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Small Is Beautiful? A Comparison of Major and Minor Credit RatingAgencies Credibility

Dr S.B.Thorat[1], Dr N.D. Shinde[2], Dr.A.O.Gill[3]

Abstract

The subprime crisis-related events likely hurt credit rating agencies' (CRAs') reputation, at least in the short and medium term. By analysing the market's response to rating actions, we hope to determine the severity of that reputational damage in this article. We measure the abnormal return of stock prices in the three-day timeframe centred on the announcement day from November 2003 to November 2013 using a typical event study approach. According to our theory, the market has become less responsive to downgrades, upgrades, and credit watches than it once was because of a lack of confidence in the objectivity and dependability of the rating agencies. For the three, we anticipate the phenomenon to be more noticeable. The data is overwhelming in favour of the idea that rating announcements are met with less market reaction, particularly for the three major agencies. After taking into account numerous explicative elements related to the announcement's features and the market conditions in terms of volatility, the anomalous returns of equity prices in an event window of a rating action are much lower now than they were before the crisis. According to prior research on the subject, we find that the abnormal return is larger when the valuation is close to the line separating investment grade from speculative grade because of the "certification" role that many regulations assign to rating organisations. There is therefore no difference in the market's response to announcements before the certification role is prominent.

Keyword; scredit score, event analysis, reputation, and market effectiveness

Introduction

Rating agencies were one of the primary scapegoats selected by scholars and overseeing authorities after the so-called subprime crisis, which reached its peak with the failure of Lehman Brothers. Their assessments of collateralized debt obligations (CDOs) and other such products really turned out to be incredibly subpar and untrustworthy throughout the upheaval. Thousands of bonds were swiftly downgraded from AAA to junk rating over the course of a few months (Note 1). Many banks who were heavily involved in the securitization industry as investors and originators experienced the same thing. Following the crisis, numerous trials and critical assessments centred on determining the obligations of credit rating agencies (CRAs) and the causes of a poor performance that was unparalleled in their

Director[1], Assistant Professor[2,3]
Department of Management
SSBES ITM College Nanded
suryakant_thorat@yahoo.com, snileshjobs@gamil.com, gillabhishek@gmail.com

destruction. The three credit rating agencies had a significant role in the financial crisis. Without their endorsement, the mortgage-related securities at the centre of the crisis could not have been advertised or sold. Investors frequently placed naive faith in them. They were required to utilise them in specific circumstances, or regulatory capital criteria were dependent on them. Without rating agencies, this disaster would not have been possible (Financial disaster Inquiry Commission, 2011, p. 25).

By analysing how the market has responded to CRAs' rating actions, we hope to determine the severity of the reputational harm that has been sustained by CRAs in this study. We estimate the abnormal return of stock prices in the three-day timeframe centred on the announcement day during the event using a common event study methodology. for selecting the sample, its composition, the method used to calculate the abnormal returns and the variables used in their econometric analysis. Section 6 presents an analysis of the determinants of abnormal returns for the rating actions announced by Moody's, Standard and Poor's and Fitch. The weight of various factors is taken into consideration in the empirical investigation: the kind of rating action, the extent of the rating change in terms of number of notches, the potential crossing of the border between investment and speculative grade, the distance froma previous rating action by the same or another agency. To all these – quite standard – independent variables, we add a dummy variable representing the period in which the announcement was disseminated to the market: before and during the subprime crisis or in the post-crisis period. For our research question, this temporal dummy is the main focus of interest and is the instrument through which we gauge if the market has been reacting differently to rating announcements since the subprime turmoil cast shadows over the reliability of the agencies. Section 7 repeats the analysis on the sub-sample of rating actions announced by all other minor agencies who had less direct involvement in the turbulent subprime crisis. A specific focus of the analysis is on the differential credibility of major and minor CRAs (section 8). Finally, section 9 draws the conclusions, comparing the reputational damage suffered by the rating industry as a whole and by the various players within it.

1. Criticisms of Credit Rating Agencies

With the development of the financial markets, the use of the rating system has become more intense and pervasive and its role has been enriched with new meanings. Alongside its original functions of mitigation of information asymmetry between issuers and investors (Partnoy 1999) and its monitoring of the issuers, the rating has become an important instrument in regulating the financial system and a certification standard (IMF 2010). Over the years, in fact, the supervisory authorities have increased the use of ratings to regulate the conduct of monitored operators (BIS 2009). In particular, in granting to some CRAs the status of National Recognized Statistical Rating Organization (NRSRO) and a higher value for the rating they had provided, the US supervisory authorities have given them the ability to issue a sort of regulatory licence to parties intending to carry out activity on the financial market (Partnoy 2009). Moreover, many other operators have relied on rating reviews to solve the problem of moral hazard: by including them in debt contracts (rating trigger) or by using them to align the behaviour of fund managers to investors' interests or even by controlling access to certain credit lines or to specific markets (Deb-Manning 2011).

a) a) Several studies on the reliability of ratings have been motivated by their broad usage in the financial industry. When credit reporting agencies (CRAs) failed to promptly inform relevant parties of major corporate defaults or financial crises, the scientific community and regulatory authorities began looking into the issue. The significance of the most crucial aspects in this area has increased throughout time. In particular, we examine the issue of the rating evaluation agency's lack of accountability. To protect itself from legal action, rating agencies argue that their views should be seen as only that, and not as a formal advice to buy or sell. (Note

3) Because of this understanding of the rating, no CRA that has been sued has ever agreed to pay compensation because of harm resulting from a rating that was either too high or too low.

b) b) The incorporation of ratings into monetary law. An excessively artificial and inflexible demand, centered on a small group of CRAs known as NRSRO, has arisen due to the widespread usage of ratings assigned by the regulatory bodies as a means of gaining access to certain types of funding or evaluating a company's capital adequacy. Investors' mistrust of registered CRAs has been exacerbated by the formation of a register, which has been handled for many years with opaque procedures (2006 Partnoy).

c) Inconsistency of interest (c). The issuer often pays the CRA for more in-depth evaluations (White, 2001). Some alignment of ideas between the parties is inevitable under the issuer-pays approach, which might reduce the trustworthiness of the agency's assessment. The issuer has a vested interest in applying pressure to get the best possible rating, and the agency may be persuaded to offer more favorable ratings without exercising independent judgment in order to keep its clientele. The agencies, however, have claimed that the necessity to protect their own credibility is sufficient to ensure the objectivity and integrity of the data they provide. In fact, it has been claimed that the selection method for rating agencies should give preference to those having a track record of dependability and independence. The CRA's high reputation would aid to mitigate the inherent conflict of interest in the issuer-pays paradigm. The financial crisis caused by subprime mortgages made it less likely that this assumption would hold up in the long run. As long as there are several issuers of a same agency, a strong reputation may act as a deterrent to the conflict of interest; but, the fear of switching to a rival, potentially more compliant, might impair its profitability. If, on the other hand, the market has the power to penalize untrustworthy agencies, then this system can work successfully. The incentive to offer more favorable ratings is unquestionably larger (Note 4) when a CRA's clients consist of a small number of major investment banks that continually pump in more than half of their income, as happened when securitized securities were examined. Furthermore, the incorporation of ratings into financial regulation has decreased CRAs' vulnerability to market reputation-based punishments. The trend of offering issuers other advice services besides rating evaluations has exacerbated the conflict of interest. Professional advice may go as far as predicting the conclusion of an analysis and recommending steps to take to improve the evaluation (Coffee, 2008). As a result, CRAs are even more reliant on the work done for a very small number of very big clients.

d) The rating agency's virtual monopoly on the data used to assess the items. This function was very helpful for assessing structured goods. Many complaints about the evaluation procedures were voiced since the market could not evaluate the credibility of the instruments in issue, which may have relied on unreliable third-party sources due to their complexity and opaqueness (Linciano, 2008).

Stability in Ratings, e. Rating agencies tend to assign the most stable rating feasible with regards to the medium to long-term development of the assessed firm in order to safeguard the credibility of their own assessments and to satisfy the demands of investors (Note 5).

Even if things are looking up now, a company's capacity to repay must be evaluated using a through-the-cycle approach to account for the possibility of a downturn. This tactic explains why CRAs prefer to ignore improvements in a company's creditworthiness after the fact.

Advantageous behavior; f. The issuer-pays compensation mechanism leads to rating shopping and unsolicited ratings. The first scenario involves the issuer soliciting a credit assessment from many agencies finally picking the one with the most upbeat review. In the second scenario, the CRAs evaluate the firm without being asked to do so, and then threaten to make its rating public if the company does not pay for its services. A CRA may engage in the same kind of exploitative behavior if the issuer chooses to direct a competitive agency.

Oligopoly. Although there are over 150 participants in the ratings sector (BIS, 2000), the top three agencies presently have a secure 96% of the worldwide market (SEC, 2013). The Big Three have substantial market dominance and a substantial revenue position due to the magnitude and stability of their respective market shares (Petit, 2011). Some academics contend that the high obstacles to entry in the rating industry inevitably lead to oligopoly. In addition to the roles played by economies of scale, advantages of experience, and the significance of reputation gained, public legislation has played a significant role in distorting competitive mechanisms, guaranteeing and strengthening dominant positions already obtained. For a rating agency, maintaining its credibility as a credible institution takes precedence above improving the accuracy of its ratings in a market with little to no competition and a relatively stable demand. However, it is unclear whether increased information quality would result from a competitive rating market. It has been suggested that more competition would lead to a decrease in market share for all players, but that this decline would be offset by a reduction in the motivation to offer quality ratings due to a reduction in future revenue.

Despite not being subject to any particular law for their actions (Note 6), CRAs have exercised a supplementary role to financial regulation for many years, allowing the rating market to flourish.

The subprime mortgage crisis and the ensuing sovereign debt crises were especially significant in removing this special treatment.

The European Securities and Markets Authority (ESMA) is responsible for enforcing the requirement that all professionals engaged in rating activities register with the agency. The main distinction between agencies qualified as NRSRO in the United States and those in Europe as ECAI is found in the access requirements, with the former placing more weight on the applicant's professional competence and organizational heft and the latter placing greater weight on the agency's established reputation. In the former, there are no obstacles for first-time applicants, whereas in the latter, established firms are given preference.

The new American law has specific rules for avoiding and resolving conflicts of interest. In reality, it takes into account conflict situations that may be resolved by disclosing their presence in a timely manner, or it imposes fines on instances with a conflict of interest, such as when the CRA has a client that generates 10% or more of its income on their own. When an issuer is affiliated with the CRA's parent company, it may be necessary to take action. This conflict of interest is avoided because to European Union standards of governance for agencies, which include things like a minimally organized control structure inside the CRA and transparency laws for the objects of evaluations. Furthermore, it forbids the agency from providing the issuers being reviewed with any corporate or legal structure and capital asset management consultancy services.

In order to ensure that ratings are accurate, regulatory bodies in the United States and Europe have instituted rules requiring CRAs to disclose their evaluation criteria and data collection procedures. The quality of the CRAs giving the evaluations will be clearer to the market in this manner.

The issue of civil responsibility for the CRAs is addressed in both the American and European law by limiting the scope of the exemption system. Finally, both agencies are working to eliminate any remaining statutory references to ratings.

2. Literature Review

There is a plethora of information out there about credit rating agencies. Since the 1970s, researchers and academics have been investigating, testing, and debating the impact these organizations have on the global financial system. The vast majority of these publications examined the usefulness of ratings and sought to quantify the aberrant returns in market prices that followed different announcements from rating organizations. To ascertain whether or whether the market expects the judgements issued by the

agencies, researchers in numerous empirical studies also considered the anomalous returns prior to grading activities. Recent works examine ratings not just for the information they provide, but also for the "certification" function they play. Crossing certain thresholds affects the behavior of numerous restricted investors who may be forced to sell a downgraded security or may regain the right to buy an upgraded one (Steiner et Heinke, 2001; Micu et al., 2006; Kiff et al., 2012). This is because many laws and regulations have given rating agencies' valuations an official role, with the most prominent example being the Basel 2 Agreement. Abnormal returns are a byproduct of the agency's gatekeeper function, which is a result of the regulatory framework rather than the information content given by the agency (Partnoy, 2006).

In addition, many studies sought to disentangle the market impact of rating announcements based on factors like the agency's stated rationale (Goh and Ederington, 1993), the issuing company's simultaneous dissemination of relevant information (Hand et al., 1992), and the presence of a review/outlook anticipating the rating action by the same agency or any preceding announcement. Studies also vary according on the analyzed market, the length of the event windows considered, and the specifics of the abnormal return calculation. The state of the art is shown in Table 1, which updates and expands the study by Norden and Weber (2004) by summarizing the important aspects and findings of the academic literature about the informational content of rating announcements.

Let's start with the "bad news": when researchers include negative credit watches in the sample of events under consideration, such occurrences are virtually always linked to large anomalous returns. Since the certification function is less vital under these circumstances, the rating agencies seem to update the markets with their cautionary lists. Most studies also find that downgrades are followed by negative anomalous returns, but on a lower scale. When the investment grade level is reached, the evidence becomes especially compelling.

The "good news" is that there is significantly less proof of anomalous returns after favorable ratings and upgrades. There is, at most, just a little market effect for favorable assessments and outlooks, and many articles find no evidence of exceptional returns after upgrades. The fact that upper management is more likely to share and emphasize positive information may be to blame for this discrepancy. Therefore, the market will not be surprised by the company's statements, and the rating agencies' upgrades and good assessments will not provide any new information to the market.

Studies sometimes also examine aberrant returns in the time period just before a rating change. With these experiments, we want to learn if credit rating organizations are market leaders or followers. Before a rating or review change, there is often clear proof of very aberrant results. This "anticipation" does not rule out a market response when a rating action is actually revealed, which demonstrates that agencies do more than only react to a trend; they also send fresh information to investors or, at the very least, reinforce and confirm their existing beliefs.

Table 1. Summary of the literature concerning the market impact of rating changes

Publication details					Sample features	Conclusions on significant abnormal return				
Authors	Year	Market	Period	Obs.	Event windows	After negative reviews	After downgrade	After positive reviews	After upgrade	Before rating actions
Katz S.	1974	Bond	1966-1972	115	[-12 months;+5 months]	N/A	Yes, in 6-10 weeks	N/A	Yes, in 6-10 weeks	No
Pinches G.E., Singleton J.C.	1978	Stock	1950-1972	207	[-30 months;+12 months]	N/A	No	N/A	No	Yes
Hand J., Holthausen R., Leftwich R.	1992	Bond and stock	1977-1983	1.350	[0;+1] for the stock market. Closer to event prices available for bond market.	Yes, but only for additions classified as unexpected.	Yes, but only for contaminated announcements.	Yes, but only for additions classified as unexpected.	No	N/A
Goh J.C., Ederington L.H.	1993	Stock	1984-1986	482	[-30;-11],[-10;-1], [0;+1], [+2;+11], [+12; +30]	Yes, when the motivation is linked to a deterioration in firm's financial prospects.	Yes, when the motivation is linked to a deterioration in firm's financial prospects.	No	No	Mixed evidence.

Authors	Year	Asset	Period	N	Event window					
Richards, A., Deddouche D.	1999	Stock	1998-1999	219	[-35 weeks; +15 weeks]	N/A	No	N/A	Yes, but negative instead of positive.	Yes, but only for downgrades.
Steiner M., Heinke V.	2001	Bond	1985-1996	728	[-180;+180]	Yes	Yes, especially for downgrades into non-investment grade.	No	No	Yes
Gropp R., Richards A.J.	2001	Bond and stock	1989-2000	186	[-40;-2], [-1;+1], [+2;+40]	N/A	Yes, but only in the stock market.	N/A	Yes, but only in the stock market.	No
Schweitzer R., Szewczyk S.H., Varma R.	2001	Stock	1977-1998	92	[+1;+2]	N/A	Yes	N/A	N/A	N/A
Hull J., Predescu M., White A.	2004	CDS	1998-2002	325	[-90;-61], [-60;-31], [-30;-2], [-1;+1], [+2;+10]	Yes	No	No	No	Yes
Norden L., Weber M.	2004	Stock and CDS	2000-2002	397	[-90;-61], [-60;-31], [-30;-2], [-1;+1], [+2;+30], [+31;+60], [+61;+90]	Yes	Yes	No	No	Yes
Ammer J., Clinton N.	2004	ABS	1997-2003	1.292	[-2 month], [-1 month], [0 month]	N/A	Yes	N/A	No	Yes, for downgrades.
Linciano N.	2004	Stock	1991-2003	299	[-20;-11], [-10;-2], [-1;+1], [+2;+10],	Yes	Yes	No	Weak evidence.	Weak evidence, limited to upgrades/ downgrades preceded by a watch.
Micu M., Remolona E., Woollridge P.	2006	CDS	2001-2005	2.014	[-61;-21], [-20;-1], [0;+1], [+2;+20]	Yes	Yes	Yes	Yes	Yes
Kiff J., Nowak S., Schumacher L.	2012	CDS	2005-2010	194	[-20;+20]	Yes	Yes, but only for downgrades out of investment grade.	Yes	Yes, but only for upgrades into investment grade.	Yes, but only for reviews.

Insufficient empirical study has been done on banks. Since banks are subject to such stringent prudential oversight and must comply to such high transparency standards, some scholars suggest that rating actions involving banks should be allowed to send less information to the market. However, detractors argue that financial authorities often suppress bad news for fear of driving away retail investors. Even if the information is already known to the regulatory bodies, the rating agencies may choose to divulge it nevertheless. If authorities are unwilling to disclose a downgrade, it might have an even bigger influence on market pricing.

11 Weak empirical data prevents us from conclusively rejecting any of the competing theories. No statistically significant anomalous stock returns and, in some cases, a reaction in the other direction were discovered by Richards and Deddouche (1999) when they looked at the effect of downgrades on the stock prices of a sample of developing market banks. For a selection of European banks, Gropp and Richards (2001) conduct an event research on the effect of rating change announcements on bond and stock prices. However, they discover that announcements of bond prices have little to no influence on bond prices, but changes in stock ratings are linked to high anomalous returns during the event window. There seems to have been no discernible impact from either the announcement or its lack. The authors believe that the lack of liquidity in the debt market is to blame for the gap between it and the stock market. Within the context of a multivariate examination of the causes of anomalous returns, Steiner and Heinke (2001) find that the market does not respond strongly to reports of banks being placed on watchlists or having their ratings changed. In addition to a substantial anomalous return, Schweitzer et al. (2001) discover that the downgrade of a money center bank affects regional banks that are not themselves rated. Our two offerings are by no means insignificant. In contrast to the great majority of previously published research, our sample goes beyond the big three rating agencies (Moody's, Standard & Poor's, and Fitch). The necessity for a broader variety of CRAs has been highlighted by recent legislative changes. Our second original contribution investigates how the subprime crisis may have an effect on the credibility of credit rating agencies. We have found very few scholarly books that go deeply into this topic. Our closest comparative study is by Hun Han et al. (2012), who, like us, are interested in the credibility of rating agencies and who, like us, discover that the credibility of the top CRAs fell during the 2007-2009 crisis period. The bond market in Japan uses a different metric than we do when comparing major and small rating agencies:

the yield difference associated with a certain level of rating.

13 There is insufficient evidence to support any of the opposing theories. Richards and Deddouche (1999) looked examined the impact of downgrades on the stock prices of a sample of emerging market banks and found no statistically significant abnormal stock returns and, in some instances, a response in the other direction, with prices climbing following a downgrading. Gropp and Richards (2001) perform an event study on the impact of rating change announcements on bond and stock prices for a subset of European banks. They do find that changes in stock ratings are associated with large abnormal returns within the event window, but bond price announcements have little to no effect on bond prices. Neither the announcement nor its absence seem to have had any noticeable effect. The authors attribute the disparity between the stock market and the debt market to the latter's lack of liquidity. Steiner and Heinke (2001) note a muted market reaction to news of watchlisting and rating revisions for banks within the framework of a multivariate analysis of the determinants of abnormal returns. Schweitzer et al. (2001) find that the downgrading of a money center bank has an effect on regional banks that are not themselves downgraded, in addition to a significant abnormal return.The two things we provide are not little. To begin, our sample expands beyond the three major rating agencies—Moody's, Standard & Poor's, and Fitch—in contrast to the vast bulk of previously published research. Recent developments in legislation stress the need for a more inclusive range of CRAs. Our second unique contribution considers how the subprime crisis could affect the authority of credit rating organizations. To our knowledge, there are few academic works that have extensively explored this question. The research by Hun Han et al. (2012) is most similar to ours since it, too, is concerned with the credibility of rating agencies and finds that the leading CRAs' credibility declined throughout the 2007-2009 crisis period. In contrast to us, the Japanese bond market compares big and minor rating agencies based on the yield differential associated with a specific level of rating rather than the abnormal return at the time of a rating change announcement.

14.15. A Description Snippet

The sample includes analyses of 1,609 ratings published between November 1, 2003 and November 1, 2013 by the Big Three credit rating agencies (S&P, Moody's, and Fitch), as well as four "minor" agencies (EJR, R&I, DBRS, and

JCR) based on their market shares (Note 7). From the STOXX 1800 (Note 8) index, we extrapolated a total of 106 financial intermediaries to evaluate (42% European, 35% Asian, and 23% North American). Changes in the issuer's rating, both up and down, confirmations of prior ratings, and watchlist entries with positive or negative indicators are all taken into account. Bloomberg was used as the source for all data extraction.
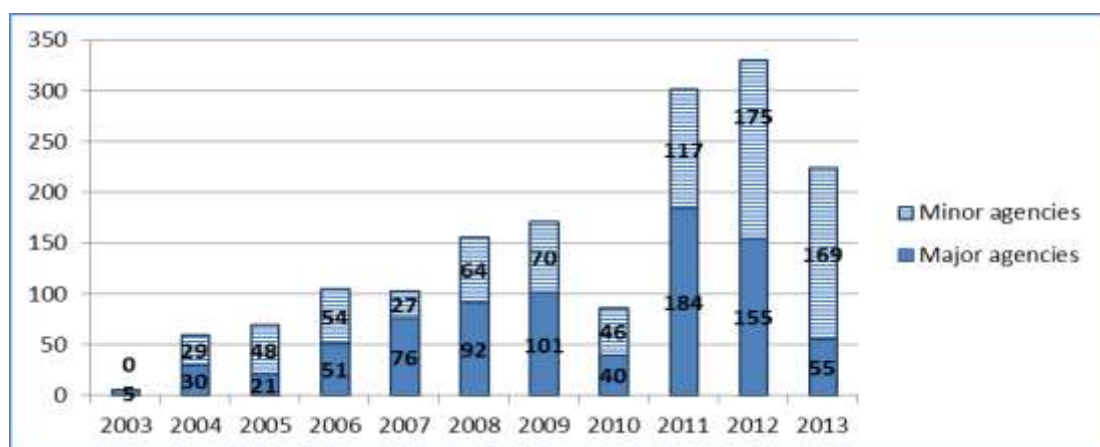
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Graph 1. Distribution of rating actions by type of credit rating agency (November 2003 – November 2013)
* The number of reviews of the year 2003 is anomalous because the survey only considers two months, just as, for the year 2013, the events of the final two months are not surveyed.

The breakdown of the 1,609 rating actions by year (graph 1) and the respective breakdown by the relevant group of CRAs suggest two considerations in relation to the dynamic and composition of the rating actions:
a) The CRAs' frenzied effort to educate the public, as shown by a steadily rising number of rating actions up to 2009 and an exponential surge after a sharp decline in 2010.
b) The crucial function played, especially after 2010, by the smaller agencies.
Each financial intermediary was tracked by an average of 2.28 agencies over the study period, with 19% of issuers using just one of the Big Three, 28% using only one or more lesser agencies, and a healthy 53% using both to get their ratings. Notably, the ESMA's rules likely impacted the decision to evaluate more than half of issuers by the two kinds of CRA beginning in 2011.

To verify how the various agencies have evaluated the issuers over time, we can convert the various alphanumeric characters used by the CRAs into a single numerical scale, where the lowest value is assigned to the best credit rating (AAA = 1) and the highest value is assigned to the worst rating (CCC = 20) (Note 10). The breakdown of the 1,609 ratings provided by agency type reveals that the smaller agencies were harsher in their assessments, with an average value greater than that of the bigger agencies. Even when the indicator is analyzed by dividing the observed time span into three sub-periods—pre-crisis, crisis, and post-crisis—the superior rigor of the smaller agencies is always apparent. It is to be predicted that as time passes from before the Lehman Brothers collapse to the era designated as "post-crisis," the average value of the ratings granted would decline. Also, across all time periods, the average value of ratings from the main agencies is higher than that from their smaller rivals. By dissecting the data, one can observe that the agency EJR, which is known to be distinct from its rivals since it has embraced the "subscriber-pay" model, is primarily responsible for the increased rigor given to the set of small CRAs. Standard & Poor's, one of the Big Three, gave the lowest possible ratings.

Table 2. Average value of outstanding ratings

	no. obs	average rating	maximum value	minimum value	standard deviation
Big	810	5,95	1	15,25	2,53

NoBig	799	6,55	2	20	2,79
Total observations	1609				
Breakdown of reviews of ratings by periods					
Pre-crisis Big	222	4,38	1	10	1,73
Pre-crisis NoBig	181	4,69	2	10	1,61
Crisis Big	142	4,99	2	11	1,49
Crisis NoBig	88	5,33	2,75	9	1,47
Post-crisis Big	437	7,05	1,25	15,25	2,60
Post-crisis NoBig	525	7,38	2	20	2,90
Breakdown of reviews of ratings by Agency					
DBRS	180	4,98	2	13	2,09
Moody's	230	5,23	1	14	2,59
R&I	249	5,35	3	10	1,36
JCR	32	5,59	2	9	2,07
Fitch	217	5,74	2	11	1,98
S&P	354	**6,54**	2	15,25	2,65
EJR	333	**8,38**	3	20	2,91

	Mean difference in rating valuations	T-stat
Big-NoBig – All periods	-0,6	-4,52***
Big-NoBig – Pre-crisis period	-0,31	-1,86**
Big-NoBig – Crisis period	-0,34	-1,69**
Big-NoBig – Post-crisis period	-0,33	-1,86**
EJR-NoBig	1,00	4,91***

When restricting the analysis on the "severity" to only 57 issuers evaluated both by the major and minor CRAs, this confirms what has previously been stated (Table 3). In 72% of cases the rating assigned by the minor CRAs was found to be on average lower by 2 notches compared to that issued by the Big Three. The evaluation difference between major and minor CRAs, more significant in the post-crisis period, justifies the decision to analyse the two samples separately, so as to verify if the loss of credibility involved all the CRAs or only the bigger ones.

Table 3. Rating severity

	2004-2013	**2010-2013**	**2004-2009**
% greater severity CRAs NoBig	72%	56%	34%
no. issuers	57	52	38
Average rating CRAs Big	5,05	6,00	3,37
Equivalent to	A+	A	AA*-
Average rating CRAs NoBig	7,17	9,05	3,97
Equivalent to	A-	BBB	AA-
Difference	2,13	3,05	0,61
Tstat	4,28***	5,37***	0,14

Analyzing the sample's make-up in terms of review types (Table 4), we see that downgrades by the main agencies predominate both during and after the crisis. This resulted in a downgrade from investment grade to speculative grade for 19 issuers, and an upgrading from speculative to investment grade for 7 issuers. One interesting feature of small agency rating action samples is the prevalence of ratings that corroborate the one assigned. The minor rating agencies R&I and EJR have both indicated "Stable" status for these 392 rating actions. According to all indications, the rating agencies in question are expected to be more stringent and "firm" in their assessments. The less number of credit watches issued by the smaller CRAs compared to those indicated by the Big Three is further evidence that the assigned rating is more stable.

Table 4. Reviews of ratings by type

	Down	Up	Stable	Watch	Down	Up	Stable	Watch	Down	Up	Stable	Watch
Big	58	140	-	48	126	16	-	45	380	50	-	166
NoBig	15	56	75	20	46	6	30	27	119	33	287	21
	Pre-crisis				**Crisis**				**Post-crisis**			

Table 5 indicates the rating boundaries, between the values of 8.25 (BBB+ with negative watch) and 10.75 (BB- with positive watch), that may result in the transfer of the issuer from the investment category to the speculative category and vice versa owing to a later rating action. That has the most rating cutoffs of any

formulated by the Big Three during the post-crisis period. Their average value, however, is slightly better than that calculated for the rating borders of the smaller CRAs.

Table 5. Rating border

Number of rating border				Average value of rating border	
	Big	**Non Big**	**Total**	**Big**	**Non Big**
Pre-crisis	10	7	**17**	9,00	9,20
Crisis	4	1	**5**	8,31	8,25
Post-crisis	89	68	**157**	8,74	9,13
Total	103	76	**179**	8,74	9,12

Finally, Table 6 identifies the incidence of cases (40%) in which a rating event has led to a market reaction contrary to expectations (appreciation of the stock against a downgrading or depreciation of the stock following an upgrading). The high number of "contrarians" is at the basis of the decision to conduct our analyses on the reliability of the CRAs considering the absolute value of the abnormal returns achieved.

Table 6. Ratings with contrarian effect

	No. observations	N. contrarian	Contrarian incidence
Pre-crisis	408	176	43,14%
Crisis	233	112	48,07%
Post-crisis	968	352	36,36%
Total	1609	640	39,78%

4. The Methodology

We use a typical event research technique to assess the harm done to credit rating companies' reputations. For each rating action in our sample, we calculate the anomalous return across a three-day event window centered on the day of the announcement ([-1]+1). Due to the possible leak of information preceding the formal communication, we have included the day before the rating action, and we have included the day after the rating action because we do not know the exact time of the announcement, which may occur in the evening when trading is closed. Our study subject, which centers on the credibility of ratings agencies and the usefulness of their activities, is well-suited to a time frame of this duration. While the immediate return is largely reliant on the amount of trust put in the knowledge of the agency, the price drift in the following days and weeks may be the product of independent analysis undertaken by investors, even if prompted by the rating change. We calculate the cumulated abnormal return as follows:

$$CAR_{t;i} = r_{t;i} - a_{t;i} - \beta_{t;i} \times r_{t;m}$$

where:

$CAR_{t;i}$ Cumulative abnormal stock price return for company i in the 3-day event window centred on a rating action announced at time t.

$r_{t;i}$ Daily stock price return of company i.

$\alpha_{t;i}$ Intercept of the regression line between the daily stock price returns of company i and the daily returns of the Stoxx 1800 Banks Index, calculated over a moving estimation window of 500 days.

$\beta_{t;i}$ Slope of the regression line between the daily stock price returns of company i and the daily returns of the Stoxx 1800 Banks Index, calculated over a moving window of 500 days.

$r_{t;m}$ Daily return of the Stoxx 1800 Banks Index.

As we are specifically interested in the informative content of rating actions and thus in the magnitude of the price reactions to the announcement by the agencies, independently from its sign, we focus on the absolute value of cumulative abnormal return, adopting an approach similar to Grothe (2013):

$$ABS\_CAR_{i;} = |CAR_{i;}|$$

One of the differences between our study and the standard literature is the dependent variable's absolute value. This methodological decision is tied to our interest in how ratings changes affect stock prices. Strong empirical evidence suggests that downgrades (upgrades) do not necessarily have a negative (positive) effect on stock prices, contrary to what would be expected in the bond market (Goh and Ederington, 2003). The rating agency's stated rationale for the downgrade (upgrade) has a significant bearing on the direction of the effect. In particular, stock prices benefit when a downgrade is associated with a rise in leverage, since this results in a shift of wealth from bondholders to shareholders. Therefore, even if we were to split the whole sample into downgrades and upgrades, the results would show a highly muddled scenario in terms of CAR signs, and the coefficients of the parameters would be unintelligible. Table 6 analyzes the evidence for this occurrence in relation to our sample.

We date the start of the crisis to September 15, 2008, when the market was informed of Lehman Brothers' default. This date was chosen because it represents the first day of the crisis for the majority of investors, marking the time when the subprime crisis morphed from a danger recognized only to a select group of experts into widespread upheaval. To determine when the crisis ended, we looked back to when the VIX Index dropped below its average level from the month before to Lehman's collapse. The volatility index (VIX), sometimes known as the "fear index," is widely used as a proxy for market anxiety. Using the above criteria, we determine that the crisis period ended on October 15, 2009. Time is divided into two parts: before and during the crisis (1 November 2003-15 October 2009) and after the crisis (15 October 2009-1 November 2013). We're especially curious in what happens after a crisis has ended. In particular, we want to know whether investors' perspective on rating actions changed following the crisis, when their vulnerabilities became more apparent. Once market conditions have stabilized, the new mindset will be easier to evaluate.

Following this, we use the OLS technique to conduct a multivariate econometric analysis of the 3-day cumulative anomalous returns related to rating activities. We use a group of established variables that have been shown to matter in prior empirical investigations as our independent variables. Specifically, we think about how many notches the rating went up or down. For this purpose, we've converted each agency's letter-based rating system

into a numerical scale with 14 levels, from "AAA" (or its equivalent) being assigned a value of 1 to "F" (or its equivalent) being assigned a value of 20. A negative credit watch is represented by a quarter-notch reduction, while a positive credit watch is represented by a quarter-notch increase. The absolute value of the notch-shift should increase in tandem with the dependent variable, we assume.

We next think about how agencies' certification function may have an effect, with a change in rating above or below the speculative threshold putting stress on a large number of restricted investors. We introduce a dummy variable, BORDER, set to 1 when the most recent rating or the newly disclosed rating is close to the line between speculative and investment grade (i.e., BBB or BB), and 0 otherwise. There should be a positive correlation between the two variables. When a firm is on the cusp of a crucial level, the market tends to respond more strongly to both good and bad news.

In addition, we include the dummy variables CONTAMIN (which is equal to 1) if there is evidence of another announcement by the same or by another rating agency in the 30 previous days, and ANTICIP (which is equal to 1) if the downgrade or upgrade has been predicted by a credit watch. Since the informational content of the news has been given to the investors and, in both circumstances, has been discounted by market prices, we anticipate a negative coefficient for both variables.

To tell the difference between a genuine rating change and a spot on the warning list prior to a downgrade or upgrade, we've implemented a fake CREDIT_WATCH. The research and our expectations both point to an increased market effect for credit alerts.

We also propose a new variable that measures the gap between the average outstanding ratings on a firm and the fresh assessment provided by a rating agency within the same year. When the difference between the new judgment and the average ratings the firm obtained that same year is more than one notch, the GAP_RAT variable is equal to 1. Since the market should respond more strongly to views that are much at odds with the norm, we anticipate a positive coefficient for this dummy.

We consider – as control factors – the level of VIX Index and the standard deviation of the specific stock affected by the rating action in the 50 preceding working days. We expect a positive coefficient for both variables, assuming that a more volatile and nervous market or security will react more intensely to any kind of news.

Finally, and most importantly for our purposes, we take into account a temporal dummy variable called POST_CRISIS, whose value is 1 for all dates after 15 October 2009 and 0 otherwise. To evaluate how the subprime crisis has affected the credibility of credit rating organizations, we mostly use this dummy. The POSTCRISIS variable is expected to have a negative coefficient. When the regulatory and psychological barrier of the junk level is far away, in particular, we anticipate the phenomena to be more pronounced. The BORDER_POSTCRISIS variable is set to 1 when a rating action occurs in the post-crisis period and concerns a company with an evaluation close to the threshold between speculative and investment grade, and the NOBORDER_POSTCRISIS variable is set to 1 when the action occurs in the post-crisis period and concerns a company with an evaluation far from the critical threshhold. For the second dummy variable, we anticipate a larger and more meaningfully negative coefficient. In fact, regulatory-induced trading affects market return in the former situation regardless of actual confidence in the announcement's veracity.

Subsamples of rating actions from the three main and the four minor CRAs were examined independently on the same set of variables. Finally, we combined the two samples to see whether the market's response to major ratings agency announcements (such as those from Moody's, S&P, and Fitch) is less than the effect created by announcements from the smaller agencies (using a dummy variable labeled BIG). This is something we anticipate happening when the crisis has passed. As a result, the dummy BIG has a negative predicted coefficient. We also investigated (using the variable EJR) if the market responds more strongly to the one credit rating agency with an investor-pay model than to the more common issuer-pay one. A positive coefficient for this dummy variable is anticipated given that reducing potential for conflicts of interest should increase confidence among investors. Finally, using the S&P variable, we examined whether or not the market pays special attention to the main agency that showed the most severe values throughout the descriptive analysis of the database.

Table 7 provides a concise overview of the econometric analysis's independent variables and their anticipated coefficients.

Correlations among our independent variables are shown in Table 8. Variables with bold values are strongly connected and cannot be used in the same set of requirements. In particular, we utilize alternating measures of market-wide and security-specific volatility to conduct a robustness check on our findings because of the strong correlation between them. The regressors DOWN and WATCH are strongly associated with the dummy STABLE. Instead of incorporating the dummy STABLE in the requirements, it will be utilized to define a subsample in the analysis described in Section 7.

Table 7. Independent variables included in the econometric analysis – Definition and expected sign of the coefficient

Name	Definition	Expected sign
VA_CHGNOT	Absolute value of the change in rating level, calculated on the basis of a numerical conversion of the alphanumerical scale used by CRAs, where the highest rating is equal to 1 and the lowest is equal to 14. The positive and negative watches are equal to -0.25 and +0.25 respectively.	+
DOWN	Dummy variable which is equal to 1 when the rating announcement worsens the credit valuation of an issuer.	+
STABLE	Dummy variable which is equal to 1 when the rating announcement leaves the previous valuation on the issuer unchanged.	-
CONTAMIN	Dummy variable which is equal to 1 if the distance between two subsequent rating announcements on the same company is less than 30 days, provided the two actions are in the same direction (i.e. both upgrades and downgrades).	+
ANTICIP	Dummy variable which is equal to 1 when a	-
	downgrading or upgrading are preceded by a watch in the same direction (i.e. a negative watch for the downgradings and a positive watch for the upgradings).	
CONTRARIAN	Dummy variable which is equal to 1 when the return following a rating action has a counterintuitive sign (i.e. a positive return following a downgrading or a negative return following an upgrading)	-
GAP_RAT	Dummy variable which is equal to 1 when the new rating assigned is more than one notch away from the average of outstanding ratings on the issuer in the same year	+
BORDER	Dummy variable which is equal to 1 if the last or current ratings are between BBB+ and BB- and 0 otherwise.	+
WATCH	Dummy variable which is equal to 1 if the announcement consists of a credit warning rather than a downgrading or upgrading.	+
VIX	Value of the VIX index on the day of the announcement of the rating action.	+
DEVST	Standard deviation of the daily returns in the 50 working days preceding the rating action for the specific stock affected by the announcement.	+
POSTCRISIS	Dummy variable which is equal to 1 for all announcements after 15 October 2009.	+
NOBORDER_POSTCRISIS	Dummy variable which is equal to 1 when the announcement is in the post-crisis period and concerns an issuer that is not on the verge of the critical threshold between investment and junk grade.	-

BORDER_POSTCRISIS	Dummy variable that is equal to 1 when the announcement is in the post-crisis period and concerns an issuer that is on the verge of the critical threshold between investment and junk grade.	-
BIG	Dummy variable that is equal to 1 when the rating announcement is made by Moody's, Standard and Poor's or Fitch	-
ANTICIP_BIG	Dummy variable that is equal to 1 when a rating announcement made by a minor CRA follows an announcement made by a major CRA in the last 50 days	-
EJR	Dummy variable which is equal to 1 when the rating action has been announced by the agency EJR.	+

Table 8. Correlation matrix – main independent variables

	POSTCRISIS	VA_CHGNOT	CONTAMIN	ANTICIP	DOWN	STABLE	WATCH	GAP_RAT	VIX	DEVST	BIG	ANTICIP_BIG	EJR
POSTCRISIS	1,0000	-0,0083	0,0056	-0,0434	0,0926	0,1658	-0,0315	0,0841	-0,3232	-0,2730	-0,1025	0,0014	0,3788
VA_CHGNOT	-0,0083	1,0000	0,1577	0,3460	**0,4640**	**-0,6037**	-0,1539	0,4029	0,0331	0,1283	0,3499	-0,0667	-0,1483
CONTAMIN	0,0056	0,1577	1,0000	0,0795	0,2276	-0,1956	0,1525	0,0696	0,1303	0,1868	0,2462	-0,0700	-0,1449
ANTICIP	-0,0434	0,3460	0,0795	1,0000	0,2989	-0,2842	-0,1358	0,0414	0,0050	0,1423	0,2937	-0,0649	-0,2351
DOWN	0,0926	0,4640	0,2276	0,2989	1,0000	-0,6693	0,3834	0,1816	0,3147	0,4020	**0,4944**	-0,0291	-0,2918
STABLE	0,1658	-0,6037	-0,1956	-0,2842	-0,6693	1,0000	-0,3053	-0,2497	-0,1468	-0,2503	**-0,6593**	0,0997	**0,4531**
WATCH	-0,0315	-0,1539	0,1525	-0,1358	0,3834	-0,3053	1,0000	-0,1074	0,1347	0,1714	0,2911	-0,0239	-0,2755
GAP_RAT	0,0841	0,4029	0,0696	0,0414	0,1816	-0,2497	-0,1074	1,0000	-0,0426	0,0835	0,1096	0,0652	0,0576
VIX	-0,3232	0,0331	0,1303	0,0050	0,3147	-0,1468	0,1347	-0,0426	1,0000	**0,6892**	0,1270	0,0108	-0,2119
DEVST	-0,2730	0,1283	0,1868	0,1423	0,4020	-0,2503	0,1714	0,0835	0,6892	1,0000	0,1885	0,0640	-0,1907
BIG	-0,1025	0,3499	0,2462	0,2937	0,4944	-0,6593	0,2911	0,1096	0,1270	0,1885	1,0000	-0,2522	-0,5453
ANTICIP_BIG	0,0014	-0,0667	-0,0700	-0,0649	-0,0291	0,0997	-0,0239	0,0652	0,0108	0,0640	-0,2522	1,0000	0,1586
EJR	0,3788	-0,1483	-0,1449	-0,2351	-0,2918	0,4531	-0,2755	0,0576	-0,2119	-0,1907	-0,5453	0,1586	1,0000

5. Analysis of the CARs for the Rating Actions Announced by Moody's, S&Ps and Fitch

Given their more direct participation in the subprime debacle and potential higher reputational harm, we begin our analysis with the subsample of rating actions disclosed by the three main agencies—Moody's, Standard & Poor's, and Fitch.

Using the OLS technique, we conduct a multivariate econometric analysis using ABS_CAR as the dependent variable and the regressors listed in Table 7 as the independent variables. Table 9's first two specifications are the very minimum; they include the temporal dummy and the market-wide and security-specific alternatives to volatility. Since there are no gaps in this data, all 810 observations are used. There is a favorable correlation between market and security-level volatility and the anomalous return. When market volatility is accounted for by the VIX, as opposed to the security-specific standard deviation, the DUMMY_POSTCRISIS exhibits the predicted negative sign and the coefficient is significant at the 5% confidence level.

According to the modified R-squared metric, the overall ability to explain is around 20%.

The third specification describes the findings of an analysis in which the number of events is reduced from 1024 to 716 in order to accommodate a larger number of independent variables. The additional elements account for whether or not the rating action was an upgrade or downgrade, how long it has been since the last intervention by the same or a different agency, how many notches the rating has moved, and whether or not a credit watch has previously predicted a downgrade or upgrade. Three dummies representing the distribution's outliers are also included into the regression. All components exhibit the anticipated sign, but their statistical significance is rather modest, and the improvement in R-squared, which reaches 46%, is nearly entirely attributable to the handling of outliers.

To differentiate the impact of rating actions on the cusp of speculative and investment in the post-crisis era, we replace the DUMMY_POSTCRISIS in the fourth specification with two components.

grade from those concerning companies in a "safe zone". The lack of trust should manifest more strongly when there is less regulation-induced trading. The results show that the absolute value of abnormal return is lower, in the post- crisis time, much beyond the point at when the rating would be considered to be in crisis. On the other hand, there is no major under-reaction in the post-crisis era when the current rating or the last accessible rating is on the verge of being classified as junk or investment grade. All restricted investors are, in fact, prompted to act, regardless of whether or not they place stock in the rating agency's pronouncement.

In the research, downgrades are generally connected with more useful information for market players, which is why they are highlighted in column 5. There are 552 data points to be used. The data agrees with the other requirements. In particular, the POSTCRISIS dummy's negative and statistically significant coefficient is validated.

Column (6) shows that we eliminated all rating releases made at the peak of the crisis (15 September 2008-15 October 2009) from our sample. The market may have acted quite strangely during this out-of-the-ordinary time frame, which is why it has been excluded. In addition, by reducing the sample size, we are able to compare the post-crisis era to the pre-crisis era with less of an impact from the extreme volatility that was 2009. The crisis dampened the market's response to statements from big CRAs, as seen by the data. The abnormal stock return has a positive relationship with security-specific volatility, is larger when the announcement is a watch-listing rather than a downgrade or upgrade, and is smaller when the stock return has a counter-intuitive sign, i.e. a positive return following a downgrade or a negative return following an upgrade.

Market response to major rating agencies' pronouncements has softened as a result of the subprime crisis, leading us to believe that their reputations have been damaged. This is especially true in cases when there is no need for investors to respond based on the agency's credibility in the dissemination of informational material, as is the case when no regulatory barrier has to be crossed.

Table 9. Determinants of the ABS_CAR – Major rating agencies

The regressions are all conducted with the ordinary least square method. The dependent variable is ABS_CAR i.e. the absolute value of cumulative abnormal return calculated as defined in section 5. The independent variables are described in Table 7.

The t-stat are reported in brackets under each coefficient. White heteroskedasticity-consistent standard errors and covariance. The specifications (3) and (4) have been calculated including three dummies corresponding to the outliers identified in the distribution.

* = significant at 10% level; ** = significant at 5% level; ***= significant at 1% level with a two-tailed test.

	(1)	(2)	(3)	(4)	(5)	(6)

Subsample	-	-	-	-	Downgradings	Pre-crisis + Post-crisis
VA_CHGNOT			0,27 (0,84)		0,32 (0,79)	0, ,52** (2,15)
CONTAMIN			-0,43 (-1,13)	-0,14 (-0,35)	-0,07 (-0,17)	-0,24 (-0,44)
DUMMY_ANTICIP			-0,53 (-1,40)		-0,09 (0,19)	-0,18 (-0,65)
RATING_BORDER			0,38 (0,78)		0,88 (1,51)	
CONTRARIAN						-0,18*** (-3,63)
GAP_RAT			0,55 (1,62)	0,84** (2,42)	1,04** (2,51)	0,29 (1,12)
DUMMY_POSTCRISIS	-0,62** (-2,23)	-0,96*** (-3,09)	-1,11*** (-3,26)		-2,13*** (-4,14)	-0,71** (-1,97)
NOBORDER_POSTCRISIS				-1,19*** (-3,72)		
BORDER_POSTCRISIS				0,11 (0,26)		
VIX	0,19*** (6,73)			0,15*** (7,22)	0,12*** (6,17)	
DEVST		0,90*** (7,69)	0,77*** (12,66)			0,66*** (6,53)
DUMMY_WATCH			0,57 (1,49)	0,63* (1,72)		0,96*** (3,04)
Adjusted R2	0,192	0,212	0,462	0,436	0,276	0,123
No. observations	810	810	716	716	552	578

6. Analysis of the CARs for the Rating Actions Announced by the Minor CRAs

We tested the same independent factors used for the sample of the Big Three to see whether there were any similarities or differences in the impact on the rating sample comprised of the lesser agencies (EJR, DBRS, JCR, and R&I; see Table 10 for the results). The expected sign of the coefficients is seen in the first group of regressors (1): the market responds less now than it did before the crisis, with a significant coefficient at 5% if market volatility is measured using the VIX. Adjusted R-squared shows an explanatory power of less than 20%. The addition of a watch issued by the lesser agencies induces stronger market responses, with a significant coefficient at 5%, as shown in the second scenario when the fake WATCH is added. Dummies corresponding to distribution outliers are mostly responsible for the 57% rise in R-squared, which limits the statistical significance of the highlighted components.

The sample of events is reduced, but the weight of the factors that validate our theory is increased (3) by including additional variables such as the combination of rating in the critical area and in the post-crisis period, the presence of a downgrading, any anticipation of the rating by a major agency, and the fact that the rating has been formulated by the agency EJR. Due to a strong correlation with the regressor EJR, the interaction between DUMMY BORDER and DUMMY POSTCRISIS could not be included in the analysis of this sample. As a consequence of the subprime mortgage crisis, the market responds less, but with more controlled intensity, to the opinions given by smaller agencies in comparison to their larger counterparts. In contrast to what is seen in the ratings provided by the more prominent CRAs, the negative and substantial coefficient for the border issuers may be explained by the restricted usage, for certification, of ratings produced by the smaller agencies. The market responds less when the rating is expected by the Big CRAs, but the effect is not statistically significant. The absolute value of the anomalous return is larger when EJR, the sole agency that uses "subscriber-pay" compensation, formulates the rating action.

We repeated the study, this time limiting it to just occurrences that entailed a rating change (4), since more than half of the announcements published in the sample of rating actions conducted by the smaller agencies reaffirm the prior rating and, therefore, do not offer new information. The revised set of independent factors explains a larger amount of abnormal return (R-squared 63%), but it also demonstrates that the market's reduced faith in smaller CRAs after the crisis was not statistically significant. In keeping with what is reported in the literature, the existence of the timepiece and the absolute value of the notches are the factors that explain the aberrant yield. In instance, the latter results in more pronounced changes of the abnormal return (p-value 1%). One possible explanation for this finding is that smaller rating agencies are more consistent over time yet exhibit larger fluctuations when making changes to their ratings.

Table 10. Determinants of the ABS_CAR – Minor Rating Agencies

The regressions are all conducted with the ordinary least square method. The dependent variable is ABS_CAR i.e. the absolute value of cumulative abnormal return calculated as defined in section 5. The independent variables are described in Table 7. The specifications from (2) to (4) have been calculated including eight dummies corresponding to the outliers identified in the distribution. The t-stat are reported in brackets under each coefficient. White heteroskedasticity-consistent standard errors and covariance. The specifications (3) and (4) have been calculated including three dummies corresponding to the outliers identified in the distribution. * = significant at 10% level; ** = significant at 5% level; ***= significant at 1% level with a two-tailed test.

	(1)	(2)	(3)	(4)
Subsample	-	-	-	Dummy Stable = 0
DUMMY_POSTCRISIS	**-0,83****	-0,40		-0,73
	(-2,18)	(-1,28)		(-1,49)
VA_CHGNOT				**2,28*****
				(2,52)
WATCH		**1,78****	**1,62***	**2,32****
		(2,15)	**(1,75)**	**(2,14)**
DOWN			**1,21****	
			(2,18)	
BORDER_POSTCRISIS			**-0,82****	
			(-1,93)	
ANTICIP_BIG			-0,74	
			(-1,14)	
VIX	**0,25*****	**0,19*****	**0,18*****	**0,26*****
	(6,47)	**(7,06)**	**(6,32)**	**(6,31)**
EJR			**0,63****	
			(2,02)	
GAP_RAT			0,40	
			(1,15)	
Adjusted R squared	0,195	0,57	0,615	0,63
No. observations	799	789	667	275

7. Analysis of the CARs for All Rating Actions

8. By combining the two samples and analysing the ABS_CAR in light of the independent variables already considered (Table 11), to which we have added the DUMMY_BIG, the accuracy of our theory is strengthened: following the subprime mortgage crisis, the market has less trust in the ratings issued by CRAs. In particular, stocks record lower variations especially where the operators are "forced" by the supervisory rules or by the regulations to intervene. In fact, the DUMMY_NOBORDER*POSTCRISIS appears with an appreciable negative coefficient and with a margin of error of less than 1%. In addition, it appears that the reputational damage weighs more heavily upon the more important CRAs, given the negative coefficient and the high level of significance of the DUMMY_BIG (1). We have isolated the loss of credibility by the major CRAs with respect to the others, considering

Last but not least, for the same subsample, replacing the DUMMY_BIG with the regressor EJR causes the CAR to vary by more than 1%. If the market is to be believed, therefore, the one and only agency that uses the subscriber-paid model rather than the issuer-paid model (3) has the utmost confidence of the market.

Table 11: Factors That Affect the ABS_CAR - Key and Supporting Organizations

Ordinary least squares are used for all of the regressions. ABS_CAR, the absolute value of cumulative abnormal return as described in Section 5, is the dependent variable. Table 7 lists the several factors that may be changed. All parameters have been determined, and eight dummies have been created to account for outliers in the data.

A subsample of observations relevant to issuers covered by both a minor and a major rating agency has been subjected to the conditions (2) and (3). Under each stated coefficient is the corresponding t-statistic. Standard errors and covariance that are stable under white heteroskedasticity. Both (3) and (4) have been computed using three dummies representing the distribution's outliers.

* = significant at 10% level; ** = significant at 5% level; ***= significant at 1% level with a two-tailed

	(1)	(2)	(3)
Subsample	-	Big&Nobig	Big&Nobig
VA_CHGNOT	**0,73****	0,46	0,31
	(2,30)	(1,54)	(1,1)
WATCH	**1,05*****	0,69	0,62
	(2,75)	(1,6)	(1,52)
ANTICIP	0,09		
	(0,25)		
NOBORDER_POSTCRISIS	**-0,81*****	**-0,91*****	**-1,14*****
	(-3,25)	**(-3,12)**	**(-3,73)**
BORDER_POSTCRISIS	-0,045	**-0,85****	**-1,02****
	(-0,14)	**(-2,00)**	**(-2,29)**
DEVST		**0,83*****	**0,82*****
		(9,15)	**(9,19)**
VIX	**0,19*****		
	(9,41)		
EJR			**1,12*****
			(3,14)
DUMMY BIG	**-0,99*****	**-1,18*****	
	(-2,65)	**(-3,01)**	
Adjusted R squared	0,52	0,58	0,57
No. observations	1045	1033	1033

9. Conclusions

The study confirms the hypothesis that the subprime mortgage crisis had a significant impact on the CRAs' credibility. Compared to the other types of rating agencies, the three main companies (Moody's, Standard & Poor's, and Fitch) took the worst hit to their reputation, whereas the phenomena impacted the smaller agencies less severely, albeit not entirely.

In the post-crisis era, the effect of rating actions on the stock prices of financial intermediaries has diminished, according to our research. This is especially true for issuers with better credit ratings. On the other side, stock values of companies whose credit ratings are on the verge of investment grade tend to rise when the barrier between investment and speculative grade is approached.

According to the certification value ascribed to ratings

by existing rules and by-laws, speculative grade, respond to rating activities in a similar fashion in the pre- and post-crisis eras. Even if an investor has faith in the CRAs, they may be obliged to make changes to their portfolio if the rating value moves over the line separating speculative from investment grade. Analysis of the aftermath of rating actions by the smaller agencies confirms this inference. The difference between investment grade and junk grade securities is narrowed since ratings from lesser-known CRAs, which are seldom included in the list of agencies recognized by supervisors, are not widely used in regulatory contexts. For issuers around the boundary between investment and junk grade, in particular, post-crisis data confirms a reduced market response to rating actions supplied by smaller CRAs.

Our findings corroborate the information presented in the prior literature about the other control factors. If an issuer is added to a watch list before a change in rating opinion happens, the abnormal return will be larger. Minor CRAs' watch reports tend to be more convincing since the market places a higher value on them because they are less common. Additionally, the response of share prices tends to be stronger when the amount of volatility is higher, either market-wide or security-specific, and when the change in rating, measured in notches, is constant.

Last but not least, an examination of the 1,609 rating actions issued by the agencies in our sample confirms the loss of credibility of the rating industry as a whole, while highlighting greater reputational damage for Moody's, Standard & Poor's, and Fitch, which were more deeply implicated in the subprime crisis. CAR was lower in absolute terms for the subsample of 57 financial intermediaries evaluated by both agencies in the post-crisis era, and this was notably true for rating actions initiated by the Big Three. On the other hand, the market reacts consistently and significantly to the ratings provided by Agency EJR, the only organization that does not use an issuer-pay business model.

Since CRAs' regulatory authority will be reduced in the future, it's important to see whether the credibility loss experienced during the post-crisis era can be made up for by increased supervision and more competition. A promising new area of study is therefore made possible for the future.

References
E.I. Altman & H.A. Rijken. (2004). Methods used by rating organizations to ensure consistent ratings. Banking and Financial Journal, (28).

Clinton, N., & Ammer, J. Is it true that good news doesn't make headlines? Price variations in asset-backed securities as a result of changes in credit ratings. Federal Reserve System, Board of Governors, International Finance Discussion Papers.

The Bank for Global Settlements. Joint Forum of the Basel Committee on Banking Supervision. Evaluation of Credit Rating Implementation. Originally posted on www.bis.org.

Authors: Becker, B., & Milbourn, T. What effect did tighter market conditions have on credit scores? Series N.1604 of the NBER Working Papers.

Author: Coffee, J.C. A Look at the Pros, Cons, and Future of Ratings Reform. Document 375 from the Columbia Law and Economics Group.

Reference: Deb, P., M. Manning, G. Murphy, A. Penalver, & A. Toth (2011). Where will credit rating agencies go from here? The Ninth Paper on Financial Stability.

(2009). Freeman, L. Where Is the Gatekeeper? Liability of Credit Rating Agencies for Causing the Subprime Credit Crisis. Volume 33 of the Vermont Law Review.

J. Goh & L.H. Ederington. Is a drop in the bond rating good news, terrible news, or no news at all for investors? Financial Journal, 48(2001-2008).

Richards, A.J., and Gropp, R. What can we learn about private sector monitoring of bank health from the behavior of rating agencies and the price of debt and equity of European banks? The Journal of Economics, Monte dei Paschi of Siena, Volume 30:373–398.

M. Grothe. 2013. Credit signal price in the market. Number 1623 in the Working Paper Series from the European Central Bank.

To cite this entry: Hand, J.R., R.W. Holthausen, and R.W. Leftwich (1992). What happens to bond and stock prices when rating agencies make statements. Financial Journal 47:733–752.

Hull, Jonathan; Predescu, Mihai; White, Andrew; 2004. Bond yields, credit rating announcements, and the spread on credit default swaps. 2789–2811 in the Journal of Banking & Finance.

According to the IMF (2010). How sovereign credit ratings may be used (and misused). IMF data retrieved from www.imf.org. Katz, S. (1974). Bond market efficiency is being put to the test by analyzing the cost and readjustment of bond rating downgrades. Financial Journal, 29(2), pp. 551-559.

Kiff, J., S. Novak, and L. Schumacher. Can we put faith in ratings agencies? Examining the relevance and precision of sovereign credit ratings. Working Papers of the International Monetary Fund.

Citation: Levin, C., & Coburn, T. (2011). The financial crisis on Wall Street and the anatomy of a financial meltdown. Senate Permanent Subcommittee on Investigations, United States Senate.

In 2004, N. Linciano wrote. Revisions of rating agencies' verdicts and their effects on stock prices. Evidence for the Italian Case, Bank of Commerce and Industry, Case No. XXIII.

Author: Linciano, N. The subprime mutual fund

crisis. Transparency issues and potential intervention strategies for regulatory bodies. Number 62 of the Quaderno Consob.

It was published in 2006 by Micu, E. Remolona, and P. Woolridge. The effect of rating announcements on stock prices and which announcements are most significant. Work Paper No. 207 from the Bank for International Settlements.

The effect of credit rating announcements on the informational efficiency of the credit default swap and stock markets (Norder, L., & Weber, M., 2004). The Banking and Financial Markets Journal, (28), 2813–2843.

Forrest Partnoy (1999). The Credit Rating Agencies get a "Two Thumbs Down" from the Siskel and Ebert of the financial markets.

The 77th issue of the Washington University Law Review.

Partnoy, Frank. 2006. The Distinctive Role of Credit Rating Agencies in Today's Financial System, Series of Research Papers in Law and Related Disciplines No. 07-46.

(2009). Partnoy, F. The Crisis was Caused in Large Part by an Over-reliance on Credit Ratings. No. 09-015 of the San Diego Journal of Law Studies.

N. Petit, December 2011. Competition law, credit rating agencies, and the sovereign debt crisis. European Competition Review, Issue 7(3).

G.E. Pinches and J.C. Singleton. Stock price responses to changes in bond ratings, Journal of Finance 33, 29-44.

In 1999, Richards and Deddouche published Richards and Deddouche. Bank stock price movements after rating revisions: perplexing evidence from developing countries. The 151st issue of the IMF's Working Papers.

(2001) Steiner, M., and Heinke, V. G. International Journal of Finance and Economics, 139-157. An event analysis of the impact of credit rating changes on bond prices in foreign markets.

It was published in 2001 by Szweitzer, Szewczyk, and Varma. What happens to the stock values of rival banks when their debt is downgraded.

Pages 139–156 of The Financial Reviews.

(2002). White, L. J. An Examination of the Credit Rating Industry from a Business Perspective. Ratings, Rating Agencies, and the World Financial System, edited by R. Levich, C. Reinhart, and G. Majnoni, Kluwer.

Reference: White, L.J. The Agencies That Rate Our Credit. 24(2), Spring 2012, Journal of Economic Perspectives.