THE ROLE OF INFORMATION ASYMMETRY IN MARKET REACTIONS TO BOND RATING DOWNGRADES: EXPLORING THE IMPACT OF CORPORATE GOVERNANCE

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ABSTRACT

This study examines the link between corporate governance and the information content of bond rating downgrades. A downgrade event contains more news and should generate more market reaction when the amount of financial information publicly available prior to the event is less. The more complete the information set before the event, the less the market response to the new information. Certain corporate governance mechanisms, especially those related to the boards of directors, are designed to defend shareholders from agency conflicts that give managers incentives to manage earnings and financial reporting. However, academic research has found mixed evidence as to the relation of corporate governance and transparent financial reporting. Perhaps in some cases, stronger corporate governance is necessary because the nature of the firm makes transparency in financial reporting too costly. My study attempts to provide evidence on the circumstances in which corporate governance is most valued by the market and suggests that the level of information asymmetry should be an important consideration in corporate governance research.

The data analyzed in the study are taken from the Mergent Fixed Income Security Database [FISD] for bond rating downgrades. The time period spans both the implementation of Regulation FD and the Sarbanes-Oxley Act of 2002. I control for differences in regulatory regimes during the period. I find no consistent evidence that corporate governance structures weaken market reaction to bond ratings downgrades.

However, I do show that the contrast of market reactions in the high and low governance conditions is most pronounced in conditions of high information asymmetry, and especially after the implementation of Regulation FD.

My research contributes to the corporate governance literature by formally demonstrating that the level of a firm's information asymmetry can be an important factor in determining the impact of corporate governance on the market reaction to an event. As an independent signal, bond rating downgrades provide a useful setting in which to examine this relationship.

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CHAPTER 1

INTRODUCTION

This study examines the link between corporate governance and the information content of bond rating downgrades. The information content of an event such as a downgrade is affected by the amount of financial information publicly available prior to the event. The more complete the information set before the event, the less the market response to the new information. Conventional wisdom suggests that corporate governance mechanisms should be expected to produce a more complete information set, because they are designed to defend shareholders from agency conflicts that give managers incentives to manage earnings and financial reporting. However, academic research has found mixed evidence on this point.

Certain corporate governance mechanisms directly and positively influence the information content of financial reports, because it is their role to monitor the production of financial reports. These mechanisms include independent boards of directors, independent audit committees, adequate internal controls, and independent external auditors. This monitoring should benefit the investors that boards serve by reducing information asymmetry between investors and managers. Also, those responsible for corporate governance are interested in financial reporting quality because of its impact on their ability to administer compensation contracts or make retention decisions. Thus,

boards would be expected to demand useful financial reports for their own decision making, as well as on behalf of the investors whom they represent. Stronger boards should be in a better position to obtain the desired results.

Academic researchers find mixed evidence on the effect of corporate governance on the information content of firm disclosures, measured as the market reaction to those disclosures. For example, Karamanou and Vafeas (2005) document greater market reactions to good news forecasts for firms with more independent boards and audit committee expertise, while Core et al. (2006) find no evidence that corporate governance mechanisms result in differential returns at earnings announcements. Also, research examining the direct effect of corporate governance on information quality find mixed results. Some studies find that strong corporate governance is associated with less earnings management (Klein 2002), fewer restatements (Abbott et al. 2004), less fraud (Beasley 1996), and more disclosures (Gul and Leung 2004). However, Larcker, Richardson and Tuna (2007) find a weak or inconsistent relationship between corporate governance and abnormal accruals or restatements.

These inconsistent findings suggest that the question of how corporate governance should be expected to affect the information environment of firms needs further attention. In particular, should it be expected that stronger corporate governance will reduce information asymmetry between shareholders and managers for all firms? I suggest that the strength of corporate governance may be less relevant for firms where the information asymmetry between managers and financial statement users is low, and is more important when information asymmetry is high. My study addresses this question by systematically

investigating the impact of corporate governance on the information environment of firms.

As noted above, managerial opportunism and the role of boards in curbing it have been widely studied as influences on the information environment of firms. However, there are other possible sources of information asymmetry besides managerial opportunism, including industry and firm characteristics such as the level of competition in the industry and the nature of the firm's assets. For example, high costs of disclosures, such as proprietary costs, could limit disclosures even in the presence of strong corporate governance. Verrecchia (1983; 1990) demonstrates analytically that costs of disclosure could make disclosure harmful to the firm in some cases, and other accounting researchers have provided empirical evidence of proprietary costs reducing disclosures (Bamber and Cheon 1998; Botosan and Stanford 2005; Guo et al. 2004; Jones 2007). As another example, the nature of the firm's assets affects the level of information asymmetry because the future cash flows of a firm come from its mix of assets-in-place and growth options. When the value of the firm is heavily dependent on growth options, the firm is more difficult to value (Lev 2002; Gu and Wang 2005; Aboody and Lev 2000)[1].

Thus, while on average stronger corporate governance may result in more transparent disclosures, it is not clear that this will occur in every situation. In this study,

[1] Lev (2002) discusses then-Chairman of the Federal Reserve Board, Alan Greenspan's, Semiannual Monetary Policy Report to the Congress [February 27, 2002] in which Mr. Greenspan contrasted "conceptual" and "physical" assets. Lev comments that physical assets are essentially commodities and can therefore provide only the cost of capital as a return, while investments in intangibles, whether research and development or the development of human capital or excellent processes, provide true value. Intangible assets are therefore linked conceptually to the growth options described in Anderson et al. (1993). One of the challenges of this type of firm asset it is valuation: "Nonmarketability: Market[s] in intangibles are in infancy, and lack transparency ⟨there are lots of patent licensing deals, for example, but no details released to the public⟩. Consequently, the valuation of intangible-intensive enterprises is very difficult ⟨no "comparables"⟩, and their management challenging (Lev 2002)."

I seek to provide insight into this relation by developing and testing hypotheses on the determinants of this relationship. For this purpose, I examine capital market responses to bond rating downgrades. It is well documented that bond rating changes based on confidential corporate information are viewed as significant informational events by capital markets (Jorion et al. 2005; Goh and Ederington 1999; Kliger and Sarig 2000). As an objective, third-party signal, bond rating downgrades are also a more appropriate setting for my tests than earnings announcements or other informational events originating from within the firm because these disclosures may be contaminated by management incentives.

Capital market reactions to rating downgrades are a function of the level of information asymmetry between the firm and the market prior to the rating change. To the extent strong corporate governance leads to more transparent reporting practices, the incremental information provided by a rating downgrade and the resultant market reaction should be less. However, because strong corporate governance does not necessarily result in more transparent reporting in all cases [as discussed above], rating change announcements in settings of higher information asymmetry may still be significant informational events which generate a market response.

Therefore, I examine how the level of information asymmetry affects the relationship between corporate governance and the market reaction to bond rating downgrades in order to explicitly test situations in which strong corporate governance coexists with higher levels of information asymmetry. It is expected these tests will illustrate a situation in which strong corporate governance would not necessarily translate into more informative disclosures. In settings of high information asymmetry it is

expected that the market reaction to bond rating downgrades will be lower in the presence of strong corporate governance. This result would show the importance of considering information asymmetry in corporate governance research.

In summary, this study will provide evidence on the effect of corporate governance on the amount of information content in an independent information event. Bond rating downgrades provide a strong setting to examine a relationship about which prior results have been mixed. I will control for information asymmetry that could obscure the effects of governance and explore settings in which corporate governance could be expected to have less impact on information disclosures. My findings will make a contribution to the literature on the relationship between firms' corporate governance practices and their cost of capital. My tests include periods before and after both Regulation FD and the Sarbanes-Oxley Act of 2002, thus allowing me to provide evidence of the impact of both of these regulations on firms' information environment.

The remainder of this study is organized as follows: Section 2 presents background information and develops the hypotheses. Section 3 discusses research methodology. Section 4 describes the data. Section 5 will present the results, and Section 6 will state conclusions.

CHAPTER 2

THEORY AND HYPOTHESES DEVELOPMENT

2.1. Background: Bond Ratings and Rating Downgrades

Bond ratings represent an independent assessment of the creditworthiness of a debtor with respect to a particular debt security, and are issued by agencies with access to confidential corporate information.[2] Because rating agencies maintain the confidentiality of the information provided, a firm can communicate more fully and credibly with a bond rating agency than with firm shareholders. Bond ratings have implications for both firms' cost of capital and future returns to shareholders. Thus, they provide information that is incremental to firms' disclosures and financial reports.

Several studies have described the determinants of the level of the bond rating. Of particular interest to my study, Bhojraj and Sengupta (2003) use industrial bond issues from 1991-1996 from the Warga Fixed Income Database to show that institutional ownership and outside directors are associated with higher bond ratings and lower bond yields, after controlling for other known determinants of bond ratings. Their controls

[2] This access to confidential corporate information continues even after the implementation of the Securities and Exchange Commission Regulation Fair Disclosure [FD] in October 2000. Regulation FD prohibits issuers from selectively disclosing material nonpublic information to securities market professionals or other who would be able to trade on that information. However, bond rating agencies are specifically exempted from its provisions [see 17 CFR 243.100⟨b⟩⟨1.⟩]. The other exempt communications are to persons who must keep the information confidential and communications made in connection with a public offering. The sample period for this study includes pre- and post-FD time periods. The Appendix provides a discussion of prior research on the reliability of bond rating changes over time and across agencies.

include the size of the issue, years to maturity and seniority of the debt, as well as debt levels, profit margin and market beta of the debt issuer. They also find that the impact of corporate governance is stronger for lower-rated bonds [bonds rated by Moody's below an A.]

Ashbaugh-Skaif et al. (2006) use proxy data from the 2002 fiscal year and Standard & Poor's ratings of long-term credit issuers from Compustat to show that takeover defenses, accrual quality, earnings timeliness, board independence, board stock ownership, and board expertise are associated with higher credit ratings. They also show that the number of blockholders and CEO power are associated with lower firm bond ratings.

These studies use ratings levels to show that rating agencies value corporate governance structures as protection against default. However, the studies are not designed to address the role of governance in providing credible information to investors. A research design using changes in bond ratings, rather than rating levels, allows for a measure of the information content in the ratings change event. Additionally, changes in bond ratings allow each bond issue to serve as its own control for firm characteristics associated with determining the rating levels.

Previous research on changes in bond ratings consistently shows that bond and stock markets find bond rating downgrades informative. Holthausen and Leftwich (1986) find negative abnormal stock returns for bond ratings downgrades on non-convertible, corporate long-term debt announced by Moody's and Standard and Poor's during the period 1977-1982. They also find significant abnormal stock returns for additions to Standard and Poor's credit watch list. Hand et al. (1992) extend the findings of

Holthausen and Leftwich (1986) by identifying expected bond rating changes using the same sample. Expected ratings downgrades are those with bond yields-to-maturity greater than the median yield-to-maturity of other bonds with the same rating. They find significant bond and stock price effects for the unexpected ratings downgrades, as well as weaker but still significant stock price effects for the expected rating downgrades. Goh and Ederington (1993) examine bond ratings downgrades issued by Moody's from 1984 through 1986 and distinguished between those that result from of increased debt and those that convey news of deteriorating financial condition. They find a negative stock price reaction for the latter category of downgrades.

In contrast, prior research finds less evidence of a market reaction to bond rating upgrades. Holthausen and Leftwich (1986) detect a positive market reaction when bonds are added to a watch list for possible upgrades, but find no significant reaction to actual upgrade announcements. Jorion et al. (2005) find a stock market reaction to bond ratings upgrades, but only after the implementation of Regulation FD, when the information content of bond rating changes is stronger.

It is important to note that the information provided to the market by bond rating changes appears to include more than just the future implications to firms' cost of capital and cash flows. The rating also appears to signal the current, underlying firm condition that led to the rating change. Two recent papers indicate that the bond rating agency serves as an information intermediary to the market: Jorion et al. (2005) and Kliger and Sarig (2000).

Jorion et al. (2005) show a positive market reaction to upgrade announcements after the implementation of Regulation FD, but not before. They also find a stronger

market reaction to rating downgrades after Regulation FD. The significance of Regulation FD to their study is that bond rating agencies are exempt from the restrictions on firm disclosures so that the rating agencies continue to have access to firm information that firms might not want to be widely known, such as new products, customers or forecasts. The Jorion et al. (2005) results are important to my study because market reactions to rating downgrades could occur either because of the informational content of the downgrades or because the market is capitalizing future interest costs related to the bond rating. Because the market reaction to rating downgrades differs depending on the information environment [pre- and post-FD], it appears that at least part of the market reaction is because of the information content of the downgrade.

Kliger and Sarig (2000) provide more evidence that bond rating changes contain information content about a firm beyond changes in the firm's cost of capital. They use the event of Moody's conversion to a more detailed rating system in 1982 whereby a bond issue previously identified as, for example, an AA rating, could be rated as AA1, AA2, or AA3. They show that bond prices, bond yields, and stock prices are all affected by the increased information provided by a more detailed rating system. This is despite Moody's announcement that the additional partitions were not reflective of new information, but rather represented increased disclosures of information already held by the agency. The results indicate that the rating data contain information that affect prices and are not merely proxies for other publicly available data. (Kliger and Sarig 2000).

The most important sources of bond ratings in the United States are firms designated by the SEC as nationally recognized statistical ratings organizations [NRSROs]. There are currently five NRSROs – A.M. Best Company, Inc.; Dominion

Bond Rating Service Ltd.; Fitch, Inc.; Moody's Investors Service; and the Standard & Poor's Division of the McGraw Hill Companies Inc. (Credit Rating Agencies—NRSROs 2005). The two largest are Moody's and Standard & Poor's. The Mergent Fixed Income Security Database [FISD] tracks ratings from Moody's; Standard & Poor's; Fitch, Inc.; and Duff & Phelps [which was purchased by the parent of Fitch, Inc. and is no longer issuing ratings]. Both long-term and short-term debt is rated, but for purposes of this study only the rating announcements for long-term corporate bonds are considered. This restriction makes the study more comparable to previous research and provides a more standardized event to measure market reaction.

The NRSROs change ratings as they become aware of changed circumstances. If more information is needed to assess the impact of changed circumstances, the issuer may be put on a watch list [Standard & Poor's] to indicate that the rating is being reviewed. Otherwise, a rating change may be issued without a watch list entry. I control for watch list status by noting when a change is listed in the Mergent FISD data. More information about academic research on the ratings agencies is presented in the Appendix.

2.2. Corporate Governance and Market Reaction to Events

One of the roles of corporate governance is to monitor corporate disclosures so that management does not issue misleading information to shareholders. Previous studies suggest that markets value strong corporate governance. For example, there is evidence that the stock market reacts positively to both the announcement of improvements to the audit committee (DeFond et al. 2005) or, following detection of fraud, to increases in the number of outside directors (Farber 2005).

DeFond et al. (2005) measured the market reaction during the pre-SOX period from 1993 to 2002 to the announcement of the appointment of new board members with financial expertise, either specific accounting expertise, more general financial expertise, or non-financial experts. They find a positive market reaction to the appointment of new members with accounting expertise, especially in firms with larger and more independent boards; larger and more independent audit committees; a higher score on the G index developed in Gompers et al. (2003) indicating stronger shareholder rights; and higher institutional ownership. Each characteristic is expressed as a dichotomous variable by comparing the value to the median, then summing the six measures for each sample observation into a single governance measure. These results indicate that the market may perceive specific governance improvements as more effective when the basic board structure is strong.

Farber (2005) examines 87 firms which the SEC identified as issuing fraudulent financial statements during the period from 1982-1997, based on Accounting and Auditing Enforcement Releases [AAERs] issued by the SEC. He tracks the changes in a large number of corporate governance measures for the firms over three years following the AAER[3]. He finds increases in the percent of outside directors and the number of audit committee meetings compared to their levels before the AAER is issued. He also finds that the pre-AAER governance of the fraud firms is weaker than the control firms with respect to the number and percent of outside board members, number of audit committee

[3]Corporate governance variables examined by Farber (2005) include: outside director percentage; Big 4 audit firms; same person as CEO and board chair [CEO duality, a situation that increases CEO power and decreases board power]; percentage of shares held by 5 percent blockholders; percentage institutional ownership; the percentage of shares held by management and directors; number of outside directors; number of directors; number of audit committee meetings; number of audit committee members; number of outside directors on audit committee; and the number of financial experts on audit committee.

meetings, number of financial experts on the audit committee, Big 4 auditing firms, and CEO/Board chair duality. Finally, he finds that firms that improve governance by adding more outside directors or increasing the number of audit committee meetings have less negative buy-and-hold abnormal returns for the three years following fraud than do firms that do not make positive changes.

Prior research also finds a positive association between the strength of board structures and the quality of financial reporting, with stronger corporate governance relating to disclosures that are less optimistically biased, more persistent (Frankel et al. 2006b) and more accurate (Karamanou and Vafeas 2005). Frankel et al. (2006b) used the independence of the board, i.e., the proportion of outside directors, as their measure of corporate governance. For the period from 1988 to 2002, they find that the differences between GAAP quarterly earnings and so-called "street" earnings announced by management are more transitory in nature for firms with more independent boards [and hence more appropriately excluded for analysis and forecasting purposes.] Karamanou and Vafeas (2005) examine management forecasts of 275 Fortune 500 companies between 1995 and 2000, and consider the effects of board and audit committee characteristics on the likelihood of firms issuing forecasts and the accuracy of those forecasts. They find that firms with a higher proportion of outside board members and higher levels of institutional ownership are more likely to make forecasts. Also, forecasts are more accurate for firms with higher proportions of outsiders on the board.

Ajinkya, Bhojraj and Sengupta (2005) use 2,934 annual earnings forecasts for 1,253 firms from 1997-2002 to show that higher institutional ownership [but not concentrated ownership], and more outside directors relate to firms issuing more, and

more accurate forecasts. Similarly Gul and Leung (2004) find, for 385 Hong Kong listed companies from 1996, that firms with non-CEO chairs have more voluntary disclosures compared to firms with board chairs who were also CEOs.

Further evidence on the impact of corporate governance on financial reporting and disclosure comes from studies examining earnings management, fraud, and restatements. For example, firms with more independent boards and audit committees, as measured by the number of outside members, experience less earnings management and fraud (Beasley 1996; Klein 2002). Beasley examines 75 fraud firms identified by AAERS and the Wall Street Journal Index from 1980-1991 and 75 matching non-fraud firms. He finds that the percent of outsiders on the board decreases the likelihood of fraud. He also finds that fraud decreases as outside director ownership tenure increases, and that fraud increases as the number of other directorships increases beyond two. Klein tested 692 firm-years for S&P 500 firms from 1992 and 1993. She finds that lower unexpected accruals are related to both a higher percentage of outside board members and to majority independent boards and audit committees.

Firms whose boards and audit committees meet more frequently and have greater financial expertise also tend to show less earnings management[4] (Xie et al. 2003). SEC accounting enforcement actions are positively associated with insider boards, CEO's who are also the board chair, and the lack of an audit committee (Dechow et al. 1996). Similarly, outside board members are associated with less income-increasing abnormal

[4] Xie et al. (2003) followed Teoh et al. (1998) in measuring earnings management as discretionary current accruals. They began by estimating ordinary least square regressions of current accruals on one plus the change in sales from the previous year for all non-sample firms listed on Compustat in the same two-digit SIC, deflating one and change in sales [the two variables in the model] by the book value of total assets from the prior year. Using the resulting regression coefficients, they estimated each sample firm's non-discretionary current accruals, and subtract that result from current accruals to find discretionary current accruals.

accruals to avoid reporting losses or earnings declines, in U.K. firms from 1993-1996 (Peasnell et al. 2005). Fraudulent firms also have fewer numbers and percentages of outside board members, a higher percentage of CEO/Chair duality, and a less-active audit committee (Farber 2005). Finally, Srinivasan (2005) examines 264 companies that made income-decreasing restatements from 1997-2001 and finds that outside directors lose other directorships when associated with a restating firm as a board member, indicating that outside board members have incentives to monitor firms. Taken together, these studies indicate that stronger corporate governance is associated with more complete, less biased, more accurate, and more credible information being available to investors. Therefore, not only does the market react as if the information disclosed by well-governed firms is more credible, but in addition, prior research reveals motivators for this reaction.

While prior studies suggest that strong corporate governance results in more reliable disclosures that are valued by the markets, there is mixed evidence regarding whether governance structures can moderate market reactions to new information. Some studies show that this is the case. For example, Karamanou and Vafeas (2005) show higher market reactions to good news forecasts for firms with more independent boards and audit committee expertise, and Wild (1996) documents stronger market reactions to earnings reports after the formation of an audit committee. Bhojraj and Sengupta (2003) also find that higher institutional ownership and more outside directors are associated with lower bond yields, which they interpret as governance factors reducing information asymmetry.

On the other hand, Core et al. (2006) finds no evidence of differential returns to stronger corporate governance at the time of earnings announcements. This result supports their suggestion that the Gompers et al. (2003) results of anomalous positive market returns to firms with strong shareholder rights around earnings announcements could relate to the prevalence of takeover activity in the period studied. The Core et al. (2006) argument, consistent with their results, is that because a firm's corporate governance structure is public knowledge, the impact of governance on operating results should be impounded in the stock price rather than being a surprise to the market at the time of earnings announcements. Their results indicate that the impact of shareholder rights provisions on firm performance and market returns is a complicated question that is likely influenced by the level of takeover activity in the economy as a whole and within specific industries. In contrast, the Gompers et al. (2003) argument is that the market should find the announcements of firms with strong governance more credible and therefore react to them more strongly. Core et al. (2006) do not address the impact of corporate governance on a firms' information environment. Both papers address important questions about the role of governance mechanisms in firm performance and the market reaction to firm information.

Previous governance research uses events such as company forecasts or earnings announcements. My study extends research in this area by using third-party announcements, specifically bond rating changes issued by NRSRO's. These agencies have reputational and litigation incentives to be accurate and continue to have private access to confidential firm information even after the implementation of Regulation FD. Using a third-party announcement enables me to infer the market's assessment of extant

information released by firms by measuring the reaction to new, credible information at the time of the rating change. My study focuses on determining the role of governance, specifically board structures and board members, in producing complete and reliable disclosures so that third-party news is less surprising or important. Therefore, this study attempts to measure the impact of corporate governance by indirectly using the entire information environment surrounding the firm.

While current research finds mixed results regarding the effects of corporate governance on market reactions to information, there is evidence that market reactions in general are conditioned on the reliability of information. Rogers and Stocken (2005) examine 925 management forecasts from 1995-2000 and find that market responses to "good news" management forecasts are affected by predictable bias in the forecasts. That is, the market responds more strongly to good news forecasts when management has incentives to bias the forecast downward and less strongly to good news forecasts when management has incentives to bias the forecast upward. Teoh and Wong (1993) find a stronger market reaction to earnings announcements when the perceived audit quality [proxied as Big-8 audit firms versus non-Big-8 audit firms] is high using a sample of 1,282 matched pairs of firm-year observations from the 1980's.

Taken together, the prior research suggests that strong corporate governance relates to more reliable and less biased financial reporting that the market should consider in its evaluation of new information. In my study, bond ratings issued by third parties are assumed to be of a constant reliability, but are thought to be more informative when previously available information is produced by a financial information system with weaker monitoring. This leads to the following hypothesis:

Hypothesis 1: the magnitude of the market reaction to bond rating downgrades is lower for firms with stronger corporate governance.

That is, the rating downgrade provides less information because the existing information environment is richer and, as such, the absolute value of the cumulative abnormal return is smaller.

2.3. Information Asymmetry and Market Reaction

When there is high asymmetry of information between firm insiders and outsiders, ceteris paribus, the information content of a new, credible signal based on private information should be higher. This reasoning is consistent with the finding of Ho, Liu and Ramanan (1997), who use a sample of 335 open-market repurchase announcements from 1978 to 1992 and find that the market reaction to share repurchase announcements is stronger for firms that are smaller and have fewer analysts following them, i.e., where information asymmetry is expected to be higher. They also suggest that the market reaction to the repurchase announcement indicates a reinterpretation of previously released accounting information. The amount of reinterpretation, and thus the size of the market reaction, indicates the level of information asymmetry for the firm. Likewise, Brooks and Patel (2000) examine seasoned equity and debt offerings in 1989 for 135 firms and observe the largest market reaction to seasoned equity announcements for firms with the largest level of pre-event information asymmetry. For debt offers, the market reaction is only significant for firms with the largest pre-event levels of asymmetric information.

In the Ho, Liu and Ramanan (1997) study, management's belief that shares are undervalued is credible to the market because it is accompanied by the costly action of

buying shares. The event of interest in my study is a bond rating downgrade, which is thought to have information for the market incremental to that in financial reports and disclosures because it comes from an independent, credible, third-party source. Thus, Hypothesis 2, as stated in the alternate is:

Hypothesis 2: the magnitude of the market reaction to bond rating downgrades is greater for firms with higher information asymmetry.

2.4. Corporate Governance and Information Asymmetry

Because information asymmetry is measured in this study by analyst following, analyst forecast error and forecast dispersion, high information asymmetry firms are those where analysts are not interested in making, or are not able to make, reliable earnings estimates. From the investors' point of view, there is therefore a dearth of information and analysis from third parties. The disclosures made directly by the firm may be more important to investors as a result; or in other words, with less interest or agreement from analysts, the firm's direct disclosures may be more important in shaping the information environment. All firms must make the minimum required disclosures, but boards at least partially fulfill their governance function by causing corporate disclosures to be more credible, reliable and complete. Therefore, 1) it is in the condition of high information asymmetry that a firm's disclosure matter most to investors; and 2) it is in the condition of strong governance that those disclosures should lead to a more complete information environment that will, in turn, result in less information content from an event.

Taken together, this leads to the following hypothesis:

Hypothesis 3: High levels of information asymmetry increase the association between market reaction and corporate governance, while low levels of asymmetry weaken this association.

This could be referred to as the "information content" hypothesis, because the role of the board is seen as helping to enrich the understanding of the firm among financial statement users, so that the information content of a new event is lower.

An alternative argument could be made, however. There are several situations of high information asymmetry that could exist independent of governance considerations. Examples include: firms with high proprietary costs of disclosure, and also firms with higher levels of unique or non-transferable assets that create difficulties in communicating firm value to the market. In these situations, strong corporate governance might not result in reduced information asymmetry because it would be either too costly or not feasible to make sufficient disclosures because of the firm's investment strategy, as discussed in more detail below.

Verrecchia (1983; 1990) demonstrates analytically that disclosure-related costs, such as the cost of disclosing proprietary information, create a threshold level of disclosure whereby a manager only discloses information above the threshold and withholds it otherwise. This suggests that managers will withhold proprietary information harmful to firm value or helpful to competitors, and would be supported in this by their boards.

There is also empirical evidence of proprietary costs limiting disclosures. Bamber and Cheon (1998) provide evidence that managers are less likely to issue forecasts using the high-profile medium of a special press release when proprietary costs of disclosure

are higher. Botosan and Stanford (2005) show that firms in more concentrated industries are less likely to disclose profitable segments until they were required to do so by Statement of Financial Accounting Standards No. 131. Guo et al. (2004) examine the amount of product-related information disclosed by biotechnology companies in their prospectuses. They find that in highly competitive industries, full disclosure may harm future prospects. Finally, Jones (2007) shows that R&D-intensive firms make fewer voluntary disclosures in the presence of proprietary costs.

Concerning the information asymmetry that is created by certain investment strategies, the Financial Accounting Standards Committee (2003) notes that, perhaps due to imprecise measurement, levels of voluntary disclosure about intangibles are low, which "raise[s] the possibility that managers are correct in stating that disclosures in this area do not provide net benefits to current shareholders. [p. 180]" They further note, "The nondisclosure of value relevant information creates 'information asymmetries' between insiders such as management and external investors. [p. 180.]" The authors cite the Aboody and Lev (2000) finding of larger gains to insider trading in R&D-intensive firms as empirical evidence of higher information asymmetry for these firms. Likewise, Gu and Wang (2005) use analyst data to show that intangible assets result in firms with higher information complexity.

Anderson et al. (1993) find that firms with assets consisting of relatively high levels of growth options, compared to assets-in-place, spend more on directorships relative to internal and external auditing. Specifically, they find that the ratio of directors' compensation to auditing costs increases as the ratio of the book value of assets to the market value of assets decreases. As explained above, firms with high market value

relative to the book value of assets are difficult to value and could have higher levels of information asymmetry. The Anderson et al. (1993) findings indicate that not only could strong corporate governance structures co-exist with high information asymmetry, but also that we might expect firms to choose stronger corporate governance structures when financial statements are less informative. In fact, Ferreira et al. (2011) find that board independence is negatively related to their proxy for stock price informativeness (the probability of informed trading (PIN)), which they interpret as demonstrating that firms with higher stock price informativeness require less board monitoring, or in other words, that board monitoring can substitute for informativeness.

Therefore, the direction of the relation between corporate governance to the information content of an event, given high information asymmetry, could be argued as follows. If the cause of the information asymmetry is something other than managerial opportunism, the board would not be expected to decrease that asymmetry by insisting on additional disclosures. Indeed, the investors would require a strong board when informativeness is low, in order to protect their own interests, so that a strong board would be the result of low informativeness of firm disclosures, instead of being the agent to increase those disclosures.

In short, two competing hypotheses are possible, and it may be that both are true. In that case, it is an empirical question as to which effect is stronger. For this study, the well-documented influence of corporate governance measures on increased, less biased, and more complete financial disclosures leads to my choice for the hypothesized direction of the relation.

CHAPTER 3

METHODOLOGY

I first present the models used to test my hypotheses and then briefly discuss the measurement of the variables. I then provide a rationale for selecting the specific variables included in the models and discuss how the variables have been used in prior research.

3.1. Regression Models

All models are estimated for the full sample period for main tests. Additional analyses are performed for the observations from before and after the Sarbanes-Oxley Act of 2002, and before and after the implementation of Regulation FD, to evaluate the effects of these market-wide changes on firms' information environment.

3.1.1. Model for Hypotheses 1 and 2

I use the following equation to test the relationships expressed in hypotheses 1 and 2 concerning the effect of corporate governance and information asymmetry on the market reaction to bond rating downgrades.

$$ABSCAR_i = a_0 + a_1 BdInd + a_2 ACInd + a_3 BdEqOwn + a_4 Non\text{-}CEO + a_5 InvNumEst + a_6 FcstError + a_7 FcstDisp + a_x Controls \quad [1]$$

Where:

$ABSCAR_i$ is the absolute value of CAR_i. CAR_i is the size-adjusted cumulative abnormal return for firm *i*, calculated as the actual rate of return on the common stock of the *i*th firm on day *t* minus the portfolio return index on that day from the same CRSP daily size decile to which firm *i* belongs. I use a three-day accumulation period for returns [day before, day of, and day following the downgrade]. The use of the absolute value of cumulative abnormal returns is discussed in the accounting literature as an appropriate measure when the objective is to examine the information content of an event, such as an analyst report (Frankel et al. 2006a) or an earnings announcement (Francis et al. 2002).

The **Governance variables** are:

BdInd	=	The proportion of independent board members to total board members.
ACInd	=	The proportion of independent audit committee members to total audit committee members.
BdEqOwn	=	The proportion of outstanding shares owned by outside board members to total shares outstanding.
Non-CEO	=	Takes the value of 1 when the board chair is not the CEO, and 0 otherwise.

These variables are all expressed so that a higher value represents stronger corporate governance. I expect that strong corporate governance will decrease the stock market reaction to the bond ratings change; therefore, I expect the coefficients of the governance variables to be negative.

The governance data is from the IRRC dataset. The subset of IRRC data used in this study, board data, is based on the information from proxies for annual meetings. I match the rating changes to the governance data from the annual meeting that immediately precedes the rating change.

The **Information asymmetry variables** are:

InvNumEst = The inverse of the number of analyst estimates in the seventh month of the year being forecast.

FcstDisp = The standard deviation of analyst forecasts made during the seventh month, scaled by the stock price at the beginning of the fiscal year being forecast. If there are not at least 4 estimates, the value of the variable is coded as missing.

FcstErrorAbs = The absolute value of the average forecast error from the I/B/E/S monthly summary data from the seventh month of the year being forecast.

These variables are simple averages from the I/B/E/S monthly summary data for forecasts of the year-end earnings per share from the seventh month of the year being forecast, following Leuz (2003). I choose the analyst data related to the year-end immediately previous to the bond rating downgrade. The stock price used to scale the dispersion variable is as of the beginning of the fiscal year being forecast and is obtained from Compustat.

As in hypothesis 2, I expect that information asymmetry will increase the stock market reaction to the bond ratings change. These variables are all stated so that higher

values indicate higher information asymmetry; therefore, I expect the coefficients of the information asymmetry variables to be positive.

The sample is limited to straight (i.e., non-convertible), long-term corporate debenture bonds that are denominated in dollars. The intent of limiting the sample observations to only this type of bond is to bring some uniformity to the bond rating downgrade event. To produce more precise results, I use previous research to identify appropriate control variables that capture variability in market reactions due to differences in the rating change characteristics.

The **Control variables** are:

RLEVEL	The residual of the beginning rating level of the observation regressed on the governance variables.
AT	Total assets (in millions) as of the year-end prior to the ratings change, from Compustat.
RCHANGE	The magnitude of the rating downgrade, calculated as the old rating minus the new rating, where rating AAA is assigned a value of 1 and rating D is assigned a value of 23, as shown in Table 1. (Jorion et al. 2005). (Note: Changes from rated to unrated and vice versa are excluded.)
CLASS CHG	Takes the value of 1 for downgrades to a different class, for example from A to BBB. Each row in Table 1 represents a different class.
DAYS	The number of days since the previous rating change.
WATCHLIST	Takes the value of 1 if the bond issue was on a negative watch list at the time of the bond rating downgrade and 0 otherwise.

The control variables included in my models consider different aspects of ratings changes that might affect stock market reaction. I control for the rating level at the time of the change [RLEVEL], the size of the company [AT], the size of the rating change [RCHANGE], whether or not the change results in a change in class [CLASS CHG], the number of days since the previous rating change [DAYS], and whether the bond was included on a watch list at the time of the rating change [WATCHLIST].

The WATCHLIST variable takes the value of one if the bond issue was on a watch list at the time of the rating change, and zero otherwise. It is included as a control because the presence of a bond on a watch list, indicating that a rating change could be forthcoming, may dilute the market response to the eventual change. Indeed, Hand et al. (1992) use additions to the Standard & Poor's Credit Watch List, as well as actual rating changes by Standard & Poor's and Moody's, as their events of interest. They find excess stock returns related to all the events studied [positive and negative watch downgrades and rating upgrades and downgrades] except for actual upgrade announcements. In the Mergent FISD data for the years of my study, the watch list variable [which is labeled Rating_Status in the database] is missing for the majority of my observations. For example, only 547 downgrades show Rating Status out of the 1,228 downgrades in my total sample. Even more problematic from the standpoint of using watch list status as an event, the date of a change in the watch list is generally not available. Only 70 downgrades in the total sample show a rating status date, and all of the dates shown are in the years 2001 and later.

Previous research finds that the ratings level affects the market reaction to bond rating changes. Ederington and Goh (1999) find that the market reacts more strongly to downgrades at the lower end of the rating scale. The ratings level is related to firm governance characteristics and is mentioned by ratings agencies as a factor in determining bond ratings (Bhojraj and Sengupta 2003). This means that the ratings level is endogenously related to the governance variables in my study. Therefore, I use an instrumental variables approach by calculating the ratings level residual from the regression of my governance variables on the beginning ratings level and including the residual for each observation as the control variable in all of my models. The residual is calculated as the error term in the equation: $Rating = a_1BdInd + a_2ACInd + a_3BdEqOwn + a_4Non\text{-}CEO + e$.

3.1.2. Models for Hypothesis 3

I test hypothesis 3 in two ways. First, I create scores for governance and for information asymmetry so that a term can be created to show the interaction between the two variables (untabulated). Second, I use the governance and information asymmetry scores to partition the sample into high and low governance segments and high and low information asymmetry segments. I compare the coefficients on the governance score to in the low and high information asymmetry conditions. I then use the sample partitions to produce four quadrants in a two-by-two design. I compare the coefficients for the relevant variables in the low and high governance groups in the condition of high information asymmetry, and also in the condition of low information asymmetry. For the scores method, I use the following regression:

$$ABSCAR_i = b_0 + b_1GOV + b_2IA + b_xControls \quad [2]$$

For the quadrants method, I use this model:

$$ABSCAR_i = c_0 + c_1 Quadrant + c_x Controls \quad [3]$$

The construction of the scores and the resulting quadrants is described in the data section. For model 2, I expect the coefficients on the GOV and IA variables to be negative, because the variables are coded so that strong governance is represented by a higher GOV score, and information asymmetry scores are inverted. That is, lower information asymmetry is represented by a higher IA score and negative coefficients are expected for both the GOV and IA scores. For model 3, I expect that market reaction will be stronger for the low governance observations in the high information asymmetry condition, so when comparing the other quadrants to that one, I expect that the coefficient on the quadrant variable will be negative.

3.2. Corporate Governance Variables

I will now provide a more detailed description of how the corporate governance measures included in this study – independence of board, independence of the audit committee, equity ownership of outside board members, and non-CEO chair – have been associated with financial reporting and disclosure quality in prior literature. These variables are similar in that they measure the motivation of the board to provide oversight to management in the financial reporting process. The data for these board-related measures are obtained from the IRRC database.

3.2.1. Board Independence

Concerning board independence, Frankel, McVay and Soliman (2006b) show that exclusions from street earnings are less transitory and more related to future returns for less independent boards. Further, while insider trading activity is positively associated

with the permanence of management's exclusions from street earnings [indicating opportunistic disclosures], higher board independence weakens the association. They measure board independence several ways including as a continuous percentage, as the quartile rank, and as an indicator variable indicating that a firm has an "independent" board if the majority of the directors are independent. They find similar results with each measure. For this study, I measure board independence as the percentage of independent board members to total board members.

Many other studies have used board independence as a measure of the strength of corporate governance. Peasnell, Pope and Young (2005) find that outside directors reduce income-increasing abnormal accruals in British firms. Srinivasan (2005) find a reduction in other board memberships for the outside directors of restatement firms, and especially for outside audit committee members – evidence that outside directors bear a significant reputational penalty that may provide incentives to monitor disclosures closely. Leuz, Triantis and Wang (2008) use both the number of independent directors and the percent of independent directors (in separate regressions) as measures of strong governance and show that firms are more likely to "go dark" with the weaker monitoring implied by less independence.

Kanagaretnam et al. (2007) use principal components analysis to identify board attributes related to reduced information asymmetry. Their board independence factor, of which the most influential components are the percentage of outside directors on the board and on the audit committee, are significantly related to reduced bid-ask spreads around quarterly earnings announcements.

3.2.2. Audit Committee Independence

While some recent papers have stressed the presence of experts on the audit committee (DeFond et al. 2005; Farber 2005; Karamanou and Vafeas 2005), others examine the proportion of outside directors on the audit committee. Davidson, Goodwin-Stewart and Kent (2005) find that a majority of outside directors on the audit committee relates to less earnings management in Australian firms. Krishnan (2005) find that both independence and expertise of the audit committee are negatively associated with the reporting of internal control problems. Finally, Anderson, Mansi and Reeb (2004) find that fully independent audit committees are associated with a significantly lower cost of debt financing, which they attribute to increased reliability of financial reports. For this study, the proportion of outside directors on the audit committee is used as the measure of audit committee quality.

3.2.3. Equity Ownership of Outside Board Members

I use the equity ownership of outside board members to represent the incentives board members have to provide active monitoring. Prior researchers have observed favorable market reactions to the adoption of equity-based compensation for outside directors (Fich and Shivdasani 2005), although no reaction is noted when the equity holding of outside directors is already high. Also, researchers find a positive association between the market-to-book ratio and the presence of equity holdings by outside directors of 5% or more of outstanding shares. Bhagat, Carey and Elson (1999) measure the impact of director stock ownership using the concept of the median director, that is, the director in the middle of a rank-ordering by equity ownership of all the directors of a firm. They find a positive relation between the dollar value of equity ownership of the median

director [but not the percentage of outstanding shares owned] and the market-to-book ratio, the prior performance of the firm and the future sales growth. They also document a positive relationship between CEO turnover following poor performance and equity ownership by board members (Bhagat et al. 1999).

I measure equity ownership of outside board members in two ways. First, for the main tests I use the percentage ownership of outside directors [Ind_OwnP], which is captured in the IRRC data as the percentage ownership disclosed in the proxy statements. The data is available for all years of my sample. Because the ownership percentage of outside directors is typically small in my sample, many observations are rounded to zero. Therefore, I use a second variable [SharesHeld] in supplemental tests. The second variable is the number of shares owned by independent directors, scaled by the total outstanding shares at the beginning of the fiscal year [from Compustat], which is only available from the IRRC dataset for 1998 and after. Because this variable limits my sample size but does not affect the results, my results with this variable are untabulated.

3.2.4. Non-CEO Board Chair

Boards with chairs other than the CEO of the firm are thought to provide more monitoring of managerial actions. CEO's who are also the chair of the board are essentially monitoring themselves. Separation of the two functions provides more independence of the board from management. Farber (2005) finds that board chairs of fraud firms are more likely to be the CEO of the firm, while Gul and Leung (2004) find that Hong Kong firms in 1996 with a non-CEO as board chair disclose more than firms with a dual CEO/Chair and lower board independence [but not more than firms with a dual CEO/Chair and a high proportion of independent board members]. Tsui et al.(2001),

using a sample of 650 Hong Kong firms from 1994-1996, find that firms with a dual CEO/Chair have higher audit fees than firms where these positions are held by separate people, even after considering common control variables from the audit fee literature, including growth indicators. Their findings indicate that the audit firms consider the audits of firms with a dual CEO/Chair to be riskier than those of firms with more independent boards. Also, Dechow, Sloan and Sweeney (1996) find that firms subject to accounting enforcement actions of the SEC are more likely to have a dual CEO/Chair and a less independent board, and Leuz et al (2008) find that firms are less likely to "go dark", a move which is considered to be potentially harmful to shareholders when the CEO and Chair functions are separate.

Dahya, McConnell, and Travlos (2002) consider the impact of both board independence and non-CEO chairs on CEO turnover for firms that voluntarily adopted the Cadbury Conventions. They find no evidence that non-CEO chairs are incrementally significant when board independence is included in their model. Because they tested voluntary adopters, it could be argued that the boards they tested care expected to be highly vigilant. While I expect that a non-CEO board chair is highly related to board independence, I include both to provide a finer measure of the strength of corporate governance, and to use test variables consistent with prior literature.

3.3. Information Asymmetry Variables

The information asymmetry measures I include in this study [number of analyst following, forecast dispersion and forecast error] are frequently used in the prior literature. In general, I most closely follow Lang and Lundholm (1996) in my choice and measurement of variables. They use disclosure scores from the Financial Analysts

Federation [based on annual and quarterly financial statements, proxies and other filings, and other disclosures made by investor relations] and I/B/E/S data. They demonstrate that within an industry, increased disclosures are related to a higher number of analysts following a firm, and lower forecast error, less dispersion of forecasts and less volatility of forecast revision. Their tests for causality suggest that analysts choose to follow a firm because there is sufficient disclosure. Similarly, Kanagaretnam et al. (2005) use analyst forecast dispersion, revision volatility, and level of analyst coverage as proxies for the level of information asymmetry. Leuz (2003) uses the natural log of analyst following, as well as forecast dispersion in the fifth month after the fiscal year-end, as proxies for a firm's level of disclosure. In my study, I use the level of analyst following [or the inverse of the level of analyst following, when constructing scores], forecast error and forecast dispersion as proxies for information asymmetry.

Concerning the number of analysts, Roulstone (2003) shows that a high number of analyst following is associated with greater market liquidity. In turn, market liquidity is determined by the level of information asymmetry and the quality of information available about a firm (Coller and Yohn 1997). Using 4,766 seasoned equity offerings [SEOs] from 1984–2000, Bowen et al. (2008) find that analyst coverage is negatively correlated with SEO underpricing. In fact, firms followed by three analysts have a relative decrease in underpricing of 38 percent compared to firms with a lower analyst following, even after controlling for firm size and other characteristics relevant to SEO underpricing. SEO underpricing is evidence of information asymmetry because it represents the discount at which firms must issue their shares in order to overcome the

reluctance of uninformed investors to trade; therefore, greater analyst coverage decreases information asymmetry.

Analyst forecast dispersion is another proxy for information asymmetry that has been shown to be lower for firms with more informative disclosure policies (Lang and Lundholm 1996). Abarbanell et al. (1995) show analytically that, in certain circumstances[5], dispersion is positively associated with the magnitude of price reactions around a subsequent earnings release. Imhoff and Lobo (1992) use the variance in analyst earnings forecasts just prior to annual earnings announcement for 3,167 firm-year from 1979-1984 as a proxy for ex ante uncertainty about firms' future cash flows. It should be noted that they find that the market reaction to earnings announcements is stronger when forecast variance is lower, which differs from my prediction. However, their study differs from mine by the source of the announcement [earnings announced by the firm versus a bond rating change announced by an independent third party]. In contrast, Barron and Stuerke (1998) find a positive relation between forecast dispersion and the subsequent market reaction to earnings announcements even after controlling for firm beta and the variance of daily stock returns. Behn et al. (2008) find that high-quality audits provided by Big 5 auditors and industry specialist non-Big 5 auditors are associated with lower analyst forecast dispersion, indicating that the lower dispersion is related to a higher quality information environment. Finally, Bowen et al. (2008) find that lower earnings forecast dispersion, defined as the standard deviation of one-year-ahead earnings forecasts in the month before the SEO deflated by the closing price prior to the offer, is related to less SEO underpricing.

[5]The condition for this finding in Abarbanell et al. (1995) was that the uncertainty about firms' future cash flows, indicated by forecast dispersion, causes investors to desire additional information.

Analyst forecast error has been used as a measure of the amount of information available to investors to predict future cash flows. Lang and Lundholm (1996) show that analyst forecast accuracy increases with the informativeness of a firm's disclosure policy, using data from the Report of the Financial Analyst Federation Corporate Information Committee for 1985-1989. Gu and Wang (2005) find that analyst forecast error is increasing in intangible intensity greater than the industry median and the diversity and innovativeness of the firms' technology, and decreases for regulated industries. They use data from 1981-1998, including data on patents filed during the period. Their findings indicate that the type of firm assets adds difficulty to the task of predicting the future performance of firms. Thus, analyst forecast error is a measure of a firm's information environment.

CHAPTER 4

DATA

4.1. Sample

I follow prior research (Jorion et al. 2005; Hand et al. 1992) in matching the bond ratings schemes across ratings agencies and assigning numerical values to those ratings, as shown in Table 1 [e.g., a BB rating from Standard & Poor's is considered equivalent to a Ba rating from Moody's]. These values should be considered an ordered, but not interval, scale. I also follow prior research in calculating the magnitude of ratings changes by subtracting the old rating from the new rating.

I obtain the sample of bond ratings changes from the Mergent Fixed Income Securities Database [FISD]. Observations included in the total include rating changes for certain bond issues from the Mergent FISD database for the years 1997-2003, except for any rating changes from rated to unrated or vice versa. The bond issues included are those considered straight [non-convertible] long-term corporate debentures, a sample that excludes all of the following: medium term notes, asset-backed, Yankee, Canadian, secured lease obligation issues [SLOB], defeased, exchangeable, and preferred securities. Changes to or from non-rated, including the Duff & Phelps ratings that changed to non-rated on June 1, 2000 when that agency merged with Fitch, are also excluded.

The beginning and end of the sample period is dictated by data availability from the Investor Responsibility Research Center, Inc. [IRRC]. This period includes the implementation of Regulation FD in October 2000 and of the Sarbanes-Oxley Act of 2002. These regulatory changes very likely influenced the information environment of firms. Therefore, I also estimate the models using subsamples of the data based on the period of the changes; that is, before and after Regulation FD and before and after the Sarbanes-Oxley Act of 2002.

I require CRSP data to generate the abnormal returns. This data requirement did not affect the sample size. I use the I/B/E/S dataset for the information asymmetry variables. Compustat data is used to scale certain variables.

There could be multiple rating changes on a single day for any issuer because of the multiple rating agencies or because each issuer could have multiple issues. Following prior research (Jorion et al. 2005), when there are multiple rating changes for a single issuer on a single day, I use the rating change with the highest absolute value.

I also delete observations with overlapping event returns windows. Because the window is one day before and one day after the downgrade, this deletes any rating downgrades that follow by one or two days from the downgrade selected for testing.

News contamination is determined by examining the Wall Street Journal [Proquest database]. Items are considered contaminated if there is a significant Wall Street Journal story about the firm published during the event window [the day before, the day of, and the day after the rating change]. Significant stories are defined as those concerning mergers or potential mergers, earnings, forecasts, lawsuits, regulatory actions, products, customers, markets, changes in personnel at the executive level, etc. A news

story is not considered contaminating if it is solely reporting the rating change. Observations are also considered contaminated if the Compustat date of quarterly earnings release fell in the rating downgrade event window. Events contaminated by quarterly earnings announcements or other news are excluded from the sample.

Generally, a rating agency announces a rating change for all issues of a firm at the same time, but because downgrades from multiple rating agencies are included in the data, it is possible that rating downgrades related to the same firm could follow each other closely in time and yet escape the screens just described. The difficulty this poses is that, for example, a downgrade by Standard & Poor's that lowers the ratings on a firm's bond issues that were already downgraded by Moody's, say, three days previously would contain less information for the market than the original Moody's downgrade. In my models, I control for this using the *DAYS* variable. Table 2, panel A shows how the sample size is affected by the datasets used and the elimination of duplicate or overlapping ratings.

I winsorize the sample by removing some extreme observations. Examining the data, I find that there tend to be few extreme observations in the governance variables. By construction, these variables have values between 0 and 100. Therefore I do not remove any observations for extreme values of governance variables. However, I do remove observations with the top and bottom one percent of values for the dependent variable, size-adjusted cumulative abnormal returns, and for the information asymmetry variables. Table 2, panel A provides details of the impact of these actions on the sample.

The sample observations occur both before and after SOX, and before and after the implementation of Regulation FD, as shown in Table 2, panel B. I follow Jorion, Liu

and Shi (2005) in setting the implementation period for Regulation FD, so that observations before October 2000 are considered "pre-FD", observations in October are considered "during implementation", and observations after October 2000 are considered "post-FD". Because the Sarbanes-Oxley Act of 2002 was signed into law on July 30, 2002, observations from August 2002 on are considered post-SOX. The period from February 2002 through July 2002 is considered during the debate, as this period encompasses the time from the initial introduction of Representative Oxley's House bill through the signing date. The observations during FD implementation and during SOX debate are discarded for the robustness tests related to these different information regimes.

Table 2, panel C shows that the majority of observations in my sample relate to bonds with ratings in the "Investment" category. This is probably an artifact of the selection process, since firms must be followed by Compustat, I/B/E/S, and the IRRC databases in order to be included, which may lead to the exclusion of some firms with lower bond ratings.

Table 2, panel D shows the sample composition by rating agency. Prior research on bond ratings and ratings changes sometimes use only ratings from one agency, especially Moody's and Standard and Poor's. For example, Hand et al (1992), Bhojraj and Sengupta (2003) and Ederington and Goh (1998) use Moody's ratings. Others ((Dhaliwal and Reynolds 1994; Mills and Newberry 2005) use Standard and Poor's ratings. The Compustat database includes Standard and Poor's bond ratings as an information field; as a result, much of the research using levels of bond ratings in combination with other Compustat variables uses Standard & Poor's data. The Mergent

FISD database, which is the source of my ratings, includes ratings from Moody's, Standard and Poor's, Fitch, and Duff & Phelps, and I include observations from all rating agencies represented in the database.

Another consideration involves the industry composition of the sample. I follow the industry classifications used in Barth et al (1998), with the addition of including SIC codes from 000-999 in the "Other" classification along with SIC codes in the 9000's. It is noticeable that in the sample before industry deletions there are no observations in the industry category "Insurance and real estate", which consists of SIC codes 6500-6999. This is due to the loss of observations when matching to Compustat, corporate governance, and analyst data. It should be reiterated that only long-term corporate debenture bonds are used in this study, and it may be that firms in this industry issue debt in other forms. Regulated industries, such as utilities, financial institutions, insurance and real estate [industry codes 10, 12, and 13] could have different governance characteristics than firms in other industries (Vafeas 1999). In accordance with prior governance research, I therefore omit observations from regulated industries in my sample. Table 2, panel E shows sample composition by industry.

4.2. Sample Partitions

I create sample partitions in order to allow for comparison of the strong and weak governance conditions, and the high and low information asymmetry conditions. I assign one point for governance to each observation if the observation is above the median for the percent of independent board members; a point for observations where the percent of independent board members on the audit committee is 100%; a point where the common stock ownership of independent board members is greater than 0%; and finally, a point

where the CEO is not also the chairman of the board of directors. Thus, my observations have governance scores ranging from zero to four. I assign observations with scores of zero or one to the low governance condition, and observations with scores of two or above to the high governance condition.

In a similar manner, I assign one point for information asymmetry to each observation if the observation is greater than or equal to the median value of the inverse of the number of analyst estimates at the seventh month of the observation's fiscal year, the absolute value of analyst forecast error comparing the seventh month estimates to actual values, and the dispersion of analyst forecasts in the seventh month. The result is that observations have information asymmetry scores ranging from zero to three. I assign observations with scores of zero or one to the low information asymmetry condition, and observations with scores of two or three to the high information asymmetry condition.[6]

Finally I divide the sample into quadrants using the high and low governance and high and low information asymmetry conditions. This allows for more targeted comparisons of observations by identifying firms with both strong governance and high information asymmetry, as well as those with weaker governance and low information asymmetry. These combinations of conditions, by providing the most extreme contrast, allow for another test of the hypotheses.

[6] Note: this coding does not apply to the regressions using an information asymmetry scores variable. For the scores used in regressions, I reversed the coding so that information asymmetry scores ranged from one to four, with one representing high information asymmetry.

CHAPTER 5

RESULTS

5.1. Descriptive Statistics and Univariate Results

Table 3, panel A shows the mean and median values for the variables of interest for the overall sample. The majority of directors in my sample are considered independent of the firm on whose board they are serving. The audit committees are more independent than the board as a whole, which is to be expected, because an independent audit committee has been considered best practice even before the enactment of the Sarbanes-Oxley Act of 2002, which mandated 100% independent audit committees. However, it is noticeable that most companies in my sample have a CEO who is also board chair, even though the governance literature has identified a separate chair as being the stronger governance condition.

The median value for the inverse of the number of analysts following of about 0.10 indicates that the median number of analysts following the firms in the sample is 10. The ending rating level for the majority of my sample is investment grade [as opposed to speculative grade], and the majority of rating changes are a decrease of one level. A change of one level would be, for example, a change from AAA and AA, or from B+ to B. Slightly less than half of the ratings changes in the sample involved a change from one ratings class to another. Each row of Table 1 represents a different class.

Table 3, panel B shows the mean and median variable values for the four quadrants of the sample. Because the number of observations is different for each quadrant, the design is considered unbalanced, making it necessary to use nonparametric comparison statistics to assess the significance of the univariate comparisons.

The observations in the low and high governance conditions are contrasted in Table 3, panel C. The two groups are contrasted with nonparametric Z-scores based on the median values. The contrasts of the two groups on the cumulative abnormal return and the absolute value of the cumulative abnormal return variables do not support Hypothesis 1, which would argue that the return should be more strongly negative for the low governance condition. Instead, if one accepts the one-sided Z test at the 10% level of significance, the univariate tests show that the cumulative abnormal returns are more strongly negative for the high governance condition. The comparison of the groups along the other variables shows that the partitioning worked, in the sense that the high governance sample medians are significantly higher in the high governance group. It is also notable that two of the three information asymmetry variables, the inverse of the number of estimates and the absolute value of forecast errors, are higher for the high governance condition, and the differences are significant. Also, the two groups are significantly different in regard to the control variables, Ratings level residual and Watch list status. The residual is smaller in the High Governance condition. Because the residual is created by regressing the rating level on the governance variables, it appears that governance conditions are perhaps more congruent with the rating level in the High Governance condition, and less predictive of the rating level in the Low governance condition. The high governance observations are more likely to be on a negative watch

list at the time of their downgrade. The presence of an observation on the watch list might be expected to diffuse some of the news from a ratings downgrade, which is not consistent with the more negative CARs of the high governance observations. This may demonstrate the importance of using multivariate tests.

The high and low information asymmetry conditions are contrasted in Table 3 panel D. The univariate comparison for the dependent variable shows that the cumulative abnormal returns are significantly more negative in the high asymmetry conditions, as predicted in Hypothesis 2. However, the contrast does not reach the five percent significance level for the absolute value of cumulative abnormal returns. As in the governance comparison, the information asymmetry conditions are significantly different on the partitioning variables. Perhaps not surprisingly, the high information asymmetry condition observation firms are smaller, have worse bond ratings and more frequent rating changes. The rating changes are also larger for the high information asymmetry condition, demonstrating the importance of including the size of the rating change as a control variable in multivariate analysis.

I also compare individual quadrants on a univariate basis. Table 3 panel E1 shows that the differences in CARs between the high and low information asymmetry conditions are driven by the differences in the strong governance condition. The difference is in the predicted direction, because the market reaction is stronger in the high information asymmetry condition. There is no significant difference between information asymmetry groups on the dependent variable in the weak governance condition, as shown in Table 3 panel E2. The results for the absolute value of cumulative abnormal returns are in the same direction, but only weakly significant.

Table 3 panel E3 shows the comparison between low and high governance in the high information asymmetry condition, which provides a test of hypothesis 3. According to the hypothesis, the difference in market reactions of the two governance conditions should be more obvious in the high information asymmetry condition with the absolute value of the cumulative abnormal return higher (or the cumulative abnormal return more negative) for the weak governance observations. However, similar to the results for the overall comparison of the governance conditions, the univariate results indicate no significant difference in the dependent variable between the two governance conditions in the high information asymmetry condition.

Table 3 panel E5 compares the two extreme quadrants: observations with weak governance and high information asymmetry, and those with strong governance and low information asymmetry. There are no significant differences in the dependent variable between these two quadrants.

While not hypothesized, I also present results of the univariate comparison between the weak governance and low information asymmetry conditions and the strong governance and high information asymmetry conditions in Table 3 panel E6. The two conditions are working at cross-purposes in these quadrants: either the weak governance should result in a stronger market reaction while the low information asymmetry mutes the reaction, or the strong governance should mute the market reaction to downgrade announcements while the high information asymmetry increases the reaction. I find that differences in the median absolute value of cumulative abnormal return are not significant between the two groups. However, the cumulative abnormal return is significantly more negative in the high information asymmetry condition, indicating a

stronger market reaction to bond rating downgrades. I interpret these results as suggesting that the information asymmetry effect outweighs the corporate governance impact in my sample, at least in this univariate test.

5.2. Multivariate Results

In this section, I present the empirical results of the ordinary least square regressions examining the effects of the governance variables, information asymmetry variables, and controls on the absolute value of the size-adjusted returns. Table 4 presents the regression results for Model 1. In panel B of Table 4, I use ranked values as an alternative to the original governance variables.

Several governance variables are significantly related to the absolute value of CARs, in the original variables and ranked variables models. Unfortunately, the direction of the relationship is in the opposite of the predicted relationship because the positive coefficients indicate that higher governance is related to more market reaction.

The same regressions also test hypothesis 2 because the models include the analyst variables. Unfortunately, there are no significant results so there is no evidence in support of the hypothesis.

The rating level residual is significant for both models in Table 4. Because the ratings are coded so that the lowest quality bonds are assigned the highest numerical rating, the absolute market reaction is greater for ratings changes in low-quality bonds. This positive relationship between the rating level and the absolute market reaction is consistent with prior research.

The size of the rating change is also significant for all models, but the direction of this relationship is not consistent with prior research. The negative signs on the rating

change coefficient show that the smaller the rating change, the greater the market reaction. It should be noted that the coefficients are very close to zero. The days since last change variable also shows a statistically significant coefficient with a value very close to zero. The sign on the coefficient indicates that the smaller the number of days since the last change, the larger the size of the market reaction. This is not consistent with expectations, as it might be expected that the more days elapsed since the last rating change the more news would be contained in the ratings change.

Model 1 does not provide a test of Hypothesis 3, because governance and information asymmetry are considered separately. As described above, the governance and information asymmetry variables are used to create governance and information asymmetry scores. The scores regressions are shown in Table 5. The same control variables are used as in Model 1.

The regressions for the full sample in panel A provides an additional test of Hypotheses 1 and 2. The governance scores are significantly related to the market returns; however, the information asymmetry score is not, so Hypothesis 2 is not supported. Also, the governance score coefficient in Panel A is positive. This indicates that higher governance scores are related with stronger market reactions, which is not consistent with Hypothesis 1. The control variables rating level residual, size of rating change and days since last change are significant, as in Table 4. In Panel B and Panel C of Table 5, the overall sample is divided into the observations with a high information asymmetry score and those with low information asymmetry. For both sub-samples, the governance score is significant (at the 10% level for the high information asymmetry

observations.) The coefficient on that variable is lower in the low information asymmetry condition, which provides some support for Hypothesis 3.

Table 6 shows more evidence related to Hypothesis 3. The model uses the quadrants described earlier. The descriptive statistics for these quadrants are shown in Table 3, panel B; univariate tests are shown in the panels of Table 3, panel E. The regression results shown in Table 6 should be interpreted as the difference of each of the 3 quadrants shown compared to the remaining quadrant, which serves as the basis of comparison.

The results in Table 6 indicate that there is a significant difference between the high and low governance quadrants in the high information asymmetry condition. However, the interpretation of these results is that the absolute value of the size-adjusted CAR for the high governance, high information asymmetry quadrant is greater than that for the low governance, high information asymmetry condition which is, again, the opposite from the hypothesized direction of the relationship. In fact, the results are more consistent with a different explanation, that investors are more surprised by a bad-news event for companies with strong governance than for a bad-news event for companies with weak governance.

The contrast of the low governance, high information asymmetry condition to the high governance, low information asymmetry condition is also significant at the 10% level. The positive coefficient indicates that market reaction was greater for the high governance, low information asymmetry quadrant; again, this does not support Hypotheses 1 and 2 because it is the opposite of the predicted direction of the relationship. The greater significance of the contrast of strong governance to weak

governance in the high information asymmetry condition than in the low governance condition does indicate that considering information asymmetry can be important in corporate governance research.

CHAPTER 6

EXTENDED TESTS

As shown in Table 2, panel B, the observations in my sample occur before and after the passage of the Sarbanes-Oxley Act of 2002, and before and after the implementation of Regulation FD. Both of these events have implications for my results. The Sarbanes-Oxley Act reduced the variance of the governance conditions by mandating that the audit committee of the board consists of only independent directors. Regulation FD changed the information environment for investors by reducing private disclosures by management to favored analysts (Ahmed and Schneible 2007). The potential impacts of Regulation FD are complex, because in response to this regulation, management could choose to make previously private disclosures public, or simply disclose less. The choice of a rating downgrade event for this study is relevant to Regulation FD, because bond rating agencies are specifically exempted from Regulation FD, so that these agencies have an opportunity to obtain private information, and then disclose it to the market in the form of a rating change. Prior research shows that ratings changes are more significantly related to cumulative abnormal returns after the implementation of Regulation FD (Jorion et al. 2005), indicating that the market interest in this signal increased.

The strength of my tests should be improved in the pre-SOX period compared to the full period, because of the greater variability of governance possibilities. Also, while

the changes caused by Regulation FD are complex, prior research indicates that absolute value of cumulative abnormal returns around the bond rating downgrade event should be stronger in the post-FD period. Therefore, I repeated some of my main tests for the pre-SOX, post-SOX, pre-FD and post-FD periods. As shown in Table 2, I have a limited number of observations in the post-SOX period. As a result, none of the models tested in the post-SOX period are significant, so I do not present results for the post-SOX period.

Table 7 shows the regression results using the individual variables with the dependent variable of size-adjusted cumulative abnormal returns. The period sub-samples yield very similar results to the full period sample. The percent of independent directors on the board is significantly positively related to the dependent variable, which indicates that the market reaction is stronger as the board independence increases – not the hypothesized relationship. It is also notable that the adjusted R^2 is higher for the post-FD sub-sample than for the full period, despite the smaller number of observations.

Table 7 panel B shows the regression results for the individual, ranked variables. Again, the results for the period sub-samples are similar to the overall sample. Again, the adjusted R^2 for the post-FD period is stronger than for the full period.

Table 8 shows the results of scores regressions using the period sub-samples. Panel A, without interaction and panel B with an interaction term. The main result in Table 8 is for the post-FD sub-sample in panel A. The information asymmetry variable is significant and the adjusted R^2 is much stronger for this sub-sample than for the full sample. This result agrees with prior research that indicates the importance of Regulation FD to the market reaction to bond ratings changes (Jorion et al. 2005). In panel B, the governance score is significant at the 10 percent level in the post-FD period. Because

prior research indicates that information asymmetry increased after the implementation of Regulation FD, this could be interpreted as weak evidence that governance is more significant when information asymmetry increases. However, the positive coefficient on the governance variable indicates that stronger governance is related to stronger market reactions.

Table 9 extends the results from Table 6 to the period sub-samples and shows that the full sample results are magnified in the post FD period. This sub-sample shows significant differences between the low governance, high information asymmetry condition and the two high governance conditions. In both cases, the coefficient on the variables is the wrong sign to support the hypotheses, however. The other period sub-samples demonstrate a weakly significant difference between the high and low governance conditions when high asymmetry is present.

CHAPTER 7

SUPPLEMENTAL TESTS

Table 10 shows the results of a variance inflation factor (VIF) test of the regression model. The correlation between variables in the model suggests the necessity for this test. Because the VIF is less than 5 for all variables, it appears that the coefficients of the individual variables are reasonably stable. By including tests of scores and quadrant comparisons, the study design considers the correlation between variables in the model as much as possible.

CHAPTER 8

DISCUSSION AND CONCLUSION

This study investigates how corporate governance impacts the information available to investors, as demonstrated by the market reaction to an independent, third party signal. While governance "best practices" stress the importance to investors of close board monitoring of the financial reporting process, previous empirical research has shown mixed results about the impact of corporate governance on market reactions to corporate events. For example, Core et al. (2006) did not find differential returns to stronger governance and suggested that the findings of an earlier paper (Gompers et al. 2003) are sample-specific.

Much of the research into how corporate governance impacts market reactions, including both the Core et al. (2006) and Gompers et al. (2003) papers, use earnings announcements as the market event. Earnings announcements are produced by the same accounting information system that is primarily responsible for the information environment for the firm. How corporate governance would be expected to affect the market reaction to earnings announcements is a problematic question because corporate governance has already affected not only the base stock price, but also the information environment into which the earnings announcement is released.

In contrast, my dependent variable is the market reaction to an independent, third-party signal: a bond rating downgrade. Thus, the market reaction serves as a reflection of the existing information environment surrounding a firm, and produced by the firm, at the time of the downgrade event.

Following prior research, I used board independence measures as the specific type of corporate governance expected to improve the firm information environment, ceteris paribus. However, following Verrecchia (1983; 1990), when there are costs to disclosure, even strong boards will not necessarily impel firms to greater disclosure in every circumstance. Therefore, I also examine the relation of information asymmetry to market reaction and to the interaction of board independence and information asymmetry.

My tests include regressions using individual governance and information asymmetry variables, as well as regressions using individual and governance scores and interactions. I also divide the sample into quadrants based on governance strength and the information asymmetry level, and contrast the sample quadrants to each other. Finally, I extend the tests by examining the pre-SOX, pre-Regulation FD and post-Regulation FD periods.

Hypothesis 1

I hypothesize that market reaction to the negative third-party signal is weaker in the presence of a strong and independent board. The theorized mechanism of the relationship is that board monitoring improves the informativeness of information available to investors before the bond rating downgrade, which reduces the informativeness of a new signal relative to that for firms with weaker boards. The null was not rejected by my analysis. In fact, where governance variables had a significant

relation to market reaction, it appears that stronger governance relates to larger reactions to bond rating downgrades. This is shown consistently throughout the test results, including the univariate quadrant comparisons and the regressions using individual variables.

Hypothesis 2

I also hypothesize that the market reaction to a negative third-party signal is stronger for firms with higher levels of information asymmetry, as represented by analyst measures. Univariate tests show that cumulative abnormal returns are more strongly negative in the high information asymmetry condition. However, in multivariate tests the null is not rejected for the overall sample period. I do show evidence of the hypothesized relation in supplementary tests for some models after implementation of Regulation FD.

Hypothesis 3

Finally, I examine the interaction of governance and information asymmetry as they relate to the market reaction. I hypothesize that governance is most significantly related to the size of the market reaction when information asymmetry is high. The evidence most relevant to this hypothesis is from the quadrant comparison tests. When the absolute value of cumulative abnormal returns is the dependent variable, the high and low governance groups differ most markedly in the high information asymmetry condition. When the dependent variable is the cumulative abnormal returns, the groups differ in the post-Regulation FD period, a time when overall information asymmetry is demonstrated to have increased by prior research. This shows that the information environment does affect the relationship between corporate governance and market reactions, although not in the hypothesized direction.

Because market reactions to bad news were generally more strongly negative for firms with stronger corporate governance, my results could be interpreted as indicating that the market is not reassured by the presence of strong governance, but rather that strong governance structures have been adopted by firms, or imposed on them, because the market has concerns about these firms – concerns which are apparently not completely dispelled by the stronger governance. Therefore, it appears that further work considering the joint impact of governance and information asymmetry on the information environment of companies is warranted.

APPENDIX:

RELIABILITY OF BOND RATING DOWNGRADES

It is a maintained hypothesis of this study that bond rating downgrades have similar meanings over time and between rating agencies. Prior research has examined the objectivity of ratings and their reliability across time and across rating agency. Cantor and Packer (1994) investigated the reliability of Moody's and Standard & Poor's ratings from 1973-1987 and find that while the absolute default risk represented by specific ratings categories had drifted over time, the ratings did provide a reliable rank ordering of default risk. However, Blume, Lim and Mackinlay (1998) did not find that credit quality had declined in the period from 1978 to 1995. Baker and Mansi (2002) surveyed institutional investors and bond issuers in 1999 and found that the majority did not perceive a decline in credit standards over the past ten years.

Concerning comparisons of ratings across agencies, Blume et al. (1998) noted that survey respondents perceived Moody's and Standard & Poor's ratings to be more accurate than ratings from Duff & Phelps or Fitch. Concerning objectivity, Covitz and Harrison (2003) find no evidence that Moody's and Standard & Poor's rating changes were systematically affected by conflicts of interest, and were better explained by a desire to maintain an reputation for objectivity. They also show that this result holds for both the pre- and post-Enron periods. Also, Beaver, Shakespeare and Soliman (2004) examine

criticisms of the validity of the ratings of certified bond rating agencies in the wake of the Enron and WorldCom implosions, and find that Moody's rating changes are as timely for negative news as the changes of a non-certified rating agency.

In total, these results suggest that it is acceptable in this study to follow prior literature that uses pooled regressions of bond rating downgrades over several years.

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Table 1 Credit Ratings

Classification of Credit Ratings

Explanation	Standard & Poor's [modifiers]	Moody's Service [modifiers]	Fitch Service [modifiers]	Ordinal Scale
Investment grade:				
Highest grade	AAA	Aaa	AAA	1
High grade	AA [+, none, –]	Aa [1, 2, 3]	AA [+, none, –]	2, 3, 4
Upper medium grade	A [+, none, –]	A [1, 2, 3]	A [+, none, –]	5, 6, 7
Medium grade	BBB [+, none, –]	Baa [1, 2, 3]	BBB [+, none, –]	8, 9, 10
Speculative grade:				
Lower medium grade	BB [+, none, –]	Ba [1, 2, 3]	BB [+, none, –]	11, 12, 13
Speculative	B [+, none, –]	B [1, 2, 3]	B [+, none, –]	14, 15, 16
Poor standing	CCC [+, none, –]	Caa [1, 2, 3]	CCC	17, 18, 19
Highly speculative	CC	Ca	CC	20
Lowest quality, no interest	C	C	C	21
In default	D		DDD/DD/D	23

Table 2 Sample Selection and Information

Panel A Sample Selection

	Downgrades
Bond rating changes for straight, long-term debenture bonds from 1997-2003, by bond issue	44,846
Total unique and non-overlapping observations	2,461
Not in Compustat	149
Not in IRRC	868
Not in I/B/E/S	237
Usable observations	1,207
Contaminated by other news	235
Regulated industries	223
Lost to Winsorization	112
Individual variables missing	11
Total sample	626

Panel B Sample by Period

Pre-SOX	450
During SOX debate	55
Post-SOX	121
Total	626
Pre-FD	242
During FD implementation	12
Post-FD	372
Total sample	626

Panel C Sample by Beginning Rating

Investment grade:		
Highest grade	AAA*	2
High grade	AA	33
Upper medium grade	A	176
Medium grade	BBB	235
Speculative grade:		
Lower medium grade	BB	102
Speculative	B	66
Poor standing	CCC	9
Highly speculative	CC	2
Lowest quality, no interest	C	1
In default	D	0
Total sample		626

*Following Standard and Poor's rating classification system.

Panel D Sample by Rating Agency

Duff & Phelps	9
Fitch	78
Moody's	283
Standard & Poor's	256
Total	626

Panel E Sample by Industry

Industry SIC codes	
1. Mining and construction 1000-1999, except 1300-1399	14
2. Food 2000-2111	23
3. Textiles, printing and publishing 2200-2799	91
4. Chemicals 2800-2824, and 2840-2899	54
5. Pharmaceuticals 2830-2836	9
6. Extractive industries 2900-2999, and 1300-1399	31
7. Durable manufacturers 3000-3999, except 3570-3579, and 3670-3679	161
8. Computers 7370-7379, 3570-3579, and 3670-3679	28
9. Transportation 4000-4899	39
10. Utilities 4900-4999	0
11. Retail 5000-5999	121
12. Financial institutions 6000-6411	0
13. Insurance and real estate 6500-6999	0
14. Services 7000-8999, except 7370-7379	52
15. Other 9000	3
	626

Table 3 Univariate Statistics

Panel A Total Sample, Variables Description

	N	Mean	Median	Std Dev	*t*	Pr > |*t*|
CAR	626	-0.0122	-0.0077	0.0607	-5.02	<.0001
ABSCAR	626	0.0429	0.0284	0.0446	24.07	<.0001
Governance variables						
PCTONBD	626	68.5341	71.4000	17.1985	99.70	<.0001
PCTONAUD	626	85.1979	100.0000	26.0140	81.94	<.0001
Ind_OwnP	626	0.9510	0.0000	5.2060	4.57	<.0001
SEPCHR	626	0.2173	0.0000	0.4127	13.17	<.0001
Information asymmetry variables						
InvNumEst	626	0.1017	0.0909	0.0517	49.16	<.0001
FcstErrorAbs	626	0.0191	0.0093	0.0289	16.54	<.0001
FcstDisp	626	0.1169	0.0700	0.1807	16.18	<.0001
Control variables and other descriptive variables						
Ending rating level	626	10.5655	10.0000	3.5309	74.87	<.0001
Rating level residual	626	0.4677	0.0252	4.0444	2.89	0.0039
Total Assets	626	10692.0200	4152.2100	27317.2900	9.79	<.0001
Size of rating change	626	-1.4345	-1.0000	0.8273	-43.38	<.0001
Class change	626	0.4297	0.0000	0.4954	21.70	<.0001
Watch list status	626*	-0.0927	0.0000	0.3314	-7.00	<.0001
Days since last change	626	117.6134	70.0000	212.2845	13.86	<.0001

Variable Definitions

CAR	the three-day market-adjusted abnormal return using the CRSP equally weighted market portfolio return cumulated from one trading day before to one trading day after the ratings change date.
ABSCAR	the absolute value of the CAR (the three-day market-adjusted abnormal return).
Governance variables	
PCTONBD	the percent of board members considered independent
PCTONAUD	the percent of audit committee members considered independent
Ind_OwnP	the stock ownership of independent board members as a percent of outstanding stock
SEPCHR	an indicator variable measured as 1 if board chair is not the CEO, 0 if the board chair and CEO are the same person
Information asymmetry variables	
InvNumEst	The inverse of the number of analyst estimates in the seventh month of the year being forecast.
FcstErrorAbs	The absolute value of the average forecast error from the I/B/E/S monthly summary data from the seventh month of the year being forecast.

Variables Definitions, continued

FcstDisp	The standard deviation of analyst forecasts made during the seventh month, scaled by the stock price at the beginning of the fiscal year being forecast. If there are not at least 4 estimates, the value of the variable is coded as missing.
Control variables	
Ending rating level	The new rating, coded numerically as described in table 1. Not used in regressions.
Rating level residual	The residual of the beginning rating regressed on the governance variables.
Total Assets	Total assets as of the year-end prior to the ratings change, from Compustat.
Size of rating change	The magnitude of the rating downgrade, calculated as the old rating minus the new rating, where rating AAA is assigned a value of 1 and rating D is assigned a value of 23, as shown in Table 1. (Jorion et al. 2005). (Note: Changes from rated to unrated and vice versa are excluded from test work.)
Class change	Takes the value of 1 for downgrades to a different class, for example from A to BBB. Each row in Table 1 represents a different class.
Watch list status	Takes the value of -1 if the bond issue was on a negative watch list at the time of the bond rating downgrade, 0 if not on a list. Eight observations are coded as +1. *Observations missing this variable are coded as 0.
Days since last change	The number of days since the previous rating change.

Table 3 Univariate Statistics, continued

Panel B Sample Quadrants, Variables Description

	N	Mean	Median	Std Dev	t Value	Pr > |t|
Low Gov, Low IA, Quadrant 1						
CAR	154	-0.005399	-0.00178	0.055654	-1.20	0.2305
ABSCAR	154	0.039476	0.02816	0.039473	12.41	<.0001
PCTONBD	154	58.80584	58.3	13.54135	53.89	<.0001
PCTONAUD	154	68.31688	75	32.01496	26.48	<.0001
Ind_OwnP	154	0.500649	0	1.855235	3.35	0.001
SEPCHR	154	0.097403	0	0.297473	4.06	<.0001
InvNumEst	154	0.083043	0.06667	0.050832	20.27	<.0001
FcstErrorAbs	154	0.004891	0.00362	0.006558	9.26	<.0001
FcstDisp	154	0.061948	0.04	0.069931	10.99	<.0001
Ending rating level	154	9.642857	9	3.39488	35.25	<.0001
Rating level residual	154	1.306963	0.49817	3.660258	4.43	<.0001
Total Assets	154	10391.7	5395.26	16678	7.73	<.0001
Size of rating change	154	-1.324675	-1	0.603726	-27.23	<.0001
Class change	154	0.422078	0	0.495502	10.57	<.0001
Watch list status	154	-0.064935	0	0.247215	-3.26	0.0014
Days since last change	154	107.474	56	153.4269	8.69	<.0001
Low Gov, High IA, Quadrant 2						
CAR	122	-0.012546	-0.00494	0.065746	-2.11	0.0371
ABSCAR	122	0.044783	0.02745	0.049590	9.97	<.0001
PCTONBD	122	56.39508	57.1	16.2244	38.39	<.0001
PCTONAUD	122	69.35082	75	29.58803	25.89	<.0001
Ind_OwnP	122	0.190984	0	1.669958	1.26	0.2089
SEPCHR	122	0.188525	0	0.392743	5.3	<.0001
InvNumEst	122	0.110315	0.10556	0.051714	23.56	<.0001
FcstErrorAbs	122	0.031664	0.02272	0.028865	12.12	<.0001
FcstDisp	122	0.12959	0.11	0.087683	16.32	<.0001
Ending rating level	122	11.80328	11	3.390895	38.45	<.0001
Rating level residual	122	3.25133	2.47648	4.382564	8.19	<.0001
Total Assets	122	12161.59	3444.66	36881.36	3.64	0.0004
Size of rating change	122	-1.459016	-1	0.873367	-18.45	<.0001
Class change	122	0.45082	0	0.499627	9.97	<.0001
Watch list status *	122	-0.040984	0	0.236976	-1.91	0.0585
Days since last change	122	134.082	82.5	175.8067	8.42	<.0001

Panel B Sample Quadrants, continued

	N	Mean	Median	Std Dev	t Value	Pr > |t|
High Gov, Low IA, Quadrant 3						
CAR	148	-0.007118	-0.00435	0.051163	-1.69	0.0927
ABSCAR	148	0.036784	0.027216	0.03614	12.38	<.0001
PCTONBD	148	75.68041	80	13.33558	69.04	<.0001
PCTONAUD	148	97.97635	100	10.06771	118.39	<.0001
Ind_OwnP	148	1.818243	0	7.834748	2.82	0.0054
SEPCHR	148	0.277027	0	0.44905	7.51	<.0001
InvNumEst	148	0.078737	0.07143	0.039956	23.97	<.0001
FcstErrorAbs	148	0.005641	0.00477	0.007338	9.35	<.0001
FcstDisp	148	0.054324	0.03	0.079772	8.28	<.0001
Ending rating level	148	8.844595	9	2.82051	38.15	<.0001
Rating level residual	148	-2.430777	-2.49194	2.847458	-10.39	<.0001
Total Assets	148	11597.87	6691.35	13028.79	10.83	<.0001
Size of rating change	148	-1.425676	-1	0.997215	-17.39	<.0001
Class change	148	0.337838	0	0.474579	8.66	<.0001
Watch list status	148	-0.101351	0	0.382257	-3.23	0.0015
Days since last change	148	139.9662	71.5000	350.9971	4.8500	<.0001
High Gov, High IA, Quadrant 4						
CAR	202	-0.020826	-0.01832	0.066747	-4.43	<.0001
ABSCAR	202	0.048889	0.03302	0.049891	13.93	<.0001
PCTONBD	202	78.04653	81.8	14.18273	78.21	<.0001
PCTONAUD	202	98.27624	100	7.748576	180.26	<.0001
Ind_OwnP	202	1.117822	0	5.830455	2.72	0.007
SEPCHR	202	0.282178	0	0.451178	8.89	<.0001
InvNumEst	202	0.127414	0.125	0.047048	38.49	<.0001
FcstErrorAbs	202	0.032301	0.02199	0.038355	11.97	<.0001
FcstDisp	202	0.196881	0.12	0.277233	10.09	<.0001
Ending rating level	202	11.78218	11	3.4644	48.34	<.0001
Rating level residual	202	0.27035	-0.05047	3.420947	1.12	0.2627
Total Assets	202	9369.72	2660.81	34086.89	3.91	0.0001
Size of rating change	202	-1.509901	-1	0.805702	-26.63	<.0001
Class change	202	0.490099	0	0.501144	13.9	<.0001
Watch list status	202	-0.138614	0	0.387098	-5.09	<.0001
Days since last change	202	99.0198	67.5	111.9934	12.57	<.0001

Variables are as defined for Table 3, panel A. Quadrants are based on Governance and Information Asymmetry scores. A one is assigned to observations above the median, and a zero to observations below the median, for each of the Governance and Information Asymmetry variables individually. Observations with summed governance scores of zero or one are considered Low Governance; those with scores of two, three or four are considered High Governance. Observations with summed information asymmetry scores of zero or one are considered Low Information Asymmetry; those with scores of two or three are considered High Information Asymmetry.

Table 3 Univariate Statistics, continued

Panel C High and Low Governance Groups

	High Governance, N = 276 Median		Low Governance, N = 350 Median		Comparison (Wilcoxon-Mann-Whitney) *Z* Value	
CAR	-0.0038	**	-0.0126	***	1.4927	
ABSCAR	0.0279	***	0.0300	***	-0.9821	
Governance variables						
PCTONBD	57.1000	***	81.8000	***	-14.7311	***
PCTONAUD	75.0000	***	100.0000	***	-16.6799	***
Ind_OwnP	0.0000	***	0.0000	***	-3.0390	***
SEPCHR	0.0000	***	0.0000	***	-4.2834	***
Information asymmetry variables						
InvNumEst	0.0769	***	0.1000	***	-3.7004	***
FcstErrorAbs	0.0072	***	0.0106	***	-2.6433	***
FcstDisp	0.0600	***	0.0700	***	-1.7326	*
Control variables and other descriptives						
Ending rating level	10.0000	***	10.0000	***	-0.0879	
Rating level residual	1.2338	***	-1.2432	***	9.1317	***
Total Assets	4152.2100	***	4177.7800	***	1.1059	
Size of rating change	-1.0000	***	-1.0000	***	0.5301	
Class change	0.0000	***	0.0000	***	0.2271	
Watch list status	0.0000	***	0.0000	***	2.6561	***
Days since last change	74.0000	***	68.0000	***	1.0093	

Variables are as defined for Table 3, panel A. Observations are assigned to Governance and Information Asymmetry Conditions based on scores, as defined in Table 3, panel B.

Table 3 Univariate Statistics, continued

Panel D High and Low Information Asymmetry Groups

	High Information Asymmetry, N = 302		Low Information Asymmetry, N = 324		Comparison (Wilcoxon-Mann-Whitney)	
	Median		Median		*Z* Value	
CAR	-0.0034	**	-0.0146	***	2.5123	**
ABSCAR	0.0278	***	0.0296	***	-1.6260	
Governance variables						
PCTONBD	69.2000	***	72.7000	***	-2.9581	***
PCTONAUD	100.0000	***	100.0000	***	-2.0480	**
Ind_OwnP	0.0000	***	0.0000	***	0.3355	
SEPCHR	0.0000	***	0.0000	***	-1.8622	*
Information asymmetry variables						
InvNumEst	0.0714	***	0.1111	***	-11.1197	***
FcstErrorAbs	0.0041	***	0.0221	***	-17.5440	***
FcstDisp	0.0400	***	0.1150	***	-14.5595	***
Control variables and other descriptives						
Ending rating level	9.0000	***	11.0000	***	-9.4867	***
Rating level residual	-0.9217	**	0.9056	***	-6.0575	***
Total Assets	5896.0000	***	2971.6500	***	6.3918	***
Size of rating change	-1.0000	***	-1.0000	***	2.4379	**
Class change	0.0000	***	0.0000	***	-2.3848	**
Watch list status	0.0000	***	0.0000	***	0.7243	
Days since last change	64.0000	***	71.5000	***	-0.6922	

Variables are as defined for Table 3, panel A. Observations are assigned to Governance and Information Asymmetry Conditions based on scores, as defined for Table 3, panel B.

Table 3 Univariate Statistics

Panel E1 Compare Information Asymmetry groups in High Governance condition

Quadrant 3 v 4	High Gov, Low IA	High Gov, High IA	
N 148, 202 respectively	Median	Median	
CAR	-0.0043	-0.0183	**
ABSCAR	0.0272	0.0330	*
Governance variables			
PCTONBD	80.0000	81.8000	**
PCTONAUD	100.0000	100.0000	
Ind_OwnP	0.0000	0.0000	
SEPCHR	0.0000	0.0000	
Information asymmetry variables			
InvNumEst	0.0714	0.1250	***
FcstErrorAbs	0.0048	0.0220	***
FcstDisp	0.0300	0.1200	***
Control variables and other descriptives			
Ending rating level	9.0000	11.0000	***
Rating level residual	-2.4919	-0.0505	***
Total Assets	6691.3500	2660.8100	***
Size of rating change	-1.0000	-1.0000	**
Class change	0.0000	0.0000	***
Watch list status	0.0000	0.0000	
Days since last change	71.5000	67.5000	

Panel E2 Compare Information Asymmetry groups in Low Governance condition

Quadrant 1 v 2	Low Gov, Low IA	Low Gov, High IA	
N 154, 122 respectively	Median	Median	
CAR	-0.0018	-0.0049	
ABSCAR	0.0282	0.0275	
Governance variables			
PCTONBD	58.3000	57.1000	
PCTONAUD	75.0000	75.0000	
Ind_OwnP	0.0000	0.0000	*
SEPCHR	0.0000	0.0000	**
Information asymmetry variables			
InvNumEst	0.0667	0.1056	***
FcstErrorAbs	0.0036	0.0227	***
FcstDisp	0.0400	0.1100	***
Control variables and other descriptives			
Ending rating level	9.0000	11.0000	***
Rating level residual	0.4982	2.4765	***
Total Assets	5395.2600	3444.6600	***
Size of rating change	-1.0000	-1.0000	
Class change	0.0000	0.0000	
Watch list status	0.0000	0.0000	
Days since last change	56.0000	82.5000	*

Table 3 Univariate Statistics

Panel E3 Compare Governance groups in High Information Asymmetry condition

Quadrant 2 v 4	Low Gov, High IA	High Gov, High IA	
N 122, 202 respectively	Median	Median	
CAR	-0.0049	-0.0183	
ABSCAR	0.0275	0.0330	
Governance variables			
PCTONBD	57.1000	81.8000	***
PCTONAUD	75.0000	100.0000	***
Ind_OwnP	0.0000	0.0000	***
SEPCHR	0.0000	0.0000	**
Information asymmetry variables			
InvNumEst	0.1056	0.1250	***
FcstErrorAbs	0.0227	0.0220	
FcstDisp	0.1100	0.1200	
Control variables and other descriptives			
Ending rating level	11.0000	11.0000	
Rating level residual	2.4765	-0.0505	***
Total Assets	3444.6600	2660.8100	*
Size of rating change	-1.0000	-1.0000	
Class change	0.0000	0.0000	
Watch list status	0.0000	0.0000	**
Days since last change	82.5000	67.5000	**

Panel E4 Compare Governance groups in Low Information Asymmetry condition

Quadrant 1 v 3	Low Gov, Low IA	High Gov, Low IA	
N 154, 148 respectively	Median	Median	
CAR	-0.0018	-0.0043	
ABSCAR	0.0282	0.0272	
Governance variables			
PCTONBD	58.3000	80.0000	***
PCTONAUD	75.0000	100.0000	***
Ind_OwnP	0.0000	0.0000	
SEPCHR	0.0000	0.0000	***
Information asymmetry variables			
InvNumEst	0.0667	0.0714	
FcstErrorAbs	0.0036	0.0048	*
FcstDisp	0.0400	0.0300	
Control variables and other descriptives			
Ending rating level	9.0000	9.0000	
Rating level residual	0.4982	-2.4919	***
Total Assets	5395.2600	6691.3500	
Size of rating change	-1.0000	-1.0000	
Class change	0.0000	0.0000	
Watch list status	0.0000	0.0000	
Days since last change	56.0000	71.5000	

Table 3 Univariate Statistics

Panel E5 Compare Extreme Groups, High Contrast

Quadrant 2 v 3	Low Gov, High IA	High Gov, Low IA	
N 122, 148 respectively	Median	Median	
CAR	-0.0049	-0.0043	
ABSCAR	0.0275	0.0272	
Governance variables			
PCTONBD	57.1000	80.0000	***
PCTONAUD	75.0000	100.0000	***
Ind_OwnP	0.0000	0.0000	***
SEPCHR	0.0000	0.0000	*
Information asymmetry variables			
InvNumEst	0.1056	0.0714	***
FcstErrorAbs	0.0227	0.0048	***
FcstDisp	0.1100	0.0300	***
Control variables and other descriptives			
Ending rating level	11.0000	9.0000	***
Rating level residual	2.4765	-2.4919	***
Total Assets	3444.6600	6691.3500	***
Size of rating change	-1.0000	-1.0000	
Class change	0.0000	0.0000	*
Watch list status	0.0000	0.0000	
Days since last change	82.5000	71.5000	

Panel E6 Compare Extreme Groups, Not Hypothesized

Quadrant 1 v 4	Low Gov, Low IA	High Gov, High IA	
N 154, 202 respectively	Median	Median	
CAR	-0.0018	-0.0183	**
ABSCAR	0.0282	0.0330	
Governance variables			
PCTONBD	58.3000	81.8000	***
PCTONAUD	75.0000	100.0000	***
Ind_OwnP	0.0000	0.0000	
SEPCHR	0.0000	0.0000	***
Information asymmetry variables			
InvNumEst	0.0667	0.1250	***
FcstErrorAbs	0.0036	0.0220	***
FcstDisp	0.0400	0.1200	***
Control variables and other descriptives			
Ending rating level	9.0000	11.0000	***
Rating level residual	0.4982	-0.0505	**
Total Assets	5395.2600	2660.8100	***
Size of rating change	-1.0000	-1.0000	*
Class change	0.0000	0.0000	
Watch list status	0.0000	0.0000	**
Days since last change	56.0000	67.5000	

Significance of the contrasts is indicated as follows, as defined by the non-parametric Z-score (two-sided).

* 10% significance

** 5% significance

*** 1% significance

Variables are as defined for Table 3, panel A. Observations are assigned to Quadrants based on scores, as defined for Table 3, panel B.

Table 4 Regression Results with Individual Variables

	Dependent Variable is Absolute Value of Size-Adjusted CAR			
Model	Panel A Original Variables		Panel B Ranked Variables	
Intercept	-0.0101		-0.0001	
	(-0.96)		(-0.02)	
PCTONBD	0.0003	**		
	(2.18)			
PctonBd, Ranked			-0.0000	
			(-0.76)	
PCTONAUD	0.0003	***		
	(3.95)			
PctonAud, Ranked			0.0000	***
			(4.18)	
Ind_OwnP	0.0001			
	(0.27)			
Ind_OwnP_Ranked			0.0001	***
			(3.34)	
SEPCHR	0.0096	**	0.0042	
	(2.11)		(0.96)	
InvNumEst	-0.0447		-0.0449	
	(-1.26)		(-1.27)	
FcstErrorAbs	-0.0008		0.0108	
	(-0.01)		(0.16)	
FcstDisp	0.0072		0.0078	
	(0.74)		(0.80)	
Rating level residual	0.0043	***	0.0042	***
	(7.22)		(7.10)	
Total Assets	-0.0000		-0.0000	
	(-0.26)		(-0.24)	
Size of rating change	-0.0069	***	-0.0069	***
	(-3.06)		(-3.03)	
Class change	-0.0003		-0.0002	
	(-0.09)		(-0.06)	
Days since last change	-0.0000	**	-0.0000	**
	(-2.28)		(-2.33)	
Watch list status	-0.0029		-0.0027	
	(-0.56)		(-0.53)	
Adj. R^2	0.1206		0.1224	
F-Value	7.59	***	7.71	***
N	626		626	

* 10% significance
** 5% significance
*** 1% significance

Variables are as defined in Table 3, panel A.

Table 5 Regression Results with Scores, by Information Asymmetry Condition

Model	Panel A Full Sample		Panel B High IA Score		Panel C Low IA Score	
Intercept	0.0229	***	0.0233		0.0206	***
	(4.50)		(1.59)		(3.20)	
Governance score	0.0067	***	0.0064	*	0.0073	***
	(3.03)		(1.89)		(2.61)	
Info. Asymmetry score	0.0000		0.0006		-0.0011	
	(0.02)		(0.11)		(-0.25)	
Rating level residual	0.0033	***	0.0036	***	0.0032	***
	(6.57)		(4.80)		(4.85)	
Total Assets	0.0000		0.0000		0.0000	*
	(-0.03)		(-0.57)		(1.90)	
Size of rating change	-0.0074	***	-0.0096	***	-0.0044	***
	(-3.25)		(-2.74)		(-1.57)	
Class change	-0.0003		-0.0052		0.0051	
	(-0.09)		(-0.89)		(1.07)	
Days since last change	0.0000	***	0.0000	**	0.0000	*
	(-2.62)		(-1.99)		(-1.94)	
Watch list status	-0.0039		-0.0014		-0.0044	
	(-0.76)		(-0.18)		(-0.66)	
Adj. R^2	0.1013		0.0927		0.0897	
F-Value	9.81	***	5.13	***	4.71	***
N	626		324		302	

* 10% significance level
** 5% significance level
*** 1% significance level

Variables are as defined in Table 3, panel A. Scores are assigned as described for Table 3, panel B.

Table 6 Compare Quadrants, All contrasted to Low Governance, High IA condition

Model	Dependent Variable is Absolute Value of Size-Adjusted CAR	
Intercept	0.0265	***
	(4.92)	
High Governance, High IA condition	0.0124	**
	(2.42)	
High Governance, Low IA condition	0.0106	*
	(1.79)	
Low Governance, Low IA condition	0.0013	
	(0.26)	
Rating level residual	0.0032	***
	(6.60)	
Total Assets	-0.0000	
	(-0.07)	
Size of rating change	-0.0074	***
	(-3.25)	
Class change	-0.0006	
	(-0.15)	
Days since last change	-0.0000	**
	(-2.58)	
Watch list status	-0.0030	
	(-0.57)	
Adj. R^2	0.0985	
F-Value	8.59	***
N	626	

Control variables are as defined in Table 3, panel A.
Quadrants are created from governance and information asymmetry scores as described for Table 3, panel B.

Table 7 Regression Results with Individual Variables, by Period

Panel A: Original Variables; Dependent variable is Absolute Value of Size-Adjusted Cumulative Abnormal Returns

Model	Original Variables, Full Period		Original Variables, Pre-SOX		Original Variables, Pre-FD		Original Variables, Post-FD	
Intercept	-0.0101		-0.0083		-0.0061		-0.0244	
	(-0.96)		(-0.67)		(-0.37)		(-1.36)	
PCTONBD	0.0003	**	0.0003	*	0.0001		0.0002	
	(2.18)		(1.67)		(0.67)		(1.22)	
PCTONAUD	0.0003	***	0.0003	***	0.0003	***	0.0005	***
	(3.95)		(3.64)		(3.06)		(2.60)	
Ind_OwnP	0.0001		0.0001		-0.0008		0.0003	
	(0.27)		(0.13)		(-0.64)		(0.86)	
SEPCHR	0.0096	**	0.0097	*	0.0112		0.0103	*
	(2.11)		(1.80)		(1.60)		(1.71)	
InvNumEst	-0.0447		-0.0295		0.0307		-0.0695	
	(-1.26)		(-0.67)		(0.47)		(-1.58)	
FcstErrorAbs	-0.0008		0.0869		0.0568		-0.0381	
	(-0.01)		(1.10)		(0.42)		(-0.50)	
FcstDisp	0.0072		0.0049		0.0231		0.0037	
	(0.74)		(0.30)		(0.92)		(0.35)	
Rating level residual	0.0043	***	0.0041	***	0.0038	***	0.0049	***
	(7.22)		(5.73)		(4.28)		(6.01)	
Total Assets	-0.0000		-0.0000		0.0000		-0.0000	
	(-0.26)		(-0.26)		(0.94)		(-0.16)	
Size of rating change	-0.0069	***	-0.0051	**	-0.0031		-0.0106	***
	(-3.06)		(-1.97)		(-0.96)		(-3.33)	
Class change	-0.0003		0.0023		0.0052		-0.0024	
	(-0.09)		(0.49)		(0.87)		(-0.48)	
Days since last change	-0.0000	**	-0.0000		-0.0000		-0.0001	***
	(-2.28)		(-1.44)		(-1.49)		(-3.02)	
Watch list status	-0.0029		-0.0015		0.0048		-0.0041	
	(-0.56)		(-0.18)		(0.16)		(-0.78)	
Adj. R^2	0.1206		0.1136		0.1098		0.1572	
F-Value	7.59	***	5.43	***	3.29	***	6.32	***
N	626		450		242		372	

* 10% significance level
** 5% significance level
*** 1% significance level

Variables are as defined in Table 3, panel A.

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Panel B: Individual Ranked Variables; Dependent variable is Absolute Value of Size-Adjusted Cumulative Abnormal Returns

Model	Ranked Variables, Full Period		Ranked Variables, Pre-SOX		Ranked Variables, Pre-FD		Ranked Variables, Post-FD	
Intercept	-0.0001		0.0036		0.0070		-0.0159	
	(-0.02)		(0.32)		(0.47)		(-1.16)	
PctonBd, Ranked	-0.0000		-0.0000		-0.0000		-0.0000	
	(-0.76)		(-0.66)		(-1.34)		(-0.62)	
PctonAud, Ranked	0.0000	***	0.0000	***	0.0000	***	0.0001	***
	(4.18)		(3.42)		(2.83)		(3.38)	
Ind_OwnP_Ranked	0.0001	***	0.0001	**	0.0000		0.0001	***
	(3.34)		(2.40)		(1.03)		(3.83)	
SEPCHR	0.0042		0.0052		0.0076		0.0044	
	(0.96)		(1.00)		(1.13)		(0.76)	
InvNumEst	-0.0449		-0.0304		0.0321		-0.0696	
	(-1.27)		(-0.69)		(0.49)		(-1.59)	
FcstErrorAbs	0.0108		0.1023		0.0957		-0.0350	
	(0.16)		(1.29)		(0.69)		(-0.46)	
FcstDisp	0.0078		0.0073		0.0308		0.0029	
	(0.80)		(0.45)		(1.23)		(0.27)	
Rating level residual	0.0042	***	0.0040	***	0.0037	***	0.0049	***
	(7.10)		(5.68)		(4.24)		(6.01)	
Total Assets	-0.0000		-0.0000		0.0000		-0.0000	
	(-0.24)		(-0.27)		(1.06)		(-0.10)	
Size of rating change	-0.0069	***	-0.0051	**	-0.0033		-0.0107	***
	(-3.03)		(-2.00)		(-1.02)		(-3.34)	
Class change	-0.0002		0.0021		0.0053		-0.0023	
	(-0.06)		(0.45)		(0.89)		(-0.46)	
Days since last change	-0.0000	**	-0.0000		-0.0000		-0.0001	***
	(-2.33)		(-1.54)		(-1.61)		(-3.07)	
Watch list status	-0.0027		-0.0019		-0.0019		-0.0042	
	(-0.53)		(-0.23)		(-0.07)		(-0.80)	
Adj. R^2	0.1224		0.1141		0.1169		0.1595	
F-Value	7.71	***	5.45	***	3.45	***	6.41	***
N	626		450		242		372	

* 10% significance level
** 5% significance level
*** 1% significance level

Variables are as defined in Table 3, panel A.

Table 8 Regression Results by Period
Panel A: Scores only. Dependent variable is Absolute Value of Size-Adjusted Cumulative Abnormal Returns

Model	Full period		pre-SOX		pre-FD		post-FD	
Intercept	0.0231	***	0.0297	***	0.0397	***	0.0061	
	(3.15)		(3.37)		3.6100		(0.60)	
Governance score	0.0067	***	0.0063	**	0.0050	*	0.0099	***
	(3.03)		(2.35)		(1.48)		(3.39)	
Information Asymmetry score	0.0000		-0.0016		-0.0051		0.0044	**
	(-0.02)		(-0.76)		(-1.81)		(2.00)	
Rating level residual	0.0033	***	0.0031	***	0.0026	***	0.0046	***
	(6.57)		(5.16)		(3.65)		(6.50)	
Total Assets	0.0000		0.0000		0.0000		0.0000	
	(-0.03)		(0.03)		(1.02)		(0.03)	
Size of rating change	-0.0074	***	-0.0059	**	-0.0036		-0.0112	***
	(-3.25)		(-2.30)		(-1.10)		(-3.60)	
Class change	-0.0003		0.0023		0.0047		-0.0019	
	(-0.09)		(0.50)		(0.79)		(-0.38)	
Days since last change	0.0000	***	0.0000	*	0.0000		-0.0001	***
	(-2.62)		(-1.80)		(-1.56)		(-3.27)	
Watch list status	-0.0039		-0.0016		0.0086		-0.0045	
	(-0.76)		(-0.18)		(0.29)		(-0.87)	
Adj. R^2	0.1013		0.0903		0.0831		0.1593	
F-Value	9.81	***	6.57	***	3.73	***	9.79	***
N	626		450		242		372	

* 10% significance level
** 5% significance level
*** 1% significance level

Variables are as defined in Table 3, panel A. Scores are assigned as described for Table 3, panel B.

Table 8 Regression Results by Period

Panel B: Scores and Interactions. Dependent variable is Absolute Value of Size-Adjusted Cumulative Abnormal Returns

Model	Full period		pre-SOX		pre-FD		post-FD	
Intercept	0.0282	***	0.0313	**	0.0488	***	0.0040	
	(2.71)		2.5600		(3.22)		(0.27)	
Governance score	0.0035		0.0053		-0.0011		0.0110	*
	(0.71)		(0.87)		(-0.14)		(1.68)	
Information Asymmetry score	-0.0020		-0.0023		-0.0087	*	0.0052	
	(-0.60)		(-0.57)		(-1.75)		(1.14)	
Interaction	0.0013		0.0004		0.0026		-0.0005	
	(0.69)		(0.19)		(0.87)		(-0.19)	
Rating level residual	0.0033	***	0.0031	***	0.0026	***	0.0046	***
	(6.54)		(5.15)		(3.63)		(6.49)	
Total Assets	0.0000		0.0000		0.0000		0.0000	
	(-0.05)		(0.02)		(0.88)		(0.03)	
Size of rating change	-0.0073	***	-0.0059	**	-0.0036		-0.0112	***
	(-3.23)		(-2.29)		(-1.10)		(-3.60)	
Class change	-0.0002		0.0024		0.0049		-0.0019	
	(-0.05)		(0.51)		(0.81)		(-0.40)	
Days since last change	0.0000	***	0.0000	*	0.0000		-0.0001	***
	(-2.64)		(-1.81)		(-1.61)		(-3.25)	
Watch list status	-0.0039		-0.0015		0.0084		-0.0045	
	(-0.75)		(-0.18)		(0.28)		(-0.87)	
Adj. R^2	0.1005		0.0883		0.0822		0.1571	
F-Value	8.76	***	5.8300	***	3.4	***	8.68	***
N	626		450		242		372	

* 10% significance level
** 5% significance level
*** 1% significance level

Variables are as defined in Table 3, panel A. Scores are assigned as described for Table 3, panel B.

Table 9 Compare Quadrants, All contrasted to Low Governance, High IA condition, By Period

Dependent variable is the Absolute Value of Cumulative Abnormal Returns

Model	Full Period		Pre-SOX		Pre-FD		Post-FD	
Intercept	0.0265	***	0.0296	***	0.0331	***	0.0180	**
	(4.92)		(4.73)		(4.08)		(2.25)	
High Governance, High IA condition	0.0124	**	0.0123	*	0.0093	*	0.0193	***
	(2.42)		(1.96)		(1.07)		(2.87)	
High Governance, Low IA condition	0.0106	*	0.0096		0.0043		0.0212	***
	(1.79)		(1.35)		(0.49)		(2.63)	
Low Governance, Low IA condition	0.0013		-0.0022		-0.0081		0.0151	*
	(0.26)		(-0.36)		(-1.15)		(1.93)	
Rating level residual	0.0032	***	0.0032	***	0.0029	***	0.0042	***
	(6.60)		(5.44)		(4.03)		(6.01)	
Total Assets	0.0000		0.0000		0.0000		0.0000	
	(-0.07)		(0.04)		(0.65)		(0.00)	
Size of rating change	-0.0074	***	-0.0059	**	-0.0034		-0.0108	***
	(-3.25)		(-2.27)		(-1.04)		(-3.47)	
Class change	-0.0006		0.0025		0.0057		-0.0025	
	(-0.15)		(0.54)		(0.94)		(-0.52)	
Days since last change	0.0000	**	0.0000	*	0.0000		-0.0001	***
	(-2.58)		(-1.77)		(-1.54)		(-3.14)	
Watch list status	-0.0030		-0.0016		0.0067		-0.0028	
	(-0.57)		(-0.19)		(0.23)		(-0.53)	
Adj. R^2	0.0985		0.0897		0.0758		0.148	
F-Value	8.59	***	5.92	***	3.20	***	8.16	***
N	626		450		242		372	

* 10% significance level
** 5% significance level
*** 1% significance level

Control variables are as defined in Table 3, panel A.
Quadrants are created from governance and information asymmetry scores as described for Table 3, panel B.

Table 10: Variance Inflation Factors for Regression Model

Variable	DF	Tolerance	VIF
Intercept	1	.	0.00000
PCTONBD	1	0.52412	1.90796
PCTONAUD	1	0.71715	1.39441
Ind_OwnP	1	0.97430	1.02638
SEPCHR	1	0.76487	1.30741
InvNumEst	1	0.81034	1.23405
FCSTErrorABS	1	0.73616	1.35840
FCSTDISPSC_NM	1	0.73135	1.36734
Rating level residual	1	0.41967	2.38283
AT	1	0.92619	1.07969
RCHANGE	1	0.80315	1.24509
Class_Change	1	0.79936	1.25100
DAYS	1	0.96130	1.04026
Status_Code_NM	1	0.97127	1.02958

Variables are as defined in Table 3 Panel A.