UNSOLICITED CREDIT RATINGS: THEORY AND EMPIRICAL ANALYSIS

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ABSTRACT

The compensation structure, hence agency framework, for unsolicited ratings differs markedly from solicited ratings in that the agency is not compensated by the firm for an unsolicited rating. Agencies have been criticized for the use of unsolicited ratings as punishment of issuers for not hiring them to rate their issues. By investigating valuation effects of unsolicited ratings we investigate whether they have credible punitive content. Previous research to investigate the information content of rating changes was limited to solicited ratings of US firms. In this study we investigate whether different markets, especially Asian markets, assess creditworthiness differently. We first develop a model that provides implications regarding rating agencies' motivations and the effects of unsolicited ratings on firm value. We then empirically examine the implications of the model. Our results generally support the model.

INTRODUCTION

A firm's debt rating affects the cost of borrowing. For example, the spread between A rated and BBB rated bonds during 1990-1998 period was on average 46 basis points and the average spread between BBB and BB during the same period was 170 basis points (Kao, 2000). Bond ratings now play an important role in most established capital markets and many emerging markets. There are growing interests in credit risk issues due to factors such as regulatory concerns, the globalization of credit rating industry, and the growth of derivatives tied to credit-related events such as default and rating changes.

The bond rating industry has been expanding globally, as non-US debt issuers have sought access to US and other capital markets.[1] Bonds rated BBB (by S&P's) and above are classed as investment grade and bonds below BBB as speculative. The investment-grade label has considerable significance from a regulatory standpoint, especially in the US and Japan. Credit ratings become increasingly important as they severely affect the cost of borrowing in the international capital markets.

Previous studies address the question of whether a bond rating change conveys new information to capital markets by examining stock or bond price reactions to the announcements of rating changes. A general view is that rating agencies are information specialists who obtain information that is not in the public domain; i.e., information acquisition is costly and rating agencies are a low cost provider of information. Consequently, this view predicts that rating changes affect security prices.

Pinches and Singleton (1978) examine the reaction of common stock prices to bond rating changes and find that the information content of bond rating change announcements is very small. Griffin and Sanvicente (1982), and Holthausen and Leftwich (1986) find that bond downgrading announcements result in significant price reactions while bond upgrading announcements do not result in significant reaction. Wansley and Clauretie (1985) also find a significant stock price reaction when firms are listed on S&P's CreditWatch and subsequently downgraded by the agency.

Other studies examine abnormal bond returns associated with the announcement of bond rating changes. Weinstein (1977) and Hite and Warga (1997) find some information effects of rating changes on bond prices. Katz (1974) and Grier and Katz (1976) suggest that some trading rules can be developed to make moderate excess returns for downgradings of industrial bonds. Ederington, Yawitz and Roberts (1987) investigate whether market participants base their evaluation of a bond issue's default risk on agency ratings or on publicly available financial information. Their results suggest that the ratings bring some information to the market above and beyond publicly available accounting variables. Hand, Holthausen and Leftwich (1992), Zaima and McCarthy (1988), and Hite and Warga (1997) also report that bond downgrading announcements provide negative average effects on

[1] There are five primary credit rating agencies for publicly traded debt in the US: Standard & Poor's (S&Ps), Moody's, Fitch IBCA, Duff & Phelps, and Thompson Financial BankWatch. Rating agencies outside the U.S. are Canadian Bond Rating Service, Japan Rating & Investment Information (R&I), Japan Credit Rating Agency (JCR), Seoull Credit Rating & Investment Information, and Rating Agency of Malaysia (RAM), etc.

bond and stock prices. The effect of upgrading, however, is weaker. Kliger and Sarig (2000) also find that rating information affects debt value and equity value, but that overall firm value remains the same.[2]

This study differs from previous research in several important ways. First, we develop a model that provides testable implications regarding credit ratings. We assume that there exist two types of firms, good and bad, and asymmetric information between the insiders and market participants. We also assume that a rating agency is an information specialist who is able to obtain and convey information with the lowest cost. We then develop conditions for a separating equilibrium in which only good firms signal their quality through the rating agency and investors' beliefs about the firm type from issued ratings are confirmed. Second, we test the implications of the model using solicited and unsolicited ratings for firms in Japan and other developing counties. An unsolicited rating is a credit rating of a firm that has not requested a rating evaluation. Previous studies either focus on solicited ratings or do not distinguish between the solicited and unsolicited ratings. However, a credit rating agency carries out two types of ratings: a full (solicited) rating where the rating agency usually has access to confidential data, and an unsolicited rating where the agency makes its analysis based on information available in the public domain. Third, our study is distinguished from previous studies in that we are examining credit ratings of firms while previous studies examine ratings of specific bond issues. Fourth, we investigate credit ratings issued for international firms. Previous research investigates the information content of rating changes only for the U.S. firms. In this study, we take a very important step in investigating whether investors rely on the credit ratings of US rating agencies in assessing the creditworthiness of foreign companies. Rating agencies have been criticized for using unsolicited ratings to increase revenues from rating fees and to punish an issuer for not hiring them to rate the issue. Critics of unsolicited ratings argue that unsolicited ratings are compromised and conservative because analysts do not have full access to company data. Unsolicited ratings are also considered a means of raising a rating agency's profile in particular countries: that is, rating agencies provide unsolicited ratings to investors in an attempt to gain a competitive advantage over those who do not assign unsolicited ratings. Rating agencies argue that they are responsible for the protection of investors and that they inform investors of the risk of a firm whether the rating is solicited or not. According to their argument, when an issuer has not applied for a rating but there is sufficient information to make a judgment and investors would find the opinion valuable, rating agencies may assign a rating regardless of remuneration.

In February 1999, the US Department of Justice ended its wide-ranging inquiry into Moody's alleged antitrust violations in its rating practices. The civil inquiry, launched in 1996, examined the use of unsolicited rating. Most bond ratings are issued with the consent of the municipality or firm that pays a fee to a credit rating agency. But in recent years, issuers have begun to shop for the lowest price among the rating agencies. Putting Moody's in the Justice Department's investigation were allegations by some bond issuers that Moody's fought this trend by threatening to issue lower, unsolicited ratings to force bond issuers into buying its assessments (Moody's denied the charge). Originally, primary revenues of rating agencies were fees charged to subscribers to the rating bulletins. Now the revenues of the US agencies come almost entirely from fees charged to the issuer of the security, although subscription fees are still important in some markets outside the US. Typical issuer fees include an initial fee based on the size and complexity of the issue and monitoring fees.[3]

The Japan Center for International Finance (JCIF, 1997) claims that cultural bias often impairs the judgment of the US rating agencies and causes damage to the international standing of Japanese and other Asian companies. Focusing on the operations of six major foreign and Japanese rating agencies including Moody's and S&P's, the JCIF also charges that while Japanese rating agencies take into account factors unique to Japanese corporate governance structure, non-Japanese agencies attach more importance to the uniformity of global standards.

JCIF argues that the successive revision of ratings by the rating agencies during Asian financial crisis caused resonant market reactions, possibly exacerbating the currency and economic crises in Asian countries. It also argues that the rating agencies often issue an unsolicited rating of a company and approach the company to persuade it to seek a solicited rating by paying a fee.[4] The JCIF also says that the solicited ratings

[2] Another line of study examine whether bond yields are related to rating information. For example, West (1973), Liu and Thakor (1984) and Ederington Yawitz, and Roberts (1984, 1987) find that ratings explain cross-sectional differences in yield spreads.

[3] According to the Financial Times, Moody's and S&P's charge an initial fee on average between $35,000 and $50,000 to rate new bond issues as of 1998.

[4] According to the Financial Times, Moody's and S&P's have set targets to derive at least 30% of revenues from non-US ratings until 2000. In 1998, the proportion of international ratings is about 20\% of overall revenues.

tend to be higher than the unsolicited ratings as the agency has direct access to nonpublic information.[5] Even the Japanese word used to translate unsolicited (Katte) has vague negative overtones. The word means that one is doing something without permission and perhaps in a selfish way. This reveals deep-rooted suspicion among Japanese market participants about the ratings given by US rating agencies.

In those countries we investigate in this study, bond markets are very small and the secondary markets are virtually non-existent. Bank loans are predominant source of corporate borrowing. For example, Japanese firms issued only 10 trillion yens of corporate bond in 2000, while bank loans amount to 391 trillion yens in the same year. For this reason, we focus on the effect of firm credit ratings on the stock price.

The model is developed in Section II. Section III describes the data. The empirical analyses and results are discussed in Section IV. Conclusions follow in Section V.

THE MODEL

We consider a two-period economy where firms come to the debt market at time 1 to acquire funds, I, to invest in their projects and operate until time 2. There are two types of firms: good firms and bad firms. Of the total number of firms, proportion $\theta(0<\theta<1)$ are good firms and $1-\theta$ are bad firms. Investors cannot directly observe the quality of a firm. However, there is a rating agency who gathers information and issues the rating of the firm's default risk. The rating agency is an information specialist who is able to obtain and convey information with the lowest cost. The rating agency will announce the rating based on public and private information. The rating can be either `safe' or `risky.' A `safe' grade indicates a low probability of default, while a `risky' grade indicates a high probability of default. If a firm is assigned as a safe grade, the cost of borrowing for its debt is i_s; i.e., the promised value at the end of the second period is $I(1+i_s)$, while the cost is i_r if assigned as a risky grade with $i_r > i_s$.

If the firm invests in the project, the firm value can be either H or L at the end of the second period, with $H > I(1+i_r) > I(1+i_s) > L \geq 0$. Since the firm value of L at the end of the second period is less than the face value of debt, the probability of default is the same as the probability of having firm value L. Good firms, with the investment of I, have a probability $p_{s|g}$ of realizing value H and a probability $1-p_{s|g}$ of realizing value L. Here we use a conditional probability notation because the probability of realizing H for a good firm is the same as the conditional probability of being `safe' given the firm is good and the probability of realizing $L$ for a good firm is the same as the conditional probability of being `risky' given the firm is good. Similarly, by investing I, bad firms have probabilities $p_{s|b}(<p_{s|g})$ and $1-p_{s|b}$ of realizing firm value H and L, respectively. This implies that the quality of the firm directly determines the default risk of its debt.

For simplicity, we assume that managers act in the best interest of existing shareholders. Before the time of debt financing, managers know the quality of their firm and thereby the default risk of debt, and they have two choices; ether reveal the information to the public through a rating agency or do nothing. If the firm manager chooses to do nothing, the rating agency correctly rates a firm's credit risk without the firm's inside information (an unsolicited rating) with a probability of λ. There will be costs for firms to convey information about the quality of the firm to the public through the rating agency but no immediate costs of doing nothing. If the firm chooses to convey the true information, the cost will be $C_t(\lambda)$ (with $C'_t(\lambda)<0$), otherwise it will be C_f (with $C'_f(\lambda)>0$), with $0<\frac{C_t(\lambda)}{C_f(\lambda)}<\frac{1-\lambda}{\lambda}$ for all λ.[6]

Before time 1, the credit ratings are revealed, and investors update their prior beliefs on the basis of this new information, which determines the cost of borrowing and thereby the equity value at time 1. Suppose investors' prior probability that a particular firm

[5] The JCIF conducted a survey by sending questionnaires to 264 major Japanese firms in 1998. About 30% of the respondents supported the statement that unsolicited ratings are used by rating agencies in their market strategies to solicit ratings, and this creates problems regarding the reliability of the ratings. Some Japanese firms say they are disturbed by unsolicited ratings by Moody's, and they are urging Moody's to specify in its debt evaluation when the assessment is unsolicited. Unlike other rating agencies in Japan, Moody's assigns a number of unsolicited ratings and does not specify whether a rating was drawn up at the firm's request or not. Moody's says this is the same policy in any country.

[6] The condition implies that the cost of a true signal decreases with λ and the cost of a false signal increases with λ. The signal is alterable and therefore potentially subject to manipulation by the firm manager and the cost is higher for a false signal than for a true signal if $\lambda > .5$.

is good is p_0. Before the issue of ratings, investors value the firm as[7]

$$V_0 = E_0 + D_0 = \delta[(p_0 p_{s|g} + p_{s|b} - p_0 p_{s|b})H + \{1 - (p_0 p_{s|g} + p_{s|b} - p_0 p_{s|b})\}L, \quad (1)$$

$$E_0 = \delta[(p_0 p_{s|g} + p_{s|b} - p_0 p_{s|b})(H - I) - p_0 p_{s|g} I i_s - (1 - p_0) p_{s|b} I i_r], \quad (2)$$

$$D_0 = \delta[(p_0 p_{s|g} + p_{s|b} - p_0 p_{s|b})I + \{1 - (p_0 p_{s|g} + p_{s|b} - p_0 p_{s|b})\}L + p_0 p_{s|g} I i_s + (1 - p_0) p_{s|b} I i_r], \quad (3)$$

where V_0 is the value of the firm, E_0 is the value of equity, D_0 is the value of debt, and δ is a discount factor. If there is no rating, investors simply reaffirm their beliefs and there will be no update on the prior probabilities. After the revelation of the rating, however, investors change their beliefs about the firm quality, conditional on the credit rating. If they observe a safe grade, they change the probability that the firm is good from p_0 to $p_{s|g}$. If they observe a risky grade, the probability changes to $p_{g|r}$. Here we adopt Bayes' rule in updating investors' prior probability. The Bayesian posterior probabilities that the firm is good, conditional on having observed respectively a safe grade and a risky grade, are

$$p_{g|s} = \frac{p_{s|g} p_0}{p_{s|g} p_0 + p_{s|b}(1 - p_0)}, \quad (4)$$

$$p_{g|r} = \frac{(1 - p_{s|g}) p_0}{(1 - p_{s|g}) p_0 + (1 - p_{s|b})(1 - p_0)}. \quad (5)$$

Note that the probability of being safe conditional on being good $p_{s|g}$ is the same as the probability of having firm value H conditional on being good. Similarly, $p_{s|b}$ is the probability of having firm value H conditional on being bad. Equation (4) is the ratio of the probability of no default for a good firm to the probability of no default for either firm, and equation (5) is the ratio of the probability of default for a good firm to a probability of default for either firm. With the posterior probabilities, now investors value the firm's equity with an issued safe grade as

$$E_s = \delta[p_{g|s} p_{s|g}\{H - I(1 + i_s)\} + (1 - p_{g|s}) p_{s|b}\{H - I(1 + i_s)\}], \quad (6)$$

and the firm with a risky grade as

$$E_r = \delta[p_{g|r} p_{s|g}\{H - I(1 + i_r)\} + (1 - p_{g|r}) p_{s|b}\{H - I(1 + i_r)\}]. \quad (7)$$

Note that E_s and E_r reflect public information and firms with safe grade have higher values than firms with risky grade $(E_s > E_r)$. Equations (6) and (7) also show that the credit rating affects the equity value in two ways; through the changes in posterior probabilities and different interest rates.

The manager of the firm may choose not to reveal private information about the quality of her firm. Since the probability of the rating agency's issuing the true credit risk of a firm through an unsolicited rating is λ, the equity values perceived by the manager by not revealing private information are

$$E_g^n = \lambda E_S + (1 - \lambda) E_r \quad (8)$$

for good firms, and

$$E_b^n = \lambda E_r + (1 - \lambda) E_s \quad (9)$$

for bad firms.

If the manager of a good firm reveals information truthfully about firm quality to the rating agency by providing inside information and the signaling cost, the equity value is given by

$$E_g^t = E_S - C_t(\lambda), \quad (10)$$

and the equity value by signaling falsely is

[7] Note that as investors are more optimistic about the firm, the prior probability and the expected value of the firm will be greater.

$$E_b^f = E_S - C_f(\lambda). \qquad (11)$$

By falsely signaling to the market, the bad firm has to incur a cost C_f, but gains higher equity value E_s.[8]

Quasi-Separating Equilibrium with Rating Agency

If there is no asymmetric information in the market so that investors can identify the good and bad firms, the prior probability of investors ρ_0 is one for good firms, and zero for bad firms and their respective equity value will be given by $\delta p_{S|g}\{H - I(1+i_S)\}$ and $\delta p_{s|b}\{H - I(1+i_r)\}$. Thus, in the perfect world of symmetric information, there is no need for a rating agency and all securities are fairly valued. But under the information asymmetry, if there is no rating agency and investors' only prior information is the proportion of good or bad firms, each firm's equity is worth unconditional expected value with $p_0 = \theta$ in equation (2), i.e.,

$$E_0 = \delta[\theta p_{s|g}\{H - I(1+i_s)\} + (1-\theta)p_{s|b}\{H - I(1+i_r)\}]. \qquad (12)$$

Even if there is no signaling at all, if the rating agency produces a rating on each firm, there is λ probability of assessing the default risk of each firm and thereby revealing the firm type correctly. With no information about the firm quality, investors' prior beliefs will be given by $p_0 = \theta$. Given unsolicited ratings of firms, the equity values of `safe' and `risky' firms are given by equations (6) and (7) with[9]

$$p_{g|s} = \frac{\lambda\theta}{\lambda\theta + (1-\lambda)(1-\theta)}, \qquad (13)$$

and

$$p_{g|r} = \frac{(1-\lambda)\theta}{(1-\lambda)\theta + \lambda(1-\theta)}. \qquad (14)$$

Interesting result here is that even though there is no signaling by either firm, in the presence of the rating agency, we have separate valuation schedules for good and bad firms. For the rating agency to be of any use, it has to provide additional information to investors. In other words, by incorporating the credit ratings issued by the rating agency, investors should be able to assess the firm quality better so that the probability of being a good firm given a safe grade will be higher and the probability of being a good firm given a risky grade will be lower than those without the credit ratings.[10] This condition, which we will call quasi-separating, is equivalent to $p_{g|s} > \theta$ for a good firm and $p_{g|r} < 1-\theta$ for a bad firm. Using equations (13) and (14), the condition is satisfied if $\theta < 1$ and $\lambda > .5$. The rating agency has a strong incentive to increase λ, otherwise it will lose its job. However, as we will see later, the rating agency also has a strong incentive not to keep λ too high because it will reduce firms' incentives to signal their quality through the rating agency and thereby compensation for the rating agency.

For this quasi-separating with no signaling by either firm to be an equilibrium, credible signaling by good firms and false signaling by bad firms must be less profitable than quasi-separating i.e., $E_g^t > E_g^n$ and $E_b^n \geq E_b^f$. These conditions are satisfied if

$$E_s - E_r \leq Min\left(\frac{C_t(\lambda)}{1-\lambda}, \frac{C_f(\lambda)}{\lambda}\right). \qquad (15)$$

In this case, firms have no incentive to signal and we have a quasi-separating equilibrium.

Separating equilibrium

In a separating equilibrium, only good firms signal their quality so that all signaling firms are good and all non-signaling firms are bad. Thus, the condition for a separating equilibrium is equivalent to $E_g^t > E_g^n$ and $E_b^n > E_b^f$, or

[8] When good firms signal falsely and when bad firms signal truthfully, the equity values are $E_g^f = E_r - C_f(\lambda)$ and $E_b^t = E_r - C_t(\lambda)$ which are clearly less than the worst possible value E_r when they do nothing. Therefore, it is clear that neither good nor bad firms want to signal that they are bad.

[9] Note that, given $p_0 = \theta$ and all the ratings are unsolicited, the probability of good firms receiving `safe' grade, $p_{s|g}$, is $\lambda$ and the probability of good firms receiving `risky' grade, $1 - p_{s|g}$, is $1-\lambda$. Similarly, for bad firms, we can define $p_{s|b} = 1-\lambda$.

[10] Here one may think of the motivation for debtholders to pay for the rating service. If we assume risk-averse debtholders' specific utility function, we should be able to show that risk-averse debtholders certainly have incentives to pay for the rating service.

$$\left(\frac{C_t(\lambda)}{1-\lambda} < E_s - E_r < \frac{C_f(\lambda)}{\lambda}\right). \qquad (16)$$

Under this condition, only good firms signal their quality through the rating agency and investors' beliefs about the firm quality from an issued rating is confirmed. To justify the existence of the rating agency, we still need the condition $\lambda > .5$.

Implications of the Model and the Hypotheses

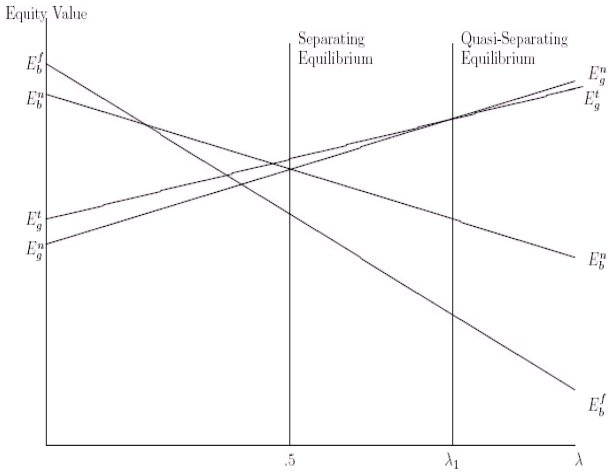

Figure 1. Uncertainty and type of equilibrium

Figure 1 sketches the relationship between the types of equilibria and the probability of correctly assessing firms' default risk by the rating agency's unsolicited ratings, λ. For $\lambda < .5$, the rating agency's ability to assess a firm's default risk is so poor that it provides wrong ratings. As we assume the rating agency is an information specialist, we consider only when $\lambda > .5$.

The separating equilibrium exists between .5 and λ_1 in which good firms have higher equity value E_g^t by signaling their quality than equity value E_g^n with doing nothing while bad firms have higher equity value E_b^n by doing nothing than equity value E_b^f with false signaling. Investors are informed by the credit ratings and their beliefs inferred from the credit ratings are confirmed. As λ increases, probability of being a good firm given the safe grade, $p_{g|s}$, will increase and the probability given a risk grade, $p_{g|r}$, will decrease, which results in larger $E_s - E_r$. Also, higher λ makes the signaling costs low for good firms and the false signaling costs high for bad firms. Thus, the condition in inequality (16) is likely to hold.

On the other hand, for λ close to one, both $C_t(\lambda)/(1-\lambda)$ and $C_f(\lambda)/\lambda$ become very large and inequality (15) is more likely to hold.[11] Thus, with λ close to one, greater than λ_1 in Figure 1, there exists a quasi-separating equilibrium in which neither type of firms signal. This implies that when uncertainty about firm type is low or the unsolicited ratings identify the firm type with high probability, even a good firm would not signal its quality.

Conditions in inequalities (15) and (16) imply that the equilibrium conditions are also affected by the signaling costs. If the true signaling costs are very high, *ceteris paribus*, we are more likely to have a quasi-separating equilibrium. On the other hand, low signaling costs are more likely to lead to a separating equilibrium.

The existence of a quasi-separating equilibrium in our discussion above is based on the implicit assumption that the rating agency issues ratings for all firms. Since the rating agency receives rating fees from the rated firms in practice, it has a strong incentive to prefer the separating equilibrium in which good firms signal by paying rating fees unless other parties pay to maintain quasi-separating equilibrium. The condition for the separating equilibrium given by inequality (16) implies that the separating equilibrium range depends upon the ratio of the signaling cost and the probability of assessing credit risk accurately by unsolicited ratings, λ. The agency can issue all grades regardless of solicited or unsolicited. However, such practice will result in too high λ. Since the signaling cost is in turn determined by λ, if the rating agency is allowed to choose either to issue or not to issue the results of unsolicited ratings, the rating agency will choose the rating results to influence λ. This endeavor of the rating agency is likely to keep the separating equilibrium range in Figure 1 by raising λ above .5 but below λ_1. Since the rating agency has discretion to issue or not to issue unsolicited ratings, one way for the rating agency to foster the separating equilibrium is to issue a certain portion of unsolicited ratings so that it can maintain desired λ and also encourage good firms to signal through solicited ratings. If the agency issues false grades, the agent's reputation will be at risk. Therefore, the best way for the agency to keep λ below λ_1 is to issue conservative grades. This leads to the following hypothesis.

[11] This argument is based on some regularity assumption, such that convexity of C_t and concavity of C_f.

H1: *Rating agencies are more likely to issue unsolicited ratings of low-grade and down-grade than of high-grade and up-grade.*

In the solicited rating process, rating agencies are supplied with considerable inside information about the firm as the agency assesses the probability of default. The market knows that these rating agencies have access to nonpublic information. Therefore, a rating change may provide additional information about total firm value to the market. However, unsolicited ratings are based on public information. If capital markets are efficient in semi-strong form, the new unsolicited rating announcements and rating changes should not affect firm values. On the other hand, to the extent that capital markets believe that rating agencies possess special skills at lowering bonding and monitoring costs for the rated firms (Diamond, 1991), markets should react to the announcements of unsolicited ratings as well. Previous studies report significant negative average excess bond and stock returns for downgrades, but insignificant average excess bond and stock returns for upgrades. Zaima and McCarthy (1988) conjectuure a potential explanation based on Galai and Masulis (1976) and Myers (1977) who suggest that stockholders may not engage in corporate restructuring or profitable investment projects when most of the benefits accrue to bondholders. They argue that limited liability may encourage stockholders to take on riskier investments to increase their expected returns and this decision of stockholders leads to a bond downgrade that reduces bondholder wealth. Any reduction in bond value is wealth expropriated from bondholders to stockholders. A bond upgrade implies a decrease in default risk, and the wealth distribution is in the reverse direction. Accordingly, the wealth transfer hypothesis implies that stock values increase (decrease) while bond values decrease (increase) for a rating downgrade (upgrade). The trouble is that only rating downgrades have the predicted effect and rating upgrades do not.

The findings of previous studies are consistent with our model. In our model, the change in posterior probability due to a risk grade is larger than the change in probability due to a safe grade. For example, from equations (4) and (5) with $p_{s|g} = .8$ and $p_{s|b} = .6$, if the prior probability of being a good firm p_0 for a firm is .8, the probability of being a good firm given a safe grade $p_{s|g}$ is .84, while the probability given a risky grade $p_{g|r}$ is .67. If p_o is .6, $p_{g|s}$ is .67, while $p_{g|r}$ is .43. The change in the posterior directly affects the value of the firm. Therefore, our model leads to the following hypothesis:

H2: *Market will react more significantly to the announcements of down-grade ratings than to those of up-grade ratings.*

Also, the change in probability due to a rating change is more profound when the prior probability of being a good firm is low. For example, if a previous rating serves as the prior, the rating change within B class (e.g., BB to B) will affect the probability more than the rating change within A class (e.g., AA to A).[12]

H3: *Market will react more significantly to the announcements of ratings within a low rating class than within a high rating class.*

DATA

Both S&P's and Moody's have a policy of publishing ratings for all large corporations with significant outstanding debt, even if the issuer does not solicit the rating. Moody's has a policy of not distinguishing between unsolicited and solicited ratings. On the other hand, S&P's began to assign unsolicited ratings in 1996 with information on whether the rating is solicited or unsolicited. Unsolicited ratings are identified by the "pi (public information)" subscript attached to S&P's traditional long-term rating symbols, and they are local currency ratings which focus on the institution's ability and willingness to repay local currency obligations. Ratings with a "pi" subscript are based on an analysis of an issuer's published financial information, as well as additional information in the public domain. They do not, however, reflect in-depth meetings with an issuer's management or incorporate material nonpublic information, and therefore are based on less comprehensive information than solicited ratings. Ratings with a "pi" subscript are reviewed annually based on a new year's financial statements, but may be reviewed on an interim basis if a major event occurs that affects an issuer's credit quality. S&P's maintains that it developed the "pi" ratings to meet growing worldwide demand for ratings coverage of financial institutions, especially in emerging markets. Our data consists of those unsolicited ratings by S&P's between November

[12] Holthausen and Leftwich (1986) provide evidence that the announcement period abnormal return for downgrades across rating classes is on average negative and statistically significant while it is not significant for downgrades within rating classes.

1996 and April 2001 obtained from Creditweek and Ratings Direct.

We identified 221 new unsolicited ratings and 85 unsolicited rating changes in 16 countries. Table 1 provides the distribution of unsolicited ratings by country. Japanese firms represent about 78 percent of the total ratings. There is no case of unsolicited rating in the US. Panel A also shows the distribution of new ratings across different rating grades. About 23 percent of the sample firms received A or better grades, about 75 percent B-grades, and 1.4 percent C-grades. For comparison with unsolicited ratings, we further collect data on solicited ratings for Japanese firms. For other countries the data are hardly available. We also use price data from Datastream and search announcement dates in the LEXIS-NEXIS database.

EMPIRICAL RESULTS

Tables 1 shows rating grades for unsolicited new ratings while Panel A of Table 3 shows rating grades for solicited ratings. Among 221 unsolicited new ratings in Panel A of Table 1, 83 ratings or 38 percent are speculative grade (BB or lower). On the other hand, for solicited ratings, none of the ratings are speculative. We also report grade changes for unsolicited rating changes in Table 2 and for solicited rating change in Panel B of Table 3. Out of 85 unsolicited ratings, only 10 are up-grades and the remaining are down-grades and 67 or 79 percent are rating changes to speculative grade. For solicited ratings, there are 12 upgrades and most of down grades are investment grade (BBB or better). Only 5 grades are speculative (BB) ratings. Also, note that the solicited rating changes are further refined by + or - signs and 54 percent of the down grades are within the same letter grade; e.g., from AA to AA- or BBB+ to BBB, etc. These findings are consistent with the hypothesis (H1) that rating agencies are more likely to issue unsolicited ratings of low-grade and down-grade than of high-grade and up-grade and that low quality firms choose not to signal their quality.

To examine the rating announcement effects, we report announcement period abnormal returns in Table 4.[13] The announcement period corresponds to a two-day window (0, +1) relative to the announcement date appearing in the LEXIS-NEXIS database. We eliminate firms with any other events within six trading days (-3, +2) around the announcement date such as earnings, new product, credit ratings by another agency, spinoff, etc. Firms with no daily return data available have also been excluded. The average abnormal returns for unsolicited new ratings announcements are -.69 percent with 46.56 percent positive returns. The average is statistically significant at 6 percent level, but the median is not significant. The average abnormal return for the rating down-grade announcement is -0.86 with p-value .08 while the median is -.64 with p-value .09. The differences in the mean and median abnormal returns between new ratings and rating changes are not statistically significant (not reported). For unsolicited rating up-grade announcement, the mean and median abnormal returns are insignificant (-.12 percent and .51 percent, respectively). This result seems to support the hypothesis (H2) that market will react more significantly to the announcements of rating down-grades than to those of rating up-grades. However, it is difficult to draw a strong conclusion due to small number of observations for unsolicited rating up-grades.

We report separate results for Japanese firms and other firms. For the Japanese firms, both new ratings and rating downgrades appear to convey negative information as indicated by significant mean (-.99 percent with p-value .02 for new ratings and -1.06 percent with p-value .05 for rating down grades) and median (-.70 percent with p-value .03 for new ratings and -1.01 percent with p-value .06 for rating down grades) abnormal returns. For other firms, new ratings are associated with positive mean abnormal return but insignificant median abnormal return and the effects of rating down-grades are not significant.

We also report announcement period abnormal return for solicited ratings of Japanese firms in Table 5. The abnormal return is not significant for solicited new ratings while it is negative and significant (mean = -1.04 and median -.93) for solicited rating changes. This result contrasts the findings of Holthausen and Leftwich (1986) that report a negative 2-3 percent abnormal return on average to solicited rating down-grades for the US firms. The difference between solicited and unsolicited down-grades for Japanese firms is not distinguishable.

To test the hypothesis that market will react more significantly to the announcements of new ratings and rating changes within a low rating class than within a high rating class (H3), we divide the sample into two groups; new ratings and rating changes to BBB or better as investment grade and new ratings and rating changes to ratings below BBB as speculative grade. The announcement period abnormal returns are reported in Table 5. For investment grade, the announcement period abnormal return for unsolicited new ratings is not significant and there is only one observation for rating

[13] We also compute mean-adjusted and market-adjusted abnormal returns. However, they are not materially different from the market model abnormal returns and suppressed from reports.

down grades. For speculative grade unsolicited new ratings and rating changes, the average abnormal returns are -1.62 (median = 1.21) percent and 1.27 (median = 1.11) percent, respectively. Panel B of Table 5 shows the results for solicited ratings. All new ratings are investment grade and the mean and median abnormal returns are not significant. For solicited rating down grades, the investment grade is associated with insignificant mean abnormal return, but the median is -.78 percent with p-value .09. On the other hand, the average abnormal return for the speculative grade is -1.96 percent and the median is -2.94 percent. However, the sample size is only 4. The overall results support hypothesis H3.

CONCLUSION

We develop a model and derive implications regarding rating agencies' motivations and the effects of unsolicited ratings on firm value. We then test some implications of the model using unsolicited and solicited credit ratings issued between 1996 and 2001. We found generally supporting evidence of the implications of our model.

Rating agencies issue much more unsolicited ratings of low-grade and down-grade than of high-grade and up-grade. For unsolicited new ratings and rating down-grades there are negative stock price reactions to their announcements. However, for solicited ratings, we find negative effects only for rating down-grades, but the magnitude is much less than that of solicited ratings found for US firms. We further find that the announcement period abnormal return to the unsolicited rating down-grades is insignificant for an investment grade class while it is significant and negative for a speculative grade class.

In an unsolicited rating the rating agency has access to only publicly available information, and hence a significant stock price reaction to an unsolicited rating would imply a violation of semi-strong form information efficiency. Unsolicited rating changes are deteriorating events for firms with down graded ratings in speculative class. Otherwise, they do not convey any significant information to the market.

Table 1. Frequency Distribution of Unsolicited New Ratings and Rating Changes by County and Grade.
The sample consists of 221 unsolicited new ratings and 85 unsolicited rating changes in 16 countries from November 1996 to April 2001. The unsolicited ratings are obtained from Creditweek and Ratings Direct database of S&P. The ratings are long-term corporate issuer rating and are not assigned to specific bond issues.

Panel A. New Ratings

	Japan	*Indonesia*	*Philippines*	*Singapore*	*Hong Kong*	*Malaysia*	*Thailand*	*Greece*	*Taiwan*	*Korea*	*Turkey*	*Peru*	*India*	*Total*
AAA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA	10	-	-	2	-	-	-	-		-	-	-	-	12
A	24	-	-	1	-	1	1	-	-	-	-	-	-	27
BBB	90	-	2	-	1	-	1	2	2	-	-	-	-	100
BB	48	3	6	-	-	2	-	1	-	1	-	1	1	63
B	17	-	-	-	-	-	-	-	-	-	1	-	-	18
CCC	2	-	-	-	-	-	-	-	-	-	-	-	-	2
CC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	191	3	8	3	1	3	2	3	2	2	1	1	1	221

Panel B. Rating Changes

Japan	*Indonesia*	*Philippines*	*Singapore*	*Pakistan*	*Malaysia*	*Thailand*	*Columbia*	*Korea*	*Poland*	*Peru*	*Total*
47	4	8	3	3	1	7	2	5	1	2	85

Table 2. Transition Matrix of Unsolicited Rating Changes
The sample consists of unsolicited ratings from November 1996 to April 2001. The unsolicited ratings are obtained from Creditweek and Ratings Direct database of S&P. The ratings are long-term corporate issuer ratings and are not assigned to specific bond issues.

	Rating Changes									
Old rating	**AAA**	**AA**	**A**	**BBB**	**BB**	**B**	**CCC**	**CC**	**C**	**Default**
AAA	-	-	-	-	-	-	-	-	-	-
AA	-	-	4	-	-	-	-	-	-	-
A	-	1	-	9	-	-	-	-	-	-
BBB	-	-	2	-	21	-	-	-	-	-
BB	-	-	-	2	-	28	1	-	-	1
B	-	-	-	-	5	-	2	1	-	1
CCC	-	-	-	-	-	-	-	4	-	1
CC	-	-	-	-	-	-	-	-	-	2
C	-	-	-	-	-	-	-	-	-	-

Downgrades:75
Upgrades:10

Table 3. Transition Matrix of Solicited Rating Changes

The sample consists of solicited ratings for Japanese firms from November 1996 to April 2001. The solicited ratings are obtained from Creditweek and Ratings Direct database of S&P. The ratings are long-term corporate issuer ratings and are not assigned to specific bond issues.

A. New Ratings

Total	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB
27	3	1	1	3	6	7	2	-	4	-	-

B. Rating Changes

Old Ratings	*Rating Changes*										
	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB
AAA	5	1	-	-	-	-	-	-	-	-	-
AA+	-	9	-	-	-	-	-	-	-	-	-
AA	-	-	8	2	-	-	-	-	-	-	-
AA-	-	-	-	3	-	-	-	-	-	-	-
A+	-	-	1	-	3	4	-	-	-	-	-
A	-	-	-	2	-	6	1	-	-	-	-
A-	-	-	-	-	3	-	11	6	-	-	-
BBB+	-	-	-	-	-	-	-	-	3	1	-
BBB	-	-	-	-	-	-	2	-	2	-	-
BBB-	-	-	-	-	-	-	1	3	-	3	-
BB+	-	-	-	-	-	-	-	-	-	-	1

Downgrades:69
Upgrades:12

Table 4. Announcement Period Abnormal Return for Unsolicited Ratings

The sample consists of 204 unsolicited new ratings and 64 rating changes announced by S&P's between November 1996 to April 2002. The abnormal returns are computed as the cumulative market model residuals, where the major market index in each country is used as the market portfolio and obtained from Datastream. The announcement period corresponds to a two-day window (-1, 0) relative to the announcement date. Parameters in the market model are estimated using the Datastream daily price data for the estimation period (-200, -10) relative to the announcement date. T(Z)-statistic p-values are reported in the last column for the null hypothesis that the mean (median) difference is zero assuming unequal variances for the two groups.

A. Unsolicited Ratings

	New Ratings		***Down Grades***		***Up Grades***	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Whole sample						
Observations	204		56		8	
Beta	0.75	0.71	0.88	0.92	0.22	0.21
Abnormal Returns (%)	-0.69	-0.37	-0.86	-0.64	-0.12	0.51
(Standard Deviation (%))	0.37		0.47		1.92	
Positive returns (%)	46.56		44.64		62.50	
Z Statistic p-Value	0.06		0.08		0.68	
Signed Rank Test p-Value		0.14		0.09		0.74
Japanese Firms						
Observations	174		24		8	
Beta	0.77	0.70	0.95	0.92	0.22	0.21
Abnormal return (%)	-0.99	-0.70	-1.06	-1.01	-0.12	0.51
(Standard Deviation (%))	0.42		0.56		1.92	
Positive returns (%)	44.25		33.33		62.50	
Z Statistic p-Value	0.02		0.05		0.68	
Rank test p-Value		0.03		0.06		0.74
Other Firms						
Observations	30		32			
Beta	0.74	0.87	.83	.92		
Abnormal return (%)	1.02	0.26	-0.71	0.04		
(Standard Deviation (%))	0.43		0.68			
Positive returns (%)	53.13		50.00			
Z Statistic p-Value	0.03		0.30			
Signed Rank test p-Value		0.12		0.39		

B. Solicited Ratings

	New Ratings		*Down Grades*		*Up Grades*	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Japanese Firms						
Observations	25		61		8	
Beta	0.85	0.79	1.09	0.99	1.03	0.98
Abnormal return (%)	-0.47	-0.33	-1.04	-0.93	-0.43	0.52
(Standard Deviation (%))	0.11		0.55		1.92	
Positive returns (%)	44.00		37.70		55.55	
Z Statistic p-Value	0.68		0.04		0.68	
Rank test p-Value		0.68		0.03		0.74

Table 5. Announcement Period Abnormal Return by Rating Grades

The sample consists of solicited and unsolicited ratings for Japanese firms announced by S&P's between November 1996 to April 2002. The abnormal returns are computed as the cumulative market model residuals, where the major market index in each country is used as the market portfolio. The announcement period corresponds to a two-day window (-1, 0) relative to the announcement date. Parameters in the market model are estimated using the Datastream daily price data for the estimation period (-200, -10) relative to the announcement date.

A. Unsolicited Ratings

	New Ratings		*Down Grades*	
	Mean	*Median*	*Mean*	*Median*
Ratings of BBB or Better				
Observations	115		4	
Abnormal Returns (%)	-0.67	-0.48	-0.02	0.19
(Standard Deviation (%))	0.38		2.10	
Positive returns (%)	46.96		50	
Z Statistic p-Value	0.11		.99	
Signed Rank Test p-Value		0.19		1.00
Ratings below BBB				
Observations	59		21	
Abnormal return (%)	-1.62	-1.21	-1.27	-1.11
(Standard Deviation (%))	0.81		0.67	
Positive returns (%)	38.98		30.00	
Z Statistic p-Value	0.06		0.07	
Rank test p-Value		0.07		0.06

B. Solicited Ratings

	New Ratings		*Down Grades*	
	Mean	*Median*	*Mean*	*Median*
Ratings of BBB or Better				
Observations	25		57	
Abnormal Returns (%)	-0.47	-0.33	-0.98	-0.78
(Standard Deviation (%))	1.12		0.47	
Positive returns (%)	48.00		50.88	
Z Statistic p-Value	0.68		0.11	
Signed Rank Test p-Value		0.68		0.09
Ratings below BBB				
Observations			4	
Abnormal return (%)			-1.96	-2.94
(Standard Deviation (%))			0.85	
Positive returns (%)			25.00	
Z Statistic p-Value			0.08	
Rank test p-Value				0.25

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