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DOES THE AMERICAN STOCK MARKET REACT  
DIFFERENTLY TO RATING ANNOUNCEMENTS  
DURING A CRISIS PERIOD?  
THE CASE OF THE 2008 WORLDWIDE  
FINANCIAL CRISIS

Dorsaf Azouz Ghachem, Abdelkader Boudriga  
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Working Paper No. 601

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## Abstract

Rating agencies seem to be an important actor on financial markets. Indeed, their announcements have informational and securing role on investor's decisions. However, recent crisis' occurrences put the blame on rating agencies for having failed in achieving one of their central role: downgrading firms at a just time. The global financial turmoil of 2008 offers a unique context to examine market reaction to rating announcements during a crisis. We use a comparative event study, which compares abnormal returns following rating announcements during a crisis period to those during stable periods. Results show that there is an overreaction to bad news and an insignificant impact of good and neutral news. Lastly, we show a change in agencies attitude toward deteriorated financial conditions.

## ملخص

تعتبر وكالات التصنيف عاملا مهما في الأسواق المالية. في الواقع، وتلعب إعلاناتهم دورا مهما في امداد المعلوماتية وتأمين قرارات المستثمرين. ومع ذلك، وضعت أحداث الأزمة الأخيرة اللوم على وكالات التصنيف لأنها فشلت في تحقيق واحد من دورها المركزي وهو خفض مستوى الشركات في الوقت المناسب. الاضطرابات المالية العالمية لعام 2008 توفر سياقاً فريداً لدراسة رد فعل السوق لإعلانات التصويت خلال الأزمة. نستخدم الدراسة المقارنة الحدث، والذي يقارن بين العوائد الغير طبيعية بعد إعلانات التصويت خلال فترة الأزمة لتلك التي تعلن في فترات الاستقرار. تظهر النتائج أن هناك رد فعل مبالغ فيه على الأخبار السيئة وأما الاخبار الجيدة والمحايدة فلها تأثير ضئيل. أخيراً، يتبين لنا تغييراً في المواقف تجاه الوكالات خلال الظروف المالية المتدهورة.

## 1. Introduction

Over several decades, rating agencies have been considered as an important actor on financial markets. It extensively documented that investors rely on agencies' announcements in their investment decisions. On one hand, besides giving estimations of risk, rating agencies contribute to alleviating information asymmetry on markets. This is due to the tight collaboration between issuers and agencies that the rating process implies. On the other hand, firms use financial ratings as a communication policy in order to attract investors and to vehicle a certain image to market participants.

Nevertheless, previous empirical studies showed that rating announcements' impact on stock markets is mixed. Early studies report evidence on the neutrality of the rating announcements (Pinches and Singleton, 1978; and Wakeman, 1978).

On the contrary, recent studies show that rating publications strongly impact stock prices, especially downgrades (Griffin and Savicente, 1982; Holthausen and Leftwich, 1986; Gropp et Richards, 2001; and Creighton, Richards and Gower, 2007).

However, the recurrent occurrence of financial crises (such as the 1997 Asian crisis, the 2007 subprime crisis and the 2008 worldwide financial crisis) highlighted the failure of rating agencies to achieve their central role; securing financial markets. Indeed, they were unable to detect the deterioration of credit quality of the firms they were rating. Their failure in timely downgrading firms led to important investors' losses.

As far as we know, this paper is the first one to examine if rating agencies remain influential on stock markets during crisis periods. On one hand, rating agencies' announcements tend to have no effect during crises because of investors' loss of faith and panic. On the other hand, investors are reported to overreact to any announcement, especially bad events, on financial markets during crises. This study is also interesting as it exploits a setting in which the overreaction hypothesis has not previously been tested. Indeed, we examine a unique sample of 192 ratings announcements made on the American stock market during the 2008 worldwide financial crisis. We also constructed a matching sample considering a period of stability (2003-2006).

This study is relevant to MENA countries to two extents. First, rating agencies such as Moodys and Standard and Poors are the main (even the only) active operators. For example, 13 of the 26 countries in which Moody's operates are from the MENA zone. Standard and Poors is present in two countries of this region. Indeed, these ratings concern several businesses involving financial and non financial sectors. Second, many of the MENA countries have adopted the standard approach of the Basel II agreement. They are thus concerned with the issue of external ratings effectiveness (based on international agencies ratings) especially for the countries with little experience in financial health assessments.

We use an event study methodology to compare short-term abnormal returns observed during the 2008 worldwide financial crisis period and those of the non-crisis period. Our results show that investors overreact to downgrades more severely during financial turmoil. We also report a more prolonged reaction to bad news. However, our findings do not show significant differences in investor's behaviour toward upgrades between the two contexts. Finally, we show that this overreaction is explained both by a shift in investors' panic and to change in agencies' attitudes, which tended to downgrade severely during the crisis period.

The remainder of the paper is organized as follows. Section 2 reviews some relevant literature on stock market reaction to rating announcements. Section 3 describes the investor's behaviour during crisis period. Section 4 presents the methodology and data employed. Section 5 and 6 outline and discuss empirical results while Section 7 concludes.

## **2. Market reaction to rating announcements during crisis**

### ***2.1. Existing literature on market reaction to rating announcements***

Existing literature offers ambiguous results on the rating announcements' effects on financial markets. A first group of studies report a significant but also small impact of rating announcements on stock prices. Weinstein (1977) studies the rating effect on bond monthly returns. He considered rating changes of 412 individual bonds announced by Moody's during the period from July 1962 to July 1974. He found a small impact during the period preceding the rating change (with asymmetric reactions to downgrades versus upgrades) and an insignificant abnormal return during the period surrounding the rating event. This result was confirmed by Pinches and Singleton (1978). They examined the impact of 207 bond rating changes on their monthly stock returns. They report a small reaction during the period preceding the rating change. They also document an asymmetric reaction of downgrades and upgrades. Finally, they highlight the absence of significant abnormal returns following the event. Creighton et al. (2007) examined the impact of rating changes on Australian financial market. They found that rating publications produce small movements on both stocks and bonds prices. However, the impacts are pronounced for small firms and for changes from investment to speculative grade.

Other studies support evidence of an asymmetric impact of downgrades and upgrades on stock prices. Griffin and Sanvicente (1982) considered different measures of stock returns during the eleven months preceding the bond rating change and the month following it. Their results are consistent with the hypothesis that bond downgrades generate a significant price reaction. In the opposite, bond upgrades generate significant reaction during the pre-event period and an insignificant one during the post-event window. In the same vein, Holthausen and Leftwich (1986) confirm the downgrades effects versus upgrades. They showed that the difference between their one-year pre-announcement returns varies from 20 to 30%. Sunder (1991) tested the stock price reaction to bond rating change with consideration to the security's risk class. His results showed that there is no stock reaction to the announcements of straight debt offerings. At the same time, the impact is the same for safe and risky debt when the bond rating is considered as the proxy for risk. Hand et al. (1992) who examined the daily abnormal bond and stock returns following rating publication found that statistically significant abnormal stock returns are observed for downgrades and not for upgrades. On the contrary, significant bond returns react to downgrades and upgrades. They also showed that only unexpected rating changes lead to stock and bond price reaction. Dichev and Piotroski (2001) studied the effect of 4,700 bond rating changes on stock markets during the period 1970 to 1997. They found that upgrades have no effect on long term stock returns. However, downgrades produce negative abnormal returns ranging from 10% to 14% during the year following the announcement. They also showed that negative abnormal returns are higher for small firms with bad credit quality. This abnormal returns show persistence even after good news such as positive future earnings. Norden and Weber (2004) studied the stock and CDS market response to credit rating announcement during the period 2000 to 2002. They consider two types of rating publication: actual changes and reviews for changes. They showed that stock and CDS markets anticipate the events and react only to bad news, especially for reviews for downgrades. Linciano (2008) investigates the impact of 299 credit rating announcements on the Italian financial market in the period 1991 to 2003. She showed that only downgrades and negative credit watch list generate significant negative abnormal returns in the event window. Halek and Eckles (2010) studied the impact of rating publications on insurance stock returns. They report evidence of asymmetric response to downgrades versus upgrades, and to announcements that tipped ratings from investment to speculative grade versus those which maintained ratings at the same category.

Other strands of literature report no evidence of the information content of rating announcements. Wakeman (1978) studied monthly stock returns and weekly bond returns following a rating change. He found no significant reactions. More recently, Singh and Power (1992) examined the effect of insurance rating changes announced by A.M. Best and Co on stock prices. They concluded that insurance rating changes do not convey new information to capital markets, which explains the absence of significant stock price reaction to both upgrades and downgrades.

More recent studies considered other aspects related to rating activities to assess the impact of announcements on equities shares. Hsueh and Liu (1992) have examined the impact of bond rating changes on stock returns, while controlling market expectations for this change. The proxy of this market anticipation is the level of information available in the market. They found that the less the information is on the market the more the reaction is. Ederington and Goh (1993) showed that stock price reaction to rating change depends on the cause of the change. In fact, due to financial statement's deterioration downgrades generate market reaction while debt's increases have no impact on stock prices. Nayar and Rozeff (1994) showed that initial ratings of commercial paper are associated with significant positive returns. They report also that rating downgrades accompanied by the exit of the commercial paper from market generate significant negative returns. On the contrary upgrades have no effects on investor's reactions. Byoun and Shin (2003) examine market reactions to solicited versus unsolicited ratings. They found that market reactions to unsolicited ratings downgrades are negative and significant. These reactions are more severe when the rating migrates from investment to speculative grade. Li et al. (2004) examined the long and short term Swedish market reaction to initial rating assignments, outlook changes, affirmations, upgrades and downgrades ratings. They found that market reacts to upgrades and downgrades in both long and short term. They also report long term returns following negative outlook announcements. Merli and Schatt (2007) reviewed the effect of successive downgrades on French leader firms' stock returns and their impact on non-rated firms belonging to the same stock index sector. On one hand, they found that bad news have a significant negative impact on the leader stock return. On the other hand, rating announcements could have a negative impact on non-rated companies belonging to the same stock index sector.

## ***2.2. Market reaction during crisis***

Rating agencies are often held to be responsible for financial crisis occurrences. In essence, they failed in timely detecting firm's distress and defaults. Accordingly, Ferri et al. (1999) analyzed rating agencies responsibility during the East Asian crisis. They showed that the pro-cyclical nature of rating activity contributed, at least in part, to the downturn. In short, they underestimate the economic fundamentals in their downgrades formulations.

More recently, Duff and Einig (2009) studied the role of rating information quality in the subprime crisis (2007) and the global credit downturn (2008). They use a measure of information quality with consideration to differences in stakeholders' perceptions. They concluded that rating agencies should make more efforts in defining their credit criteria and methodologies to avoid future rating mistakes.

Regarding investors' behaviour during crisis period, Michayluk and Neuhauser (2006) found a strong evidence of market overreaction during the 1997 market decline, after controlling for other factors such as size, beta risk, and bid and ask price. They also report an increase in uncertainty during crisis period.

These results are consistent with previous studies such as Chan and Otchere (2003) who analyzed the Hong Kong stock market during crisis times. They showed that the market becomes noisy and overreacts especially for large size firms. In the same vein, Kamesaka and Wang (2004) investigated the behaviour of foreign, institutional and individual investor

before, during and after the Asian crisis in Thailand. The main result indicates that an increase in stock prices during downturn is followed by an enhancement of foreign net buying. In contrast, they report an increase of individual investors net buying after a stock price decrease. These foreign and individual net buying are followed by positive stock returns, while wealth transfers from domestic to foreign investors increased by 12.5%.

### **3. Data and Methodology**

#### ***3.1. Data***

Our sample selection procedure is in line with both Moodys and Standard and Poor's announcements policy. Moodys publishes not only rating changes but also affirmations, whereas Standard and Poors announces only rating changes. Affirmations are implicitly communicated if no rating change occurs.

Data are first obtained from the Moody's website. We collected 212 corporate rating announcements of listed firms on NYSE and NASDAQ during a period span of two months beginning on the September 16 2008. This starting date coincides with the bankruptcy of Lehman Brothers which is considered the starting point of the panic on the American stock market.

The announcements include upgrades, downgrades, assertions and reviews for rating changes<sup>1</sup>. We divide these announcements into three categories: bad news (downgrades and reviews for downgrades), good news (upgrades and reviews for upgrades) and neutral announcements or assertions (Li et al., 2004).

To obtain data on Standard and Poor's announcements for the same sample of firms we used the same procedures. Announcements are collected from agency's websites and the Compustat North America database.

To isolate the impact of ratings on stocks returns, we exclude contaminated observations. Thus firms with ratings announcements accompanied by other events such as dividend's distribution or merger announcements are withdrawn from the sample. We ended up with a sample of 192 firms.

Second, we collect rating announcements for these 192 retained firms during a non crisis period. We considered a time span from January 2003 to December 2006. We do not include rating announcements from the year 2007 as it is considered a noisy financial year where the subprime crisis emerged. We further exclude 38 firms which had only attributions and did not have rating actions during the non crisis period. We also withdraw 19 firms for which rating actions are not available.

With the reference to the event study we consider an event window of 20 days around the announcement day. We consider two categories of events: double and single events. If the two agencies rate similarly the same firm during the same event window, the two ratings are considered as a double event and the event day corresponds to the first announcement published. If they rate the same firm at separate event windows, each announcement is considered as a single event. This process conducts us to retain 224 announcements during the crisis period and 135 announcements during the non crisis period. The announcement's types are as follow:

As shown in the Table 1, downgrades are more frequent in the crisis period than in the non crisis one. On the contrary, upgrades seem to be less recurrent during downturns. However, assertions are rather equal for the two periods.

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<sup>1</sup> We assimilate reviews for rating changes to rating changes with null amplitude. Elayan and al (1990) showed that reviews for rating changes generate market reaction that is positive if review for upgrade and negative if review for downgrade.



Table 2 exhibits the sample distribution by rating's type. For both downgrades and upgrades, we distinguish firms which rating is changed by an agency and affirmed by the other one (rating action with assertion), those which have the same rating action from the two rating agencies in the same event window (double rating action) and those that are rated only by one agency (unique action). For assertions, we distinguish firms which ratings are affirmed by the two agencies (double affirmation) and those that are rated as affirmed only by one agency (unique affirmation).

### 3.2. Methodology

To measure the market reaction to rating announcements, we use the event study methodology which consists in calculating abnormal returns during an event window around the rating announcement. In this study, we use daily abnormal returns and not monthly returns as in previous studies. We choose an event window of 20 days around the announcement day.

We first compute the abnormal returns for each event and for the two periods. We use two methods: the stock index adjusted model and the market adjusted model. Brown and Warner (1985) studied the empirical robustness of these two event study methodologies on daily observations and concluded that they offer the same power with regard to the theory.

The stock index adjusted model (1) computes the abnormal return as the difference between stock and market returns as follows

$$AR_{i,t} = R_{i,t} - R_{m,t}$$

Where  $R_{i,t}$  is the stock return observed during the event window and  $R_{m,t}$  the market index return to which the stock belongs.

The market adjusted model (2) calculates the abnormal return as the difference between the observed and the theoretical return given by the market model. The equilibrium returns are estimated using data on returns for the year preceding the first day of the event window.

$$AR_{2i,t} = R_{i,t} - \alpha_i - \beta_i * R_{m,t}$$

Where  $\alpha_i$  and  $\beta_i$  are the market model values obtained from estimated regressions.

Then, we calculate for each firm  $i$  the cumulative abnormal return for the event window (from day -10 to day +10) as follows:

$$CAR_{ji,t} = \sum_{t=-10}^{10} CAR_{ji,t} \quad j = 1 \text{ or } 2$$

To study the global market reaction to rating news, we calculate for each day of the event window the mean abnormal return and the mean cumulative abnormal return. Finally, we compare the results obtained from the two periods regarding time persistence and magnitude.

## 4. Empirical results

### 4.1. Downgrades

Significant negative abnormal returns<sup>2</sup> are observed during the crisis period for the day -5 (-1,89% with t-statistic -2,67) and the day -1 (-3,16% with t-statistic -3,46). We observe the same pattern during the announcement day (-2,6% with t-statistic -2,07) and day +3 (-1,97% with t-statistic -2,67). However, during the non crisis period only the day -1 exhibits a

<sup>2</sup> Significance test were applied even for abnormal returns and cumulative abnormal returns, with consideration to the t-student where the number of observations is more than 30 and the non parametric wilcoxon test when the number of observations is lower than 30.

significant negative abnormal return (-0,77% with t-statistic -2,51). On the contrary, we report a significant positive return three days following the rating announcement.

With reference to cumulative abnormal returns significant CARs are reported from the day -1 (-9,3% with t-statistic -4,22) to the tenth day following the announcement (-13,08% with t-statistic -3,29) during the non crisis period.

During the crisis period we observe significant negative CARs from the day -1 (-2,87% with t-statistic -2,84) to the day +2 (-4,13% with t-statistic -2,9). Our results are in line with the previous studies (Holthausen and Leftwich, 1986; Hand et al., 1992; Ederington and Goh, 1993; Dichev and Piotroski, 2001, Li et al., 2004, Creighton and al., 2007; Schatt, 2007; and Lanciano, 2008).

Our findings report that the market reacts negatively to downgrades announcements. Significant negative returns are observed before the event day. This might be explained by the fact that the market anticipates the agency's announcements.

We also find that investors overreact to downgrades' announcements during crisis period. In addition, the duration of reaction for crisis period is longer than the duration for the non crisis period. This implies that investors overreact to downgrades announcements not only in terms of time but also in terms of amplitude despite the presumed investors' loss of confidence.

Our results corroborate those of Michayluk and Neuhauser (2006), who document the overreaction of the American financial market towards announcements even during the Asian crisis. Indeed, investors' risk aversion makes them afraid and very sceptical regarding bad news, which explains their overreaction.

To compare the magnitude of investor's reaction during crisis and non crisis period, we use the mean difference test for mean abnormal returns and mean cumulative abnormal returns.

Our results show significant differences in means for abnormal returns and cumulative abnormal returns. Regarding ARs we report significant differences for day -5 (-1,55%), day -1 (-2,4%) and day +3 (-2,8% with t-statistic -3,14). For the cumulative mean abnormal returns significant differences are reported for the day -1 (-6,43%) to the day 10 (-10,62%).

Our findings give support to the overreaction hypothesis. Absolute values of mean abnormal returns and mean cumulative abnormal returns following downgrades are significantly higher during crisis period than during stable periods (-13,2% versus -2,8%, respectively).

These results suggest that market reacts more intensively to bad rating news during crisis. Due to their risk aversion and overreaction, investors are more sensitive to bad announcements during crisis.

Also, the overreaction may show that bad news contain incremental informations in particular during crisis, which are publicly unknown. As noted by Goh and Ederington (1993), downgrades contain unknown bad informations that are not revealed by firms but announced by rating agencies.

#### ***4.2. Upgrades***

Table 5 displays the mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) following upgrades announcements during crisis and non crisis periods. For upgrades announcements, we report weak reactions for both periods. Only a negative significant abnormal return is observed for the day -1 (-2,8%) during the crisis period. While a very small positive abnormal return is observed for the day +1 (0,6%) during the non crisis period.

These results give evidence to the investors' carefulness hypothesis. This is particularly true with regard to upgrades. This indicates that during market downturns upgrades announcements are shortly and badly perceived by investors.

However, we do not report any significant abnormal cumulative returns for the two periods. We explain the absence of significant CARs to the short time nature of market reaction to good news.

Besides, cumulative abnormal returns seem to be better designed than abnormal returns to reflect the impact of an informational event on stock market because of the natural downward market trend during downturns.

However, good rating news do not produce any significant abnormal cumulative returns on American stock market during the first 10 days following the rating announcement. This shows that there is no particular effect relative to upgrades (Griffin and Sanvicente, 1982; Holthausen and Leftwich, 1986; Hand et al. 1992; Li et al., 2004).

These results are consistent with the hypothesis that financial markets react more to bad news than to good ones. On one hand, this is explained by investor's aversion to risk (Griffin and Sanvicente, 1982). On the other hand, the asymmetric pattern of the rating function may explain this behaviour (Goh and Ederington, 1993). These authors highlighted that firms tend to report good news quickly, which are immediately integrated in the investors' information and reflected in stock prices. Thus, they have no effect on stock prices when they are announced by rating agencies. On the contrary, bad news are usually announced by rating agencies before they are disclosed by firms. They hence have a strong effect on stock prices as they are not anticipated by investors.

The results for the mean difference tests for abnormal returns and mean cumulative abnormal returns following upgrades announcements are presented in Table 6. Overall, it seems that investors react identically to upgrades during crisis and non crisis period. The abnormal return difference test is only significant for the day -1 (-2,9% with t-statistic -2,05) with negative significant abnormal return during crisis. In absolute value the AR is higher during crisis than in non crisis period (2,83% and 0,6% respectively). This may indicate either a shift in the investors risk aversion or a loss of confidence on rating agencies (Michayluk and Neuhauser, 2006). The mean difference test for the CARs shows no dissimilarity between market reactions during downturns and calm periods. It appears that investors do not react differently following upgrades announcements.

### **4.3. Assertions**

With regard to assertions, we report negative significant abnormal returns during financial downturns during the days 0 and 1 with respectively ARs of -2,10% (t-statistic -2,31) and -2,31% (t-statistic -2,12). Results are nearly similar for ARs during the non crisis period. Abnormal returns are however observed only during the event day -0,568% (t-statistic -2,10) and the third day after -0.43% (t-statistic -2.37).

Significant cumulative abnormal returns don't appear significant during the unstable period with exception of the day -9 when magnitude is about -1.98% (t-statistic -2.082) (Wansley and Clauretje, 1985). However, they are significantly observed during the normal period from the day 0 of the announcement -1.55% (t-statistic -1.66) to ten days after, i.e. day +10 -2.35% (t-statistic -2.16) during the unstable period. These results confirm previous research which highlighted the ambiguous impact of assertions' announcements on stock markets (Elayan et al., 2003; and Li et al., 2004)). Results highlight once a more the faith loss of investors toward rating agencies. They negatively reacted to assertions during calm period and do not during crisis. In short, we suggest that the loss of confidence and the increased risk aversion of investors during crisis may explain its negative but short reaction following neutral announcements.

Mean difference tests are displayed in Table 8. The figures show that there is a significant difference in mean abnormal returns following affirmations announcements for only the day

1 (-2,31% with t-statistic -2,08). There are no significant difference in mean cumulative abnormal returns between downturn and stable period. This is may be due to the trivial market reaction to assertions. Our results confirm the hypothesized investor's prudence towards neutral announcements especially during crisis period.

Finally, it is important to note that the weakness or absence of market reaction following good and neutral news during both periods show that these announcements convey no new information to investors. This is also explained by the asymmetric nature of ratings. In fact, rating agencies are more eager to communicate bad news than good or neutral ones. Obviously, they do care about preserving their reputation. They bear in mind that investors are more sceptical towards agencies that missed a timely downgrade than grateful to agencies that upgraded firms at the right time.

### **5. Do rating agencies change behaviour during a crisis period?**

The market overreaction to downgrades during turmoil is explained either by a change in investor's behaviour (shift in risk aversion or loss of confidence) or by a change in the way rating agencies cope with bad news. In this section we focus in the latter alternative. In fact, rating agencies may have incentives to correct previous deficiencies especially when their image and credibility is questioned. These actions may be addressed through downgrades magnitude and downgrades type.

The magnitude of a rating is measured by the number of notches up or downgraded. The relation between ratings magnitude and market overreaction is derived indirectly. On one hand, previous researches report a strong positive relation between rating magnitude and market reaction (Hand, Holthausen and Leftwich, 1992; Jorion and Zangh, 2005; and Becker and Milbourn, 2008). On the other hand, Goh and Ederington (1998) showed evidence of strong relation between rating agency's reputation and its ability to quickly report bad news. In fact, investors are more sceptical towards agencies that announce lately a downgrade or a revision for a downgrade than trustful towards agencies that timely report good news. We thus hypothesize that rating agencies act in a prudent way during crisis periods especially with regard to bad news. They hence tend to be more severe when rating downgraded firms compared to rating in normal periods. This conservative rating behaviour during downturns is first reflected in an increase of the number of reviews for downgrades. Second, this will result in an increase of downgrades with high magnitude measured by the number of notches upgraded. Given the correlation between downgrade magnitude and investor's reaction to bad news, this behaviour could lead to an excessive overreaction of investors compared to normal period.

The investors' reaction to downgrades may also be conditioned by the downgrade type. We consider three categories of downgrades: downgrades with affirmation, double downgrades and unique downgrades. Raimbourg (1990) theoretically shows that the double rating<sup>3</sup> permits to avoid the moral hazard problem. In fact, investors consider that double rated firm's are objective and independent, reflecting the real firm financial health. At the opposite, single ratings can be biased due to the agency problem between rating agency and rated firms. In general, rating agencies' revenues come from fees paid by rated firms. This could lead rating agencies to give issuers a better letter than they really are. In these circumstances, the double rating acts as a counterbalancing device, which force agencies to be more accurate about their ratings. Therefore, investors have grater confidence in double rated firms than in those rated by a single agency. As a result market reaction to double downgrades and downgrades with affirmations are stronger than reactions to unique downgrades.

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<sup>3</sup> The double rating means that a firm is rated by two or more rating agencies. In this case, the double rating concerns firms rated by both Moodys and Standard and Pools.

In conclusion, and with regard to the double rating impact on one hand and the conservative policy adopted by all rating agencies during crisis in the other hand, we assume that double rating is more pronounced during a crisis period than it is during stable periods.

To investigate our assumptions, we performed a cross table analysis to examine the differences in downgrade magnitude during crisis and non crisis period. We first examine all bad news considering that review for downgrade is assimilated to a downgrade with null magnitude. We then considered only downgrades with magnitude ranging from one to four notches. We studied 191 downgrades from which 81.8% occurred during the crisis period (157 occurring during crisis versus 34 during stable period). Besides, 92.9% of these downgrades occurred with a downgrade less than two notches (respectively, 31.5% with null amplitude, 45.4% with one notch, and 16% with two notches).

We find also that reviews for downgrades are more frequent during crisis compared to the normal period (35.3% versus 14.7%). It appears that downgrades with extreme magnitudes are more frequent during financial downturns (4.6% versus 2.9% with three notches and 3.3% versus 0% with amplitude more than three). On the contrary, downgrades with median amplitudes are more frequent during stable period than the turbulent one (64.7% with amplitude one versus 41.1% and 17.6% with amplitude two versus 15.7%).

Lastly, reviews for downgrades seem to be more marked during a meltdown. We argue that due to their conservative policy, rating agencies tend to be very prudent and preventive regarding the assessment of firms creditworthiness. In fact, taking account of investor's anxiety during downturns, they become less tolerant towards any financial indicator deterioration. Moreover, they tend to downgrade more severely firms during crisis (three and more notches). Such magnitude is rarely observed during normal periods.

To further investigate the extent of our results, we recalculate all the frequencies excluding reviews for downgrades from the sample. The results remain unchanged. In particular, we find that rating agencies are more abide to downgrade by two to more than three notches during crisis than in non crisis period. On the contrary, downgrades by one notch are more frequent during stable periods.

To investigate the differences between the two periods we performed different non-parametric tests. The Chi square independence test shows that the distribution of downgrades magnitude differs across the two periods ( $\chi^2 = 125.7$  and  $p\text{-value} = 0.000$ ). This means that agencies rate firms more severely during crisis period compared to stable periods.

Relatively to the second hypothesis, we assume that double downgrades and downgrades with affirmations appear more frequently during crisis, which lead to a stronger market reaction. In particular, rating agencies become more dynamic during crisis period which increase the number of doubly rated firms. The cross table analysis (crisis and downgrade type) show that 73.9% of downgrades announced during crisis are with affirmations versus 44% during the stable period (10.5% versus 29.4% for double downgrade and 15.7% versus 26.5% for unique downgrade).

The Chi square independence test applied to each type of downgrades supports our assumptions. Our results give evidence of a strong relation between crisis and double downgrades ( $\chi^2 = 25.4$  and  $p\text{-value} = 0.000$ ) and/or downgrade with affirmation ( $\chi^2 = 97.4$  and  $p\text{-value} = 0.000$ ). It seems that agencies tend to be more dynamic, vigilant and cautious in rating firms during crisis period. They publish nearly at the same time similar rating actions during downturns. This aims at enhancing investor's beliefs on double ratings and to limit their overreaction.

## 6. Conclusion

This paper is interesting to several extents. It is the first one that focuses on market reaction to rating announcements during crisis and non crisis periods by using comparative event studies. In fact, it aims to test market reaction changes to rating announcements during crisis period versus non crisis period. We compare abnormal returns issued from event studies applied to a sample of rated and listed firms on the NYSE and the NASDAQ. The study spanned the period during the 2008 worldwide financial downturn and a matching period of non crisis extending from January 2003 to December 2006.

Overall, our results are mixed and conditional to the announcement type. In fact, despite the assumed investors' loss of faith in rating agencies which are held responsible for the crisis occurrence, it appears that the market overreacts in terms of time span and magnitude to bad news (downgrades and reviews for downgrades). Indeed, negative abnormal returns following bad announcements are stronger and more prolonged than those observed during the stable period. This overreaction can be explained by the investors' panic and anxiety and to their risk aversion which make them very sensitive and impulsive towards bad news.

However, good and neutral news (upgrades, reviews for upgrade and assertions) have almost no significant impact on stock returns. In fact, good news generate a number of significant negative and small abnormal return the day -1. They however generate no significant cumulative abnormal returns during turmoil. At the opposite, during stable period upgrades generate small and positive significant abnormal return during the day following the announcement and produce no significant cumulative abnormal returns.

With regard to neutral announcements, a number of significant abnormal returns are observed for the days 0 and +1 for crisis period. On contrary, assertions generate negative reaction from day 0 to day +10 during calm period. These results highlight the investors' loss of faith and indifference towards good and neutral announcements.

Finally, we test if the overreaction highlighted by our results is explained by the change in the rating agencies' attitude during crisis periods. We assume that rating agencies adopt a conservative policy during turbulent financial periods to avoid public accusations. This attitude change leads to more severity in downgrading firms in one hand (more announcements of reviews for downgrades and more notches downgraded in the crisis period), and by an intensification of rating activity which is reflected in the increase of double ratings frequency during crisis period (i.e. more double downgrades and/or downgrades with affirmations), on the other hand.

In reference to downgrade magnitude, the cross table analysis reveals more reviews for downgrades during crisis than during stable period. It shows also that downgrades with 3 and more than three notches are observed only during crisis periods. Indeed, the Chi square independence test gives evidence of a statistically significant relation between crisis and downgrade magnitude. With regard to downgrade types, cross table analysis and non parametric tests support the hypothesis that double ratings are more frequent during the crisis period. On the contrary, single downgrades are less common during crisis.

In sum, we conclude that market overreacts to bad rating news during crisis periods. This reaction is small and positive towards good news during stable period but it becomes negative during crisis. Overreaction to bad news might be explained by the investors' risk aversion and the cautious behaviour of rating agencies during crisis. In particular, they seem to care more about financial firms' health during turmoil. They thus tend to increase their activities. This is reflected in one hand by rating firms more severely and in the other hand by the increase of very short double ratings. We argue that this short double rating may lead to excessive market reaction.

The policy implications of our results are as follows. First, it is needed to restore the credibility of rating agencies to regain the confidence of markets and investors. This implies necessarily the revision of rating methodologies that have been widely used by evaluators. Second, rating agencies activities need to be closely supervised to avoid interest conflicts which naturally arise between official regulators, agencies, firms and investors.

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**Table1: Descriptive statistics of the crisis and non crisis periods samples**

	Crisis period			Non crisis period		
	Downgrades	Upgrades	Assertions	Downgrades	Upgrades	Assertions
Number	152	17	55	34	43	58
%	67.86%	7.59%	24.55%	25.19%	31.85%	42.96%
<b>Total</b>			<b>224</b>			<b>135</b>

**Table2: The sample distribution by rating's types**

		Crisis	Non Crisis
<b>Downgrades</b>	With Affirmation	112	15
	Double	16	10
	Unique	24	9
<b>Upgrades</b>	With Affirmation	14	31
	Double	3	3
	Unique	0	9
<b>Assertions</b>	Double	49	50
	Unique	6	8
	<b>Total</b>	<b>224</b>	<b>135</b>

**Table 3.a: Mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) following downgrades announcements during crisis period**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.00618	-0.707	-0.00618	-0.707	-0.00154	-0.175	-0.00154	-0.174
-9	-0.00874	-1.208	-0.01493	-1.248	-0.00301	-0.387	-0.00455	-0.341
-8	0.0067	0.888	-0.00820	-0.602	0.01062	1.478	0.00607	0.406
-7	0.00216	0.252	-0.00604	-0.397	0.00744	0.796	0.01351	0.723
-6	0.00439	0.347	-0.00166	-0.092	0.00859	0.695	0.02210	1.003
-5	-0.01894***	-2.671	-0.02059	-1.088	-0.02663**	-2.602	-0.00452	-0.230
-4	-0.01260	-1.580	-0.03320*	-1.695	-0.01118	-1.420	-0.01571	-0.756
-3	-0.02216***	-3.222	-0.05538***	-2.729	-0.01166	-1.469	-0.02737	-1.212
-2	-0.00602	-0.759	-0.06139**	-2.898	-0.00651	-0.800	-0.03388	-1.491
-1	-0.03168***	-3.457	-0.09308***	-4.224	-0.02813***	-3.102	-0.06202***	-2.618
0	-0.02593**	-2.069	-0.11901***	-4.953	-0.02421*	-1.894	-0.08622***	-3.466
1	-0.00671	-0.667	-0.12572***	-4.98	-0.00639	-0.607	-0.09261***	-3.468
2	-0.00535	-0.729	-0.13107***	-4.712	0.00275	0.338	-0.08987***	-2.968
3	-0.01973**	-2.603	-0.15080***	-5.248	-0.01551**	-2.002	-0.10538***	-3.410
4	0.00365	0.498	-0.14716***	-5.218	0.00872	1.187	-0.09666***	-3.085
5	-0.00712	-0.839	-0.15426***	-4.993	-0.00125	-0.139	-0.09791***	-2.795
6	-0.00105	-0.148	-0.15531***	-4.976	-0.00629	-0.694	-0.10419***	-3.151
7	0.00504	0.532	-0.15027***	-4.466	0.00977	1.049	-0.09447***	2.663
8	0.00084	0.084	-0.14943***	-4.448	0.00019	0.019	-0.09423***	-2.675
9	0.01048	0.959	-0.13895***	-4.202	0.01073	1.005	-0.08349**	-2.384
10	0.00813	0.848	-0.130818***	-3.929	0.01215	1.276	-0.07134**	-2.002

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 3.b: Mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) following downgrades announcements during non crisis period**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	0.00533	1.489	0.00533	1.489	0.00524	1.436	0.00524	1.436
-9	-0.00359	-1.039	0.00173	0.419	-0.00284	-0.809	0.00239	0.544
-8	0.00223	0.463	0.00396	0.761	0.00252	0.517	0.00492	0.940
-7	-0.00206	-0.753	0.00190	0.328	-0.00170	-0.600	0.00322	0.563
-6	-0.00377	-1.133	-0.00187	-0.284	-0.00288	-0.892	0.00033	0.052
-5	-0.00343	-1.176	-0.00531	-0.712	-0.00261	-0.884	-0.00227	-0.317
-4	-0.00789	-1.517	-0.01320	-1.361	-0.00713	-1.393	-0.00941	-1.011
-3	-0.00720	-1.551	-0.02040*	-1.878	-0.00635	-1.387	-0.01577	-1.512
-2	-0.00070	-0.201	-0.02111*	-1.978	-0.00045	-0.127	-0.01622	-1.568
-1	-0.00765**	-2.510	-0.02876***	-2.841	-0.00658**	-2.187	-0.02281**	-2.338
0	-0.00090	-0.282	-0.02967**	-2.761	0.00021	0.069	-0.02259***	-2.188
1	-0.00606	-0.936	-0.03574***	-2.796	-0.00586	-0.889	-0.02846**	-2.200
2	-0.00559	-1.120	-0.04133***	-2.909	-0.00525	-1.069	-0.03371**	-2.309
3	0.00836*	1.760	-0.03297**	-2.486	0.00855*	1.749	-0.02516*	-1.782
4	0.00045	0.095	-0.03252**	-2.063	0.00106	0.228	-0.02409	-1.426
5	0.01201	1.031	-0.02059*	-1.826	0.01272	1.098	-0.01137	-0.965
6	0.00182	0.640	-0.01867	-1.642	0.00232	0.791	-0.00904	-0.763
7	-0.00265	-0.515	-0.02133*	-1.819	-0.00185	-0.352	-0.01090	-0.862
8	-0.00163	-0.542	-0.02296*	-1.901	-0.00141	-0.501	-0.01231	-0.959
9	0.00477	0.928	-0.01818	-1.392	0.00495	0.964	-0.00736	-0.548
10	0.00193	0.549	-0.01625	-1.265	0.00272	0.761	-0.00464	-0.344

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 4: The AR and CAR mean difference tests during crisis and non crisis periods following downgrades**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.01151	-1.218	-0.01151	-1.218	-0.00678	-0.710	-0.00678	-0.710
-9	-0.00515	-0.642	-0.01666	-1.316	-0.00017	-0.020	-0.00695	-0.496
-8	0.00449	0.500	-0.01217	-0.834	0.00809	0.931	0.00114	0.072
-7	0.00422	0.470	-0.00794	-0.487	0.00914	0.936	0.01028	0.526
-6	0.00816	0.623	0.00021	0.011	0.01147	0.899	0.02176	0.949
-5	-0.01550**	-2.021	-0.01528	-0.751	-0.02401**	-2.254	-0.00224	-0.107
-4	-0.00471	-0.494	-0.02000	-0.915	-0.00404	-0.430	-0.00628	-0.276
-3	-0.01496*	-1.803	-0.03496	-1.519	-0.00530	-0.579	-0.01159	-0.466
-2	-0.00532	-0.612	-0.04028*	-1.698	-0.00606	-0.683	-0.01765	-0.707
-1	-0.02402**	-2.487	-0.06431***	-2.652	-0.02154**	-2.254	-0.03920	-1.530
0	-0.02502*	-1.935	-0.08933***	-3.394	-0.02442*	-1.856	-0.06363**	-2.362
1	-0.00063	-0.053	-0.08997***	-3.183	-0.00052	-0.042	-0.06415**	-2.162
2	0.00024	0.027	-0.08973***	-2.872	0.00800	0.842	-0.05614*	-1.670
3	-0.02809***	-3.140	-0.11782***	-3.723	-0.02406***	-2.626	-0.08021**	-2.361
4	0.00320	0.367	-0.11462***	-3.548	0.00764	0.878	-0.07256**	-2.039
5	-0.01913	-1.327	-0.13375***	-4.069	-0.01396	-0.953	-0.08653**	-2.341
6	-0.00287	-0.377	-0.13663***	-4.113	-0.00861	-0.903	-0.09514***	-2.709
7	0.00769	0.713	-0.12894***	-3.618	0.01162	1.086	-0.08351**	-2.219
8	0.00247	0.234	-0.12646***	-3.542	0.00160	0.154	-0.08190**	-2.184
9	0.00570	0.472	-0.12075***	-3.396	0.00577	0.487	-0.07613**	-2.029
10	0.00619	0.606	-0.11456**	-3.210	0.00943	0.927	-0.06669*	-1.750

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 5.a: Mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) following upgrades announcements during crisis period**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.01531	-0.781	-0.01531	-0.781	-0.01712	-1.349	-0.01712	-1.349
-9	-0.04251	-0.260	-0.05783	-0.686	-0.03354	-0.592	-0.05067	-1.018
-8	0.03870	0.308	-0.01913	-0.308	0.03547	0.26	-0.01519	-0.355
-7	-0.01029	-0.639	-0.02942	-0.497	-0.00609	0.024	-0.02127	-0.497
-6	0.01984	1.397	-0.00958	0.450	0.02180	1.065	0.00053	0.402
-5	0.05039	1.586	0.04081	0.923	0.05013	1.491	0.05067	0.308
-4	-0.01428	-1.160	0.02652	0.402	-0.00555	-0.26	0.04511	0.213
-3	-0.01113	-0.260	0.01539	0.118	-0.00463	-0.402	0.04047	0.071
-2	-0.01282	-1.018	0.00256	-0.024	-0.01444	-1.255	0.02603	-0.213
-1	-0.02833**	-2.012	-0.02576	-0.639	-0.01457*	-1.87	0.01145	-0.592
0	0.02781	0.639	0.00205	0.118	0.03274	0.971	0.04419	0.071
1	-0.00263	-0.118	-0.00058	0.071	-0.01962	-0.971	0.02457	-0.260
2	-0.00422	-1.065	-0.00480	-0.308	-0.00492	-0.592	0.01965	-0.355
3	-0.00106	-0.355	-0.00586	-0.592	0.01187	-0.308	0.03153	-0.781
4	0.00723	1.018	0.00136	-0.450	-0.00073	0.118	0.03079	-0.971
5	-0.001920	-0.213	-0.00055	-0.166	-0.00721	-0.686	0.02358	-0.686
6	-0.00715	-0.923	-0.00770	-0.213	-0.01779*	-1.823	0.00578	-0.923
7	0.00731	0.402	-0.00038	0.071	0.00749	-0.024	0.01328	-0.639
8	-0.00692	-0.497	-0.00730	-0.071	-0.00171	-0.734	0.01156	-0.544
9	-0.00251	-0.213	-0.00982	-0.166	-0.00265	-0.024	0.00891	-1.018
10	0.00120	0.024	-0.00862	-0.166	0.00406	0.118	0.01298	-1.018

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 5.b: Mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) following upgrades announcements during non crisis period**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.00185	-0.798	-0.00185	-0.798	-0.00183	-0.841	-0.00183	-0.841
-9	0.00060	0.284	-0.00125	-0.361	-0.00051	-0.245	-0.00235	-0.740
-8	-0.00457*	-1.700	-0.00582	-1.253	-0.00522*	-1.790	-0.00758*	-1.695
-7	-0.00078	-0.220	-0.00661	-1.140	-0.00110	-0.298	-0.00868	-1.511
-6	0.00104	0.384	-0.00557	-0.852	-0.00038	-0.135	-0.00907	-1.404
-5	0.00271	0.868	-0.00285	-0.344	0.00155	0.484	-0.00752	-0.908
-4	0.00222	0.780	-0.00062	-0.066	0.00188	0.717	-0.00563	-0.612
-3	-0.00228	-1.032	-0.00291	-0.327	-0.00203	0.187	-0.00766	-0.842
-2	-0.00051	-0.143	-0.00342	-0.402	-0.00161	-0.463	-0.00928	-1.069
-1	0.00082	0.298	-0.00260	-0.280	-0.00100	-0.358	-0.01028	-1.100
0	-0.00392	-1.463	-0.00652	-0.616	-0.00419	-1.579	-0.01448	-1.394
1	0.00600**	2.086	-0.00052	-0.049	0.00409	1.455	-0.01039	-1.003
2	0.00385	1.401	0.00333	0.319	0.00271	1.013	-0.00767	-0.771
3	-0.00286	-1.007	0.00046	0.046	-0.00359	-1.213	-0.01127	-1.135
4	0.00274	1.018	0.00320	0.307	0.00174	0.652	-0.00953	-0.936
5	-0.00387	-1.227	-0.00066	-0.059	-0.00461	-1.517	-0.01414	-1.269
6	-0.00254	-0.944	-0.00321	-0.258	-0.00322	-1.193	-0.01736	-1.417
7	0.00394	1.224	0.00073	0.064	0.00233	0.769	-0.01503	-1.329
8	-0.00014	-0.069	0.00058	0.049	-0.00136	-0.654	-0.01639	-1.433
9	0.00230	0.710	0.00289	0.235	0.00160	0.499	-0.01479	-1.230
10	0.00201	0.621	0.00491	0.374	0.00090	0.278	-0.01388	-1.064

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 6: The AR and CAR mean difference tests during crisis and non crisis periods following upgrades**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.01346	-0.762	-0.01346	-1.172	-0.01529	-0.908	-0.01529	-1.399
-9	-0.04312	-0.979	-0.05658	-1.499	-0.03302	-0.997	-0.04831	-1.589
-8	0.04327	0.754	-0.01331	-0.666	0.04070	0.787	-0.00761	-0.396
-7	-0.00951	-0.950	-0.02282	-0.948	-0.00497	-0.481	-0.01258	-0.522
-6	0.01880	1.214	-0.00402	-0.160	0.02219	1.145	0.00960	0.374
-5	0.04768	1.321	0.04366	1.291	0.04858	1.305	0.05819	1.475
-4	-0.01650	-1.506	0.02715	0.540	-0.00744	-0.609	0.05075	1.194
-3	-0.00885	-0.627	0.01830	0.566	-0.00260	-0.204	0.04814	1.087
-2	-0.01230	-1.175	0.00599	0.181	-0.01282	-1.343	0.03531	0.782
-1	-0.02915*	-2.051	-0.02316	-0.763	-0.01357*	-1.873	0.02174	0.479
0	0.03173	1.138	0.00857	0.200	0.03693	1.255	0.05868	0.948
1	-0.00863	-0.776	-0.00006	-0.001	-0.02371	-1.343	0.03496	0.635
2	-0.00807	-0.763	-0.00813	-0.173	-0.00763	-0.789	0.02733	0.468
3	0.00180	0.178	-0.00633	-0.131	0.01547	0.797	0.04280	0.633
4	0.00449	0.466	-0.00184	-0.037	-0.00248	-0.248	0.04032	0.616
5	0.00195	0.181	0.00011	0.002	-0.00259	-0.274	0.03773	0.588
6	-0.00460	-0.719	-0.00449	-0.090	-0.01457	-1.356	0.02315	0.379
7	0.00336	0.348	-0.00112	-0.021	0.00516	0.436	0.02831	0.436
8	-0.00677	-0.780	-0.00731	-0.097	-0.00035	-0.029	0.02796	0.395
9	-0.00482	-0.517	-0.00982	-0.161	-0.00425	-0.424	0.02370	0.335
10	-0.00081	-0.074	-0.00862	-0.160	0.00316	0.252	0.02686	0.352

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 7.a: Mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) following assertions announcements during crisis period**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.00594	-0.648	-0.00594	-0.648	-0.01074	-1.158	-0.01074	-1.158
-9	-0.01390	-1.391	-0.01984*	-2.082	-0.00787	-0.786	-0.01861*	-1.895
-8	0.00376	0.435	-0.01608	-1.273	0.00806	0.936	-0.01055	-0.848
-7	0.01064	1.178	-0.00543	-0.351	0.01379*	1.793	0.00324	0.228
-6	0.00119	0.164	-0.00424	-0.234	-0.00117	-0.164	0.00207	0.124
-5	0.02775	0.941	0.02351	0.738	0.03481	1.201	0.03689	1.200
-4	-0.00251	-0.251	0.02100	0.711	-0.00036	-0.038	0.03652	1.255
-3	-0.01711**	-2.115	0.00388	0.133	-0.01170	-1.478	0.02482	0.877
-2	0.01384	1.450	0.01773	0.599	0.01179	1.282	0.03662	1.275
-1	-0.00003	-0.003	0.01769	0.550	-0.00312	-0.322	0.03349	1.058
0	-0.02105*	-1.837	-0.00335	-0.097	-0.02585**	-2.307	0.00763	0.227
1	-0.02313*	-2.122	-0.02648	-0.679	-0.02313**	-2.122	-0.01242	-0.334
2	-0.01155	-1.070	-0.03803	-1.086	-0.01781*	-1.815	-0.03024	-0.868
3	0.00669	0.627	-0.03134	-0.830	0.00965	0.955	-0.02058	-0.540
4	0.00252	0.308	-0.02882	-0.788	0.00276	0.361	-0.01781	-0.483
5	-0.00392	0.4169	-0.03274	-0.971	-0.00431	-0.474	-0.02212	-0.673
6	-0.00927	-1.421	-0.04201	-1.238	-0.00428	-0.772	-0.02640	-0.802
7	0.00132	0.117	-0.04069	-1.090	-0.00011	-0.010	-0.02652	-0.719
8	-0.00745	-1.236	-0.04814	-1.271	-0.00727	-1.214	-0.03379	-0.920
9	-0.01139	-1.408	-0.05954	-1.501	-0.01314*	-1.823	-0.04694	-1.203
10	0.00271	0.281	-0.05683	-1.399	0.00018	0.019	-0.04676	-1.135

\*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 7.b: Mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) following assertions announcements during non crisis period**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.00333	-1.062	-0.00333	-1.062	-0.00373	-1.269	-0.00373	-1.269
-9	0.00079	0.443	-0.00253	-0.633	0.00044	0.261	-0.00329	-0.864
-8	-0.00227	-1.467	-0.00481	-1.088	-0.00309*	-1.934	-0.00638	-1.480
-7	0.00216	1.428	-0.00264	-0.646	0.00231	1.559	-0.00407	-1.025
-6	0.00062	0.425	-0.00202	-0.449	0.00042	0.287	-0.00365	-0.843
-5	-0.00234	-1.091	-0.00437	-0.841	-0.00256	-1.218	-0.00621	-1.246
-4	-0.00123	-0.610	-0.00560	-1.022	-0.00108	-0.511	-0.00730	-1.360
-3	0.00232	1.001	-0.00328	-0.498	0.00192	0.801	-0.00538	-0.841
-2	-0.00457	-0.972	-0.00785	-0.897	-0.00530	-1.129	-0.01068	-1.196
-1	0.00076	0.316	-0.00709	-0.785	0.00117	0.472	-0.00951	-1.025
0	-0.0057**	-2.103	-0.0128*	-1.403	-0.00601**	-2.240	-0.01552*	-1.661
1	4.89E-06	0.002	-0.01278	-1.426	-0.00124	-0.586	-0.01676*	-1.824
2	-0.00015	-0.084	-0.01293	-1.453	0.00006	0.038	-0.01670*	-1.083
3	-0.0043**	-2.371	-0.0172*	-1.913	-0.00390**	-2.138	-0.02061**	-2.207
4	0.00157	1.159	-0.0156*	-1.786	0.00045	0.328	-0.02015**	-2.186
5	-0.00027	-0.173	-0.0159*	-1.747	-0.00056	-0.369	-0.02072**	-2.182
6	-0.00139	-0.898	-0.0173*	-1.911	-0.00094	-0.628	-0.02166**	-2.290
7	0.00065	0.308	-0.0166*	-1.732	0.00061	0.297	-0.02105**	-2.010
8	-0.00115	-0.716	-0.0178*	-1.776	-0.00144	-0.900	-0.02249**	-2.165
9	0.00003	0.019	-0.0177*	-1.718	0.00072	0.471	-0.02177**	-2.054
10	-0.00133	-0.845	-0.0191*	-1.783	-0.00181	-1.248	-0.02359**	-2.159

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 8: The AR and CAR mean difference tests during crisis and non crisis periods following assertions**

Day (t)	Stock adjusted returns				OLS Market model returns			
	AR	t-stat	CAR	t-stat	AR	t-stat	CAR	t-stat
-10	-0.00264	-0.258	-0.00264	-0.258	-0.00700	-0.720	-0.00700	-0.720
-9	-0.01470	-1.447	-0.01731*	-1.674	-0.00831	-0.819	-0.01532	-1.454
-8	0.00603	0.687	-0.01127	-0.842	0.01115*	1.274	-0.00416	-0.316
-7	0.00848	0.926	-0.00278	-0.174	0.01148	1.466	0.00732	0.495
-6	0.00056	-0.077	-0.00221	-0.118	-0.00159	-0.218	0.00572	0.332
-5	0.03010	1.018	0.02788	0.864	0.03738	1.286	0.04310	1.385
-4	0.00128	-0.125	0.02660	0.886	0.00072	0.074	0.04383	1.481
-3	-0.01943**	-2.308	0.00716	0.239	-0.01362	-1.647	0.03020	1.041
-2	0.01841*	1.731	0.02558	0.829	0.01710	1.655	0.04730	1.573
-1	-0.00079	-0.088	0.02479	0.742	-0.00429	-0.429	0.04300	1.304
0	-0.01536	-1.305	-0.00943	0.264	-0.01984	-1.722	0.02316	0.665
1	-0.02313**	-2.083	-0.01370	-0.342	-0.01882*	-1.770	-0.00434	0.113
2	-0.01140	-1.043	-0.02510	-0.694	-0.01787*	-1.795	-0.01353	-0.376
3	0.01099	1.016	-0.01411	-0.363	0.01356	1.320	0.00002	0.000
4	0.00095	0.114	-0.01316	-0.350	0.00230	0.296	-0.00233	0.061
5	-0.00365	-0.383	-0.01681	-0.481	-0.00373	-0.405	-0.00139	-0.041
6	-0.00788	-1.176	-0.02469	-0.703	-0.00334	-0.581	-0.00474	-0.138
7	0.00066	0.057	-0.02403	-0.623	-0.00072	-0.064	-0.00546	-0.143
8	-0.00629	-1.008	-0.03033	-0.774	-0.00582	-0.939	-0.01129	-0.296
9	-0.01143	-1.384	-0.04176	-1.018	-0.01386*	-1.881	-0.02516	-0.622
10	0.00403	0.413	-0.03772	-0.898	0.00199	0.210	-0.02317	-0.543

Notes: \*\*\*, \*\* and \* denote significance at the 1%, 5% et 10% levels respectively

**Table 9: Magnitude and Crisis Crosstabulation (all bad news)**

Magnitude		CRISIS		Total
		0	1	
0	Count	5	54	59
	% within CRISIS	14.7%	35.3%	31.5%
1	Count	22	63	85
	% within CRISIS	64.7%	41.1%	45.4%
2	Count	6	24	30
	% within CRISIS	17.6%	15.7%	16.0%
3	Count	1	7	8
	% within CRISIS	3%	4.6%	4.3%
More than 3	Count	0	5	5
	% within CRISIS	.0%	3.3%	2.8%
<b>Total</b>	Count	34	153	187
	% within CRISIS	100.0%	100.0%	100.0%



**Table 10: Downgrade magnitude and crisis (excluding reviews for downgrades)**

		CRISIS		Total	
		0	1		
Magnitude	1	Count	22	63	85
		% within CRISIS	75.9%	63.7%	66.4%
	2	Count	6	24	30
		% within CRISIS	20.7%	24.3%	23.4%
	3	Count	1	7	8
		% within CRISIS	3.4%	7.0%	6.25%
	More than 3	Count	0	5	5
		% within CRISIS	.0%	5.0%	3.95%
<b>Total</b>	Count	29	99	128	
	% within CRISIS	100.0%	100.0%	100.0%	

**Table 11: DOWNGRADE TYPE \* CRISIS Crosstabulation**

		CRISIS		Total
		0	1	
Double downgrade	Count	10	16	26
	% within CRISIS	29.5%	10.5%	13.9%
Downgrade with affirmation	Count	15	113	128
	% within CRISIS	44.0%	73.9%	68.4%
Double downgrade + Downgrade with affirmation	Count	25	129	154
	% within CRISIS	73.5%	84.3%	82.3%
Downgrade unique	Count	9	24	33
	% within CRISIS	26.5%	15.6%	17.7%
<b>Total</b>	Count	34	153	187
	% within CRISIS	100.0%	100.0%	100.0%