TILBURG UNIVERSITY

Master Thesis Finance

Credit rating changes and the effect on stock prices

How credit rating changes affect stock prices in the European market

M.A.J Timmermans
534521

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Supervisor	Juan Carlos Rodriguez
Department	Finance
Author	M.A.J. Timmermans
ANR	S534521
Study Program	Master Finance
Faculty	Faculty of Economics and Business Administration

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Abstract

This thesis investigates the informational value of credit rating changes made by the three major rating agencies during the period 1997-2012 for the European market. First, downgrades result in negative significant abnormal returns. Second, upgrades result only for the period preceding the event date in negative significant abnormal returns. Third, small firms and financial firms have stronger reactions to credit rating downgrades. The multivariate analysis suggest furthermore that a firms leverage, debt to asset ratio, the initial rating level, the financial crisis and the investment grade boundary have no significant effect on abnormal returns.

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1| Introduction

This thesis concentrates on the effect of credit rating changes on stock prices. This study also includes an investigation about whether there are any differences between large firms relative to small firms and financial firms versus non-financial firms. As last a multivariate regression will be conducted to test for different factors. Most of the research has focused on American companies. However, this study differs from existing research in that we look at the European market, conduct a multivariate regression for the European market, examine the most recent period using a relatively large dataset and investigate the difference of the effect before and during the crisis.

Credit rating information can be useful to investors. Fama (1970) reports a theory which states that financial markets are efficient. He states that efficient markets are markets in which "security prices at any time fully reflect all information" (pp.383). This indicates that all investors should have the same information, so they can't have an arbitrage opportunity on the market by using 'new' information. In this empirical analysis the theory of the market efficiency in the strong form must hold, because rating agencies create their credit ratings on public and private information. Empirical results illustrate evidence for significant abnormal returns for credit rating downgrades but most of the time not for upgrades. Furthermore there is some empirical evidence for the price pressure hypothesis, the differential information hypothesis and the issuer hypothesis. The results of the empirical analysis show also negative significant abnormal returns for downgrades. For upgrades there is one event window with a negative significant abnormal return. The evidence of the multivariate regression shows that only the size variable results in significant abnormal returns, which implies a larger effect of credit rating changes for small firms.

The research will be based on a dataset from Bloomberg, which includes daily stock prices and daily prices for the MSCI Europe index, market capitalizations, debt to asset ratio's and credit rating changes. The daily data will be used to measure the abnormal returns during the event window [-29, 30].

The remainder of the paper is organized as follows: section 2 reviews the rating industry. Section 3 provides a literature review about credit rating changes. After the literature review the formulated hypotheses will be highlighted in section 4. Section 5 will go into the data and the used methodologies. Section 6 will discuss the empirical results and section 7 provides a conclusion.

2| Review rating industry

Credit ratings are currently often in the news since a lot of countries in Europe are downgraded or they have an expectation for downgrading. Furthermore, Credit Rating Agencies have obtained worldwide criticism for their influences to the economic crisis that started in 2007 and endures currently. They are often criticized for inaccurate ratings and slow reactions to new information. Credit rating agencies play a main role in financial markets in the production of credit risk information of company's and its allocation to market participants. To become well-known with credit rating agencies, this section will provide information of the rating industry.

2.1 Credit Rating Agencies

Credit rating agencies assign credit ratings for issuers of different types of debt obligations. They focus on the issue of a judgment on the creditworthiness of Governments, companies or financial instruments. By making the judgment they make use of both quantitative and qualitative elements. According to Gonzalez et al. (2004) the analyses are based on financial statements, management quality, franchise value, and the competitive position in the corresponding industry. Based on that information they try to forecast credit performance with series of macroeconomic and credit conditions, including stress situations. The credit rating agencies use for their analysis both public and private information. The SEC mentioned that the importance and the influence of the credit ratings on the securities markets, has significantly increased.[1] The credit rating agencies use their own method in the measurement of creditworthiness and make use of a specific credit rating scale to announce its ratings opinions. The Securities & Exchange Commission (SEC) identifies 10[2] companies as credit rating agencies (NRSROs); S&P, Fitch and Moody's are the most important and called the big three. Rating agencies generally assign ratings of long-term debt ranked on a letter scale. S&P and Fitch use both the ranking scale: AAA, AA, A, and BBB for investment grade

[1] Obtained from www.sec.gov: Report on the Role and Function of Credit Rating Agencies in the Operation of the Securities Markets Credit rating rapport
[2] Obtained from www.sec.gov

categories; BB, B, CCC, CC, C, and D for speculative grade rankings. Moody's long-term rating scale for investment grade is: Aaa, Aa, A, Baa and for speculative grade: Ba, B, Caa, Ca, and C. Often they add modifiers to the ratings to classify and rank ratings within every group category. To modify the ratings Fitch and S&P use pluses and minuses, whereas Moody's generally uses numerical adjustments 1-3, where 1 indicates that a credit lies in the higher end of the rating category, 2 implies mid-range of the rating category, and 3 implies the lower bound of the rating category.[3] Appendix I shows an overview of the credit rating scales of the credit rating agencies and appendix II shows a general summary of the opinions reflected by S&P. According to S&P agencies get compensation for their services from the issuer that asks for the rating or from subscribers who obtain the announced ratings and associated credit reports. The complexity of the financial system and the transactions costs related to financial dealings decreases due to the credit rating agencies.

2.2 Credit Ratings

According to S&P, credit ratings are opinions about credit risk. They claim that ratings convey the opinion of the credit rating agency about the willingness and capacity of an issuer, such as a corporation, state or government, to meet its financial obligations in full and on time.[4] In the credit rating guide of S&P they point out numerous key factors about credit ratings. They say that credit ratings are opinions about relative credit risk. Furthermore they imply that a credit rating is not an investment advice. When making an investment decision it is simply a factor that investors could take into consideration. A credit rating is also not a guarantee of the credit risk in the future or of the credit quality. Gonzalez et al. (2004) argued that creditors and investors found it efficient to use ratings opinions in employing and monitoring their transactions because of the economies of scale in collecting and analyzing information.

[3] Obtained from www.sec.gov: Report on the Role and Function of Credit Rating Agencies in the Operation of the Securities Markets Credit rating rapport
[4] Obtained from www.standardandpoors.com: Guide to credit rating essentials

2.3 The Big Three

Moody's was the first main credit rating agency and started in 1909. Standard & Poor's established soon after Moody's in 1916 and Fitch followed in 1924. The three largest credit rating agencies are described below.

2.3.1 Standard & Poor's (S&P)[5]

Standard & Poor's published credit ratings since 1916 and is a global credit rating issuer. They cover 112 countries with 40 offices and 1400 analysts. The analysis that is being used is sometimes comparable to the credit analysis of banks or other financial institutions. However, an analyst of a credit rating agency may have access to private information submitted by issuers. They use the analyst-driven approach to perform credit ratings. The analyst performs an evaluation of the financial performance, policies and risk management strategies and also the economic and business environment of the issuer. They measure qualitative information, for instance a long-term strategy, when evaluating the issuer's ability and willingness to comply with their financial requirements. Furthermore Standard & Poor's also maintaining the S&P500 stock index and other indexes. Standard & Poor's is part of McGraw-Hill Companies and they reported total revenues of $6.2 billion in 2011.

2.3.2 Moody's [6]

Moody's investor service is a full-service credit rating agency and started in 1909 with issuing credit ratings. Moody's investor service is part of Moody's Corporation together with Moody's analytics. The agency covers more than 110 countries, 11000 corporate issuers, 22000 public finance issuers and 94000 structured finance obligations. Moody's Corporation reported in 2011 total revenue of $2.3 billion. The credit ratings of Moody's are a measurement of the probability that the issuer will default and the loss amount after the occurrence of a default.

[5] Obtained from www.standardandpoors.com, accessed 1 October 2012
[6] Obtained from www.moodys.com, accessed 1 October 2012

2.3.3 Fitch Ratings [7]

Fitch group is a subsidiary of FIMALAC and Hearst Corporation and Fitch ratings is a part of Fitch group. In 2011 the total revenue for Fitch group was $732.5 million. The sovereign team of Fitch Ratings is devoted in offering objective and timely ratings and investigation on the issue of foreign and local debt over 100 countries. The analysts rate more than 1700 corporate entities.

2.4 Financial regulation

According to Haan and Amtenbrink (2011) credit ratings have also an important role in financial market regulation. To cover risk in the European Union, financial organizations should have a minimum level of their capital. This operates as a buffer for unexpected losses and also protects depositors and these constraints play a role in the stability of the financial system. Under the Basel II framework banks can compute capital requirements by using the credit ratings of approved credit rating agencies. Furthermore, if financial institutions want to borrow from the central bank, the central banks require assets adequate for collateral with a minimum rating.

The International Organization of Securities Commissions (IOSCO) published a code of conduct in 2004 and all major Credit Rating Agencies signed this. Credit Rating Agencies should try to deliver opinions that help decrease the information asymmetry. A change of the financial condition of an issuer must be revealed, since they otherwise may mislead market participants. In reaction to the role Credit Rating Agencies in the financial crisis, the IOSCO strengthened the principles of the Code of Conduct Fundamentals.

The Securities and Exchange Commission (SEC) assigns Nationally Recognized Statistical Rating Organizations (NRSRO's). To estimate the required amount of capital of financial institutions they use the ratings of NRSRO's. Some investors, for instance pension funds and mutual funds are sometimes only allowed to invest in investment grade rated debt.

[7] Obtained from www.fitchratings.com, accessed 1 October 2012

2.5 Conclusions

The role of credit rating agencies is becoming increasingly important. The most important rating agencies are Moody's, Standard and Poor's and Fitch. There are seven other rating agencies identified by the SEC and with the big three they form the NRSRO's. Credit ratings convey the opinion of the credit rating agency of the creditworthiness of an issuer and have also an important role in financial market regulation. Pension funds are for instance sometimes only allowed to invest in investment grade rated debt. The next section provides the theoretical and empirical review regarding credit rating changes.

3| Literature review

This chapter will discuss the background about the efficient market hypothesis and credit rating changes. First, the efficient market hypothesis is described. Second, theories about credit ratings will be discussed. Finally, research about credit rating changes will be discussed.

3.1 Theoretical review

3.1.1 Efficient Market Hypothesis

An efficient market has different descriptions. The main descriptions for this study are those of Jensen (1978) and Fama (1970). According to Jensen (1978) is a market efficient with respect to an information set if it is impossible to make economic profits by trading on the basis of an information set. Fama (1970) states that efficient markets are markets in which stock prices at any time fully reflect all information. There are three underlying assumptions for this efficiency. First, investors are rational. Second, if they are not rational, their random trades will cancel each other out. Finally, all arbitrage opportunities will be used entirely.

As mentioned earlier, there are three forms of the efficient market hypothesis. The difference of these versions lies in the term: "all available information."

1) The weak form efficiency states that stock prices reflect all historical information. This suggests that an investment strategy that is based on historical information cannot give above average returns to the investor.
2) The semi-strong efficiency reflects all publicly available information, so investors should not be able to profit consistently by trading on publicly available information.
3) The strong form reflects information on both privately and publicly available information (Fama, 1970).

3.1.2 Information Content Hypothesis

Most research on credit ratings concentrates on whether credit rating changes include pricing-relevant information. A credit rating change can give the market a sign that the creditworthiness of the issuer is changed. Generally, significant stock price reactions arise as a response to news. The question is if the market thinks that a credit rating change contains new information. Under the information content hypothesis it is expected that stock prices react on the event date of a credit rating change.

3.1.3 Issuer Hypothesis

Wansley and Dhillon (1989) argued that the impact of new security issues is less for banks than for industrial firms. Calderoni et al. (2009) argued that downgrades have a larger impact for non-financial firms, because of the fact that financial issuers have stricter disclosure rules and more widespread analysts' coverage. Therefore there is more information available for financial firms than for non-financial firms. Under the issuer hypothesis it is expected that non-financial firms react stronger on a credit rating change.

3.1.4 Price Pressure Hypothesis

Due to financial regulation some investors, for instance pension funds and mutual funds, are sometimes only allowed to invest in investment grade rated debt. This regulatory requirement can affect the abnormal returns after a credit rating change. According to Steiner and Heinke (2001) this is an explanation for insignificant abnormal returns for upgrades. Due to financial regulation downgrades force to sell, while upgrades do not force to buy. In contrast to Hand et al. (1992) and Schweizer et al. (1992), Wansley et al. (1992) found significant influences of this credit rating boundary. If the price pressure hypothesis holds, rating changes that cross the boundary should result in significant stronger prices reactions.

3.1.5 Differential Information Hypothesis

The reaction of the price to a rating upgrade or downgrade may depend on the size of the company. Small firms have less chance to be analyzed by analysts because of their size and limited disclosed information. Investors probably would like to know the company they invest in and therefore want companies which give information to the market. To determine the degree of information asymmetry among the firm and the capital market, the market capitalization of that firm is often used. Larger companies attract more attention, since smaller companies reveal less information to the market and are therefore less investigated by market analysts. This is in line with research of Atiase (1985) who concluded that information asymmetry is decreasing with firm capitalization. For larger firms it is therefore expected that abnormal returns should be lower.

3.2 Empirical Review

3.2.1 United States studies

Wide-ranging research has been done concerning the effect of stock prices to changes in credit rating. The focus of most of the research lies on credit rating changes of Standard & Poor's and Moody's in the US market. The results of the responses to downgrades and upgrades of credit ratings are diverse. Weinstein (1977) investigated the behaviour of corporate bond prices during the period around the announcement of a credit rating change. He argued that the market should not expect that bond-rating changes reveal new information. He found some support of price change during the period from 18 to 7 months prior to the announcement of the rating change. However, he found no result of a price change 6 months before the announcement of a rating change. He found little evidence during the change or 6 months afterwards. Wakeman (1978) found statistically insignificant price response using weekly bond returns and monthly stock returns. Griffin and Sanvicente (1982) investigated the stock price reaction to credit rating changes. They used an event window of one year and explore the price changes eleven months preceding the credit rating change and the month during the event. Their results show significant cumulative abnormal returns for downgrades for the eleven months

before the event and also the month during the event date. However, there were no significant results for credit rating upgrades.

Holthausen and Leftwich (1986) were the first to find evidence that downgrades by Moody's and Standard & Poor's are associated with negative abnormal stock returns, while no response is found for upgrades. They used daily stock returns in there empirical analysis. They found negative significant abnormal returns during the two-day window, even after the elimination of observations that contain simultaneous issues of news. Hand et al. (1992) concluded for the US market that rating downgrades presents new information to investors, while upgrades have no effect with the explanation that they are already incorporated in the prices. According to Goh and Ederington (1993) not all rating downgrades are bad news for shareholders. Particularly, downgrades as a result of changes in financial leverage indicate shifts of wealth form bondholders to shareholders. In a later study, Goh and Ederington (1999), investigate how the reaction to downgrade announcements differs according to the implications for cash flows and the extent of surprise. Analysis show that downgrades result for the 2-day event window in a negative cumulative abnormal return of -1.21%. The effect when upgrades are announced result for the 2-day event window in a negative cumulative abnormal return of 0.095%. It states that downgrades are to a certain extent due to prior negative public information and upgrades appear just due to public information.

Kliger and Sarig (2000) test whether bond ratings convey price-relevant information by investigating security price reactions. They use refinements of Moody's and the refined information did not contain any fundamental change in the issuer's risk. Their results show that rating information does not have an impact on the firm value. When the refinements are better than expected debt value increases, equity value decreases and the implied volatility of stock options descended. If expected ratings are poorer than expected they find that stock returns increase and that the bond value decreased and the implied volatility is larger.

Dichev and Piotroski (2001) use bond ratings between 1970 and 1997 from Moody's. They find no consistent abnormal returns after upgrades. Nevertheless, they find negative abnormal returns in the first year after downgrades on the size of 10% to 14%.

Further research shows that this underperformance is particularly expresses for small, low-credit-quality firms.

3.2.2 Non-US studies

Matolcsy and Lianto (1995) explored the impact of rating reviews in Australia. They use rating changes by Standard & Poor's from 1982 to 1991. The results show that only bond rating downgrades contain significant cumulative average abnormal returns. They use for the analysis weekly stock price data. The study of Barron, Clare and Thomas (1997) concentrates on the effect of credit rating changes on the UK market. They test the effect for long and short-term debt using daily data from 1984 to 1992. They found significant excess stock returns related with bond rating downgrades and positive CreditWatch announcements. Credit rating changes influencing short-term debt have no significant effect, which is the case for new long-term debt credit ratings. The results also suggest that the profits to firms of having a credit rating do not come in the way of significant decreases in the cost of equity capital.

Steiner and Heinke (2001) have used German Eurobond data and discovered that negative reviews and downgrades cause abnormal negative bond returns on the announcement day and the following trading days. They found however no significant abnormal returns for upgrades and positive reviews. The abnormal returns are significantly stronger for downgrades into speculative grade. They analyze with univariate tests and cross-sectional regressions and found that the abnormal returns are larger the higher the default free yield level is. Furthermore they found the lowest abnormal returns for bank bonds, the reaction for government bonds is stronger and corporate bonds show the largest abnormal returns. The explanation they give to this is because the higher accessibility of credit information for banks due to prudential regulation.

Elayan, Hsu and Meyer (2003) investigated credit rating changes announcements for New Zealand firms. Unlike most of the U.S. studies where only negative announcements cause statistically significant market responses, announcements with positive connotations for New Zealand companies also generate significant abnormal returns.

This evidence supports the hypothesis that credit ratings give valuable information to investors in the markets. They conclude therefore that credit rating change contains information for investors in a small and possibly neglected market.

Linciano (2004) analysed stock price returns to credit rating changes for Italian listed firms announced by Moody's, Fitch and Standard & Poor's for a sample of 299 credit rating changes. Rating changes are categorized according to their direction, their anticipation, the presence of concurrent news, the reason of the rating action and the sector of the issuer. Their results show that, in general, stock price reactions to credit rating change announcements are relatively moderate or insignificant. Significant abnormal returns are only incorporated for negative watches and for actual downgrades. Within the 3-day event the Cumulative abnormal return equals -1.34%. In contrary to previous research they show that expected rating actions have a greater impact on market prices than unexpected ones. However the sample contains a low number of unexpected events and therefore it is not a strong conclusion. Furthermore the results show that negative abnormal returns are significant lower for financial firms than for industrial firms.

Poon and Chan (2007) conducted a study to the information content of credit rating announcements in China with a cross-sectional regression. The analysis indicated an asymmetric certification effect and an information content of credit rating changes. Firm size and manufacturing industry contribute to the negative abnormal returns for credit rating changes. Hun Han et al. (2008) examined stock market reactions to credit rating changes in emerging market countries included in the MSCI Emerging Market Index. They found evidence that stock markets react significant different to ADR markets (American depository receipts). Their results show in ADR markets significant cumulative abnormal returns for downgrades and upgrades. Companies in ADR markets have lower debt ratios and are larger than companies in local markets. The cumulative abnormal returns for both downgrades and upgrades can arise due to the fact that for companies in emerging markets the financial disclosure is much less transparent.

3.2.3 Financial firms

Schweitzer et al. (1992) investigated whether ratings changes are different for banks. They claim that there are explanations to think that ratings changes might have a dissimilar effect on banks, since they are high regulated entities, in contrast to corporates. They indicate that the regulation of an industry can increase the amount of information becoming available to the market. If so, the informational value of company-specific events may be a smaller amount for highly regulated firms. Their result show small significant impact on stock prices around the announcement of credit rating changes. Credit ratings downgrades are related to excess returns of 1.5 % and this compared with pre-announcement excess returns in the order of 10-20%, this is small. For upgrades they show even smaller excess returns, nearby 1%. They investigated if the impact of credit rating changes on corporates is statistically dissimilar from those on banks. For upgrades they obtain no statistically significant difference, while for downgrades banks seem to respond significantly more than corporates. This gives belief to the assumption that bank regulators do hold back negative information, and that bond rating agencies have a role in generating adverse information about banks to the capital market.

Gropp and Richards (2001) investigated rating change announcements by Moody's, S&P and Fitch, concentrating on European banks. Their sample contains 186 events from the period 1989 to 2000. The results show that upgrades show positive abnormal returns of 1.2% on the announcement day and 1.5% in the 3-day event window. The announcement impact on bond prices is -0.5% on the announcement day and there is no statistically significant effect over the 3-day event window.

Bremer and Pettway (2001) studied the effect of downgrades for banks on share prices in Japan. They find no significant abnormal returns during the event window and in the pre-announcement period. However, the mean returns for downgraded banks during the 2 years prior to the downgrade were negative and statistically significant at 20.6%. They conclude therefore that the equity market incorporate the higher risk into lower share prices for downgraded banks well before the announcements of Moody's. Calderoni et al. (2009) concentrated on rating adjustments announced by Moody's to European listed companies covering the period 2002 to 2007. The findings illustrate

cumulative abnormal returns of -1.07 % for downgrades in a two day window and -0.98 % in a 6-day event window. However, upgrades show no statistically significant cumulative abnormal returns for the two day and 6-day event window.

3.2.4 Firm size effect

Existing research shows that abnormal return performance is stronger for smaller firms. (E.g. Bernard and Thomas, 1990 and Fama, 1998). Beard and Sias (1997) investigated the neglected firm effect; they imply that the neglected firm effect insinuates that less well known firms are able to achieve higher returns on their stock than well known firms. Arbel and Strebel (1982) argued that neglected firms experience lack of information asymmetric information. Han, Shin and Reinhart (2008) conducted a multivariate regression and found no significant results for the firm size effect.

3.3 Conclusions

The informational value of credit ratings is investigated widely. Empirical results illustrate evidence for significant abnormal returns for credit rating downgrades but most of the time not for upgrades. Furthermore there is some empirical evidence for the price pressure hypothesis, the differential information hypothesis and the issuer hypothesis. The hypotheses are noted below.

4| Hypotheses

In the previous section the literature about credit rating changes has been discussed. The literature pointed out a few key factors which are important when investigating credit rating changes. In this section the hypotheses based on the previous literature will be formulated. Previous literature show that stock prices react quite moderate or insignificant to credit rating upgrades, on the other hand they find a significant reaction of stock prices to credit rating downgrades (Holthausen and Leftwich, 1986; Goh & Ederington, 1993; Linciano, 2004). However, it is also expected that the stock prices react to credit rating upgrades. The following hypothesis is formulated:

1. *Credit rating upgrades (downgrades) have a positive (negative) impact on the stock price*

To determine the information asymmetry between companies and the capital market, the market capitalization is used. It is possible that there is a difference between small and large firms, since large firms disclose more information. Therefore the opinions of the credit rating agencies should have a smaller effect on stock prices for large firms. If the outcome of the abnormal returns arise because of an incomplete market reaction to the credit rating upgrade or downgrade, than the impact of the stock price change would be stronger for small companies. This corresponds with research of Bernard and Thomas (1990), Beard and Sias (1997) and Fama (1998). The following hypothesis is formulated:

2. *A credit rating upgrade or downgrade has less impact on large firms*

Wansley and Dhillon (1989) argue that the impact of new security issues is less for banks than for industrial firms. Schweitzer et al. (1992) investigated whether ratings changes are different specifically for banks. They claim that there are explanations to think that ratings changes might have a dissimilar effect on banks, since they are high regulated entities, in contrast to corporates. Calderoni et al. (2009) argued that downgrades have a larger impact on non-financial firms. They mentioned this is

probably due to fact that financial issuers have stricter disclosure rules and more widespread analysts' coverage. Therefore it is expected that credit rating downgrades have more impact non-financial firms:

3. *The impact of credit rating downgrades is larger for non-financial companies compared to the impact on financial companies*

To try to explain cross-sectional variation in the window-spanning abnormal returns a multivariate regression is estimated. The regression is estimated only for downgrades and is based on firm characteristics and some dummy variables. The variable firm size represents the theory that small firms should have larger abnormal returns, which is explained earlier. Therefore the expected sign of the variable size is negative. Furthermore the firms leverage is added as variable. Generally, a firm with a low debt-to-asset ratio is considered less risky as a firm with a high debt-to-asset ratio. The results of Kligr and Sarig (2000) show that firms with higher leverage have higher price reactions to credit rating changes. For stock price reactions a negative coefficient for the leverage variable is expected. Besides there are fore dummies added to the regression model. Financial firms (industry=1) are expected to react less to credit rating changes than non-financial firms (industry=0). If the downgrade is from investment grade to speculative grade (between=0) the stock price reaction is expected to be larger than if the downgrade is within the investment or speculative grade (between=1), since sometimes regulation force institutional investors to sell if the rating is below the investment grade and the coefficient is expected to be positive. To test whether the initial rating is also reflected in abnormal returns the dummy variable grade is added with value 1 (0) if the initial rating is investment grade (speculative grade). As last, the dummy variable year is added. This reflects the credit crisis, since credit rating agencies obtain a lot of critics of inaccurate ratings. For example, a company has still an investment grade rating but is defaulted. This dummy is therefore added, to check if the credit rating agencies are still believed. To avoid multicollinearity the correlation between the variables was calculated, however there were no correlations larger than 0.7 or lower than -0.7. In table 2 the variables and their definitions are presented. To test the formulated hypotheses, in the next section the used data and methodology will be discussed.

5| Data and Methodology

This chapter will discuss the data and methodology used to conduct the research. The first section presents the dataset, followed by the sample characteristics. The second part illustrates the research methodology.

5.1 Data

The research will be based on different sets of data. The total sample with credit rating changes is obtained from the Bloomberg database. The dataset consists of downgrades, upgrades and also credit watch status of credit ratings by the three main credit rating agencies S&P, Moody's and Fitch. Changes in long term credit ratings are used since these ratings contain an agencies' opinion of a firm's capacity to meet its debt obligations. Credit rating changes are taken over a sample period of 15 years, between 1997 and 2012 and contain all firms listed in the countries in West-Europe. An example of the dataset for upgrades is shown in appendix III. As benchmark the MSCI Europe index is used to estimate normal returns for the estimation period. It is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of the developed markets in Europe. The Index consists of the following 16 developed market country indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.[8] Since these countries are the same as in the dataset this is a representative benchmark. MSCI Europe Index daily prices and daily stock prices are obtained from Bloomberg database and are adjusted for stock splits and dividends. The uses of daily stock returns allow to focus on a narrow window around the rating change.

To examine firm size effect on stock price actions, the research describes large firms as firms with a market capitalization above the mean market capitalization and small firms

[8] Information about MSCI Europe Index is obtained from the Bloomberg database

have a market capitalization below the mean. The market capitalizations on the event date of the firms are taken from Bloomberg.
For the multivariate regression the financial variables market capitalization and debt ratio are obtained from Bloomberg at the end of each fiscal year.

The original sample includes 1273 changes in long term credit ratings. The methodology of an event study requires the availability of historical stock prices, therefore the sample leaves out events without historical stock prices. More rating changes for an individual firm within one week are limited to the first credit rating change. Furthermore the market capitalization on the event date is needed and therefore the sample is limited to events with the market capitalization available on the event date. The original and the final dataset are presented in table 1

Table 1. Descriptive statistics ratings action *(1995-2012)*

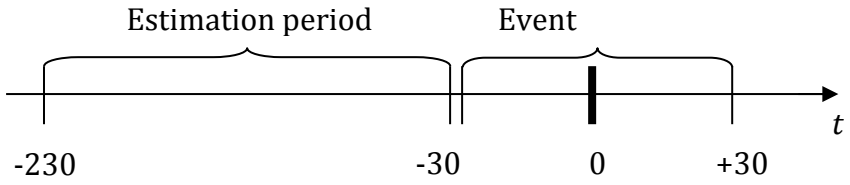
Sample	**Downgrades**	**Upgrades**
Original	889	384
Adjusted	477	212

The dataset includes 477 downgrades and 212 upgrades. The sample for downgrades is used to conclude whether firm size, debt to asset ratio, leverage, initial rating, investment grade barrier and the credit crisis influence stock returns. To test firm size effect the sample is divided in low market capitalization firms (372 downgrades) and high market capitalization firms (103 Downgrades). The effect of the rating action may also be influenced by the sector of the issuer: therefore, the observations are split into whether they refer to a financial firm (193 downgrades) or to a non-financial firm (284 downgrades). This might be true if different regulatory rules imply different levels of transparency.

5.2 Methodology

De Goeij and De Jong (2011) reduces the 5 steps in conducting an event study of Bowman (1983) to three:

1. Identify the event of interest and in particular the timing of the event.
2. Specify a "benchmark" model for normal stock return behavior.
3. Calculate and analyze abnormal returns around the event date



According to De Goeij and De Jong (2011) it is a good way defining abnormal as residuals of the market model, since this model accounts for differences in "beta" in calculating abnormal returns. Returns exceeding the expected return are identified as abnormal returns. The stock return, R_{it}, during a given period t,

$$R_{it} = \alpha + \beta_i R_{Mt} + \epsilon_{it}$$

R_{Mt}: The market's rate of return
ϵ_{it}: Part of a security's return resulting from firm-specific events
β_i: Measures sensitivity to the market return
α: The average rate of return the stock would realize in a period with a zero market return.

Returns for the stock prices and the index were calculated using the following log function:

$$R_{it} = ln\frac{P_t}{P_{t-1}}$$

Where R_t the normal return of security i at time t is, P_t is the closing price on the investigated day and P_{t-1} is the closing price the prior day.

According to De Goeij and De Jong (2011) it is a good way defining abnormal as residuals of the market model, since this model account for differences in "beta" in calculating abnormal returns. The abnormal returns are then defined as the residuals or prediction errors of the market model

$$NR_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt}$$

Where $\hat{\alpha}$ and $\hat{\beta}$ are OLS estimates of the regression coefficients and calculated as follows:

$$\hat{\alpha}_i = \hat{R}_i - \hat{\beta}_i \hat{R}_m$$

$$\hat{B}_i = \frac{Cov\ (R_i, R_m)}{Var\ (R_m)}$$

The period over which the market model is estimated differs among studies, but most studies use an estimation period 250 of days preceding the event period or around (but not including) the event period. The estimation window runs from 230 trading days before the event date to 30 days before the event date. The event window runs from 29 days before the event date to 30 days after the event date. Different event windows will be compared; within each event window the abnormal return is determined for each day.

Abnormal returns (AR_{it}) are defined as the return (R_{it}) minus a benchmark or normal return (NR_{it})

$$AR_{it} = R_{it} - NR_{it}$$

In order to study stock price changes around events, each firm's return data could be analysed separately. However, this is not very informative because a lot of stock price movements are caused by information unrelated to the event under study. (De Goeij en De Jong, 2011, p. 7). To improve the information content of the analysis, the average of the information over a number of firms is taken. Therefore the unweighted cross-sectional average of abnormal returns in period t is considered as

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

where N is the number of events in the sample. The average should replicate the effect of the particular event, since the abnormal returns are all centred on one particular event. All other information, unrelated to the event, should cancel out on average (De Goeij and De Jong, 2011).

It is also necessary to look at longer periods surrounding the event. For that reason cumulative abnormal returns are calculated. The cumulative abnormal return is the sum of all abnormal returns. When directly after the announcement date the CAR is significantly close to zero, then this is a proof for the efficient market hypothesis. The CAR is defined as:

$$CAR_i = \sum_{t=t_1}^{t_2} AR_{it}$$

Where the abnormal returns are aggregated from the start of the event period t_1, up to time t_2.

In event studies the CARs are collected over the cross-section of events to get cumulative average abnormal returns (CAAR).

$$CAAR = \sum_{t=t_1}^{t_2} AAR_t$$

5.2.1 Testing abnormal performance

According to De Goeij and De Jong (2011) there is evidence (FFJR) that stock returns do not satisfy the normality assumption, because stock return series have fat tailed distribution. However, if N is large enough it follows a standard normal distribution. In event studies the standard normal distribution is sufficient if N is larger than thirty.

To test the null hypothesis that the mean abnormal return on day t of the event window is equal to zero, the test statistic is given by

$$T_{statistic} = \sqrt{N}\frac{AAR_t}{S_t} \approx N(0,1)$$

AR_t are independent and identically distributed. This statistic approximately follows a standard normal distribution in large samples as mentioned before (De Goeij and De Jong, 2011).

The standard deviation is given by

$$S_t = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(AR_{it} - AAR_t)^2}$$

5.2.2 Significance cumulative abnormal returns

The cumulative average abnormal return is the sum of all average abnormal returns up to time t. The null hypothesis is that the expected cumulative stock price change is zero. The t-test is given by

$$T_{statistic} = \sqrt{N}\frac{CAAR}{s} \approx N(0,1)$$

with

$$S = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(CAR_i - CAAR)^2}$$

5.2.3 Multivariate analysis

To try to explain cross-sectional variation in the window-spanning abnormal returns a multivariate regression is estimated. The regression is estimated only for downgrades and is based on firm characteristics and some dummy variables. The variable firm size represents the theory that small firms should have larger abnormal returns, which is explained earlier. Therefore the expected sign of the variable size is negative. Furthermore the firms leverage is added as variable. Generally, a firm with a low debt-to-asset ratio is considered less risky as a firm with a high debt-to-asset ratio. The

results of Kligr and Sarig (2000) show that firms with higher leverage have higher price reactions to credit rating changes. For stock price reactions a negative coefficient for the leverage variable is expected. Besides there are fore dummies added to the regression model. Financial firms (industry=1) are expected to react less to credit rating changes than non-financial firms (industry=0). If the downgrade is from investment grade to speculative grade (between=0) the stock price reaction is expected to be larger than if the downgrade is within the investment or speculative grade (between=1), since sometimes regulation force institutional investors to sell if the rating is below the investment grade and the coefficient is expected to be positive. To test whether the initial rating is also reflected in abnormal returns the dummy variable grade is added with value 1 (0) if the initial rating is investment grade (speculative grade). As last, the dummy variable year is added. This reflects the credit crisis, since credit rating agencies obtain a lot of critics of inaccurate ratings. For example, a company has still an investment grade rating but is defaulted. This dummy is therefore added, to check if the credit rating agencies are still believed. To avoid multicollinearity the correlation between the variables was calculated, however there were no correlations larger than 0.7 or lower than -0.7. In table 2 the variables and their definitions are presented.

Table 2. Regression variables and definition

Variable	Definition
Size (-)	Natural logarithm of the market value of the company
Leverage (-)	Debt to asset ratio
Industry (-)	Dummy with value 1 (0), if the issuer is financial (non-financial)
Between (+)	Dummy with value 0 (1), if downgrade is (not) into speculative grade
Grade	Dummy with value 1 (0), if initial rating is investment grade (speculative grade)
Year	Dummy with value 1 (0), if the rating change is before 2007 (from 2007)

The cross-sectional analysis of the cumulative abnormal returns for downgrades is done by the following regression:

$$CAR_{[t_1,t_2]} = \beta_0 + \beta_1(Size) + \beta_2(Leverage) + \beta_3(Industry) + \beta_4(Between) + \beta_5(Grade) + \beta_6(Year)$$

Where β_n are the regression coefficients of variable n. The next section will discuss the results of the analysis described above.

6| Results

This chapter shows the empirical analysis conducted on the data which is presented in chapter 3. The analysis is based on the methodology described in chapter 3 as well.

6.1 Upgrades

In the following graph the average abnormal returns for upgrades are presented for the event window [-29,30]. Figure 1 shows a negative average abnormal return on the event date, however this abnormal return is not significant and therefore not different from zero. There are furthermore no significant average abnormal returns before or after the upgrade. This result can imply that a credit rating upgrade has no informational value.

Figure 1. Average abnormal returns for upgrades

The graph shows the average abnormal return development of upgrades for the event period [-29, 30]

In table 3 the cumulative average abnormal return for different event windows are presented. It shows negative cumulative average abnormal returns for all event windows. However, only for [-1,5] the result is significant. Existing research showed no abnormal returns or positive abnormal returns. It is difficult to say why the cumulative average abnormal return for [-1,5] is negative. Generally, upgrades should result in positive excess returns if there are excess returns, because an upgrade should be positive information.

Table 3. CAAR's and p-values for upgrades

Event window	[-29,30]	[-15,15]	[-10,10]	[-10,1]	[-1,1]	[-1,5]
$CAAR_t$	-1.06%	-0.85%	-0.82%	-0.33%	-0.63%	-0.86%*
P-value	-0.294	-0.261	-0.226	-0.653	-0.227	-0.081

The table shows the cumulative average abnormal return and their p-value for multiple event periods. *** p<0.01, ** p<0.05, * p<0.1.

6.2 Downgrades

In the following graph the average abnormal returns for downgrades are presented for the event window [-29,30]. It indicates at the event date a negative significant average abnormal return. However, it also shows that the negative abnormal returns appear earlier. This can imply that some information of the credit rating change appear earlier than the event date.

Figure 2. Average Abnormal Return for downgrades

The graph shows the average abnormal return development of downgrades for the event period [-29, 30]

In table 4 the cumulative average abnormal returns for 5 different event windows are presented. It shows negative cumulative average abnormal returns for all event windows. However not all CAAR's are significant. The event window [-1, 1] has a negative significant CAAR of 1.49% at the 1% level. This result corresponds with previous studies, for example Holthausen & Leftwich (1986); Hand et al. (1992) and Linciano (2004). Because there are significant negative CAAR's downgrades providing information. For the event window [-10,1] the CAAR equals -2.32% and is significant at the 1% level. Furthermore, the table shows that the market is not efficient in handling the downgrade information. The equity underperformance is not fully concentrated during the event, because the CAAR is -1.27 % for the event window [-1, 5].

Table 4. CAAR's and p-values for downgrades

Event window	**[-29,30]**	**[-15,15]**	**[-10,10]**	**[-10,1]**	**[-1,1]**	**[-1,5]**
$\boldsymbol{CAAR_t}$	-0.99%	-1.06%	-1.55%**	-2.32%***	-1.49%***	-1.27%**
P-value	-0.405	-0.225	-0.037	-0.001	-0.001	-0.014

The table shows the cumulative average abnormal return and their p-value for multiple event periods. *** p<0.01, ** p<0.05, * p<0.1.

6.1.1 Large firms versus small firms

In the following tables the results of the low market capitalization firms (small firms) and high market capitalization firms (large firms) are presented. Low market capitalization firms are categorized as firms with a market capitalization below the mean and as a result high market capitalization firms are firms with a market capitalization above the mean. Table 5 indicates that the cumulative average abnormal returns for a seven day period [-3, 3] has a significant result of -1.92 percent for large firms. For small firms the cumulative average abnormal return is lower and equals -2.17 percent for the same seven day period.

Table 5. CAAR's and p-values for downgraded large firms

Event window	[-29,30]	[-15,15]	[-10,1]	[-3,3]	[-1,1]	[-1,5]
$CAAR_t$	-1.63%	-1.68%	-1.32%	-1.92%**	-0.56%	-0.83%
P-value	-0.367	-0.234	-0.211	0.019	-0.424	-0.242

The table shows the cumulative average abnormal return and their p-value for multiple event periods. *** p<0.01, ** p<0.05, * p<0.1.

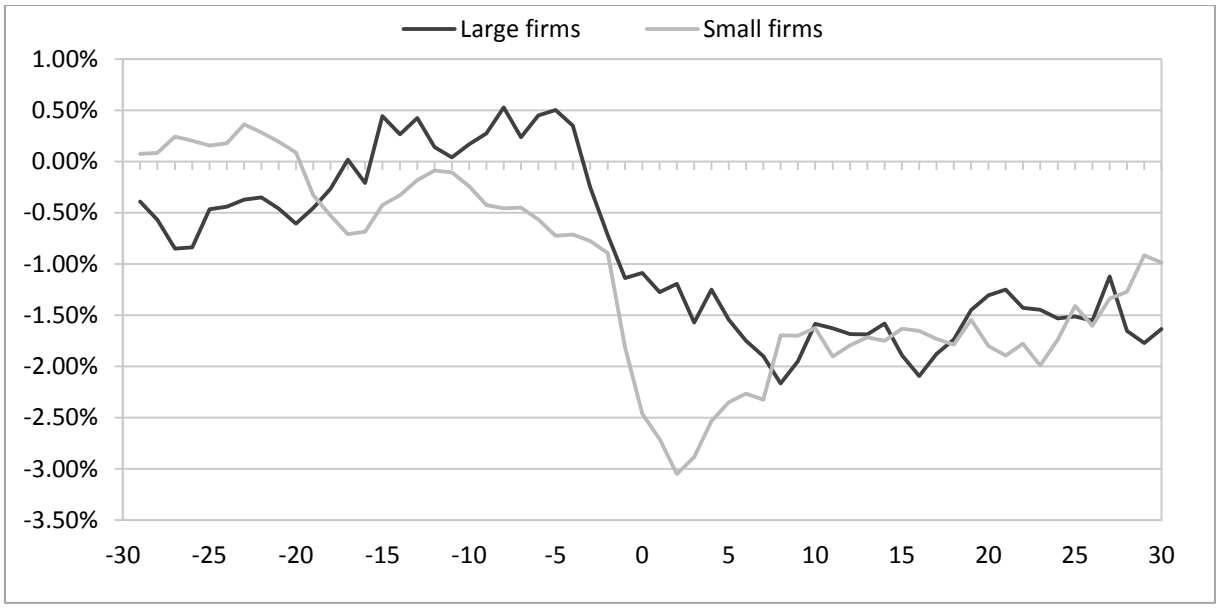
Table 6. CAAR's and p-values for downgraded small firms

Event window	[-29,30]	[-15,15]	[-10,1]	[-3,3]	[-1,1]	[-1,5]
$CAAR_t$	-0.99%	-0.95%	-2.60%***	-2.17%***	-1.81%***	-1.46%**
P-value	-0.497	-0.367	-0.001	-0.003	-0.002	-0.025

The table shows the cumulative average abnormal return and their p-value for multiple event periods. *** p<0.01, ** p<0.05, * p<0.1.

Figure 3 illustrates the development of the cumulative average abnormal returns for small firms versus large firms. The sample of the small firms decreases more a few days before the event compared to the sample of the large firms. After the event the average abnormal returns are generally positive. The average abnormal returns for large firms fluctuate after the event date. The tables indicate higher significant negative cumulative average abnormal returns for small firms for the seven day window [-3, 3]. Therefore a downgrade has more effect on small firms for the seven day event window. This corresponds with existing research Bernard and Thomas (1990) and Fama (1998).

Figure 3. Cumulative Average Abnormal Return for small firms versus large firms



The graph shows the cumulative average abnormal return development of downgrades for the event period [-29, 30]

6.1.2 Financial firms versus non-financial firms

In table 7 and 8 the cumulative average abnormal returns for non-financial firms' respectively financial firms are presented. Table 7 indicates significant negative cumulative average abnormal returns during the event of 1.16 percent [-1, 1]. As can be seen in table the cumulative average abnormal return for financial firms is lower for the three day event window and equals -2.04 percent. For the event window [-10, 1] and [-3, 3] the CAAR is also lower for financial firms. Therefore this outcome indicates that a credit rating downgrade has more impact on financial firms than on non-financial firms.

Table 7. CAAR's and p-values for downgraded non-financial firms

Event window	**[-29,30]**	**[-15,15]**	**[-10,1]**	**[-3,3]**	**[-1,1]**	**[-1,5]**
$\boldsymbol{CAAR_t}$	-0.52%	-0.59%	-1.28%*	-1.68%***	-1.16%**	-0.98%
P-value	-0.680	-0.563	-0.078	-0.008	-0.037	-0.113

The table shows the cumulative average abnormal return and their p-value for multiple event periods. *** p<0.01, ** p<0.05, * p<0.1.

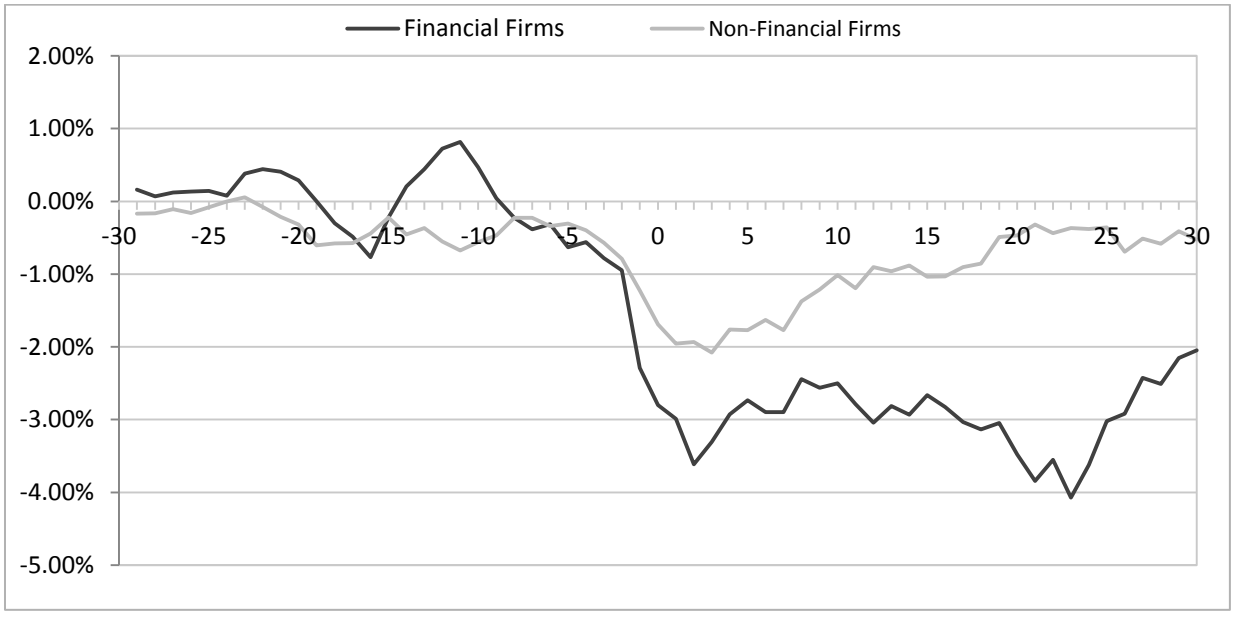
Table 8. CAAR's and p-values for downgraded financial firms

Event window	[-29,30]	[-15,15]	[-10,1]	[-3,3]	[-1,1]	[-1,5]
$CAAR_t$	-2.05%	-1.89%	-3.81%***	-2.75%**	-2.04%***	-1.79%*
P-value	-0.369	-0.214	-0.002	-0.013	-0.014	-0.053

The table shows the cumulative average abnormal return and their p-value for multiple event periods. *** p<0.01, ** p<0.05, * p<0.1.

In figure 4 the graph of the development of the cumulative average abnormal returns for financial firms versus non-financial firms can be seen. The CAAR's for financial firms are often lower than the CAAR's for non-financial firms. However, about two weeks before the downgrade it is mostly higher. Nevertheless these results are not significant. So the results show that the impact of a downgrade is higher for financial firms compared to non-financial firms.

Figure 4. Cumulative Average Abnormal Return for financial versus non-financial firms



The graph shows the cumulative average abnormal return development of downgrades for the event period [-29, 30].

6.3 Multivariate regression

Table 9 shows the results for the regression. The dependent variable is the cumulative abnormal return for different event windows. The variable size is the only significant variable in the regression for the event window [-5,5]. The coefficient of -1.57% is significant at the 10% level. This results supports that small firms should have larger

abnormal returns and is in line with the univariate analysis. The R^2 for the regression model for all the event windows are very low. There are more studies with such low values (Wansley et al., 1992; Hand et al., 1992; Steiner and Heinke, 2001).

The insignificance of the leverage variable suggests that the market not reacts in a stronger way for firms with higher leverage. In contrast to Steiner and Heinke (2001) no evidence is found for the price pressure hypothesis and the issuer hypothesis since the variables between and industry shows insignificant results. Furthermore, the variable year and grade have also insignificant results. This also indicates that the market not reacts in a stronger way for credit rating changes before 2007 and for initial ratings that have investment grade. The F-statistics and R-squares imply that the explanatory power of this model is poor.

Table 9. Regression tests on cumulative abnormal returns for downgrades

Variable	**[-5,5]**	**[-3,3]**	**[-1,1]**	**[0,1]**	**[-1,5]**
Constant	0.0924	0.0399	0.0102	0.00191	0.0147
	-0.121	-0.447	-0.795	-0.943	-0.781
Size	-1.57%***	-0.71%	-0.19%	-0.05%	-0.26%
	-0.004	-0.106	-0.581	-0.800	-0.562
Leverage	-0.05%	-0.05%	-0.04%	-0.02%	-0.05%
	-0.351	-0.255	-0.315	-0.520	-0.300
Industry	-1.33%	-1.69%	-1.14%	-0.19%	-0.92%
	-0.342	-0.191	-0.240	-0.754	-0.404
Between	3.64%	2.43%	0.67%	-0.11%	0.75%
	-0.175	-0.435	-0.780	-0.953	-0.733
Grade	1.78%	0.18%	-0.14%	0.71%	-0.35%
	-0.373	-0.911	-0.912	-0.498	-0.797
Year	0.71%	0.18%	0.33%	-0.50%	1.54%
	-0.574	-0.868	-0.710	-0.435	-0.135
Observations	475	475	475	475	475
R-squared	0.03	0.01	0.01	0.00	0.01
F-stat	1.96	0.86	0.38	0.36	0.71

The table shows the coefficient of the variables and their p-value for multiple event periods.
*** p<0.01, ** p<0.05, * p<0.1.

6.4 Discussion

The results show only significant cumulative average abnormal returns for the event window [-1,5]. The coefficient is negative, in contrast to what was expected. This outcome is not in line with several studies mentioned before. Holthausen and Leftwich (1986) and Steiner and Heinke (2001) found no significant abnormal returns for upgrades. Elayan, Hsu and Meyer (2003) show positive significant abnormal returns for upgrades. However Han et al. (2008) found also negative significant abnormal returns, although they don't have an explanation for these results.

The results for downgrades show negative significant abnormal returns. These results correspond with the results of e.g. Hand. et al (1992) and Goh and Ederington (1993), which imply that a credit rating downgrade results in a decrease of the stock prices. For the event window [-10,1] the CAAR is -1.55% and this indicates that the downgrades are maybe anticipated, because the market often reacts already before an event takes place. There are also significant results during and after the event date. That implies that the market is not efficient in managing new information, since there are still abnormal returns after the event date.

According to the price pressure hypothesis, downgrades from investment grade to speculative grade should result in stronger price reactions. The multivariate regression shows no significant results for the price pressure hypothesis. The multivariate regression further indicated that markets do not react in a stronger way for credit rating changes before 2007 and for initial ratings that have investment grade. In contrast to Kliger and Sarig (2000) there are no significant abnormal returns for the leverage variable. The insignificant leverage variable implies that the market does not react in a stronger way for firms with high leverage. The univariate analysis and multivariate regression show both that small firms have larger abnormal returns and the results are therefore in line with the firm size effect documented for example in Bernard and Thomas (1990).

Due to regulation credit rating changes for financial firms should have less impact on stock prices than credit rating changes for non-financial firms Schweitzer et al. (1992)

found dissimilar results than expected. Banks seem to response significantly more than corporates. The analysis show also that financial firms seem to react more than non-financial firms. A possible explanation of Schweitzer et al. (1992) is that bank regulators may hold back negative information to maintain depositor confidence in a bank with troubles and retain the bank's capability to attract capital in the markets. They may also hide 'bad news' to preserve stability for the entire banking system. As a result credit rating changes can have more effect for financial firms than for non-financial firms.

7| Conclusion

This thesis investigates the effect of credit rating changes on stock prices. A sample with daily stock prices, daily prices for the MSCI Europe Index, market capitalization, debt to asset ratio and credit rating changes is used. The analysis was conducted by calculating abnormal returns over an event window of 30 days.

The role of credit rating agencies is becoming increasingly important. Credit ratings convey the opinion of the credit rating agency of the creditworthiness of an issuer. Pension funds are sometimes only allowed to invest in investment grade rated debt and therefore credit rating agencies play also an important role in regulation.

Due to the larger role of credit rating agencies the information content of credit ratings is examined. Existing research illustrates evidence for significant abnormal returns for credit rating downgrades and occasionally for upgrades. Holthausen and Leftwich (1986), Hand et al. (1992) and Dichev and Piotroski (2001) found negative significant reaction for downgrades and no significant abnormal performance for upgrades. This thesis shows negative significant abnormal returns to downgrades. The negative cumulative average abnormal return for the 3-day period [-1,1] is 1.49 % and is significant at the 1% level. The evidence for downgrades is related to earlier research. For upgrades there is only a significant cumulative average abnormal return for the six day period of [-5,1] of -0.9%. The negative sign of the coefficient is unusual. If abnormal returns are found for upgrades in previous research they have a positive coefficient. However, Han et al. (2008) found also negative significant abnormal returns, but they don't have an explanation for these results. The evidences of multivariate regression for downgrades present no significant results for the price pressure hypothesis, the issuer hypothesis the initial rating category, the year variable, and the leverage variable. The univariate analysis and multivariate regression show both that small firms have larger abnormal returns and the results are therefore in line with the firm size effect documented in existing research (e.g. Bernhard and Thomas (1990) and Beard and Sias (1997)). According to the information content between financial issuers versus non-financial issuers, financial issuers response stronger to credit rating downgrades which

is contrary to earlier findings of Steiner and Heinke (2001). A possible explanation provided by Schweitzer et al. (1992) is that bank regulators may hold back negative information to maintain depositor confidence in a bank with troubles and retain the bank's capability to attract capital in the markets.

In conclusion this research provides evidence that credit rating downgrades result in significant negative abnormal returns for different event windows and this is consistent with previous research. The evidence of the multivariate regression implies that only the size variable results in significant abnormal returns.

Further research is needed to identify other events that occurred within -/+ 10 days, since the abnormal returns can also arise due to other information. According to De Goeij and De Jong (2011), potential problems with the market model are calendar time effects. It is well documented that returns on Mondays are lower, and on Friday slightly higher, compared with other trading days. If events are clustered on one of these days, the usual abnormal returns may be biased.

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Appendix

I Overview credit rating scales

II Summary of opinions of Standard & Poor's

III Sample dataset

Appendix I

Overview credit rating scales[9]

	Standard & Poor's	Moody's	Fitch Ratings
Investment grade	AAA	Aaa	AAA
	AA+	Aa1	AA+
	AA	Aa2	AA
	AA-	Aa3	AA-
	A+	A1	A+
	A	A2	A
	A-	A3	A-
	BBB+	Baa1	BBB+
	BBB	Baa2	BBB
	BBB-	Baa3	BBB-
Speculative grade	BB+	Ba1	BB+
	BB	Ba2	BB
	BB-	Ba3	BB-
	B+	B1	B+
	B	B2	B
	B-	B3	B_
	CCC+	Caa1	CCC
	CCC	Caa2	
	CCC-	Caa3	
	CC	Ca	
	C		
	D	C	DDD
		/	DD
		/	D

[9] Obtained from www.standardandpoors.com; www.fitchratings.com and www.moodys.com

Appendix II

General summary of the opinions reflected by Standard & Poor's ratings[10]

Investment grade	**AAA**	Extremely strong capacity to meet financial commitments. Highest rating
	AA	Very strong capacity to meet financial commitments
	A	Strong capacity to meet financial commitments, but somewhat susceptible to adverse economic conditions and changes in circumstances
	BBB	Adequate capacity to meet financial commitments, but more subject to adverse economic conditions
	BBB-	Considered lowest investment grade by market participants
Speculative grade	**BB+**	Considered highest speculative grade by market participants
	BB	Less vulnerable in the near-term but faces major ongoing uncertainties to adverse business, financial and economic conditions
	B	More vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet financial commitments
	CCC	Currently vulnerable and dependent on favorable business, financial and economic conditions to meet financial commitments
	CC	Currently highly vulnerable
	C	A bankruptcy petition has been filed or similar action taken, but payments of financial commitments are continued
	D	Payments default on financial commitments

Ratings from 'AA' to 'CCC' may be modified by the addition of a plus (+) or

[10] Obtained from www.standardandpoors.com: Guide to credit rating essentials

minus (-) sign to show relative standing within the major rating categories.

Appendix III

Overview dataset upgrades

This table presents a selection of the dataset which is obtained from Bloomberg database

Company Name	Event Date	Rating Type	Agency	Current Rating	Last Rating	Country	Industry Type
Rolls-Royce Holdings PLC	30-07-12	Senior Unsecured Debt	Fitch	A	A-	GB	Aerospace/Defense
Compass Group PLC	26-07-12	Senior Unsecured Debt	Fitch	A-	BBB+	GB	Food-Catering
Imperial Tobacco Group PLC	3-07-12	Senior Unsecured Debt	Fitch	BBB	BBB-	GB	Tobacco
Royal Bank of Scotland Group PLC	21-06-12	Subordinated Debt	Moody's	Ba2	Ba2 *-	GB	Diversified Banking Inst
Standard Life PLC	18-06-12	Subordinated Debt	Fitch	BBB+	BBB	GB	Life/Health Insurance
Kingfisher PLC	16-04-12	Senior Unsecured Debt	Fitch	BBB	BBB-	GB	Retail-Building Products
ITV PLC	27-03-12	Senior Unsecured Debt	Fitch	BB+	BB	GB	Television
ITV PLC	21-03-12	Senior Unsecured Debt	Moody's	Ba1	Ba2	GB	Television
ITV PLC	21-03-12	LT Corp Family Rating	Moody's	Ba1	Ba2	GB	Television
ITV PLC	21-03-12	Probability of Default	Moody's	Ba1	Ba2	GB	Television
Allianz SE	27-01-12	Financial Strength	S&P	AA	AA *-	DE	Multi-line Insurance
Pernod-Ricard SA	8-09-11	Senior Unsecured Debt	Moody's	Baa3	Ba1	FR	Beverages-Wine/Spirits
Aegon NV	12-08-11	Subordinated Debt	Moody's	Baa1	Baa2	NL	Multi-line Insurance
Aegon NV	12-08-11	JR Subordinated Debt	Moody's	Baa1	Baa2	NL	Multi-line Insurance
Vodafone Group PLC	3-08-11	Senior Unsecured Debt	Moody's	A3	Baa1	GB	Cellular Telecom
Vedanta Resources PLC	25-07-11	Senior Unsecured Debt	Moody's	Ba2	Ba2 *-	GB	Metal-Diversified
Vedanta Resources PLC	25-07-11	LT Corp Family Rating	Moody's	Ba1	Ba1 *-	GB	Metal-Diversified
Hammerson PLC	30-06-11	Senior Unsecured Debt	Fitch	A-	BBB+	GB	REITS-Diversified
Old Mutual PLC	23-05-11	Subordinated Debt	Fitch	BBB	BBB- *+	GB	Invest Mgmnt/Advis Serv
Old Mutual PLC	23-05-11	Senior Unsecured Debt	Fitch	BBB+	BBB *+	GB	Invest Mgmnt/Advis Serv
RSA Insurance Group PLC	19-04-11	Subordinated Debt	Fitch	BBB	BBB-	GB	Property/Casualty Ins