Unsolicited Credit Ratings: Theory and Empirical Analysis[1]

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Abstract

The compensation structure, hence agency framework, for unsolicited ratings differs markedly from solicited ratings in that the rating agency is not compensated by the firm for an unsolicited rating. Rating agencies have been criticized for the use of unsolicited ratings as punishment of issuers for not hiring them to rate their issues. We develop a model based on asymmetric information that provides implications regarding rating agencies' motivations and the effects of unsolicited ratings on firm value. We then empirically examine the implications. Consistent with the model, many unsolicited ratings are speculative grades while most solicited ratings are investment grades. Market reactions to unsolicited rating downgrades are negative and significant and the reactions are more severe for speculative grades. *Keiretsu* affiliation of Japanese firms does not mitigate the negative market reaction to unsolicited ratings.

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1. Introduction

A firm's credit rating affects the cost of borrowing. For example, the spread between A-rated and BBB-rated bonds during the 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 such factors as regulatory concerns, the globalization of the credit rating industry, and the growth of derivatives tied to credit-related events such as default and rating changes. The rating industry has been expanding rapidly with the growth of global public capital markets.[1] According to the 2001 annual report of S&P's, its international revenue has grown from 26.0% of total revenue in 1998 to 32.2% in 2000. For Moody's, its international revenue has increased by an annual rate of more than 20% while it has grown by 11% in the U.S. during the same period.

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 low-cost providers 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 listed on S&P's *CreditWatch* are subsequently downgraded. Other studies examine abnormal bond returns associated with the announcement of bond rating changes. Weinstein (1977) and Hite and Warga

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

(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 bond and stock prices. The effect of upgrading, however, is weaker.[2] Dichev and Piotroski (2001) also find negative long-run abnormal stock performance following rating downgrades, but no significant abnormal performance following upgrades.

We analyze the role of credit rating agencies in providing information to the marketplace, and how the market utilizes such information. Our 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 in which investors' beliefs about the firm type from issued ratings are confirmed. Second, we test the implications of the model using solicited and unsolicited ratings. 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. For an unsolicited rating, the rating agency makes its analysis based on information available in the public domain while the agency has access to confidential data for a full (solicited) rating. Therefore, any reaction to unsolicited ratings would mean a violation of market efficiency. However, our model suggests that unsolicited ratings reflect signaling decisions and result in market reaction. 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

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

for non-U.S. firms. Previous research investigates the information content of rating changes only for U.S. firms. In this study, we take a very important step in investigating whether investors rely on the credit ratings of the U.S. rating agencies in assessing the creditworthiness of foreign companies.

Rating agencies have been criticized for using unsolicited ratings to induce solicited ratings in order to increase revenues from rating fees. Most ratings are issued with the consent of the municipality or the 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. Some bond issuers argue that rating agencies fought this trend by threatening to issue lower, unsolicited ratings to force bond issuers into buying their assessments.[3] Originally, primary revenues of rating agencies were fees charged to subscribers to the rating bulletins. Now the revenues of the U.S. agencies come almost entirely from fees charged to the issuer of the security, although subscription fees are still important in some markets outside the U.S. Typical issuer fees include an initial fee based on the size and complexity of the issue and monitoring fees.[4] 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 that 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. 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.

Most Asian firms, Japanese firms in particular, complained bitterly about unsolicited ratings. The Japan Center for International Finance (JCIF, 1999) claims that cultural bias often impairs the judgment of the U.S. rating agencies and causes damage to the international standing of Japanese and other Asian companies. Focusing on the operations of six major 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 U.S. rating agencies during a recent Asian financial crisis caused resonant market reactions, possibly

[3]According to the New York Times (March 13, 1999), following the allegations by some municipal bond issuers, the U.S. Department of Justice launched an investigation into the charge of antitrust violations in the rating practices of Moody's.

[4]According to Kliger and Sarig (2000), rating agencies typically charge $25,000 for bond issues of up to $500 million and half a basis point of the issued amount for issues of more than $500 million.

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.[5] JCIF examined differences in solicited ratings and unsolicited ratings issued by S&P's and Japan Rating & Investment Information (R&I). JCIF found that the unsolicited ratings of S&P's are 4 notches lower than solicited ratings of R&I while solicited ratings of S&P's are only 2 notches lower than those of R&I. The findings of JCIF show the conservative nature of unsolicited ratings.

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. Some Japanese firms say they are disturbed by unsolicited ratings by Moody's, and urge Moody's to specify whether the rating is solicited or unsolicited.[6] Moody's says this policy is the same in every country. The Japanese word used to translate unsolicited (*katte*) has a vague negative overtone. The word means that one is doing something without permission and perhaps in a selfish way.

Unlike Moody's, S&P's reveals whether the rating is solicited or unsolicited. Our data consist of those unsolicited ratings issued by S&P's for non-U.S. firms. Therefore, the market knows whether the ratings are unsolicited or not. The primary implication of our model is that unsolicited ratings bring about market reactions due to signaling effects: bad firms choose not to signal and their quality is revealed by unsolicited ratings. Consistent with the implications of our model, we find that many unsolicited ratings are speculative grades while most solicited ratings are investment grades. Furthermore, market reactions to the announcement of unsolicited rating downgrades are negative and significant, especially for ratings of speculative grades. Finally, we test the assertion by Japanese firms that the analysis by a U.S. rating agency of Japanese firms can be impaired by the agency's lack of understanding of Japanese culture and nature of firm governance in Japan. In particular, a firm may have *keiretsu* affiliation, in which it enjoys backing from a group of other firms

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

[6]The survey of JCIF (1999) shows that more than 60% of respondents expressed negative views on unsolicited ratings such as "rating companies should disclose in greater detail the grounds for their unsolicited ratings" and "rating companies should disclose unsolicited ratings separately from solicited ratings." In addition, the survey states that some 30% of respondents argue that "unsolicited ratings are used by rating agencies in their marketing strategies to solicit ratings, and this creates problems regarding the reliability of the ratings."

or financial institutions. Intuitively, *keiretsu* affiliation should serve to enhance investor confidence, and therefore mitigate the effects of a low credit rating announcement. On the contrary, we find that *keiretsu* affiliation does not mitigate the negative market reaction to unsolicited ratings.

The model is developed in Section II. Section III describes the data. The empirical analyses and results are discussed in Section IV. Section V provides an analysis on the relation between Japanese corporate governance structure and credit rating effects. Conclusions follow in Section VI.

2. 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 θ ($0 < \theta < 1$) are good firms and $1 - \theta$ are bad firms. 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, but investors cannot directly observe the firm quality. 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 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 a risky grade, with $i_r > i_s$.[7]

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

[7] We assume that firms can issue at the given rates only after rating information is revealed. Without rating information, however, the interest rate should be determined according to probabilities. As shown below, exogenous interest rates are not necessary conditions in our model.

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.

Managers have two choices: reveal the firm type to the public through a rating agency or do nothing. If the manager chooses to do nothing, the rating agency rates the firm's credit risk without inside information (an unsolicited rating) with a probability of λ; i.e.,

$$\text{Prob[agency finds firm safe|firm is good]} = \text{Prob[agency finds firm risky|firm is bad]} = \lambda.$$

Therefore, λ can be directly affected by the rating agency's ability to rate each firm without inside information. 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 $C_f(\lambda)$ (with $C_f'(\lambda) > 0$), with $0 < \frac{C_t(\lambda)}{C_f(\lambda)} < \frac{1-\lambda}{\lambda}$.[8] 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 $\lambda > .5$.

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 is good is p_0. Before the issue of ratings, investors value the firm as[9]

$$\begin{aligned} V_0 = E_0 + D_0 &= \delta\left\{p_0[Hp_{s|g} + L(1-p_{s|g})] + (1-p_0)[Hp_{s|b} + L(1-p_{s|b})]\right\} \\ &= \delta\left\{(p_0p_{s|g} + p_{s|b} - p_0p_{s|b})H + [1 - (p_0p_{s|g} + p_{s|b} - p_0p_{s|b})]L\right\}, \end{aligned} \tag{1}$$

$$E_0 = \delta\left\{(p_0p_{s|g} + p_{s|b} - p_0p_{s|b})(H - I) - p_0p_{s|g}Ii_s - (1-p_0)p_{s|b}Ii_r\right\}, \tag{2}$$

$$D_0 = \delta\left\{(p_0p_{s|g} + p_{s|b} - p_0p_{s|b})I + [1 - (p_0p_{s|g} + p_{s|b} - p_0p_{s|b})]L + p_0p_{s|g}Ii_s + (1-p_0)p_{s|b}Ii_r\right\} \tag{3}$$

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. Without any other information, the interest rate charged by investors is given by

[8] The condition is equivalent to $0 < \frac{C_t(\lambda)}{C_f(\lambda)} < 1$ for $\lambda > .5$ and $0 < \frac{C_t(\lambda)}{C_f(\lambda)} < \infty$ for $\lambda \leq .5$.

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

$i = p_0 p_{s|g} i_s + (1-p_0) p_{s|b} i_r$. In fact, if we assume the risk-neutral economy, the interest rate can be endogenized and explicitly solved from

$$(1+r_f)I = \left[p_0 p_{s|g} + (1-p_0)p_{s|b}\right] I(1+i) + \left[p_0(1-p_{s|g}) + (1-p_0)(1-p_{s|b})\right] L$$

where r_f is a risk-free rate. 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's quality, conditional on the credit rating. If they observe a safe grade, they update the probability that the firm is good from p_0 to $p_{g|s}$. If they observe a risky grade, the probability is updated 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 a safe grade and a risky grade, respectively, are

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

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

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

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

and with a risky grade as

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

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.[10] The manager of the firm may choose not to reveal private information about the quality of

[10] If investors are risk-neutral, the interest rates can be endogenously determined. For example, with a safe grade we can solve for the interest rate from:
$(1+r_f)I = [p_{g|s} p_{s|g} + (1-p_{g|s}) p_{s|b}] I(1+i_s) + [1 - p_{g|s} p_{s|g} - (1-p_{g|s}) p_{s|b}] L$.

the 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

$$E_g^n = \lambda E_s + (1-\lambda)E_r \tag{8}$$

for a good firm, and

$$E_b^n = \lambda E_r + (1-\lambda)E_s \tag{9}$$

for a bad firm.

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

$$E_g^t = E_s - C_t(\lambda), \tag{10}$$

and the equity value by signaling falsely is

$$E_b^f = E_s - C_f(\lambda). \tag{11}$$

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

2.1. 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 p_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.,

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

Even if there is no signaling at all, if the rating agency produces an unsolicited 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[11]

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

and

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

An 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.[12] This condition, which we will call quasi-separating, is equivalent to $p_{g|s} > \theta$ for a good firm and $p_{g|r} < \theta$ for a bad firm. Using equations (13) and (14), the condition is satisfied if $\theta < 1$ and $\lambda > .5$.

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., $E_g^n \geq E_g^t$ and $E_b^n \geq E_b^f$. These conditions are satisfied if

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

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

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

[12]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.

2.2. 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

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

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 $\lambda > .5$.

2.3. Implications of the Model and the Hypotheses

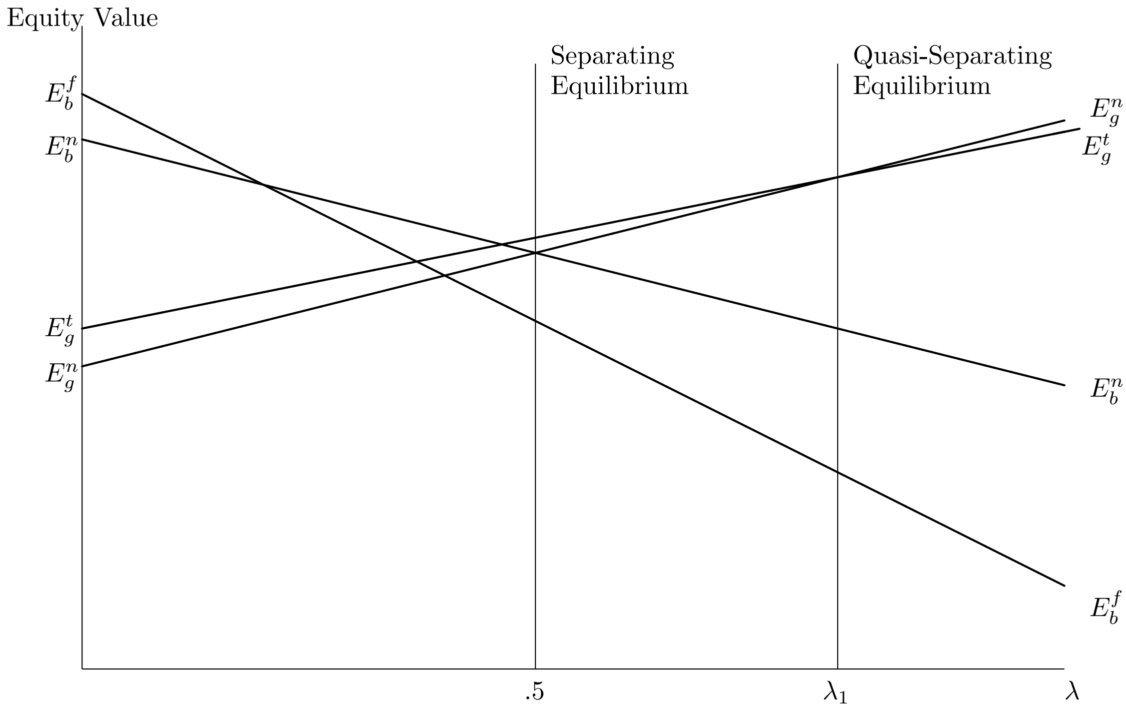

Figure 1. Uncertainty and type of equilibrium

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 bad firms command higher equity value: investors will not rely on the 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 without signaling 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, the probability of being a good firm given the safe grade, $p_{g|s}$, will increase and the probability given a risky 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.[13] Thus, for $\lambda_1 < \lambda < 1$ in Figure 1, there exists a quasi-separating equilibrium in which neither type of firms signals. 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 signaling costs are very high, *ceteris paribus*, a quasi-separating equilibrium is more likely to hold. 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. When the rating services were first begun, the primary revenues of a rating agency were fees charged to subscribers to the rating bulletins. Thus, the rating agency had to provide accurate ratings whether they were solicited or unsolicited, i.e., to increase λ. However, now the revenues of the rating agency come almost entirely from fees charged to security issuers,[14] and the rating agency 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. This implies that the rating agency will strongly prefer the separating equilibrium in which good firms signal by paying rating fees. The condition for the separating equilibrium given by inequality (16) implies that the separating equilibrium range

[13]This argument is based on some regularity assumptions such as convexity of C_t and concavity of C_f.

[14]The subscription fees are still important in some markets outside the U.S.

depends upon the ratio of the signaling cost and the probability of correctly assessing credit risk of a firm by unsolicited rating, λ. If the agency issues all grades regardless of solicited or unsolicited, it will result in too high λ. Since the signaling cost is in turn determined by λ, if the rating agency is allowed either to issue or not to issue the results of unsolicited ratings, the rating agency will selectively issue the rating results to influence λ. This endeavor of the rating agency is likely to result in the separating equilibrium in Figure 1 by keeping 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 agency's reputation will be at risk. Therefore, the best strategy for the agency to keep λ below λ_1 is to issue conservative and low grades. This leads to the following hypothesis:

H1: *Rating agencies are more likely to issue unsolicited ratings of low-grade (e.g., speculative grade) and downgrade than of high-grade (e.g., investment grade) and upgrade.*

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, 1984), 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) conjecture 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 risky grade is larger than the change in probability due to a safe grade.

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Please insert Table 1 about here.

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In Table 1, we simulate the posterior probabilities and changes in equity values due to issued ratings with $\delta = 1$, $i_r = .2$, and $i_s = .1$. 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, is .5, the probability of being a good firm given a safe grade $p_{g|s}$ is .57, while the probability of being a good firm given a risky grade $p_{g|r}$ is .33. If a previous rating serves as the prior, the change in equity value is more significant for rating downgrades than for rating upgrades. For example, when the prior probability of being a good firm p_0 is .5, the equity value changes by -15.15 percent with risky grade while it changes by 10.39 percent with safe grade. Of course, if the rating change is mostly unexpected (e.g., from CCC to A), then the effect of upgrade will also be highly significant as shown for the case of safe grade with prior $p_0 < .4$. However, such cases are rarely observed. Therefore, our model leads to the following hypothesis:

> **H2:** *Market will react more significantly to the announcements of downgrade ratings than to those of upgrade ratings.*

Table 1 further shows that the changes in probability and equity value are more profound for risky grade with lower prior probabilities ($p_0 < .4$) than for safe grade with high prior probabilities ($p_0 > .6$). This implies that the changes in probability and equity value due to a rating change will be more significant when the prior probability of being a good firm is low. For example, 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).[15]

[15] 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

H3: *Market will react more significantly to the announcements of ratings within a low rating class (e.g., speculative grade) than within a high rating class (e.g., investment grade).*

3. The 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 information in the public domain, 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 1996 and April 2001 obtained from *Creditweek* and *Ratings Direct*.[16]

We identified 221 unsolicited new ratings and 85 unsolicited rating changes in 16 countries.[17] For most of these countries, bank loans are the predominant source of corporate borrowing, bond markets are very small and the secondary markets are virtually non-existent. For example, Japanese firms issued only 10 trillion yens of corporate bond in 2000, while bank loans amounted to 391 trillion yens in the same year. For this reason, we focus on the effect of firm credit ratings on the stock price rather than bond value. Table 2 provides the distribution of unsolicited ratings by country. Japanese firms represent about 78 percent of the total ratings. 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

significant for downgrades within rating classes.

[16]According to *Creditweek* and *Ratings Direct*, among total unsolicited ratings in the world as of April 2001, 73% are assigned to Asian firms. In particular, Japanese firms account for 51% of total unsolicited ratings and other unsolicited ratings are concentrated on emerging markets.

[17]Unsolicited ratings are rare in the U.S.

with unsolicited ratings, we further collect data on solicited ratings for Japanese firms. We also use price data on individual firms and the broad market index for each country from Datastream, and search announcement dates in the LEXIS-NEXIS database. Additional accounting variables are obtained from Worldscope.

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Please insert Table 2 about here.

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4. Empirical results

Table 2 shows the distribution of unsolicited ratings while Table 4 shows the distribution of solicited ratings. Among 221 unsolicited new ratings in Panel A of Table 2, 83 ratings or 38 percent are speculative grades (BB or lower). On the other hand, Panel A of Table 4 shows that none of the solicited new ratings are speculative grades. We also report unsolicited rating changes in Table 3 and solicited rating changes in Panel B of Table 4. Out of 85 unsolicited rating changes, only 10 are upgrades and the remaining are downgrades, and 67 or 79 percent are rating changes to speculative grades. For solicited rating changes, there are 12 upgrades and most of the downgrades are changes within investment grades (BBB or better). Only 5 ratings are speculative grades (BB). Also, note that the solicited rating changes are further refined by '+' or '−' signs and 54 percent of the downgrades 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 downgrade than of high-grade and upgrade and that low-quality firms choose not to signal their quality through the rating agency.

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Please insert Tables 3 and 4 about here.

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To examine the effect of the rating announcement, we report announcement period abnormal returns given as the cumulative market model residuals in Table 5.[18] The announcement period corresponds to a two-day window $(-1, 0)$ relative to the announcement date appearing in the LEXIS-

[18] 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.

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. Parameters in the market model are estimated against the major market index in each country using daily price data for the estimation period $(-200, -10)$ relative to the announcement date. For the whole sample, the average announcement period abnormal return for unsolicited new ratings is $-.69$ percent with 46.56 percent positive returns. The average is statistically significant at the 6 percent level, but the median is not significant. The average announcement period abnormal return for the rating downgrades is $-.86$ percent with p-value .08 while the median is $-.64$ percent 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 upgrades, the mean and median abnormal returns are insignificant ($-.12$ percent and .51 percent, respectively). The results support the hypothesis (H2) that the market will react more significantly to the announcements of rating downgrades than to those of rating upgrades.

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Please insert Table 5 about here.

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We also report separate results for Japanese firms and other firms in Table 5. For the sample of 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 downgrades) and median ($-.70$ percent with p-value .03 for new ratings and -1.01 percent with p-value .06 for rating downgrades) abnormal returns. For the sample of other firms, new ratings are associated with positive mean abnormal return (1.02) but insignificant median abnormal return and the effects of rating downgrades are not significant. Most emerging markets in our sample have very thin bond markets and hence credit rating announcements are not of profound significance. Table 5 also reports estimated beta for each group. Downgrade ratings are associated with greater estimated betas in all cases. Both mean and median beta estimates are greater than those for new ratings.

Panel B of Table 5 reports announcement period abnormal returns for solicited ratings of Japanese firms. 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 downgrades. This result contrasts the findings of Holthausen and Leftwich (1986) that report negative 2-3 percent abnormal returns to the announcement of solicited rating downgrade for the U.S. firms. The difference in announcement period abnormal return between solicited and unsolicited downgrades for Japanese firms is not distinguishable. Beta estimates are also greater for solicited rating downgrades than for solicited new ratings. Regardless of solicited or unsolicited, firms receiving rating downgrades tend to have higher systematic risk than firms receiving new ratings.

To check the robustness of our results, we consider regression analyses including dummy variables. This is especially important as our sample size is small. Following Henry (2002), we use the international capital asset pricing model (ICAPM) to measure the abnormal return as follows:

$$R_{it} = \alpha + \beta R_t^W + \gamma_1 NEW_{it} + \gamma_2 DOWN_{it} + \gamma_3 UP_{it} + \varepsilon_{it} \tag{17}$$

where R_{it} is the return on firm i's stock on day t, R_t^W is the return on the Morgan Stanley Capital Market Index (MSCI) world stock market index on day t, NEW is a dummy variable equal to one for days of $(-1, 0)$ relative to a new rating announcement and zero otherwise, $DOWN$ is a dummy variable equal to one for days of $(-1, 0)$ relative to a downgrade rating announcement and zero otherwise, and UP is a dummy variable equal to one for days of $(-1, 0)$ relative to a upgrade rating announcement and zero otherwise. The parameter γ_1 measures the average daily stock return for all new ratings, γ_2 for all downgrade ratings, and γ_3 for all upgrade ratings. As an alternative specification, when we allow for country specific intercepts, the dummy variable for Japan tends to produce marginally significant negative coefficient estimates but all other results are similar.

We include $(-210, +10)$ days relative to each event and the estimation is based on pooled cross section time series panel data. The results are not sensitive to the time span. As some periods overlap, the error term is likely to be correlated. To allow both possible serial correlation and heteroskedasticity across countries, we estimate equation (17) using feasible generalized least squares (FGLS).

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Please insert Table 6 about here.

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The estimation results are reported in Table 6 separately for solicited rating (Panel A) and unsolicited rating (Panel B) samples. Since the sample of solicited ratings consists only of Japanese firms, we use the DataStream Japanese market index instead of the MSCI world market index for solicited ratings. The coefficient estimates from the ICAPM suggest that the announcement date abnormal returns are negative .72 percent per day and significant at 5 percent level for unsolicited rating downgrades and negative .65 percent per day and significant at 10 percent level for solicited rating downgrades. These results are consistent with those in Table 5. The announcement effects of unsolicited new ratings are negative but not significant.

To test the hypothesis (H3) that the market reacts more significantly to the announcements of new ratings and rating changes in a low rating class than in a high rating class, 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 for the sub-groups of unsolicited ratings are reported in Panel A of Table 7. For investment grade, the announcement period abnormal returns for both unsolicited new ratings and rating downgrades are negative but not significant. For speculative grade unsolicited new ratings and rating downgrades, the average abnormal returns are -1.23 (median = -1.21) percent and -1.27 (median = -1.11) percent, respectively. The greater estimate of beta for speculative grade group than investment grade group indicates that firms with speculative ratings are associated with greater systematic risk. We further examine the abnormal return for the subsample of firms with unsolicited rating downgrades from investment grade to speculative grade. As shown in Panel A of Table 7, the mean (-1.54 percent) and median (-2.29 percent) abnormal returns are negative and significant, suggesting that the market reacts more severely when the downgrades are from investment grade to speculative grade.[19]

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Please insert Table 7 about here.

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Panel B of Table 7 shows the results for solicited ratings. All new ratings are investment grade and the mean and median abnormal returns are not significantly different from zero. For solicited

[19]For new ratings we find statistically significant (at 10 percent level) difference in abnormal return between investment grades and speculative grades. But for downgrades, test statistics are not reliable due to few investment grade unsolicited ratings.

rating downgrades, the investment grade is associated with insignificant mean abnormal return, but the median is −.78 percent with p-value of .09. On the other hand, the average abnormal return for the speculative grade is −1.96 percent and the median is −2.94 percent. In fact, these downgrades are all from investment grade to speculative grade. However, the sample size is only 4 and we cannot make a strong conclusion. The overall results in Table 7 suggest that the general market reaction to unsolicited new and downgrade ratings is much more severe for speculative grade class than for investment grade class, supporting hypothesis H3.[20]

We also estimate announcement abnormal returns using the ICAPM for different classes of rating grades, following the same procedure as in Table 5:

$$R_{it} = a + bR_t^W + \lambda_1 NEW_{it} \cdot IG_{it} + \lambda_2 NEW_{it} \cdot SG_{it} + \lambda_3 DOWN_{it} \cdot IG_{it} + \lambda_4 DOWN_{it} \cdot SG_{it} + \varepsilon_{it} \quad (18)$$

where IG is a dummy variable equal to one for days of $(-1, 0)$ relative to an investment-grade rating announcement and zero otherwise, and SG is a dummy variable equal to one for days of $(-1, 0)$ relative to a speculative-grade rating announcement and zero otherwise. All other variables are defined the same as in equation (17).

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Please insert Table 8 about here.

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The estimation results of equation (18) are shown in Table 8. The coefficient estimate associated with unsolicited new ratings of speculative grade ($NEW \cdot SG$) is negative .54 percent per day with p-value of .081. Also, the reactions to unsolicited downgrade rating announcements are negative and significant for both investment grade ($DOWN \cdot IG$, −.69 percent per day with p-value of .044) and speculative grade ($DOWN \cdot SG$, −.98 percent per day with p-value of .021). An additional test shows that there is significant difference in the market reaction between unsolicited rating downgrades to investment grades and unsolicited rating downgrades to speculative grades. For solicited ratings, we find significant announcement return for rating downgrades to speculative grades ($DOWN \cdot SG$, −.65 percent with p-value of .076), while the abnormal return is not significant when the rating downgrades are to investment grades. These results are consistent with those found in Table 7 and

[20] We also perform pair-wise t-tests for abnormal return difference (not reported) between solicited and unsolicited ratings and find no significant differences. However, some of the pair-wise comparisons are not reliable due to small samples.

support the hypothesis that the general market reaction to downgrade ratings is more severe when the resulting grades are speculative-grade than when they are investment-grade.

5. Japanese governance structure and the effects of credit ratings

In this section, we estimate a multivariate regression model using the sample of Japanese firms to take their different governance structure into consideration. According to the survey of JCIF, managers of Japanese firms assert that the split ratings between U.S. and Japanese raters may be attributed to insufficient appreciation of the realities of Japanese corporate governance by U.S. agencies. In particular, with *keiretsu* links, any company finding itself in financial trouble would be bailed out by fellow members of its financial or industrial group. *Keiretsu* is a large financial or business network based on cross shareholdings, mutual appointment of officers and other key personnel, intra-group financing to group firms by group financial institutions, and formation of presidential councils. There are two types of *keiretsu*; horizontal (financial) *keiretsu* and vertical (industrial) *keiretsu*. In 1997, eight major financial *keiretsu* accounted for 6.0% of employment, 20.8% of paid-in capital, 17.0% of sales, and 8.4% of net profits in Japan's corporate sector (*Industrial Groupings in Japan*, 1999).

Table 9 shows the distribution of solicited and unsolicited ratings and some firm characteristics across *keiretsu* affiliations. Note that for unsolicited ratings, about 54 percent of the firms are affiliated with financial *keiretsu* while for solicited ratings, only about 36 percent of the firms are affiliated with financial *keiretsu*. On the other hand, only about 10 percent of firms with unsolicited ratings belong to industrial *keiretsu* while about 26 percent of firms with solicited ratings belong to industrial *keiretsu*. This implies that relatively fewer financial *keiretsu* firms solicit ratings while relatively more industrial *keiretsu* firms solicit ratings. On average, solicited ratings are associated with larger companies as indicated by significantly larger asset sizes while market-to-book equity ratios are lower for solicited ratings. There is no significant difference in book-value debt to total assets ratio between solicited and unsolicited rating samples.

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Please insert Table 9 about here.

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Considering the importance of *keiretsu* affiliation for Japanese firms, we specify the following regression model:

$$\begin{aligned} ABR &= \alpha_0 + \beta_1 Down + \beta_2 Uns \cdot Down + \beta_3 IK + \beta_4 FK + \beta_5 Bank + \beta_6 Down \cdot IK \\ &\quad + \beta_7 Down \cdot FK + \beta_8 Down \cdot Bank + \beta_9 Uns \cdot IK + \beta_{10} Uns \cdot FK + \beta_{11} Lasset \\ &\quad + \beta_{12} Debt/Asset + \beta_{13} BM + \varepsilon, \end{aligned} \tag{19}$$

where ABR is the cumulative market model residual from Table 5, $Down$ is a dummy variable equal to one for downgrades and zero otherwise, Uns is a dummy variable equal to one for unsolicited ratings and zero otherwise, IK is a dummy variable equal to one for firms affiliated with an industrial *keiretsu* and zero otherwise, FK is a dummy variable equal to one for firms affiliated with a financial *keiretsu* and zero otherwise, and $Bank$ is a dummy variable equal to one for banks and zero otherwise. During our sample period, the Japanese banking industry was suffering from bad loan problems and there can be potentially different market reactions for banks. Note that we include several interaction variables in the regression model to see the different effects of downgrades: for industrial *keiretsu* firms ($Down \cdot IK$), for financial *keiretsu* firms ($Down \cdot FK$), and for banks ($Down \cdot Bank$). We also include interaction variables of unsolicited rating for industrial *keiretsu* firms ($Uns \cdot IK$) and for financial *keiretsu* firms ($Uns \cdot FK$). To account for some firm characteristics, we include the logarithm of total assets ($Lasset$), book debt to assets ratio ($Debt/Asset$), and book-to-market equity ratio (BM).

Table 10 reports estimation results of the multivariate regression specified by equation (19). If a firm's affiliation with financial *keiretsu* provides additional support for the credit standing of the firm, the market reaction should be less severe for this firm. Consistent with this notion, the coefficient estimate for financial *keiretsu* indicator variable (FK) is positive and significant (p-value of .019). However, financial *keiretsu* firms with rating downgrades and unsolicited ratings experience more severe market reactions than other firms, as indicated by the negative and significant estimates of interaction dummy variables $Down \cdot FK$ and $Uns \cdot FK$. Investors seem to recognize that financial *keiretsu* firms with solicited ratings are good, but those with unsolicited ratings are bad. The coefficient estimate of the interaction variable between unsolicited ratings and industrial *keiretsu* ($Uns \cdot IK$) is also significant and negative, suggesting that unsolicited ratings convey negative information in the market for industrial *keiretsu* firms as well. Downgrades for banks ($Dwon \cdot Bank$)

are also associated with a significant and negative market reaction. The results in Table 10 imply that investors do not value *keiretsu* relationship, but solicited ratings, consistent with the implications of our model.

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Please insert Table 10 about here.

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6. Conclusion

We develop a model and derive implications regarding rating agencies' motivations and the effects of unsolicited ratings on firms' equity value. We derive a separating equilibrium in which good firms have higher equity value by signaling their quality through solicited ratings while bad firms choose not to signal. Another interesting result is that there exists a quasi-separating equilibrium in which neither good nor bad firms signal. Since the rating agency is compensated through the solicited ratings only, the agency strongly prefers the separating equilibrium. The condition for the separating equilibrium depends upon the signaling cost and the probability of accessing credit risk by unsolicited ratings. Since the rating agency has discretion for unsolicited ratings, it will issue a certain portion of unsolicited ratings in order to foster the separating equilibrium. This implies that the rating agency will issue conservative, low grades. Thus, market reaction to unsolicited ratings is likely to be negative due to revealed firm quality. The model further implies that the market's reaction will be more profound for downgrades than for upgrades and for changes within a low rating class than for those within a high rating class.

We test some of the implications using unsolicited and solicited credit ratings issued for non-U.S. firms between 1996 and 2001. We find generally supporting evidence of the implications of our model. Rating agencies issue much more unsolicited ratings of low-grade and downgrade than of high-grade and upgrade. For unsolicited new ratings of a speculative grade and rating downgrades, there are negative stock price reactions to their announcements. However, for solicited ratings, we find negative effects only for rating downgrades. We further find that the market reaction to the unsolicited rating downgrades is more profound for a speculative grade class than for an investment grade class. Unsolicited rating changes appear to be deteriorating events for firms with downgrade ratings especially to 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 implies a violation of semi-strong form efficiency. However, our model suggests that the significant market reaction reflects signaling effects.

Japanese unique governance structure, *keiretsu*, does appear to affect market reactions to credit rating announcements. Unsolicited ratings convey negative information in the market especially for firms affiliated with *keiretsu*. Thus, the market does not appear to agree with the assertion that a firm's affiliation with *keiretsu* provides additional support for the credit standing of the firm. However, this evidence is consistent with our model. As good firms signal their quality through solicited ratings while bad firms choose not to signal, unsolicited ratings convey negative information in the market.

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Table 1. Posterior probabilities and changes in equity value due to issued ratings for various prior probabilities

Firm value (V_0), equity value (E_0), and debt value (D_0) are calculated for given priors (p_0), based on values of $p_{s|g}$ = .8, $p_{s|b}$ = .6, d = 1, i_r = 20%, and i_s = 10%, where $p_{s|g}$ and $p_{s|b}$ are conditional probabilities of being 'safe' given good and bad firms, respectively; d is a discount factor; i_r and i_s are interest rates for a firm with risky-grade and safe-grade, respectively. $p_{g|s}$ and $p_{g|r}$ are posterior probabilities of being a good firm given safe grade and risky grade, respectively. E_r and E_s represent equity values given risky grade and safe grade, respectively.

p_0	V_0	E_0	D_0	$p_{g\|s}$	$p_{g\|r}$	E_r	$(E_r - E_0)/E_0$	E_s	$(E_s - E_0)/E_0$
0.9	178	52.32	125.68	0.92	0.82	42.76	-18.27%	53.35	1.98%
0.8	176	50.24	125.76	0.84	0.67	41.07	-18.26%	52.25	4.01%
0.7	174	48.16	125.84	0.76	0.54	39.63	-17.71%	51.09	6.09%
0.6	172	46.08	125.92	0.67	0.43	38.40	-16.67%	49.87	8.22%
0.5	170	44.00	126.00	0.57	0.33	37.33	-15.15%	48.57	10.39%
0.4	168	41.92	126.08	0.47	0.25	36.40	-13.17%	47.20	12.60%
0.3	166	39.84	126.16	0.36	0.18	35.58	-10.70%	45.75	14.82%
0.2	164	37.76	126.24	0.25	0.11	34.84	-7.72%	44.20	17.06%
0.1	162	35.68	126.32	0.13	0.05	34.19	-4.18%	42.55	19.27%

Table 2. Frequency distribution of unsolicited ratings by country 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's. The ratings are long-term corporate issuer ratings 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 3. 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's. The ratings are long-term corporate issuer ratings and are not assigned to specific bond issues.

Old rating	***Rating changes***									
	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 4. Distribution of solicited new ratings and 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's. The ratings are long-term corporate issuer ratings and are not assigned to specific bond issues.

Panel A: New ratings

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

Panel B: Rating changes

Old	*Rating changes*										
Ratings	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 5. Announcement period abnormal return for solicited and unsolicited ratings

The sample consists of 203 (25) unsolicited (solicited) new ratings and 65 (71) unsolicited (solicited) rating changes announced by S&P's between November 1996 and April 2001. 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.

Panel A: Unsolicited ratings

	New ratings		***Downgrades***		***Upgrades***	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Whole sample						
Observations	203		57		8	
Beta	0.75	0.71	0.88	0.92	0.22	0.21
Abnormal return (%)	-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	173		25		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	
Signed 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		

Panel B: Solicited ratings

	New ratings		*Downgrades*		*Upgrades*	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Japanese firms						
Observations	25		61		10	
Beta	0.85	0.79	1.09	0.99	1.03	0.98
Abnormal return (%)	-0.47	-0.33	-1.04	-0.93	0.24	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	
Signed rank test p-value		0.68		0.03		0.74

Table 6. Announcement period abnormal return from international capital asset pricing model (ICAPM)

The sample consists of 203 (25) unsolicited (solicited) new ratings and 65 (71) unsolicited (solicited) rating changes announced by S&P's between November 1996 and April 2001. The abnormal returns from the ICAPM are measured by the following regression:

$$R_{it} = a + bR_t^W + l_1 NEW_{it} + l_2 DOWN_{it} + l_3 UP_{it} + e_{it}$$

where R_{it} is the return on firm *i*'s stock on day *t*, R_t^W is the return on the Morgan Stanley Capital Market Index (MSCI) world stock market index (the Datastream Japanese market index for solicited ratings), *NEW* is a dummy variable equal to one for days of (-1, 0) relative to a new rating announcement, *DOWN* is a dummy variable equal to one for days of (-1, 0) relative to a downgrade rating announcement, and *UP* is a dummy variable equal to one for days of (-1, 0) relative to an upgrade rating announcement. The parameter l_1 measures the average daily stock return for all new ratings, l_2 for all downgrade ratings, and l_3 for all upgrade ratings. We include (-210, +10) days relative to each event and the estimation is based on pooled cross section time series panel data. The regression is estimated using the feasible generalized least squares (FGLS) allowing for serial correlation and heteroskedasticity across countries.

	Panel A: Unsolicited ratings		Panel B: Solicited ratings	
Variables	**Estimated coefficient**	**p-value of t-statistics**	**Estimated coefficient**	**p-value of t-statistics**
R_t^W	.4743	.000	1.0211	.000
NEW	-.0015	.114	.0013	.345
DOWN	-.0072	.032	-.0069	.065
UP	.0005	.345	-.0026	.185
Intercept	-.0006	.000	.0001	.521

Table 7. Announcement period abnormal return by rating grades

The sample consists of 203 (25) unsolicited (solicited) new ratings and 57 (61) unsolicited (solicited) rating downgrades announced by S&P's between November 1996 and April 2001. 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.

Panel A: Unsolicited ratings

	New ratings		***Downgrades***	
	Mean	*Median*	*Mean*	*Median*
Investment grade (BBB or better)				
Observations	128		10	
Beta	0.70	0.65	0.79	0.82
Abnormal returns (%)	-0.04	-0.48	-0.45	-0.59
(Standard deviation (%))	0.38		.60	
Positive returns (%)	46.96		46	
Z statistic p-value	0.11		.13	
Signed rank test p-value		0.19		.21
Speculative grade (below BBB)				
Observations	75	0.76	47	
Beta	0.84	0.76	0.98	1.01
Abnormal return (%)	-1.23	-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	
Signed rank test p-value		0.07		0.06
From Investment grade to Speculative grade				
Observations			30	
Beta			1.13	1.15
Abnormal return (%)			-1.54	-2.29
(Standard deviation (%))			0.78	
Positive returns (%)			25.00	
Z statistic p-value			0.08	
Signed rank test p-value				0.04

Panel B: Solicited ratings

	New ratings		*Downgrades*	
	Mean	*Median*	*Mean*	*Median*
Investment grade (BBB or better)				
Observations	25		57	
Beta	0.85	0.69	1.10	1.11
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
Speculative grade (below BBB)				
Observations			4	
Beta			1.00	0.81
Abnormal return (%)			-1.96	-2.94
(Standard deviation (%))			0.85	
Positive returns (%)			25.00	
Z statistic p-value			0.08	
Signed rank test p-value				0.25

Table 8. Announcement period abnormal return from international capital asset pricing model (ICAPM)

The sample consists of 203 (25) unsolicited (solicited) new ratings and 57 (61) unsolicited (solicited) rating downgrades announced by S&P's between November 1996 and April 2001. The abnormal returns are from the ICAPM is measured by the following regression:

$$R_{it} = a + bR_t^W + g_1 NEW_{it} \cdot IG_{it} + g_2 NEW_{it} \cdot SG_{it} + g_3 DOWN_{it} \cdot IG_{it} + g_4 DOWN \cdot SG_{it} + e_{it}$$

where R_{it} is the return on firm *i*'s stock on day *t*, R_t^W is the return on the Morgan Stanley Capital Market Index (MSCI) world stock market index (the Datastream Japanese market index for solicited ratings), *NEW* is a dummy variable equal to one for days of (-1, 0) relative to a new rating announcement, *DOWN* is a dummy variable equal to one for days of (-1, 0) relative to a downgrade rating announcement, *IG* is a dummy variable equal to one for days of (-1, 0) relative to an investment-grade rating announcement, and *SG* is a dummy variable equal to one for days of (-1, 0) relative to a speculative-grade rating announcement. The parameter l_1 measures the average daily stock return for all new ratings, l_2 for all downgrade ratings, and l_3 for all upgrade ratings. We include (-210, +10) days relative to each event and the estimation is based on pooled cross section time series panel data. The regression is estimated using the feasible generalized least squares (FGLS) allowing for serial correlation and heteroskedasticity across countries.

	Panel A: Unsolicited ratings		**Panel B: Solicited ratings**	
Variables	**Estimated coefficient**	**p-value of t-statistics**	**Estimated coefficient**	**p-value of t-statistics**
R_t^W	.4743	.000	1.021	.000
NEW.IG	-.0003	.384	.0012	.356
NEW.SG	-.0054	.081		
DOWN.IG	-.0069	.044	-.0029	.146
DOWN.SG	-.0098	.021	-.0065	.076
Intercept	-.0006	.000	.0001	.497

Table 9. Distribution of ratings and firm characteristics by *keiretsu* affiliation

The sample consists of solicited and unsolicited ratings for Japanese firms announced by S&P's between November 1996 and April 2001. Firms are divided into three categories: Firms affiliated with financial *keiretsu*; Firms affiliated with industrial *keiretsu*; and Independent firms not affiliated with any *keiretsu*. Debt / Asset is total debt divided by total assets and Market / Book is the market-to-book equity ratio. In the parentheses are the standard deviations.

	Independent firms	Financial *keiretsu*	Industrial *keiretsu*	Total
Panel A: Unsolicited ratings				
Number of ratings	73	112	21	206
	35.44%	54.37%	10.19%	100%
Total assets (billions)	¥2.117	¥1.400	¥1.079	¥1.617
	(1.965)	(1.367)	(1.064)	(1.615)
Debt / Asset	.7808	.7817	.8138	.7848
	(.2264)	(.1438)	(.1670)	(.1784)
Market / Book	2.0702	2.3255	3.2532	2.3395
	(2.1226)	(5.4482)	(5.9633)	(4.6931)
Panel B: Solicited ratings				
Number of ratings	36	34	25	95
	37.89%	35.79%	26.32%	100%
Total assets (billions)	¥6.031	¥17.196	¥5.344	¥9.888
	(6.744)	(25.547)	(4.822)	(16.879)
Debt / Asset	.8229	.8653	.6588	.7946
	(.1837)	(.1680)	(.1660)	(.1912)
Market / Book	1.7680	1.7116	2.1556	1.8400
	(1.1030)	(.7468)	(1.0075)	(.9709)

Table 10. Multivariate regression of announcement period abnormal return

The sample consists of solicited and unsolicited ratings for Japanese firms announced by S&P's between November 1996 and April 2001. The dependent variable is an announcement period abnormal return computed as the cumulative market model residuals, where the Datastream Japanese market index 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. Independent variables are defined as follows: Uns = dummy variable equal to one for unsolicited ratings and zero otherwise; Down = dummy variable equal to one for down grades and zero otherwise; IK = dummy variable equal to one for firms affiliated with an industrial *keiretsu* and zero otherwise; FK = dummy variable equal to one for firms affiliated with a financial *keiretsu* and zero otherwise; Bank = dummy variable equal to one for banks and zero otherwise; Lasset = Logarithm of total assets; Debt/Asset = total debt divided by total assets; and BM = book-to-market equity ratio. Sample consists of 305 observations (206 unsolicited ratings plus 95 solicited ratings)

Variables	Estimated coefficient	p-value of t-statistics
Intercept	-0.093	0.062
Down	0.009	0.507
Uns*Down	0.016	0.322
IK	0.007	0.652
FK	0.042	0.019
Bank	0.002	0.912
Down*IK	-0.017	0.414
Down*FK	-0.041	0.028
Down*Bank	-0.041	0.007
Uns*IK	-0.036	0.058
Uns*FK	-0.028	0.079
Lasset	0.005	0.204
Debt/Asset	0.012	0.599
BM	-0.001	0.442
R-square	0.092	