying economic news.

These results show that the market reaction to rating changes is asymmetric. According to Holthausen and Leftwich (1985), there may be several reasons for this. First, the loss function of the rating agencies may be asymmetric and thus downgrades might be timelier than upgrades.

Second, management´s incentive to release information might be asymmetric as there is a natural tendency to reveal good information as soon as possible which is not the case with bad news. Therefore, on average good news are “early” and bad news are “late” due to which good news are already discounted into the share price before the announcement of a rating change whereas bad news are not.

When studying the extent to which the market reaction can be related to the announcement itself, it becomes evident that downgrades are more contaminated. The difference between the announcement period and pre-announcement period returns is not statistically significant for downgrades whereas it is significant at 5% level for upgrades. Downgrades tend to cluster as do bad news in general. In such situation, as Galil and Soffer (2011) point out, the contribution of any single source of information is smaller. Upgrades do not have the same tendency to cluster and thus a bigger proportion of the market reaction can be attributed to the announcement itself. Thus, upgrades, even though the overall market reaction is smaller around them, do on average explain a bigger proportion the abnormal returns than downgrades.

When carrying out additional analysis, I found that the market reaction is stronger when the rating change is bigger. I divided the sample into two groups, single-notch actions and multiple-notch actions. When the rating action was multiple notches the market reaction was bigger for both upgrades and downgrades. Surprisingly, there was no statistical significance for multiple notch downgrades whereas the MAR for day 0 was significant at 5% level for single notch downgrades. However, one possible explanation is that the number of observations in the multiple notch group is only 20 whereas the number of single notch downgrades is 484. The ratio of negative observations in the multiple notch group (59%) is bigger than the same ratio in the single notch group (56,4%) but due to the small sample size the sign test does not show significance. The results for upgrades show that one notch actions are anticipated as the only significant abnormal returns are in the [-25,-5] pre announcement period whereas for multiple notch actions the only significant abnormal returns are in the announcement window [-1,+1]. It seems that multiple notch actions come as a bigger surprise to the markets.

I also found that the initial rating of the company is related to the market reaction around the announcement day. For downgrades the market reaction is much stronger and statistically more significant when the company has been initially rated below investment grade. Hand et al. (1992)

also found economically more significant abnormal returns for the below investment grade companies but only the results for investment grade companies were statistically significant. I do, however, believe that the small sample size in non-investment grade companies (N=29) may at least partly explain the lack of significance in their study. For upgrades market anticipation is significant when the initial rating is in investment grade but announcement period returns show no significance. When looking at non-investment grade companies the only significant abnormal returns take place during the announcement period.

These results indicate that lower rated companies suffer more from a downgrade. This is in line with the findings of Avramov et al. (2009). Several factors might be behind this. Low quality firms may suffer more from costs of financial distress. Also the rating based regulation may play a part in this because institutions often have limitations set to them regarding the rating of securities they can hold in their portfolio. Therefore, when a company's rating falls below a certain threshold these institutions are forced to sell the securities and this accelerates the price decline. The different behavior of abnormal returns for upgrades between the groups can possibly be explained by psychological factors. It seems that people are more skeptical towards good news when they concern a low rated company. Therefore, the market reacts to the announcement because it acts a confirmation for the news, a confirmation which is not needed when the news concern a high rated company because people are more prone to believe them.

When studying the countries separately the results vary significantly. When looking at the results it must be kept in mind that the sample sizes were unfortunately very small for some markets but it seems that the markets in my sample react to rating announcements differently from each other. UK data yielded results that suggest a significant negative reaction to downgrades and no reaction to upgrades. This result is consistent with past findings, especially when comparing to the US results. On the other hand, Dutch data among a few others yielded very different results as there were no reactions during the announcement period for either types of actions and significant anticipation before downgrades. The results gained using Nordic data show no reaction to downgrades and a significant positive reaction to upgrades.

This raises the question about the effect of the structure of the financial markets on the stock market return to rating announcements. UK is the closest match to the US in my sample when the extent of bank financing compared to bond markets is considered. In both countries the bond

markets play a more significant role than in other countries in my sample. Therefore, the presence of rating agencies in those countries can be assumed to be stronger. This may be one factor behind the similar results between those two countries when other countries produced mixed results. I think that this would be an excellent topic for further research as it is important to understand the reasons behind the market reactions in different countries, not least due to the growing importance of rating agencies worldwide. It would be interesting to see which are more important in defining the market reaction, country-specific or company specific factors.

The image of rating agencies is very important as they play such a major role in the markets today. Relating to this, I believe that it would be useful to know how much investors give value to the similarity of the ratings. If investors do not give value to similarity (ratings from all agencies as close to the same level as possible) do they rely on a single company more than the others or think that it is somewhere in the middle? Is a rating action seen as a stronger signal when it is moved to/away from the ratings that other agencies have assigned to the same company? Finding the answer to this might help in analyzing the dynamics of the industry and shed light on how investors see multiple ratings.

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