

**Global Equity and Debt Market Responses to Sovereign Credit Ratings
Announcements**

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(January 2002)

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Abstract

Sovereign risk assessment has again captured the attention of international capital markets as the most recent international debt crisis has been resolved and several developing countries are again sourcing funds in the international capital markets. Similar to other credit ratings, sovereign ratings evaluate the relative likelihood that a debtor central government will default on its obligations. The economic information used by, for example, Standard and Poor's to aid in tracking sovereign risk includes; economic data, general government finance data, balance of payments data, and external debt data. This information is also normally available to the public. Thus, the question that has been central to the discussions associated with corporate ratings can also be asked here. Does a sovereign rating simply mirror the existing international market's assessment of country's risk?

This research addresses the issue whether sovereign credit ratings provide incremental information to the marketplace. For international equity markets, we find that negative outlook assignments are associated with negative and statistically significant abnormal returns, positive outlook assignments are associated with a statistically significant positive impact on abnormal returns and stable outlooks are not statistically significant. Further, when a country is placed on credit watch for negative implications or for a possible downgrade we find that there is a negative and statistically significant market reaction. For international debt markets we find that market reactions to the announcement of credit rating assignments conveyed no new information for ratings associated with below investment grade sovereign bonds, for different sized countries and for emerging markets. The announcement of credit rating assignment is found to provide new and negative information on the announcement date for developed countries and the day after investment grade sovereign bonds.

The global market reaction to the announcement of credit rating changes is found to convey no new information for the ratings of upgrade and affirm. However, there is a significantly negative impact on bond returns before the change announcements for rating downgrade.

1. Introduction

Credit ratings and their critical roles in debt finance have generated considerable interest in terms of understanding and explaining how financial markets assimilate information concerning borrowers' creditworthiness. Among the issues receiving attention in the market efficiency literature is risk assessments of non-sovereign borrowers, i.e., firms, companies, banks, local

governments, etc. The literature has illustrated that several outstanding issues still exist including the nature of information impacts on global market participants' decisions.

Sovereign risk assessment has again captured the attention of international capital market participants as the most recent international debt crisis has been resolved and several developing countries are once again sourcing funds in the international capital markets. Similar to other credit ratings, sovereign ratings evaluate the relative likelihood that a debtor central government will default on its obligations. The economic information used by, for example, Standard and Poor's to aid in tracking sovereign risk includes; economic data, general government finance data, balance of payments data, external debt data. This information is normally available to the public as well. Thus, the question that has been central to the discussions associated with corporate ratings can also be asked here. Does a sovereign rating simply mirror the existing international market's assessment of country's risk? Research on this question to date has not fully answered this fundamental question, particularly in relation to global market participant reactions.

The present paper attempts to fill this gap by investigating the reactions of global stock and bond markets to the changes in sovereign credit ratings. In other words, we intend to evaluate informational market efficiency by analyzing the adjustments of selected national stock and bond markets indexes to "news" characterising the quality of sovereign governments' creditworthiness.

2. Sovereign credit ratings

Sovereign credit ratings may be classified according to four different debtors: as corporate, sub-national, sovereign, and supranational. As the name suggests, a sovereign rating involves a sovereign government, and summarizes the results of assessing its likelihood to default on its obligations. The rating's objective is to determine a country's overall risk or creditworthiness based on the government's willingness and ability to meet its obligations in accordance with the debt issue terms.

Since the early 1990s the demand for sovereign credit ratings has been increasing rapidly, due to increasing levels of national government borrowing in the international capital markets. The bonds issued by sovereigns can be denominated in either foreign or domestic currency and typically offerings are placed with international investors. In fact, international investors care more about whether bonds are rated than the currency in which they are denominated. Investors generally prefer rated to non-rated securities when both have similar default risk. In addition, once a sovereign rating is assigned, the corporate rating is simultaneously given for firms domiciled in the rated country. Thus, sovereign ratings, including domestic and foreign currency

ratings, serve two functions, one is to increase access to foreign capital, and second to affect the capital raising ability of firms using domestic capital markets.

Among those agencies that assign sovereign ratings, the best known includes Standard and Poors Corporation (hereafter, S&Ps) and Moody's Investors Service (hereafter, Moodys). S&P offers an unmatched combination of credit, political, financial and economic analysis that provides comprehensive assessments of nearly 90 governments in developed and emerging markets worldwide. Moodys provides similar assessments for more than 100 nations, nearly every country that participates in the world's capital markets. For each nation, Moodys publishes several types of ratings to capture divergent risks. When assessing a country's willingness and ability to service its debt, rating agencies will generally take into consideration the country's political risk and economic risk. Political risk assessment evaluates a country's underlying political and social stability which impact the central government's willingness to meet its debt obligations. The main criteria used include the characteristics of a political system, executive leadership, government institutions, social coalitions, social indicators, and external relations (See, for example, Standard and Poors, 1982). Economic risk assessment involves the analysis of economic characteristics affecting a country's ability to support its current and anticipated level of external debt. For this purpose, a rating agency will look at factors like demographic characteristics, structure of the economy, recent economic trends, and economic policy (See, for example, Standard and Poors, 1982).

Table A below illustrates the differences and similarities between the rating symbols used by S&Ps and Moodys. Obligators rated "AAA" ("Aaa") down to "BBB" ("Baa") are generally regarded as "investment grade" or as eligible for bank investment, while those rated below "BB" ("Ba") fall into category of "speculative grade" or non-investment grade. For S&Ps, the ratings from "AA" to "B" may be modified by the addition of a plus or minus sign to show relative standing within the major rating categories, while Moodys applies numerical modifiers 1, 2, and 3 in each generic rating category from Aa to Caa.

Table A. Rating Symbols Used by Standard and Poors and Moodys

Investment-Grade Ratings			Speculative-Grade Ratings		
Capacity to Pay Interest and Repay Principal			Degree of Speculation Regarding Capacity to Service Debt		
	S&P's	Moody's		S&P's	Moody's

Extremely strong	AAA	Aaa	Lowest	BB+	Ba1
				BB	Ba2
				BB-	Ba3
Very strong	AA+	Aa1	Low	B+	B1
	AA	Aa2		B	B2
	AA-	Aa3		B-	B3
Strong	A+	A1	High	CCC	Caa1
	A	A2			Caa2
	A-	A3			Caa3
Adequate	BBB+	Baa1	Highest	CC	Ca
	BBB	Baa2			
	BBB-	Baa3		In default	SD&D

Source: Standard and Poors; Moodys. (Dates needed here)

Sovereign ratings are affected by many of the variables listed above, however, there are a large number of non quantifiable sub-criteria contained in the ratings. Even when the rating agencies provide information concerning the variables used to determine sovereign ratings, they provide little information concerning how they assign weights to each of their criteria. Thus, it is difficult to identify the relationship between the variables used and announced ratings. Given this uncertainty, it is left to the market researcher to quantify the relationship between variables and published ratings by searching for the relative significance of variables, and to determine which variable(s) will bring new information to financial markets causing market participants to change their decisions..

3. A selective survey of the literature

Informational efficiency of financial markets when corporate ratings change has been, extensively explored. However, comparatively little research has considered the impact of changes in sovereign ratings on financial markets.

Studies of capital market efficiency that involve corporate ratings have largely focused on bond rating changes and earnings forecast revisions. These studies attempt, to discern information content by testing market reactions to rating changes and forecast revisions. But, due

to the difficulty of obtaining bond price data, research has focused on stock market reactions. Existing research has determined that if abnormal positive or negative stock returns are driven by the announcements of bond downgrades, upgrades or forecast revisions, then rating agencies and stock analysts appear to have provided new information previously unavailable to bondholders or stockholders through public announcements.

Early studies yielded conflicting findings (Ederington and Yawitz, 1987). However, by the 1980s and 1990s a trend was emerging: Bond rating downgrades induce negative stock market reactions whereas upgrades had no incremental information content (See, for example, Wansley and Clauretje, 1985; Cornell, Landsman, and Shapiro, 1989; Hand, Holthausen, and Leftwich, 1992; and Matolcsy and Lianto, 1995). But there was lingering controversy as evidence of stock market reactions to both upward and downward revisions in analyst earnings forecasts were reported by Lys and Sohn(1990) and Stickel(1991). The empirical results appear to imply that new information may be conveyed to stock markets by bond rating downgrades as well as earnings forecast revisions. One possible explanation put forward by Cornell, Landsman and Shapiro(1989) for the bond downgrade information effect was that rating agencies may have inside information that the market does not possess, and thus the rating agency can provide a more informed estimate of a firm's intangible assets and the implicit claims on an equity by other stakeholders such as employees and suppliers.

The process of transmitting bond downgrade information to the marketplace is not completely understood by researchers. While such downgrades may have negative implications for bondholders, this may not be true for stockholders.. Further, do all types of downgrades have the same impact on market participants? Goh and Ederington (1993) address these issues when they consider two types of rating downgrades: those due to a deterioration in the firm's financial prospects (Type 1) and those due to an increase in leverage (Type 2). They find a negative, *post*-announcement stock market reaction. Since the pre-announcement abnormal returns for Type 1 downgrades are insignificant, they conclude that downgrades reflect information not released over the *pre*-announcement periods. Goh and Ederington (1993) also report that Type 2 downgrades generally respond to past known leverage increases, and are unlikely to have new or important information content: They conclude that rating changes may or may not be a surprise to the market. The ultimate impact will depend on the source of the information change.

Another issue relating to the process of information transmission is the causal relationship since rating agencies usually claim to have informational advantage over market analysts (Ederington and Yawitz, 1992). If a rating change is believed to have reflected inside information

unavailable to stock analysts, it may lead them to change earnings forecasts although forecast revisions may also respond to other public information releases. On the other hand, ratings changes may occur after a series of downward (upward) earnings forecast revisions or after stable or rising (declining) earnings forecasts. In the former case, the rating change is primarily a response to existing negative (positive) information, while in the latter case, the rating change will have new information content for the market. Ederington, Goh and Nelson (1998) explore Granger causality between bond rating changes and earnings forecast revisions. They find that causality runs from the rating changes to forecast revisions and that earnings analysts have stronger responses following downgrades than following upgrades. More specifically, bond downgrades respond to both public information already impounded in market prices and private information. This is supported by the observation that financial analysts revise their forecasts sharply downward in response to a downgrade announcement, although these revisions react, with a lag, to negative public information released before the downgrade. Bond upgrades, however, respond only to public information as firms see no need to keep good news confidential or "inside". But financial analysts are observed to revise their earnings forecasts upward after upgrades occur. It is not clear, whether the observed upward revisions of forecasts are the result of incremental positive information or a lagged reaction, to public information.

In contrast to the number of studies considering informational efficiency of stock markets when corporate ratings change, there have been relatively few considering the market impact of sovereign rating changes. We now turn to those studies.

Sovereign ratings, which seek to assess sovereign default risk, are affected by a borrowing country's macro-factors including economic, political and social variables. One area of Sovereign rating change investigation is the reaction of the syndicated Euro-credit market to changes in sovereign risk assessments by Euro-syndicate lenders. One of the first works to directly test the relation between sovereign risk assessments and Euro-credit pricing appeared in Feder and Ross (1982). These authors used the Institutional Investors' 1979 creditworthiness ranking as a measure of lenders' perceived default probabilities, and found that the risk premiums (Euro-spreads) in the market fully reflected such perceptions. This result suggested that anticipated events have systematically been incorporated in Euro-credit pricing, and they concluded that the Euro-credit market functioned efficiently. Doukas (1989) extended the literature by arguing if the Euro-credit market was efficient, then *changes* in the credit spreads (i.e., in the risk premiums or prices of Euro-syndicate credit) should only be caused by "news" or unanticipated events which will induce *changes* in lenders' perceptions of sovereign borrower's risk, not anticipated events.

Doukas (1989), following work conducted by Saunders (1986) and Doukas and Jalilvand (1986), argues that a macro-factor like a borrowing countries' economic growth potential (proxied by the ratio of exports to international reserves) may be used to evaluate the likelihood of sovereign default because "new information" in such a macro-factor could not have been anticipated. Doukas (1989) reported that Euro-spread movements occurred immediately after the announcements of the macro-factor. This result suggested that announcements concerning sovereign borrowers' future growth (or creditworthiness) contain new information, and the Euro-credit market could be considered efficient because changes in the prices of international loans quickly responded to unanticipated events signalling changes in a borrowing country's default risk.

Cantor and Packer (1996) investigated the relationship between sovereign ratings announcements and sovereign yields on Eurodollar bonds, and the impact of sovereign ratings announcements on US-dollar bond spreads. Their analysis indicated that sovereign ratings provide the international bond markets with both public and private information and were strongly associated with changes in sovereign bond spreads. Cantor and Packer (1996) also report that, six macroeconomic indicators were important sovereign ratings determinants. The literature has failed to solve at least two puzzles. First, the impact of rating announcements on spreads appears stronger for below-investment-grade than for investment-grade sovereigns. Second, more fully anticipated rating announcements have a larger impact than less anticipated ones.

There have also been several studies examining the relationship between stock markets and macroeconomic variables that do not fall into the category of debt finance. These studies have established that changes in macroeconomic variables contain important information for stock market participants (See, for example, Chen et al., 1986; Pearce and Roley, 1983; Kim and Wu, 1987; and Mookerjee and Yu, 1997). It is hypothesized that investors incorporate the information into their estimates of the appropriate discount rate and the expected flow of dividend from stocks, which in turn affects stock returns. Hardouvelis (1987) analyses the response of stock prices to the announcements of 15 representative economic variables, and finds that stock prices respond primarily to announcements of monetary variables. Not surprisingly, stocks of financial companies were the most sensitive to monetary news.

Our selective literature survey identifies two major issues that require further attention. First, the link between changes in sovereign ratings and the stock market of the rated nation has not been fully established. Corporate ratings are normally concerned with the creditworthiness of the private firm, company, bank, or local government, or an index of such entities. It is not clear

whether a corporate rating will affect the individual stock price of the rated entity or the index of the national stock market. We conjecture in this research that the returns on the national stock index will respond to changes in sovereign risk as assessed by sovereign credit ratings for two reasons. Companies owned or supported by national governments are typically large, often dominating their share market's aggregate stock index. Thus, sovereign ratings serve as a proxy for bond ratings of companies. Therefore, it would be expected that changes in sovereign ratings would induce a response from a large number of stockholders and a movement of stock returns at the aggregate level. Also, sovereign ratings tend to dominate corporate ratings in many cases. As noted by Cantor and Packer (1996), agencies seldom assign a credit rating to a corporate higher than its home country or national government rating. So, changes in the sovereign rating must induce changes in corporate ratings. This would be expected to change most, if not all, stock prices of the entities domiciled in that country. As a result, aggregate stock return movements would be observed.

The second issue considered in this research focuses on the differential impact of sovereign ratings information on stock markets. There are two strands of arguments emerging from the literature. In short term markets like Euro-credit market, it was reported that the unpredictable component ("news") played a predominant role in Euro-spread changes, while the anticipated component was fully reflected in the Euro-credit pricing (Doukas, 1989). Both of these findings point to the conclusion that the Euro-credit market is informationally efficient. The long term markets like the international bond market react differently to rating changes. Here, the more fully anticipated are the rating announcements, the greater will be their impact on spread *changes* (Cantor and Packer, 1996). In the context of the market efficiency literature, this suggests that the international bond markets do not operate efficiently as sovereign risk considerations have not been fully incorporated in sovereign bond pricing. As a result one would expect sovereign ratings to bring "news" that could not have been anticipated to the stock market which in turn would react to both public and private information concerning the country's creditworthiness.

Sovereign ratings are based on a number of publicly available macro-factors. However, even publicly available information may be hard to use at times and may be costly to assemble. So there is no guarantee public information *will be* known by all investors prior to the announcement of rating changes. A sovereign rating change under this scenario would convey some new information to the capital markets. In addition, rating agencies' sovereign risk opinions are likely to be partially based on information not publicly available.. So, market participants may

anticipate rating announcements to varying degrees. Accordingly, we expect markets are efficient processors of information, anticipated announcements of sovereign ratings should be reflected in the pre-announcement stock prices, and the unanticipated announcements will cause post-announcement movements of stock returns.

To date little is known about the process where information contained in macroeconomic variables is transferred to market prices by announcements of sovereign rating changes. To our knowledge, only Cantor, R. and F. Packer (1996) attempt to identify economic factors embedded in sovereign ratings. There is also no reason to expect economic variables affecting international bond markets to be the same ones which affect equity markets. Therefore, this work should be of interest to international investors and sovereign governments who wish to forecast changes in both the bond market and the equity market.

4. Data Description and Method of Analysis

Sovereign credit rating announcements of rating assignments, changes in rating, and the placement on credit watch list are collected for the period from January 1, 1985 to June 30, 2000. A list of sovereign credit rating announcements is compiled from Standard and Poor's Credit Week and from Reuters Business Briefing. Daily price indexes for each country and the daily world index around the announcement date are collected from DataStream database from the Global Indices Section. The final sample satisfies the following data filters:

- (1) The announcement date of sovereign credit rating must be found in the Credit Week or Reuters Business Briefing.
- (2) The country subject to the announcement, has index data available on DataStream.
- (3) The country's daily return index and the world daily return index are available from Datastream for the period from 225 days before to 45 days after, the announcement date.
- (4) No major confounding events related to the country took place in a three-day window from one day before to one day after the announcement date.

Tables 1 and 1a provide the sample's announcement frequency distribution by year of announcement for shares and bonds respectively. Tables 2 and 2a provide a frequency distribution by country for credit rating assignment and credit watch placement for shares and bonds respectively. Notice that 41 countries are used in this work and that announcements are evenly spread across countries and no one year dominates the sample.

A market model is used to estimate the abnormal stock returns associated with sovereign rating announcements. This model assumes that realised rates of return are represented by the following relationship.

$$R_{j,t} = \alpha_j + \beta_j * R_{m,t} + \varepsilon_{j,t}, \quad (1)$$

where: $R_{j,t}$ — the rates of return on country j's stock index for period t;

$R_{m,t}$ — the rate of return on the value-weighted world stock indexes for period t;

α_j — the intercept of the linear relationship between country j's stock return and the world stock return, given by $E(R_j) - \beta_j * E(R_m)$;

β_j — the slope of the linear relationship between country j's stock return and the world stock return;

$\varepsilon_{j,t}$ — the unsystematic component of country j's stock return for period t.

The estimated returns on country j's index for period t based on the actual world returns for the same period is given by the following equation:

$$\hat{R}_{j,t} = \hat{\alpha}_j + \hat{\beta}_j * R_{m,t} \quad (2)$$

where: $\hat{\alpha}_j$ and $\hat{\beta}_j$ are estimates of α_j and β_j .

These estimates are obtained by regressing the daily returns for country j on the daily returns for the world market over the 130-day period from day $t = -250$ through day $t = -121$. The abnormal return for each country j on day t is given by the following equation.

$$A_{j,t} = R_{j,t} - (\hat{\alpha}_j + \hat{\beta}_j * R_{m,t}) \quad (3)$$

The average abnormal return (AAR_t) on day t is the sample mean represented in (4).

$$AAR_t = \frac{1}{N} \sum_{j=1}^N A_{j,t} \quad (4)$$

where t is defined in trading days relative to the event day (e.g. $t = -20$ means 20 trading days before the event. And $t = 0$ represents the event day). Over an interval of two or more trading days beginning with day T_1 , and ending with T_2 , the cumulative average abnormal return ($CAAR_{T_1, T_2}$) is given in (5).

$$CAAR_{T_1, T_2} = \frac{1}{N} \sum_{j=1}^N \sum_{t=T_1}^{T_2} A_{j,t} \quad (5)$$

Following Patell (1976) and many other published studies (See, for example, Linn and McConnell, 1983; and Schipper and Smith, 1986), the standardized abnormal return approach is used to generate test statistics. Under the null hypothesis, each $A_{j,t}$ has a mean of zero and $\sigma_{A_{j,t}}^2$.

The maximum likelihood estimate of the variance is given by (6).

$$S_{A_{j,t}}^2 = S_{A_j}^2 \left[1 + \frac{1}{D_j} + \frac{(R_{m,t} - \bar{R}_m)^2}{\sum_k^{D_j} (R_{m,t} - \bar{R}_m)^2} \right] \quad (6)$$

where: $S_{A_j}^2 = \frac{1}{D_j - 2} \sum_{k=1}^{D_j} A_{j,k}^2$

$R_{m,t}$ — the observed returns on the world market index on day t ;

\bar{R}_m — the mean world market return over the estimation period; and

D_j — the number of non-missing trading-day returns used to estimate the parameters for country j .

The standardised abnormal return ($SAR_{j,t}$) is represented by (7):

$$SAR_{j,t} = \frac{A_{j,t}}{S_{A_{j,t}}} \quad (7)$$

Under the null hypothesis, each $SAR_{j,t}$ follows a Student's t distribution with $D_j - 2$ degrees of freedom. Summing $SAR_{j,t}$'s across the sample produces the total standardized abnormal return (TSAR) as follows:

$$TSAR_t = \sum_{j=1}^N SAR_{j,t} \quad (8)$$

The expected value of $TSAR_t$ is zero. The variance of $TSAR_t$ is given as follows:

$$Q_t = \sum_{j=1}^N \frac{D_j - 2}{D_j - 4} \quad (9)$$

The test statistic for the null hypothesis that $CAAR_{T_1, T_2} = 0$ is represented in (10).

$$Z_{T_1, T_2} = \frac{1}{\sqrt{N}} \sum_{j=1}^N Z_{T_1, T_2}^j \quad (10)$$

where:

$$Z_{T_1, T_2}^j = \frac{1}{\sqrt{Q_{T_1, T_2}^j}} \sum_{t=T_1}^{T_2} SAR_{j,t}, \text{ and}$$

$$Q_{T_1, T_2}^j = (T_1 - T_2 + 1) \frac{D_j - 2}{D_j - 4}$$

Under cross-sectional independence of Z_{T_1, T_2}^j and other conditions (See Patell, 1976), Z_{T_1, T_2} follows the standard, normal distribution under the null hypothesis.

The precision-weighted cumulative, average, abnormal return (PWCAAR) is constructed using the same relative weights as those implied in the definition of Z_{T_1, T_2} . The formula for the PWCAAR is given in (11) below.

$$PWCAAR_{T_1, T_2} = \sum_{j=1}^N \sum_{t=T_1}^{T_2} W_j A_{j,t} \quad (11)$$

$$\text{where: } w_j = \frac{\left(\sum_{t=T_1}^{T_2} S_{A_{j,t}}^2 \right)^{-1/2}}{\sum_{j=1}^N \left(\sum_{t=T_1}^{T_2} S_{A_{j,t}}^2 \right)^{-1/2}}$$

To test for the fraction of positive and negative average abnormal returns the generalized sign test (GST) is used. The null hypothesis for the GST is that the fraction of positive returns is the same as in the estimation period. For examples of how GST is used see Cowan (1992).

5. Results

Share Market Results

Table 3 reports the results using the standardised cross-sectional method. The 226 announcements comprise the total sample of sovereign rating assignments by Standard and Poor's credit rating agency. This represents the assignment of credit rating when the outlook is negative, positive, stable and nil. It also represents the assignment of foreign currency rating and /or local currency rating for the country. Table 3 shows that the three day (t-1, t+1) announcement period's average abnormal return (AAR) is a positive but not statistically significant 0.26. The lack of significance may be attributed to the use of an aggregated sample including announcements with positive outlook, negative outlook, and stable outlook. Each of these categories may be expected to have a unique impact on the index's value. When the sample was partitioned by outlook type, different results were obtained.

Table 4 reports the results of the announcement effect when the assigned rating was associated with negative outlook. The three-day announcement period's average abnormal return is a negative and statistically significant, at the 0.1 percent level, -2.25 percent. There were 32 negative returns relative to 8 positive returns, and the generalized sign Z was -3.61, statistically significant at the 0.1% level. This suggests that our results are not driven by outliers. Over the entire examination period, the largest negative abnormal return, -1.25%, occurs at t₀. This is followed by day t+1 with a negative 0.78%. Both returns are statistically significant at the 1% level. This indicates that the announcements of credit rating assignment with negative outlook conveys negative information to the international capital market.. A negative outlook may convey that a country is heading for a difficult time and its ability to service and pay foreign currency and local currency debt is uncertain.

Table 5 reports the announcement effect when a rating assignment is associated with positive outlook about the future prospect of a country's ability to pay and service its foreign and local currency debt. The average abnormal return of the three day announcement period (t-1, t+1) is a positive 1.83%, which has a statistically significant Z-statistic of 3.26. There are 41 announcements with positive cumulative average abnormal returns (CAAR) and 18 with negative CAARs. The ratio of positive to negative returns has a generalized sign Z of 3.38 which is statistically significant at the 0.1% level. The two-day window (t-1, t) and the five-day window (t-2, t+2) are associated with a CAAR of 1.22% and 1.86% respectively. Both are statistically significant at the 1% level. Over the entire announcement period between t-45 and t+45, the largest positive abnormal return occurs on days t₀, t₊₁, and t₋₁. All of these returns are positive and statistically significant. The results in Table 5 demonstrate that the assignment of rating with positive outlook provides positive information to the global capital market about the future economic prospect of a country, and its ability to support foreign and local currency debts.

Table 6 presents the results from the market model when a credit rating assignment is associated with a stable outlook. The average abnormal return of the three-day is a positive but not statistically significant 0.34%. Further, no other windows are associated with a significant abnormal return. This suggests that the announcement of rating assignment with a stable outlook does not convey new information to the international capital market, and there is no surprise associated with the market announcement.

Table 7 reports the results of the announcement effect when the assignment of credit rating is not associated with outlook assignment. The three-day announcement period's cumulative abnormal return is a negative but not statistically significant, -0.02%. We conclude that there is no market reaction in the absence of outlook assignments.

Finally, Table 8 presents announcement effect results when Standard and Poor's places a country on a credit watch list for possible downgrade or for negative implications. Normally, Standard and Poor's places a country on the credit watch list for (1) positive implication with possible upgrade; (2) negative implication with possible downgrade; and (3) developing implications with possible upgrade or down grade, or affirms the previous rating. But our sample only includes placement on the credit watch list with negative implications as our sample had. no cases where a country was placed on the credit watch list for positive or developing implications. One can see that the three day announcement period's average return is a statistically significant negative 4.80%. There were only 3 positive CAARs and 16 negative CAARs. The generalized sign Z statistic is -2.79, which is statistically significant at the 1% level. So outliers do not appear

to be a problem in this analysis. The two-day window and the five day window CAARs are -3.35% and -6.23% respectively. Both windows are statistically significant at the 0.1% level. These results suggest that the announcement of credit watch placement with negative implication conveys negative information to the global capital markets concerning the ability of a country to pay and service its foreign and local currency debts, and ultimately about its future economic prospects.

Bond Market Results

Tables 9 and 10 examine the market reaction to announcements for investment grade and below investment grade sovereign bonds. There is a statistically significant effect for investment grade bonds but no reaction for rating assignments for below investment grade bonds. This appears to be due to the number of negative assignments given to investment grade bonds.

Tables 11, 12, 13, and 14 consider the announcement effect of rating assignment by country characteristics. Tables 11 and 12 consider country size. There was not any reaction for large or small country. Tables 13 and 14 consider the announcement effect of rating assignments by emerging or developed market classification. Here there was no effect for emerging markets but developed markets exhibited a statistically significant negative effect on day zero. Once again on that day there were more negative than positive assignments.

Table 15 considers the announcement effect of rating changes within all classifications. Here there is no impact, most likely the differential effects are cancelling each other out. To check that we consider the announcement effect of rating changes for upgrades, affirms and downgrades in tables 16, 17 and 18. No significant effects were found for upgrades and affirms. However, as reported in table 18, downgrades did exhibit a significant negative effect on day zero.

6. Conclusions and Future Work

The work addresses the question, "Does a sovereign rating simply mirror the existing international market's assessment of country's risk?" Research on this question to date has not fully answered this fundamental question, particularly in relation to global markets. Using traditional event study methods, this work reports that the total sample credit rating assignments have a positive but not significant average abnormal return. We suggest that this result may not be surprising since there are many countervailing messages contained in the total sample. Thus we partition the sample by positive, negative and stable outlook and re-examine the impact of information releases. Now, negative outlook assignments are associated with negative and statistically significant abnormal returns, positive outlook assignments are associated with a

statistically significant positive impact on abnormal returns and stable outlooks are not statistically significant. Further, when a country is placed on credit watch for negative implications or for a possible downgrade we find that there is a negative and statistically significant market reaction. Our share market results imply that announcements of sovereign credit ratings contain new information for market participants and do not simply mirror existing public information.

We next turned to global debt markets. Once again, we wished to find out if rating assignments and changes had an impact on bond returns. If they did, then rating agencies would not be simply summarising existing public information but would be providing new information previously unavailable to global debt holders. The research found that debt market reactions to the announcement of credit rating assignments conveyed no new information for the total combined sample and for ratings associated with below investment grade sovereign bonds, for different sized countries and for emerging markets. The announcement of credit rating assignment is found to provide new and negative information on the announcement date for developed countries and the day after announcement for investment grade sovereign bonds.

The global market reaction to the announcement of credit rating changes is found to convey no new information for the ratings of upgrade and affirm. However, there is a significantly negative impact on bond returns before the change announcements for rating downgrade. Clearly there appears, as consistent with prior literature, new information contained in downgrade changes in global debt markets.

The final step in this research will include a cross sectional analysis for both share and bond markets in order to identify key economic variables which may be used to forecast future market reactions to credit rating information releases and changes.

Table 1a Frequency distribution of the final sample of 245 announcements of sovereign credit rating assignment, and the announcement of placement on credit watch list distributed by the country subject to credit rating by Standard and Poor's.

COUNTRY	FREQUENCY	PERCENTAGE
AUSTRALIA	13	5.31%
AUSTRIA	2	0.82%
BELGIUM	6	2.45%
BRAZIL	8	3.27%
CANADA	4	1.63%
CHILE	4	1.63%
CHINA	3	1.22%

COLOMBIA	7	2.86%
DENMARK	6	2.45%
FINLAND	9	3.67%
FRANCE	2	0.82%
GERMANY	2	0.82%
GREECE(HELLENIC REPUBLIC)	2	0.82%
HONG KONG	8	3.27%
INDIA	7	2.86%
INDONESIA	11	4.49%
IRELAND	8	3.27%
ITALY	9	3.67%
JAPAN	3	1.22%
KOREA	14	5.71%
LUXEMBOURG	1	0.41%
MALAYSIA	12	4.90%
MEXICO	11	4.49%
NETHERLANDS	4	1.63%
NEW ZEALAND	8	3.27%
NORWAY	4	1.63%
PERU	1	0.41%
PHILIPPINES	8	3.27%
POLAND	4	1.63%
PORTUGAL	5	2.04%
SINGAPORE	5	2.04%
SOUTH AFRICA	3	1.22%
SPAIN	6	2.45%
SWEDEN	7	2.86%
SWITZERLAND	5	2.04%
TAIWAN	4	1.63%
THAILAND	11	4.49%
TURKEY	13	5.31%
UNITED KINGDOM	3	1.22%
UNITED STATES	2	0.82%
TOTAL	245	

Table 1a

Frequency distribution by year for bond credit rating assignment

Year	Number of announcement	% of total
1986	1	0.0075
1988	1	0.0075
1989	21	0.1567
1990	6	0.0448
1991	8	0.0597
1992	19	0.1418
1993	11	0.0821

1994	9	0.0672
1995	18	0.1343
1996	8	0.0597
1997	9	0.0672
1998	12	0.0896
1999	9	0.0672
2000	2	0.0149
Total	134	1

Table 1a
Frequency distribution by year for bond credit rating changes

year	Number of Announcement	% of total
1992	4	0.0430
1994	1	0.0108
1995	2	0.0215
1996	15	0.1613
1997	13	0.1398
1998	29	0.3118
1999	29	0.3118
Total	93	1.0000

Table 2 Frequency distribution of the final sample of 245 announcements of sovereign credit rating assignment and the announcement of credit watch placement distributed by year of the announcement.

YEAR	FREQUENCY	PERCENTAGE
1985	1	0.41%
1986	5	2.04%
1987	1	0.41%
1988	3	1.22%
1989	31	12.65%
1990	8	3.27%
1991	15	6.12%
1992	26	10.61%
1993	16	6.53%
1994	18	7.35%
1995	25	10.20%
1996	14	5.71%
1997	23	9.39%
1998	34	13.88%
1999	24	9.80%
2000	1	0.41%
TOTAL	245	100%

Table 2a

Country classification and frequency table for bond credit rating assignments.

Country	No. of announcement	% of total	DC	EM
ARGENTINA (REPUBLIC OF)	8	0.0597		EM
AUSTRALIA (COMMONWEALTH OF)	8	0.0597	DC	
AUSTRIA (REPUBLIC OF)	2	0.0149	DC	
BELGIUM (REPUBLIC OF)	6	0.0448	DC	
BRAZIL (REDEERATIVE REPUBLIC OF)	8	0.0597		EM
CANADA (GOVERNMENT OF)	4	0.0299	DC	
DENMARK (KINGDOM OF)	5	0.0373	DC	
FINLAND (REPUBLIC OF)	9	0.0672	DC	
FRANCE	2	0.0149	DC	
GERMANY	2	0.0149	DC	
IRELAND (REPUBLIC OF)	6	0.0448	DC	
ITALY (REPUBLIC OF)	7	0.0522	DC	
JAPAN	3	0.0224	DC	
MEXICO (UNITED STATES)	11	0.0821		EM
NETHERLANDS	4	0.0299	DC	
NEW ZEALAND	8	0.0597	DC	
NORWAY	4	0.0299	DC	
PERU	1	0.0075		EM
PHILIPPINES (REPUBLIC OF)	8	0.0597		EM
POLAND (REPUBLIC OF)	4	0.0299		EM
SOUTH AFRICA (REPUBLIC OF)	3	0.0224		EM
SPAIN (KINGDOM OF)	5	0.0373	DC	
SWEDEN (KINGDOM OF)	6	0.0448	DC	
SWITZERLAND	5	0.0373	DC	
UNITED KINGDOM	3	0.0224	DC	
UNITED STATES	2	0.0149	DC	
Total	134		1	19

* DC is abbreviation for Developed Country and EM is abbreviation for Emerging Markets.

Table 2a

Country classification and frequency table for bond credit rating changes.

Country	No. of announcement	% of total	DC	EM
ARGENTINA (REPUBLIC OF)	6	0.0645		EM
AUSTRALIA (COMMONWEALTH OF)	4	0.0430	DC	
AUSTRIA (REPUBLIC OF)	1	0.0108	DC	
BELGIUM (KINGDOM OF)	2	0.0215	DC	
BRAZIL (FEDERATIVE REPUBLIC OF)	7	0.0753		EM
CANADA (GOVERNMENT OF)	4	0.0430	DC	
CZECH (REPUBLIC OF)	1	0.0108		EM
DENMARK (KINGDOM OF)	2	0.0215	DC	
FINLAND (REPUBLIC OF)	3	0.0323	DC	
IRELAND (REPUBLIC OF)	4	0.0430	DC	
ITALY (REPUBLIC OF)	4	0.0430	DC	
JAPAN	10	0.1075	DC	
MEXICAN (UNITED STATES)	4	0.0430		EM
MOROCCO (KINGDOM OF)	1	0.0108		EM
NEW ZEALAND	7	0.0753	DC	
PANAMA (REPUBLIC OF)	1	0.0108		EM
PHILIPPINES (REPUBLIC OF)	6	0.0645		EM
POLAND (REPUBLIC OF)	1	0.0108		EM
RUSSIAN FEDERATION (THE)	11	0.1183		EM
SOUTH AFRICA (REPUBLIC OF)	5	0.0538		EM
SPAIN (KINGDOM OF)	4	0.0430	DC	
SWEDEN (KINGDOM OF)	2	0.0215	DC	
VENEZUELA (REPUBLIC OF)	3	0.0323		EM
Total	93	1.0000	12	11

* DC is abbreviation for Developed Country and EM is abbreviation for Emerging Markets.

Table 3 The Announcement Effect of Rating Assignment of All Groups for Shares

Day	Average Abnormal Return	Median Abnormal Return	Z-Statistics	N	Pos : Neg	Generalized Sign Z
-45	-0.09	0.04	-0.26	226	117:109	1.11
-35	0.06	0.03	1.03	226	118:108	1.24
-25	0.13	0.11	0.38	226	120:106	1.51
-15	0.00	-0.04	-0.74	226	108:118	-0.09
-10	0.02	-0.01	0.23	226	113:113	0.58
-9	-0.12	-0.10	-1.20	226	94:132	-1.95
-8	-0.03	-0.04	-1.15	226	107:119	-0.22
-7	0.05	0.07	0.13	226	116:110	0.98
-6	0.04	-0.10	-0.79	226	104:122	-0.62
-5	0.00	0.01	-0.94	226	114:112	0.71
-4	0.08	0.02	1.36	226	115:111	0.84
-3	-0.06	-0.09	-1.20	226	103:123	-0.75
-2	0.02	-0.15	-0.30	226	102:124	-0.89

-1	0.19	0.00	1.25	226	112:114	0.44
0	0.06	-0.02	0.39	226	110:116	0.18
1	0.02	-0.06	-0.32	226	103:123	-0.75
2	0.01	0.09	0.97	226	122:104	1.78)
3	-0.01	-0.01	-0.54	226	112:114	0.44
4	-0.04	-0.12	-1.49	226	102:124	-0.89
5	0.09	-0.05	0.84	226	108:118	-0.09
6	-0.06	-0.06	-0.01	226	105:121	-0.49
7	-0.01	-0.10	-1.28	226	101:125	-1.02
8	-0.06	-0.08	-1.15	226	97:129	-1.55
9	-0.10	-0.10	-0.85	226	104:122	-0.62
10	-0.16	-0.08	-1.65\$	226	107:119	-0.22
15	-0.14	-0.13	-1.48	226	99:126	-1.22
25	0.24	0.08	2.15*	226	120:105	1.58
35	0.04	-0.03	1.26	226	108:117	-0.02
45	-0.05	-0.15	-0.82	226	94:130	-1.83(
Interval	Cumulative AAR	Median CAAR	Z-Statistics	N	Pos : Neg	Generalized Sign Z
t-1, t0	0.24	0.07	1.03	226	119:107	1.38
t-1, t+1	0.26	-0.07	0.67	226	111:115	0.31
t-2, t+2	0.29	0.10	0.83	226	116:110	0.98
t-5, t+5	0.35	0.01	0.00	226	113:113	0.58
t-45, t-2	-0.12	0.06	-0.39	226	113:113	0.58
T+2, t+45	0.03	-0.85	-0.15	226	108:118	-0.09

Note: Average and median abnormal returns from the market model using the standardized cross-section method for 19 announcements. N is the number of announcements. Z is the statistic testing for a significant difference of the average abnormal returns from zero. Pos:Neg is the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns.

Table 4 The Announcement Effect of Rating Assignment with Negative Outlook

Day	Average Abnormal Return	Median Abnormal Return	Z-Statistics	N	Pos : Neg	Generalized Sign Z
-45	-0.37	0.01	-0.32	40	20:20	0.19
-35	0.14	0.33	0.98	40	25:15	1.77)
-25	0.37	0.40	1.21	40	24:16	1.45
-15	0.18	-0.03	0.37	40	19:21	-0.13
-10	-0.02	0.14	-0.20	40	22:18	0.82
-9	0.18	-0.02	0.42	40	18:22	-0.45
-8	0.29	-0.16	0.09	40	17:23	-0.76
-7	0.27	0.22	-0.05	40	22:18	0.82
-6	0.06	0.03	0.15	40	20:20	0.19
-5	0.16	0.08	0.17	40	21:19	0.50
-4	0.11	0.11	0.20	40	24:16	1.45
-3	0.24	-0.09	0.65	40	18:22	-0.45
-2	0.40	0.08	0.77	40	21:19	0.50
-1	-0.23	-0.13	-1.87\$	40	18:22	-0.45
0	-1.25	-0.51	-3.31***	40	13:27	-2.03<
1	-0.78	-0.22	-2.86**	40	14:26	-1.71(
2	-0.46	0.04	-0.47	40	20:20	0.19
3	0.22	0.13	0.71	40	21:19	0.50

4	0.11	-0.15	0.42	40	19:21	-0.13
5	0.10	0.36	0.67	40	21:19	0.50
6	-0.38	0.12	-0.51	40	22:18	0.82
7	0.31	0.02	0.64	40	21:19	

9	0.05	0.02	1.06	59	31:28	0.77
10	0.04	-0.02	-0.30	59	29:30	0.25
15	-0.34	-0.34	-2.15*	59	19:40	-2.36<
25	0.10	-0.12	0.94	59	23:36	-1.31
35	-0.04	-0.03	0.17	59	29:30	0.25
45	0.18	-0.04	1.28	58	28:30	0.12
Interval	Cumulative AAR	Median CAAR	Z-Statistics	N	Pos : Neg	Generalized Sign Z
t-1, t0	1.22	0.35	3.02**	59	37:22	2.34>
t-1, t+1	1.83	0.72	3.26**	59	41:18	3.38>>>
t-2, t+2	1.86	0.80	3.16**	59	39:20	2.86>>
t-5, t+5	1.62	0.92	1.32	59	35:24	1.82)
t-45, t-2	-0.26	0.83	-0.09	59	31:28	0.77
t+2, t+45	-1.13	-0.93	-0.24	59	27:32	-0.27

Note: Average and median abnormal returns from the market model using the standardized cross-section method for 19 announcements. N is the number of announcements. Z is the statistic testing for a significant difference of the average abnormal returns from zero. Pos:Neg is the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns.

Table 6 The Announcement Effect of Rating Assignment with Stable Outlook

Day	Average Abnormal Return	Median Abnormal Return	Z-Statistics	N	Pos : Neg	Generalized Sign Z
-45	0.12	0.01	0.84	116	59:57	0.60
-35	0.03	0.05	0.87	116	61:55	0.97
-25	0.09	0.11	0.96	116	60:56	0.79
-15	-0.01	-0.01	-0.54	116	58:58	0.42
-10	-0.11	-0.22	-0.72	116	49:67	-1.26
-9	-0.25	-0.16	-1.76\$	116	47:69	-1.63
-8	-0.03	-0.02	-0.44	116	57:59	0.23
-7	0.00	0.02	0.18	116	59:57	0.60
-6	-0.12	-0.17	-1.98*	116	47:69	-1.63
-5	-0.20	-0.06	-1.74\$	116	55:61	-0.14
-4	0.15	0.06	1.72\$	116	60:56	0.79
-3	-0.08	0.00	-1.06	116	59:57	0.60
-2	-0.07	-0.19	-1.03	116	46:70	-1.81
-1	0.20	-0.02	0.93	116	56:60	0.05(
0	0.09	-0.04	0.26	116	52:64	-0.70
1	0.06	-0.06	0.24	116	53:63	-0.51
2	0.05	0.11	1.29	116	66:50	1.90)
3	-0.05	0.01	-0.70	116	59:57	0.60
4	0.08	-0.05	-0.22	116	56:60	0.05
5	-0.01	-0.08	0.03	116	52:64	-0.70
6	-0.04	-0.05	-0.16	116	54:62	-0.33
7	-0.08	-0.09	-1.37	116	51:65	-0.88
8	-0.15	-0.12	-2.13*	116	47:69	-1.63
9	0.00	-0.08	-0.47	116	54:62	-0.33
10	-0.14	-0.12	-1.44	116	55:61	-0.14
15	-0.14	-0.05	-0.76	115	55:60	-0.05
25	0.02	-0.07	-0.98	115	54:61	-0.24
35	0.13	-0.03	1.51	115	55:60	-0.05

Interval	Cumulative AAR	Median CAAR	Z-Statistics	N	Pos : Neg	Generalized Sign Z
t-1, t0	0.28	-0.04	0.81	116	57:59	0.23
t-1, t+1	0.34	-0.05	0.83	116	57:59	0.23
t-2, t+2	0.32	-0.02	0.67	116	58:58	0.42
t-5, t+5	0.20	-0.24	-0.19	116	53:63	-0.51
t-45, t-2	-0.61	-0.08	-0.73	116	57:59	0.23
t+2, t+45	0.17	-0.80	-0.38	116	54:62	-0.33

Note: Average and median abnormal returns from the market model using the standardized cross-section method for 19 announcements. N is the number of announcements. Z is the statistic testing for a significant difference of the average abnormal returns from zero. Pos:Neg is the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns.

Table 7 The Announcement Effect of Credit Assignment without Outlook Assessment

Day	Average Abnormal Return	Median Abnormal Return	Z-Statistics	N	Pos : Neg	Generalized Sign Z
-45	-0.04	0.12	0.08	11	6 : 5	0.32
-35	0.20	0.08	0.90	11	6 : 5	0.32
-25	0.21	0.37	0.88	11	8 : 3	1.53
-15	-0.04	0.07	-0.32	11	6 : 5	0.32
-10	0.28	0.23	0.70	11	6 : 5	0.32
-9	0.16	-0.12	0.62	11	4 : 7	-0.88
-8	0.05	-0.03	0.45	11	5 : 6	-0.28
-7	0.37	0.15	1.24	11	6 : 5	0.32
-6	0.01	0.16	0.10	11	6 : 5	0.32
-5	0.62	0.59	4.27***	11	10 : 1	2.74>>
-4	-0.16	-0.04	-0.10	11	5 : 6	-0.28
-3	0.28	0.02	1.08	11	6 : 5	0.32
-2	-0.15	-0.15	-1.23	11	5 : 6	-0.28
-1	0.17	0.08	1.92*	11	9 : 2	2.13>
0	-0.08	0.13	-0.18	11	6 : 5	0.32
1	-0.11	-0.05	-0.93	11	5 : 6	-0.28
2	0.24	0.36	0.53	11	7 : 4	0.93
3	-0.26	-0.55	-1.31	11	3 : 8	-1.49
4	0.00	0.14	-0.07	11	6 : 5	0.32
5	0.15	0.08	0.69	11	6 : 5	0.32
6	0.23	0.01	1.23	11	6 : 5	0.32
7	-0.05	-0.09	-0.64	11	5 : 6	-0.28
8	-0.02	-0.08	-0.69	11	4 : 7	-0.88
9	-0.24	-0.37	-0.54	11	3 : 8	-1.49
10	-0.47	-0.48	-2.12*	11	3 : 8	-1.49
15	0.13	0.12	0.54	11	8 : 3	1.53
25	0.75	0.33	2.47*	11	10 : 1	2.74>>
35	-0.10	-0.21	-0.57	11	4 : 7	-0.88
45	0.03	-0.08	-0.37	11	5 : 6	-0.28

Interval	Cumulative AAR	Median CAAR	Z-Statistics	N	Pos : Neg	Generalized Sign Z
t-1, t0	0.08	0.32	0.87	11	7 : 4	0.93
t-1, t+1	-0.02	0.33	-0.22	11	6 : 5	0.32

t-2, t+2	0.06	-0.32	-0.38	11	6 : 5	0.32
t-5, t+5	0.70	-0.56	0.53	11	5 : 6	-0.28
t-45, t-2	5.23	5.97	3.62***	11	8 : 3	1.53
T+2, t+45	1.57	0.61	1.06	11	8 : 3	1.53

Note: Average and median abnormal returns from the market model using the standardized cross-section method for 19 announcements. N is the number of announcements. Z is the statistic testing for a significant difference of the average abnormal returns from zero. Pos:Neg is the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns.

Table 8 The Announcement Effect of Credit Watch Placement with Negative Implication

Day	Average Abnormal Return	Median Abnormal Return	Z-Statistics	N	Pos : Neg	Generalized Sign Z
-45	-1.28	-1.06	-2.09	19	7:12	-0.96
-35	1.03	0.26	1.22	19	11:8	0.88
-25	0.38	0.29	0.23	19	11:8	0.88
-15	0.41	-0.14	0.33	19	9:10	-0.04
-10	-0.03	-0.44	-0.14	19	7:12	-0.96
-9	-0.94	-0.13	-1.15	19	7:12	-0.96
-8	-0.60	-0.93	-0.52	19	6:13	-1.42
-7	-0.04	-0.18	-0.25	19	9:10	-0.04
-6	0.75	1.07	0.60	19	12:7	1.34
-5	-0.39	-0.58	0.05	19	6:13	-1.42
-4	0.98	0.93	1.16	19	11:8	0.88
-3	-0.97	-0.69	1.43	19	7:12	-0.96
-2	-1.07	0.48	-1.09	19	8:11	-0.50
-1	-1.50	-0.06	-1.46	19	8:11	-0.50
0	-1.85	-0.86	-1.75\$	19	5:14	-1.88(
1	-1.46	0.04	-1.63	19	10:9	0.42
2	-0.36	-0.16	-1.04	19	8:11	-0.50
3	0.56	0.92	0.50	19	13:6	1.80)
4	0.36	0.02	0.62	19	10:9	0.42
5	0.01	-0.48	-0.45	19	6:13	-1.42
6	-0.12	-0.24	0.01	19	7:12	-0.96
7	-0.51	-0.51	-1.26	19	8:11	-0.50
8	0.23	-0.02	0.06	19	9:10	-0.04
9	-0.29	-0.35	-0.94	19	7:12	-0.96
10	-0.05	0.03	-0.31	19	10:9	0.42
15	-0.20	-0.06	0.15	19	8:11	-0.50
25	1.14	-0.07	1.64	19	9:10	-0.04
35	0.13	0.55	0.28	19	13:6	1.80)
45	-0.12	-0.12	-0.36	19	7:12	-0.96
Interval	Cumulative AAR	Median CAAR	Z-Statistics	N	Pos : Neg	Generalized Sign Z
t-1, t0	-3.35	-2.69	-3.31***	19	5:14	-1.88(
t-1, t+1	-4.80	-3.64	-3.99***	19	3:16	-2.79<<
t-2, t+2	-6.20	-5.88	-4.24***	19	3:16	-2.79<<
t-5, t+5	-5.66	-4.54	-3.12**	19	5:14	-1.88(
t-45, t-2	-9.03	-7.52	-2.08*	19	5:14	-1.88(
T+2, t+45	2.94	5.45	0.64	19	10:9	0.42

Note: Average and median abnormal returns from the market model using the standardized cross-section method for 19 announcements. N is the number of announcements. Z is the statistic testing for a significant difference of the average abnormal returns from zero. Pos:Neg is the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns.

Table 9
The Announcement Effect of Rating Assignment Associated with Above
Investment Grade Sovereign Bonds.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 120 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference form zero that considers the ratio of positive to negative returns. MCAR.is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Posi tive: Negative	General ized Sign Z
-45	0.00%	-0.09%	0.19	120	49:71	-1.83(
-35	0.04%	0.09%	1.89\$	120	78:42	3.46>>>
-25	-0.17%	-0.04%	-3.28**	120	54:66	-0.92
-15	-0.05%	0.01%	-0.43	120	62:58	0.54
-10	-0.12%	-0.05%	-2.06*	120	50:70	-1.65(
-9	0.02%	0.08%	0.95	120	67:53	1.45
-8	0.11%	0.07%	2.19*	119	71:48	2.28>
-7	0.01%	0.02%	0.30	119	63:56	0.82
-6	0.17%	0.10%	3.30***	120	74:46	2.73>>
-5	0.08%	0.09%	1.50	119	66:53	1.37
-4	0.00%	0.01%	-0.42	120	62:58	0.54
-3	0.05%	-0.01%	1.29	120	60:60	0.18
-2	0.00%	0.03%	0.85	120	62:58	0.54
-1	-0.03%	-0.01%	-0.74	119	58:61	-0.10
0	-0.06%	-0.02%	-0.99	119	58:61	-0.10
+1	-0.10%	-0.08%	-2.11*	119	46:73	-2.30<
+2	0.13%	0.01%	1.75\$	118	62:56	0.73
+3	-0.04%	-0.03%	-0.66	118	52:66	-1.11
+4	-0.11%	-0.10%	-2.49*	120	46:74	-2.38<
+5	0.08%	0.05%	1.30	120	63:57	0.72
+6	-0.12%	0.00%	-1.50	120	61:59	0.36
+7	0.02%	0.02%	0.43	120	62:58	0.54
+8	0.08%	0.05%	1.43	120	67:53	1.45
+9	0.07%	-0.04%	0.40	120	56:64	-0.55
+10	0.11%	0.07%	1.86\$	120	69:51	1.82)
+15	-0.21%	-0.12%	-3.79***	119	45:74	-2.48<
+25	0.06%	0.06%	1.58	120	64:56	0.91
+35	0.15%	0.13%	3.21**	120	72:48	2.37>
+45	0.08%	-0.01%	0.80	120	59:61	-0.01

Days	CAAR	MCAR	Z	Pos: Neg	General ized - sign Z
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(-1, 0)	-0.09%	-0.03%	-1.58	54:65	-0.83
(-1, +1)	-0.19%	-0.18%	-2.58**	50:69	-1.57
(-2, +2)	-0.05%	-0.11%	-0.90	55:65	-0.74
(-5, +5)	-0.01%	0.26%	-0.24	67:53	1.45
(-45, -1)	-0.94%	-0.32%	-1.51	57:63	-0.37
(+2, +45)	0.99%	0.66%	1.21	76:44	3.10>>
(-45, +45)	-0.11%	0.58%	-0.54	65:55	1.09

S, (,) significant at .10 *, <, > significant at .05
 , <<, >> significant at .01 *, <<<, >>> significant at .001

Table 10
The Announcement Effect of Rating Assignment Associated with Below
Investment Grade Sovereign Bonds.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 38 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Positive: Negative	Generalized Sign Z
-45	-0.08%	-0.03%	-0.69	38	17:21	-0.84
-35	-0.14%	-0.02%	-0.61	38	18:20	-0.51
-25	-0.17%	-0.05%	-0.90	38	14:24	-1.81(
-15	-0.10%	-0.04%	-0.57	37	17:20	-0.68
-10	0.13%	0.04%	0.04	38	20:18	0.14
-9	-0.03%	0.03%	-0.45	38	20:18	0.14
-8	0.28%	0.10%	1.37	37	22:15	0.97
-7	0.06%	-0.01%	0.67	38	19:19	-0.19
-6	-0.20%	-0.04%	-0.22	38	17:21	-0.84
-5	-0.25%	0.01%	-0.37	37	19:18	-0.02
-4	0.09%	0.02%	0.43	38	20:18	0.14
-3	-0.09%	-0.09%	0.02	38	17:21	-0.84
-2	-0.41%	-0.27%	-1.40	38	13:25	-2.13<
-1	-0.21%	-0.01%	-1.08	36	17:19	-0.52
0	0.43%	0.06%	1.67S	36	22:14	1.15
+1	0.03%	-0.06%	-0.66	37	16:21	-1.01
+2	0.54%	0.05%	1.35	36	22:14	1.15
+3	0.01%	-0.02%	0.19	36	18:18	-0.18
+4	0.10%	0.04%	0.49	36	19:17	0.15
+5	0.28%	0.17%	1.20	38	23:15	1.11
+6	-0.19%	0.00%	-0.80	37	19:18	-0.02
+7	0.16%	0.01%	-0.07	38	19:19	-0.19
+8	0.15%	0.04%	0.53	38	21:17	0.46
+9	0.38%	0.17%	2.16*	38	24:14	1.44
+10	0.14%	0.02%	0.61	38	20:18	0.14
+15	-0.14%	-0.03%	-0.57	38	18:20	-0.51
+25	0.11%	0.06%	1.06	38	23:15	1.11

+35	0.16%	0.04%	1.07	38	23:15	1.11
+45	0.18%	-0.02%	0.82	38	18:20	-0.51
Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z	
(-1, 0)	0.21%	-0.06%	0.21	18:18	-0.18	
(-1, +1)	0.25%	0.14%	-0.24	20:17	0.31	
(-2, +2)	0.37%	-0.24%	-0.21	16:22	-1.16	
(-5, +5)	0.52%	0.09%	0.25	20:18	0.14	
(-45, -1)	-2.05%	-1.52%	-1.29	15:23	-1.49	
(+2, +45)	2.28%	2.12%	0.51	24:14	1.44	
(-45, +45)	0.69%	0.40%	-0.47	21:17	0.46	

S, (,) significant at .10 *, <, > significant at .05
 , <<, >> significant at .01 *, <<<, >>> significant at .001

Table 11

The Announcement Effect of Rating Assignment of Large Sized Country (Classified by GNP)

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 63 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Pos: Neg	Generalized Sign Z
-45	-0.09%	-0.08%	-1.28	63	26:37	-1.41
-35	0.00%	0.02%	0.76	63	36:27	1.11
-25	-0.04%	-0.06%	-1.29	63	27:36	-1.16
-15	-0.06%	-0.08%	-1.29	62	26:36	-1.30
-10	0.05%	0.08%	0.11	62	34:28	0.74
-9	-0.06%	-0.03%	-0.97	63	29:34	-0.66
-8	0.09%	0.12%	0.72	62	37:25	1.50
-7	0.19%	0.12%	1.77\$	63	38:25	1.61
-6	0.08%	0.02%	1.36	63	34:29	0.60
-5	0.11%	0.21%	2.89**	62	41:21	2.51>
-4	-0.16%	-0.12%	-1.94\$	63	28:35	-0.91
-3	0.01%	0.01%	0.84	63	32:31	0.10
-2	-0.04%	-0.07%	0.08	63	29:34	-0.66
-1	-0.20%	0.00%	-0.93	63	32:31	0.10
0	-0.12%	-0.10%	-0.97	62	27:35	-1.04
+1	-0.05%	0.00%	-0.96	62	31:31	-0.03
+2	0.01%	-0.04%	-0.79	62	29:33	-0.53
+3	0.18%	-0.01%	1.03	62	31:31	-0.03
+4	0.03%	-0.08%	-0.34	63	26:37	-1.41
+5	0.04%	-0.02%	0.31	61	30:31	-0.15
+6	0.02%	-0.05%	-0.17	63	28:35	-0.91
+7	0.04%	0.02%	0.29	62	31:31	-0.03
+8	0.14%	0.01%	0.34	63	32:31	0.10

+9	0.18%	0.04%	1.75\$	63	36:27	1.11
+10	0.09%	-0.03%	0.92	63	29:34	-0.66
+15	-0.26%	-0.16%	-2.21*	62	25:37	-1.55
+25	-0.08%	-0.03%	-1.16	63	31:32	-0.15
+35	0.17%	0.20%	1.79\$	63	39:24	1.86)
+45	0.17%	0.22%	2.31*	63	38:25	1.61

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z
(-1, 0)	-0.32%	-0.07%	-1.84\$	29:34	-0.66
(-1, +1)	-0.37%	0.10%	-1.91\$	34:29	0.60
(-2, +2)	-0.39%	-0.19%	-1.83\$	27:36	-1.16
(-5, +5)	-0.19%	0.22%	-0.40	33:30	0.35
(-45, -1)	-1.67%	0.02%	-1.34	32:31	0.10
(+2, +45)	1.50%	0.70%	1.70\$	42:21	2.62>>
(-45, +45)	-0.33%	0.98%	-0.10	37:26	1.36

\$, (,) significant at .10 *, <, > significant at .05
 , <<, >> significant at .01 *, <<<, >>> significant at .001

Table 12
The Announcement Effect of Rating Assignment of Small Sized Country
(Classified by GNP)

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 62 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Positive: Negative	Generalized Sign Z
-45	-0.18%	-0.11%	-2.69**	62	21:41	-2.64<<
-35	-0.11%	-0.03%	-1.16	62	28:34	-0.86
-25	-0.31%	-0.13%	-3.68***	62	19:43	-3.15<<
-15	0.00%	-0.02%	0.63	62	29:33	-0.61
-10	-0.07%	-0.03%	-0.48	62	29:33	-0.61
-9	-0.04%	-0.01%	-0.62	62	28:34	-0.86
-8	0.12%	0.11%	2.98**	62	40:22	2.19>
-7	0.15%	0.06%	1.25	62	36:26	1.17
-6	0.08%	-0.01%	0.70	61	30:31	-0.23
-5	0.09%	0.17%	2.30*	62	39:23	1.93)
-4	-0.06%	-0.08%	-1.31	62	27:35	-1.12
-3	0.15%	0.03%	1.90\$	62	34:28	0.66
-2	-0.05%	0.03%	0.46	62	32:30	0.15
-1	-0.01%	-0.06%	-0.45	61	28:33	-0.74
0	0.11%	-0.01%	-0.25	61	30:31	-0.23
+1	0.18%	0.02%	1.69\$	61	32:29	0.28
+2	-0.04%	-0.09%	-1.04	61	24:37	-1.76(
+3	0.12%	0.10%	1.50	61	36:25	1.31
+4	-0.04%	-0.03%	-0.71	62	26:36	-1.37

+5	-0.07%	-0.02%	-1.28	62	30:32	-0.35
+6	-0.09%	0.05%	0.15	62	34:28	0.66
+7	-0.06%	0.01%	-0.47	62	32:30	0.15
+8	0.08%	0.03%	0.17	62	34:28	0.66
+9	0.01%	-0.04%	-0.16	62	28:34	-0.86
+10	0.19%	0.09%	1.95\$	62	39:23	1.93)
+15	-0.15%	-0.08%	-2.21*	62	25:37	-1.62
+25	0.00%	-0.05%	0.09	62	29:33	-0.61
+35	-0.03%	0.05%	0.11	62	35:27	0.92
+45	0.06%	0.02%	1.03	62	33:29	0.41

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - Sign Z
(-1, 0)	0.10%	-0.06%	-0.49	26:35	-1.25
(-1, +1)	0.28%	-0.07%	0.69	27:34	-1.00
(-2, +2)	0.19%	-0.18%	0.27	26:36	-1.37
(-5, +5)	0.38%	0.31%	1.25	37:25	1.42
(-45, -1)	-0.18%	-0.77%	-0.71	29:33	-0.61
(+2, +45)	0.24%	0.37%	-0.72	35:27	0.92
(-45, +45)	0.35%	0.32%	-0.72	32:30	0.15

\$, (,) significant at .10 *, <, > significant at .05
, <<, >> significant at .01 *, <<<, >>> significant at .001

Table 13
The Announcement Effect of Rating Assignment of Emerging Market Countries.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 43 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Pos: Neg	Generalized Sign Z
-45	-0.18%	-0.09%	-1.64	43	17:26	-1.36
-35	-0.06%	-0.02%	0.17	43	21:22	-0.14
-25	-0.04%	-0.04%	-0.52	43	17:26	-1.36
-15	-0.07%	-0.05%	-0.49	42	17:25	-1.22
-10	0.03%	-0.02%	-0.14	42	20:22	-0.30
-9	-0.07%	-0.01%	-0.81	43	19:24	-0.75
-8	0.22%	0.11%	1.60	42	26:16	1.55
-7	0.24%	0.08%	1.03	43	24:19	0.77
-6	0.01%	-0.03%	0.33	43	20:23	-0.45
-5	-0.30%	0.00%	-0.60	42	21:21	0.01
-4	-0.07%	-0.01%	-0.31	43	20:23	-0.45
-3	-0.06%	-0.08%	0.09	43	19:24	-0.75
-2	-0.25%	-0.23%	-0.87	43	18:25	-1.06
-1	-0.27%	-0.02%	-1.33	42	18:24	-0.92
0	0.37%	0.05%	1.79\$	41	24:17	1.10

+1	-0.01%	-0.08%	-1.00	41	18:23	-0.77
+2	0.15%	0.01%	0.43	41	21:20	0.17
+3	0.21%	-0.14%	0.66	41	19:22	-0.46
+4	0.14%	0.07%	0.64	43	24:19	0.77
+5	0.12%	0.06%	0.32	41	23:18	0.79
+6	-0.15%	-0.02%	-0.95	43	21:22	-0.14
+7	-0.05%	-0.02%	-0.69	42	20:22	-0.30
+8	0.30%	0.06%	1.06	43	25:18	1.08
+9	0.36%	0.19%	2.74**	43	25:18	1.08
+10	0.08%	-0.02%	0.17	43	21:22	-0.14
+15	-0.26%	-0.06%	-1.54	43	20:23	-0.45
+25	0.03%	0.06%	0.71	43	25:18	1.08
+35	-0.06%	0.00%	0.26	43	22:21	0.16
+45	0.07%	-0.03%	0.41	43	20:23	-0.45

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z
(-1, 0)	0.09%	-0.06%	0.05	19:23	-0.61
(-1, +1)	0.08%	0.04%	-0.57	21:21	0.01
(-2, +2)	-0.01%	-0.32%	-0.78	18:25	-1.06
(-5, +5)	0.01%	0.13%	-0.32	23:20	0.47
(-45, -1)	-2.29%	-1.53%	-1.57	16:27	-1.67(
(+2, +45)	1.37%	1.92%	0.13	26:17	1.38
(-45, +45)	-0.56%	-0.13%	-0.94	21:22	-0.14

§, (,) significant at .10 *, <, > significant at .05
, <<, >> significant at .01 *, <<<, >>> significant at .001

Table 14

The Announcement Effect of Rating Assignment by Developed Country.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 91 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Positive: Negative	Generalized Sign Z
-45	-0.09%	-0.10%	-2.01*	91	35:56	-2.32<
-35	-0.06%	0.01%	-0.73	91	48:43	0.40
-25	-0.25%	-0.11%	-3.90***	91	32:59	-2.95<<
-15	-0.02%	-0.03%	-0.19	91	43:48	-0.65
-10	-0.01%	0.01%	0.08	91	48:43	0.40
-9	-0.02%	-0.03%	-0.55	91	43:48	-0.65
-8	0.03%	0.09%	1.61	91	55:36	1.87)
-7	0.09%	0.09%	1.59	91	55:36	1.87)
-6	0.14%	0.03%	2.27*	90	50:40	0.93
-5	0.32%	0.26%	5.08***	91	65:26	3.97>>>
-4	-0.13%	-0.13%	-2.75**	91	39:52	-1.49
-3	0.11%	0.01%	1.60	91	49:42	0.61
-2	0.07%	0.06%	1.65§	91	48:43	0.40

-1	-0.01%	0.00%	0.21	91	46:45	-0.02
0	-0.20%	-0.07%	-3.39***	91	36:55	-2.11<
+1	0.09%	0.05%	1.57	91	50:41	0.82
+2	-0.09%	-0.09%	-2.27*	91	35:56	-2.32<
+3	0.12%	0.09%	1.80\$	91	51:40	1.03
+4	-0.04%	-0.05%	-0.99	91	35:56	-2.32<
+5	-0.07%	-0.07%	-0.73	91	41:50	-1.07
+6	0.03%	0.04%	0.63	91	46:45	-0.02
+7	0.00%	0.01%	0.45	91	47:44	0.19
+8	0.03%	0.01%	0.12	91	47:44	0.19
+9	-0.05%	-0.08%	-0.86	91	42:49	-0.86
+10	0.18%	0.10%	2.50*	91	53:38	1.45
+15	-0.17%	-0.14%	-2.78**	90	34:56	-2.44<
+25	-0.07%	-0.07%	-1.50	91	39:52	-1.49
+35	0.13%	0.17%	1.70\$	91	59:32	2.71>>
+45	0.12%	0.16%	2.44*	91	55:36	1.87)

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z
(-1, 0)	-0.20%	-0.03%	-2.52*	41:50	-1.07
(-1, +1)	-0.11%	-0.09%	-1.11	43:48	-0.65
(-2, +2)	-0.13%	-0.19%	-1.02	39:52	-1.49
(-5, +5)	0.16%	0.33%	1.34	53:38	1.45
(-45, -1)	-0.33%	0.34%	-0.87	48:43	0.40
(+2, +45)	0.70%	0.63%	1.12	57:34	2.29>
(-45, +45)	0.27%	0.98%	0.03	51:40	1.03

\$, (,) significant at .10 *, <, > significant at .05

, <<, >> significant at .01 *, <<<, >>> significant at .001

Table 15

The Announcement Effect of Rating Changes with All Groups.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 93 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Positive: Negative	Generalized Sign Z
-45	-0.26%	-0.09%	-1.93\$	93	38:55	-1.80(
-35	0.05%	0.01%	0.97	93	47:46	0.07
-25	-0.11%	-0.03%	-1.12	93	44:49	-0.55
-15	-0.16%	0.04%	-0.18	93	49:44	0.49
-10	-0.28%	-0.05%	-1.90\$	93	42:51	-0.97
-9	-0.54%	-0.06%	-2.14*	93	36:57	-2.21<
-8	0.14%	0.08%	-0.01	93	51:42	0.90
-7	-0.45%	-0.01%	-1.40	93	45:48	-0.34
-6	-0.23%	-0.08%	-1.03	93	40:53	-1.38
-5	-0.13%	-0.01%	-1.15	93	45:48	-0.34

-4	-0.29%	0.02%	-0.11	93	50:43	0.69
-3	-0.18%	0.03%	0.13	93	50:43	0.69
-2	-0.18%	0.01%	-0.12	93	48:45	0.28
-1	-0.30%	-0.03%	-0.93	93	43:50	-0.76
0	0.21%	0.03%	0.22	93	49:44	0.49
+1	0.09%	0.01%	0.85	93	47:46	0.07
+2	-0.16%	-0.09%	-0.93	93	41:52	-1.17
+3	-0.07%	0.02%	-0.12	93	48:45	0.28
+4	-0.33%	-0.07%	-1.11	93	40:53	-1.38
+5	-0.14%	0.02%	-0.57	93	50:43	0.69
+6	0.02%	0.05%	-0.05	93	54:39	1.52
+7	-0.54%	-0.05%	-1.68\$	93	42:51	-0.97
+8	-0.38%	0.01%	-1.58	93	47:46	0.07
+9	-0.07%	-0.01%	-0.18	93	46:47	-0.14
+10	-0.50%	-0.03%	-1.78\$	93	40:53	-1.38
+15	-0.12%	0.02%	-0.95	93	49:44	0.49
+25	-0.09%	-0.08%	-1.99*	93	40:53	-1.38
+35	-0.17%	-0.03%	-0.86	93	42:51	-0.97
+45	0.21%	0.00%	1.11	93	47:46	0.07

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z
(-1, 0)	-0.08%	0.00%	-0.55	47:46	0.07
(-1, +1)	0.00%	0.01%	-0.02	47:46	0.07
(-2, +2)	-0.33%	-0.11%	-0.59	42:51	-0.97
(-5, +5)	-1.47%	0.05%	-0.89	48:45	0.28
(-45, -1)	-4.82%	-0.09%	-2.40*	44:49	-0.55
(+2, +45)	-0.81%	0.29%	-0.65	49:44	0.49
(-45, +45)	-5.33%	-0.16%	-2.22*	46:47	-0.14

\$, (,) significant at .10 *, <, > significant at .05

, <<, >> significant at .01 *, <<<, >>> significant at .001

Table 16

The Announcement Effect of Rating Changes for Upgrades.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 26 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Positive: Negative	Generalized Sign Z
-45	-0.03%	-0.09%	-0.83	26	10:16	-1.13
-35	0.11%	-0.02%	0.42	26	11:15	-0.74
-25	0.09%	0.12%	0.08	26	16:10	1.22
-15	0.00%	0.02%	-0.42	26	14:12	0.44
-10	-0.26%	-0.11%	-0.45	26	11:15	-0.74
-9	-0.24%	-0.07%	-1.64	26	9:17	-1.53
-8	0.33%	0.20%	2.43*	26	21:5	3.18>>
-7	0.08%	0.09%	1.41	26	15:11	0.83
-6	-0.16%	-0.14%	-1.14	26	10:16	-1.13

-5	0.22%	0.02%	0.96	26	14:12	0.44
-4	0.05%	0.00%	0.26	26	13:13	0.04
-3	0.08%	0.03%	0.68	26	14:12	0.44
-2	-0.12%	-0.02%	-0.49	26	12:14	-0.35
-1	0.01%	-0.08%	-0.02	26	12:14	-0.35
0	0.17%	0.08%	1.66\$	26	17:9	1.61
+1	-0.03%	0.01%	0.84	26	13:13	0.04
+2	-0.16%	-0.13%	-2.63**	26	10:16	-1.13
+3	-0.04%	0.00%	-0.29	26	13:13	0.04
+4	-0.09%	-0.08%	-0.19	26	10:16	-1.13
+5	-0.16%	-0.06%	-1.65\$	26	11:15	-0.74
+6	0.01%	0.08%	-0.07	26	16:10	1.22
+7	-0.12%	-0.01%	-1.34	26	13:13	0.04
+8	0.06%	0.04%	-0.60	26	16:10	1.22
+9	0.04%	0.00%	0.07	26	13:13	0.04
+10	0.03%	-0.02%	0.25	26	12:14	-0.35
+15	0.06%	0.01%	-0.24	26	14:12	0.44
+25	-0.15%	-0.13%	-2.04*	26	9:17	-1.53
+35	0.04%	0.05%	0.55	26	14:12	0.44
+45	-0.29%	-0.14%	-1.21	26	11:15	-0.74

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z
(-1, 0)	0.18%	0.13%	1.02	16:10	1.22
(-1, +1)	0.15%	0.27%	1.25	15:11	0.83
(-2, +2)	-0.11%	-0.12%	-0.18	11:15	-0.74
(-5, +5)	-0.05%	0.30%	-0.35	14:12	0.44
(-45, -1)	0.72%	0.66%	0.85	14:12	0.44
(+2, +45)	-2.55%	-0.84%	-2.11*	11:15	-0.74
(-45, +45)	-1.68%	-1.44%	-0.73	12:14	-0.35

\$, (,) significant at .10 *, <, > significant at .05
 , <<, >> significant at .01 *, <<<, >>> significant at .001

Table 17
The Announcement Effect of Rating Changes for Affirm.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 34 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Positive: Negative	Generalized Sign Z
-45	0.01%	0.04%	0.49	34	19:15	0.67
-35	0.14%	0.12%	1.31	34	18:16	0.33
-25	-0.10%	-0.04%	-1.09	34	16:18	-0.35
-15	0.45%	0.14%	1.16	34	20:14	1.02
-10	0.07%	-0.06%	-0.15	34	16:18	-0.35
-9	-0.22%	-0.01%	-0.64	34	16:18	-0.35

-8	0.11%	-0.01%	0.11	34	16:18	-0.35
-7	-0.17%	0.02%	-1.15	34	20:14	1.02
-6	0.00%	-0.04%	-0.23	34	16:18	-0.35
-5	0.13%	-0.09%	-0.08	34	14:20	-1.04
-4	0.08%	0.13%	0.74	34	22:12	1.70)
-3	0.41%	0.20%	2.15*	34	23:11	2.05>
-2	0.26%	0.13%	0.48	34	19:15	0.67
-1	0.43%	0.06%	1.60	34	20:14	1.02
0	0.50%	0.01%	1.22	34	17:17	-0.01
+1	0.25%	0.00%	-0.30	34	17:17	-0.01
+2	-0.05%	0.03%	0.60	34	19:15	0.67
+3	0.08%	0.11%	0.90	34	19:15	0.67
+4	-0.05%	0.02%	-0.05	34	17:17	-0.01
+5	0.03%	0.06%	0.66	34	21:13	1.36
+6	-0.18%	-0.02%	-0.57	34	16:18	-0.35
+7	0.02%	0.13%	0.88	34	19:15	0.67
+8	-0.24%	-0.07%	-0.49	34	15:19	-0.70
+9	-0.08%	-0.04%	0.09	34	16:18	-0.35
+10	-0.02%	-0.02%	-1.18	34	17:17	-0.01
+15	0.06%	-0.08%	-0.20	34	16:18	-0.35
+25	-0.24%	-0.09%	-1.28	34	16:18	-0.35
+35	-0.06%	-0.24%	-1.56	34	11:23	-2.07<
+45	0.05%	0.00%	0.68	34	17:17	-0.01

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z
(-1, 0)	0.92%	0.13%	1.71\$	18:16	0.33
(-1, +1)	1.17%	0.13%	1.16	19:15	0.67
(-2, +2)	1.39%	0.52%	1.64	20:14	1.02
(-5, +5)	2.07%	0.59%	1.75\$	21:13	1.36
(-45, -1)	2.01%	1.78%	-0.09	19:15	0.67
(+2, +45)	0.63%	-0.37%	0.60	16:18	-0.35
(-45, +45)	3.39%	0.28%	0.40	17:17	-0.01

\$, (,) significant at .10 *, <, > significant at .05

, <<, >> significant at .01 *, <<<, >>> significant at .001

Table 18

The Announcement Effect of Rating Changes for Downgrades.

Average and median Abnormal Returns come from Market Model, Standardized Cross-Sectional Method for 27 announcements. N is number of announcements. Z is the statistic testing for a significant difference of the average abnormal return from 0. Pos:Neg indicates the number of announcements with positive or negative returns on a given day. Generalized Sign Z is the non-parametric test statistic for a significant difference from zero that considers the ratio of positive to negative returns. MCAR is the median cumulative abnormal return.

Day	Average Abnormal Return	Median Abnormal Return	Z	N	Positive: Negative	Generalized Sign Z
-45	-0.84%	-0.32%	-2.93**	27	6:21	-2.94<<
-35	0.14%	0.01%	-0.10	27	14:13	0.14
-25	-0.15%	-0.11%	-0.70	27	10:17	-1.40
-15	-1.31%	-0.06%	-0.42	27	13:14	-0.24

-10	-0.72%	-0.02%	-1.78\$	27	12:15	-0.63
-9	-1.32%	-0.10%	-1.32	27	9:18	-1.78(
-8	-0.34%	-0.12%	-1.56	27	11:16	-1.01
-7	-1.13%	-0.27%	-1.19	27	9:18	-1.78(
-6	-0.96%	-0.19%	-1.38	27	10:17	-1.40
-5	-1.03%	-0.01%	-1.54	27	13:14	-0.24
-4	-1.14%	-0.20%	-1.28	27	11:16	-1.01
-3	-1.20%	-0.24%	-1.81\$	27	10:17	-1.40
-2	-0.54%	0.15%	-0.32	27	16:11	0.91
-1	-1.32%	-0.14%	-1.52	27	11:16	-1.01
0	-1.34%	-0.20%	-2.02*	27	11:16	-1.01
+1	-0.53%	-0.03%	0.07	26	12:14	-0.44
+2	-0.37%	-0.11%	-0.46	27	10:17	-1.40
+3	-0.33%	-0.24%	-0.48	27	12:15	-0.63
+4	-1.06%	-0.13%	-1.25	27	12:15	-0.63
+5	-0.27%	0.06%	-0.28	27	15:12	0.53
+6	0.05%	0.11%	0.42	27	18:9	1.68)
+7	-1.72%	-0.72%	-1.94\$	27	8:19	-2.17<
+8	-1.10%	-0.14%	-1.48	27	11:16	-1.01
+9	-0.41%	-0.12%	-0.41	27	12:15	-0.63
+10	-1.57%	0.00%	-1.37	27	11:16	-1.01
+15	-0.61%	0.02%	-1.13	27	15:12	0.53
+25	-0.10%	-0.08%	-0.93	27	11:16	-1.01
+35	-0.39%	0.03%	-0.50	27	14:13	0.14
+45	0.87%	0.25%	1.45	27	17:10	1.30

Days	CAAR	MCAR	Z	Pos: Neg	Generalized - sign Z
(-1, 0)	-2.65%	-0.37%	-2.67**	9:18	-1.78(
(-1, +1)	-3.18%	-0.68%	-1.95\$	9:18	-1.78(
(-2, +2)	-4.09%	-0.50%	-1.97*	9:18	-1.78(
(-5, +5)	-9.12%	-0.49%	-2.18*	11:16	-1.01
(-45, -1)	-19.70%	-3.06%	-2.79**	10:17	-1.40
(+2, +45)	-3.59%	1.92%	-0.17	18:9	1.68)
(-45, +45)	-25.16%	-0.27%	-2.38*	13:14	-0.24

\$, (,) significant at .10 *, <, > significant at .05

, <<, >> significant at .01 *, <<<, >>> significant at .001

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