NORGES HANDELSHØYSKOLE

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The Impact of Credit Rating Announcements on Norwegian Equities

An event study on Oslo Stock Exchange

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Executive summary

This paper studies the effect of credit rating announcements on daily stock returns for Norwegian equities listed on Oslo Stock Exchange. The empirical study is conducted using an event study, defining an event as a rating action from one of the credit rating agencies (CRA's) Standard & Poor (S&P) and Moody's. Besides core rating changes the paper also investigates several categories of other rating actions and subsamples of rating actions with certain features.

Rating news reflects the CRA's review of the company and its ability to service its debt. It is a signal to the market about the expected future performance of the company. However as a credit rating in focusing on the liability side, a credit rating can also signal the CRA's opinion about how management is prioritising a company's claimants.

If the market is concerned about the CRA's assessment and views it as an analysis of performance, we expect to find negative (positive) abnormal stock returns around negative (positive) rating announcements. If the CRA's actions are viewed as signals about altered prioritising of claimants, the opposite logic could to some degree apply. We initially assume that negative (positive) credit actions are interpreted as negative (positive) for both equity and debt holders by the market. We therefore anticipate negative abnormal equity returns for negative news and vice versa for positive news. Significant negative abnormal stock returns for negative rating actions, especially downgrades, are in line with most previous studies on the subject. On the different positive rating news, prior research is less conclusive.

The analysis does not show any significant abnormal return in the case of downgrades. However, our results display a significant negative abnormal return when aggregating all negative rating announcements, i.e. including outlook and watchlist placements. Investigating this further we find that the most severe rating action is a negative watchlist placement which shows large and significant negative abnormal returns. In addition, the negative effect is larger for small firms, unexpected rating news is more severe and a rating change between investment and speculative grade is more dramatic for the issuer's stock price. Our analysis also shows that the significance of negative rating announcements in the Norwegian market seems to have increased after the credit crisis in 2008.

Aggregating positive announcements we find a significant negative abnormal return, surprising given the positive news. The analysis of upgrades suggests negative returns as well, but delivers no significance. It seems to be the aggregation and higher number of observations when including all positive rating actions that increases the significance.

Our results support the claim that credit rating agencies provide new information to the market to some degree, especially concerning negative rating actions. The analysis of positive announcements shows somewhat puzzling results. This may be the product of other factors determining stock prices around the event, overshadowing the effect of the credit rating. Thus, positive rating actions could be regarded non-news in the Norwegian market. The results could also partly be explained by the fact that positive rating actions are not necessarily only interpreted as the CRA view about performance expectations for the issuer.

The credit rating agencies has gotten much attention in the aftermath of the crisis. The paper describes and discusses the industry and criticism against it, highlighting the various conflicts of interest. In the core of the challenges lies the business model which creates a challenging relationship between rating agency and issuer, and the regulatory authorities who plays a central role in the development going forward.

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1. Introduction

This study investigates the effect of credit rating announcements on stock returns. Our analysis includes firms listed on Oslo Stock Exchange which is rated by S&P and Moody's. If the CRA's provide any new information to the market, we should be able to detect significant abnormal returns around the announcement day. Following the financial crisis, there has been a debate whether the CRA's possess any superior skills concerning the analysis of companies. If their ratings do not contain any new information, the impact on abnormal returns should be minimal as the price already reflects all news about the firm.

As our sample is relatively small, we focus on all the different categories of rating announcements, including upgrades/downgrades, outlook and watchlist placements. Both aggregated news and samples sorted by category are investigated in order to see if there are different characteristics. We also divide the sample in several subsamples to analyse if there is a difference in significance between small and large companies, if there is larger impact connected to unexpected news, whether a downgrade below investment grade is more dramatic or if the financial crisis has affected the importance of the CRA's. We make use of daily stock returns around the rating announcement in order to try to capture the effect as accurately as possible.

The background section gives a thorough review of the CRA industry, commenting on the many conflicts of interest and historical features important for understanding of the CRA and their role and development. Especially the ratings given to complex derivatives in the preface to the financial crisis has brought much negative attention to the industry.

The thesis starts with the background in section 2, explaining the historical development as well as the methods and terminology. Section 3 describes the previous literature and findings, while the statistical methodology is explained in section 4. The data sample and discussion of possible shortcomings of this is found in section 5. Our result and interpretations of these are discussed in section 6. The last section consists of a conclusion, followed by references and appendix.

2. Background

2.1 Why credit ratings?

"The historical logic underlying the existence of credit rating firms has clearly resided within a basic problem in finance: How do lenders determine the creditworthiness of potential borrowers and assure themselves of the continued soundness of borrowers after a loan has been extended?" – White (2001, pp. 4).

The financial market is in a high degree based on trust and the access to information when transactions are made. This is especially important in the flow of funds from people that save to people that need to borrow. Financial intermediaries like banks, finance companies, insurance companies etc. is regarded specialist lenders, they have in many cases the resources and competence to access the information needed to ensure that the borrower is creditworthy and continues to stay so. However, in many cases the information can be difficult to obtain, and a big part of the financial market is regarded non-specialist lenders. Especially when corporations borrow in the public debt market, these non-specialist lenders will have a need for information they can't find themselves, or cannot find to a reasonable price. In some cases this issue exists even for many specialist lenders.

Credit rating agencies are the solution to the economical problem of asymmetrical information that emerge when borrowers know more about their financial situation than the lenders. But the agencies also provide a service to the borrowers; it makes it easier to access the bond markets by lowering investor uncertainty about the firm's financial position.

2.2 The credit rating market

The market for CRA's is dominated by three major US companies: S&P, Moody's and Fitch. S&P's credit rating services are a part of a larger financial information service that S&P provide, which in turn is owned by McGraw-Hill[1]. Moody's is an independent company listed on NYSE[2]. In addition they also provide some other financial information

[1] standardandpoor.com

[2] moodys.com

services on governments and corporations. Fitch is smaller than the two others, and is divided in FitchRatings and FitchSolutions[3]. The rating department handles the traditional credit rating of corporations and governments, while FitchSolutions deliver financial products to the market. The company is owned by Fimalac, a French company.

In our analysis, we have used data from the two biggest, S&P and Moody's. These two cover most of the relatively small Norwegian market for credit ratings.

2.3 Credit rating

The way the CRA's operate is by analyzing the given debt issuer, corporation or government, and assign a letter from a scale reflecting the creditworthiness of the issuer. In essential they determine the likelihood of default. The different CRA's has different scales from which they take their ratings, as seen in table 1.

[3] fitchsolutions.com

Table 1							
Ratings and rating classes							
Moody's		**S&P**		**Fitch**		**Description**	**Rating class**
Long-term	**Short-term**	**Long-term**	**Short-term**	**Long-term**	**Short-term**		
Aaa		AAA		AAA		Prime	
Aa1		AA+		AA+			
Aa2		AA		AA			
Aa3		AA-	A-1+	AA-	F1+	High grade	**1**
A1		A+		A+			
A2	P-1	A	A-1	A	F1	Upper medium grade	
A3		A-		A-			
Baa1	P-2	BBB+	A-2	BBB+	F2		
Baa2		BBB		BBB		Lower medium grade	
Baa3	P-3	BBB-	A-3	BBB-	F3		
Ba1		BB+		BB+		Non-investment grade, speculative	**2**
Ba2		BB		BB			
Ba3		BB-		BB-			
B1		B+		B+			
B2		B		B		Highly speculative	
B3		B-	B	B-	B		
Caa1		CCC+				Substantial risks	
Caa2		CCC				Extremely	
Caa3		CCC-				In default with little prospect for	
		CC					**3**
Ca		C	C	CCC	C		
C				DDD			
/				DD			
/	Not prime	D	/	D	/	In default	

Common for all the CRA's is that they use letters when categorizing the different ratings, with plus and minus and the number of letters to differentiate within each class. The most common rating is on long-term debt, but the three agencies also publish short-term credit ratings. The long-term rating is assigned to bonds with a maturity longer than one year, and represents the view on the medium- to long-term risk and creditworthiness of the issuer. Short-term ratings express opinion about the creditworthiness of the borrower in the near future, and is used when maturity is less than one year. This rating looks at the same characteristics as the long-term rating, but is more concerned with the liquidity profile of the issuer. The short-term rating is closely linked to funding and liquidity management, but tends to correlate with the long-term rating.

When categorizing the debt, the scale is divided in different parts following the respective creditworthiness. However, the two most important parts is the investment grade and speculative grade (junk bonds). Investment grade is considered relatively safe, while speculative grade is linked to a higher degree of uncertainty, and should therefore give a higher return. These are also called high-yield bonds. A downgrade resulting in a change from investment to speculative grade could therefore be viewed as more severe than a downgrade within the two classes, especially when taking the psychological aspects of the market into consideration[4].

2.3.1 Outlook and Watchlist

In addition, CRA's also publish updates on firms and governments. This is done by changing the outlook for the given borrower. The three big companies all make use of this method, and the outlook can vary from negative via stable to positive. Some also operate with a developing outlook, meaning that the CRA is waiting for an announcement or event from the issuer. A change in outlook is an opinion on the likely direction of the rating in the medium-term[5]. A corporation can also be put on watchlist which can be both positive and negative. This means that a rating is under review for possible rating change in the short-term[6], usually within 90 days.

2.3.2 The rating process

The rating process is fairly the same across the different CRA's, and the steps towards a new rating or a rating change is thoroughly described on their web sides. The process is displayed in figure 1. Using S&P[7] as an example, the process typically involve one lead analyst with knowledge to the industry and the issuer, and one backup analyst. In addition, a committee of five members is appointed. The role of the committee is to review, provide checks and balances and make sure that the rating criteria is followed.

[4] Chart 7 in appendix shows historical default rates related to different ratings

[5] Moodys Investor Service, 2002

[6] Moodys Investor Service, 2011

[7] strandardandpoors.com

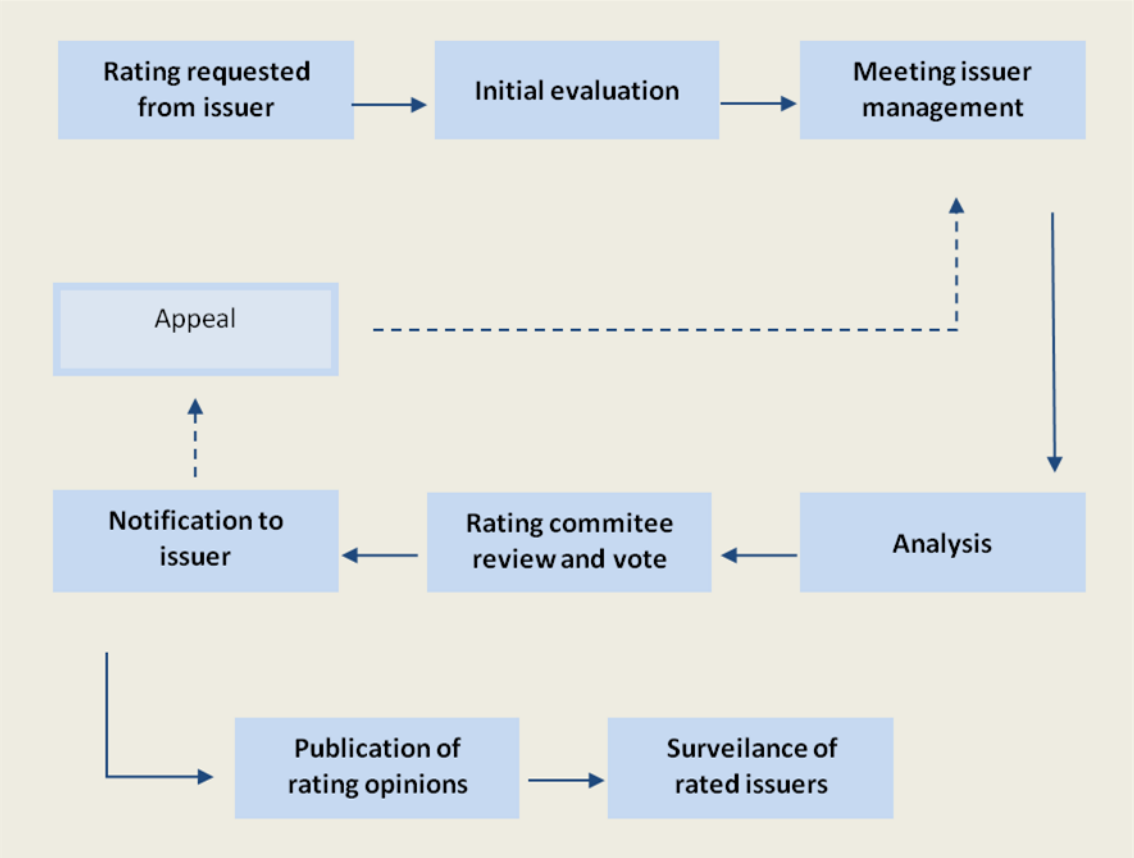


Figure 1: The rating process. Source: S&P

The analyst conducts analysis based on publically known accounting information as well as other relevant information provided by the issuer. The analysis is based on both financial and business risk factors in order to get the total risk level of the company. A part of the process is meeting with the management to probe pertinent information in greater detail, and both public information and non-public information that may be relevant to the rating agency.

The fact that the CRA may have access to non-public information like strategic plans, M&A plans etc. could increase the markets awareness when the ratings are published. The lead analyst then writes an internal report which the committee uses as starting point for the discussion regarding short-term rating, long-term rating and outlook.

Notification and publication

When the CRA assigns a rating or changes rating or outlook, the CRA almost always notifies the issuer about the rating action and the rationale behind the decision[8]. The issuer is given a limited amount of time to appeal if they disagree. In order to succeed with an appeal, the issuer needs to provide some new information to the CRA.

As rating actions are considered sensitive to the stock market, the CRA follow specific procedures for publication. The CRA's declare that their ratings are not released to anyone before publishing. For public rating actions, the CRA publish a press release which is distributed to the relevant news providers. In addition, the rating is posted on the CRA's web page, and is then automatically public available free of charge. If you want more information on the issuer like ratings history or the full report behind the rating action, you typically need to pay a subscription fee. The methodology and rationale concerning credit ratings generally is available free of charge on the CRA's website.

2.4 The central role in bond markets for CRA's

The current position of the CRA's is closely connected to the regulatory authorities, so it is useful to shed some light over the historical development of the rating agencies. The credit rating industry grew out from the US economy in the beginning of the 2000th century. At this time the ratings were sold to the investors in order to secure right information before investing. The business model involved in the beginning payment from the investor, called an "investor-pays" model (White, 2009b). This changed later for regulatory reasons, and the regulations in the US markets has since formed the CRA industry.

2.4.1 Regulators form the credit rating industry

The depression starting in 1929 changed the credit rating industry. After the depression, authorities demanded that banks were not allowed to invest in speculative securities, i.e. they had to keep their assets rated investment grade[9].

[8] standardandpoors.com

[9] See table 1 for explanation

The banks had no choice but to use the recognized bond manuals published only by Moody's, Poor's, Standard and Fitch[10]. The regulators had effectively outsourced the judgement of bond quality to these third-party agencies. In the following decades the same rule were applied to insurance companies and federal pension entities. The importance and strength of the credit rating agencies increased with these regulations.

In 1975, the Securities Exchange Commission (SEC) modified the minimal capital requirement for broker-dealers so that the requirements were sensitive to the riskiness of the dealer-brokers asset-portfolio. SEC wanted to use the ratings on the assets as the measure of risk. However, there were problems connected to who should be able to issue ratings: SEC were afraid that false rating companies would assign an AAA rating to a firm that in reality deserved DDD in order to make money.

2.4.2 NRSRO and barriers to entry

The solution was to create a new category: "Nationally Recognized Statistical Rating Organisation" or NRSRO. Moody's, S&P and Fitch were immediately let into the category as providers of ratings that satisfied the requirements to rate the broker-dealers assets. Soon the other financial regulators adopted SEC's system of NRSRO. For the next 25 years SEC has only let in four additional firms, but mergers caused the number to return to three in 2000 (White, 2009b).

As SEC was strict with NRSRO certification which was crucial to get business, the system worked as a barrier to entry for new rating agencies. This made the three incumbent companies even more powerful in the market. The SEC was also reluctant to inform how to get status as NRSRO and why some were given the certification while others were denied (White, 2009b).

The NRSRO system and the boost from regulatory authorities is not the only reason for the fewness in the CRA industry. The gathering of information is resource demanding with a high degree of economics of scale, advantage of experience and advantage of reputation. Still the regulators has contributed to that three major players dominate the market. The lack

[10] Standard and Poor's merged in 1941

of competition creates a danger that the tight and protected oligopoly may become lazy and complacent.

2.4.3 "Issuer-pays" and conflict of interest

Another important change in the industry happened when the business model changed from "investor-pays" to "issuer-pays"[11]. White (2009b) describes four[12] reasons why the business model changed, which let the door open for potential conflict of interest.

The "issuer-pays" business model gives the investors access to the ratings free of charge, while the issuer pays for the rating. According to Partnoy (2009), information gathering companies needs to satisfy three criteria before their certification on a security is regarded trustworthy by investors. First, the agent must have reputational capital at stake in the activity. This means that the agent must be able to pledge that it will suffer a loss if its ratings are systematically wrong. Second, this expected loss must be greater than the expected gain from publishing false or biased information. And third, the agent's services must be costly to obtain and related to asymmetrical information between buyer and seller.

This reputational component of the credit rating market keeps the CRA's on their toes when the investors are paying for the ratings, like they did until regulatory authorities began relying heavily on the CRA's in assessing risk in banks and other parts of the financial sector. With an "issuer-pays" model, the CRA's faces little or no risk of loss if the ratings are biased or wrong, while the gain from giving favourable ratings to their clients increases.

There is however also problems connected to the old "investor-pays" model as it represents a free-rider problem where it is easy to obtain the rating information without paying for it (White, 2009b). The question of how to compensate the CRA's while at the same time avoid conflict of interest is a central part of the debate on the future of the CRA industry.

[11] Happened in the early 1970s for the three major CRA (White, 2009)

[12] 1) Free rider problem. 2) Issuer willing to pay in order to get the CRA to vouch from them. 3) Issuers needed rating if their bonds were to be a part of the portfolios of financial institutions. 4) The market is "two-sided"; which side pays can be quite idiosyncratic.

2.4.4 Norwegian regulations

Bank regulations

Through the Basel II[13] agreement, banks are allowed to use certain CRA ratings when calculating their capital requirements. A lower rating on an asset means that the bank must hold more capital, and the CRA gets an important role when determining these capital requirements. The Basel II arrangement was imposed by Finanstilsynet[14] in Norway 2007 (Lund, interview, 2011), and Norwegian entities under these regulations are allowed to make use of ratings from S&P, Moody's, Fitch and DBRS.

However, there is another possible solution for Norwegian banks when weighting their capital requirements. If approved by Finanstilsynet, they are allowed to use internal ratings by applying the "probability default" or "loss-given-default" methods (Finanstilsynet, 2009). Combined with the relatively low historical importance, credit ratings are therefore not as central in the Norwegian bank sector compared to the US.

The Basel Commitee announced the Basel III framework in December 2010 (Finanstilsynet, 2010) as a response to the financial turbulence in 2008. The new framework will be implemented in the years to come, and involves a further strengthening of capital requirements in addition to several new requirements in order to secure short-term liquidity. These regulations will be incorporated in EU capital requirements, which will be implemented in Norway as well. The increased regulations could increase the importance of credit ratings in the Norwegian market. The implementation and exactly how the new regulations will look like is an ongoing debate both internationally and in Norway.

Insurance regulations

Solvency II is planned to be incorporated for Norwegian insurance companies from January 2013 (Finanstilsynet, 2011a). Solvency II is a review of the capital requirement for insurance industry in the EU, forwarding from Solvency I. The aim is to increase protection for policyholders, and at the same time contribute to stability in the financial market. According to Finanstilsynet (2011b) a number of Norwegian insurers lack sufficient buffers to meet the

[13] The Basel Committee is a forum for cooperation on banking supervisory matters. The Basel II agreement is an agreement on standard banking regulations between members of the committee (bis.org)

[14] The financial regulatory authorities in Norway.

new requirements entailed by Solvency II, and an effort need to be made to enable the built-up of the needed buffers. The rating of the insurance company's investments is used in relation to determining their risk and solvency level, hence their buffers. The importance of the CRA might therefore increase for the insurance industry.

Though not through Norwegian regulations, credit ratings further impacts the business of Norwegian insurance companies through rating requirements emplaced by insurance brokers. International and national brokers are unwilling to offer business to insurance companies that are not themselves rated investments grad or better by the major CRA (Pedersen, interview, 2011).

The role of the CRA's in Norway

Norwegian banks and insurance companies are influenced by the CRA directly through to capital requirements and regulations concerning their investments. Self-imposed regulations for other Norwegian investors with regards to the ratings of their assets also illustrate how the CRA has an impact on the Norwegian market and Norwegian firms in general.

However, due to the limited use of credit ratings from the major CRA in previous Norwegian regulations and the small size of the Norwegian financial sector, we assume CRA to have a relatively restrained role in the Norwegian market compared to larger economically developed countries as of today. The importance of credit ratings may increase going forward, for both banks and the insurance industry, as new financial regulations are imposed. This again could increase the importance of the CRA in the Norwegian market in general, resulting in a possible higher sensitivity regarding stock returns and rating news.

2.5 CRA's and the financial crisis

The financial meltdown in 2008 set focus to the credit rating agencies, addressing the various interest of conflict when publishing ratings, especially with the "issuer-pays" business model.

The core of the criticism against the CRA's role under the crisis origins from the ratings of structured products like CDO's[15], mortgage backed securities and other complex derivatives.

[15] Collaterized Debt Obligation

The CRA's played a crucial role in the successful sale of subprime residential mortgages and other debt obligations (White, 2009b and Partnoy, 2009). The sale of these bonds fuelled the rise in American housing prices. When the prices began to fell and the true quality of the highly rated obligations was uncovered, the financial markets collapsed.

The complex nature of the mortgage obligations that needed rating were a new opportunity and a source of irresistible temptations for the CRA's In fact, as described by Skreta and Veldkamp (2009), the more complex the securities the more will the ratings inflate due to the fact that issuers can shop around ("issuer-pays" business model) for ratings from multiple CRA's. A simple obligation is likely to get almost the same rating from all agencies, as it is easy to understand and the information is available. A more complex obligation would receive a broader range of ratings, and the issuer is able to pick the highest and most favourable. Even if the CRA's has the best intentions, the ratings would inflate.

Norwegian authorities have made an effort to minimise one of the problems related to the "issuer-pays" model. If a Norwegian firm has acquired ratings from more than one agency, the lowest rating will be used in relation to Norwegian regulations (Lund, interview, 2011).

When the housing market collapsed and the market realised that the former highly rated CDO's were in fact infected with risk, the investors lost confidence in the NRSRO ratings according to SEC (2008). This had broader consequences for the financial markets as investors fled the market for structured products with no trust in the ratings provided by the CRA's. The lack of a commonly accepted measure of risk drained the liquidity out of the CDO and RMBS[16] market.

The central role of the CRA's in the financial crisis and their dependence on reputation raises the question whether the market's perception of the CRA's has changed. Our study investigates the difference before and after the crisis for firms listed on Oslo Stock Exchange, and we will come back to this in our results.

[16] Residental Mortgage-backed Securities

2.6 Other criticism

2.6.1 Ancillary business

The business for the CRA's has changed somewhat over the last decade, opening up for ethical conflicts. The agencies now offer more than just ratings, and services like risk management and consulting have grown to be an important source of revenue for the industry. According to AMF (2004), these services include (i) analysis of ratings for investors and market professionals; (ii) databases and tools for research and credit risk modelling; (iii) general information services; (iv) "rating assessment services" for strategic acquisitions, which involve opinion on potential ratings.

This may give issuers an incentive to provide the CRA with more ancillary business in order to increase their rating. Also, the agencies may be tempted to present favourable rating prospects to issuers and later make sure that the issuer gets the promised rating from the ratings department. The CRA's claims that they avoid the conflict of interest by not offering ancillary services at all to sensitive issuers, or by creating firewalls[17] between the departments (AMF, 2004).

The IOSCO code of conduct for credit rating agencies[18] (IOSCO, 2004) does not prohibit the CRA from providing ancillary services, but indicates that the CRA should "separate its credit rating business (...) from any other business of the CRA, including consulting business, that may present a conflict of interest" (IOSCO Code of Conduct, 2004, page 6)

2.6.2 Competition

As seen in figure 2, the three dominant CRA's covers almost the entire market with Moody's and S&P at 40 % market share each and Fitch with 15 % (White, 2010). The three dominant CRA's all follow the "issuer-pays" model. The competition is fierce in spite of the fewness in the market, but competition may not be exclusively beneficial to the society. While

[17] Involves a total separation between the departments, both in terms of correspondence and physical presence.

[18] International Organisation of Securities Commision (IOSCO) Code of Conduct focuses on corporate governance rules designed to ensure quality and integrity, avoid conflict of interest and increase transparency in the credit rating business. The code does not involve any enforcement of the rules, IOSCO recommends the rules as part of the CRA's own code of conduct.

competition in itself is theory is a good thing, the business model they follow may lead to inflated ratings as the issuers will buy rating services from the CRA with the highest rating.

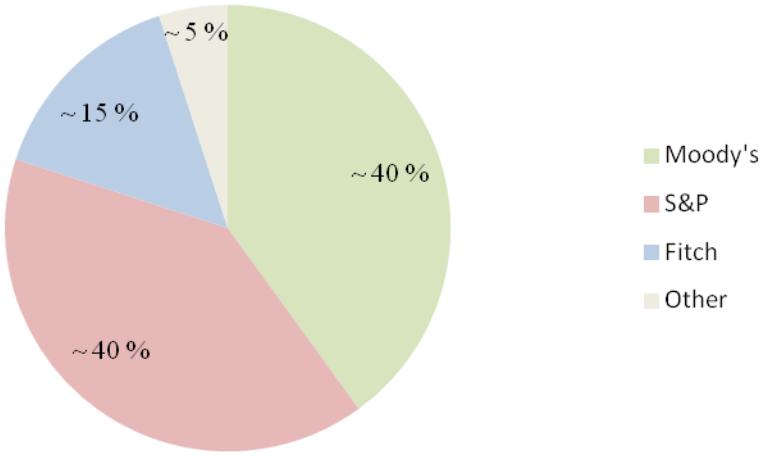


Figure 2: Market shares. Source: White (2010)

Camanho et al. (2010) develops a model which investigates the lack of competition in the CRA industry, and the consequences of more competition. They argue that there are two effects: the disciplining effect and the market-sharing effect. The first effect decreases ratings inflation as rating agencies has incentives to improve in order to maintain or gain market leadership. The other effect involves that higher competition decreases the reward from maintaining reputation as there are more competitors in the market. Reputation and trust enjoyed from investors are key elements in the CRA industry and important in order to increase business. The fewer the players, the more important this factor is. The result of the study reflects the problems with competition because in general, the market-sharing effect dominates the disciplining effect. This implies that increased competition will aggravate ratings inflation and reduce expected welfare.

On the other hand, lack of competition may have severe consequences as the incumbent agencies have reduced incentives to develop new and innovative methods for performing the credit ratings. It may also lead to monopolistic pricing as the CRA's are free to take a high price from the issuers who are dependent on the ratings in order to access the bond market.

The CRA's high profits indicate the dominance the big CRA's enjoy in the market, and may indicate lack of efficiency. Moody's, which is the only public company, had an operating profit of 44, 6 % in the second quarter of 2011 (Wall Street Journal, 2011)

2.7 CRA's in the future

2.7.1 SEC

In the aftermath of the crisis, the criticism of the CRA industry has increased and many possible solutions has been suggested to solve the problems in order to increase the integrity and the transparency. The Securities and Exchange Commission (SEC) has proposed multiple new regulations in order to prevent interests of conflict to emerge when determining ratings (SEC, 2011). Some of the suggestions are described in the following.

Greater internal control

The CRA is obliged to report on their internal control to the SEC once a year, with focus on the structure and effectiveness of the internal controls. In addition, in order to prevent interests of conflict, employees are not allowed to work with both sales/marketing and rating action on the same customer. Another proposed rule is the "look back review" which monitors former employees who participated in making a particular credit rating and how their relationship is with the particular issuer after they resigned from the CRA.

Standard performance measures

There are ways to track the CRA's and monitor their performance by checking the accuracy of their ratings. Standard performance measures would make it easier to evaluate the CRA's. It should also be easily accessible on the CRA's websites in an understandable way so that market participants can compare and evaluate.

Thrid-party due dilligence for asset-backed securities

Due diligence providers must provide a written certification to any CRA (NRSRO certified) that rates the securities. The certification is a form which describes the due diligence and the findings and conclusions. This measure is aimed to prevent complex asset backed securities to get a rating they don't deserve, like they did before the crisis.

Increase transparency and competence

The proposal also includes a higher degree of information published with each rating action. This means that assumptions and the rationale behind the analysis are included in the rating announcement. The CRA's should also establish standards to increase training, experience and competence for the credit analysts.

2.7.2 Other solutions

Clearing house

White (2009a) proposes two alternative solutions to the challenges of credit ratings. The first involves the creation of a department that houses a centralized clearing central for rating agencies. When an issuer demands a rating, it goes to the clearing house and pays a flat fee dependant on the type of debt. The clearing house then assigns the rating to one of the CRA's. This can either be random or based on criteria's like experience and knowledge which would enhance beneficial competition. This would solve the free-rider problem as the issuer still pays, the conflict of interest problem as the agency is chosen by the regulating body and the competition as the choice can be based on some degree of excellence.

Withdraw regulations

The other proposal from White (2009a) is the complete opposite and involves the withdrawal of all regulations that in effect put the CRA's in the centre of the bond market. This means more flexibility for financial institutions in where they can seek advice. They could turn to the sources they consider most reliable based on track record, competence, business models and other activities. The institutions will have to justify their choice of advisor, but the bond-information market would be opened up for new ideas, methodologies and business models in a way that has not been true since the 30's.

There may even be other instruments that could function as an information provider in financial markets. Flannery et al. (2010) presents empirical work which arguments that credit default swaps (CDS) spreads can work as a substitute for credit ratings. Their study shows that CDS-spreads incorporate new information about as quickly as equity prices and significantly more quickly than credit ratings.

The debate on CRA's and their role in the financial markets is not finished and only time will show how the business will look like in the future. The regulators control much of the business environment, and the process will be highly political driven.

3. Previous literature

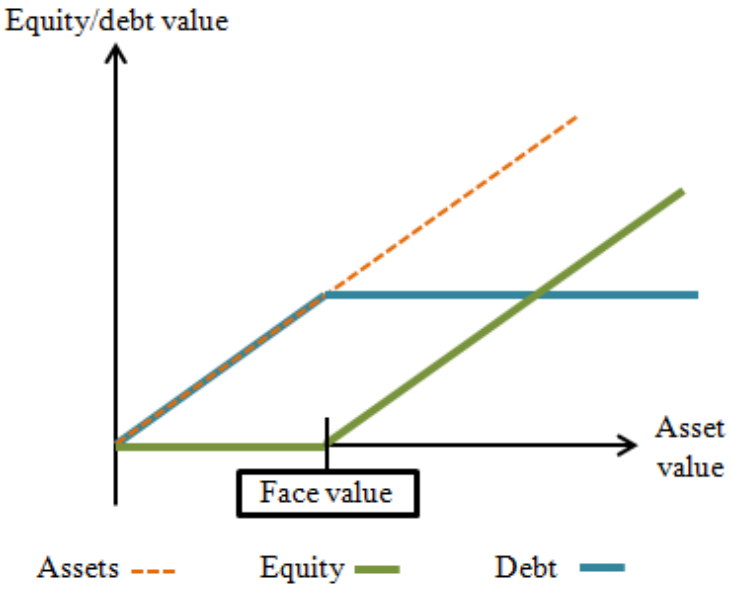
Many studies on the effect of credit ratings in stock and bond markets and the role of the CRA's in the financial markets have been performed. As our study is concentrated on what effect rating changes have on stock returns, previous literature focused on this will be presented here.

Most studies investigating what impact rating changes have on stock returns examine if there is any effect from rating actions in a specific national market. The majority of the early studies origins from the US. The reason is the well developed financial market, and the fact that the dominant CRA's started rating issuers here. In addition, data is easily accessible and the number of observations available is more extensive than anywhere else. In all markets, the analysis carried out tend to conclude that there is a significant negative impact on stock prices from downgrades and, to some degree, other negative rating actions. Further, none or insignificant effects from upgrades and other positive rating news have been found.

3.1 Credit ratings and stock returns

All though the larger part of the studies on the subject find negative abnormal return for various negative rating actions, considering the intuitive and theoretical connection between a rating action and the price of a company's stock may bring insights to the matter.

The purpose of a rating is to communicate information about a company's creditworthiness to the market and especially to lenders. A negative (positive) credit rating signals a lower (higher) expected cash flow for debt holders. Given a downgrade where the value of a company's total assets is not expected to deteriorate, this is good news for the company's stock holders, as they can expect a larger part of an unchanged cash flow. Valuing a company's stock as a call option on the firm's assets and debt as the value of total assets minus the call (or risk free debt minus a put option with the same strike price) underlines the logic, as the value of equity and debt must sum up to the value of total assets. Basically, debt holders receive the first part of the company's cash flow up to a certain threshold (face value of debt), while equity holders receive what is left after debt has been paid. Figure 3 describes the logic and relevant equations.



$$Value\ of\ debt = PV\ (Face\ value) - Put_{Face\ value} = Asset\ value - Call_{Face\ value}$$
$$Value\ of\ equity = Call_{Face\ value}$$

Figure 3 Valuing debt and equity as options

The logic applies for positive rating changes as well. If the value of a company's assets is expected to remain unchanged, this is bad news for the company's stock holders.

Therefore, bad news for bond holders need not be bad news for stock holders and vice versa. Studies on the impact of credit ratings have to some degree taken this into consideration. Creighton et al. (2004) points out that a rating change could be interpreted as a CRA's view with regards to how a firm's management prioritises a company's claimants. A downgrade could for example mean that the CRA consider stock holders to be benefited at the expense of bond holders and vice versa for upgrades.

Goh and Ederington (1993) argue that all though downgrades in general lead to negative equity return, the cause of the downgrade must be taken into consideration. They group downgrades from the US market into downgrades due to worsening financial outlook for the company, and downgrades due to increased leverage. They conclude that no negative abnormal return exists for the latter group, implying that this is not bad news for the company's stock holders. In classic corporate finance theory a firms risk and expected return is not influenced by changes in capital structure. However, the reasoning for a downgrade due to a higher debt to equity ratio is based on the possible increased risk for certain debt

holders. New debt could make old debt more risky, as it could be given a lower priority. Equity risk and required return will also rise. As negative abnormal stock returns are not found in this US study, investors in general anticipate that equity return is expected to rise in line with their required return. The higher expected return may be due to new investments and other debt financed business opportunities being revealed.

Our study does not include an analysis of the reasoning behind every rating action, thus a redo of the Goh and Ederington analysis from 1993 could not be performed on our sample of Norwegian companies.

Studies taking the reasoning behind upgrades into consideration have not been found, however, we presume that the same logic could apply. Lower leverage decreases the probability of default for remaining debt holders. The market could judge that equity holders are missing out on business opportunities resulting in a decreased stock return.

Goh and Ederington (1993) found that downgrades usually leads to negative stock returns, meaning they were most commonly related to the issuer's financial situation in their study. Their analysis carried out focusing on the US market also contains more negative rating changes related to financial performance than downgrades related to increased leverage. We assume that the same is true for the how the CRA rate Norwegian issuers. Moreover, all though downgrades does not have to be bad news for stock holders in the Norwegian market, it is most common and therefore what we expect that in our study.

Stating these features about the connection between rating changes and stock returns, we turn to studies where the motive for the rating change is not included. We note that all though discussions focusing on rating changes have been presented here, the same underlying principle applies for the less strong rating actions provide by the CRA.

3.2 Previous analysis

One of the early and most referred studies is Holthausen and Leftwich (1986). They conducted an analysis on 1014 rating changes for US companies in the period 1977 to 1982. Daily stock returns are used, as opposed to earlier research where monthly prices have been the base. They also removed observations influenced by other events in order to isolate the rating effect as much as possible. The results gave strength to the hypothesis that the CRA's

provide new information to the market when downgrading a company as the abnormal return was significantly negative. The same result did not apply to upgrades. They also tested for watchlist announcements and found that a placement on both positive and negative watchlist is associated with significant abnormal returns. Another finding was that abnormal returns also happened in the 300 days prior to the announcement, indicating that the information in which the rating action is based on were already known in the market.

Hand et al (1992) test both stock and bond returns in the UK market, and finds the same results. They also find that the effect is significantly larger for securities that are not put on a watchlist before the rating change. This indicates that the more unexpected the rating action is, the larger is the effect on the price of the security. Another finding was that the impact on abnormal returns was greater if the downgrade resulted in a rating below investment grade.

More recent empirical work such as Dichev and Piotroski (2001) indicate that upgrades have become more significant, but the effect is still about one fifth of the effect from downgrades. The study focuses mostly on log-run returns following rating actions, but they report a 3-day price effect of -1.95 % for downgrades and +0.48 % for upgrades.

Jorion and Zhang (2006) connect the stock price effect to the prior rating and find that the information effect is much stronger for the low-rated firms compared to the high-rated. The task is executed by grouping ratings based on the different classes[19] given by the CRA. Accounting for this will, according to Jorion and Zhang (2006), in large part explain the puzzle why stock price effects are associated with downgrades and not upgrades in former studies.

Several studies have also investigated the effect of credit ratings in other markets. The sample is relatively small compared to the reports on US securities, but as the CRA's has expanded their business the number of observations has increased. Creighton et al. (2004) find that both Australian equity prices and yield spreads move in the expected direction following a rating announcement, but the impact is rather small. In the case for downgrades, they find evidence of large movements in the period before the rating action. This suggests that the information the CRA's provide is already known in the market. Investigating subsamples, their results suggest that the impact is larger for small firms and that unexpected

[19] See table 1

announcements are more severe for the stock return. A re-rating from investment to speculative grade is also more severe for the stock price of the issuer.

Barron et al. (1997) examined the impact of credit watch announcements, rating changes and new ratings on corporate bonds and commercial papers on UK stock returns. They find, in line with Holthausen and Leftwich (1986), a significant negative excess return around the date of a downgrade, but little evidence for the opposite effect in the case on an upgrade. The results also suggest that a positive watchlist announcement give significant positive abnormal returns. New ratings had no significant impact on returns. They also tested the effect on the volatility of the stock returns. Increased volatility increases beta, which in turn increases the cost of capital for the company. The results showed no evidence for the hypothesis that a rating change influences the cost of capital.

The only known study of the sensitivity to ratings for the stock returns in the Norwegian market is Baumann and Hille (2008). They find evidence that downgrades provide significant abnormal returns for companies listed on OSE, while upgrades do not. This is in line with the results in international studies. In their investigation of different subsamples, they also find that the effects of negative rating actions are more significant for small than for large companies. If an issuer is not put on a negative watchlist, defined as an unexpected announcement, the impact on stock returns are more severe. Another finding is that most of the total negative returns occur in a 120 day interval prior to the rating announcement, indicating that the information provided from the CRA is already known in the market.

3.2.1 Our study

Our study is based on much of the same theory and methodology as the early studies. We perform an event study on a sample of observations, and break down the sample in order to analyse more specific parts of the data. Our sample is taken from Norwegian companies listed on Oslo Stock Exchange, which has only been done one time before (Baumann and Hille, 2008).

The limited research on the topic for Norwegian firms has been lack of data as Norwegian companies are in most part not rated by the CRA's. This has changed over the past 10 years as the CRA's has expanded their business and more companies are rated, especially the last

couple of years. Our sample is about twice[20] as large compared to Baumann and Hille (2008), which should increase our ability to make inference. In addition, we have investigated the impact of the financial crisis as the CRA's has gained a lot of attention in the aftermath of the crisis.

Still, in spite of the increased sample, our sample contains a limited number of observations compared to the international studies like Holthausen and Leftwich (1986) which had about 1000 observations. This increases their reliability significantly.

We also removed contaminated events in order to isolate the effect form rating changes as much as possible. This is in line with the early American studies. Our subsamples are also known categories from previous work, except for our pre/post financial crisis sample. This intends to investigate whether the market is more or less focused on the rating announcements after the crisis and all the negative publicity it brought to the CRA's.

[20] We have in total 133 observations against 74 in Baumann and Hille (2008)

4. Methodology

To investigate how stock prices react to credit rating changes announced by the CRA's, we make use of an event study. Financial theory states that in efficient markets, all public known information about the company is reflected in the security price. The price should then react immediately to new information in the market. By observing a security price over a relative short period of time it is therefore possible to measure the economic impact of an event.

The theory behind an event study is described in MacKinley (1997), and we will use his notations as a basis for our analysis. The structure of the analysis is first to define the event of interest and find the period (event window) in which the security prices of the chosen firms will be investigated for abnormal returns. The event in our analysis is a credit rating announcement.

To identify the abnormal returns around the event date, we must first estimate the normal return. This is done by defining an estimation window from which the market model gives us the normal return. The next step is to deduct the normal return from the actual return observed in the event window. To make statistical inference, we conduct a two-sided t-test.

The following will describe further our methods and the theory behind our analysis.

4.1 Event Window

The first task of conducting an event study is to define the event of interest and set the period of which we would like to analyse the security prices of the firms involved. In our analysis, the event is the rating action from the CRA's and involve actions concerning downgrades and upgrades, shift in outlook and if the firm is put on a watchlist.

The event date is the date which the information is publicly known. The more accurate you can identify this date, the more accurate and powerful tests can be produced. It will also be easier to measure the impact of the new information given that the information is not known in the market in front of the announcement.

Different data frequencies can be used when conducting an event study. We have used daily stock prices to examine the effect from rating changes. This gives to two advantages

(Holthausen and Leftwich, 1986, pp. 733-734), relative to less frequent data. First it gives more powerful tests given that the event date can be identified. When identifying the event dates, we have used announcement dates given by Standard & Poor and Moody's. The CRA's publish the information on their websites, often along with a press release. Second, the limited amount of time investigated around the event date reduces the chance for other events influencing the response in stock prices to the new information announced by the CRA. In our study we have also removed numerous events influenced by other happenings in the event window[21].

When defining the event window in which we seek to find abnormal returns, it is important to try to capture the entire effect of the new information. Therefore, it is customary to define the event window to be larger than the one day of announcement. This allows us to investigate whether the information has an impact in the days ahead of or the days after the rating action. Even though the CRA's are very peculiar about their confidentiality[22], it is possible that the information is leaked and rumours are spread to some market actors before the date set. A broader event window will allow us to investigate the pre-event returns to see if this is the case.

We have therefore decided to define the event window as the period 20 days before the event to 20 days after. This makes it also possible to conduct tests on different dates and time intervals within the event window. If the new information from the CRA's is known in front of the announcement, it is likely that a 20-day event window allows us to capture the possible abnormal returns reflecting this.

Inside the 41 days long event window, we have chosen to investigate different periods, referred to as event intervals. These include day - 20 to 20, - 10 to 10, - 5 to 5, -5 to 0, - 2 to 2, - 20 to - 1, 1 to 20 as well as the individual days - 2, - 1, 0, 1 and 2.

[21] See chapter 4

[22] See chapter 1.3

4.2 Normal return

In order to identify the stock price reaction to an event, we need to measure the abnormal return during the event window. This is defined as the actual ex-post return of the security in the event window less the normal return for the firm. The normal return is a measure of the return the firm is likely to have in a normal situation, i.e. unaffected by events, defined as the expected return without conditioning on the event. For firm i and the event date τ the abnormal return is

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_\tau)$$

where $AR_{i\tau}$, $R_{i\tau}$, and $E(R_{i\tau}|X_\tau)$ are the abnormal, actual return and normal return for the period τ, respectively. X_τ is the conditioning information for the normal return model.

According to MacKinley (1997), it is possible to loosely group the different approaches of how to measure normal performance in two categories; economic and statistical models. The difference is that as the first category depends on assumptions about investor preference and behaviour that are not purely statistical. Still, the economic models needs statistical assumptions, but have the potential advantage of using economic restrictions in order to calculate more accurate measures.

4.2.1 Statistical models

There are two common statistical choices for modelling the normal return: the constant mean return model where X_τ is constant, and the market model where X_τ is defined as the market return.

Constant mean return model

The constant mean return model is perhaps the simplest approach, but Brown and Warner (1985) find that it often yields the same results as more sophisticated models. This often relates to the fact that the variance of the abnormal return is not reduced much by choosing another model.

Market model

The market model is a statistical model which assumes that the return on a security is linearly dependent on the return on the market portfolio. The market model is defined as:

$$R_{ti} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it}) = 0 \qquad var(\varepsilon_{it}) = \sigma_\varepsilon^2$$

Where R_{it} and R_{mt} is the return on security i and the market return, ε_{it} is the zero mean disturbance return. The parameters in which we need to estimate is α_i, β_i and σ_ε^2. This model provides an advantage over the constant mean return model as it removes the part of variation that is related to the market return, i.e. the variance of the abnormal return is reduced. This can increase the ability to detect possible event effects, and the benefit will depend on the strength of the $R^2$of the market model regression.

Other statistical models

In addition, there are numerous other statistical models that can be used to determine normal return. An example is the factor models which are motivated by the possibility to reduce the variance of abnormal returns by adding factors that can explain more of the variation in abnormal returns. The market model is a one-factor model where the market is the only factor. However, the gains from using multifactor models are limited as the variance is only marginally reduced by using factors beside the market factor.

4.2.2 Economic models

Economic models takes in addition to statistical assumption use of economical restrictions to obtain a more accurate measure of abnormal returns. The most common is the Arbitrage Pricing Model (APT) and the Capital Asset Pricing Model (CAPM).

The CAPM states that the expected return of a security is determined by its covariance with the market return (Sharpe, 1964, Lintner, 1965), while the APT describes expected asset returns as a linear combination of multiple risk factors.

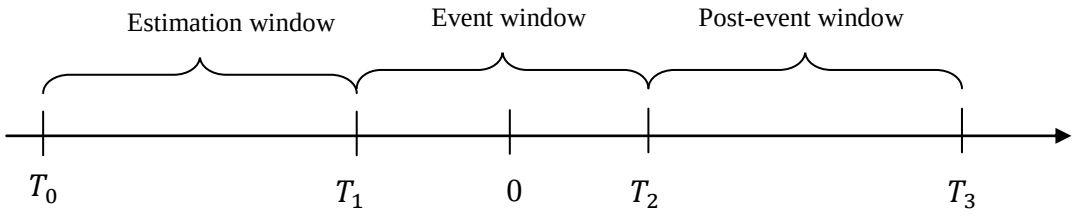
While the CAPM was widely used in the 70's when using event studies, different deviations from the model could mean that results are affected by CAPM restrictions. This can easily avoided by using the market model. As for the APT model, the most important factor seems to be the market. Other risk factors seems to add little or none extra explanation power, and the advantage over the market model is minimal.

Therefore we have chosen to use the market model in order to estimate the normal return in our study.

4.3 Estimation window

Using the market model, we need to define an estimation window in which we estimate the variables in the market model. It is most common to use the time before the event to estimate the parameters in the market model. We have chosen to use a selection of 100 trading days before the event window starts, i.e. our estimation window starts 120 days prior to the event.

The estimation window and event window do not overlap as the event would influence the parameters in the normal return model. The impact of the event would then be both on the normal and the abnormal return, which is problematic because the analysis is built around the theory that the event is captured by the abnormal return. Following the framework from MacKinley (1997), we can define the following timeline for our event study:



Define $L_1 = T_1 - T_0$ and $L_2 = T_2 - T_1$ as the length of the estimation window and the event window. The post-event window is described in MacKinley as possible to include in the estimation in order to increase the robustness of the normal return. We have not used the post-event window in our study as we regard the 100 days prior to the event window as sufficient.

4.4 Estimating the market model

To estimate the parameters in the market model, we use ordinary least squares (OLS). Given the assumptions that asset returns are jointly multivariate normal and independently and identically distributed through time[23], the estimations taken from the estimation window for firm i in event time τ is:

[23] All though the assumption is strong, this generally does not lead to problems because the statistical models tend to be robust in relation to deviations from normality and because normality is empirically reasonable (MacKinlay, 1997)

$$\widehat{\beta_\iota} = \frac{\sum_{\tau=T_0+1}^{T_1}(R_{i\tau} - \widehat{\mu_\iota})(R_{m\tau} - \widehat{\mu_m})}{\sum_{\tau=T_0+1}^{T_1}(R_{i\tau} - \widehat{\mu_m})^2}$$

$$\widehat{\alpha_\iota} = \widehat{\mu_\iota} - \widehat{\beta_\iota}\widehat{\mu_m}$$

$$\widehat{\sigma_{\varepsilon_\iota}^2} = \frac{1}{L_1 - 2}\sum_{\tau=T_0+1}^{T_1}\left(R_{i\tau} - \widehat{\alpha_\iota} - \widehat{\beta_\iota}R_{m\tau}\right)^2$$

Where

$$\widehat{\mu_\iota} = \frac{1}{L_1}\sum_{\tau=T_0+1}^{T_1} R_{i\tau}$$

And

$$\widehat{\mu_m} = \frac{1}{L_1}\sum_{\tau=T_0+1}^{T_1} R_{m\tau}$$

4.5 Abnormal returns

Using the estimation parameters for each event, it is possible to investigate abnormal returns to analyze whether CRA's bring new information to the market or not. The market model gives us the abnormal return (AR) for firm i at time τ as:

$$AR_{i\tau} = R_{i\tau} - \widehat{\alpha_\iota} - \widehat{\beta_\iota}R_{m\tau}$$

The abnormal return is the return occurring in the event window that is not explained by excess return (α) or the degree which the security moves with the market (β). Under the null hypothesis that the abnormal return is not significant different from zero, conditional on the market returns, the abnormal returns will be normally distributed with a zero conditional mean and conditional variance equal to:

$$\sigma^2(AR_{i\tau}) = \sigma_{\varepsilon i}^2 + \frac{1}{L_1}\left[1 + \frac{(R_{m\tau} - \widehat{\mu_m})^2}{\widehat{\sigma_m^2}}\right]$$

This variance consists of two parts; the disturbance variance and the increased variance due to the sampling error in α and β. However, this part will go towards zero as L_1increases. We operate with an estimation window of 100 observations, and so choose to overlook this component to the variance in abnormal returns. Finally, under H_0 the distribution of the sample abnormal return of a given observation in the event window is:

$$AR_{i\tau} \sim N[0, \sigma^2(AR_{i\tau})]$$

4.5.1 Aggregation of AR

In order to draw inference about abnormal returns it is necessary to aggregate the data from each sample analyzed. This is done through two dimensions, both through time for each firm and across all securities through time.

The sample cumulative abnormal return (CAR) for firm i from $\tau_1$to τ_2 is defined as the sum of all included abnormal returns:

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}$$

The variance of CAR_i, given that L_1 (100 in our case) is large:

$$\sigma_i^2(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1)\sigma_{\varepsilon_i}^2$$

In order to get sensible results, this is however not enough to make inference. We need to aggregate also across all observations in the sample. This is done by aggregating each individual security using $AR_{i\tau}$for each event period; $\tau = T_1 + 1, T_1 + 2, \ldots., T_2$. Given N events, we obtain the average abnormal return for period τ:

$$\overline{AR_\tau} = \frac{1}{N}\sum_{i=1}^{N} AR_{i\tau}$$

The variance is, given that L_1 is large enough:

$$var(\overline{AR_\tau}) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma_{\varepsilon_i}^2$$

Then the average abnormal returns can be aggregated over the event window so that we get average cumulative abnormal returns. This makes us able to analyze abnormal returns in different time intervals across the event window. For any interval, abnormal returns and variance is defined as:

$$\overline{CAR}(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \overline{AR_\tau}$$

$$var[\overline{CAR}(\tau_1, \tau_2)] = \sum_{\tau=\tau_1}^{\tau_2} var(\overline{AR_\tau})$$

Equivalently, it is possible to calculate CAR for each security and then aggregate through time.

Now inference can be drawn from the distribution:

$$\overline{CAR}(\tau_1, \tau_2) \sim N(0, var[\overline{CAR}(\tau_1, \tau_2)]$$

We test the null hypothesis that the abnormal returns are equal to zero. We conduct a two-sided t-test using the abnormal returns from our calculations and the sample variance from the market model regression. The distribution is asymptotic with respect to the number of securities N and the length of the estimation window. Given the fact that we have two estimators, the degrees of freedom is equal to N-2.

In the analysis we have tested on 99 %, 95 % and 90 % level of confidence level, indicated by number of stars in the tables. The p-values are also in some cases given. These values give the probability for obtaining a result at least extreme as the one observes given that the null hypothesis is true.

Using the sample variance $\sigma_{\varepsilon_i}^2$, we test H_0using θ as the test observatory.

$$\theta_1 = \frac{\overline{CAR}(\tau_1, \tau_2)}{var\left(\overline{CAR}(\tau_1, \tau_2)\right)^{1/2}} \sim N(0,1)$$

This distribution is asymptotic with respect to the number of securities N and the length of the estimation window L_1.

4.6 Proportion of returns

For analysis of all rating actions in different directions and rating changes we have also tested to see if the amount of negative returns is significantly different from 50 % in the different intervals in the event window. Based on Keller (2008) this has been done through a binomial test with the test statistic $Z = \frac{\frac{X}{n} - p}{\sqrt{\frac{p \times (1-p)}{n}}}$. The null hypothesis is that there are no more negative than positive returns, hence $H_0: p = 0{,}5$. Using the normal approximation for this binominal test requires $p \times (1-p) \times n \geq 10$ (or at the very least $p \times (1-p) \times n > 5$). We have tested to check if this condition holds for all samples where the binominal test has been used.

5. Data

The sample consists of rating announcements by two of the three leading rating agencies; Standard & Poor (S&P) and Moody's. We have received data from S&P on request and from Moody's by applying for an academic subscription to their online database. Our data consist of rating history for the Norwegian companies listed in table 2. Table 2 also include the ratings from S&P and Moody's that has been used.

Table 2

Company	Rating used Moody's	Rating used S&P
DnB	Senior Unsecured (Foreign)	Issuer Credit Rating Foreign LT (Long term)
Aker Kværner	Senior Unsecured (Foreign)	N.A
Norske Skog	Senior Unsecured (Foreign)	Issuer Credit Rating Foreign LT (Long term)
PGS	All debt*	Issuer Credit Rating Foreign LT (Long term)
Statoil	Senior Unsecured (Foreign)	Issuer Credit Rating Foreign LT (Long term)
Telenor	Senior Unsecured (Foreign)	Issuer Credit Rating Foreign LT (Long term)
Yara	Senior Unsecured (Foreign)	Issuer Credit Rating Foreign LT (Long term)
Hydro	Long term rating**	Issuer Credit Rating Foreign LT (Long term)
RCL	Senior Unsecured (Foreign)	Issuer Credit Rating Foreign LT (Long term)
Storebrand	Senior Unsecured MTN (Foreign)**	Issuer Credit Rating Foreign LT (Long term)
SAS	Backed Senior Unsecured MTN (Foreign)	N.A
Ocean Rig	All debt*	Issuer Credit Rating Foreign LT (Long term)
Saga Petroleum	All debt*	Issuer Credit Rating Foreign LT (Long term)

* No rating class given by Moody's. All individual debt show the same development and are therefore used as a proxy for a rating.
** MTN: Medium term note. Only available.
*** Four different ratings given for Hydro: LT Issuer Rating, Senior Unsecured MTN (Foreign) Subordinate MTN (Foreign) and Junior Subordinate MTN (Foreign). These all show the same development and have been used.

Our focus is on long-term ratings. From Moody's we have used Senior Unsecured (Foreign) rating and from S&P we have used Issuer Credit Rating Foreign LT (Long-term). Table 2 explains the solution we have chosen if Senior Unsecured (Foreign) rating from Moody's is unavailable for a company. A long-term rating takes into account how the cash flow and risk of the issuer is expected to evolve in the medium and long-term - more than one year ahead. We judge this to have a higher relevance for stock holders than short-term ratings, as stock prices theoretically is based on future expected earnings many years ahead. Moreover, relatively few short-term ratings were available to us from the CRA, and the once we received had an inadequate rating action history.

We have adjusted our sample for simultaneous rating actions. If both Moody's and S&P have changed their rating of a company, we have treated this as one rating change. Further, if there is both a watchlist or outlook and a rating change, the strongest rating action has been used. A rating change is the strongest signal, followed by watchlist and finally outlook, the weakest signal. For rating actions where event windows are interfering we have removed the latest event.

Identifying and removing events affected by non-credit-rating-related actions is necessary for finding an unbiased sample. Non-credit-rating-related actions can be surprising earnings announcements, public offerings and mergers and acquisitions. Events affected by these actions have been removed, if they occur in the event window. We have also removed events with such extreme returns, within the event window, that we see it as very unlikely to be caused by rating actions. Removing events based on these criteria is a process that should be watchfully conducted.

Firstly, it seems right to remove events where the effect of the rating action probably is overshadowed by more influencing happenings. On the other hand, removing events could affect the validity of our conclusions. Our sample should be an unbiased collection of events to be used for statistical inference about the effect credit ratings have. Removing rating actions could potentially threaten this condition, if we unintentionally delete events relevant to our study. The selection process and exclusion of contaminated data is important to insure that our results are not biased in either direction. McWilliams and Siegel (1997) emphasise the importance of the selection process and points out how several studies has neglected this task.

By checking all events at Newsweb[24] and Retriver[25] we have identified 55 contaminated events, which have been removed. These are shown in appendix, table 22.

Stock prices needed to conduct the event study have been collected from Datastream, from October 1991 to October 2011[26]. We have used daily adjusted stock prices, thus accounting

[24] Newsweb: News service where companies listed on OSE make announcements

[25] Retriever: News database containing articles from Norwegian news papers

[26] Given that the specific company has been listed the whole period, if not the period when it is listed has been used in the analysis

for dividends, stock splits and rights offerings. This further allows us to calculate returns unaffected by corporate actions.

The same source has been used to check the companies for infrequent trading around the events. No observations were excluded due to infrequent trading. Recognizing that giving a credit rating to an illiquid company might not be worth the effort for the company, this was no surprise. As our sample-companies are traded on the Oslo Stock Exchange, we have used the Oslo Stock Exchange Benchmark Index (OSEBX) as our Benchmark. OSEBX prices are obtained from Datastream as well.

Table 3 and 4 gives the positive and negative events we have included in our study.

Table 3

Company	Upgrade	*(removed)*	Pos. outlook	*(removed)*	Pos. watchlist	*(removed)*	Total
DnB	3		3				6
Aker Kværner	2						2
Norske Skog			2				2
PGS	3	*1*	3				6
Statoil	2	*1*	1		1		4
Telenor	1		1		1		3
Yara	1		2				3
Hydro	3	*1*	2		1		6
RCL	3		7		2		12
Storebrand	3		2		1		6
SAS	2		1				3
Ocean Rig	2	*1*	1		3		6
Saga Petroleum	1					*1*	1
Sum	**26**	*4*	**25**	*0*	**9**	*1*	**60**

Table 4

Company	Downgrade	*(removed)*	Neg. outlook	*(removed)*	Neg. watchlist	*(removed)*	Total
DnB	2	*1*	2		1	*1*	5
Aker Kværner							0
Norske Skog	9	*4*	5	*2*	3	*1*	17
PGS		*11*	1	*1*		*3*	1
Statoil		*4*	1	*1*		*2*	1
Telenor	2		1	*2*	2		5
Yara	1			*1*	2		3
Hydro	3	*2*	2		1	*2*	6
RCL	6		3	*2*	2	*1*	11
Storebrand	3	*1*	3			*1*	6
SAS	8		3		3	*2*	14
Ocean Rig						*4*	0
Saga Petroleum	2		1		1	*1*	4
Sum	**36**	*23*	**22**	*9*	**15**	*18*	**73**

5.1 Data limitaions

We recognize that our data suffers from some limitations. We have relatively few events, compared to studies conducted in larger countries like the US and the UK (Holthausen and Leftwich, 1986). This affects the significance of our results. The variance used as an estimator for the daily variance (σ_{it}^2) in the event window can be expected to decreases as the number of events increases. Because the sum of the variances in the estimation period is divided by n^2, the same abnormal returns will yield different test results depending on the number of events.

The number of events also affects the degrees of freedom, though this has only a small impact on the significance in our study. The uncertainty regarding a relatively small sample of events is accounted for when testing for significance by t-tests. However, all though our tests are performed according to statistical theory and we have removed events with extreme equity returns, we note that an event with a relatively high or low abnormal return within the tested event window could alter our test results. We observe this by checking the test results after removing various events.

The event study conducted includes the financial crisis. We suspect that this could bias our data. Our suspicion is that identifying and isolating the effect of a credit action is extra challenging in a troubling market. Also, it is reasonable to assume the volatility will be higher in certain periods in our study. The sample variance used as an estimator will thus be higher, which will influence our tests. Issues and specific test concerning the financial crisis are presented in chapter 6.6.

In addition to the macro economic factors, financial factors related to the individual companies could potentially influence our analysis. Downgrades might occur when a company is in turmoil. Isolating the effect a change in credit rating might have could therefore be challenging, as the stock price of a company in turmoil is likely to fall. We cannot with our study state with absolute certainty that the potential abnormal returns detected are due to a rating action, all though the selection of events has been watchfully carried out.

Our number of events is almost twice that of Baumann and Hille (2008)[27], the only other Norwegian study we have found which looks at how rating actions impact stock returns. This can in large parts be explained by the number of new rating actions on the same companies since 2008. However, our study also seems to differ from Baumann with regards to the selections process concerning which events should be included and which should be deleted for various reasons.

Given our higher number of events we would expect to get higher significance than Baumann. Our result tells a different story, as we generally have lower significance. Initially, we believed that possible differences relating to the selection process and the fact that our study includes the financial crisis could explain this. As the results in chapter 6.6 shows, excluding post-financial crisis events does not lead to higher significance in our tests. Our hypothesis is therefore that the difference concerning selection leads to the difference in results. As pointed out earlier, this process can influence the results dramatically.

5.2 Features concerning Norwegian data

We assume that the reason for the relatively few observations in the Norwegian market is related to the historical regulatory environment in Norway and the size of the Norwegian financial market. The regulatory body in Norway is less concerned with credit ratings as a measure of risk than what is the case in the US and several other larger English-speaking countries, where many of the referred studies have been conducted. The CRA industry plays, for reasons mentioned in chapter 2.4, a much more central role in economies with a larger financial sector and larger corporate entities compared to the Norwegian market. The CRA's especially impacts the US market, where they originated and have a great proportion of their business[28].

The narrow financial market, the limited regulatory attention offered to the CRA and the resulting low number of ratings could influence investors in the Norwegian market. It could possibly make them put less weight on rating actions when evaluating investments,

[27] Banmann and Hille: 74 observations; our study: 133 observations

[28] 52 % of Moody's revenues was generated in the US in the third quarter 2011 (moodys.com)

compared to the average investor. This again will off course have an impact on our testing of abnormal equity returns.

6. Results

6.1 Regression analysis

There may be several characteristics regarding the downgrade and the issuer that can affect the abnormal return on the event day. Following Holthausen and Leftwich(1986), we therefore employ a multivariate regression in order to explain cross-sectional variation in abnormal return on the event day for downgrades. We seek to investigate how the abnormal return is affected by four variables[29], and estimate the regression in the following:

$$AR_i = \beta_0 + \beta_1(WATCHLIST_i) + \beta_2(INV_j) + \beta_3(POST_i) + \beta_4(LARGE_i)$$

AR_i = Abnormal return for observation i on the event day.

$WATCHLIST_j$= Dummy variable equal to one if the downgrade is a resolution to a watchlist placement.

INV_i= Dummy variable equal to one if the downgrade moves the bond from investment to speculative grade.

$POST_i$= Dummy variable equal to one if the observation is defined as post financial crisis[30].

$LARGE_i$= Dummy variable equal to one if the company is defined to be large[31].

For the $WATCHLIST$ variable, we expect the sign to be positive as a watchlist placement works as a warning before the downgrade. Thus, the price response connected to the actual downgrade should be smaller compared to a downgrade not put on negative watchlist.

We anticipate the variable INV to be negative, as a downgrade between investment and speculative grade is viewed more severe for the issuer. The response in equity prices should be larger compared to downgrades within the two grades.

[29] The rationale behind the variables is discussed later in chapter 5.

[30] See chapter 5.6 for the discussion regarding pre/post the financial crisis.

[31] See Appendix, table 23.

As CRA's has gotten much negative attention after the financial crisis, we expect the importance of the CRA's in the market to be less than before the crisis. The background for this is discussed in chapter 6.6. Therefore we anticipate a positive coefficient for $POST$ as the market is less concerned with the analysis from the CRA's.

Large companies are often heavy analyzed by market participants, whereas small companies receive relatively less attention. The extra information added by the CRA's could therefore be more important for small companies. We therefore expect the sign of the coefficient $LARGE$ to be positive.

The result of our regression is displayed in table 23 in the Appendix. The explanatory power of the regression is low, in fact slightly negative (-0.2 %). None of the variables reveal any significance, and the F-statistic suggests that the regression as a whole has no explanatory power.

However, the sign of the coefficients seems to be in line with what we expected for $WATCHLIST$, $LARGE$ and INV. This indicates that a downgrade which is a resolution to a watchlist placement affects abnormal return less than an "unexpected" downgrade. In addition, it seems to be more dramatic for a small company to be downgraded, and a move from investment to speculative is more severe for the issuer. The coefficient of $POST$ is opposite of our hypothesis, and suggests that the market is more aware of the assessments of the CRAS after the crisis.

This analysis is only performed for the event day, and it is plausible that the effect from a downgrade is spread over the event window. In the reminder of the paper we will go deeper in the analysis of all types of rating actions, and investigate other time intervals than just the day of the announcement.

6.2 Event Study

In this section we will look at all negative and positive announcements aggregated, as well as different categories within these two main groups. Credit rating announcements include upgrades, watchlist and outlook placements which can be either positive or negative. Further, we will examine subsamples by grouping events with certain characteristics, in order to investigate the effect of credit rating actions more thoroughly.

All tests are performed by looking at abnormal returns within the event window, day -20 to 20 relative to the event. As mentioned earlier, we will test for significant p-values related to both average abnormal returns (AAR) for specific days close to the event, and average cumulated abnormal returns (ACAR) for specified intervals within the event window. Where the sample of events satisfies the criteria's for normal approximation, we have also tested to see if the amount of negative returns is significantly different from 50 % in the different intervals in the event window.

When testing all negative and positive events we get the highest possible number of events, n, for the tests. As pointed out earlier, this affects the significance of our tests. We therefore hope to increase the statistical power of our test by grouping downgrades, negative watchlist and negative outlook, and vice versa for positive events. Pooling different rating actions has been done by Creighton et al. (2004) for Australian equities, as well as Baumann and Hille (2008) for Norwegian stocks.

6.3 Overview of the event period

Before focusing on our more in-depth analysis of the abnormal returns and their nature, it is interesting to take a gaze at the whole event period. Interesting features important to consider in relation to our more thorough analysis may be revealed. For this reason we will look at our samples stock returns from day -120 to -20.

To execute the task of getting a first glimpse at this estimation period, the plain average return for these days has been calculated. Further, the average benchmark return for the same days has been deducted from this figure. This gives a non-risk-adjusted view of whether the stocks subject to a rating action underperform or outperform their benchmark. Examining the abnormal returns in the event window, day -20 to 20, is done by plotting the AAR. This allows us to investigate both the AAR and ACAR in the period.

6.3.1 The estimation window

Chart 1 shows the average return of all negative and positive observations in the estimation window, minus the benchmark return. This gives an impression of how the stocks have performed in the time before the event. Keep in mind that as the benchmark return simply is

subtracted from the equity return, the graph does not take the differences in beta risk into account. Moreover, the table cannot state anything with regards to statistical significance.

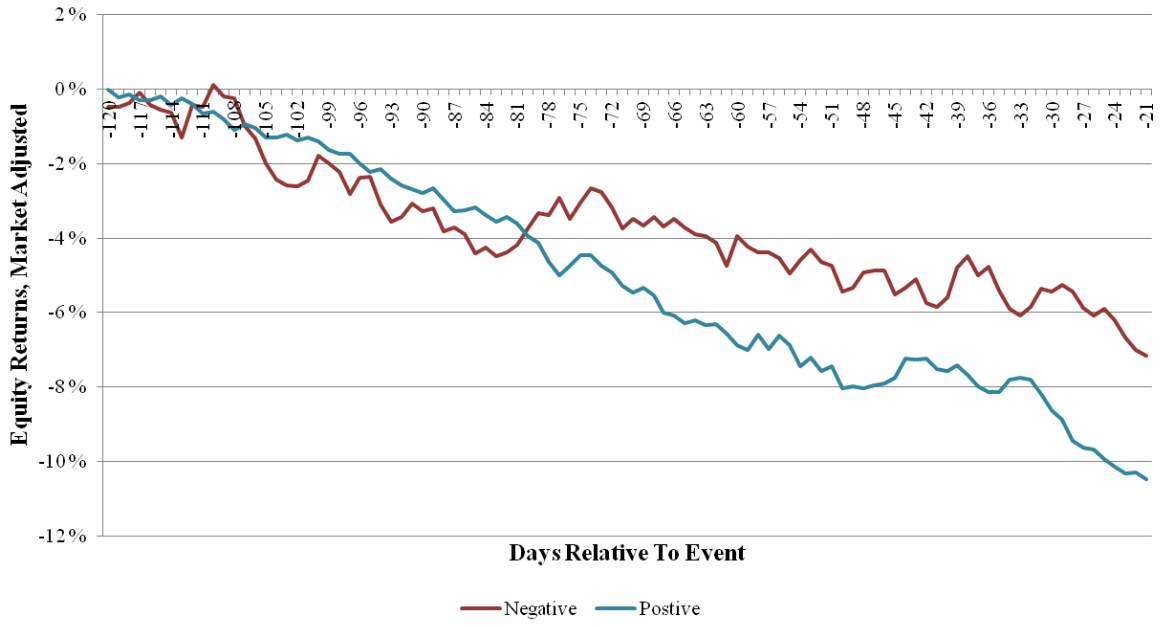


Chart 1: Market adjusted equity return. Source: Datastream (18.10.2011)

The chart shows how, on average, both companies who are subject to a positive and companies who are subject to a negative rating action underperforms relative to benchmark in the 100 days before the event window. Holthausen and Leftwich (1986) found statistical negative abnormal returns for downgrades (part of negative) in a 300 day period prior to the announcement. Acknowledging that our table does not illustrate abnormal returns (but actual stock return, less benchmark return), and without stating anything about the statistical significance, our graph could indicate that the same is true for our sample of events. The finding suggests that the information the rating action is based on is already known in the market before the event.

Underperformance therefore seems to be a reasonable result for negative rating news. However, contrary to our expectations, we observe underperformance for positive news as well. Also surprisingly, the underperformance is higher for the companies who experience positive rating news. This underperformance cumulates to approximately 12 %, while negative events give an underperformance of 9 %.

Looking at only downgrades and upgrades (chart 2) this picture changes somewhat, but still upgrades underperform by 8 %, while companies soon to be downgraded underperforms by

approximately 14 % relative to the market. Again, our graph suggests the same as what Holthausen and Leftwich (1986) uncovered with respect to the when information is reflected in the stock market (now only including downgrades).

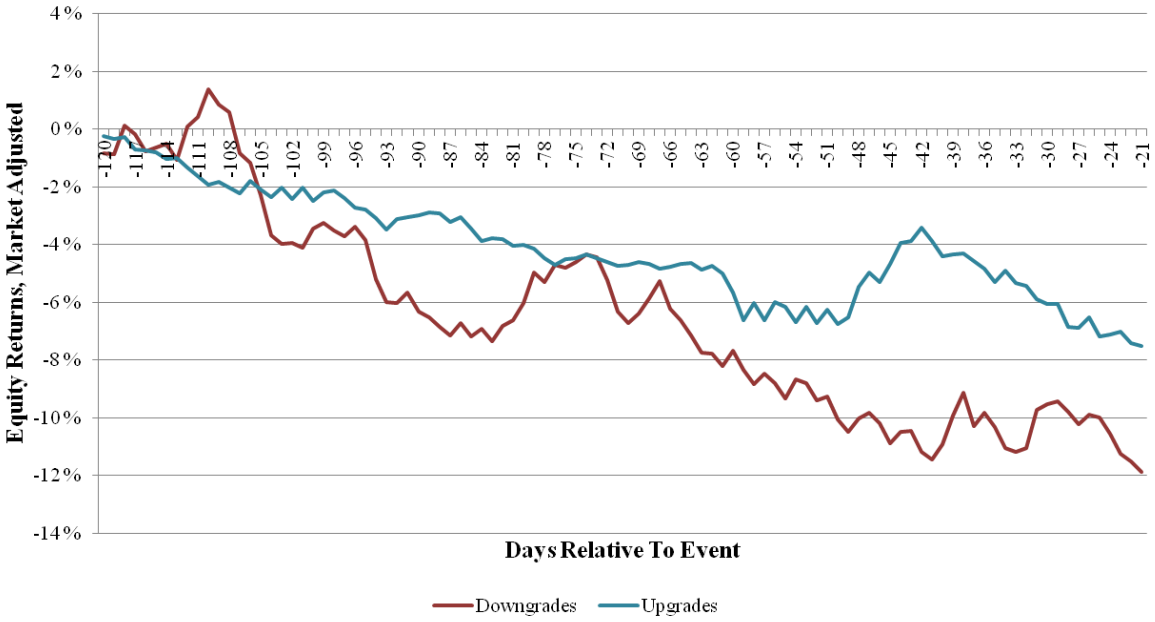


Chart 2: Market adjusted equity return, only upgrades and downgrades. Source: Datastream (18.10.2011)

A downgrade is the strongest negative signal a CRA can give on the creditworthiness of a company. Thus, it seems logical that the category downgrades, on average, gives a lower return than all negative rating actions in the period before the downgrade if the information is known in the market. Correspondently, it seems reasonable that upgrades would outperform all positive rating actions. However, we see no immediate plausible economical explanation for the fact that all positive events has a lower return than all negative events and the fact that upgrades and all positive events both have a lower return than benchmark in the period prior to the event.

Calculating the average benchmark return for all negative events in the 100 day estimation window gives approximately -5 %. For all positive events the return on OSEBX is 11 % in the period prior to the rating action. This indicates that negative rating announcements tend to follow periods of negative development on the stock exchange, and positive rating

announcement follows times of prosperity. A timeline[32] of the rating actions in our sample in relation to the OSEBX returns shows that this truly is the case for our data.

The average benchmark return in the estimation period for upgrades is 17 % and -5.3 % for downgrades, with betas of 0.89 and 0.95 respectively. Even though there are large differences related to benchmark returns, this does not change the fact that both upgrades and positive rating action underperform relative to benchmark in the period presented in chart 1 and 2.

6.3.2 The event window

Chart 3 shows the average cumulative abnormal returns (ACAR) in the event window for all negative and positive events. In difference from chart 1 and 2, the returns are now risk-adjusted. Both negative and positive events achieve an equity return just below OSEBX in first 1/3 of the 41 day window. After this the ACAR for negative events takes a sharp dip from day -6 to day 1. The average cumulative abnormal returns for positive rating actions shows a relatively stable downwards trend from day -1 to day 20.

If significant abnormal returns are found for ACAR, intervals around these days are where we would expect to find such, for all negative and all positive events respectively. At the end of the event window the ACAR for negative events is -2.4 %, and -3.4 % for positive events. Compared to the non-risk-adjusted returns presented in chart 1 this seems small, and we are unsecure as to whether our test will generate significant results for all negative and positive events.

[32] See chart 6

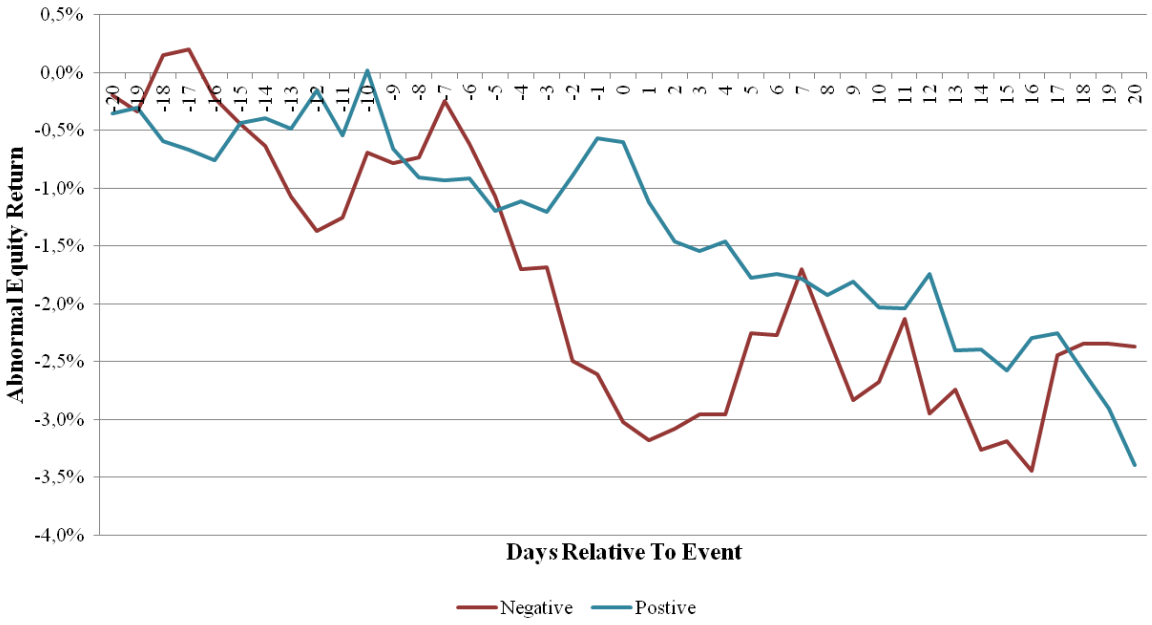


Chart 3: Risk-adjusted equity return in event window. Source: Datastream (18.10.2011)

Average cumulative abnormal returns for downgrades and upgrades are displayed in chart 4. The same trend for downgrades (part of negative) and upgrades (part of positive) events can be identified. However, we note that the downward trend for upgrades goes further down compared to positive events.

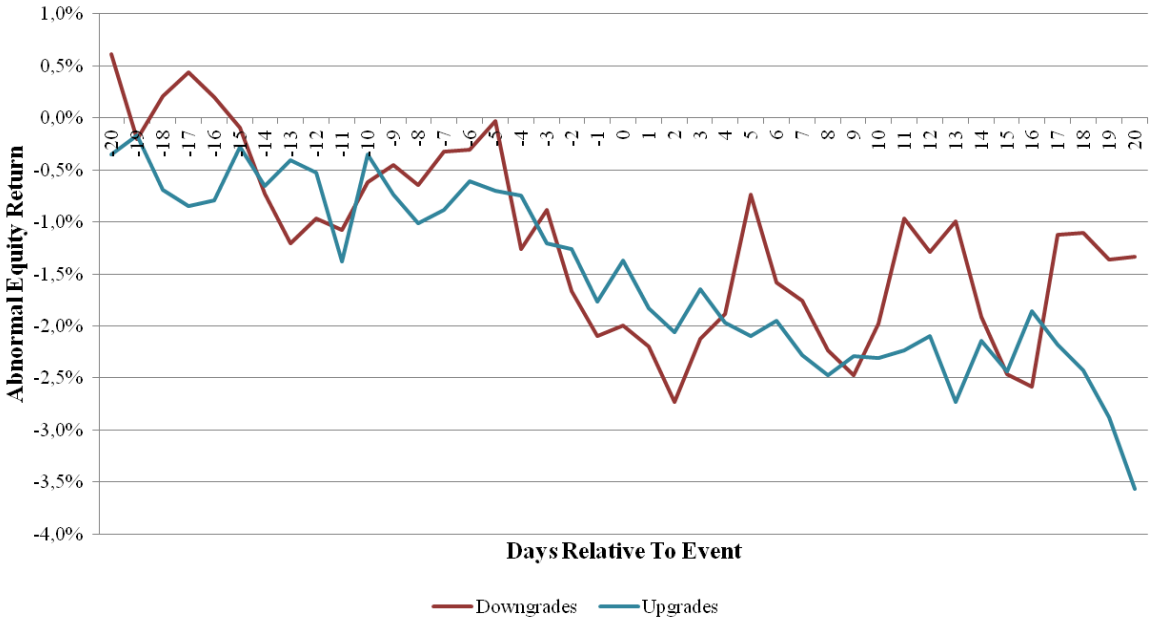


Chart 4: Risk-adjusted equity return, only upgrades and downgrades. Source: Datastream (18.10.2011)

Initially it seems natural to assume that the potential abnormal returns should be negative for negative events and positive for a positive event. The same logic applies to downgrades and upgrades. The charts show that this is not the case for either all positive ratings or upgrades in our study. The implications of these results will be discussed later in chapter 6.5. However, we emphasis the fact that no conclusions with regards to the statistical significance of the abnormal returns can be drawn based on these graphs. In light of the information chart 3 and 4 provides us with, the decision to test for abnormal returns in both directions appear reasonable. We will use a two-sided t-tests for all tests performed related to significance of the abnormal returns.

We initially suspected that rating changes will have the greatest impact on stock prices. Looking at the estimation window and the event window presented in the previous graphs it seems unclear what rating action has the greatest impact on equity returns. Including tests with pooled rating actions therefore seems interesting not only due to the higher number of events, but also due to the nature of the abnormal returns.

6.4 Negative events

First we investigate negative announcements from the CRA's both aggregated and segregated after category. According to our null hypothesis, a rating action should have no significant effect on returns. In these samples we have also included the test for the amount of negative returns in the event window.

6.4.1 All negative events

Table 5 gives the test results for all negative rating actions. All tested AAR and ACAR are negative. Based on the assumption that negative rating announcements are bad news for a company's stock holders and the charts shown in chapter 6.3.1 and 6.3.2, this is in line with our expectations. The alternative hypothesis for AAR (-2) is adopted at the 5 % significance level. At the same level of significance the alternative hypothesis for ACAR (-5 to 0) is accepted. As pointed out earlier, chart 3 indicates that a 6 day slot prior to the announcement is of interest. Our analysis of all negative events confirms this.

The results indicate that the effect of the rating action could be incorporated in the pricing of a stock in the days prior to the announcement. Chart 3 and the significant results for ACAR(-

5 to 0) further indicates that the market responds to the information by lowering the price of an equity in an interval, rather than reacting immediately when the security experiences the coming negative rating action. Significant negative abnormal returns for days prior to the announcement for all negative rating actions are in line with previous studies like Baumann and Hille (2008) and Creighton et al. (2004). However, our tests show no significance at the event date, which contradicts this previous research.

Table 5

Abnormal returns related to all negative announcements

Sample	All negative events	
# observations	73	
Stdev daily AAR	0,0039	
Day relative to event	**AAR**	**% Negative Returns**
-2	-0,81 %**	45 %
-1	-0,11 %	47 %
0	-0,41 %	52 %
1	-0,16 %	55 %
2	0,10 %	49 %
	ACAR	**% Negative Returns**
0 to 2	-0,47 %	68 %***
-2 to 2	-1,39 %	68 %***
-5 to 5	-1,63 %	71 %***
-5 to 0	-2,40 %**	63 %**
-10 to 10	-1,42 %	68 %***
-20 to -1	-2,61 %	60 %*
1 to 20	0,65 %	58 %
-20 to 20	-2,37 %	67 %***

Note 1: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test

Note 2: Test for use of normal approximation for % negative returns: $n \times p \times (1 - p) = 18{,}25$

None of the test for percentage of negative returns for AAR gives any significance. It therefore seems like it is the magnitude of some of the negative AAR and not the fact that there are many of them that produces the significance in AAR(-2).

For ACAR the picture is somewhat different, indicating a significant large proportion of negative results. This seems plausible given the negative nature of the rating action. Five of the results are strongly significant at a 1 % level.

The daily standard deviation for all negative events from the estimation window, which is used as an estimator for the variance in the event window, equals 0.0039. Given this standard deviation, chart 5 can be drawn for the relationship between the number of observations, the

power of the test statistic to reject the null hypothesis (AAR(-2, -1, 0, 1, 2) = 0) and the level of abnormal returns[33].

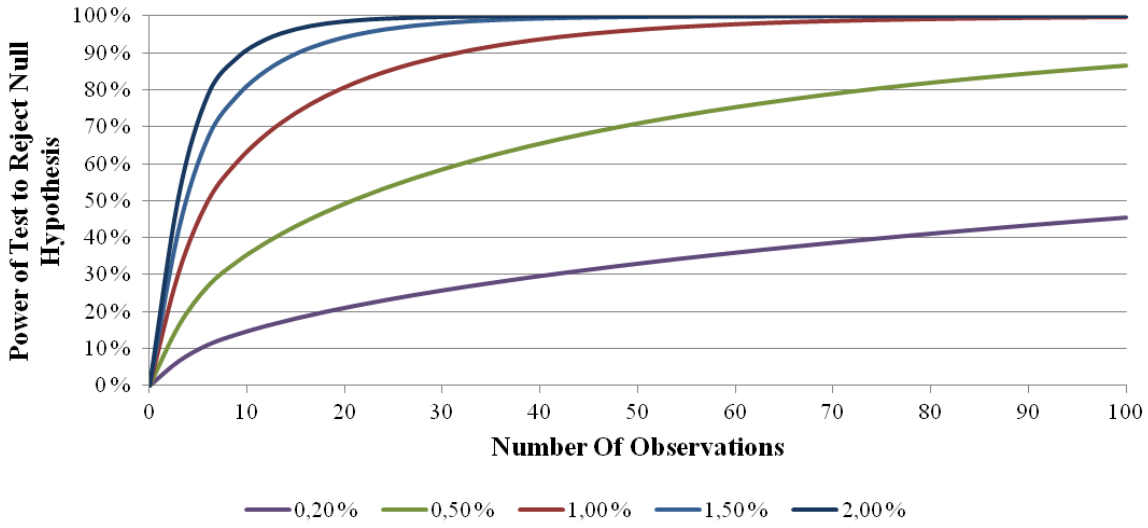


Chart 5: The power of the test at different abnormal returns in relation to the number of observations. Source: MacKinlay (1997)

The chart is used to describe how the power of the test increases as the number of observations increases for a given level of AAR. When abnormal returns are low, the power of the test will be low, even with a sample of 100 events. With 20 observations, the power of a test with an AAR of 0.5 % is only 20 %. A sample size of more than 60 is needed to reach a power of 50 % for this level of AAR. However, for a given sample size, increases in power are substantial when AAR is large. We only present this illustration for all negative events, the fundamentals however applies for all tests. The plots for different levels of abnormal returns would shift downwards (upwards) in the chart as the variance and standard deviation increases (decreases) for other samples.

6.4.2 Downgrades

We now turn to analyse downgrades isolated. In addition to AAR and ACAR, we test the percentage of negative returns in the samples.

Table 6 consist of all downgrades, 36 in total. Compared to the all negative rating events, we notice that the standard deviation is almost doubled[34]. The abnormal return for the day of the

[33] Abnormal returns in absolute value

event has a positive figure, while the others are negative. All are small and none of them yields any significance. As for the previous tables, a graphical representation can be found in chapter 6.3.1 and 6.3.2. Further, we note that most of the event intervals (ACAR) are negative. We find no significance for these tests either.

The analysis of proportions suggest a fairly evenly distribution between negative and positive returns. None of the proportions are significant. Compared to the test of all negative events, this suggests that there are a higher proportion of negative results connected to the other types of rating news concerning ACAR.

Table 6

Abnormal returns related to downgrades

Sample	Downgrades	
# observations	36	
Stdev daily AAR	0,0063	
	AAR	**% Negative Returns**
-2	-0,78%	47%
-1	-0,43%	56%
0	0,10%	42%
1	-0,20%	53%
2	-0,54%	53%
	ACAR	**% Negative Returns**
0 to 2	-0,63%	53%
-2 to 2	-1,85%	53%
-5 to 5	-0,43%	56%
-5 to 0	-1,69%	47%
-10 to 10	-0,90%	56%
-20 to -1	-2,10%	58%
1 to 20	0,66%	53%
-20 to 20	-1,33%	61%

Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test

Note 2: Test for use of normal approximation for % negative returns: $n \times p \times (1 - p) = 9$

This contradicts previous studies conducted on the subject. Holthausen and Leftwich (1986) find highly significant AAR for the period 0 to 1. This window is not presented in our study. However, by looking at ACAR(0 to 2) (-0.63) and AAR(2) (-0.54) we see that the average

[34] Partly due to the lower n and partly due to the lower average variance for all negative events.This is calculated by comparing the average variance of the observations included in the two samples.

abnormal return for day 2 is the major contributor to the negative ACAR(0 to 2). A test of ACAR(0 to 1) would give a small insignificant negative figure in our study.

Barron et al. (1997) finds abnormal negative returns for downgrade at the day of the event, allowing them to reject their null hypothesis (AAR(0) = 0). Hand et al. (1992) observe the same for day 0 to 1 (corresponds to ACAR(0 to 1), for companies with downgraded bonds.

We note that there are dissimilarities concerning methodology between Holthausen and Leftwich (1986), Hand et al. (1992) and Barron et al. (1997) and our study. We calculate the normal return parameters beta and alfa based on the interval stretching from day -120 to -20 relative to the event. The three other studies use an interval after[35] the rating action to estimate beta and alfa. Their rationale for this approach is that upgrades (downgrades) are preceded by positive (negative) excess return (Holthausen and Leftwich, 1986, pp. 740). If this is the case for our sample of events, using an estimation window prior to the event will result in higher (lower) normal returns for upgrades (downgrades). This could explain the lack of significance in our analysis of downgrades compared to these international studies as lower normal returns result in less negative abnormal returns for this category.

The choice of estimation window influence the analysis, not only for downgrades as presented here in relation to previous studies, but for all tests conducted in this event study. We will not discuss the possible implications of the differences further or address the question of what is most correct. We however note that our approach of using an estimation window prior to the event is in line with the event study mythology derived by MacKinlay (1997).

Our results concerning the effect of downgrades also differ from the only other Norwegian paper on the matter, Baumann and Hille (2008). This study, like ours, uses an estimation period prior to the event and finds significant abnormal returns on the event day. As mentioned earlier, our hypothesis remains that the dissimilarities are caused by the selection process.

The lack of conclusive negative abnormal returns for downgrades could possibly also be due to the different reasons the CRA can have for downgrading a company. If our sample of

[35] Holthausen and Leftwich (1986) day 61 to 360, Hand et al. (1992) day 62 to 361, Barron et al. (1997) day 61 to 160

Norwegian firms consists of downgrades due to equity being given a higher priority at the expense of debt, we would expect that this resulted in higher equity return for these events. Likewise, nil or positive returns is be expected if downgrades are based on higher leverage. These factors would affect our tests by lowering the average abnormal returns, thus producing less significance results when testing downgrades without considering the reason behind the rating change.

6.4.3 Negative watchlist and negative outlook

Negative watchlist and negative outlook placements are regarded less strong signals from the CRAs to the market. We therefore originally expected the abnormal returns to be smaller and generate less significant results that what was the case for downgrades. On the other hand, as has no significance was found for our sample of downgrades while all negative events generated some significance, testing these categories could reveal some noteworthy features about our data. The fact that an outlook or watchlist placement could result in a downgrade later on, may suggest that the market are more concerned with these announcements while a downgrade could be anticipated and accounted for by the market participants. This question will be more thoroughly dealt with in chapter 6.8 focusing on expected vs. non-expected rating announcements.

Table 7 shows the average abnormal return and average cumulative abnormal returns for the tested event intervals. The table includes both negative watchlist and negative outlook. For these categories no test of the proportion of negative returns has been conducted, due to the low number of events.

Table 7		
Abnormal returns related to negative outlook and watchlist		
Sample	Negative outlook	Negative watchlist
# observations	22	15
Stdev daily AAR	0,0062	0,0063
	AAR	**AAR**
-2	-0,81%	-0,88%
-1	0,56%	-0,34%
0	-0,95%	-0,86%
1	0,40%	-0,86%
2	1,26%*	-0,07%
	ACAR	**ACAR**
0 to 2	0,71%	-1,80%
-2 to 2	0,46%	-3,02%**
-5 to 5	-1,37%	-4,91%**
-5 to 0	-2,49%	-4,00%
-10 to 10	0,09%	-4,91%*
-20 to -1	-3,07%	-3,17%
1 to 20	0,12%	1,40%
-20 to 20	-3,89%	-2,64%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

Negative outlook provides few significant results, and our assumption regarding the small effect for these rating actions is confirmed. Surprisingly, AAR(2) is significant at the 10 % level, with an average abnormal return of 1.26 %. Given the negative nature of the rating action, it seems unnatural that the stock return should be positive. A reason could be that the market views an outlook placement as a weak signal, and that other events are contributing to the abnormal return. Like for all our tests, we cannot rule out the possibility that other factors influence our data, even though our selection process of events has been carefully conducted.

The picture changes when looking at negative watchlist announcements. Despite a low number of observations, the analysis reveals significant average cumulative abnormal return in the negative direction. This indicates that a watchlist placement has a consequence for equity performance, lowering the price in an interval around the event. As neither outlook or downgrade actions seems to provide any significant negative, it seems to be the contribution from watchlist announcements that influences the test of all negative rating actions in the negative direction. We will explore the relationship between watchlist and downgrades more thoroughly in chapter 6.8.

The finding partly supports the results from Baumann and Hille (2008). Their analysis displays significant negative abnormal returns on AAR(0) and ACAR(-20 to -1) for negative watchlist. Table 7 shows that we have conclusive negative abnormal returns in intervals around the event, but not on the event date itself. They find like us no evidence for a negative impact from a negative outlook announcement.

International studies on the effect of negative watchlist announcements are not conclusive. Our results are in line with the findings of Holtausen and Leftwich (1986) on US equities, but contradict what Barron et al. (1997) found for UK stocks.

6.5 Positive events

This section describes the effect from positive rating announcements on stock returns, and follows the same structure as the section on negative events.

6.5.1 All positive events

Table 8 gives the results for all positive events. We find that AAR(-2) and AAR(-1) returns positive figures, while AAR(0) and the days after the event gives negative figures. However, only AAR(1) is significant at a 10 % level with a return of -0.52 %. This means that there is less than a 10 % probability that the null hypothesis (AAR(1) = 0) is correct, given the data we have observed. This is a surprising result, given that we would expect a positive rating action to be positive news for a company's stock holders. As for our sample of negative news, we note that in the period prior to the rating action we detect abnormal returns with the expected sign, all though not significant for all positive rating action.

Our test of the percentage of negative returns shows a strange result compared to our initial expectations. For AAR(1), the proportion of negative returns are significant at a 1 % level while the AAR(2) is approved at a 10 % level. This indicates that most of the companies receiving positive rating news experience negative abnormal return on day 1 and 2 after the announcement. The same trend applies for ACAR, showing a significant proportion of negative results in five intervals. These intervals include both periods before and after the announcement day.

Table 8		
Abnormal returns related to all positive announcements		
Sample	All positive events	
# observations	60	
Stdev daily AAR	0,0028	
	AAR	**% Negative Returns**
-2	0,31%	50%
-1	0,32%	57%
0	-0,03%	47%
1	-0,52%*	68%***
2	-0,34%	62%*
	ACAR	**% Negative Returns**
0 to 2	-0,89%*	62%*
-2 to 2	-0,26%	57%
-5 to 5	-0,85%	55%
-5 to 0	0,32%	63%**
-10 to 10	-1,49%	62%*
-20 to -1	-0,57%	65%**
1 to 20	-2,80%**	62%*
-20 to 20	-3,40%*	60%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		
Note 2: Test for use of normal approximation for % negative returns: $n \times p \times (1 - p) = 15$		

Chart 3 reveal that ACAR do not have any notable trends from day -20 to -10. After day -10 the graph takes a dip before going upwards and peaking at day -1. This results in the small and insignificant ACAR of -0.57 for days -20 to -1. After the event (day 0) the abnormal returns moves steadily downwards, resulting in an average cumulative abnormal return of -2.80 % for the interval day 1 to 20 which is significant at a 5 % level.

Combined with the significant negative return on AAR(1), this is puzzling results and contrary to previous studies of positive announcements. Holthausen and Leftwich (1986) find significant positive result for positive watchlist announcements, and insignificant results for upgrades isolated. Baumann and Hille (2008) conduct the same test as we do, finding non-significant results. However, they get zero or negative abnormal returns in nine out of ten event intervals analyzed, which is somehow closer to our study. Their sample is much smaller compared to ours (29 vs. 60 positive observations), resulting in a higher variance which could explain the increased significance we find. Creighton et al. (2004) also investigates the effect from aggregated positive announcements, and find a positive significant abnormal return on the event day. They also exhibit positive abnormal returns for other periods, however not significant.

The result confirms our impression from chart 1 and 3, and imposes difficulties when seeking an economical plausible explanation for the outcome. Looking first at plausible explanations acknowledging that positive rating actions are related to negative stock returns for Norwegian companies, the cause for the news should be taken into account. In line with the logic described in relation to downgrades, if the value of a company's assets is expected to remain unchanged, positive rating actions are bad news for the company's stock holders. They are given a smaller part of an unchanged cash surplus.

Further, we suspect that a positive rating action due to lower leverage could be viewed as negative by the market as this means less cash for general business expansion. Risk and required return for equity holders will be lower with a lower debt to equity ratio. However, if this is the case for some of our events, the Norwegian market might seem to judge that these positive factors do not make up for the lost growth potential.

However, we find it difficult to believe that there is a systematic connection between a positive rating publication and a fall in the stock price for all our rating actions. Therefore we seek to find other reasons explaining the outcome.

One reason could be that the return for positive announcements follows a more random distribution, and that the development in the stock price is influenced by other events than the rating action. It could also be possible that the price is affected by factors we do not recognize and have failed to take into account when filtering our observations. The development in chart 1 shows that the companies underperform relative to benchmark in the 100 days prior to the rating action, further increasing the impression that other factors determine the negative development in stock return.

Another explanation for the unusual negative returns could be that Norwegian investors are not that concerned with a positive rating announcement, indicating that positive rating news is a "non-event" for Norwegian companies. This also means that other factors affect the stock returns around the rating. Also, the CRA's could be putting more effort in the analysis of a negative announcement. If the market assumes or predicts this, it could make them less aware of the positive news.

As mentioned, we assume that the CRA's assessment of risk has a less central role in Norwegian regulations and the Norwegian market in general, compared to their role in English-speaking countries and some EU countries. If this truly is the case, it suggests that

the market consider other news and factors to be more important for valuation, at least for positive news.

As the sample consists of all positive rating news, the outcome could be explained by one of the specific categories of announcements. Grouping all events in one direction could disguise different properties. In the following we will investigate these rating actions isolated.

6.5.2 Upgrades

Results for upgrades are presented next. The null hypothesis is the same as for previous tests, and a two-sided test has been applied. Table 9 shows that none of the average abnormal returns or average cumulative abnormal returns gives any significance.

Our findings for upgrades are thus in line with most international previous studies presented in chapter 3. However, we acknowledge that one of the newer studies, Dichev and Piotroski (2001), shows significant positive abnormal returns for upgrades. As for all positive announcements, negative AAR and ACAR is unforeseen. Still, no significance means that the null hypothesis may not be rejected, as opposed to the conclusion we could make for several event intervals in the test of all positive news. This is in large parts due to the higher variance observed with fewer events, as the difference in magnitude of the AAR and ACAR is small.

The findings related to upgrades are in line with Baumann and Hille (2008) regarding the sign of the AAR's. They also find negative abnormal returns for all AAR except AAR(0). Our hypothesis remains that positive rating actions are regarded non-news and that other factors are determining the returns, and no conclusion are drawn based on non-significant test results. However, we note that a positive figure for AAR (0) could be a sign of a positive effect on returns for upgrades.

Table 9		
Abnormal returns related to upgrades		
Sample	Upgrades	
# observations	26	
Stdev daily AAR	0,0039	
	AAR	**% Negative Returns**
-2	-0,05%	50%
-1	-0,51%	69%**
0	0,40%	31%**
1	-0,46%	69%**
2	-0,24%	46%
	ACAR	**% Negative Returns**
0 to 2	-0,30%	38,5%
-2 to 2	-0,86%	50,0%
-5 to 5	-1,49%	57,7%
-5 to 0	-0,76%	57,7%
-10 to 10	-0,93%	61,5%
-20 to -1	-1,77%	69,2%**
1 to 20	-2,20%	50,0%
-20 to 20	-3,57%	65,4%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		
Note 2: Test for use of normal approximation for % negative returns: $n \times p \times (1 - p) = 6.5$		

Three tests for the number of negative returns generate significance at the 5 % level. AAR (-1) and AAR (1) both has 69.2 % negative returns, while AAR (0) has 30.2 % positive returns. We found non-significant positive abnormal returns on the day of the event (AAR (0)). However, we see that the null hypothesis stating that the number of negative returns is equal to 50 % is rejected for the same day with a relatively high number of positive returns. From the high number of positive returns, we conclude that AAR (0) is generated by relatively low figures from several positive abnormal returns, rather than by high figures for few abnormal returns.

Baumann and Hille (2008) conduct the same test, and find like us a greater proportion of negative returns on day 1 and 2. However, they get no significance.

Various reasons for the negative abnormal returns we generally observe for positive announcements (including upgrades) are discussed in chapter 6.5.1. In relation to why no significance is observed for upgrades in our study and international studies, the logic explained by Goh and Ederington (1993) for downgrades can apply for upgrades as well. An upgrade need not be good news for stock holders, as it could indicate that the CRA find that bond holders are given a higher priority than stock holders.

Jorion and Zhang (2006) explain the lack of conclusive positive abnormal returns for upgrades by taking the prior rating into account. This has not been done in our study, due to the low number of rating changes this would return in each class.

6.5.3 Positive watchlist and positive outlook

In line with the rational for negative watchlist and negative outlook we initially expect these rating actions to have small and non-significant AAR and ACAR. We see from table 8 and 9 that all positive rating actions produce some statistical significant results, whereas upgrades produce no such test results. As the case was for rating actions in the negative direction, it seems like the magnitude of the results for all positive events are generated by the categories watchlist and outlook.

Table 10 displays the results. Investigating abnormal returns linked to positive outlook reveals the same picture in terms of the sign of the abnormal returns on the days examined, as for all positive announcements. However, as a contrast to the results for all positive events, testing for positive outlook reveals significance for one of the tested AAR's. AAR (-1) is significant at the 1 % level with a positive figure of 1.25 %, even with a higher variance in the category for outlook. This observation suggests that the market reacts to this positive rating action prior to the event. Further, this implies that the information about the rating action is known or anticipated by the market before the outlook is changed by the CRA.

We note that over the event period, the abnormal returns cumulates to -5.02 %. This is one of the three intervals which return significant results at the 10 % level. Table 10 further shows that the negative abnormal returns contributing to this sum primarily comes from days after the event.

Table 10		
Abnormal returns related to positive outlook and watchlist		
Sample	Positive outlook	Positive watchlist
# observations	25	9
Stdev daily AAR	0,0042	0,0097
	AAR	**AAR**
-2	0,17%	1,74%
-1	1,25%***	0,13%
0	-0,61%	0,36%
1	-0,48%	-0,81%
2	-0,17%	-1,11%
	ACAR	**ACAR**
0 to 2	-1,27%*	-1,56%
-2 to 2	0,15%	0,32%
-5 to 5	-1,06%	1,56%
-5 to 0	0,04%	4,21%*
-10 to 10	-2,36%	-0,66%
-20 to -1	-0,80%	3,53%
1 to 20	-3,61%*	-2,26%
-20 to 20	-5,02%*	1,63%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

For positive watchlist we see the same trend as for outlook in terms of the sign of the abnormal returns in the period prior to the event. Due to the higher variance caused by the lower number of observations, none of the AAR are however significant. AAR (-2) would have been significant at the 1 % level with a variance equal to what we found for positive outlook. Still, there are large differences between outlook and watchlist in terms of how the abnormal returns evolve. While ACAR (-20 to 20) is negative for outlooks, ACAR (-20 to 20) is positive (1.63 %) for watchlist.

Significant results for watchlist are only found for ACAR (-5 to 0), which returns a value of 4.21 % (significant at the 10 % level). We again emphasise the fact that the variance is high for this subsample. This could be one of the reasons why our conclusions with regards to the effect of a positive watchlist placement contradicts previous studies conducted on larger samples. Holthausen and Leftwich (1986), Hand et al. (1992) and Barron et al. (1997) all detect significant abnormal returns. Our conclusion concerning the significance is in line with the only Norwegian study on the subject, Baumann and Hille (2008).

It seems to be the aggregation of the three positive rating actions that give the surprising negative results shown in the table for all positive events. The main reason behind this could

be the effect from the upgrades (which is mostly negative). The significance increases as the number of observations increase accordingly. This indicates that an outlook and watchlist announcement has a more significant positive impact on the stock return whereas an actual upgrade is already calculated for by the market. As mentioned, the relationship between rating changes and watchlist placements are discussed more thoroughly in chapter 6.8.

6.6 The Financial Crisis

As a part of our study we investigate if the effect of rating announcements on stock returns has changed after the criticism against the CRA industry following the financial crisis. The CRA's played an important part of the build-up to the crisis with their favourable ratings of mortgage backed securities. When the housing prices began to fall, the market lost confidence in the CRA's ratings as the true risk of the complicated securities were unfolded. This analysis intends to investigate whether the market changed perception concerning new information from the CRA's after the crisis.

We have separated the study in positive and negative announcements, with subsamples on downgrades and upgrades, the most severe rating actions. In order to look at effects we need to decide a relevant point in time to divide the sample. We have chosen to use observations up to 20.07.2007 as the pre-financial crisis sample, and all observations after this as the post-financial crisis.

The rationale behind this is that the period before the summer of 2007 consists of observations more or less unaffected by the uncertainty connected to the fall in the American housing market. According to Partnoy (2009), by 2006 or 2007 at the latest, it was apparent that the mortgage asset correlations underlying the CDO's and the other complex securities were significantly higher that what the rating agencies had calculated. The trust in the CRA's at this time were about to take a dramatic hit. The blue line in chart 6 shows the development in OSEBX from 1992 until today. The summer of 2007 marks the top of the bull-market on the Norwegian stock exchange starting in 2003 and the start of the uncertainty in financial markets.

The columns in the chart 6 show all the rating actions in our sample categorized by year and type of rating action. The first observation is the increasing number of rating announcements the last decade, reflecting the CRA's expanding business in the Norwegian market. In

addition, in 2008 there is a dramatic increase in negative announcements showing the negative views on the future economy and the turbulence connected to the mortgage-backed securities rated by the CRA's.

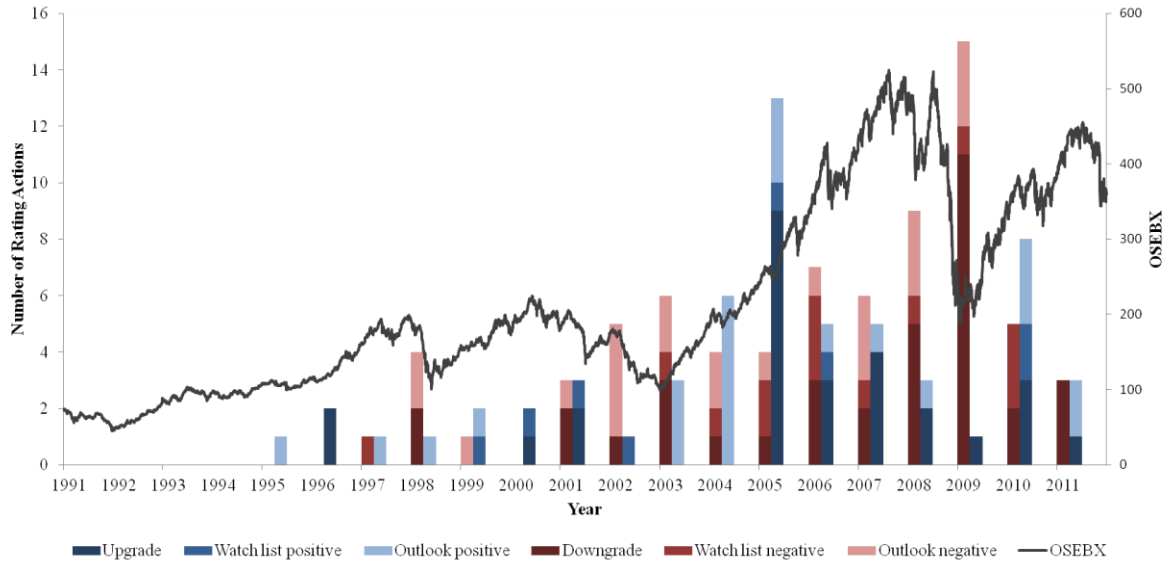


Chart 6: Historical development in OSEBX and number of observations. Source: S&P, Moody's, Oslo Stock Exchange

This means that we include the extremely volatile period in the autumn of 2008 and the possible effects this has on our statistical variables.

In total we find that the summer of 2007 is a natural point in time to divide our sample in order to investigate the effects of the financial crisis. Our hypothesis is that lack of trust in the ratings from the CRA's means that the markets put less weight on ratings after the crisis.

6.6.1 All negative annoncements

The results for all negative announcements are shown in table 11. Our analysis shows that the AAR and ACAR is mostly negative both before and after the financial crisis which is in line with our assumptions that a negative announcement means negative abnormal returns. The number of observations in each sample is about the same.

Table 11		
Abnormal returns related to all negative announcements		
Sample	Before FC	After FC
# observations	37	36
Stdev daily AAR	0,0036	0,0069
	AAR	**AAR**
-2	0,04%	-1,68%**
-1	-0,39%	0,17%
0	0,49%	-1,34%*
1	-0,11%	-0,21%
2	-0,27%	0,47%
	ACAR	**ACAR**
0 to 2	0,11%	-1,07%
-2 to 2	-0,24%	-2,58%*
-5 to 5	-1,49%	-1,78%
-5 to 0	-0,89%	-3,96%**
-10 to 10	-0,59%	-2,29%
-20 to -1	-0,71%	-4,56%
1 to 20	0,90%	0,40%
-20 to 20	0,67%	-5,50%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

Even though the period before the crisis displays mostly negative returns, the results lack significance and we cannot conclude on these findings. The results from the period after the crisis shows a somewhat different picture as the abnormal returns are larger and significant. For AAR (-2) we find a negative return of 1.68 % which is significant on a 5 % level. We also find for AAR (0) a negative return of 1.34 % on a 10 % significance level. The same picture applies for the cumulative periods where the abnormal returns are larger and significant for the periods -2 to 2 (10 % level) and -5 to 0 (5 % level).

The fact that we get significant result almost exclusively for the period before the announcement indicates that the market incorporates the information before the CRA's publish their analysis.

These results are contrary to our hypothesis that the market is less sensitive to the CRA's after the crisis. One possible explanation for this is that investors still have confidence in the CRA's and are in fact more concerned with their opinions in a time of distress in the financial markets. Dialynas and Edington (1992) points out that the yield spread is widening in economic recessions, and shrinks during times of economic expansion. This means that

investors are more concerned with risk in troubled times, and could explain the increased significance during and after the financial crisis.

The strength of the results is even more impressive when you take volatility in account. Increased volatility should, ceteris paribus, decrease the significance of our tests. The post-financial crisis sample has around two times as high volatility as the pre sample, but still shows more significant results.

However, the period defined as post-financial crisis include a period with a substantial amount of negative news. Thus our results could be affected by other events and it is hard to conclude exclusively that the significant abnormal returns displayed are a consequence of the rating action.

6.6.2 Downgrades

In the previous literature, downgrades have been the rating action with the most impact on stock returns, in a negative way. Thus it is interesting to investigate downgrades separately when comparing pre- and post-financial crisis.

The results are presented in table 12. It shows mostly negative returns, but unlike all negative announcements, none of the results are significant, in line with our previous tests. Hence we cannot draw any conclusions concerning downgrades. This could be a result of high volatility[36] and few observations compared to the sample consisting of all negative rating actions.

[36] 0.0091 for downgrades vs. 0.0069 for all negative

Table 12		
Abnormal returns related to downgrades		
Sample	Before FC	After FC
# observations	13	23
Stdev daily AAR	0,0069	0,0091
	AAR	**AAR**
-2	-0,30%	-1,05%
-1	-0,67%	-0,30%
0	0,93%	-0,37%
1	-0,29%	-0,15%
2	-0,91%	-0,32%
	ACAR	**ACAR**
0 to 2	-0,28%	-0,83%
-2 to 2	-1,25%	-2,18%
-5 to 5	0,42%	-0,91%
-5 to 0	-0,39%	-2,42%
-10 to 10	-2,07%	-0,23%
-20 to -1	1,41%	-4,08%
1 to 20	-0,32%	1,22%
-20 to 20	2,02%	-3,23%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

6.6.3 Positive annoncements

Table 13 displays the results for all positive announcements. The result follows our previous results concerning positive rating news as the returns are mostly negative. We find significance for a negative return of -1.14 % at AAR(2) after the crisis, and for ACAR(1 to 20) at -2.77 for the period before the crisis.

The reason for these negative finding could come from reasons discussed previous in our paper. We will therefore not go through them again, but we conclude that no inference can be drawn on the difference pre/post the financial crisis for all positive events.

Table 13		
Abnormal returns related to positive announcements		
Sample	Before FC	After FC
# observations	44	16
Stdev daily AAR	0,0035	0,0046
	AAR	**AAR**
-2	0,40%	0,06%
-1	0,36%	0,20%
0	-0,24%	0,55%
1	-0,50%	-0,58%
2	-0,05%	-1,14%**
	ACAR	**ACAR**
0 to 2	-0,79%	-1,18%
-2 to 2	-0,02%	-0,91%
-5 to 5	-0,61%	-1,50%
-5 to 0	0,59%	-0,44%
-10 to 10	-1,36%	-1,83%
-20 to -1	-0,56%	-0,61%
1 to 20	-2,77%*	-2,88%
-20 to 20	-3,56%	-2,94%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

The same picture applies when investigating only upgrades. The results are found in table 19 in the appendix, and suggest no difference in the two periods. The only significant results are found in AAR(2) and ACAR(-20 to 20), but with a negative return.

6.7 Small vs big companies

We test if there is a difference in sensitivity to rating actions between small and large companies. Our hypothesis is that small companies are more dependent on a credit rating than large due the relatively less attention they get from the market. Large companies tend to have more analyst coverage as they are more interesting to a broader segment of investors. This is given that the markets are not fully efficient. If markets were fully efficient, this argument would not be valid as this means that the markets at all time reflects all available information, meaning that there would be no difference between small and large companies. As we assume that the information is less available, we expect that the market puts more weight on the CRA's assessment which creates a larger and more significant impact on the returns for small companies.

We segment our sample based on market capitalization, and find a natural separation at about 31 billion NOK with Royal Caribbean Cruiselines as the largest in the small category. The smallest in the big category is Hydro with a market cap at about 57 billion NOK. The data is collected from Oslo Stock Exchange[37] and the Amadeus database available through The Norwegian School of Economics (NHH)[38].

6.7.1 All negative annoncements

We investigate the difference first for all negative announcements. The results are shown in table 14. We find as expected mostly negative returns for small companies with significant results for AAR (-2) with a return of -1.14 % at 5 % level, ACAR (-2 to 2) with a return of -2.03 % at 10 % level and ACAR with a return of -3.44 % (-5 to 0) at 1 % level. The negative returns are substantial and much higher than for large companies. In the large company category we find no significant results which support our hypothesis that negative rating actions are more severe for small companies. This also indicates that our assumptions concerning the efficiency of the market being higher for large than small companies.

[37] oslobors.no

[38] See appendix table 22

Table 14		
Abnormal returns related to all negative announcements		
Sample	Small companies	Large companies
# observations	53	20
Stdev daily AAR	0,0048	0,0061
	AAR	AAR
-2	-1,14%**	0,08%
-1	0,00%	-0,43%
0	-0,70%	0,35%
1	0,00%	-0,58%
2	-0,19%	0,87%
	ACAR	ACAR
0 to 2	-0,89%	0,64%
-2 to 2	-2,03%*	0,29%
-5 to 5	-2,16%	-0,23%
-5 to 0	-3,44%***	0,34%
-10 to 10	-2,09%	0,35%
-20 to -1	-3,49%	-0,27%
1 to 20	0,61%	0,77%
-20 to 20	-3,58%	0,85%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

The fact that most of the significant results occur in the period before the announcements further confirms the impression we get from other analysis that the CRA's are somewhat lagging the market with their information.

In theory the small firms should display a smaller volatility compared to large. This is due to the often more stable market positions and predictable cash flows for the large companies. As mentioned earlier, they are also more closely analyzed than small companies, and tend to have a higher degree of liquidity in the daily trade of the stock.

Our results indicate the opposite with a higher volatility for the large companies. This can be because the number of observations for large companies are limited compared to the number of observations for small companies. A larger sample reduces the uncertainty and the volatility in the sample.

6.7.2 Downgrades

We have also investigated the effects from only downgrades, the most severe rating action. The results are presented in table 15, and show somewhat puzzling results compared to our

expectations. Even though most of the abnormal returns are negative for small companies, none of them are significant. For large companies, we get a significant negative result for AAR (-1) with a return of -1.58 % (10 % significance). The rest is not significant, but the results are opposite from the sample including all negative announcements.

Table 15		
Abnormal returns related to downgrades		
Sample	Small companies	Large companies
# observations	28	8
Stdev daily AAR	0,0078	0,0079
	AAR	**AAR**
-2	-1,06%	0,20%
-1	-0,10%	-1,58%*
0	-0,19%	1,12%
1	0,08%	-1,19%
2	-1,00%	1,08%
	ACAR	**ACAR**
0 to 2	-1,11%	1,01%
-2 to 2	-2,27%	-0,36%
-5 to 5	-0,11%	-1,55%
-5 to 0	-1,95%	-0,75%
-10 to 10	-0,80%	-1,23%
-20 to -1	-2,57%	-0,43%
1 to 20	0,62%	0,83%
-20 to 20	-2,14%	1,51%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

The reason for this is difficult to explain as we would expect more significant result when only analyzing downgrades. Baumann and Hille (2008) perform the same study on Norwegian companies, and gets significant results for both small and large companies.[39] Creighton et al. (2004) gets significant results only on small firms in their analysis of the Australian market.

The reason why all negative announcements display significant result according to our expectations, while downgrades do not, could be that all negative includes watchlist and outlook opinions. These rating actions occur often before an actual downgrade, and the

[39] Small firms: AAR (0) with a return of -4.1 % at 10 % significance. Large firms: AAR (-1) with a return of -1.2 % at 10 % significance.

effect on stock returns could therefore be already calculated for by the date of the actual downgrade.

6.7.3 Positive annoncements

We have also studied the effects of positive announcements. The results are listed in table 16. AAR (-1) with a return of 0.77 % for small companies is reasonable given that small companies are more dependent on rating announcements. This finding isolated could indicate that small firms are affected by the positive rating. The other four significant results have negative abnormal returns which are unexpected given the positive news, and could display a more random distribution of returns. The returns could be affected with other events we have not recognised in our filtering of observations, as discussed previously.

Baumann and Hille (2008) have performed the same study and conclude that there are no significant results regarding the difference between small and large companies concerning positive news, either all events or only upgrades.

When investigating only upgrades[40], we see a more fragmented picture with significant negative results both for small (ACAR(1 to 20)) and large (AAR(-1)). The table of results is found in the appendix. We cannot make any inference regarding the difference between the two classes.

[40] See appendix, Table 20

Table 16		
Abnormal returns related to all positive announcements		
Sample	Small companies	Large companies
# observations	38	22
Stdev daily AAR	0,0041	0,0029
	AAR	**AAR**
-2	0,36%	0,22%
-1	0,77%*	-0,47%
0	-0,01%	-0,06%
1	-0,57%	-0,45%
2	-0,43%	-0,18%
	ACAR	**ACAR**
0 to 2	-1,00%	-0,70%
-2 to 2	0,13%	-0,94%
-5 to 5	-0,42%	-1,61%
-5 to 0	1,12%	-1,07%
-10 to 10	-2,23%	-0,20%
-20 to -1	-0,86%	-0,08%
1 to 20	-3,88%**	-0,93%
-20 to 20	-4,74%*	-1,07%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

6.8 Expected Vs. unexpected

We have also created a subsample consisting of events we have categorized as expected or unexpected downgrades as done in Creighton et al. (2004) and Baumann and Hille (2008). Unexpected downgrades are defined to be downgrades that have not been put on a negative watchlist prior to the announcement of the downgrade. Thus the market has gotten no warning that the CRA are analyzing the company for a possible downgrade. Our hypothesis is that the impact on the stock return is more significant following an unexpected downgrade compared to an expected.

The results are displayed in table 17. The average abnormal returns for the days surrounding the event are negative for unexpected returns, but none are significant. This is contrary to the findings of Creighton et al. (2004) and Baumann and Hille (2008). The latter found significant negative results for AAR (0), but their sample consisted only of 8 observations against our 27. The results for expected downgrades are both positive and negative, with no significant result. This indicates that the impact of a "known" downgrade is small and negligible.

Table 17		
Abnormal returns related to downgrades		
Sample	Expected	Unexpected
# observations	9	27
Stdev daily AAR	0,0117	0,0061
	AAR	**AAR**
-2	0,16%	-1,10%
-1	0,38%	-0,70%
0	1,46%	-0,35%
1	-0,45%	-0,12%
2	-0,30%	-0,62%
	ACAR	**ACAR**
0 to 2	0,72%	-1,09%
-2 to 2	1,27%	-2,89%*
-5 to 5	3,84%	-1,85%
-5 to 0	3,43%	-3,39%*
-10 to 10	6,40%	-3,33%
-20 to -1	7,33%	-5,24%
1 to 20	5,59%	-0,98%
-20 to 20	14,39%*	-6,57%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

However, for average cumulative abnormal returns, our results suggest that unexpected rating announcements have a more severe impact. ACAR (-2 to 2) gives a significant result of – 2.89 % at a 10 % level. Also, all the cumulative results display negative abnormal returns for unexpected rating actions and all positive for unexpected. This supports the hypothesis that unexpected news has a larger negative impact on returns.

Our test also show a significant positive result for expected rating actions in the period -20 to 20. This is a strange result given that the news is negative, but together with the fact that all cumulative returns are positive, this could mean that the downgrade is already accounted for in the markets.

6.9 Between investment and speculative grade

In the following analysis we have divided downgrades into downgrades within investment grade or within speculative grade and downgrades between the two[41]. We suspect that a

[41] See table 1

change between the two grades could have a greater impact on stock returns than a downgrade within one. One reason is the considerable differences in historical default rates between lower investment grade and non-investment grade. As an example, the average cumulative default rate for a BB- rated corporate bond is 4.75 times as high as the default rate BBB rated bond after one year[42].

However, there are major alterations in the default rates for downgrades within investment grade and speculative grad as well. The psychological aspect of a downgrade may on the other hand be more severe to investors if a downgrade sends a security from investment grade to speculative grade. Regulations for institutional investors with regards to the amount of speculative rated stocks they can hold could also contribute to lowering the abnormal returns related to such rating actions.

Companies being downgraded to speculative grade are likely to be in turmoil. We therefore acknowledge that the risk regarding whether our observations are contaminated by other more significant factors may be greater for such downgrades. There may be happenings outside the event window influencing the test results.

[42] See Appendix, chart 6

Table 18		
Abnormal returns related to downgrades		
Sample	Within grades	Between grades
# observations	32	4
Stdev daily AAR	0,0069	0,0132
	AAR	**AAR**
-2	-1,11%	1,84%
-1	-0,48%	-0,04%
0	0,25%	-1,08%
1	0,21%	-3,45%
2	-0,37%	-1,88%
	ACAR	**ACAR**
0 to 2	0,09%	-6,41%***
-2 to 2	-1,50%	-4,61%
-5 to 5	0,22%	-5,64%
-5 to 0	-1,29%	-4,84%
-10 to 10	0,51%	-12,14%**
-20 to -1	-2,18%	-1,40%
1 to 20	1,35%	-4,83%
-20 to 20	-0,59%	-7,30%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

The analysis conducted is presented in table 18. As suspected, the abnormal returns are more negative for downgrades between investment grade and speculative grade. None of the AAR between the two grades gives any significance, but two of the tested intervals do. ACAR (0 to 2) is significantly negative at the 1 % level, while ACAR (-10 to 10) returns the same at the 5 % level. No significance is found for any of the test conducted on the group for downgrades within investment grade or speculative grade.

Our finding contradicts what Baumann and Hille found in 2008 for Norwegian stocks and what Creighton et al. uncovered for Australian equities in 2004. Their tests allowed them to conclude on the opposite. Hand et al. (1992) however concluded like us, that a downgrade from investment grade to speculative grade have the greatest impact on stock returns.

7. Conclusion

We observe that both all positive and all negative announcements, as well as upgrades and downgrades, have negative returns in the interval prior to the event period, compared to the non-risk-adjusted benchmark in the estimation period. The deviation from benchmark could suggest that the information in which the rating is based on is accounted for by the market before the rating action is announced. The CRA's therefore seems to bring little new input to the market.

However, our statistical evidence indicates that there are some significant abnormal returns surrounding the event day supporting the hypothesis that the CRA's play a role in the Norwegian market. For the different categories we have investigated, positive outlook and negative watchlist placements has the most significant influence on equity returns. Positive outlook has positive abnormal returns, while negative watchlist shows negative abnormal returns, the initially expected sign for positive and negative news respectively. This suggests that unforeseen and less severe rating announcements have the most dramatic impact on the Norwegian market.

Negative events

In our study we find evidence that a negative rating announcement gives significant negative abnormal return for stocks listed on the Oslo Stock Exchange. When investigating the different categories, our study reveals that watchlist announcements give the most dramatic impact on stock returns. A negative outlook placement provides no significant impact on returns.

We find no significant results for downgrades isolated, which should be the most important signal to the market according to previous studies. This evidence indicate that CRA's not provide any new information to the Norwegian market when downgrading as the information is already accounted for in equity prices.

Positive events

Contrary to previous studies, our study suggests a negative impact on stock return connected to all positive rating announcements. It is hard to find a plausible economical reason behind this, but the result could indicate that a positive rating announcement is a non-event for Norwegian firms. This means that other factors are determining the stock returns and that the

positive rating announcements are not considered important by the market. Another explanation for the unforeseen results on these tests could be that good news for debt holders need not be good news for stock holders.

Breaking down the positive observations, it seems to be the aggregation of positive rating announcements that provides the negative impact on returns. Upgrades suggest no significant results, though negative returns, while positive outlook and positive watchlist show significant positive abnormal returns in varies intervals.

Subsamples

The financial crisis has given much negative attention to the CRA's, but our results provide evidence that the market is more concerned with ratings now than before the crisis. Earlier studies find evidence that investors are more wary regarding risk in troubled times than in booms, and this could be the reason for the result.

Another finding is that negative news seems to have a larger impact on small firms. Unexpected rating announcements are more dramatic than expected, further supporting our finding regarding the importance of unpredicted rating actions. Also, a rating change between investment and speculative grade is more severe compared to a rating change within grade.

8. Further research

Working with the thesis, we have identified matters that we consider to be of interest to get a better understanding of how the CRA influences the stock market. The issues are related to the data material we have exploited, the metrology used in this event study and what other analysis that could be performed to get insight on the matter.

Obtaining more data on rating actions from the CRA would make our tests more robust in two ways. Additional observations would most likely decrease the variance in our t-test. Further, our analysis would be less sensitive with regards to outliers in our data set when calculating AAR and ACAR. Making inference and drawing conclusions would thus be easier. As we have captured almost the entire Norwegian market for ratings, looking abroad, perhaps to the other countries in Scandinavia, could be a solution. From chart 6 we see that the number of rating actions on Norwegian issuers has increased considerably over the last years. This suggests that there may be possible to acquire further understanding of what impact the CRA have in the Norwegian market in the future with more observations.

In relation to the event study mythology, finding out more about what is the appropriate estimation period for calculating normal stock return is in our opinion worth investigating. We have used a period prior to the rating action, in line with MacKinlay (1997). As pointed out, other studies like Holthausen and Leftwich (1986) have used a period after the rating. We suspect, without having tested this for our events, that the results of an event study may be considerably influenced by the choice of estimation window.

Additionally, grouping rating changes for Norwegian firms based on the CRA reason for the downgrade/upgrade could prove interesting. Goh and Ederington (1993) showed that taking this into consideration reveals interesting differences between downgrades due to financial deterioration and downgrades due to a higher debt-to-equity ratio.

Tests could be conducted to see if long-term and short-term rating effect stock returns differently. The lack of history for short-term ratings is however a problem for the Norwegian market. Looking into whether the cost of capital or the liquidity changes due to rating actions for Norwegian companies are other areas of interest.

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10. Appendix

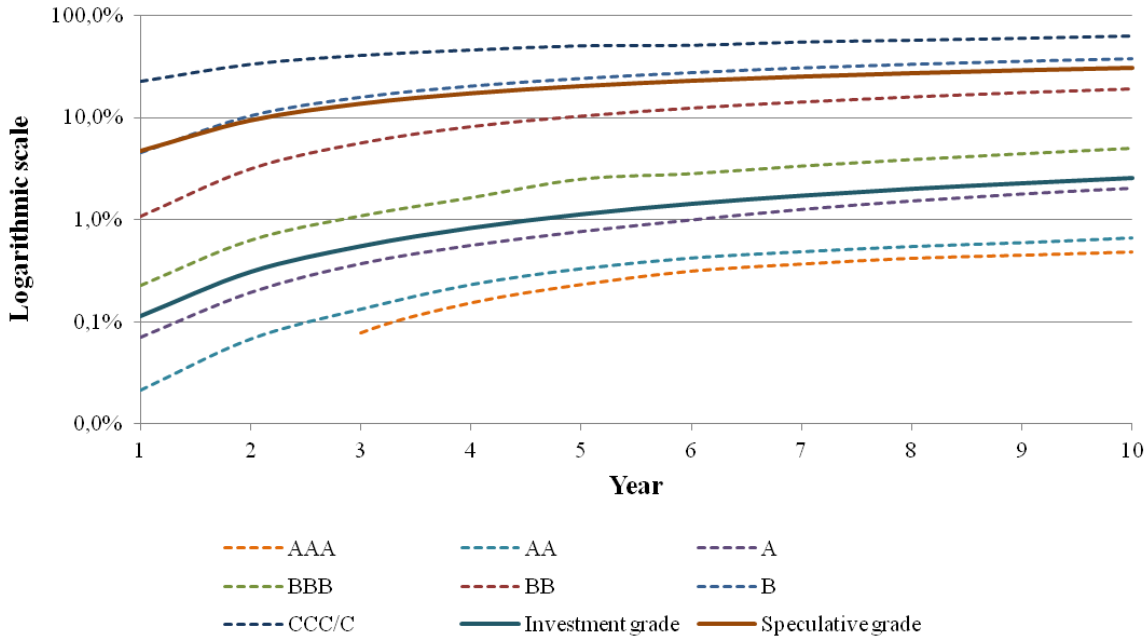

Chart 7: The relationship between rating class and historical default rate. Source: Standard & Poor's Global Fixed Income Research, Standard & Poor's CreditPro and Moody's Investors Services. Equally weighted between Moody's and S&P

Table 19		
Abnormal returns related to positive upgrades		
Sample	Before FC	After FC
# observations	18	8
Stdev daily AAR	0,0049	0,0049
	AAR	**AAR**
-2	-0,46%	0,40%
-1	-0,18%	-0,71%
0	0,04%	0,67%
1	-0,37%	-0,29%
2	0,32%	-1,07%*
	ACAR	**ACAR**
0 to 2	-0,01%	-0,70%
-2 to 2	-0,64%	-1,01%
-5 to 5	-1,74%	-0,72%
-5 to 0	-1,34%	0,95%
-10 to 10	-2,28%	1,94%
-20 to -1	-3,38%	2,27%
1 to 20	-2,78%	-0,60%
-20 to 20	-6,11%*	2,34%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

Table 20		
Abnormal returns related to upgrades		
Sample	Large companies	Small companies
# observations	10	16
Stdev daily AAR	0,0044	0,0057
	AAR	**AAR**
-2	0,29%	-0,27%
-1	-1,04%**	-0,18%
0	-0,05%	0,68%
1	-0,01%	-0,74%
2	-0,21%	-0,25%
	ACAR	**ACAR**
0 to 2	-0,27%	-0,31%
-2 to 2	-1,03%	-0,76%
-5 to 5	-1,47%	-1,50%
-5 to 0	-1,66%	-0,20%
-10 to 10	0,61%	-1,89%
-20 to -1	-1,96%	-1,65%
1 to 20	1,24%	-4,35%*
-20 to 20	-0,77%	-5,32%
Note: ***, **, * indicate significance of 1%, 5% and 10% level, two tailed t-test		

Table 21		
Company	**Market Cap (MNOK)***	**Category**
DnB	101 474	Large
Aker Kværner**	15 212	Small
Norske Skog	513	Small
PGS	14 445	Small
Statoil	445 705	Large
Telenor	146 367	Large
Yara	72 122	Large
Hydro	56 957	Large
RCL	31 234	Small
Storebrand	14 999	Small
SAS	3 082	Small
Ocean Rig	7 683	Small
Saga Petroleum	15 501	Small
*From oslobors.no and Amadeus (NHH) 18.10.2011		
**Now Aker Solutions		

Table 22				
CRA	**Company**	**Date**	**Rating action**	**Reason for removal**
S&P	Telenor	30.10.2008	Outlook negative	Acquisition of Unitech 29.10.2008, volatile return in event window
S&P	Telenor	01.11.2005	Outlook negative	Part of other event window
Moody's	Yara	15.03.2010	Outlook negative	Part of other event window
S&P	Hydro	28.05.1996	Upgrade	Part of other event window
S&P	Hydro	02.06.2006	Downgrade	Buybacks in period, unusually negative return in window
S&P	Hydro	18.12.2006	Watchlist negative	Influenced by the merger between Statoil and Hydro
Moody's	Hydro	30.01.2009	Watchlist negative	Part of other event window
S&P	Hydro	20.03.2009	Downgrade	Part of other event window
S&P	RCL	17.06.1997	Watchlist negative	Not enough history for return on OSEBX
S&P	RCL	26.09.1997	Outlook negative	Not enough history for return on OSEBX
S&P	RCL	05.12.2008	Outlook negative	Part of other event window
S&P	Storebrand	21.10.2002	Downgrade	Part of other event window
Moody's	Storebrand	21.10.2002	Watchlist negative	Part of other event window
Moody's	SAS	11.04.2003	Watchlist negative	Part of other event window
Moody's	SAS	11.02.2004	Watchlist negative	Part of other event window
S&P	Saga Petroleum	02.10.1998	Watchlist negative	Part of other event window
S&P	Saga Petroleum	10.05.1999	Watchlist positive	Influenced by the offer from Hydro on all Saga stocks
S&P	Ocean Rig	15.07.1999	Watchlist negative	Not enough history on rating
Moody's	Ocean Rig	25.10.1999	Watchlist negative	Not enough history on rating
S&P	Ocean Rig	01.03.2001	Watchlist negative	Uncertainty regarding completion of rigs by Friede Goldman
Moody's	Ocean Rig	01.03.2001	Watchlist negative	Uncertainty regarding completion of rigs by Friede Goldman
S&P	Ocean Rig	15.06.2005	Upgrade	Part of other event window
Moody's	DnB	10.04.2007	Downgrade	Moody's evaluates their methods
Moody's	DnB	03.04.2007	Watchlist negative	Moody's announces an evaluation of methods and possible downgrade
S&P	Norske Skog	21.04.2008	Downgrade	Part of other event window
S&P	Norske Skog	21.04.2008	Watchlist negative	Part of other event window
Moody's	Norske Skog	02.11.2007	Downgrade	Part of other event window
S&P	Norske Skog	14.11.2006	Downgrade	Part of other event window
S&P	Norske Skog	21.03.2006	Outlook negative	Part of other event window
S&P	Norske Skog	08.04.2004	Downgrade	Part of other event window
S&P	Norske Skog	05.02.2003	Watchlist negative	4. quarter presented same day
Moody's	PGS	23.02.2003	Downgrade	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	30.07.2003	Downgrade	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	30.12.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	30.12.2002	Watchlist negative	Volatile stock due to merger and situation concerning debt situation
Moody's	PGS	25.11.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	20.11.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
Moody's	PGS	07.11.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	29.10.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	31.07.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
Moody's	PGS	31.07.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
Moody's	PGS	01.07.2002	Downgrade	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	03.05.2002	Watchlist negative	Volatile stock due to merger and situation concerning debt situation
Moody's	PGS	02.05.2002	Watchlist negative	Volatile stock due to merger and situation concerning debt situation
Moody's	PGS	12.03.2002	Outlook negative	Volatile stock due to merger and situation concerning debt situation
S&P	PGS	19.01.2001	Downgrade	Negative earnings forecast on announcement date
S&P	PGS	20.10.1997	Upgrade	Merger with Awilco announced same date
S&P	Statoil	19.06.2001	Downgrade	Two days estimation window
Moody's	Statoil	14.05.2001	Downgrade	Statoil not listed on Oslo Stock Exchange
Moody's	Statoil	23.11.2000	Watchlist negative	Statoil not listed on Oslo Stock Exchange
S&P	Statoil	15.11.2000	Watchlist negative	Statoil not listed on Oslo Stock Exchange
S&P	Statoil	15.03.2000	Downgrade	Statoil not listed on Oslo Stock Exchange
S&P	Statoil	17.12.1999	Outlook negative	Statoil not listed on Oslo Stock Exchange
S&P	Statoil	02.12.1998	Downgrade	Statoil not listed on Oslo Stock Exchange
Moody's	Statoil	16.02.1995	Upgrade	Statoil not listed on Oslo Stock Exchange

Table 23

Regression statistics

Multiple R	0,335
R-Squared	0,112
Adjusted R-Squared	-0,002
Standard Eerror	0,037
# Observations	36

ANOVA

	df	*SS*	*MS*	*F*	*Significance-F*
Regression	4	0,005	0,001	0,98	0,433
Residuals	31	0,042	0,001		
Total	35	0,047			

	Coefficient	*Standard Error*	*t-Stat*	*P-value*
Intersection	0,002	0,01	0,13	0,90
WATCHLIST	0,018	0,02	1,06	0,30
INV	-0,019	0,02	-0,92	0,37
POST	-0,010	0,02	-0,67	0,51
LARGE	0,015	0,02	0,97	0,34