Differential Properties in the Ratings of Certified vs. Non-Certified Bond Rating Agencies*

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ABSTRACT

We examine whether the properties of bond ratings from certified agencies (designated by the SEC) differ from those of non-certified bond rating agencies. Bond ratings from non-certified agencies are used solely for investment advice. Certified ratings are used by a variety of constituents, many of whom write contracts incorporating these ratings. We find that the properties of the ratings from the two agency types differ in predictable ways. Our results show that the non-certified agency's ratings are consistent with their role of providing information to investors. The certified agency is generally more conservative, consistent with their significant role in contracting.

JEL Classification: M41, G29, G38

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1. Introduction

The scandals and failures of major companies such as WorldCom and Enron shocked the investment community. Many blamed bond-rating agencies for missing the impending meltdown of these firms and not being responsive to investors' needs (Hunt, 2002).[1] Since then, there has been much debate about the role of bond-rating agencies as financial intermediaries and their function in capital markets. In particular, the structure of the bond-rating industry received regulatory scrutiny from Congress and the Securities and Exchange Commission (SEC). Both have held hearings on the certification of bond-rating agencies, referred to as the "Nationally Recognized Statistical Ratings Organizations" (NRSRO), and whether this system stifles competition and reduces the quality of bond ratings.[2] In this paper, we examine how the properties of bond ratings are shaped by the institutional incentives placed on them by their clientele—specifically, how ratings produced by NRSRO agencies differ from those produced by non-NRSRO agencies.[3]

We argue that it is the needs of the *users* of bond ratings that drive the properties of bond ratings and refer to these needs as the *clientele* effect. We identify two major bond-rating uses: contracting and valuation. Further, we argue that the two different types of agencies (certified vs. non-certified) serve the needs of these different constituencies in different ways and hypothesize that the clientele effect will result in ratings with different properties. Comparing the ratings of these two types of agencies allows us to examine the incremental impact of contracting on the properties of bond ratings.

[1] For example, Moody's rated WorldCom debt as investment grade up until four days before bankruptcy.
[2] The approved list of firms currently includes Moody's Investor Services (Moody's), Standard & Poor's (S&P), Fitch Ratings, Dominion Bond Rating Services, and A. M. Best.
[3] Throughout the paper we shall refer to NRSRO bond-rating agencies as 'certified' and non-NRSRO agencies as 'non-certified.'

One major use of bond ratings is for valuation. Non-certified agencies provide this type of investment advice exclusively because their ratings are used solely for investment or valuation purposes, and investors are the primary customers and consumers of these ratings. Thus, their ratings can be seen as a benchmark for primarily investor-oriented bond ratings. As such, we argue that changes in their ratings should be more consistent with this role and should, for example, change quickly as new relevant information about the creditworthiness of the firm becomes available. Accordingly, our first hypothesis is that non-certified agency rating changes will be timelier than certified agencies' rating changes due to the demands of providing timely investment advice. Moreover, agencies that focus on valuation should be concerned with both upgrades and downgrades, and their response to information is likely to be more symmetric.

Another major use of bond ratings is for contracting. In addition to investing, the bond ratings produced by certified agencies play a different role in the capital markets because SEC regulations effectively require all public bond issues to be rated by these agencies.[4] This second requirement further shapes the properties of the ratings. For example, bond ratings are used by regulators to determine bond portfolio eligibility and by banks in debt covenants. Though we do not know the exact shape of the loss functions of certified rating agencies, we assume that given the contracting role, certified agencies will have a more asymmetric loss function than non-certified agencies (Watts, 2003). As Watts (1977) points out, the nature of the political process provides incentives for regulators to be more conservative because the costs from losses due to overvaluation are greater than the foregone gains due to undervaluation, i.e., downgrades are more important than upgrades. Consistent with the literature on managers producing conservative accounting for contracting purposes (Holthausen and Watts, 2001), we expect certified agencies to produce similarly conservative bond ratings as a result of their regulatory responsibilities. We define

[4] Some go so far as to label certified agencies' involvement as "quasi-regulatory" (Macey, 2002).

conservatism as requiring a higher standard of evidence to report good news than to report bad news (Watts, 2003). In particular, our second hypothesis is that certified agencies have an asymmetric response to information and will incorporate bad news sooner than good news. Finally, given the importance of the investment vs. non-investment grade cutoff for a variety of contracts, our third hypothesis is that the certified agency will respond differently around this benchmark, while there will be no such difference for non-certified agencies.

However, certified agencies have an effective oligopoly in the market for bond ratings due the historic development of the credit rating industry. Therefore, certified agencies may have little incentive to be responsive to the needs of investors. This market power may explain some of the properties of the certified agencies that we document. Some of the tests we employ in this paper can not distinguish between a market power hypothesis and a contracting hypothesis.

Empirically, we find results consistent with these three hypotheses by comparing the ratings of a certified (Moody's) and non-certified agency (EJR) along several key dimensions including the timeliness of rating changes, the association of rating changes with equity prices over both short and long windows, and the association of rating changes with bond yields on the day of a bond issue.

Granger Causality tests provide evidence that EJR leads Moody's by up to six months for upgrades but only between one and four months for downgrades. Moreover, EJR makes nearly twice as many rating changes as does Moody's. These results are consistent with Moody's conservatism with respect to upgrades and EJR's timely response to information that is pertinent to investors, respectively. However, the results are also consistent with the market power hypothesis, i.e., Moody's unresponsiveness to the needs of investors and other users of credit ratings could simply be due to the lack of competition.

Next we examine the association between abnormal stock returns and bond rating changes over short windows around ratings changes for both agencies. The abnormal returns centered on

EJR's rating changes are higher in magnitude than those centered on Moody's, i.e., EJR rating upgrades (downgrades) have a significantly larger positive (negative) contemporaneous abnormal return than does Moody's. Thus, consistent with EJR's investor orientation, it is EJR rather than Moody's that appears to be changing its ratings when the stock market is substantially revising its priors about the firm in question.[5] We also examine long-window abnormal returns that lead up to the bond rating change. We find that the returns leading up to EJR bond rating changes are larger than those leading up to the changes by Moody's (for both upgrades and downgrades).[6] This closer association is consistent with EJR capturing more of the information that the stock market deems important to the valuation of securities. For EJR changes, the graph of the abnormal returns over the prior three months shows a strong symmetric relation between upgrades and downgrades. Strikingly, the same graph for Moody's shows a strong asymmetric response; there is effectively no abnormal return for upgrades while the stock return for downgrades is similar between EJR and Moody's, indicating that Moody's exerts more effort in capturing relevant negative market information than it exerts for positive information. Thus, consistent with their conservative contracting role Moody's incentives to capture downside risk are clearly illustrated in the long-window return graphs. Furthermore, this asymmetric response to bad news as compared to good news can not only be explained by a market power hypothesis.

Finally, we also examine the association between the agency's ratings and bond yields on the day the firm issues senior unsecured debt. As expected, the ratings for both agencies are

[5] One could argue that the Egan Jones' rating change is an information event that drives the market return. Note, however, that Egan Jones relies exclusively on public information, so its ratings changes *per se* are at most a new interpretation of already public information. Though theoretically such interpretations can move the stock price (Verrecchia, 2001), Egan Jones is not the only expert source of information interpretation. The stock market has many other expert interpreters of information, such as equity analysts. To confirm that EJR ratings are not driving the market return, we reviewed news events around the return window for 100 EJR changes chosen at random. 76 firms have one or more news events in the events window, confirming that EJR appears to be moving on information events, rather than the market reacting to EJR. However, tests of differences in the returns between the 76 and the remaining 24 were not statistically significant.

[6] The test design is in the spirit of Ball and Brown (1968).

significantly positively associated with the bond yields after controlling for issue- and issuer-specific characteristics. When the ratings from both agencies are included in the regression, EJR's are more highly associated with the yield on the day of the bond issue. We interpret this as showing that EJR's ratings impound more publicly available information than do Moody's and are therefore timelier. Again, this lack of responsiveness could be due to lack of competition among the certified agencies.

Overall, our results are consistent with the notion of conservatism playing a larger role in the production of Moody's ratings than in the production of EJR's ratings. However, some of our results are also consistent with a market power hypothesis, i.e., Moody's lacks the incentive to be responsive to its constituents. The setting of this study allows us to investigate the impact that different uses (contracting vs. valuation) have on bond rating properties; we find that the users of these ratings affect ratings in a predictable manner.

This paper contributes to the literature since it is the first paper to explicitly examine the impact of agency-level incentives on the properties of bond ratings. Prior research has investigated the properties of ratings among different certified member firms. For example, Butler and Rodgers (2003) investigate the differences in solicited versus unsolicited ratings, and Covitz and Harrison (2000) investigate the financial versus reputational incentives of Standard and Poor's (S&P) and Moody's Investor Services (Moody's). However, this is the first paper to compare a certified agency to a non-certified bond rating agency.

The remainder of the paper is organized as follows. Section 2 discusses the institutional background. Section 3 develops our hypotheses and empirical methodology. Section 4 discusses the sample. Section 5 contains the results and Section 6 concludes.

2. Institutional Background

Rating agencies act as information intermediaries. Their role is to improve the efficiency of securities markets by increasing the transparency of securities, i.e., reducing information asymmetry between investors and issuers. This service is especially valuable to the small investor who faces high costs (relative to their investment) in assessing the creditworthiness of securities. Through economies of scale, credit rating agencies can provide this service in a more efficient manner.[7] Accordingly, they have grown both in number and size over the years.

More recently, the use of ratings has expanded to include a contracting role. Starting in 1975, a series of governmental regulations effectively gave the credit rating agencies a quasi-governmental role. In that year, the SEC introduced Rule 15c3-1, which required broker-dealer firms to calculate net capital requirements using the credit rating assigned by an approved group of credit-rating agencies. These approved credit-rating agencies, referred to as the "Nationally Recognized Statistical Ratings Organizations" (NRSRO), initially included Moody's, S&P and Fitch Ratings. The process for securing an NRSRO classification from the SEC consists of a review of the rating agency's operations, its position in the marketplace, and other criteria by the SEC commission staff (Hunt, 2002). Currently, there are five certified agencies: Moody's, S&P, Fitch Ratings, Dominion Bond Rating Services, and A. M. Best.

The requirement to only use ratings from certified agencies quickly expanded to several other regulatory institutions and throughout many facets of the economy. For example, the United States Treasury Department, through the Office of the Comptroller of the Currency, adopted the use of credit ratings of certified agencies as a way to determine the quality of national bank bond

[7] Credit rating is an old industry. Moody's traces its roots back to 1900 when John Moody & Co. first published the Manual of Industrial and Miscellaneous Securities. In 1916, S&P entered the credit rating business along side Moody's. The two companies have grown into the world's largest credit rating agencies; worldwide Moody's credit research covers a broad range of debt totaling more than $30 trillion.

portfolios. National banks are required to write down the carrying value of bonds that fall below a certain credit rating, while bonds with sufficiently high credit ratings are carried on the banks' books at cost.

The use of credit ratings for contracting is also employed extensively beyond governmental regulations. Among these uses are debt covenants, where a downgrade below investment grade from a certified agency can result in a company violating its debt covenants and possibly triggering a default on its debt obligation. Furthermore, the prospectus of money market mutual funds may dictate that only securities with the highest certified agency ratings for short-term debt can be purchased. More recently, debt ratings are used in performance pricing contracts, where the interest rate charged on the loans varies with the performance of the firm (Asquith, Beatty and Weber, 2005; Doyle, 2004). Performance pricing contracts typically require a certified rating. Furthermore, many institutions, such as pension funds, can only hold bonds rated as investment-grade by a certified agency (Cantor and Packer, 1995).

Because many contracts are written to incorporate certified credit ratings, the NRSRO system is designed to certify only high-quality rating agencies that follow firms in all areas of the economy. Hunt (2002) states that, "The single most important criterion is that the certified rating agency is nationally recognized, which means the rating organization is widely accepted in the United States as an issuer of credible and reliable ratings by the predominant users of securities ratings." Many claim this system is appropriately designed to ensure certified agencies posses the competence to develop accurate and reliable ratings (Borrus, 2002 and Weinberg, 2002). Certified agencies argue that opening the market to new entrants could result in the establishment of rating organizations that could haphazardly issue investment grade ratings to low-quality securities.

On the other hand, the powerful oligopoly of the credit rating industry has led many observers to believe that certified agencies have few incentives to be responsive to investors.

Pinches and Singleton (1978) found that the information contained in bond rating changes is impounded into the stock price up to one year in advance of the rating change. More recently, a survey by the Association for Financial Professionals (2002) indicated that "only 40% of practitioners who work for companies with rated debt believe that changes in their companies' ratings are timely." In addition, 29% of respondents felt that their companies' ratings were not accurate. Most striking of all, only 22% felt that ratings favored the interests of investors. On the other hand, when Graham and Harvey (2001, p. 211) survey managers they find that "firms are very concerned about their credit ratings".

The central question in public choice economic theory examines whether regulation of entry is desirable. Djankov, La Porta, Lopez-di-Silanes, and Shleifer (2002) described the regulation debate in great detail. On one hand, public interest theorists such as Pigou (1938) hold that deregulated markets exhibit frequent failures and introduce harmful, low-quality entrants. This position would argue for maintaining the certified status of credit rating agencies. On the other hand, economists such as Stigler (1971) see regulation as less benign because it entrenches certified agencies (regulatory capture) and reduces their incentives to provide good services, ultimately keeping out competitors and raising certified agencies' profits. Therefore, the credit rating industry should be opened up to all potential agencies. Though the results in this paper can not directly answer the question of whether to regulate entry into the credit rating industry, we can shed light on how this regulatory structure affects the bond rating properties produced by ratings agencies operating within this environment. Currently, proposed legislation is making its way through Congress to open up the NRSRO system to more competition.

3. Hypotheses and Empirical Methodology

3.1 Hypotheses

The institutional setting described above creates several predictable differences between the certified and non-certified agencies we study. The primary difference comes as a result of the *clientele* effect. Non-certified bond rating agencies have one primary constituent: the investors who pay them. Thus, their role is to provide relevant information in a timely fashion to be used by investors, and changes in their ratings should be consistent with this advisory role. Additionally, these non-certified firms, such as EJR, are competing in an open market of information intermediaries where they are judged on the perceived quality of their bond ratings by institutional investors. As such, using a non-certified bond rating agency provides us with a benchmark for an agency whose clients are purely interested in investing. Because these ratings are not generally used in contracts, they allow us to calibrate and ultimately tease out the effect of contracting on the properties of ratings.

In contrast, certified agency ratings have two uses. First, they are used by investors as described above in much the same way as non-certified bond ratings are. However, as mentioned in section 2 above, certified ratings also are used in a variety of contractual settings. Thus, in addition to their investment advisory role, certified agencies *also* play a quasi-regulatory role because the SEC regulations effectively require all bond issues to be rated by at least one certified agency. We predict that this additional use of certified bond ratings will change their properties vis-à-vis the use of non-certified ratings which are focused solely on their investment advisory role.

We hypothesize that these two uses for ratings will result in different rating properties and we make several predictions both *within* the respective bond rating agency and *across* the certified and non-certified agencies. The following dimensions are tested: (1) timeliness (across agencies); (2) asymmetric response to new information (within and across agencies); and (3) behavior around the investment grade/non-investment grade cutoff (across agencies). We discuss each of these three hypotheses in detail below.

Our first set of predictions relates to the overall timeliness of the bond ratings changes with respect to both (1) certified vis-à-vis non-certified ratings and (2) the release of new information. Non-certified agencies must be responsive to the investors that pay for their services and who want timely information to manage investments. In contrast, the contracting role played by certified agencies means they will wish to avoid unnecessary rating changes. For example, a non-certified agency would not hesitate to make a rating change based on a short-term change in the credit quality of the firm to satisfy investor needs. However, if certified agencies downgrade too quickly, this could potentially become a self-fulfilling prophecy and send the firm into a tailspin, especially if the firm is going through a refinancing (Wayne, 2002). Thus, when comparing the certified and non-certified rating agencies, we expect that non-certified ratings will be more closely associated with the release of relevant information than will certified ratings. We also would expect non-certified agencies to make more frequent ratings changes. We propose the following hypotheses:

H1a: The rating changes of non-certified agencies will lead the rating changes of certified agencies.

H1b: The rating changes of non-certified agencies will reflect information sooner than the rating changes of certified agencies.

Certified agencies might also be untimely simply due to their market power. These agencies have an effective oligopoly in the market for bond ratings due the structure of the industry. Therefore, certified agencies may have little incentive to be responsive to the needs of investors. The tests we employ in this paper can not distinguish between a market power hypothesis and a contracting hypothesis.

Since investors can take advantage of both downturns and upturns in the market, we expect that non-certified rating agencies would be equally responsive to both good and bad news and incorporate them symmetrically into their bond ratings. Accordingly, we predict a symmetric

response to information for upgrades and downgrades consistent with the loss function of the non-certified agency and its clients. However, the process for certified agencies can be more complicated. Prior literature has argued that in their role as regulators rating agencies may have an asymmetric loss function (Watts, 1977; Holthausen and Leftwich, 1986; Watts, 2003) in that they have more incentive to downgrade than to upgrade. Thus, we expect certified agencies to react to bad news faster than good news, i.e., we expect them to be faster to downgrade than to upgrade. All the above leads to the following hypotheses:

H2a: The rating changes of non-certified agencies are symmetrical with respect to positive and negative information.

H2b: The rating changes of certified agencies are asymmetrical and will incorporate negative information in bond ratings sooner than positive information.

The interaction between H1 and H2 is potentially very interesting. H1 predicts that non-certified agencies will lead certified agencies. In H2, we expect certified agencies to be timelier with respect to bad news relative to good news when compared *to themselves*. However, the question still arises as to whether certified agencies will be as timely as non-certified agencies when there is bad news suggesting a downgrade. It is difficult to make an *ex-ante* prediction on this matter and accordingly we have chosen not to make a formal hypothesis here, but rather explore the issue descriptively with the data.

The boundary between investment grade and non-investment grade is a critical point in the distribution of ratings. Contracts are written and have clauses that pertain directly to this cutoff. Because of the reasons discussed above, a downgrade below investment grade by a certified agency may have real economic consequences to the issuer such as mandatory sales by bond portfolio managers, the triggering of debt foreclosures (loan covenants), or increases in interest rates on performance pricing contracts (Doyle, 2004). Therefore, we expect that for certified agencies, the

investment/non-investment grade distinction is an important point on the rating distribution. As a result, we expect the behavior of rating changes will be different around this point when compared to other points on the rating distribution.[8] We predict that certified rating agencies will be slower to downgrade below investment grade as compared to other points in the distribution, but non-certified agencies will not change their rating change behavior at this point in the rating distribution. To non-certified agencies this cutoff point should have fewer consequences since they are giving investment advice, and as such the rating changes through this point could be seen as merely discrete points on a continuum of default probabilities. A movement from investment grade to non-investment grade (or vice versa) should not be any more critical than the move to and from any other point in the distribution. This discussion leads to the following hypotheses:

H3a: Certified agencies will be slower to change a firm's rating to below investment grade compared to other points in the rating distribution.

H3b: Non-certified agencies will have no difference in the speed of rating changes to below investment grade compared to other points in the rating distribution.

3.2 Empirical Methodology

To test the hypotheses above, we employ four different tests: (1) We investigate timeliness using Granger Causality tests to statistically test the inferences of relative timeliness between the two rating agencies. (2) We examine stock market returns over both short and long windows as proxies for the arrival of information. (3) We examine bond yields on the day of a bond issue to explore whether the information in the various ratings is associated with how bond market

[8] Discussions with officials at Moody's bear this out. There is real consideration made about the consequences of such a downgrade to a firm. For example, there is the possibility that the very act of downgrading a security to non-investment grade could force an otherwise viable going concern into bankruptcy. Dynegy's proposed takeover of Enron was conditional on Enron maintaining an investment-grade debt rating. One possible alternative to actual downgrading is to put firms on "Credit Watch" (Hand, Holthausen, and Leftwich, 1992).

participants price default risk. (4) We look at descriptive statistics, including distributional tests where we explore the shape of the distribution and the respective percentage of observations by rating category for each agency. Because our tests do not clearly map to a particular hypothesis, we summarize how they relate to our hypotheses below:

Hypothesis:	**Empirical Tests:**
H1a: Non-certified leading certified	1) Timeliness tests
H1b: Non-certified capturing information sooner	2) Stock Return tests, 3) Bond Yield tests
H2a: Non-certified reflecting information symmetrically	1) Timeliness tests, 2) Stock Return tests, 3) Bond Yield tests
H2b: Certified reflecting information asymmetrically	1)Timeliness tests, 2) Stock Return tests, 3) Bond Yield tests
H3a: Certified slow below investment grade	4) Descriptive statistics
H3b: Non-certified indifferent across investment grade	4) Descriptive statistics

3.2.1 Timeliness Tests

Hypotheses H1a, H2a, and H2b, relate to the timeliness of the rating changes *within* and *across* bond-rating agencies. Our first test examines whether one agency is timelier than the other. We rely on Granger Causality (Granger, 1969) tests to assess whether the non-certified agency leads the certified agency as predicted by H1. In addition, this empirical methodology allows us to determine whether there is a difference between the lead for upgrades versus the lead for downgrades for certified agencies as predicted by H2. Though this test cannot determine true causality, it does help determine whether a change by one rating agency can help predict a change by the other, and vice-versa (i.e., the existence and direction of any *temporal* relationship). We estimate two logistic regression models for both upgrades and downgrades, one for EJR and one for Moody's. Our two dependent variables of interest are indicator variables, $EJRDown_t$ and $MDDown_t$ which take on the value of 1 if there has been a downgrade by EJR or Moody's in month t and 0

otherwise. *EJRUp* and *MDUp* are defined similarly for upgrades. The unrestricted model includes lagged values of the dependent variable up to six months prior to the downgrade as well as the other firm's lagged indicator variables, resulting in the following models:[9]

$$EJRDown_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRDown_{t-j} + \sum_{j=1}^{6} \beta_j MDDown_{t-j} + \varepsilon_t \quad (1)$$

$$MDDown_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRDown_{t-j} + \sum_{j=1}^{6} \beta_j MDDown_{t-j} + \varepsilon_t \quad (2)$$

$$EJRUp_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRUp_{t-j} + \sum_{j=1}^{6} \beta_j MDUp_{t-j} + \varepsilon_t \quad (3)$$

$$MDUp_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRUp_{t-j} + \sum_{j=1}^{6} \beta_j MDUp_{t-j} + \varepsilon_t \quad (4)$$

If Moody's bond rating changes *Granger Cause* EJR changes, then we would expect the β coefficients in equations (1) and (3) to be positive and significant. Conversely, if EJR is leading Moody's rating changes, we would expect the α coefficients in equation (2) and (4) to be positive and significant. H1a states that the ratings of non-certified agencies will generally lead those of the certified agency. Therefore, we predict that the α coefficients in equations (2) and (4) should be positive and significant and the F-statistic (discussed below) should be significant, indicating that EJR is incremental to Moody's in predicting future Moody's changes. Furthermore, H2b states that certified agencies are asymmetric in their response to information, reflecting negative information in their ratings sooner than positive information. This suggests that EJR will lead Moody's by a longer time for upgrades as compared to downgrades. Thus, the α coefficients in equation (4) should be significant for longer lags than the α coefficients in equation (2). Finally, prior literature has found serial autocorrelation in downgrades but not in upgrades, i.e., once a firm has been

[9] Granger Causality tests can be sensitive to the length of the lag included in the models. Therefore, we estimate the analysis including up to 10 lags with no difference in inferences drawn from the tests.

downgraded there is a tendency for it to be followed by a second downgrade (e.g., Altman and Kao, 1992a; Altman and Kao, 1992b; Christensen, Hansen, and Lando, 2004). Therefore, we predict the α coefficients in equation (1) and β coefficients in equation (2) to be positive and significant, reflecting this serial autocorrelation. In addition, we predict the α coefficient in equation (3) and β coefficients in equation (4) to be insignificant.

We test for Granger Causality by calculating an F-statistic that compares the explanatory power of the unrestricted model to the explanatory model of the restricted model, where the restricted model is the dependent variable regressed on only the lagged six dependent variables.[10] In equation (1), for example, the model is estimated with only the α (lagged EJR rating changes) coefficients (the *restricted* model). Then the full (unrestricted) model is estimated including the β (lagged Moody's rating changes) coefficients. Statistical significance of the Granger F-statistic indicates that the explanatory variables Granger Cause the dependent variable (e.g., Moody's downgrades Granger Cause EJR downgrades in equation (1)).

3.2.2 Stock Return Tests

Our premise is that stock market returns capture the release of public information in a timely manner. Although the tests above describe how the two rating agencies relate to one another, they do not capture what is happening in the overall marketplace of information. Thus, stock return tests can be used to make inferences about the timeliness of rating changes with respect to information

[10] The F-statistic is calculated as follows: $F = \dfrac{\left(RSS_R - RSS_{UR}\right)/m}{RSS_{UR}/\left(n-k\right)}$ where RSS_R is the residual sum of squares from the restricted model, RSS_{UR} is the residual sum of squares from the unrestricted model, m is equal to the number of lagged terms, k is the number of parameters estimated in the unrestricted regressions, and n is sample size (Granger, 1969).

that is relevant for pricing equity securities. Thus, we conduct a series of stock return tests in this study to provide evidence relating to H1b, H2a, and H2b. [11]

Our first return test examines short-window abnormal returns around both Moody's and EJR rating changes and sheds light on H1b. Large abnormal returns in the same direction as the change imply that the rating agency is timely because it is making a ratings change at the time the stock market is receiving new information about the firm.[12] We calculate the announcement return using a short window (three-day period beginning one day before the rating announcement and ending one day after) around the rating announcement date by either EJR or Moody's. We predict that since non-certified bond ratings agencies primarily provide services to investors, their ratings will be timelier and therefore more highly correlated with contemporaneous stock returns.

Next, we look at longer window stock return tests that compare the stock returns before upgrades and downgrades. In the spirit of Ball and Brown (1968), we examine the past realized returns after conditioning *ex-post* on the outcome of the change in rating by the bond-rating agency. We examine the change in stock price *preceding* upgrades and downgrades from both EJR and Moody's. We argue that the bond-rating agency that has the larger association with movements in the stock price captures more relevant information, making their bond rating changes more responsive to investors. Consistent with H2a and H2b, we expect symmetrical treatment of

[11] However, one could argue that returns measure good news for stockholders but not for bondholders. This does not appear to be a serious concern for several reasons. First, several authors argued that stockholder-bondholder conflicts are typically small and pertain largely to distressed firms (Parrino and Weisbach, 1999). Confirming this intuition, empirical studies found that bond-rating changes are positively associated with changes in stock prices (e.g., Holthausen and Leftwich, 1986; Dichev and Piotroski, 2001; Hotchkiss and Ronen, 2002). Finally, a primary reason for rating bonds is to assess the probability of bankruptcy, and several studies argued that stock returns are a significant predictor of bankruptcy (Watts and Zimmerman, 1986, p. 116; Shumway, 2001). Additionally, we could look at the association between ratings changes and bond returns. Unfortunately, bond returns are extremely difficult to work with empirically due to issues about database reliability (Goodhart and O'Hara, 1997; Hotchkiss and Ronen, 2002). Therefore, we focus our tests on the association with stock returns in this section and examine bond yields in the next section.

[12] Of course, an alternative explanation is that the bond rating change is an information event in itself. This is plausible for Moody's but not as plausible for EJR's ratings.

information by non-certified agencies and an asymmetrical use of positive and negative information by certified agencies.

3.2.3 Bond Yield Tests

Finally, we explore the association between bond ratings and bond yields because stock returns may not necessarily map into debt security prices. Like bond ratings, bond yields capture the market's assessment of the probability of default. Thus, bond yields and ratings should be positively associated. Similar to our stock return tests we assume that bond yields capture all publicly available information in a timely manner. H1b predicts that non-certified ratings reflect this information sooner than certified agency's rating changes. Therefore, we expect EJR ratings to have closer associations with the bond yields. Specifically, the bond yield tests give us some insight into how closely related the various rating agencies' bond ratings are to the yield of a given debt security at the time of the bond issuance. The advantage of these tests is that they examine the pricing of debt (versus equity in the stock returns above) and give a better picture of how bond ratings reflect default risk, which is ultimately what bond yields capture.

We examine the *Treasury Spread* for every bond issuance, which is defined as the difference between the issue's offering yield and the yield on a benchmark treasury security expressed in basis points. This serves as the dependent variable in our regressions. The benchmark treasury is chosen as a corresponding U.S. treasury bond with similar duration and maturity as the bond issuance by the firm in our sample. This yield spread, also called the risk premium, ultimately measures the default risk of the bond (Fisher, 1959) and should be explained by bond ratings.[13] We estimate regressions with *Treasury Spread* as the dependent variable and either EJR's or Moody's bond rating as the independent variable. Since yields jump significantly based on whether the bond is deemed a "junk bond" (i.e., below investment grade), we include an indicator variable

[13] Note that subtracting the treasuries yield with similar duration and maturity controls for most interest rate risk.

(*Junk_Indicator*) which takes the value of one if the rating is below investment grade and zero otherwise. Movements in ratings may have a different effect on yield below investment grade (i.e., different slope). Therefore, we include an interactive term (e.g., *EJR_Rating * Junk_Indicator*) to capture any differential slope effect. Finally, we re-estimate the yield after partitioning our sample into two separate sub-samples of either investment or non-investment grade ratings.

We also select a number of additional explanatory control variables based on prior research of corporate bond yields. These studies typically explain bond yields in terms of *issue* characteristics (Fisher, 1959; Horrigan, 1966; West, 1970; Kaplan and Urwitz, 1979; Sorensen, 1979; Fung and Rudd, 1986; Ziebart and Reiter, 1992):

Name:	**Description:**
Enhance	A flag indicating the issue has credit enhancements.
Offering Amount	The log of the par value of the debt initially issued (in millions of dollars).
Shelf	A flag indicating whether this is a shelf registration. On short notice, the issuer may take securities off the shelf and offer them to the public.
Call	A flag indicating that the issue is callable on a pre-determined schedule.
Put	A flag indicating that the bondholder has the option, but not the obligation, to sell the security back to the issuer under certain circumstances.
Redeem	A flag indicating that the bond is redeemable under certain circumstances.
Years to Maturity	The number of years to maturity of debt.

In addition to the above-mentioned issue characteristics, following Blume et al. (1998) and Campbell and Taksler (2003), we also control for the following *issuer* characteristics:

Name:	Description:
Pre-Tax Interest Coverage	[Operating income (178) + interest expense (15)] / [interest expense (15)].
Debt Ratio	Long-Term Debt (LTD) (9) / Total Assets (6).
Margin	Operating Income (178) / Sales (12).
Debt to Total Capitalization	LTD (9) / [LTD (9) + Market Value of Equity (199) x (25)].
Market to Book Ratio	Market Value of Equity / Book Value of Equity (60).
Total Assets	Firm's total assets (6).

4. Sample Selection

Following prior studies, such as Holthausen and Leftwich (1986) and Dichev and Piotroski (2001), that viewed existing major credit rating agencies as relatively homogenous, we use Moody's as our representative certified credit rating agency. However, choosing the best non-certified firm is less straight forward. The set of entrants is not very large (they include A.M. Best Company, EJR and Lace Financial [Association for Financial Professionals, 2002]). We use Egan Jones Rating Company (EJR) as our representative non-certified credit rating agency for several reasons. First, unlike other independent bond rating firms that specialize in particular industries, EJR covers and rates a broad range of companies in the industrial, financial, and service sectors. Second, EJR participated in both the credit rating agency hearings in Congress and at the SEC; moreover, EJR ratings have received extensive coverage in the media, including positive reviews in *The New York Times*, *Fortune* and *Investment Dealers Digest.* Finally, EJR ratings are publicly available. EJR is willing to provide any available rating for a firm upon request. In addition, they also have a subscription service on Bloomberg that is available to their clients and includes not only their

ratings, but also detailed analyses of the firms they rate. EJR kindly granted our request for access to their ratings via the Bloomberg subscription service.

The sample covers the senior unsecured credit rating *changes* made by either Moody's or EJR for the period July 1996 through June 2002. We started with July 1996 because of the limited number of ratings provided by EJR before this time. We hand-collected the EJR bond ratings from Bloomberg, which resulted in 10,458 EJR observations (see Table 1 for a reconciliation of the data used in the study). Over this period EJR provided several different types of ratings: initial rating (the first rating by EJR), upgrades, downgrades, 'affirms' (confirming the existing rating), and 'drops' (indicating coverage ceased). In this study, we focus only on rating changes and accordingly delete initial ratings, 'affirms', and 'drops', since they do not represent a rating change by EJR. Their ratings follow a scheme similar to that of S&P. We assigned a numerical value to each rating as follows: AAA = 1, AA+ = 2, AA = 3, AA- = 4 A+ = 5 A = 6 A- = 7 BBB+ = 8, BBB = 9, BBB- = 10, BB+ = 11, BB = 12, BB- = 13, B+ = 14, B = 15, B- = 16, CCC+ = 17, CCC = 18, CCC- = 19, CC = 20, C = 21, D = 22.

We obtained Moody's credit rating changes for senior unsecured debt from the Moody's Corporate Bond Default Database.[14] There are 16,873 senior unsecured initial ratings and ratings changes available for Moody's from this source. We removed all initial ratings and all ratings changes prior to the first EJR observation to ensure that observations are over similar time periods. To ensure consistency between the debt rating services, we assigned numerical values to the Moody's debt ratings as follows: Aaa = 1, Aa1 = 2, Aa2 = 3, Aa3 = 4, A1 = 5, A2 = 6, A3 = 7, Baa1 = 8, Baa2 = 9, Baa3 = 10, Ba1= 11, Ba2 =12, Ba3 = 13, B1 = 14, B2 = 15, B3 = 16, Caa1 = 17,

[14] Although this database is entitled "Moody's Corporate Bond Default Database," it also contains, among other things, the history of all rating changes for senior unsecured ratings made by Moody's.

Caa2 = 18, Caa3 = 19, Ca = 20, C = 21. Note that investment grade is a rating of 10 or higher under both Moody's and EJR's rating schemes.

We obtained financial statement data from the *Compustat* annual database. The financial variables are as follows: Sales (Compustat item # 12); Total assets (Compustat item # 6); Market value of equity (MVE) = # of shares outstanding * price at the end of the year (Compustat item # 25 * Compustat item # 199); and Net income (Compustat item # 18). Many observations in the EJR sample and the Moody's sample are of subsidiaries of larger firms. Since these subsidiaries do not have financial statement data available on *Compustat*, the available sample of rating changes was further reduced to 12,818 observations. Removing all of Moody's observations before the sample begins results in a starting point of 2,724 rating changes with all available information (*All Firms Rated Sample*) from 1996 to 2002 (1,902 are EJR changes and 822 are Moody's changes). Panel B of Table 1 indicates that the 2,724 observations in the *All Firms Rated Sample* equates to 1,928 firm-year observations (1,243 are EJR's and 685 are Moody's).[15] We examine this sample in our preliminary descriptives to see if we can identify systematic differences between the firms rated by Moody's and those rated by EJR.

Finally, we delete firms that are covered by Moody's but not covered by EJR or covered by EJR but not by Moody's, resulting in a loss of 198 observations and 163 firm-year observations. This sample (*Firms Rated by Both Sample*s), comprised of 2,526 observations and 1,369 firm-year observations, is our sample for the tests described above. Because systematic differences may exist between the firms EJR is asked to rate and the ones that Moody's rates, we restrict our analysis of the hypotheses to this final sample to ensure consistency.

[15] Note that there can be multiple movements by either EJR or Moody's in a given year whereas there will only be one firm-year observation.

The stock return tests require data from the *CRSP* daily stock return files, which reduces the sample from 2,526 to 2,303 observations (see Table 1). We measure stock returns using compounded buy-and-hold returns, inclusive of dividends and other distributions. We calculate market-adjusted returns by deducting the corresponding return on a value-weighted market portfolio.

In the bond yield tests, we use data from *The Fixed Investment Securities Database* (FISD) and examine the risk premium of newly issued bonds. This database provides key characteristics on every publicly traded bond issuance for the firms in our sample during the sample period. For these tests, we require firms to have had a senior unsecured bond issue during the period since our sample of ratings is only for senior unsecured debt. When we merge this data-set with our current sample of firms, we further reduce the sample to 1,278 observations.

5. Results

5.1 Descriptive Statistics

Panel A of Table 2 presents descriptive statistics for the *All Firms Rated Sample* that is comprised of firms that had rating changes by either Moody's or EJR during the sample period. The firms that EJR rates are, on average, slightly larger than the firms rated by Moody's in the sample period; market value of equity and net income are both significantly different between EJR and Moody's at the 5% level or better. This is to be expected and is consistent with Moody's quasi-regulatory role of rating all firms with public debt, while EJR only rates firms requested by their client base, i.e., there appears to be a clientele effect for the firms rated by EJR. Because of these possible differences in the sample, we restrict our analysis and tests only to firms that are rated by both agencies. Panel B of Table 2 presents the descriptive statistics for firms that are rated by both credit rating agencies *(Firms Rated by Both Sample).* A few statistics stand out. EJR makes on

average 1.96 changes per firm compared with Moody's 0.61 rating changes per firm, which is consistent with EJR being more active than Moody's and descriptively lending support for H1a and H1b.[16] Non-certified agencies such as EJR are responding to public information. New information about firms is constantly disclosed, and we would expect EJR to make more rating changes on average than Moody's makes in response to this new information. Moody's changes appear to be more reserved and could be signaling a more cautious approach to rating changes due to their conservative nature. Alternatively, Moody's market power may also make them unresponsive to investors.

Table 3 presents the distribution of ratings for the two credit rating agencies. Panel A presents the summary statistics for the *Firms Rated by Both* sample. The mean rating for all firms with rating changes by EJR is 10.22; interestingly, the mean rating for all firms with rating changes by Moody's is slightly higher (indicating a lower average bond rating) at 11.67, which corresponds to non-investment grade. This indicates that for the same firms and over the same period, Moody's tends to rate the firms lower than EJR, which is consistent with H2 that certified agencies provide more conservative ratings. Panel B shows the detailed number of ratings by EJR and Moody's for each bond rating. In the last two columns, cumulative percentages are presented. Note that at the investment grade cutoff (10 and higher), Moody's has a smaller percentage of total ratings in this region at 41.9% versus EJR's 52.1%. This is again consistent with more conservatism in Moody's ratings.[17]

Figure 1 graphically compares the distributions of the two credit rating agencies. Panel A of Figure 1 shows the distribution of EJR's ratings. EJR has a larger proportion of observations in the investment grade ratings (rates 1-10). It is also interesting to note that the rating bins are relatively

[16] This difference is statistically significant at the 1% level.
[17] An alternative explanation is that EJR is more active for firms with better credit ratings. In untabulated tests, we find no evidence for this explanation.

smooth around the investment/non-investment grade cutoff. These results suggest that this cutoff is not generally considered by EJR in deciding upon their ratings. Panel B of Figure 1 shows the distribution of Moody's ratings. Here there is a pronounced "kink" right at the investment grade cutoff. There appears to be a large number of observations directly before the cutoff, and a drop-off in the number of observations directly after the cutoff. Similar to Burgstahler and Dichev (1997), we statistically test the smoothness of the distribution and find in untabulated results that the difference is significant for Moody's but insignificant for EJR.[18] This supports H3, that investment grade to non-investment grade is an important consideration in the distribution for certified agencies but not for non-certified agencies.

Table 4 presents descriptive statistics rating changes for the final sample. We have 2,526 rate changes during the period (697 for Moody's and 1,829 for EJR). Consistent with prior research (Blume, Lim, and MacKinlay, 1998; Jewell and Livingston, 1998), both agencies have significantly more downgrades than upgrades across both panels of Table 4. In Panel A, both Moody's and EJR have similar percentages of downgrades (73% for Moody's and 67% for EJR) with Moody's percentages slightly higher. Once again, this appears to be consistent with H2 in indicating a more timely incorporation of negative information by certified rating agencies. Panel B presents the same information around the investment grade cutoff. Interestingly, EJR's proportions remain constant around investment grade (32% upgrade and 68% downgrade). However, Moody's has a higher proportion of upgrades to downgrades when the change straddles investment grade (downgrades

[18] Specifically, our definition of smoothness is that the expected number of observations in any given interval of the distribution is the average of the number of observations in the two immediately adjacent intervals. The test statistic used to test the null hypothesis that the distribution is smooth is the difference between the actual number of observations in an interval and the expected number of observations in the interval, divided by the estimated standard deviation of the difference calculated in the same fashion as Burgstahler and Dichev (1997). In untabulated results, we find that the Moody's interval corresponding to a "10" bond rating is statistically higher than would be expected and the interval corresponding to "11" is statistically lower than would be expected. For EJR, the difference for either interval is statistically insignificant. Note that unlike Burgstahler and Dichev (1997), we do not argue that there is any kind of "management" at this kink.

drop to only 56% as compared to 73% in Panel A). This change in the proportion of upgrades to downgrades is consistent with H3.[19] The rating change behavior of Moody's appears to change around this crucial point in the distribution, i.e., Moody's appears to be more reluctant to downgrade when the downgrade entails a drop to below investment grade.

5.2 Timeliness Results

We now turn to our Granger Causality tests of timeliness to determine which agency leads and which agency follows. Table 5 presents the results of the Granger Causality tests with Panel A presenting the downgrade tests and Panel B the upgrades. The first column of Panel A regresses EJR Downgrades ($EJRDown_t$) on lagged EJR downgrades indicators and lagged Moody downgrades indictors. Consistent with our predictions, none of the Moody Downgrade indicator variables are statistically significant. Thus, a Moody's downgrade does not Granger cause an EJR downgrade after controlling for the lagged EJR downgrade indicators. Consistent with this, the F-statistic rejects the null that Moody's downgrades Granger cause EJR downgrades.

The second column of Panel A tests whether an EJR downgrade Granger causes a Moody's downgrade. Consistent with our predictions, EJR downgrade indicators are significant at the 1% level from one to four months prior to a Moody's downgrade after controlling for the lagged value of Moody's downgrades indicating that EJR leads Moody's by between one to four months in downgrades. The monotonic decrease in the magnitude of the coefficients suggests that the probability of a Moody's downgrade following an EJR downgrade decreases over time. Further, the Granger F-statistic is significant, indicating that an EJR rating downgrade Granger causes a Moody's downgrade. Thus, the addition of EJR variables in the unrestricted equation significantly improves the forecasting of Moody's downgrades above and beyond its own lagged values

[19] Untabulated Chi-square tests indicate that this difference is statistically significant.

(restricted equation). This evidence supports H1a and is consistent with EJR leading Moody's with respect to downgrades. We find no evidence of serial autocorrelation in the EJR downgrades indicators in equation (1) and limited evidence of such correlation in equation (2): only one lagged variable for Moody's downgrades (lag 6) is significant.

Panel B presents the results of the upgrade tests. Similar to the downgrade tests and consistent with our predictions, the first column indicates that adding Moody's upgrade indicators does not significantly increase the forecasting ability of the model to predict $EJRUP_t$ since none of the bolded Moody coefficients are significant and the Granger F-statistic is insignificant. The coefficients on lags five and six of the EJR upgrade indicators are significant in equation (4) (both with p-values of 0.00). In addition, the F-statistic is significant, suggesting EJR upgrades Granger cause Moody's upgrades. These results support our predictions in H1a. Consistent with prior literature, we find no evidence of serial autocorrelation for Moody's upgrades.

We have hypothesized that differences in the timeliness of rating changes is consistent with a *clientele* effect, i.e., EJR have one primary constituent, investors, while Moody's must also serve a quasi-regulatory role. Our timeliness results are consistent with this hypothesis. However, we can not rule out a market power hypothesis, i.e., Moody's is not timely simply because they have no incentive to be responsive to investors due to lack of competition.

The Granger Causality tests provide evidence about the response to new information. A comparison of the length of time by which EJR leads Moody's provides evidence in support of H2. In Panel A, EJR leads Moody's by as little as one month and up to four months for downgrades. However in Panel B, the lead time is longer; EJR leads Moody's between five and six months. This supports the proposition in H2 that certified firms will incorporate bad news into ratings faster than

they will good news. This is consistent with Moody's stated position as being slower on upgrades but faster to downgrade.[20]

5.3 Stock Return Tests

Panel A of Table 6 reports the abnormal returns in a short window around the rating change announcement by both credit rating agencies. There is a negative mean adjusted market return to the announcement of a Moody's downgrade of –2.78% and no significant return to the announcement of an upgrade. This is consistent with Holthausen and Leftwich (1986), who found that bond rating changes by Moody's are information events for the stock market and that abnormal returns exist for downgrades but not for upgrades. We find that the mean abnormal market return to the announcement of both downgrades and upgrades by EJR are significant at –6.07% and 3.83%, respectively, and that they are significantly larger than the returns for Moody's (Panel B). EJR thus appears to change its rating at the same time that new information about the firm is released to the market. To the extent the market reacts to new information in a timely manner, this suggests that EJR is timelier to investors who rely on their reports and is consistent with H1b.

To further explore the short window return, we examine abnormal returns around EJR ratings changes for day –1, day 0, and day +1 individually. Table 6, Panel A presents the results. For EJR downgrades, day –1 and day 0 returns are much larger (in absolute magnitude) than day +1 returns (–1.45%, –4.40%, and –0.47% respectively), suggesting that the market receives substantial information in the days (or hours) preceding the EJR announcement. Likewise, the returns for Moody's are also larger in days –1 and 0 compared to day +1.

We now move to the longer-window past stock return tests. The buy and hold returns end when either EJR or Moody's makes a bond rating change and begins up to 12 months prior to that

[20] In untabulated results, we increase the number of lags to 10 months and find substantially similar results.

date. Table 7, Panel B reports these results along with their statistical significance. H2 states that certified agencies are asymmetric in their response to news but that non-certified agencies will respond equally to good and bad news. Therefore, we expect to see an asymmetry in long window returns for Moody's but no such asymmetry for EJR.

The first column simply repeats the results from panel A of the announcement window (day –1 through day +1) for comparison purposes. These results show that all the three-day returns are statistically significant at the 1% level, with the exception of Moody's upgrades (as indicated by **), and that the returns are statistically different from one another (as indicated by the p-values below). Looking at the return in the 10 days prior (day –11 through day –1), we find that there is a negative abnormal return for EJR downgrades of –9.4% compared with only –4.05% for Moody's downgrades, showing that the EJR downgrade is accompanied by more negative information about the firm in the stock market (this difference is statistically significant). These results are consistent with the prediction that EJR bond rating changes are more timely; they are associated with a greater release of negative contemporaneous information. The upgrades mirror these results. In the 13-day period leading up to and around an EJR upgrade, the stock price increases about 11.3% (compound return between 3.8% and 7.25%) on average, whereas the stock price is actually slightly negative for the Moody's upgrades (-0.41% + 0.24%). Thus, Moody's upgrades do not appear to be associated with any positive news about the firm, lending support to the prediction that they also do not upgrade on a timely basis.

We find similar results over the six months prior to the start of the announcement window. EJR's negative return before downgrades is –21.99%, which is slightly larger than Moody's at –19.08% (statistical difference with a p-value of .0707). The results are even more extreme for the upgrades where EJR upgrades are preceded by an abnormal positive return of 24.87%, whereas they are only 4.14% for Moody's. One obvious inference from these findings is that Moody's is more

timely and reactive in the case of negative information and updates its ratings more rapidly for downgrades, which is consistent with H2. However, when the window moves out to a full year before the downgrade, EJR and Moody's are now almost identical at –27.38% and –30.48% respectively, and are not statistically different.

The same story is echoed in Figure 2 where we graphically plot the returns for the three months *prior* to the bond rating change conditional on the direction of the change and on the firm. Since we are interested in timeliness and the response to information, this graph gives us a sense of the nature of information being released about the firm in the months prior to the bond rating change. For bond upgrades, note that Moody's firms hover around zero, indicating that the upgrade by Moody's is not associated with any contemporaneous release of positive information in the marketplace over the three months prior to Moody's rating change. Firms with an EJR upgrade show a considerable increase in stock price over the three months prior to the change in bond rating, consistent with the ratings capturing more timely (positive) information that is relevant to the stock market.

The downgrade side of the graph exhibits interesting differences. Both EJR and Moody's are strongly associated with large-magnitude stock returns prior to a downgrade. Thus, there appears to be strong asymmetry in the return pattern between upgrades and downgrades for Moody's but not for EJR. Several things can explain this. First, if Moody's puts firms on a negative credit watch, this might cause a negative reaction in the stock price (Hand, Holthausen, and Leftwich, 1992). The graph also is consistent with Moody's having a more timely response to negative information about a firm than to positive information, consistent with its role in informing those who use its bond ratings about an increased likelihood of default and bankruptcy. Moody's ratings may not be intended to indicate when a firm is undervalued or a "good deal," but rather is meant to protect users of their ratings on the downside.

Assuming an overall efficient stock market, our interpretation of these results is that, relative to EJR, Moody's waits until a substantial amount of information is released (indicating that there has been a permanent change in the firm's credit status) before changing a rating and is more conservative, i.e., has a higher standard of reporting good news, which is consistent with its contracting role.

5.4 Bond Yield Tests

Next we look at the association between bond rating changes and yields. As described earlier, we use a sample of firms issuing senior unsecured bonds during the sample period to test our predictions. Table 7 presents a descriptive table of this bond issuance sample. For ease of comparison, we have compressed +/– ratings into one, e.g., AA– (numerical rating equal to 2) and AA+ (numerical rating equal to 4) would both be compressed to AA (numerical rating 2-4). There were no bond issues at rating levels 21-22. The bold diagonal is when the two bond rating agencies agree. For example, of the 151 bond issuances where Moody's gave a bond numerical rating of 2-4, EJR agreed 118 times. In 33 instances, however, EJR disagreed and gave a lower bond rating of only 5-7. The highest proportion of disagreements between the two firms happens for non-investment grade bond issues (a rating of 11 or higher). There are a total of 334 bond issuances rated non-investment grade by Moody's (153+171+10). Moody's and EJR disagree for 119 of these issues. Moreover, Moody's issues a lower rating than EJR for 100 issues (43+46+3+8), suggesting that for bonds with lower ratings (non-investment grade), Moody's is more conservative in its ratings. This descriptive result is consistent with conservatism arguments made by Watts (1977) that these agencies are more focused on capturing downside risk, and provides evidence consistent with H3.

Table 8 presents the results for the bond yield tests. Recall that the dependent variable in this regression is the *Treasury Spread* (measured as the difference between the issue's offering yield and the yield on a benchmark treasury security expressed in basis points. The benchmark treasury is chosen as a corresponding U.S. treasury bond with similar duration and maturity as the bond issuance by the firm in our sample). Therefore, the coefficients can be interpreted as the average change in the yield for the issue (expressed in basis points) for a one-unit change in the independent variable. H1b predicts that non-certified agencies are timelier than certified agencies. To the extent that excess yield over treasury on the day of the bond issue is a good proxy for publicly available information, this hypothesis implies that EJR ratings are more closely aligned with the spread than are Moody's ratings.

Model 1 shows the EJR bond rating along with the *Junk Indicator*, the interaction term, and the issue control variables. The explanatory power is strong, showing an adjusted R^2 of 61.56%, which indicates that the bond rating does a good job of explaining the default risk in the *Treasury Spread* dependent variable. We see that the bond rating term is positive, indicating that higher yields are required for bonds with higher ratings (riskier), consistent with intuition and basic economic theory (Fisher, 1959).[21] For example, each EJR rating level adds approximately 14.6 basis points to the yield. This jumps to an average of 34.23 (14.60 + 19.63) basis points when the bond issued is non-investment grade. In model 2 we substitute the Moody's ratings for EJR ratings and find similar results. The adjusted R^2 is slightly higher at 62.42%, but this is not an economically meaningful difference. Overall, the result of models 1 and 2 provide evidence that the ratings of both agencies incorporate publicly available information. However, we cannot yet distinguish which agency is timelier. Therefore, we include both variables in the same regression in model 3 as well as

[21] Note the *Junk Indicator* is negative. In unreported tests, without the interaction term, this variable is positive as would be expected. However, when the interaction term between *Junk Indicator* and the bond rating is added to the regression, the estimated coefficient becomes negative.

all issue and issuer control variables. Consistent with H1b, the Moody's bond rating is no longer significant while EJR bond ratings are positive and significant.

Interestingly, an important switch takes place in the non-investment grade ratings in model 3. Note that the *Moody*Junk* indicator variable is significant and *EJR*Junk* is insignificant. To further explore this finding, we split the sample into two sub-samples: (1) non-investment grade ratings (those with ratings 11 or higher) and (2) investment grade ratings (those with ratings of 10 or lower) in models 4 and 5.[22] In the non-investment grade sample (model 4), Moody's ratings are positive and significant while EJR ratings are insignificant. The reverse is true for the investment grade sample (model 5): *Moody Rating* is insignificant and *EJR Rating* is positive and significant. Our results imply that Moody's is timelier than EJR for non-investment grade ratings. Therefore, the timeliness of the ratings of certified firms appears to be impacted by the position of the rating.

6. Conclusion

We argue that the incentives of certified bond rating agencies differ from those of non-certified bond rating agencies. Using several tests we find that the non-certified firm, EJR, is more responsive to and its ratings are more closely associated with investors. On average, EJR's ratings are timelier and lead Moody's ratings, as measured by Granger Causality tests and publicly available information through stock returns. In addition, EJR's ratings appear to incorporate good news and bad news symmetrically. Moody's ratings, on the other hand, appear to be asymmetrically timely with respect to information as measured by stock returns, in that they do a better job of reflecting negative news than they do positive news. However, Moody's ratings are more highly correlated with non-investment-grade bond yields as compared to those of EJR, suggesting that Moody's may be more focused than EJR on the non-investment grade segment of the market.

[22] We estimate the regressions in separate sub-samples because the control variables also may be a function of junk status. An alternative approach would be to include an interaction term between *Junk* and every control variable.

Finally, Moody's ratings downgrades appear to be slower at the critical investment grade cutoff as compared to other Moody's ratings downgrades. Taken together, the results support the notion that Moody's ratings contain properties that are consistent with the contracting use. Specifically, bond ratings by certified firms are used in contracting and accordingly tend to have a more conservative bias, i.e., there is a higher standard of evidence required to report good news. Thus, calls to make bond ratings more timely and useful to investors may be ignoring the roles that certified bond rating agencies play in contracts. A similar parallel may be drawn to regulators pushing accounting toward value-relevance while ignoring its other uses (Watts, 2003).

However, the results of this paper are also consistent with Moody's market power. The certified agencies within the credit rating industry have an effective oligopoly due to various regulations that have developed over time. It is nearly impossible for firms to have a successful bond issue without a certified agency rating. Therefore, Moody's has little incentive from competitive pressures to be responsive to the needs of investors. Proposed legislation has been introduced into Congress that would open up the certified agencies to more competition.[23]

Though we believe we have identified firms that represent their industry segments well, it is always possible that our results are agency-specific and therefore not generalizable. To the degree that the bond rating agencies we have chosen are not representative of all certified or non-certified agencies, then our results may be idiosyncratic. However, prior research has found Moody's to be a good substitute for other certified agencies (e.g., Dichev and Piotroski, 2001). In addition, EJR is widely known for having testified in hearings at Congress and the SEC and has been written about extensively in the financial press. In addition, EJR operates in the highly competitive world of financial intermediation and accordingly we consider EJR to be a representative agency. Our results also could be due to Moody's having been "captured" by their clients (a common accusation made

in the popular press), because Moody's is paid by the firms they rate and this could result in a conflict of interest. Economically, we do not believe this argument can be supported. Moody's has testified that no one single client makes up more than 1.5 percent of its income. In fact, Enron only represented ¼ of 1% of total revenues. Thus, we believe that our results of Moody's ratings are a function of the contracting environment rather than some form of collusion between certified and bond-rating agencies and the firms they rate.

[23] Hearings were being conducted as of early March 2006 by the US Senate Banking Committee to explore the option of introducing more transparency and competition into the bond rating market (Partnoy, 2006).

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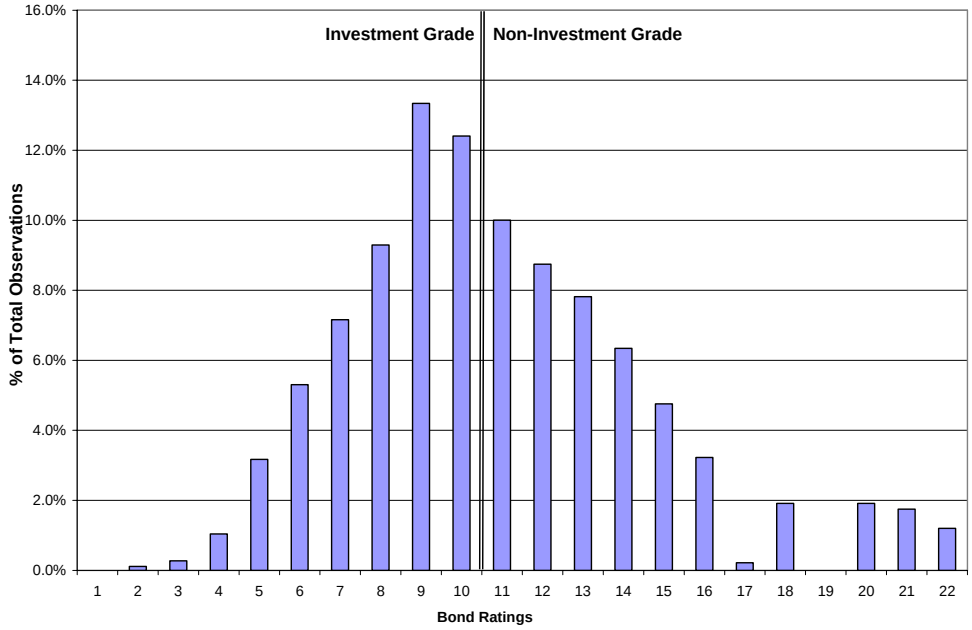
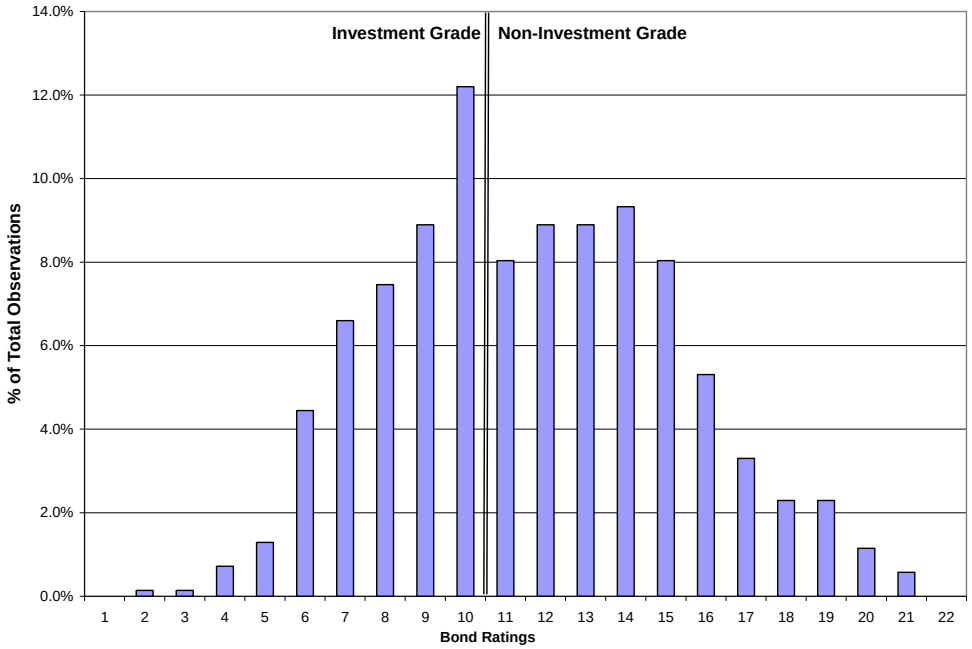
Figure 1
Distribution of Moody and EJR Ratings

Panel A: EJR Ratings



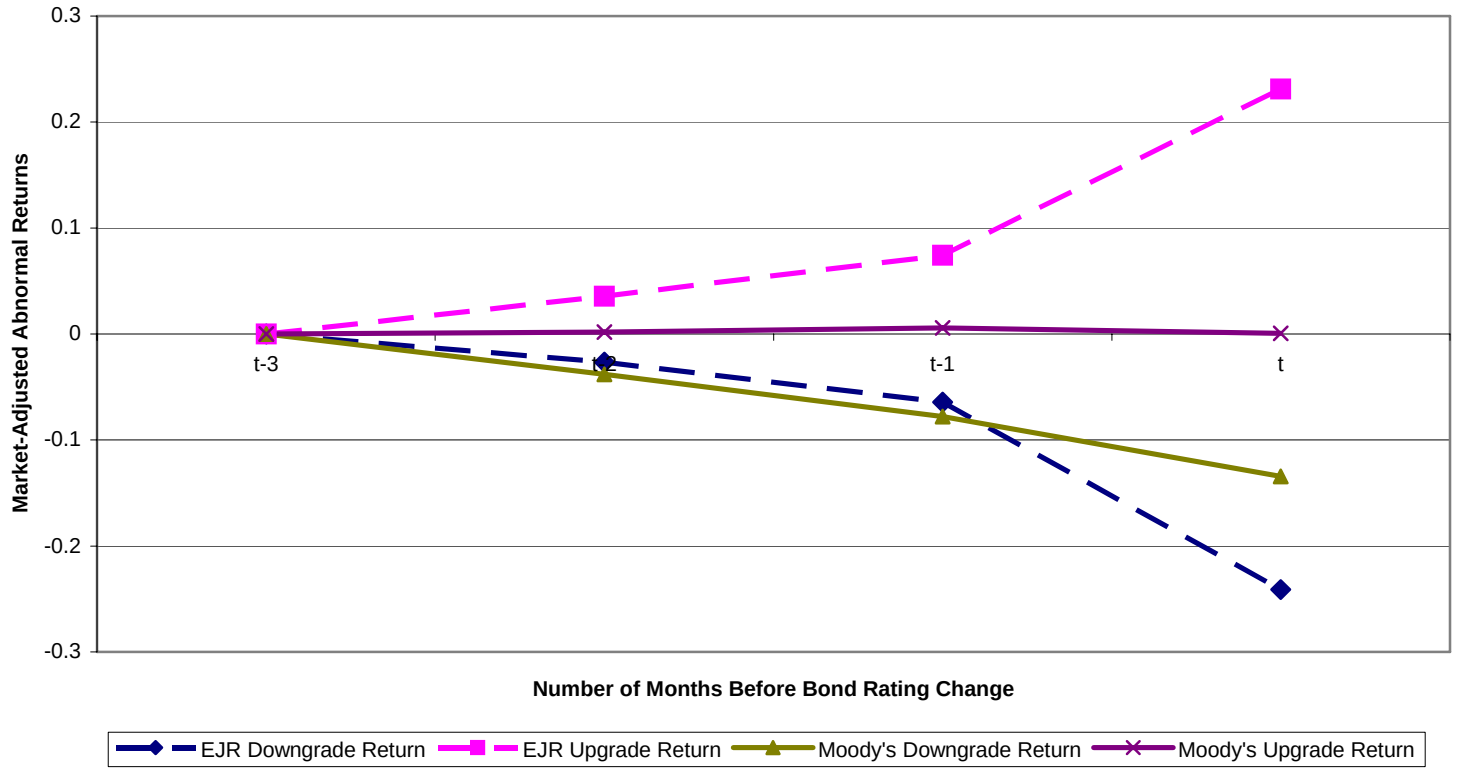
Panel B: Moody's Ratings



Notes: These figures show the bond rating distribution by EJR and Moody's. Each bin represents the percentage of total bond ratings in the respective rating between 1996 and 2002.

Figure 2

Monthly Mean Stock Returns Conditional on Change in Bond Ratings



Notes: This figure shows market-adjusted compound buy-and-hold stock returns, inclusive of dividends for the three months prior to bond rating change from either EJR or Moody's. This figure uses a sample of 2,303 observations.

Table 1

Sample Collection and Reconciliation Detail for the Period 1996-2002
Rating changes represent the change in the senior unsecured debt ratings of the firm

Panel A: Number of Rating Change Observations

	Subtotals	# of Rating Changes Observations	Table & Panel Location
Number of Observations Hand-Collected from EJR between 1996 and 2002 with CUSIP		10,458	
Less: Initial Rates, Affirms, and Drops		(4,973)	
Final EJR Sample		5,485	
Plus: Moody's File		16,873	
Aggregate Sample with Available CUSIPs		22,358	
Aggregate Sample covered in COMPUSTAT[24]		12,818	
Remove all Moody's observations before first observation of EJR & Initial Ratings		(10,094)	
All Firms Rated Sample (comprised of):		**2,724**	
Moody's	822		
EJR	1,902		
Less: Moody's obs not covered by EJR or vice-versa		(198)	
Firms Rated by Both Sample (comprised of):		**2,526**	Table 3, Panels A & B
Moody's	697		Table 4 Panels A
EJR	1,829		Table 5 & 6, Figure 1
Less: Unavailable on CRSP		(223)	
Stock-Return Sample		**2,303**	Table 7 & Figure 2
Less: Unavailable on FISD		(1,025)	
Bond Issuance Sample		**1,278**	Tables 8 & 9

[24] Many of the observations are bond ratings for subsidiaries of larger firms that are not publicly traded self-standing entities. This causes the large reduction in the sample size when requiring *Compustat* data.

Panel B: Number of Firm-Year Observations
Single Annual Observation per CUSIP

	Sub-Totals	# of Firm-Year Observations	Table Location
All Firms Rated Sample (comprised of):		**1,928**	Table 2, Panel A
Moody's	685		
EJR	1,243		
Less: Overlapping Observations[25]		(396)	
Less: EJR obs not covered by Moody's or vice-versa		(163)	
Firms Rated by Both Sample (comprised of):		**1,369**	Table 2, Panel B

All EJR observations were hand-collected from public information available on Bloomberg terminals. All Moody's observations are from the Moody's Corporate Bond Default Database. Initial ratings from both Moody's and EJR are deleted from the sample, thus only changes are used throughout. Also, any Moody's rating changes that precede the first change in EJR are deleted. Only observations that meet these criteria and have available COMPUSTAT information are used in the analysis. The *Firms Rated by Both Sample* drops observations of firm's covered by EJR, but not covered by Moody's and vice-versa. The stock return sample requires the firm to have returns data available on CRSP. The bond issuance sample requires the firm to have issued a senior unsecured bond during the period of our sample and to be included on the Fixed Investments Securities Database (FISD).

[25] Comprised of firm-year observations where both EJR and Moody's have an observation in the same year. In these cases, when the samples are combined, the firm's CUSIP needs to be selected only once to pull the annual *Compustat* financial information.

Table 2

Descriptive Statistics on the *All Firms Rated Sample* and *Firms Rated by Both Sample* Using Only One Observation per Firm per Year

Panel A: *All Firms Rated* Sample

		Moody's	EJR	Total
Firm-year Observations	**N**	**685**	**1,243**	**1,928**
Sales (in millions)	Mean	$6,349	$6,772	
	Median	2,196	2,712	
	Std Dev	13,280	11,471	
Total Assets (in millions)	Mean	$12,397	$13,504	
	Median	2,959	3,825	
	Std Dev	33,512	45,305	
MVE (in millions)	Mean	$7,725	$8,867*	
	Median	1,733	2,631	
	Std Dev	18,943	22,039	
M/B	Mean	3.78	3.69	
	Median	1.74	1.96	
	Std Dev	11.16	8.17	
Net Income (in millions)	Mean	$84	$193*	
	Median	41	78	
	Std Dev	1,367	1,210	

Panel B: *Firms Rated by Both* Sample

		Final Sample
Firm-year Observations	**N**	**1,369**
Sales (in millions)	Mean	$6,587
	Median	2,695
	Std Dev	11,056
Total Assets (in millions)	Mean	$13,227
	Median	3,726
	Std Dev	43,898
MVE (in millions)	Mean	$8,967
	Median	2,299
	Std Dev	21,416
M/B	Mean	3.87
	Median	1.94
	Std Dev	10.16
Net Income (in millions)	Mean	$202
	Median	76.9
	Std Dev	1,181
Number of EJR rate changes per firm per year	Mean	1.96
	Median	2.00
	Std Dev	1.00
Number of Moody rate changes per firm per year	Mean	0.61
	Median	0.00
	Std Dev	0.78

Note that in calculating the descriptive statistics for this table only, one observation is selected for each CUSIP annually. This ensures that firms with multiple observations within a year are not double-counted in calculating these descriptive statistics. Sales represents annual revenue (item # 12), Total Assets (item #6), MVE is the market value of common equity at year-end (shares x price - item #25 x item #199). M/B is the *Market-to-Book Ratio* = MVE / Book value of equity (item # 60) and Net Income (item #18). Number of EJR rate changes per firm represents the average number of times EJR changes a firm's senior debt rating per year. Number of Moody's rate changes per firm is defined similarly for Moody's. The *All Firms Rated Sample* in Panel A presents rating changes from Moody's and EJR, but does not include any Moody's observations prior to the first EJR rating. Panel B presents the *Firms Rated by Both Sample* that excludes any firms not covered by both rating agencies.

* significantly different at 0.05 level or higher

Table 3
Distribution of Moody's and EJR Ratings of Senior Unsecured Debt Rating for the Period 1996 to 2002

Panel A: Summary Statistics for *Firms Rated by Both* Sample

	N	Mean	Std Dev	25%	Median	75%
Moody's	697	11.67	3.62	9	12	14
EJR	1,829	10.22	3.31	8	10	12
Total	**2,526**					

Panel B: Detailed Distribution for *Firms Rated by Both* Sample

Rating	# of EJR	# of Moody	EJR % of Total	Moody's % of Total	EJR Cumulative %	Moody's Cumulative %
1	0	0	0.0%	0.0%	0.0%	0.0%
2	2	1	0.1%	0.1%	0.1%	0.1%
3	5	1	0.3%	0.1%	0.4%	0.3%
4	19	5	1.0%	0.7%	1.4%	1.0%
5	58	9	3.2%	1.3%	4.6%	2.3%
6	97	31	5.3%	4.4%	9.9%	6.7%
7	131	46	7.2%	6.6%	17.1%	13.3%
8	170	52	9.3%	7.5%	26.4%	20.8%
9	244	62	13.3%	8.9%	39.7%	29.7%
10	227	85	12.4%	12.2%	52.1%	41.9%
11	183	56	10.0%	8.0%	62.1%	49.9%
12	160	62	8.7%	8.9%	70.9%	58.8%
13	143	62	7.8%	8.9%	78.7%	67.7%
14	116	65	6.3%	9.3%	85.0%	77.0%
15	87	56	4.8%	8.0%	89.8%	85.1%
16	59	37	3.2%	5.3%	93.0%	90.4%
17	4	23	0.2%	3.3%	93.2%	93.7%
18	35	16	1.9%	2.3%	95.1%	96.0%
19	0	16	0.0%	2.3%	95.1%	98.3%
20	35	8	1.9%	1.1%	97.0%	99.4%
21	32	4	1.7%	0.6%	98.8%	100.0%
22	22	0	1.2%	0.0%	100.0%	100.0%
Totals:	**1,829**	**697**	**100.0%**	**100.0%**		

For the EJR ratings, the alpha-numerical ratings are converted to a numerical scale as shown in the table below. The scaling is done such that the numerical codes map into similar ratings for easier comparisons.

Numerical Rating	EJR	Moody's		Numerical Rating	EJR	Moody's
Investment Grade				**Non-Investment Grade**		
1	AAA	Aaa		11	BB+	Ba1
2	AA+	Aa1		12	BB	Ba2
3	AA	Aa2		13	BB-	Ba3
4	AA-	Aa3		14	B+	B1
5	A+	A1		15	B	B2
6	A	A2		16	B-	B3
7	A-	A3		17	CCC+	Caa1
8	BBB+	Baa1		18	CCC	Caa2
9	BBB	Baa2		19	CCC-	Caa3
10	BBB-	Baa3		20	CC	Ca
				21	C	C
				22	D	

Panel A presents summary statistics of the senior unsecured rating changes made by both EJR and Moody's for firms rated by both agencies during the period. Panel B presents the detailed distribution by each rating.

Table 4
Upgrade vs. Downgrade Detail for the Period 1996 to 2002

Panel A: *Firms Rated by Both* Sample

	Upgrade	Downgrade	Total
Moody's	187 (27%)	510 (73%)	697 (100%)
EJR	611 (33%)	1,218 (67%)	1,829 (100%)
Total	**798 (32%)**	**1,728 (68%)**	**2,526 (100%)**

Panel B: *Firms Rated by Both* Sample around Investment Grade

	Upgrade	Downgrade	Total
Moody's	23 (44%)	29 (56%)	52 (100%)
EJR	51 (32%)	107 (68%)	158 (100%)
Total	**74 (35%)**	**136 (65%)**	**210 (100%)**

Panel A represents the number of rating changes made by each agency broken out by rating direction (upgrade or downgrade) for the firms rated by both agencies. Panel B limits the rating changes to only these that straddle investment grade and non-investment grade (10 or lower and 11 or higher, respectively) and thus do not tie directly to any prior reconciliation. Number of rating changes is presented in each cell with the proportion of upgrade or downgrade included in brackets. Chi-squared test tests for the difference in proportions across the four cells.

Table 5

Logistic Regression Tests of Whether EJR Rating Changes Granger Cause Moody's Rating Changes and Vice Versa

Panel A: Downgrades

$$EJRDown_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRDown_{t-j} + \sum_{j=1}^{6} \beta_j MDDown_{t-j} + \varepsilon_t \qquad (1)$$

$$MDDown_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRDown_{t-j} + \sum_{j=1}^{6} \beta_j MDDown_{t-j} + \varepsilon_t \qquad (2)$$

	EJRDown$_t$		***MDDown$_t$***	
	Coefficient	P-value	Coefficient	P-value
Intercept (α_0)	-0.02	0.01	-1.53	0.01
$EJRDown_{t-1}$	-0.39	0.38	**0.86**	**0.00**
$EJRDown_{t-2}$	0.13	0.59	**0.75**	**0.00**
$EJRDown_{t-3}$	0.08	0.60	**0.52**	**0.00**
$EJRDown_{t-4}$	-0.11	0.57	**0.53**	**0.00**
$EJRDown_{t-5}$	-0.11	0.54	**0.38**	**0.07**
$EJRDown_{t-6}$	0.21	0.25	**-0.72**	**0.72**
$MDDown_{t-1}$	**-0.01**	**0.94**	0.34	0.18
$MDDown_{t-2}$	**0.45**	**0.17**	0.15	0.58
$MDDown_{t-3}$	**0.16**	**0.57**	0.08	0.77
$MDDown_{t-4}$	**0.13**	**0.65**	0.34	0.28
$MDDown_{t-5}$	**0.24**	**0.34**	0.00	0.97
$MDDown_{t-6}$	**0.33**	**0.19**	0.71	0.01
Granger F-Statistic (P-value)	4.90 (0.09)		38.79 (0.0001)	

Table 5 (continued)

Panel B: Upgrades

$$EJRUp_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRUp_{t-j} + \sum_{j=1}^{6} \beta_j MDUp_{t-j} + \varepsilon_t \quad (3)$$

$$MDUp_t = \alpha_0 + \sum_{j=1}^{6} \alpha_j EJRUp_{t-j} + \sum_{j=1}^{6} \beta_j MDUp_{t-j} + \varepsilon_t \quad (4)$$

	EJRUp$_t$		***MDUp$_t$***	
	Coefficient	P-value	Coefficient	P-value
Intercept (α_0)	-1.26	0.01	-2.46	0.01
$EJRUp_{t-1}$	-0.48	0.17	**0.66**	**0.07**
$EJRUp_{t-2}$	1.02	0.01	**0.31**	**0.42**
$EJRUp_{t-3}$	0.51	0.09	**0.42**	**0.31**
$EJRUp_{t-4}$	0.50	0.08	**0.03**	**0.94**
$EJRUp_{t-5}$	-0.11	0.76	**1.24**	**0.00**
$EJRUp_{t-6}$	0.26	0.36	**1.13**	**0.00**
$MDUp_{t-1}$	**0.56**	**0.31**	-13.28	0.98
$MDUp_{t-2}$	**0.21**	**0.72**	-0.34	0.74
$MDUp_{t-3}$	**-0.20**	**0.72**	-0.72	0.49
$MDUp_{t-4}$	**0.83**	**0.16**	-0.37	0.73
$MDUp_{t-5}$	**0.66**	**0.24**	0.33	0.67
$MDUp_{t-6}$	**0.13**	**0.85**	0.55	0.49
Granger F-Statistic (P-Value)	3.01 (0.22)		17.41 (0.0001)	

There are 2,526 observations in each logistic regression estimation. Where $EJRDown_t$ =1 ($EJRUp_t$ =1) if a rating downgrade (upgrade) is announced for the firm in month t and zero otherwise. The same is applicable to Moody's ratings as denoted by *MDDown* and *MDUp*, respectively. Firm *i* subscripts are repressed. The Granger F-Statistic (Granger, 1969) tests whether lagged bond rating changes by Moody's (EJR) provides any statistically significant information about EJR (Moody's) bond rating changes in the presence of lagged Moody's (EJR) changes. The F-statistic is calculated as follows: $F = \dfrac{\left(RSS_R - RSS_{UR}\right)/m}{RSS_{UR}/\left(n-k\right)}$ where RSS_R is the residual sum of squares from the restricted model, RSS_{UR} is the residual sum of squares from the unrestricted model, *m* is equal to the number of lagged terms, *k* is the number of parameters estimated in the unrestricted regressions and *n* is sample size. The restricted model is an agency's rating changes regressed only on lagged values of that agency's ratings, while the unrestricted model regresses the rating changes of the agency on lagged values of rating changes from agencies. P-values are two-sided.

Table 6
Announcement Stock Returns Around Bond Rating Changes

Panel A: Mean Market Adjusted Returns Around Rating Revisions Announcement Returns

Event:		N	Day -1 through day +1	Return Day -1	Return Day 0	Return Day +1
Downgrade	EJR	1,180	-6.07%	-1.45%	-4.40%	-0.47%
	Moody's	413	-2.78%	-0.94%	-1.33%	-0.75%
Upgrade	EJR	573	3.83%	1.07%	2.77%	0.18%
	Moody's	137	-0.45%	0.00%	-0.17%	0.12%
Total:		**2,303**				

Panel B: Longer Window Returns and Statistical Tests of Significance between EJR and Moody's

Event:		Day -1 through day +1	Day -11 through Day -1	-6 months through day -1	-12 months through day -1
Downgrade	EJR	-6.07%**	-9.40%**	-21.99%**	-27.38%**
	Moody's	-2.78%**	-4.05%**	-19.08%**	-30.48%**
	p-value	*0.0001*	*0.0001*	*0.0707*	*0.1356*
Upgrade	EJR	3.83%**	7.25%**	24.87%**	37.79%**
	Moody's	-0.45%	0.18%	4.14%	25.09%**
	p-value	*0.0001*	*0.0001*	*0.0001*	*0.0570*

Returns are measured as the buy-hold size-adjusted return. The size-adjusted return is calculated by deducting the value-weighted average return for all firms in the same size-matched decile, where size is measured as market capitalization at the beginning of the return accumulation period. The return accumulation period is as indicated at the top of each column. Panel C presents the p-value estimates from t-tests testing the statistical difference between means of returns. **Indicates that returns are statistically different from zero at the 1% level.

Table 7
Comparison of Ratings by Each Firm for Bond Issuance Sub-Sample

		Moody's Ratings							
		1	**2-4**	**5-7**	**8-10**	**11-13**	**14-16**	**17-19**	**Total**
EJR's Ratings	**1**	**0**							0
	2-4	15	**118**	9					142
	5-7	6	33	**286**	47				372
	8-10			49	**349**	43	3		444
	11-13			1	30	**95**	46		172
	14-16				1	15	**118**	8	142
	17-19						4	**2**	6
	Total	21	151	345	427	153	171	10	1,278

This table presents the bond ratings of the bond issuance sample with 1,278 observations. The numbers along the bold diagonal indicate when Moody's and EJR agree on the bond rating. The off-diagonal observations are where Moody's and EJR disagree or "split" over the rating. We assigned numerical values to the Moody's debt ratings as follows: Aaa = 1, Aa1 = 2, Aa2 = 3, Aa3 = 4, A1 = 5, A2 = 6, A3 = 7, Baa1 = 8, Baa2 = 9, Baa3 = 10, Ba1= 11, Ba2 =12, Ba3 = 13, B1 = 14, B2 = 15, B3 = 16, Caa1 = 17, Caa2 = 18, Caa3 = 19, Ca = 20, C = 21. We assigned a numerical value to EJR debt rating as follows: AAA = 1, AA+ = 2, AA = 3, AA- = 4 A+ = 5 A = 6 A- = 7 BBB+ = 8, BBB = 9, BBB- = 10, BB+ = 11, BB = 12, BB- = 13, B+ = 14, B = 15, B- = 16, CCC+ = 17, CCC = 18, CCC- = 19, CC = 20, C = 21, D = 22. Note that investment grade is a rating of '10' or higher under both Moody's and EJR's rating schemes.

Table 8
Comparison of Moody's and EJR Bond Ratings to Explain Bond Yield Spread

Independent Variable:	**Predicted Sign**	**Model 1**	**Model 2**	**Model 3**	**Model 4** *Junk Only Sub-Sample*	**Model 5** *Non-Junk Sub-Sample*
Intercept	**?**	53.55 (4.08)	467.29 (5.46)	43.96 (2.70)	**-262.49** **(-1.71)**	**47.72** **(3.04)**
EJR Rating	+	**14.60** **(9.53)**		**14.54** **(4.17)**	**4.72** **(0.47)**	**16.46** **(5.22)**
Moody Rating	+		**12.65** **(8.60)**	**2.84** **(0.88)**	**39.32** **(3.00)**	**-3.98** **(-1.38)**
Junk Indicator	+	-133.19 (-3.08)	-300.73 (-6.00)	-383.86 (-7.47)		
EJR * Junk	+	**19.63** **(5.23)**		**-13.58** **(-1.92)**		
Moody * Junk	+		**30.91** **(7.66)**	**51.45** **(6.59)**		
Enhance	-	-12.79 (-1.10)	-11.43 (-0.99)	-10.55 (-0.81)	-52.12 (-1.87)	39.20 (2.40)
Offering_Amount	-	0000 (-2.41)	0.000 (-2.39)	-0.000 (-2.75)	-0.000 (-1.64)	-0.000 (-2.94)
Shelf	-	-24.20 (-3.04)	-20.00 (-2.53)	-8.95 (-1.23)	-2.46 (-0.09)	-9.37 (-1.32)
Call	-	-61.94 (-1.58)	-167.86 (-4.22)	-167.74 (-4.12)	-186.45 (-2.84)	29.50 (5.16)
Put	-	-63.75 (-4.16)	-62.98 (-4.15)	-70.10 (-4.43)	-13.95 (-0.12)	-66.88 (-4.64)
Redeem	+	83.79 (2.11)	189.17 (4.72)	197.32 (4.81)	234.32 (3.38)	187.33 (4.28)
Years to Maturity	-			-0.26 (-1.07)	-3.13 (-1.11)	-0.21 (-0.95)
Pre-Tax Interest Coverage	-			0.02 (0.23)	-6.09 (-0.59)	0.03 (0.35)
Debt Ratio	-			8.12 (0.28)	150.71 (1.26)	-20.55 (-0.72)
Margin	+			24.61 (1.78)	13.47 (0.26)	43.52 (2.96)
Debt to Total Capitalization	-			39.82 (1.81)	-6.89 (-0.08)	27.54 (1.28)
Market to Book Ratio	-			-2.17 (-2.37)	-1.35 (-0.53)	-2.94 (-2.92)
Total Assets	+			0.000 (0.80)	0.001 (0.83)	0.000 (0.12)
Adj. R^2		61.56%	62.42%	67.03%	54.79%	36.72%

The dependent variable in this regression, *Treasury Spread*, is defined as the difference between the issue's offering yield and the yield on a benchmark treasury security expressed in basis points. The benchmark treasury is chosen as a corresponding U.S. Treasury bond with similar duration and maturity as that expressed in the bond issuance by the firm in our sample. *EJR Rating* is the rating on the day of the bond issue from EJR. *Moody Rating* is the rating on the day of the bond issue from Moody's. *Junk Indicator* is an indicator variable that takes on the value of one, if the respective rating is greater than 10 (i.e., non-investment grade or 'junk' status), and zero otherwise. *Enhance* is a flag indicating the issue has credit enhancements. *Offering Amount* is log of the par value debt initially issued (in millions of dollars). *Shelf* is a flag indicating whether this is a shelf registration. On short notice, the issuer may take securities off the shelf and offer them to the public. *Call* is a flag indicating that the issue is callable on a particular schedule. *Put* is a flag indicating that the bondholder has the option, but not the obligation, to sell the security back to the issuer under certain circumstances. *Redeem* is a flag indicating that the bond is redeemable under certain circumstances. *Years to Maturity* is the number of years to maturity of debt. *Pre-Tax Interest Coverage* is calculated as [Operating income (178) + interest expense (15)] / [interest expense (15)]. *Debt Ratio* is Long-Term Debt (LTD) (9) / Total Assets (6). *Margin* is Operating Income (178) / Sales (12). *Debt to Capitalization* is LTD (9) / [LTD (9) + Market Value of Equity (199) x (25)]. *Market to Book Ratio* Market Value of Equity / Book Value of Equity (60). *Total Assets* is the firm's total assets (6). The *Junk Only* sub-sample is comprised of observations where the bond rating is 11 or lower; conversely the *Non-Junk* sub-sample is comprised of observations where the bond rating is 10 or higher. T-tests are shown in parentheses below coefficients.