**American Finance Association**

The Effect of Bond Rating Agency Announcements on Bond and Stock Prices
Author(s): John R. M. Hand, Robert W. Holthausen, Richard W. Leftwich
Source: *The Journal of Finance*, Vol. 47, No. 2 (Jun., 1992), pp. 733-752
Published by: Blackwell Publishing for the American Finance Association
Stable URL: http://www.jstor.org/stable/2329121
Accessed: 25/11/2009 11:46

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at http://www.jstor.org/page/info/about/policies/terms.jsp. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at http://www.jstor.org/action/showPublisher?publisherCode=black.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

*Blackwell Publishing* and *American Finance Association* are collaborating with JSTOR to digitize, preserve and extend access to *The Journal of Finance.*

http://www.jstor.org

THE JOURNAL OF FINANCE • VOL. XLVII, NO. 2 • JUNE 1992

# The Effect of Bond Rating Agency Announcements on Bond and Stock Prices

JOHN R. M. HAND, ROBERT W. HOLTHAUSEN, and RICHARD W. LEFTWICH*

**ABSTRACT**

This paper examines daily excess bond returns associated with announcements of additions to Standard and Poor's Credit Watch List, and to rating changes by Moody's and Standard and Poor's. Reliably nonzero average excess bond returns are observed for additions to Standard and Poor's Credit Watch List when an expectations model is used to classify additions as either expected or unexpected. Bond price effects are also observed for actual downgrade and upgrade announcements by rating agencies. Excluding announcements with concurrent disclosures weakens the results for downgrades, but not upgrades. The stock price effects of rating agency announcements are also examined and contrasted with the bond price effects.

THIS PAPER EXAMINES DAILY excess bond and stock returns associated with two types of bond rating agency announcements; warnings of possible rating changes via additions to Standard and Poor's Credit Watch List between 1981 and 1983, and actual rating changes announced by Moody's and Standard and Poor's between 1977 and 1982. Prior work that has used bond price data to examine the effect of rating changes has been mixed. Weinstein (1977) (monthly bond returns), and Wakeman (1978) (monthly stock and weekly bond returns) do not find a price reaction at the time of rating changes. Other studies, such as Katz (1974) (monthly changes in bond yields), Grier and Katz (1976) (average monthly bond prices) and Ingram, Brooks and Copeland (1983) (monthly changes in municipal bond yields), find significant bond price reactions. One potential advantage of our study is the

*Hand and Leftwich are from the Graduate School of Business at the University of Chicago. Holthausen is from the Wharton School at the University of Pennsylvania. We wish to thank John Elliott, Paul Healy, Gene Imhoff, Wayne Mikkelson, Dale Morse, Pat O'Brien, Scott Stickel, Tom Stober, an anonymous referee and David Mayers (editor) for their comments on a previous version of this paper, as well as workshop participants at Cornell University, Massachusetts Institute of Technology, the University of Michigan, Ohio State University, the University of Pennsylvania, and the University of Rochester. We wish to thank the Interactive Data Corporation for a research grant allowing access to the daily bond prices used in this study. Holthausen and Leftwich gratefully acknowledge the financial support of the Institute of Professional Accounting of the University of Chicago and the Center for Research in Security Prices.

use of daily data to isolate the announcement effect on bond prices, although nontrading of bonds does not always allow the use of short windows for estimating the price response. Another potential advantage is the separate examination of warnings of possible rating changes via additions to the Standard and Poor's Credit Watch List, and of actual rating changes that are not preceded by such warnings. Standard and Poor's began the Credit Watch List in November 1981, and companies are added to the list when Standard and Poor's believes a rating change is likely, with additions designated as "indicated upgrades" or "indicated downgrades", or "developing" if a rating change of unknown direction is likely. As a result, a rating change announcement may occur after a firm's debt is placed on the Credit Watch List, or it may occur without being preceded by a Credit Watch designation. We also develop an expectations model of rating changes to distinguish between those rating changes that are expected and those that are unexpected.

Overall results on the announcement effects of additions to the Credit Watch List do not indicate significant average excess bond returns. However, when we study those additions classified as unexpected additions by our expectations model, a significant negative average excess bond return of $-1.39\%$ is associated with indicated downgrades and a significant positive average excess bond return of 2.25% is associated with indicated upgrades. Significant average excess stock returns are observed at the time of indicated downgrades but not at the time of indicated upgrades.

The average excess bond return on the announcement of actual rating downgrades by Moody's and Standard and Poor's is $-1.27\%$ and the median excess return is $-0.45\%$. Investment grade bonds experience a mean excess return of $-0.55\%$, with a similar median excess return. Below investment grade bonds on average lose 3.82%, but the median bond loses only 0.62%. Downgrade announcements also affect the equity price of the rerated firm, and the negative average effects on the debt and equity are similar, though the effects on equity are somewhat more negative than the effect on the debt. The evidence on upgrades is weaker; the mean and median announcement effects are both approximately 0.35%, and little difference is observed between above and below investment grade bonds. Finally, there is little evidence of positive excess returns for the equity of upgraded firms.

To determine whether our results are the product of the rating announcement or of simultaneously announced news from other known sources, we classify observations as either "contaminated" or "noncontaminated" by other news. In general, the excess bond returns associated with Credit Watch announcements are even more supportive of price effects when the noncontaminated observations are examined. However, the significant negative average excess bond returns associated with actual rating downgrades disappear when we examine noncontaminated observations, though evidence of negative average excess stock returns is still apparent. For upgrades, elimination of contaminated events causes the measured average excess bond returns to become more positive, but stocks still evidence little impact associated with the rating change.

Results in previous studies on the effect of rating agency announcements on daily common and preferred stock prices are generally consistent with the results in this paper. Holthausen and Leftwich (1986) examine the common stock price response to Credit Watch announcements and bond rating changes, and find evidence consistent with a stock price response to all of those announcements except actual rating upgrades. Stickel (1986) examines the effect of preferred stock rating changes on preferred stock returns and finds evidence consistent with price effects for both upgrades and downgrades.

Section I of the paper describes the sample of additions to the Credit Watch List, and of actual rating changes by Moody's and Standard and Poor's. Section II describes the bond and stock price tests, and Section III reports results. A cross-sectional analysis of the excess bond returns associated with rating changes is given in Section IV. Concluding remarks are in Section V.

## I. Data: Moody's and Standard and Poor's Rating Changes

We analyze two types of bond rating agency announcements. First, we examine a sample of approximately 250 additions to the Standard and Poor's Credit Watch List. Second, we examine a sample of approximately 1,100 bond rating change announcements by Moody's and Standard and Poor's.

Standard and Poor's began the Credit Watch List in November 1981. Companies are added to the list when Standard and Poor's believes a rating change is likely, with additions designated as "indicated upgrades", "indicated downgrades", or "developing" if a rating change of unknown direction is likely (for example, due to a potential merger). Additions to the Credit Watch List are published every Friday.[1] We sampled observations from the inception of the Credit Watch List to December 31, 1983. Observations are included if they relate to taxable straight-debt other than commercial paper and if the firm's common stock was publicly traded on the New York or American Stock Exchanges at the time of the announcement.

The sample of actual rating change announcements consists of bond rating changes announced by Moody's and Standard and Poor's during the period 1977–1982. Moody's rating changes are obtained from the section "Taxable Corporate Securities—Ratings Reviewed and Revised" of *Moody's Bond Survey*. Standard and Poor's rating changes are obtained from a listing entitled "Standard and Poor's Corp. Corporate Finance Rating Changes" supplied by officials of the Standard and Poor's Corporation. Only rating changes for fully taxable corporate straight-debt bonds are included in the study (i.e., tax-free industrial revenue bonds, convertible debt, and floating

[1] The announcements usually take place during trading. If Friday is a holiday, the announcement is made on Thursday. The *Wall Street Journal* story about Credit Watch additions typically appears on Monday. We define Friday as Day 0 unless the *Wall Street Journal* story precedes Monday, in which case Day 0 is the day before the *Wall Street Journal* story.

[2] All Moody's rating changes on April 20, 1982 are eliminated. On that day, Moody's announced a large number of rating changes to reflect a new rating system incorporating three rating grades within each class between AA and B.

rate notes are excluded).[2] The announcement date, Day 0, for each observation is the press release date indicated by Moody's and Standard and Poor's.[3]

If several bonds of the same firm are affected simultaneously, we select a maximum of five bonds with the longest time to maturity for both the samples of Credit Watch additions and actual rating changes. Long maturities are sampled to increase the likelihood of detecting excess bond returns. If bonds of the same firm in two different rating classes are affected, we sample from both classes. No firm in the sample has bonds in more than two rating categories.

Daily bond prices and volume, coupon amounts, payment dates and maturity dates were collected from the Interactive Data Corporation (IDC) Corporate Bond Data Base from 11 days before to 60 days after the announcement of an addition to the Credit Watch List or a rating change. Only transactions prices are used in this study. Many corporate bonds trade infrequently, and often only bid prices are reported. We performed extensive filtering on the price data, visually inspected every series, and decided to exclude all bid data. Large reversals are common in the price series if both bid and transaction prices are included. Even if transaction prices adjust to news announcements or interest rate shocks, many bid prices adjust only with a lag. Consequently, for some series the bid prices are consistently either above or below transaction prices (by more than half any plausible bid-ask spread) for one or two months.

Table I provides information on the trading frequency for the 1,548 bonds in the sample of bonds experiencing rating changes. At the extremes, no trades occur in the sample period (11 days before to 60 days after the rating change announcement) for 6.9% of the sample, and 9.7% of the sample trades on at least 61 of the 72 days in the sample period. Table I reveals that the trading frequency is considerably higher for bonds below investment grade (below BAA) than for investment grade bonds (BAA and above). For example, 25.2% of the 238 bonds below investment grade trade on at least 61 of the 72 sample days, while only 6.9% of the investment grade bonds trade that frequently. Further inspection reveals that 50% of the bonds below investment grade trade on at least half of the sample days while only 22.8% of the investment grade bonds trade that regularly.

Table II summarizes the distribution of differences between the original and the revised rating categories for the 1,133 bonds with at least one transaction price in the 11 days before the rating change and at least one transaction price in the 60 days after the rating change. Relative to Table I, the sample size declines from 1,548 to 1,133 because a bond is only included in Table II if it has a transaction price both before and after the rating change announcement. There are 841 downgrades and 292 upgrades. The imbalance in the number of downgrades and upgrades is probably due to the time period chosen. For the vast majority of observations, the difference

[3] We are grateful for the officials of Moody's and Standard and Poor's for providing this information.

**Table I**

**Distribution of Frequencies of Days with Trades for Sample of 1548 Bonds having Rating Changes by Moody's or Standard and Poor's during 1977-1982: Trading Period of 72 Tradings Days from 11 Days before to 60 Days after the Rating Change**

| Number of Days with Trades | Investment Grade | | | Below Investment Grade | | | All Grades | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Bonds | Percent of Bonds | Cumulative Percent of Bonds | Number of Bonds | Percent of Bonds | Cumulative Percent of Bonds | Number of Bonds | Percent of Bonds | Cumulative Percent of Bonds |
| 61-72 | 90 | 6.9 | 6.9 | 60 | 25.2 | 25.2 | 150 | 9.7 | 9.7 |
| 49-60 | 87 | 6.6 | 13.5 | 24 | 10.1 | 35.3 | 111 | 7.2 | 16.9 |
| 37-48 | 122 | 9.3 | 22.8 | 35 | 14.7 | 50.0 | 157 | 10.1 | 27.0 |
| 25-36 | 171 | 13.1 | 35.9 | 41 | 17.2 | 67.2 | 212 | 13.7 | 40.7 |
| 13-24 | 257 | 19.6 | 55.5 | 38 | 16.0 | 83.2 | 295 | 19.1 | 59.8 |
| 1-12 | 481 | 36.7 | 92.2 | 35 | 14.7 | 97.9 | 516 | 33.3 | 93.1 |
| 0 | 102 | 7.8 | 100.0 | 5 | 2.1 | 100.0 | 107 | 6.9 | 100.0 |
| Total | 1310 | | | 238 | | | 1548 | | |

Table II

**Distribution of Differences between Original and Revised Rating Categories for a Sample of 841 Downgrades and 292 Upgrades of Corporate Taxable Debt Ratings Revised by Moody's and Standard and Poor's during 1977-1982**[a]

The grading of the rating categories is based on the rating scheme introduced April 20, 1982. Grades are a cardinal variable measured on a scale of 28 (for rating AAA) to 1 (for rating D). Since some of the 10 classes (AAA to D) have three grades, each class is assigned three numbers. Classes without grades (D, C, CC, CCC, AAA, and all Moody's classes before April 20, 1982) are assigned the midpoint of the three numbers.

| Number of Ratings Categories Changed | Downgrades | Upgrades | Total |
|---|---|---|---|
| 1 | 345 | 116 | 461 |
| 2 | 258 | 84 | 342 |
| 3 | 216 | 84 | 300 |
| 4 | 13 | 1 | 14 |
| 5 | 4 | 4 | 8 |
| 6 | 0 | 1 | 1 |
| 7 | 1 | 0 | 1 |
| 8 | 2 | 1 | 3 |
| 9 | 0 | 1 | 1 |
| 10 | 0 | 0 | 0 |
| 11 | 2 | 0 | 2 |
| Total | 841 | 292 | 1133 |

[a] The sample includes only bonds that have prices both before and after the rating change.

between the original and the revised rating category is only either one category (461 observations) or two categories (342 observations). Nevertheless, 330 observations change three or more categories. Though not shown in Table II, 50 bonds change from above investment grade (rating categories BBB − and above) to below investment grade (rating categories BB + and below) and 17 are upgraded to an investment grade category from a below-investment grade category.

Some of the subsequent excess returns tests depend on whether the rating agency announcement is accompanied by one or more concurrent disclosures. To identify concurrent disclosures for each announcement, we searched the *Wall Street Journal* index for potential new stories in the window spanning the first trading day with an available bond price prior to the rating change announcement through the first trading day with an available bond price after the rating change announcement. For each news item found, we read the story to determine if it discussed the rating agency announcement and if it contained information from any source other than the rating agency. If a story containing information other than the rating agency announcement appeared in the *Wall Street Journal* during the period used to measure the price effect (defined later), the observation is classified as contaminated. All remaining observations are classified as noncontaminated. Of course, in-

vestors may obtain information from sources other than the *Wall Street Journal*, and our tests will not detect that "contaminating" news. However, conditional on employing only one source for news releases, our test is particularly stringent because we exclude observations even if the contaminating disclosure is triggered by the bond rating agency's announcement. For example, we classify an observation as contaminated if a rating change causes a firm to announce postponement of a new debt issue or reduction in a capital expenditure program.

## II. Measurement of Excess Bond and Stock Returns

### *A. Estimation of Excess Bond Returns*

'Window-spanning' excess returns are employed because bonds trade infrequently, and bond prices are often not available on Days 0 and +1, the preferred window. The window-spanning raw return for each bond is measured from the last transaction price in the period −11 to −1 to the first transaction price on or after Day +1. For example, if a bond trades on Days −10, −3, +2, and +5, the window spanning return is calculated from transactions prices on Day −3 and Day +2. Accrued interest is added to the price change to calculate the bond's return over the period. If there are more than 20 days between the two prices the observation is eliminated.[4] For most of the following tests, the median number of days in the window-spanning return is five or six days. Excess returns for each bond for a given firm are equally weighted and the average is treated as a single observation.[5]

We measure excess bond returns as raw bond returns minus the return on a risk free bond (a long-term U.S. Treasury bond) for the window-spanning period. The benchmark controls for shifts in interest rates due to changes in real rates or expectations of inflation, but it does not control for variations in term or default premiums since we use one relatively long-term riskless bond as the benchmark for all bonds, regardless of maturity. Since default premia are positive, this measure overstates (understates) the impact for upgrades (downgrades). For short estimation periods, this bias is negligible.[6]

Estimation of the return variances and covariances between individual bonds is hampered by the overall paucity of trades. Consequently, we use relatively simple test statistics to determine whether the average excess bond

[4] The results reported are not sensitive to reducing the maximum number of days allowed in a window spanning return. For example, we obtain similar results with smaller sample sizes if we restrict the sample to firms that have window spans of no greater than five days.

[5] The results are similar if tests are conducted on individual bonds, or on a weighted-least squares estimate of mean abnormal performance. The weighted-least squares estimate assumes that each observation is independent with the same mean and a variance proportional to the length of the window. Each observation is weighted inversely according to the window length.

[6] We obtain similar results with the mean-adjusted excess return model used by Handjinicolaou and Kalay (1984). In that model, abnormal performance is defined as the bond's return less the return on a long-term U.S. Treasury bond, less the bond's default premium estimated using data after Day 0.

return differs from zero. We calculate a $t$-statistic based on the cross-sectional standard deviation of window-spanning excess returns, assuming that excess window-spanning returns of the firms are cross-sectionally independent and identically distributed. This $t$-statistic has one degree of freedom fewer than the number of firms in the sample.

The estimated excess returns for bonds are slightly skewed so we also report both median excess bond returns and the proportion of positive window-spanning excess bond returns. A binomial test (a $Z$-statistic) indicates whether the observed proportion of positive window-spanning excess bond returns is reliably different from 50%.[7]

### B. *Estimation of Excess Stock Returns*

Excess stock returns are defined as stock prediction errors calculated from a market model, summed over event Days 0 and +1. Market model parameters are estimated using the 300 day post-rating change period from Day +62 to +361, because there is evidence in previous studies that downgrades (upgrades) are preceded by negative (positive) average excess returns. The index is the CRSP equally weighted New York and American Stock Exchange Index. Median excess stock returns and the proportion of positive excess stock returns are also reported. The $t$-test on the mean excess stock return is based on the cross-sectional standard deviation.[8]

### C. *Expectations Model for Bond Rating Agency Announcements*

We develop an expectations model of bond rating changes based on yields-to-maturity, and use that model to increase the likelihood of detecting announcement effects associated with Credit Watch additions and bond rating changes. We measure the expectation of a bond rating change by comparing the yield-to-maturity on a bond of interest (Credit Watch or actual rating change), estimated from the price available just prior to the rating agency announcement, with the yield-to-maturity of a benchmark, namely the median yield to maturity of other bonds with the same bond rating.[9]

[7] Since our measure of the excess bond return does not control for variation in term or default premia, and default premia are positive, the expected proportion of positive window-spanning excess bond returns is actually slightly higher than 50%.

[8] We also estimated, but do not report, $t$-statistics based on the time-series standard deviation of the common stock prediction errors of the portfolio. The $t$-statistics based on the time-series standard deviation always exceed (in absolute value) the $t$-statistics based on the cross-sectional standard deviation.

[9] The yield-to-maturity of a rating class at a point in time is estimated from the yields-to-maturity of our sample of rerated bonds in the sixty trading days after they are rerated. A bond is used to estimate the yield-to-maturity of a rating class if its post-rating change rating class matches the pre-rating change rating class of the bond of interest, and if it trades within 10 trading days of the date on which the yield-to-maturity of the bond of interest is estimated. This procedure does not allow us to form an expectation for every announcement, hence the sample size is reduced for results based on the expectations model.

If the yield-to-maturity of a bond of interest is greater than the benchmark, we argue that investors believe that bond has greater default risk than comparable bonds. Thus, if the bond is downgraded, we classify it as an expected downgrade. If the bond is upgraded, we would classify it as an unexpected upgrade. If the bond's yield-to-maturity is lower than the benchmark, a subsequent downgrade would be classified as unexpected, while an upgrade would be considered expected. Some tests which follow use the relative size of the expectation error, defined as the yield-to-maturity of the bond of interest less the yield-to-maturity of the benchmark, divided by the yield-to-maturity of the benchmark.

We selected a price-based expectations model to capture the expectation of a rating change just prior to its announcement, because the prior literature on rating changes indicates that downgrades (upgrades) are preceded by negative (positive) excess returns for both bonds and stocks. We tested other price-based expectations models, including yield-to-maturity benchmarks based on matching rating class and duration, and matching rating class and maturity, but did not discover superior models.

## III. Results

### *A. Standard and Poor's Credit Watch Announcements*

The results for the entire sample of Credit Watch additions in Table III provide little evidence of excess bond and stock returns associated with either indicated downgrades or indicated upgrades. However, use of the expectations model increases the observed price effects considerably. For the entire sample of Credit Watch downgrades, mean and median excess bond returns are $-0.35\%$ ($t$-statistic of $-1.37$) and $-0.37\%$, and 40.4% of the excess bond returns are positive ($Z$-statistic of $-1.96$). The mean excess stock return is $-0.79\%$ ($t$-statistic of $-1.81$). The 75 bonds of 50 firms classified as unexpected downgrades have a mean excess bond return of $-1.39\%$ ($t$-statistic of $-3.15$), with only 28% positive ($Z$-statistic of $-3.11$). The mean excess stock return for these observations is $-1.78\%$ ($t$-statistic of $-2.63$). Average excess stock and bond returns for the sample of indicated downgrades classified as expected are not reliably different from zero. Moreover, comparisons of the expected and unexpected samples suggest reliable differences between the two portfolios. For example, for all Credit Watch indicated downgrades, the difference in mean bond returns of the expected and unexpected portfolios is 1.59% with a $t$-statistic of 2.20. Moreover, regressions of excess bond returns on the magnitude of the expectation error indicate that the coefficient is positive (4.1) as expected and significantly different from zero with a $p$-value of 0.037.

Results for the noncontaminated subsample of indicated downgrades are even more supportive of price effects for unexpected announcements. Mean excess bond and stock returns are each $-0.83\%$ ($t$-statistics of $-2.08$ and $-1.07$) for all noncontaminated observations. Splitting the sample into ex-

Table III

## Mean and Median Excess Bond and Stock Announcement Returns for Sample of Firms Placed on Standard and Poor's Credit Watch List during 1981-1983

Excess bond returns are defined as bond returns minus the risk free rate, calculated over the window spanning the announcement. The window runs from the last day on which the bond is traded before the announcement through the first day the bond is traded after the announcement. Excess stock returns are defined as market model prediction errors for the day of and the day after the announcement. *t*- and *Z*-statistics are given in parentheses directly below the mean % excess return, and the percent of excess returns > 0 respectively.

| | | | Bonds | | | Stocks | | |
|---|---|---|---|---|---|---|---|---|
| Sample | Number of Bonds | Number of Firms | Mean % Excess Return | Median % Excess Return | Percent of Excess Returns > 0 | Mean % Excess Return | Median % Excess Return | Percent of Excess Returns > 0 |
| | | | Panel A: Indicated Downgrades | | | | | |
| All | 215 | 104 | −0.35 | −0.37 | 40.4 | −0.79 | −0.43 | 45.5 |
| | | | (−1.37)[a] | | (−1.96)[b] | (−1.81) | | (−0.90) |
| Expected | 92 | 54 | 0.20 | −0.02 | 50.0 | −0.36 | −0.48 | 45.1 |
| | | | (0.57) | | (0.00) | (−0.76) | | (−0.70) |
| Unexpected | 75 | 50 | −1.39 | −0.87 | 28.0 | −1.78 | −0.91 | 40.0 |
| | | | (−3.15) | | (−3.11) | (−2.63) | | (−1.41) |
| Noncontaminated | 91 | 47 | −0.83 | −0.82 | 36.2 | −0.83 | −0.23 | 46.8 |
| | | | (−2.08) | | (−1.90) | (−1.07) | | (−0.44) |
| Expected | 41 | 24 | −0.02 | −0.13 | 45.8 | −0.05 | −0.23 | 50.0 |
| | | | (−0.04) | | (−0.41) | (−0.08) | | (0.00) |
| Unexpected | 40 | 26 | −1.79 | −1.09 | 30.8 | −2.14 | −1.11 | 42.3 |
| | | | (−2.31) | | (−1.96) | (−1.84) | | (−0.78) |

**Table III**—*Continued*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Panel B: Indicated Upgrades | | | | | | | | |
| All | 38 | 23 | −0.69 | 0.04 | 52.2 | −0.33 | −0.03 | 50.0 |
| | | | (−0.79) | | 0.21 | (−0.62) | | (0.00) |
| Expected | 24 | 16 | −2.12 | −0.85 | 31.3 | −0.13 | 0.01 | 53.3 |
| | | | (−2.22) | | (−1.50) | (−0.21) | | (0.26) |
| Unexpected | 10 | 8 | 2.25 | 1.13 | 87.5 | −0.88 | −0.79 | 25.0 |
| | | | (1.53) | | (2.12) | (−1.04) | | (−1.41) |
| Noncontaminated | 22 | 13 | −0.15 | 0.08 | 53.8 | 0.44 | 0.01 | 66.7 |
| | | | (−0.11) | | (0.28) | (0.99) | | (1.15) |
| Expected | 15 | 8 | −2.26 | −1.19 | 25.0 | 0.53 | 0.01 | 75.0 |
| | | | (−1.44) | | (−1.41) | (0.82) | | (1.41) |
| Unexpected | 5 | 4 | 4.15 | 1.08 | 100.0 | −0.22 | −0.79 | 25.0 |
| | | | (1.76) | | (2.00) | (−0.43) | | (−1.00) |

[a] The $t$-statistic on the mean return is based on the cross-sectional standard deviation of the excess returns.
[b] The $Z$-statistic on the proportion positive is based on a binomial test of whether that proportion is > 50%.

pected and unexpected downgrades has the predicted effect for both bond and stock returns. For the unexpected sample, the average excess bond (stock) return is −1.79% (−2.14%), with a $t$-statistic of −2.31 (−1.84). The medians for excess bond and stock returns suggest similar conclusions.

For the indicated upgrades, comprised of 38 bonds representing 23 different firm-observations, average excess bond and stock returns are not reliably different from zero. Splitting the sample into expected and unexpected subsamples reveals some evidence of positive average excess returns for bonds in the unexpected sample, but not for the stocks. A regression of excess bond returns on the magnitude of the expectation error again produces a coefficient that is significantly greater than zero with a $p$-value of 0.019. Results for the noncontaminated Credit Watch upgrades are marginally significant for the bonds but these results are based on a small number of observations.

### *B. Moody's and Standard and Poor's Bond Rating Changes*

When the sample of actual rating changes by Moody's and Standard and Poor's is analyzed, the results are difficult to interpret because of several apparent inconsistencies; for example, we observe significantly negative average excess bond and stock returns for downgrades, but weaker positive average excess bond and stock returns for upgrades. Moreover, because the expectations model does not sharpen the results as it did in the case of Credit Watch announcements, we do not present subsamples of rating changes based on expected and unexpected classifications. The results obtained from analyzing the rating changes are summarized in Table IV.

Detailed results for downgrades are reported in Table V. Announcements of rating downgrades are associated with statistically significant negative average excess bond and stock returns. For the entire sample of 785 downgrades representing 356 firm-observations, the average excess bond return is −1.27% ($t$-statistic of −4.33) for the window spanning return which has a median length of 4 days. These results are inconsistent with Weinstein (1977), Pinches and Singleton (1978), and Wakeman (1978), who do not find significant bond price effects associated with rating changes. Even though the average excess bond return includes some large negative individual

**Table IV**

**Summary of Excess Return Results for Moody's and Standard and Poor's Rating Change Announcements**

Sample of 841 downgrades and 292 upgrades of corporate taxable debt ratings revised by Moody's and Standard and Poor's during 1977–1982.

| | Downgrades | | Upgrades | |
|---|---|---|---|---|
| | Bonds | Stocks | Bonds | Stocks |
| Entire sample | Negative | Negative | Positive | Zero |
| Noncontaminated | Zero | Negative | Positive | Zero |

**Table V**

## Mean and Median Excess Bond and Stock Announcement Returns for Sample of Firms with Rating Downgrade Announcements by Moody's and Standard and Poor's during 1977–1982

Excess bond returns are defined as bond returns minus the risk free rate, calculated over the window spanning the rating change announcement. The window runs from the last day on which the bond is traded before the rating change announcement through the first day the bond is traded after the rating change announcement. Excess stock returns are defined as market model prediction errors for the day of and the day after the rating change announcement. *t*- and *Z*-statistics are given in parentheses below the mean % excess return and the percent of excess returns > 0.

| Sample | Number of Bonds | Number of Firms | Bonds: Mean % Excess Return | Bonds: Median % Excess Return | Bonds: Percent of Excess Returns > 0 | Stocks: Mean % Excess Return | Stocks: Median % Excess Return | Stocks: Percent of Excess Returns > 0 |
|---|---|---|---|---|---|---|---|---|
| **Panel A: Downgrades** | | | | | | | | |
| All | 785 | 356 | −1.27 | −0.45 | 41.1 | −1.52 | −0.75 | 39.1 |
| | | | (−4.33)[a] | | (−3.37)[b] | (−4.11) | | (−3.99) |
| Investment grade | 638 | 273 | −0.55 | −0.45 | 41.5 | −0.83 | −0.65 | 38.4 |
| | | | (−3.45) | | (−2.82) | (−3.72) | | (−3.76) |
| Below investment grade | 147 | 87 | −3.82 | −0.62 | 40.2 | −4.22 | −2.22 | 40.8 |
| | | | (−3.22) | | (−1.82) | (−2.95) | | (−1.61) |
| **Panel B: Noncontaminated Downgrades** | | | | | | | | |
| All | 205 | 90 | −0.37 | −0.23 | 45.6 | −1.12 | −1.10 | 30.7 |
| | | | (−1.16) | | (−0.84) | (−1.82) | | (−3.62) |
| Investment grade | 176 | 79 | −0.09 | −0.09 | 46.8 | −1.06 | −1.06 | 28.6 |
| | | | (−0.39) | | (−0.56) | (−2.17) | | (−3.76) |
| Below investment grade | 29 | 13 | −1.91 | −1.00 | 30.8 | −1.89 | −1.28 | 46.2 |
| | | | (−1.13) | | (−1.39) | (−0.60) | | (−0.28) |

[a] The *t*-statistic for the mean return is based on the cross-sectional standard deviation of the excess returns.
[b] The *Z*-statistic for the proportion positive is based on a binomial test of whether that proportion is greater than 50%.

returns,[10] the median excess bond return is still −0.45%, and the percentage of firms with positive returns is 41.1% (*Z*-statistic of −3.37). Over the period Day 0 to +1, the mean excess stock return for these firms is −1.52% (*t*-statistic of −4.11), and the median return is −0.75%, with only 39.1% of the excess stock returns positive (*Z*-statistic of −3.99).

The remainder of Table V provides information about certain strata of downgrades. The (pre-rating change) investment grade bonds represent 273 firm-observations and have mean and median excess bond returns of −0.55% and −0.45%. The stock of these firms loses 0.83% on average. The test statistics indicate that the negative mean excess returns are reliably different from zero for both bonds and stocks. The 87 firms below investment grade experience mean and median excess bond returns of −3.82% and −0.62%, reflecting large losses experienced by 12 of the 87 observations. Only 40.2% of the observations have positive excess bond returns. The mean and median excess stock returns for these firms are −4.22% and −2.22%. Test statistics indicate the bond and stock returns are significantly different from zero. The average excess bond and stock returns for below investment grade bonds are reliably more negative than for investment grade bonds driven in part by the number of firms with bonds losing more than 10%.

While the entire sample of downgrades provides strong evidence of bond and stock price effects, the results based on noncontaminated observations provide little evidence that those bonds experience negative average excess returns (mean of −0.37% with a *t*-statistic of −1.16). Paradoxically, for the same observations, the stocks experience an average excess return of −1.12% (*t*-statistic of −1.82). Table V also presents separate evidence for noncontaminated bond rating changes on bonds above or below investment grade. Of the 205 noncontaminated observations, 176 are bonds which were above investment grade prior to the rating change. The mean and median excess bond returns are generally close to zero for investment grade bonds. Nevertheless, firms with downgraded investment grade bonds classified as noncontaminated experience mean and median excess stock returns of −1.06% (*t*- and *Z*-statistics of −2.17 and −3.76). The below-investment grade downgrades are associated with excess stock and bond returns of approximately −1.90%, but those results are not reliably different from zero due to the large standard deviation of returns (in excess of 6%) and because of the small sample size. The difference in mean returns between noncontaminated investment grade and below-investment grade bonds of −1.82% is insignificantly different from zero.

There is some evidence of a significant positive mean excess bond return for upgrades, but there is no evidence of a significant positive mean excess stock return. Table VI contains results for upgrades of 263 bonds of 141 different firms. The mean excess bond return is 0.35% (*t*-statistic of 1.93). The median return is 0.36%, and 62% are positive (*Z*-statistic of 2.85). The

[10] Thirteen firms have bonds with window spanning returns below −10%, including one of −63.3%, and five in the range −30% to −45%.

**Table VI**

## Mean and Median Excess Bond and Stock Announcement Returns for Sample of Firms with Rating Upgrade Announcements by Moody's and Standard and Poor's during 1977–1982

Excess bond returns are defined as bond returns minus the risk free rate, calculated over the window spanning the rating change announcement. The window runs from the last day on which the bond is traded before the rating change announcement through the first day the bond is traded after the rating change announcement. Excess stock returns are defined as market model prediction errors for the day of and the day after the rating change announcement. *t*- and *Z*-statistics are given in parentheses below the mean % excess return and the percent of excess returns > 0.

| | | | Bonds | | | Stocks | | |
|---|---|---|---|---|---|---|---|---|
| Sample | Number of Bonds | Number of Firms | Mean % Excess Return | Median % Excess Return | Percent of Excess Returns > 0 | Mean % Excess Return | Median % Excess Return | Percent of Excess Returns > 0 |
| **Panel A: Upgrades** | | | | | | | | |
| All | 263 | 141 | 0.35 | 0.36 | 62.0 | 0.24 | 0.16 | 55.5 |
| | | | (1.93)[a] | | (2.85)[b] | (1.13) | | (1.28) |
| Investment grade | 200 | 98 | 0.33 | 0.15 | 56.6 | 0.23 | 0.15 | 55.7 |
| | | | (1.49) | | (1.31) | (0.97) | | (1.12) |
| Below investment grade | 63 | 43 | 0.40 | 0.59 | 74.4 | 0.28 | 0.17 | 55.0 |
| | | | (1.23) | | (3.20) | (0.59) | | (0.63) |
| **Panel B: Noncontaminated Upgrades** | | | | | | | | |
| All | 66 | 29 | 0.60 | 0.71 | 72.4 | −0.07 | 0.02 | 55.2 |
| | | | (2.77) | | (2.41) | (−0.16) | | (0.56) |
| Investment grade | 54 | 22 | 0.55 | 0.70 | 72.7 | 0.09 | 0.02 | 59.1 |
| | | | (2.16) | | (2.13) | (0.25) | | (0.85) |
| Below investment grade | 12 | 7 | 0.75 | 0.71 | 71.4 | −0.59 | −0.91 | 42.9 |
| | | | (1.69) | | (1.13) | (−0.38) | | (−0.38) |

[a] The *t*-statistic for the mean return is based on the cross-sectional standard deviation of the excess returns.

[b] The *Z*-statistic for the proportion positive is based on a binomial test of whether that proportion is greater than 50%.

mean excess stock return is 0.24% ($t$-statistic of 1.13). The differences between investment and below-investment grade bond returns are small.

Of the 263 upgrades, 66 are classified as noncontaminated. The mean and median excess return estimates for the noncontaminated upgrades are 0.60% ($t$-statistic is 2.77) and 0.71%, with 72.4% excess returns being positive ($Z$-statistic is 2.41). Thus, unlike downgrades, the noncontaminated upgrade sample is more supportive of a positive mean bond price reaction to the rating change announcement. There is no evidence of positive mean excess stock returns for upgraded bonds classified as noncontaminated.

## IV. Cross-Sectional Analysis of Excess Bond Returns

We estimate multivariate regressions to try to explain cross-sectional variation in the window-spanning excess bond returns. Separate regressions are estimated for downgrades and upgrades, and for contaminated and non-contaminated observations. The regressions are based on individual bonds (not firm-observations) because the independent variables are primarily bond characteristics, not firm characteristics. Consequently, there is probably some cross-sectional dependence in the residuals of the regression. The following variables are included in the regression:

a) a cardinal variable representing the number of grades changed (new rating less old rating, measured on a scale of 28 for rating AAA to 1 for rating D);
b) the magnitude of the yield-to-maturity expectation error (defined previously);
c) a dummy variable set equal to one if the rating change is a resolution of a Standard and Poor's Credit Watch Listing;
d) a dummy variable set equal to one if the rating change moves the bond into or out of investment grade;
e) a dummy variable set equal to one if the rating change occurs after December 31, 1980; and
f) the time lapse since a similar rating change by the other agency.

The excess bond return should depend positively on the number of grades changed by the rerating, and should be closer to zero for resolutions of a Credit Watch Listing. The yield-to-maturity expectation error is designed to capture the degree of the market's expectation of the rating change—stronger (meaning larger in absolute value) excess bond returns should be observed for reratings that are more unexpected. If there are separate clienteles for investment and below-investment grade bonds, rating changes that cross the investment/below-investment grade boundary should result in stronger excess returns. The dummy variable for pre- and post-1980 splits the sample period approximately in half because the financial press conjectures that competition forced rating agencies to begin monitoring companies more

closely in the early 1980's.[11] Post-1980 rating change announcements are expected to result in stronger price effects. The time lapse variable tests whether a change by one rating agency has the same impact if it follows a similar rating change by the other agency. Bond ratings which immediately follow a similar rating by the other agency are not expected to produce strong excess bond returns.

The results in Table VII indicate little consistency other than the finding that the number of grades is significantly related to the excess bond return in the downgrade and upgrade sample for the contaminated observations. In the regression using contaminated downgrade observations, the *t*-statistic on the number of grades changed is 16.17 and the coefficient of 1.87 implies that holding all else constant, the marginal effect of an additional one grade decline (e.g., from AA + to AA) on average results in a 1.87% decline in the value of the bonds. The variable PREV is also significant and has the predicted sign, indicating less of a price impact when there was a recent prior rating change on the same company by the other agency. The adjusted-$R^2$ of the regression is 37.7%. While the number of grades changed is significant in the regression using contaminated upgrades, the explanatory power is much lower (*t*-statistic of 2.32) and no other variable is significant. While the results on the contaminated observations do not reveal whether the excess returns around the time of bond rating change announcements result from the rating change or the contaminating announcement, at a minimum the evidence on #GRADES suggests that rating agencies respond relatively quickly to some events. In the regressions using noncontaminated observations, not a single variable is both significant and has the predicted sign.

## V. Summary and Conclusion

Excess bond returns for additions to the Credit Watch List are generally insignificant until the expected rating changes are excluded. Examination of noncontaminated observations which are classified as unexpected, generally increases the measured bond and stock price effects of the Credit Watch announcements. In addition, statistically significant average excess bond and stock returns to announcements of downgrades of straight debt are observed, with less reliable effects for upgrades. Moreover for downgrades, the average excess bond returns are stronger for below investment grade bonds than for investment grade bonds. When observations with concurrent disclosures are eliminated, the negative average excess returns associated with downgrades disappear, but those for stocks remain. For upgrades, significant bond price

[11] See, for example, "Moody's Dominance in Municipals Market is Slowly Being Eroded", *Wall Street Journal*, November 2, 1981, pp. 1 and 20. In addition, it is likely that the start of Standard and Poor's Credit Watch List was a response to the long standing charge that rating agencies reacted slowly to changes in default risk.

**Table VII**

## Regression Tests on Excess Bond Announcement Returns for Bonds with Rating Changes by Moody's or Standard and Poor's during 1977–1982

$$\mathbf{BERj} = \beta 0 + \beta 1\,(\#\mathbf{GRADESj}) + \beta 2\,(\mathbf{YTMERRj}) + \beta 3\,(\mathbf{CR\ WATCHj}) + \beta 4\,(\mathbf{INV\ GRADEj}) + \beta 5\,(\mathbf{PRE/POSTj}) + \beta 6\,(\mathbf{PREVj}) + \mathbf{ej}$$

BERj is the window-spanning excess return on bond j, defined as the raw return on bond j less the risk free rate, calculated over the window spanning the rating change announcement. #GRADESj is the number of grades changed (new rating less old rating)—a cardinal variable measured on a scale of 28 (for rating AAA) to 1 (for rating D). Since some of the 10 classes (AAA to D) have three grades, each class is assigned three numbers. Classes without grades (D, C, CC, CCC, AAA, and all Moody's classes before April 20, 1982) are assigned the midpoint of the three numbers. YTMERRj is a yield-to-maturity expectation error designed to capture the market's expectation of the rating change. CRWATCHj is a dummy variable set equal to one if the rating change is a resolution of Standard and Poor's Credit Watch, zero otherwise. INV GRADEj is a dummy variable set equal to one if the rating change moves a bond into investment grade (BBB, or above) from below, or out of investment grade from above, zero otherwise. PRE/POSTj is a dummy variable set equal to one if the rating change occurs after December 31, 1980, zero otherwise. PREVj is the natural log of the reciprocal of the maximum number of days since the previous rating change in the same direction by the other agency. The number of days is set equal to 60 if both reratings are within four days (the average return window length), if the previous rating change by the other agency was not in the same direction, or if the previous rating change occurred more than 60 days previously.

Panel A: Downgrades

| Predicted Sign | INTERCEPT | #GRADES (+) | YTMERR (+) | CRWATCH (+) | INV GRADE (−) | PRE/POST (−) | PREV (+) | Adj-$R^2$ | Number of Obs. | $F$-Stat |
|---|---|---|---|---|---|---|---|---|---|---|
| Noncontaminated observations | | | | | | | | | | |
| Estimated coefficient | 0.72 | 0.03 | −1.34 | 0.32 | 0.65 | −0.33 | 0.14 | −2.90 | 177 | 0.17 |
| $t$-statistic | (0.27) | (0.10) | (−0.51) | (0.37) | (0.63) | (−0.64) | (0.22) | | | |
| Mean of variable | 1.00 | −1.70 | 0.01 | 0.08 | 0.05 | 0.72 | −4.01 | | | |
| Standard deviation of variable | 0.00 | 0.79 | 0.09 | 0.27 | 0.22 | 0.45 | 0.38 | | | |
| Contaminated observations | | | | | | | | | | |
| Estimated coefficient | 5.95 | 1.87 | −2.68 | 0.78 | 1.16 | 0.42 | 0.97 | 37.70 | 472 | 48.50 |
| $t$-statistic | (3.91) | (16.17) | (−1.56) | (1.12) | (1.36) | (0.92) | (2.68) | | | |
| Mean of variable | 1.00 | −2.19 | 0.02 | 0.10 | 0.07 | 0.69 | −3.88 | | | |
| Standard deviation of variable | 0.00 | 1.83 | 0.12 | 0.30 | 0.25 | 0.46 | 0.57 | | | |

**Table VII**—*Continued*

Panel B: Upgrades

| Predicted Sign | INTERCEPT | #GRADES (+) | YTMERR (+) | CRWATCH (−) | INV GRADE (+) | PRE/POST (+) | PREV (−) | Adj-$R^2$ | Number of Obs. | $F$-Stat |
|---|---|---|---|---|---|---|---|---|---|---|
| Noncontaminated observations | | | | | | | | | | |
| Estimated coefficient | 0.35 | 0.14 | −8.90 | 0.46 | NA | 0.31 | NA | 8.20 | 46 | 2.00 |
| $t$-statistic | (0.58) | (0.49) | (−2.42) | (0.66) | NA | (0.62) | NA | | | |
| Mean of variable | 1.00 | 1.74 | −0.01 | 0.15 | NA | 0.52 | −4.09 | | | |
| Standard deviation of variable | 0.00 | 0.80 | 0.06 | 0.36 | NA | 0.51 | 0.00 | | | |
| Contaminated observations | | | | | | | | | | |
| Estimated coefficient | 2.54 | 0.40 | 0.29 | 1.94 | 1.32 | −0.34 | 0.78 | 5.70 | 153 | 2.50 |
| $t$-statistic | (0.95) | (2.32) | (0.20) | (1.50) | (1.28) | (−0.79) | (1.20) | | | |
| Mean of variable | 1.00 | 2.16 | −0.05 | 0.04 | 0.05 | 0.47 | −4.01 | | | |
| Standard deviation of variable | 0.00 | 1.27 | 0.14 | 0.19 | 0.21 | 0.50 | 0.38 | | | |

effects are observed for the noncontaminated sample, but no stock price effect is detected.

There are some inconsistencies in the results; in particular, we find asymmetric results with respect to rating change downgrades and upgrades. For example, we observe significantly negative average excess bond and stock returns for downgrades, but weaker positive average excess bond and stock returns for upgrades. When we examine the noncontaminated samples the asymmetries disappear in the bond results (or if anything, they reverse, that is, there is a greater absolute effect for the upgrades than downgrades). The asymmetry persists for stocks in the noncontaminated subsample. However, we do find symmetric results for the excess bond returns of indicated downgrades and upgrades for additions to the Credit Watch List, especially when we control for prior expectations. Despite the inconsistencies, our overall conclusion is that there are both bond and stock price effects associated with announcements of additions to the Credit Watch list, and with announcements of actual rating changes by Moody's and Standard and Poor's.

## REFERENCES

Grier, P. and S. Katz, 1976, The differential effects of bond rating changes on industrial and public utility bonds by maturity, *Journal of Business* 49, 226-239.

Handjinicolaou, G. and A. Kalay, 1984, Wealth redistributions or changes in firm value: An analysis of returns to bondholders and stockholders around dividend announcements, *Journal of Financial Economics* 14, 35-63.

Holthausen, R. and R. Leftwich, 1986, The effect of bond rating changes on common stock prices, *Journal of Financial Economics* 17, 57-89.

Ingram, R., L. Brooks and R. Copeland, 1983, The information content of municipal bond rating changes: A note, *Journal of Finance* 38, 997-1003.

Katz, S., 1974, The price adjustment process of bonds to rating reclassifications: A test of bond market efficiency, *Journal of Finance* 29, 551-559.

Pinches, G. and J. Singleton, 1978, The adjustment of stock prices to bond rating changes, *Journal of Finance* 33, 29-44.

Stickel, S., 1986, The effect of preferred stock rating changes on preferred and common stock prices, *Journal of Accounting and Economics* 8, 197-216.

Wakeman, L., 1978, Bond rating agencies and the capital markets, Working paper, University of Rochester, Rochester NY.

Weinstein, M., 1977, The effect of a rating change announcement on bond price, *Journal of Financial Economics* 5, 329-350.