Why Do Firms Buy Multiple Ratings?

Zhihua Chen
School of Finance
Shanghai University of Finance and Economics
[1]

First version: October 30, 2008
Current version: July 15, 2011

[1]This paper is a revised version of Chapter 2 of my Ph.D. dissertation at the University of Lausanne and Swiss Finance Institute. I am grateful to the members of my dissertation committee: Norman Schürhoff, Erwan Morellec, Jean-Piere Danthine and Henry Schellhorn. I would also like to thank Rüdiger Fahlenbrach and Michel Dubois for detailed discussions and very constructive comments. I thank Jan Peter Kulak, Thomas Lufkin and Lalitha Naveen for providing valuable feedbacks, as well as seminar participants at the 2009 FMA Doctoral Student Consortium, University of Neuchatel, Fudan University and Shanghai Jiaotong University, Shanghai University of Finance and Economics. I gratefully acknowledge financial support from the Swiss Finance Institute and from NCCR FINRISK of the Swiss National Science Foundation. Postal address: Shanghai University of Finance and Economics, 777 Guoding Road, Shanghai, 200433, China. E-mail address: `chen.zhihua@mail.shufe.edu.cn`. Tel: +86 (0)21 65908397, Fax: +86 (0) 21 65103925.

Abstract

Corporate purchases of a third rating (Fitch) in the US corporate bond market have dramatically increased over recent years. This paper empirically explores the rationale behind the corporate purchase decisions for multiple ratings on their securities. Empirical findings indicate that firms use multiple ratings to target a minimum rating level. Firms near a credit rating downgrade exhibit strong demand for a third rating, as well as firms that are close to the investment grade boundary. The increasing demand for multiple ratings is associated with the change of holding preferences by constraint institutional investors. Taken together, this study suggests that having multiple ratings provides a valuable service for firms to avoid costly consequences of a downgrade and to comply with institutional investment restrictions, and the trading in capital markets can affect corporate decisions.

JEL Classification: C7, D83, G14

Key words: Rating agency; Multiple rating; Corporate bond rating; Rating regulation; Sample selection bias; Yield spread; Borrowing cost; bond liquidity

I. Introduction

Corporate purchases of multiple ratings in the US corporate bond market have dramatically increased over recent years. Chen *et al.* (2009) document that, in addition to Moody's and Standard and Poor's, more than 50% of corporate bonds acquired a third rating from Fitch after 2005. This rising demand seems striking when compared to the fact that only approximately 10% of bonds were rated by Fitch during the early 1990s (see Jewell and Livingston (1999)). Intuitively additional ratings cost money,[1] corporate managers contemplating hiring more rating agency must weigh these costs against the benefits. Yet, there is little empirical evidence address the economic benefits of corporate purchases of multiple ratings, even though the financial crisis in the 2007 - 2009 has attracted an increasing number of studies to explore the role of credit rating agency. This paper is aim to fill this gap - *why do firms buy multiple ratings? Does institution holding preference affect corporate purchase decisions for multiple ratings and why?* In particular, I explore the rationale behind the corporate purchase decisions for a third rating issued by Fitch.

Several issues make these questions worth investigating. First, the economic role of multiple rating agencies is still an open question. Second, understanding managerial incentives induced by the current rating system provides regulators timely information on the future design of industry regulatory regime. Third, unlike most empirical corporate finance studies that draw a clear line between asset pricing and corporate finance by assuming an elastic supply of capital and perfect competition among financial intermediaries, this paper illustrates that how the supply of capital and institutional investors' holding preference can affect corporate decisions.

Credit ratings play a central role in the US corporate bond market which has been a major channel for firms to access external fundings. They evaluate the relative default risk of public firms and their bonds. Ratings are also used by regulators as reference points in financial market supervision if assigned by nationally recognized statistical rating organizations (NRSROs)[2]. For

[1] Rating fees are usually around 2 to 3 basis points of the amount of the bond offering.

[2] For the purpose of protecting investors and maintain financial stability, the SEC began using the term 'NRSRO' in 1975 to promulgate rules regarding bank and broker-dealer net capital requirements. Subsequently, the term was taken up by other regulators and the private investment community. In the early 1980s, there were seven NRSROs, but, due to mergers, this number dropped to three during the 1990s: Moody's, Standard and Poor's, and Fitch. In

instance, many financial institutions, including banks, insurance companies, pension funds and some mutual funds are not allowed to hold speculative-grade bonds (bonds rated BB or below) or are required to hold extra capital against their low-rated bonds holdings. These institutions consist of the main participant in the bond market.

Firms have strong incentive to maintain their target credit ratings. A recent survey conducted by Graham and Harvey (2001) shows that credit ratings are the main concern of CFOs. Hovakimian, Kayhan and Titman (2009) find that the deviations from target credit ratings influence debt versus equity issuance and repurchase choices, dividend changes and acquisition activities in ways that managers tend to move the firm towards their targets. Kisgen (2006) provides supporting evidence that firms that are near a rating change issue less debt than other firms to avoid downgrades. The main reason that firms tend to maintain a minimum rating level, as Kisgen(2009) points out, is to avoid a costly downgrade.

A downgrade can hurt the firms' access to capital and lead to declines in stock and bond prices. For instance, a downgrade from investment-grade to high-yield, can trigger fire sales from constraint institutional investors who are not allowed to hold low-rated bonds or are required to hold extra capital against their holdings and dry up the supply of capital within a very short time period. Recent research by Allen and Gale (2007) confirms that, in principle at least, fire sales forced by sharp increases in investors' liquidity preference can drive asset prices below their fundamental value, at significant cost to the financial system and the firms.

How does having multiple ratings help firms to achieve their target ratings? This issue depends heavily on how institutional investment restrictions deal with rating differences in the presence of multiple ratings. US rating-based regulations provides no unique solution, therefore it is highly related to the common practice of how to resolve disagreements among NRSROs.[3] For instance, as an industry leader for institutional investors, Lehman Brothers changed how it computed its index

2003, the SEC added Dominion Bond Rating Service (a Canadian CRA), and A.M. Best (particular for insurance firms) in 2005. By the end of 2004, more than 90% of bond issues were rated by Standard and Poor's and Moody's, and around 70% rated by Fitch.

[3]Cantor and Packer (1997) document that in the case of split ratings, the common practice is to use the highest or second highest rating provided by NRSROs. As Boot *et al.* (2006) pointed out, the common practice may not be followed by all investors. In addition, the common practice may change over time.

ratings (now Barclays Capital) in 2005. Before the rule change, Lehman used the more conservative of the Moody's and S&P ratings. While the new rating rule would include Fitch as a third rating agency, therefor a bond's index rating would be the middle rating assigned by Moody's, S&P and Fitch. One should be beware that the new rating rule provides a potential "upgraded" benefit. For example, a bond with two ratings, BB+ from S&P and BBB from Moody's, would have a BBB rating using the common practice. If it required a third rating from Fitch, the final rating based on the common practice cannot be "downgraded" even if Fitch assigned a lower rating, say, a B rating. However, it is possible to be "upgraded" to BBB- if Fitch assigned a rating higher than BB+, say BBB-. This "upgraded" benefit could encourage firms to buy a third rating. An interesting finding from Chen *et al.* (2011) is that there seems to be a structural break in Fitch's market penetration following the Lehman 2005 rule change–the demand for a third rating from Fitch increased significantly around 10 percent.

Using U.S. corporate bond new issues from January 2000 to December 2006, I find that concerns for the costs of downgrades affect managers' purchase decision for a third rating, which is consistent with the ratings targets hypothesis. Following Kisgen (2006), I construct two sets of measures to distinguish between firms which are close to a downgrade or a upgrade and those not close to a rating change. The empirical testing results show that firms near a rating downgrade have strong demand for a third rating. In addition, firms rated just below investment grade and firms rated as investment grade but close to the boundary (BBB-) also have strong demand. In particular, the closer to the investment grade boundary, the stronger the demand for a third rating. These results are robust across all specifications and after controlling for various bond specific characteristics, firm specific characteristics and other risk factors. This suggests that it is particularly important for firms to maintain a stable ratings target to avoid the costly consequences of a downgrade.

The Lehman 2005 rule change provides a unique opportunities to examine how constraint institutional investors change their holding preferences. Using the differences-in-differences (DD) approach, I find that holdings for investment-grade bonds with multiple ratings increased significantly from mutual funds and insurance companies following the Lehman announcement. Interestingly, around the very same time period, Chen*et al.* (2011) documents that corporate purchases for a

third rating increased significantly. The exogenous feature of the demand shock for institutional investors suggests that the increasing demand of corporate purchase decisions for multiple ratings is linked with the change of institutional holding preferences.

Having established the link between institutional holdings and multiple ratings, I then look at the impact of market trading activities on corporate purchase decision for a third rating. I find that corporate purchase decisions for multiple ratings are especially welcomed by institutional investors. Firms with three ratings enjoyed 8 percent higher turnover and 3.5 percent larger trade sizes than those with only two ratings. Results are robust after controlling for various bond- and firm-specific characteristics, macro-economic factors and year fixed effects. These findings confirm that bonds with three-raters are actively traded and most likely to be hold by institutional investors. These findings may be due to the capital immobility of institutional investors in the corporate bond markets. As Chen *et al.* (2011) noted, investment policies formulated for institutions such as insurance companies, pension funds and mutual funds typically restrict ownership to securities with low credit risk. Bonds with three ratings are less likely to downgrade to junk bonds and more likely to maintain their current ratings targets, thus enhancing the confidence of constraint institutional traders who are willing to trade actively.

I further extend the paper by testing how the state of corporate governance affect managers' decision for multiple ratings. Results show that entrenched firms – with a higher value of the E index (see Bebchuk, Cohen and Ferrell 2009) – exhibit strong demand for multiple ratings. In particular, this positive correlation mainly comes from those firms with anti-takeover provisions such as poison pills and golden parachutes. This findings suggest that firms having anti-takeover provisions are most likely vulnerable for a rating downgrade, thus ex-ante demand protections through multiple ratings.

This paper contributes to the limited literature on the economic roles of multiple ratings and the link between corporate decision and institution trading. A few recent papers are closely related to this study. Bongaerts, Cremers and Goetzmann (2010) study the relationship between credit

spreads and multiple ratings and find that Fitch ratings mainly matter for regulatory purpose. This paper complements theirs and extends to explore the link between institution trading, corporate governance and multiple ratings. Doherty, Kartasheva and Phillips (2008) found that improved competition results in improved information disclosure. Becker and Milbourn (2010) showed that competition leads to more issuer-friendly and less informative ratings.

The paper proceeds as follows. I discuss related literature and the main hypotheses in Section II, and describe the various data sources and summary statistics in Section III. In Section IV, I explain the empirical strategy, report the main empirical results and perform robustness tests. Section V provides the study's conclusions.

II. Related literature and hypothesis

A. The credit rating industry

Over time, credit rating agencies have become increasingly important. In general, they provide three main functions. First, rating agencies serve as information intermediaries. They assign credit ratings to measure the relative creditworthiness of underlying obligations, i.e. the debtors' ability to pay back their debt. Investors in financial markets differ in their access to information, and issuers may not be able to credibly and cheaply convey information to investors. Therefore, ratings can help to achieve economies of scale in information production and dissemination and to solve principal-agent problems.

Second, ratings assigned by Nationally Recognized Statistical Rating Organizations (NRSROs) are heavily used by regulators to protect investors and maintain financial stability. By 2002, there were at least eight federal statutes and 47 federal regulations, along with over 100 state laws and regulations, that reference Nationally Recognized Statistical Rating Organizations (NRSROs) as benchmarks.[4] Many institutional investors, such as mutual funds and pension funds, are restricted

[4]A summary of ratings-based regulations is provided in US Senate (2002).

from holding debt securities rated below a pre-defined threshold, which in most cases is BBB-, the lowest investment-grade credit rating. The number of such rating-based regulations has been growing steadily. In addition, the Basel II accord in its "standardized approach to credit risk" relies explicitly on external credit assessments.

Third, ratings assigned by rating agencies also serve as a "standardized framework" to compare risky securities of all possible classes and countries (Moody's (1991)). In general, regulators implicitly assume that rating scales are equivalent among NRSROs.

Surprisingly, the credit rating industry power is very concentrated in a small number of NRSROs; despite that, ratings have become more prominent and important than ever before. In the early 1980s, there were seven NRSROs, but, due to mergers, this number dropped to three during the 1990s: Moody's, Standard and Poor's, and Fitch. In 2003, the SEC added Dominion Bond Rating Service (a Canadian CRA), and A.M. Best (particular for insurance firms) in 2005. As of 25 September 2008, ten organizations were designated as NRSROs: Moody's, Standard and Poor's, Fitch Ratings, A. M. Best, Dominion Bond Rating Service, Japan Credit Rating Agency, Egan-Jones Rating Company, LACE Financial and Real-point.

In the rating industry, there are three groups of players in the rating industry: issuers, investors and rating agencies. Their interests differ from each other. Investors mostly care about information quality, as issuers may not truthfully reveal information. Thus, rating agencies act as information intermediaries to alleviate adverse selection effects. Investors can get full rating information for free. However, rating agencies assign ratings and receive rating fees paid by issuers except when unsolicited. This may result in potential conflict of interest problems; for instance, rating agencies may assign higher (favorable) ratings to attract issuers to maximize their own profits.

B. Multiple ratings and the rating norm

Over the past decades, a two-rating norm has developed in the U.S. corporate bond market, i.e. most public bonds have been rated by two large ratings agencies, Moody's and S&P. However, the evidence saw a new trend towards multiple ratings – a three-rating norm with Fitch (see Jewell

and LIVINGSTON (1999) and Chen *et al.* (2011)). For instance, on January 24, 2005, the Lehman Brothers (now Barclays Capital) announced that it would incorporate Fitch rating into its index rating starting from July 1, 2005. An important question must be asked: Why do firms buy multiple ratings?

Intuitively, multiple ratings can reduce ratings volatility, thus ex-ante maintain a relatively stable rating for issuers. The question here is why issuers care about stable ratings. Kisgen (2006) argues that a ratings downgrade can result in forced sales by constrained investors, loss of contracts, or required repurchases of bonds. A downgraded firm is particularly vulnerable to bankruptcy in an economic downturn. **Target ratings hypothesis** assumes firms target a minimum rating level. This hypothesis is related to the benefit and cost associated with certain rating level tied to regulations. For instance, many financial institutions, including insurance companies, pension funds and some mutual funds are not allowed to hold speculative grade bonds (bonds rated BB or below) or are required to hold extra capital against their low-rated bonds holdings. A rating downgrade could result in forced sales from these constrained investors. The forced sales can dry up the supply of capital and contribute to further declines in bond prices beyond the fundamental value change. Therefore, maintaining target ratings is particularly important for firms in order to guarantee a low cost of capital. We expect that firms that are close to a rating change (especially downgrades) and firms that are close to the investment-grade boundary have strong incentives to buy a third rating. The increasing demand for multiple ratings should be linked directly with the rating norm change. Under the three-rating norm, bonds with multiple ratings are less likely to downgrade and more likely to maintain their current ratings targets, thus enhancing the confidence of constraint institutional traders who are willing to trade actively.

Some have argued that multiple ratings may convey a positive signal to the market by providing more independent and reliable information (see Irvine (2002); Millon and Thakor (1985)). However, empirical evidence on the informational value of a rating is mixed. Bongaerts *et al.* (2011) argues that additional credit ratings do not seem to provide significant additional information related to credit quality. Partnoy (1999) suggests that ratings in most cases reflect only information already priced into the debt securities' market prices. Kliger and Sarig (2000) find that there is at least

a small independent informational effect, by examining Moody's revision of its ratings categories in 1982. Dittrich (2007) suggests that the informational value created by ratings agencies includes two components. One is the credit information itself and the other is the information quality or "reputation value", which captures how much market participants trust the quality of ratings due to an agency's reputation. Jappelli and Pagano (2000) find that simply being rated by a reputable agency serves as a positive signal to the capital market. Others regard multiple ratings as the "dark side" of competition. This argument comes from the potential conflicts of interests embedded in the remuneration system. Issuers may prefer a higher (favorable) rating if investors are willing to lend at lower interest rates for a higher rating. Therefore, issuers prefer to buy favorable multiple ratings from ratings agencies who have less stringent standards. This may be particularly attractive for small agencies with low market power who may want to lower their standards in order to expand their market influence. Apart from this negative view, Sette (2007) raises concerns that increased entry could reduce experts' incentives to exert effort. Mariano (2008) suggests that competition can interfere with the reputation mechanism.

III. Data and sample construction

This section describes in detail the main data sources and the construction of the main variables. I use newly issued bonds in the U.S. corporate bond markets from January 2000 to December 2006.

A. Corporate bond and firm characteristics

I collect corporate bond characteristics and ratings information from Mergent's Fixed Income Securities Database (FISD). The FISD contains a complete ratings history from Moody's, S&P and Fitch for individual corporate bonds. It also covers comprehensive issuance information on all fixed income securities that were either assigned CUSIPs, or likely to receive one in the near future. The main bond characteristics include issue size, maturity, industry code, offering date, offering

price, and offering yield. I calculate the yield and duration for each bond by using the offering price, coupon rate, interest frequency and new issue date. Credit spreads are also computed by subtracting Treasury bond yields from calculated bond yields with matched durations. I exclude bonds with special features, such as convertibles, floating-rate and private placements, except for SEC Rule 144A bonds with registration rights. In order to avoid asynchronous ratings adjustment among agencies as well as unsolicited ratings, the rating date was required to be within 40 days after a new bond issue's offering date. For the purpose of studying the third rating from Fitch, bonds were required to have at least two ratings from both Moody's and S&P.[5]

I obtain accounting data from Compustat and stock prices from CRSP. Firm characteristics include the log value of total assets, leverage, return on assets, coverage and the log value of net sales. Variable definitions are described in Table 2. I also compute moving average standard deviations of stock returns over six-month and three-month windows. I then manually merge corporate bond characteristics with associated firm characteristics from Compustat and CRSP, taking into account mergers, name changes and parent subsidiary relationships. Bond characteristics are linked with the previous year's firm characteristics from Compustat and previous six-month standard deviations of stock returns from CRSP. Bonds that could not be matched from all three data sources are dropped from the sample. I also exclude bonds with missing values for their required characteristics. The final sample for this study consists of 5,845 new issue corporate bonds from 2000 through 2006. By the nature of the data construction, all bonds are rated by both Moody's and S&P. Of the 5,845 bond issues, 62% have a third rating from Fitch.

B. Institutional holdings and others

The data source for bond trading activities is the Trade Reporting and Compliance Engine (TRACE) database. The data provides Transaction information by transaction price, quantity, and supplementary information on the universe of TRACE-eligible corporate fixed income securities. Beginning on July 1, 2002, the NASD required all over-the-counter corporate bond transactions in

[5]Over 95% of all bonds are rated by both Moody's and S&P in the sample.

TRACE-eligible securities to be reported to the TRACE system. While TRACE provides high-quality data on a large proportion of the universe of bond transactions, it has two important limitations. First, transaction volume is truncated at $ 5 million for investment-grade bonds and at $ 1 million for high-yield bonds, which means that our turnover results should be interpreted with some caution. Second, the publicly disseminated version of TRACE does not provide any information on whether the trade was buyer or seller initiated, which limits the usefulness of the TRACE data for calculating order imbalance. I delete all transactions flagged as canceled or corrected to ensure that our results are based on actual transactions. The two main variables - turnover and log value of trade size - are constructed to measure trading activity. I divide daily dollar trading volume by issue size to obtain daily turnover, then average this over a 6-month window after the new issue date. Trade size is computed by dividing dollar trading volumes by the number of trades at the daily level, then is averaged over a 6-month window after the new issue date.

The National Association of Insurance Commissioners (NAIC) database provides detailed information on corporate bonds traded by insurance companies. I also obtain mutual fund holding data on quarterly frequency from Lipper's eMAXX fixed-income database. This database provides fund and managing firm holdings at each individual bond level. It also provides holding at the individual fund level and their aggregated value at the managing firm level. Firms' enrenchment index levels are obtained from Lucian Bebchuk's website.

In addition, I collecte both treasury bonds and Lehman corporate bond index data from Datastream. This provide me with data on treasury bonds with a broad range of maturity from 1 to 30 years and on Lehman corporate bonds with a wide range of ratings from investment grade to high yield. Following the literature, I choose several macro-economic variables to control for business cycle effects, such as one-year treasury bond yields, treasury yields with matched duration and the slope of the yield curve at the date of the new issue. The total returns of the Lehman indices A and BB are selected as additional variables to control for credit risk, but they were insignificant in most cases.

Table 1 shows the standard rating notch scales corresponding to the three ratings agencies: Moody's, S&P and Fitch. I assign a numerical value for a ratings notch from 1 (the highest rating

AAA) to 22 (default rating D) to simplify the ratings difference computation. Table 2 provides definitions and computation for the main variables in the estimation. Table 3 reports descriptive statistics for the main variables.

IV. Empirical methodology and findings

A. Firms near a downgrade and multiple ratings

The hypotheses of target ratings imply that firms close to a credit rating downgrade would like to purchase additional ratings to avoid a costly downgrade and drain of the supply of capital. Following Kisgen (2006), I measure proximity to a rating change in three ways. The first set of key variables include *Border*, *Near downgrade* and *Near upgrade*. *Border* is a dummy variable that equals 1 if the lower rating of Moody's and S&P is Ba1 or BB+. *Near downgrade* and *Near upgrade* are indicator variables which take value one if their bond rating is designated with minus or plus notch within the broad rating. For instance, BBB- firms are defined to be near a downgrade and BBB+ are near a upgrade. The second measure – *IV downgrade* and *IV upgrade* – aims to increase the precision of firms near a rating change. As Kisgen (2006) points out that a strong minus firm may not necessarily close to a downgrade and likewise a weak plus firm may not be near an upgrade. Therefore, I compute a Altman Z score for each firm and then separate these firms within each broad rating category into a high third, middle third, and low third based on the value of their Altman Z scores. The third set measures how close a bond rating to the investment-grade and high-yield boundary. *Dist. border IG* is computed as an absolute notch value to the IG boundary (BBB-) for bonds with investment grade ratings. *Dist. border HY* is computed as an absolute notch value to IG boundary (BBB-) for bonds with high yield ratings.

Using a Probit model, I explore the relationship between firms near a rating change and the demand for a Fitch rating by including three sets of key measures of a rating change. Table 4 presents the results of a Probit model on examining the likelihood of firms' purchases for a Fitch

rating. Empirically, I find that all the coefficients on three sets of variables related to a rating downgrade are economically and statistically significant. This finding is robust after adding various controls, such as firm size, profitability, coverage, equity price volatility, bond issue size, bond maturity, rating dummies based on the conservative one from Moody's and S&P, industry dummies and year fixed effect. Standard errors are clustered by issuer.

Empirical results indicate that firms near a rating downgrade tend to have strong demand for a third rating by Fitch, while firms near a rating upgrade do not. The closer to the IG/HY boundary, the stronger demand from the investment-grade bonds. These findings implicate that it is important for firms to maintain a minimum rating level, particularly for those rated at the investment-grade category. The concerns of costly downgrade from investment-grade to high-yield seems provide a strong incentive for firms to buy additional ratings. I also find that large firms tend to buy a third rating, which may due to the ratings fee structure[6] with both a floor and a ceiling.

B. Lehman 2005 rating rule and institutional bondholdings

This section I explore the link between constrained institutional investors holding preference and multiple ratings. Chen*et al.* (2011) documents a structural break in Fitch's market share in the U.S. corporate bond market and the demand for a third rating Fitch increased significantly following the Lehman 2005 rating rule change. The U.S. corporate bond market is dominated by constraint institutional investors, around 22 percent of bonds hold by insurance companies, 13 percent by mutual funds. The 2005 Lehman index rating rule change provides an ideal setting to examine whether constraint institutional investors change their holding preference accordingly.

I use difference-in-differences (DD) estimators to identify effects of the rating norm change – switching from the two-rating into three-rating norm – on holding preference of constrained institutional investors, such as mutual funds and insurance companies. Difference-in-differences

[6]Cantor and Packer (1995) documented that ratings agencies charge fees that vary with the size and type of issue, but a representative fee on a new long-term corporate bond issue ranges from two to three basis points of the principal for each year the rating is maintained, normally with both a floor and a ceiling.

approach is often used to identify the treatment effect – holding three ratings bonds in this study – when there is a sharp change in the institutional environment. Following Roberts and Whited (2011), I estimate a simplified version of the DD model as

$$y_{i,j} = \beta_0 + \beta_1 \times d \times p + \beta_2 \times d + \beta_3 \times p + Controls + u_{i,j} \tag{1}$$

where d is the treatment dummy equal to one if a bond is rated by three rating agencies and zero otherwise, controls for the permanent differences between the treatment and control groups. p is a post-event dummy which takes a value one if in 2005 and zero in 2004, controls for the common trend for both the treatment and control samples round the event. And $y_{i,j}$ is the amount of a bond i hold by a certain type of constrained insitution investor j. The DD estimates β_1 captures the change in constrained institutional bondholdings with three ratings relative to the change in the two-rating bondholdings.

Table 5 presents results from the difference-in-differences estimates on effects of the rating norm change on holding preference of mutual funds. As expected, results show that the DD estimate β_1 is 1.63, both statistically and economically significant. And the coefficients on the treatment is also positively significant. A similar pattern can be found for insurance companies. Figure ??? plots the holding change of insurance companies' around the Lehman 2005 rating rule change. These results are consistent with the holding preference change in constrained instiutional investors after the change in the rating norm. Interestingly, constrained institutional investores' holding change exhibits a similar pattern as the increasing demand for multiple ratings from corporation managers. This finding suggests that corporate purchase decisions for a third rating is most likely motivated by the change in constrained institutional investors holding preference.

C. What happens when firms buy a third rating?

Suppose we are interested in a causal if-then question. Specifically in this study, it includes two questions: (1) Does the purchase of a third rating reduce a firm's new issue borrowing costs? (2)

Does the purchase of a third rating encourage institutional investors' trading activity? The simplest solution is to use a dummy variable in an OLS regression model. This dummy variable will take a value of 1 when a bond has a third rating and zero otherwise. However, if the decision to buy a third rating is not random and if this effect is different across bonds, the simple OLS estimation may result in misleading inferences. Therefore, the treatment effect model should be the best choice when a potential endogenous problem poses a severe challenge. The term "treatment effect" refers to the impact of receiving a third rating on a particular outcome.

The treatment effect model consists of two stages. The first stage uses a probit model to estimate decision making of firms require a third rating. Then the second stage adds a correction term to study the causal effect of receiving a third rating from Fitch on borrowing costs and bond liquidity.

Let us assume that the treatment decision can be described by a probit equation

$$\begin{aligned} D_i^* &= \alpha_D + X_D\beta_D + \varepsilon_i, \qquad (1) \\ D_i &= 1 \text{ if } D_i^* \geq 0 \text{ and } 0 \text{ if } D_i^* < 0, \end{aligned}$$

Where ε_i is assumed to be $NID(0,1)$, independent of X_D, D_i^* refers to the likelihood of a firm's requiring a third rating, as determined by a vector of decision regressors X_D including key variables, bond specific characteristics and firm specific characteristics. Key variables include *Disagree*, *Abs(SPR-MR)* for information uncertainty, *Border*, *Near Change*, *Dist. border IG* and *Dist. border HY* for rating stability measures and Rating Dummies for rating shopping measures. Bond specific characteristics control for issue size, maturity and industry sector. And firm characteristics control for the natural logarithm of total assets, leverage, return on assets, coverage, natural logarithm of net sales and moving average standard deviations of stock returns over past 6 month window. However, D_i^* is unobservable, only D_i is observable, which denotes firms' decision to buy a third rating if $D_i^* \geq 0$.

Assume each bond has two potential outcomes y_{0i} and y_{1i} corresponding to the outcome without or with a Fitch rating, respectively. However, only one of the two potential outcomes is observed on the decision to buy a third rating. We are interested in the average treatment effect, i.e. the average difference between with and without a third rating.

To solve this problem, let us assume that

$$y_{0i} = \alpha_0 + X_i\beta_0 + u_{0i}, \quad \text{if } D_i^* \geq 0 \tag{2}$$

$$y_{1i} = \alpha_1 + X_i\beta_1 + u_{1i}, \quad \text{if } D_i^* < 0 \tag{3}$$

where u_{0i} and u_{1i} are zero mean error terms.

We can write

$$\begin{aligned} y_i &\equiv (1 - D_i)y_{0i} + D_i y_{1i} \\ &= \alpha_0 + X_i\beta_0 + u_{0i} + D_i\underbrace{[(\alpha_1 - \alpha_0) + X_i(\beta_1 - \beta_0) + (u_{1i} - u_{0i})]}_{\text{gain from the treatment}}, \\ &= \alpha_0 + X_i\beta_0 + \delta D_i + X_i\gamma D_i + u_i, \end{aligned}$$

where $\delta \equiv (\alpha_1 - \alpha_0)$, $\gamma \equiv \beta_1 - \beta_0$ and $u_i \equiv u_{0i} + D_i(u_{1i} - u_{0i})$.

If we assume $\beta_0 = \beta_1 = \beta$, then we can derive

$$E(y_i \mid X_i, D_i) = \alpha_0 + X_i\beta + \underbrace{\delta D_i + \sigma_{1D} D_i IMR + \sigma_{0D}(1 - D_i)IMR}_{\text{Difference between treatment and non treatment}},$$

where σ_{1D} and σ_{0D} are the covariances of the error terms in (2) (3) with the error terms in (1), respectively, IMR is Inverse Mill's Ratio which captures the sample selection effect. The detailed rationale can be found in Heckman (1979) and Maddala (1983).

Table 7 examines economic benefits of a third rating purchase on bond liquidity by implementing the treatment approach. Bond liquidity is measured by trading activity variables: turnover and the log value of trade size using pricing data from TRACE over a six-month period after the date of

new issue. After controling for various bond- and firm-specific characteristics and macro-economic factors, rating dummy variables, Fitch rating dummy variables and year fixed effects, the treatment estimation results show that the daily turnover increases by 8 percent and the log value of trade size by 3.5 percent after requiring a Fitch rating. Both coefficients are significant at the 1% level.

Table 6 investigates the impact of the new issue borrowing costs upon corporate purchase decisions. New issue borrowing costs are computed by subtracting Treasury bond yield from issuance yield with matched duration. I ask whether bond issues with three ratings have a lower borrowing cost than bond issues with only two ratings, and what the effect is on a firm's decision to purchase a third rating.

Positive and significant coefficients of the IMR are strong evidence for the presence of a selection process. Failure to take into account this endogeneity problem would result in misleading inferences. I control for various bond and firm specific characteristics and macro-economic factors, rating dummy variables and year fixed effects. The results from the treatment effect model show that the expected borrowing cost savings from a Fitch rating for Fitch rated firms. I find that for Fitch-rated firms, requiring a Fitch rating reduces their new issue borrowing costs by 13 basis points, but statistically insignificant. This finding makes sense given the empirical test is designed under the hypothetical downgrade while the real downgrade does not happen.

D. Multiple ratings and corporate governance

To be completed soon.

V. Conclusion

This study provides a novel perspective on the economic role of multiple ratings. By examining the link between corporate purchase decisions for a third rating and the holding preference of constrained institutional investors, I show that multiple ratings play a valuable service for both

firms and institutional investors. The main concern of firms' CFOs on credit ratings comes from the potentially costly consequences of a downgrade, such as sudden declines in stock and bond prices and dangeous drain of the supply of capital. Multiple ratings can provide an ex-ante relatively stable rating, which is particularly important for firms, especially those of them with entrenched managers.

References

Becker, B. and Milbourn, T., 2011. "Reputation and competition: evidence from the credit rating industry" Journal of Financial Economics, forthcoming.

Bongaerts,D., Cremers, M. and Goetzmann, W., 2011. "Multiple Ratings and Credit Spreads" Journal of Finance, forthcoming.

Boot, A., Milbourn, T. and Schmeits, A., 2006. "Credit raings as coordination mechanisms" Review of Financial Studies 19(1), 81-118.

Campbell, T.S. and Heinkel, R., 1984. "A theory of rating agencies: pricing, quality and market structure" University of Southern California Working paper.

Cantor, R. and Packer, P., 1995. "The credit rating industry " Journal of Fixed Income, December, 10-34.

Cantor, R. and Packer, P., 1997. "Differences of opinion and selection bias in the credit rating industry " Journal of Banking and Finance, 21, 1395-1417.

Chen, Z., Lookman, A., Schürhoff, N., and Seppi, D., 2009, "Why ratings matter: Evidence from Lehman's index rating rule change" Carnegie Mellon University Working paper.

Dittrich, F., 2007. "The credit rating industry: competition and regulation" University of Cologne.

Doherty, N., Kartasheva, A., and Phillips, R.D., 2008. "Competition among rating agencies and information disclosure" Working paper.

Graham, J. R., and Havey, C., 2001. "The Theory and Practices of Corporate Finance: Evidence From the Field" Journal of Financial Economics 60, 187-243.

Goh, J. and Ederington, L., 1993. "Is a bond rating downgrade bad news, good news, or no news for stockholders?" Journal of Finance 48, 2001-2008.

Hand, J., R. Holthausen and R. Leftwich, 1992. "The effect of bond rating agency announcements on bond and stock prices" Journal of Finance 47, 733-752.

Heckman, J., 1979. "Sample selection bias as a specification error" Econometrica 47(1), 153-161.

Hovakimian, A., A. Kayhan and S. Titman, 2009. "Credit Rating Targets" Unviersity of Texas at Austin and NBER, Working paper.

Hsueh, P. and Kidwell, D., 1988. "Bond ratings: are two better than one?" Financial Management 17(1), 46-53.

Irvine, P.J., 2002. "The incremental impact of analyst initiation coverage" Goizueta Business School Emory University working paper.

Jappelli, T. and Pagano, M., 2000. "Information sharing in credit markets: a survey" CSEF Working paper No. 36.

Jewell, J., and Livingston, M., 1999. "A comparison of bond ratings from Moody's, S&P and Fitch" Financial Markets, Institutions and Instruments, 8, 1-45.

Kisgen, D., 2006. "Credit ratings and capital structure" Journal of Finance 61, 1035-1072.

Kisgen, D., 2009. "Do Firms Target Credit Ratings or Leverage Levels?" Journal of Financial and Quantitative Analysis, forthcoming.

Kliger, D. and Sarig, O., 2000. "The information value of bond ratings" Journal of Finance 55, 2879-2902.

Lizzeri, A., 1999, "Information revelation and certification intermediaries" RAND Journal of Economics 30(2), 214-231.

Maddala, G., 1983, "Limited-dependent and qualitative variables in econometrics" Cambridge University Press, New York.

Mariano, B., 2008. "Do reputational concerns lead to reliable ratings?" University Carlos III of Madrid Working paper.

Micu, M., Remolona, M. and Wooldridge, P., 2006. "The price impact of rating announcements: which announcements matter?" BIS Working paper No. 207.

Millon, M.H. and Thakor, A.V., 1985. "Moral hazard and information sharing: a model of financial information gathering agencies" Journal of Finance 40, 1403-1422.

Moody's Investor Service, 1991. "Global Credit Analysis" London.

Norden, L. and Weber, M., 2004. "Information efficiency of credit default swap and stock markets: the impact of credit rating announcements" Journal of Banking & Finance 28(11), 2813-2843.

Partnoy, F., 1999. "The Siskel and Ebert of Financial Markets?: Two thumbs down for the credit rating agencies" Washington University Law Quarterly 77(3), 619-714.

Senate, US. 2002. "Financial oversight of enron: the SEC and private-sector watchdogs " Technical report, Senate Committee on Governmental Affairs.

Sette, E., 2007. "Sorting, reputation and entry in a market for experts " LSE Working paper.

Table 1: Bond rating scales

Table 1 reports the rating scales in notch from three rating agencies S&P, Moody's and Fitch with assigned numerical value.

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

Table 2: Data definition.

Table 2 lists definitions for main variables in the estimation.

Variable	Description
Key variables:	
IV downgrade	Dummy, = 1 if the value of Altman Z score is at the low third of bonds' broad rating category
IV upgrade	Dummy, = 1 if the value of Altman Z score is at the high third of bonds' broad rating category
Border	Dummy, = 1 if a bond rating is BB+
Near downgrade	Dummy, = 1 if a bond rating has minus sign, such as AA-, A-, BBB-, BB-
Near upgrade	Dummy, = 1 if a bond rating has plus sign, such as AA+, A+, BBB+, BB+
Dist. border IG	Absolute notch value to IG boundary in IG category
Dist. border HY	Absolute notch value to IG boundary in HY category
Firm characteristics:	
Ln(TA)	log(Total assets)
Leverage	Book Debt / (Total assets - Book equity + Market value)
ROA	Return on assets = (EBIT + Depreciation) / Total assets
Coverage	EBIT / Interest expense
Size	log(Net sales)
Std(6m stock return)	Standard deviation of daily equity returns over past 6 month
Bond characteristics:	
Ln(issue size)	ln(Issue size)
ln(maturity)	ln(maturity)
Rating BBB	Dummy, = 1 if the lower rating from Moody's and S&P is BBB
Rating BB	Dummy, = 1 if the lower rating from Moody's and S&P is BB
Rating B	Dummy, = 1 if the lower rating from Moody's and S&P is B
Rating C-D	Dummy, = 1 if the lower rating from Moody's and S&P is CCC to D
Financial	Dummy, = 1 if FISD industry group belongs to financial
Utility	Dummy, = 1 if FISD industry group belongs to utility
Fitch rated	Dummy, = 1 if Fitch rated
Issue cost related:	
Yield spread	Difference between bond yield and treasury bond yield with matched duration
Tr. yield duration matched	Yield of the duration matched treasury bond
Tr. yield 1 year	Yield of 1 year treasury bond
Term slope	Difference between 10 year and 2 year treasury bond yield
Liquidity variables:	
Turnover	= trading volume / issue size, average daily, over 6 month after new issue
Ln(trade size)	log(Trading volume / Nb. Of trades), average over 6 month after new issue

Table 3: Descriptive statistics.

Table 3 reports descriptive statistics for the main variables used in the estimation. The sample is based on FISD, CRSP, Compustat and TRACE database. The study covers the period from 2000 to 2006. A detailed definition of the variables is provided in Table 2.

	Mean	Std	Min	Max	Obs
Firm and bond characteristics:					
Ln(TA)	10.387	1.934	4.688	14.217	5845
Leverage	0.654	0.266	0.023	1.000	5845
ROA	0.048	0.071	-1.318	0.499	5845
Coverage	2.396	17.939	-472.713	420.416	5845
Size	8.980	1.338	1.363	12.564	5845
Std(6m stock return)	0.021	0.010	0.000	0.120	5845
Ln(issue size)	17.563	2.345	6.908	22.333	5845
Issue cost related:					
Yield spread	5.834	10.256	-3.950	33.260	5381
Tr. yield duration matched	4.041	1.200	0.870	6.930	5501
Tr. yield 1 year	3.021	1.655	0.880	6.440	5501
Term slope	1.261	0.995	-0.520	2.750	5501
Liquidity variables:					
Turnover (%)	1.048	1.420	0.002	39.391	1,298
Ln(trade size)	13.276	1.317	9.282	15.134	1,298

Table 4: Firms near a rating change and multiple ratings

Table 4 presents results from the Probit regressions in examining the relationship between firms near a rating change and the demand for an additional rating from Fitch. Three sets of key variables for the likelihood of a rating change: (i) IV downgrade, IV upgrade; (2) Near downgrade, Near upgrade, Border; (iii) Dist. border IG and Dist. border HY. Table 2 provides a detailed definition of the variables. Standard errors are clustered by issuer. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
IV downgrade	0.529***		
IV upgrade	-0.425		
Near downgrade		0.954**	
Near upgrade		-0.420	
Border		0.854*	
Distance to IG-HY border			-0.858***
Distance to HY-IG border			-0.187
Ln(issuesize)	-0.084	-0.072	-0.068
Ln(maturity)	-0.242*	-0.150	-0.088
ROA	-2.840	-1.790	-1.610*
Coverage	0.014	0.020*	0.020*
Firm size	0.430***	0.567***	0.646***
Stock return volatility	12.400	-5.520	-14.500
Rating dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Bond type dummies	Yes	Yes	Yes
Fixed year effect	Yes	Yes	Yes
Constant	-4.170*	-5.52**	2.43
Obs.	3987	3987	3987
Pseudo R^2	0.466	0.478	0.541

Table 5: Difference-in-differences estimates of mutual funds bondholding around the Lehman rule change

Table 5 presents results from the difference-in-differences estimates to identify effects of the rating norm change – switching from the two-rating into three-rating norm – on holding preference of mutual funds - a certain type of constrained institutional investors. Coefficients on the treatment, post-event and the interaction item are reported. t statistics are in brackets with robust standard errors clustered by issuers. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Interaction item β_1:	
Treatment * Post-event	1.63^{***}
	[9.38]
Treatment	0.31^{***}
	[8.31]
Post-event	-0.08
	[1.63]
Controls:	
Rating dummies	Yes
Industry dummies	Yes
Time dummies	Yes
Bond type dummies	Yes
Rating dummies * Interaction	Yes
R^2	0.08
Obs.	45763

Table 6: The treatment effect: does a third rating reduce borrowing costs?

Table 6 presents the treatment effect estimation results of new issue borrowing costs on requiring a Fitch rating. New issue borrowing costs are computed by subtracting Treasury bond yield from issuance yield with matched duration. The treatment term refers to requiring a third rating from Fitch. Control variables include log(issue size), industry dummies, maturity dummies, ln(TA), leverage, ROA, coverage, size, std(6m stock return), bond type dummies, year fixed effect. Standard errors are clustered by issuer. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variables	New issue borrowing costs (%)
Panel A:	
Mean treatment	5.722***
	0.098
Mean non treatment	5.855***
	0.100
Diff = Treatment -Non Treatment	-0.133
	0.140
Panel B:	
First stage	
IMR	2.944***
	0.670
Second stage	
Fitch rated	-6.016***
	1.146
Rating A	1.618***
	0.570
Rating BBB	2.495***
	0.651
Rating BB	7.755***
	0.855
Rating B	12.213***
	0.786
Rating C-D	10.998***
	1.294
Tr. yield 1 year	6.521***
	0.511
Term slope	8.303***
	0.722
Controls	Yes
Cons.	-14.198**
	6.562
Obs	5501
Wald χ^2	6101

Table 7: The treatment effect of liquidity on having a Fitch rating.

Table 7 presents the treatment effect estimation results of liquidity on requiring a Fitch rating. The treatment term refers to requiring a third rating from Fitch. Control variables include log(issue size), industry dummies, maturity dummies, ln(TA), leverage, ROA, coverage, size, std(6m stock return), bond type dummies, year fixed effect. Standard errors are clustered by issuer. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variables	Turnover	ln(trade size)
Panel A:		
Mean treatment	1.087***	13.502***
	0.007	0.015
Mean non treatment	1.006***	13.038***
	0.007	0.013
Diff = Treatment -Non Treatment	0.081***	0.464***
	0.042	0.020
Panel B:		
First stage		
IMR	0.035	0.204
	0.356	0.323
Second stage		
Rating A	-0.055	-0.300*
	0.193	0.175
Rating BBB	-0.402*	-0.356*
	0.226	0.206
Rating BB	-0.428	-0.342
	0.320	0.291
Rating B	-0.650**	-0.353
	0.323	0.293
Rating C-D	-0.641	-0.233
	0.645	0.587
Tr. yield 1 year	0.070	-0.733***
	0.246	0.223
Term slope	-0.204	-0.082
	0.362	0.328
Controls	Yes	Yes
Fitch rating dummies	Yes	Yes
Cont.	1.970	13.982***
	2.047	1.860
Obs.	1298	1298
Wald χ^2	8474	8535