Corporate Governance and its Effects on REIT Credit Ratings

Abstract

In this paper we investigate whether REITs with strong corporate governance benefit from higher credit ratings relative to REITs with weak governance. We document that, after controlling for REIT-specific characteristics, the credit ratings are negatively associated with number of CEOs, CEO busyness and number of directors above 70 years old; and positively related to expertise of the board and aggregated stock ownership of the board. We find that REITs with stronger corporate governance has higher probability of being in investment grade. We also find that the relationship between corporate governance and credit ratings are stronger among REITs with lower dividend yield.

Keywords: REIT, corporate governance, credit ratings, agency conflicts

1. Introduction

US REITs market has become very well developed since Congress passed the Real Estate Investment Trust Act of 1960 and has developed substantially over the past few decades. Since REITs are required to pay out at least 90 percent of their taxable net income and unable to retain much of their annual earnings, they primarily depend on other external financing sources to fund their capital projects and asset acquisitions. Credit ratings act as a proxy for bondholders' assessment of REITs and therefore they[1] are key determinants of REITs´ costs of debt capital, which, in turn are very important for maintaining target leverage ratios. Factors that influence these credit ratings are therefore of immense significance and even small changes in ratings could lead to large shifts in capital allocation.

REIT bondholders have inherently more interest in the long term financial performance than shareholders, since most bonds have less liquidity than stocks. Well-functioning corporate governance promotes good financial performance and helps to maintain the flow of capital between shareholders and debtholders. Ashbaugh-Skaif et al. (2006) and Chen and Bradley (2011) document that bondholders pay attention to corporate governance. Corporate governance that reduces agency cost makes the REITs more appealing to bondholders as a source of future income. Also, it is becoming more common for investors to consider governance when making investment decisions. Credit agencies therefore, are concerned with governance since weak governance can affect a firm's financial position negatively and thereby let bondholders be exposed to losses (FitchRatings, 2004).

[1] Credit rating agencies such as Moody's or Standard & Poor's are private financial service firms that estimate the credit-worthiness of borrowers or financial instruments (Cantor/Packer 1994). These ratings are risk assessments and are widely used for making investment decisions.

Prior literature on REIT credit ratings investigate its role in external financing, transparency and capital structure decisions (Ghosh and Sirmans, 2003; Brown and Riddiough, 2003; Highfield, Roskelley and Zhao, 2007; Hardin and Wu, 2010). Campbell, Dodd, Hill and Kelly (2012 working paper) offer evidence that credit ratings are inversely related to dividend volatility. Although the REIT literature is rich with studies documenting the significance of credit ratings in relation to financing decisions, to our knowledge the REIT literature is silent on studies examining the role of corporate governance on their credit ratings.

Well-defined and enforced corporate governance provides a structure that, at least in theory, works for the benefit of every stake holder including bondholders. Real Estate Investment Trusts (REITs) have recently seen huge changes in corporate governance, especially in the aspects of board structure and diversity. REIT's ranking in governance now is substantially better than most of non-REIT industries and is expected to positively affect shareholders' value[2]. But shareholders are not the only type of stakeholders that benefit from improved governance. REIT shareholders want to pressure REIT management for better monitoring of managers' actions, effective decision making, limited managerial opportunistic behaviors, and reduced information asymmetry; all of which are potentially beneficial for external REIT stakeholders such as bondholders.

[2] Institutional Shareholder Services (ISS), a monitor service, uses 80 corporate governance factors across four main areas: board structure, compensation, shareholder rights, and audit, to compile scores for 43 industries and have the top-7 ranks as: (1) diversified utilities with perfect 100; (2) electric utilities with 98; (3) computers and peripherals with 74; (4) diversified financial services with 73; (5) food and staples retailing with 64; (6) insurance with 58; and (7) REIT with 57.

Research firm Green Street Advisors reports in 2013 that REITs with above-average governance trade at an average 2% premium and REITs with below-average governance trade at an average 4% discount to asset value (https://www.reit.com/node/20956/reit-governance-capital-transparency).

Prior literature on corporate governance in REITs mainly focuses on the effects of governance from the standpoint of shareholders rather than debtholders. Whether REIT credit ratings are determined by corporate governance aspects is an important question that has not been examined in REIT literature. In this paper we investigate whether REITs with strong corporate governance benefit from higher credit ratings relative to REITs with weaker governance. Does a REIT's governance affect its ability and willingness to honor its debt obligations proxied by the credit ratings?

In this paper we investigate the role of REIT governance on their credit rating assessments. To conduct our analysis, we apply a framework for assessing REIT corporate governance structures and practices, focusing on major components: REIT Ownership Structure and Influence, REIT Financial Stakeholder Rights and Relations, REIT Financial Transparency and Disclosure, and REIT Board Structure and Processes, with multiple governance attributes within each component that are mainly designed to increase monitoring and reduce information asymmetry. We test the effects, if any, of these REIT governance features on REITs' long-term issuing bond credit ratings.

We come up with several key empirical findings. First, we identify major elements of REIT corporate governance that play deterministic role in REIT credit ratings, after controlling for REIT characteristics based on prior literature[3]. More specifically, we find that REITs' overall credit ratings are: (1) negatively associated with the number of CEOs in position; (2) negatively correlated to CEO busyness; (3) negatively related to number of directors that are 70 or older; (4) positively associated with the presence of a formal governance policy; and (5) positively related

[3] See Table 3 in section 3 for the full list of independent and control variables.

to the expertise of the board. Second, we find that REITs with stronger corporate governance has higher probability of being in investment grade. Third, we also find that the relationship between corporate governance and credit ratings are stronger among REITs with lower dividend yield.

The main contribution of our study is that it is the first to examine corporate governance from the perspective of REIT bondholders. We demonstrate that a good REIT governance mechanism not only benefits REIT shareholders but benefits REIT bondholders as well. Therefore, a REIT governance mechanism designed to strengthen REIT shareholders' power does not necessarily do so at the expenses of REIT bondholders but the effect leaves REIT bondholders better off. We use a comprehensive dataset of credit ratings from four largest agencies, namely Standard & Poor's, Moody's, Fitch Ratings, and DBRS, provided by SNL Financial services in examining the impact of governance on credit ratings.

The remainder of the paper is organized as follows. Section 2 reviews the extant literature. It sets forth the framework of major components that affect evaluation of a REIT's corporate governance mechanism and the empirical proxies for them. Section 3 describes the REIT sample, data sources, variable measurements, and their descriptive statistics. Section 4 presents empirical testing models we use to investigate the relationship between various REIT corporate governance mechanisms and REITs' credit ratings, and the main findings. Section 5 reports some additional robustness tests and Section 7 concludes.

2. Literature Review

Bauer, Eichholtz and Kok (2009) use a unique database of REITs to test for the effect of corporate governance on performance of U.S. REITs and find only significant relationship in low payout REITs group and in broader securities group. Strong REIT governance plays an important

role when and only when there lacks of transparency in the REIT's financial decision, in this case, lower dividend payments, leaving room for managerial private benefits, and it is called the "REIT effect". Campbell, Ghosh, Petrova and Sirmans (2011) examine 132 REIT mergers and acquisitions to find no significant relationship between the presence of staggered board and abnormal bidder returns, suggesting that anti-takeover provisions (ATPs) measures have significantly reduced importance for REIT industry and consequently, REIT investors suffer less from entrenched managers trying to make no value-enhancing acquisitions.

Brown and Riddiough (2003) conduct an analysis of equity REITs and find a notable finding that the REIT debt market is integrated with the broader debt market, and REITs with higher credit quality can issue longer-maturing bonds. It is very common for REITs to initially finance growth with unsecured credit, and then refinance short-term debts using a combination of long-term bond issuance and seasonal equity offerings (SEOs) (Elayan, Meyer and Li, 2004). Having not much cash holdings, REITs use credit lines as an effective substitute funding for daily operational expenses (Hardin, Highfield, Hill and Kelly, 2009). Ooi, Ong and Li (2010) find empirical results to support that market timing plays primary role in short-term and target leverage plays primary role in long-term financing decisions of REITs, and in the long run, most REITs do reach their target debt level and maintain a stable capital structure.

REITs therefore are exposed to frequent monitoring in capital markets, mostly in long-term bond issuance, and there have been many studies on REIT capital structure, transparency, and financing decisions in relations with REIT credit ratings (Tidwell et al., 2013). Agencies assess a firm's credit ratings to express their opinions of the firm's overall creditworthiness and the probability distribution of its future cash flows being sufficient to cover debt costs and principal payments payable. Ashbaugh-Skaife, Collins and LaFond (2006) explore the effects of corporate

governance on U.S. listed firms' credit ratings, using the Standard & Poor framework of assessment to extend traditional governance factors into four different groups of governance components, with control variables that feature principal-agent conflicts. They find that weak corporate governance can result in lower credit ratings and therefore higher debt financing costs in publicly traded firms.

In this paper, we investigate this relationship specifically for REITs considering its unique asset characteristics and transparent nature. We expect a similarly positive impact of strong governance on corporate credit ratings and cost of debt, but the fundamental importance and significance of each governance element may differ from other industries.

We hypothesize that REIT corporate governance features positively affect REIT credit ratings. Furthermore, we investigate if bondholders benefit from the same improvements in governance that benefit shareholders. The question is specific to REIT industry, where financial transparency is generally higher and board members are generally independent experts. When there is better monitoring of management, the interests of shareholders and bondholders are more aligned, but some aspects may have stronger effects on shareholders but not as much on bondholders, and some other elements may have opposite effects on bondholders and shareholders. Below, we discuss the empirical proxies for major corporate governance attributes and their impacts on REIT credit ratings.

2.1.Board ownership and influence

A recommendation from CFA Institute for better governance involves a compensation structure that rewards managers for growth and penalizes them for poor performance, for example a pay-performance fee schedule. The Dodd Frank Act implemented in 2011 requires companies to hold

regular say-on-pay votes and has been complied by REITs with stocks more common than options. The higher the percentage of directors on board that own REIT stocks, the more committed the board is to long-term performance of the REIT. We expect a positive influence of BRD_STOCK on REIT credit ratings.

SEC (2003) also endorsed the proposals from the two stock exchanges NYSE and NASDAQ that firms adopt a formal governance policy with two main things: outlines of the roles and responsibilities of directors and establishes, and an explicit code of ethics and business conduct for directors. A formal governance policy in place can reduce management opportunism. We expect a positive relationship between GOV_POLICY and REIT credit ratings.

2.2.Board power-sharing

According to CFA Institute, one of the most effective ways for better governance in REIT is to have most directors on the board of REIT managers as independent, which means that they should not be related to management, sponsors, and substantial shareholders. Having a more independent board, to some extent, reduce the impression that there exists conflict of interests between managers and stakeholders. Based on literature, we expect BRD_IND to have a positive relationship with REIT credit ratings.

Boards that are comprised of experienced members who are more knowledgeable or competent can do a better monitoring job (Klein, 1998), and the higher number of seats board members take on other REITs' boards, the higher expertise level of the board is. We predict a positive correlation between BRD_EXPERT and REIT credit ratings.

For governance committee, we expect a positive relationship between its independence, GOV_IND, and REIT credit ratings because it contributes to the integrity of governance process.

For finance committee, we expect a positive relationship between its percentage of insiders, FINCOM_INSIDE, and REIT credit ratings because having insiders improve investment decisions, financial performance, and creditworthiness.

2.3.Board structure

We include some traditional board structure measures: the number of member on the board, the number of CEOs, the number of seats on other committees that CEO holds, the chairman-CEO separation identification, and number of directors of 70 years old or more sitting on the board. Based on corporate governance literature, we expect REIT credit ratings to have a (diminishing) positive relationship with BOARDSIZE, positive relationship with CEOCOUNT, negative relationship with CEO_BUSYNESS, negative relationship with DUALITY, and negative relationship with DIROVER70.

2.4.Financial transparency and disclosure

Transparency in financial reporting plays a critical role in reducing asymmetric information between REIT managers and other stakeholders and building up financial reliability, which will then be assessed by credit rating agencies. The required practice of paying out at least 90 percent of net income can enhance financial transparency in REITs, compared to other industries, but it need not mean exclusion of financial opacity. The quality and integrity of audit process can be enhanced by the presence of a "financial expert" set forth by a SEC provision (2003)[4] and the independence of audit committee. We predict both FIN_EXPERT and AUD_IND to have positive influence on REIT credit ratings.

[4] This is a provision of Sarbanes-Oxley Act (SOX, 2002), adopted by SEC in 2003.

3. Sample, Variables, and Descriptive Statistics

3.1.Sample and Data Sources

Our sample is constructed from three main sources of data: the credit ratings come from SNL Financial Services, directorship and governance variables from GMI Rating files compiled by ISS[5] via WRDS interface, and accounting variables from Compustat North America Quarterly Fundamental file also via WRDS interface. Quarterly is the most frequent accounting data we can get from Compustat. Our sample covers an 11-year time period of 2003-2013, because our credit ratings data ends at the end of fiscal year 2013, and not all governance factors that we need are available before 2003.

The first step is to collect a full list of REIT identifiers from SNL's credit ratings, and collect annual data on these REITs' board and directorship information. Then, each REIT-year is matched with available credit ratings. Since we use a unique and comprehensive dataset of credit ratings[6] from four different agencies, there are REITs with multiple credit ratings in some years as well as REITs with no credit ratings in some other years. The last step is to merge these REIT-credit rating observations with quarterly accounting data available at the end of the calendar quarters the credit ratings were provided. Our final sample[7] represents in total 112 different REITs, 734 REIT-year observations of board and directorship, 1,229 REIT-quarter observations of accounting data, and

[5] An independent research firm that provides data and analysis of corporate governance issues, formerly named Board Analyst in The Corporate Library.
[6] SNL provides 9 different tranches of credit ratings, namely "Corporate Family"; "Long-term Issuer"; "Long-term Rating"; "Preferred Stock"; "Probability of Default"; "Senior Secured Debt"; "Short-term/ Commercial Paper"; and "Subordinated Debt". Since we want to examine the credit quality from bondholders' perspective, we retain only "Long-term Issuer" and "Long-term Rating" for our analysis.
[7] See Table 2 Panel A for more details.

2,988 REIT credit ratings. Throughout the sample period of 2003-2013, there are more credit rating observations during 2006-2011 with 300 or above ratings each year.

3.2.Dependent Variable (CRSCORE)

For REITs' credit ratings, we use long-term bond issuance credit ratings[8], compiled by four largest credit rating agencies, including Standard & Poor's[9], Moody's, Fitch Ratings, and DBRS, and reported by SNL Financial Services. The ratings range from AAA or Aaa (highest rating) to D or RD / SD (lowest rating – debt in payment default), and reflect assessments of the creditworthiness of REITs as obligors with respect to their debt obligations. For empirical analysis purpose, the alphabetical ratings are collapsed into numerical versions of credit ratings, applying the schedule provided in Table 1: seven categories (CRSCORE) for basic testing (Ashbaugh-Skaife et al., 2006) and a 10-point scale (CRNUM) [10] for robustness check. Credit ratings are clustered by quarters because that is the highest frequency of accounting data we can get. We use ordered logistic regression model[11] to analyze the non-monotonic probability distribution across the full range of REIT credit ratings. For some further analysis of economic significance of the findings, we also use binary logistic regression model for binary dependent variable by dividing credit ratings into investment grade and speculative grade (junk bonds). The classification scheme for INVGRADE is shown in the last column of Table 1.

(Insert Table 1 here)

[8] We also use the full dataset with both long-term and short-term credit ratings for similar results.
[9] Compustat Fundamental Annual files provide credit ratings, but it is not as comprehensive for two reasons: (1) long-term domestic issuer credit rating (data item #280) represents only Standard & Poor's assessments; and (2) S&P credit ratings are available as fiscal year end aggregated data rather than as of date they are compiled.
[10] CRNUM (following http://www.multimarkets.com) gives similar qualitative results in untabulated tables.
[11] In Table 6B, we also provide similar qualitative results from full-sample pooled regressions.

Table 2, Panel A summarizes the sample selection procedure and reports number of REITs lost because of data requirements from each step. The final sample for credit rating analysis is determined by the REITs that meet all requirements: credit ratings available from SNL; quarterly accounting reports available from Compustat; and ownership and governance available from GMI Ratings between 2003 and 2013.

Table 2, Panel B provides details on board and committee composition for our sample REITs. REITs in general have very high level of financial transparency, reflected in the very low number of insiders and very high number of outsiders sitting on board or each committee.

(Insert Table 2 here)

3.3.Independent Variables

3.3.1. REIT corporate governance measures

Section 3 identifies variables used to capture key governance attributes. Table 3 summarizes these variables alongside with REIT characteristics control variables and the predicted sign of relationship they might have with CRSCORE.

Board members are identified as unique individuals in GMI Directorship data file. "Unique" means there is no other person in the same REIT-year that has same first and last name, and same age[12].

[12] Two family-controlled REITs have father and son with identical names and both sit on the board.
Over the period of 2004-2008, Kilroy Realty Corporation (TIC: KRC) have both father John B. Kilroy (aged 81-85) and son John B. Kilroy (aged 55-59) on board, and the younger Kilroy was CEO during 2004-2008.

In 734 REIT-years, there are in total 520 CEOs and 211 chairmen, suggesting higher turnover for CEO positions and presence of multiple CEOs (co-CEOs) in some REIT-years[13]. CEOs are considered "busy" if they hold other Chairman position on the board or any other committee. Out of 112 REITs, 0.89 percent (1 REIT) has CEO holding three more chairmanships, another 0.90 percent (1 REIT) has CEO holding two more chairmanships, but 33.93 percent (38 REITs) still have CEOs holding one more chairmanship.

CEOs are identified as individuals in GMI Directorship data file with either "Chief Executive Office" or "CEO" in title. Chairmen are identified as individuals with "Chairman" but not "Vice") in title[14]. Duality is identified as individuals who hold both CEO and chairman position in any REIT-year. CEO and chairman separation is a common practice in REITs, and we have only six observations of duality.

For these variables, CEOCOUNT and DUALITY may not have enough variation within REIT group for statistical testing, so we include them in all of our full-sample models, expecting insignificant impacts and exclude them in sub-sample tests to avoid multicollinearity issues.

(Insert Table 3 here)

Over the period of 2003-2013, Public Storage (TIC: PSA) have both father B. Wayne Hughes (aged 69-79) and son B. Wayne Hughes (aged 43-53) on board. The older Hughes was CEO during 2003-2004, and the younger Hughes was Vice President in 2003 and President during 2006-2008.

[13] REITs with 2 CEOs: Boyd Gaming Corporation (TIC: BYD) during 2004-2006; Forest City Enterprises Inc. (TIC: FCEA) in 2003; Host Hotels & Resorts Inc. (TIC: HST) in 2008; KB Home (TIC: KBH) in 2003 and during 2006-2008; Marriott International Inc. (TIC: MAR) in 2006; Pulte Homes Inc. (TIC: PHM) in 2006; Public Storage (TIC: PSA) during 2003-2004; and Weyerhaeuser Company (TIC: WY) in 2007.

REITs with 3 CEOs: Host Hotels & Resorts Inc. during 2006-2007; and MGM Mirage during 2006-2008.

[14] Among 50+ combined titles GMI assigns to directors, many are overlapping and require careful text extraction, for example, "Chairman/ CEO", "Chairman/ President/ CEO/ Found", "Chairman/ President/ CEO/ Founder", and "Chief Executive Officer" all represent CEOs with different other roles.

3.3.2. Control variables - REIT characteristics

We include in the rating models using additional REIT-specific explanatory variables based on prior literature on the determinants of corporate bond ratings in general, excluding for those that are not as much relevant for REITs.

To proxy for REITs' default risks, we use accounting-based ratios of debt-to-assets (LEV), return-on-assets (ROA), and interest coverage (INT_COV). Two other controls for default risk that comes from profitability are LOSS, a binary variable set equal to one if the REIT reports negative earnings in two consecutive quarters, the current one and the prior one; and dividend yield (DY), a continuum variable equal to current dividend yield. Firm size (SIZE) is also a control variable as larger firms face lower risk and are expected to have higher credit ratings.

We estimate the above regression by pooling all data together since there is one single industry and we have unbalanced panel dataset of REIT-rating observations. We also have models that control for year fixed effects and come up with similar qualitative results.

3.4.Descriptive statistics

Table 4 presents descriptive statistics for various governance and characteristic variables.

On a 7-point scale, during 2003-2013, REITs have an average long-term issuance score of 3.36, and more than half have scores of 4 or more and are therefore graded as investment REITs.

In terms of board ownership and influence, 93.71 percent of board members own REIT stocks, and 91.10 percent of REITs have a formal governance policy.

Regarding board power-sharing, on average REITs have 13.94 percent of board members also holding positions in other firms' boards; and 27.22 percent of board as insiders. Most REIT committees have roughly 60 percent or more of committee members being independent.

For board structure, most REITs have CEO-chairman separation (99.87 percent), and co-CEOs is very uncommon (one CEO in at least 95 percentile). Half of REITs have board size ranging between 11 and 17 members, and at least half of CEOs do not hold chairman position on the board or any committee. Since REIT industry highly value experience, on average 19.56 percent of board members are 70 years old or more.

Financial transparency is very high in REIT since 85.91 is the average percentage of independent directors in audit committee, more than half of the REITs have all audit committee members independent, and 44.08 percent of REITs have at least one financial expert on board.

(Insert Table 4 here)

Table 5 presents the Pearson product-moment correlations with credit rating and within-group for REIT-characteristic variables in Panel A and for governance variables in Panel B. The simple correlations in Panel A between each of REIT characteristics and credit ratings are in the predicted directions and significant at 0.01 level of significance or higher. Specifically, we find that ROA, INT_COV, and SIZE are significantly and positively correlated with credit ratings, while LEV and LOSS are significantly and negatively correlated with credit ratings. Some of the REIT characteristic variables exhibit high inter-correlations as we can expect.

Panel B of Table 5 presents correlations between each of corporate governance attributes and credit ratings. Some of the high inter-correlations between the committee and board independence measures are expected as committees are usually drawn from board membership. We will consider excluding some committee independence measures in our logistic model. Eight out of fifteen governance variables show Pearson correlations with credit ratings as significant at 0.01 or higher.

(Insert Table 5 here)

4. Empirical Tests and Results

4.1.Ordered Logistic Model

We adapt a general model for credit ratings as a function of REIT characteristics and corporate governance attributes. We also apply year fixed effects and/ or quarter fixed affects to control for endogeneity issues that arise from omitted variables.

REIT credit ratings = f (REIT characteristics, corporate governance attributes)

We use an ordered logistic regression model to test the predicted relationships between corporate governance attributes and long-term bond credit ratings in REITs. The ordered logit model allows us to relax the assumption of uniform differences across seven rating categories (CRSCORE)[15] while maintaining the ranking order at the same time to test for non-monotonic probability distribution of credit ratings.

The empirical result is reported in the first column of Table 6A where we jointly test the impact of REIT characteristics and governance attributes on credit ratings. In terms of managerial performance, REIT bondholders expect similar things as REIT investors, such as return on asset

[15] In case of CRNUM, it is 21 rating categories as it goes by 0.5 on a scale from 0-10.

and loss avoidance. The coefficients on REIT characteristics have the expected signs and are all significant at the 0.01 level or better. Specifically, we find that REIT credit ratings are positively related to ROA, INT_COV, and SIZE, and negatively related to LEV and LOSS.

Regarding board ownership and structure, bondholders and shareholders' interests converge in several aspects. Both prefer to have board members as stock owners who have much expertise, CEOs that hold fewer chairman positions where else, fewer of board members 70 years old or more, and larger boards provide marginally diminishing positive impacts.

Because financial transparency by nature is high in REITs, factors such as board independence and committee independence do not necessarily benefit bondholders as they do shareholders, and so does the presence of a formal governance policy.

The most interesting finding is with respect to power-sharing attributes between CEO and the board. While shareholders prefer limited CEO power and increased number of insiders sitting on the board for monitoring purposes, bondholders on average prefer more CEO power and decreased number of insiders sitting on the board. This is supported by significantly negative impact of board insiders and significantly positive impact of co-CEO structure and CEO-chairman structure on credit ratings, specifically in REITs. It may look like someone cannot get better without having someone else worse off and exhibit the strong conflict of interest between shareholders and bondholders.

(Insert Table 6A here)

For robustness, we also test the same dataset with two measures of credit ratings, using pooled panel regression model, with and without omission of committee independence variables, and with and without fixed year and quarter effects. All tests provide similar qualitative results and implications[16]. Similar mpirical results are presented in Table 6B for pooled regressions using credit ratings on scale 1-7, and in untabulated table for credit ratings on scale 0-10.

(Insert Table 6B here)

4.2.Investment Grade vs. Speculative Grade Analysis

Credit ratings convey information on ordinal risk assessments by major credit rating agencies, but it is difficult to quantify the marginal effects of changes in each corporate governance variable on credit ratings across multiple categories (seven for the first measure and twenty-one for the second measure). Therefore, we run additional tests using an alternative classification of credit ratings into two categories, namely investment grade or speculative grade[17]. The main reason for doing so is that, speculative-grade bonds are prohibited to many bond portfolio managers and thus REITs with speculative-grade bonds incur significantly higher costs. This testing model provides readily available economic implications of corporate governance on REITs' expected cost of debt, which they heavily rely on for operational costs.

Table 7 displays the results of logistic regression estimates with INVGRADE as the binary dependent variable, which takes a value of 1 if the REIT's credit rating is BBB or better, and zero otherwise. The results are qualitatively similar to the regression results using numeric credit ratings

[16] Model 1: Credit ratings = f (REIT characteristics, full governance attributes)
Model 2: Credit ratings = f (REIT characteristics, full governance attributes, fixed year and quarter effects)
Model 3: Credit ratings = f (REIT characteristics, major governance attributes)
Model 4: Credit ratings = f (REIT characteristics, major governance attributes, fixed year and quarter effects)
[17] Classification scheme for INVGRADE is explained in the last column of Table 1.

reported in Table 7. REIT credit ratings depends on REIT performance, board ownership, the power-sharing scheme, and board structure more than the transparency reflected in the independence of board and committees. More specifically, a REIT has higher probability of being in investment grade with a strong financial performance, having a large enough board with members as expert owners with compensation attached to REIT value, with CEOs focusing on only on their main job, and fewer number of 70-years-or older members on board.

(Insert Table 7 here)

5. Additional Analyses

5.1. Impact of financial crisis on the relationship

Since REIT suffered more than an average industry or the whole aggregated economy during the mortgage crisis, we want to know if the relationship between REIT corporate governance and REIT credit ratings varies over time and fundamentally changes under financial difficulties. Following National Bureau of Economic Research (NBER)[18], we define the crisis period as from December 2007 until June 2009, covering a total of 7 financial quarters[19]. Consistent and significant impacts on REIT credit ratings remain the same for REIT performance, board independence and expertise, board insiders, board size, and CEO busyness, but the rest of governance attributes have changing impacts depending on time periods. The independence of committees does not have consistent and predictive impacts on REIT credit ratings.

[18] http://www.nber.org/cycles.html

[19] They include: 2007Q4, 2008Q1, 2008Q2, 2008Q3, 2008Q4, 2009Q1, and 2009Q2; of which 2007Q4 is an overlapping period for pre-crisis ratings made in 2007 before December and crisis ratings made during December.

(Insert Table 8 here)

5.2.Impact of high vs. low dividend yield on the relationship

We want to test the "REIT effect" from the bondholders' perspective compared to the "REIT effect" from shareholders' perspective (Bauer et al., 2010) by documenting the variations in how and how much each governance attributes affect credit ratings of sub-group of low payout REITs and sub-group of high-payout REITs, although both of them are required to distribute at least 90 percent of their wealth back to investors. We do find remarkably different patterns in the relationships between corporate governance and credit ratings within low vs. high payout REITs after controlling for similar fundamental impacts from financial performance. Credit ratings of high dividend yield REITs tend to have less connection with committee independence and more connection with board structures, while credit ratings of low dividend yield REITs on average are more determined by committee independence, financial transparency than by effectiveness from board structure. This "REIT effect" in bond ratings implies that by paying out high dividends, REITs signal better financial transparency and thereby internal governance mechanisms are not significantly important.

(Insert Table 9 here)

5.3.Impact of high vs. low dividend yield across business cycles

We further examine the "REIT effect" of high dividend yield REITs and extract that away from testing using a binary variable to identify these REITs. We calculate each year's median value of

dividend yield among our REITs and then divide REITs into two groups: REITs with dividend yield above annual median value have HIGHDY as one, and REIT with dividend yield below annual median have HIGHDY[20] as zero. This dummy variable HIGHDY takes care of the difference between the base group of low dividend yield REITs and the control group of high dividend yield REITs and drives away some explanatory power of previous regression models.

(Insert Table 10 here)

6. Summary and Conclusions

The study adapts Standard & Poor's framework for evaluating corporate governance structures to investigate whether strong governance in REIT industry results in higher overall REIT long-term bond issuance credit ratings, compared to weak governance. We run tests with a variety of governance attributes that belong to four major components of REIT corporate governance as potential explanatory variables for REIT credit ratings, controlling for REIT characteristic determinants from prior research.

We find empirical evidence that REIT credit ratings are positively related to the ownership structure of the board, expertise of the board, number of CEOs, and CEO-chairman duality; positive but diminishing with number of members on board; and negatively related to committee independence, number of chair positions CEO holds on other committees, and number of 70-year-old or more directors on board. We also show the marginal probability of REITs with desirable governance characteristics to receive investment grade of credit rating, which

[20] Every year, we calculate the mean value of dividend yield among our REIT sample and divide them into two groups. REITs with dividend yield above annual median value will have HIGHDY that takes value of 1, and REITs with dividend yield below annual median value will have HIGHDY that takes value of zero.

hypothetically implies that good governance attributes in bondholders' viewpoints result in significant debt cost savings, which is extremely important in REIT industry.

The primary analysis documents that REITs' credit ratings are affected by REIT corporate governance. The secondary analysis provides explanations why not all REITs improve corporate governance for better credit ratings if it is believed that good corporate governance should result in better ratings. One possible reason is that not all the times shareholders and bondholders can compromise and come to an agreed plan of corporate governance policy. It is commonly understood that for investors to be better off, debt owners should be worse off. But we find that it need not be the case. Some corporate governance improvements tend to be beneficial for both groups of stakeholders. Some other corporate governance factors may look like a trade-off, but once we identify them as components of board power sharing, it is advised that some so-called corporate governance enhancing activities could be avoided for better credit ratings and lower cost of debt financing, so long as the investors have trust in the board. Another possible reason roots from the "REIT effect" which explains that corporate governance factors do not affect credit ratings the same way to REITs with high dividend yields and REITs with low dividend yields.

Organizations and companies like Standard & Poor's, Moody's, Fitch Ratings, and DBRS, among others, have started to compile credit ratings of corporate governance practices along several dimensions. It is useful for researchers and practitioners to extend future research into investigation of whether these composite attributes are significant determinants of credit ratings. It is also important to focus on the benefits of strong governance that shareholders may have through the channel of equity cost.

In conclusions, corporate governance should be structured in a way that it consistently supports the company's overall strategy. Good corporate governance should allow for powerful leadership and effective management at both board level and CEO level. There are certain corporate governance aspects that shareholders have traditionally believed would enhance the overall credit quality of the firms, but our empirical analysis says they do not necessarily do so. At the end of the day, the relationship boils down to the trust and faith investors have in the boards and how willing they are to put their monitoring power down and to give more decision making power to the directors and management.

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Table 1. Credit Rating Classifications

S&P	Fitch Ratings	Moody's	DBRS	Definitions	Credit rating score	Credit rating number	Investment/ Speculative grade
Investment grade							
AAA	AAA	Aaa	AAA	Prime, maximum safety	7	10.0	Investment
AA+	AA+	Aa1	AA high	Very high grade/ quality	6	9.5	Investment
AA	AA	Aa2	AA	”	6	9.0	Investment
AA-	AA-	Aa3	AA low	”	6	8.5	Investment
A+	A+	A1	A high	Upper medium quality	5	8.0	Investment
A	A	A2	A	”	5	7.5	Investment
A-	A-	A3	A low	”	5	7.0	Investment
BBB+	BBB+	Baa1	BBB high	Lower medium grade	4	6.5	Investment
BBB	BBB	Baa2	BBB	”	4	6.0	Investment
BBB-	BBB-	Baa3	BBB low	”	4	5.5	Investment
Speculative grade							
BB+	BB+	Ba1	BB high	Non-investment speculative	3	5.0	Speculative
BB	BB	Ba2	BB	”	3	4.5	Speculative
BB-	BB-	Ba3	BB low	”	3	4.0	Speculative
B+	B+	B1	B high	Highly speculative	2	3.5	Speculative
B	B	B2	B	”	2	3.0	Speculative
B-	B-	B3	B low	”	2	2.5	Speculative
CCC+	CCC+	Caa1	CCC high	Substantial risks	1	2.0	Speculative
CCC	CCC	Caa2	CCC	In poor standing	1	1.5	Speculative
CCC-	CCC-	Caa3	CCC low	”	1	1.0	Speculative
CC+	CC+	Ca1	CC high	Extremely speculative	1	0.5	Speculative
CC	CC	Ca2	CC	”	1	0.5	Speculative
CC-	CC-	Ca3	CC low	”	1	0.5	Speculative
C+	C+	C1	C high	Default imminent	1	0.0	Speculative
C	C	C2	C	”	1	0.0	Speculative
C-	C-	C3	C low	”	1	0.0	Speculative
SD/D	RD		D	In default	1	0.0	Speculative

Notes: REIT credit ratings are the long-term issuer credit ratings provided by SNL, compiled by four different credit rating agencies, including Standard & Poor's Ratings Services ("S&P"), Fitch, Inc. ("Fitch"), Moody's Investors Service, Inc. ("Moody's"), and DBRS, Inc. ("DBRS"). The ratings range from AAA (highest rating) to D (lowest rating). The ratings reflect the agencies' assessments on the creditworthiness of the obligor with respect to its senior debt obligations. According to the conversion schedule above, the multiple ratings are collapsed into seven categories for analysis purpose, following Ashbaugh-Skaife et al. (2006) and also into 0-10 scale for robustness check, following multi-markets.com. Ratings below BBB- (S&P-equivalent) are classified as speculative (or junk bonds).

Table 2. Sample details

Panel A: Sample construction (2003-2013)

	Number of REITs	Number of REIT-years (REIT-quarters)	Number of observations
Credit ratings in SNL Financial Services	117		5,236
From GMI Directorship files (2001-2013)	117	1,056	15,924
After merging with GMI Companies files (2003-2013)	117	1,022	15,600
After aggregating to annual directorship data	117	1,022	11,886
After merging with credit ratings from SNL	117	1,022	5,075
After excluding non-long-term credit ratings	112	734	2,988
After clustering with quarterly accounting data from Compustat	112	1,229	2,988

Panel B: Sample board composition

Breakdown of inside and outside directors by board and by committees for sample REITs during 2003-2013

REIT (single observation on first year of data)	Board	Audit committee	Compensation committee	Governance committee	Nominating committee
Number of REITs having a board (committee)	112	102	92	85	86
Average number of directors on board (committee)	9.64	2.35	2.27	1.99	2.03
Average number of insider directors on board (committee)	2.45	0.01	0.01	0.01	0.01
Average number of outside directors on board (committee)	7.19	2.34	2.26	1.98	2.02
Number of REITs having at least one insider on the board (committee)	112	27	30	42	41

Notes: This table presents the sample selection and data requirements. Panel B presents the size of the board and committees for the sample of REITs for which the specific committee exists. The difference between the average number of directors on the board (committee) and number of insiders and outsiders on the board (committee) is due to unrecognized director status from GMI Ratings Directorship database.

Table 3. Variable definitions and data sources

Variables	Predicted sign	Definitions
Board ownership and influence (GMI Ratings Directorships, CEOs and Companies)		
BRD_STOCK	(+)	% of directors that own stock in this REIT
GOV_POLICY	(+)	One if REIT has a formal governance policy, zero otherwise
Board power-sharing (GMI Ratings Directorships, CEOs and Companies)		
BRD_EXPERT	(+)	% of independent directors that hold seats on other firms' boards
BRD_IND	(+)	% of independent directors on the board
GOV_IND	(+)	% of independent directors on the governance committee
COMP_IND	(+)	% of independent directors on the compensation committee
NOM_IND	(+)	% of independent directors on the nominating committee
FINCOM_INSIDE	(+)	% of insiders on the board of directors
Board structure (GMI Ratings Directorships, CEOs and Companies)		
BOARDSIZE	(+)	Number of directors sitting on the board of directors
BOARDSIZESQ	(–)	Squared of board size
CEOCOUNT	(+)	Number of co-executives sharing Chief Executive Officers roles
DUALITY	(–)	One if the CEO is also the chairman of the board, zero otherwise
CEOBUSYNESS	(–)	Composite score representing the power of the CEO where REIT receives one point if the CEO is the chairman of the board, and one point for each committee (compensation, nominating, audit, governance, executive) that the CEO sits on
DIROVER70	(–)	Number of directors 70 years old and over sitting on the board of directors
Financial transparency (GMI Ratings Directorship)		
AUD_IND	(+)	% of audit committee made up of independent directors
FIN_EXPERT	(+)	One if REIT has an independent financial expert on the audit committee, where financial expert is defined as an audit committee member being a CFO or having a CPA, zero otherwise
REIT characteristics (Compustat North America Fundamental Quarterly)		
LEV	(–)	Total long-term debt divided by total assets
ROA	(+)	Net income divided by total assets
LOSS	(–)	One if net income is negative in current and prior quarter, zero otherwise
INT_COV	(+)	Net income divided by interest expense
SIZE	(+)	Natural log of REIT's total assets
DY	(+)	Dividend yield, as total annual dividend over end of last year stock price

Notes: Variables in grey (GOV_POLICY, CEOCOUNT, DUALITY, FIN_EXPERT) are used as much as possible in all tests, and omitted in specific subsample tests where they do not have enough variation within the REIT group and may create multicollinearity issues.

Table 4. Descriptive statistics for REITs corporate governance (to be updated)

Variables (REIT-credit rating observations)	Mean	St. deviation	Median	25%	75%
Long-term issuer credit ratings					
CRSCORE	3.3611	0.9011	4.0000	3.0000	4.0000
CRNUM	5.0012	1.3301	5.5000	4.5000	6.0000
INVGRADE	0.5335	0.4990	1.0000	0.0000	1.0000
Board ownership and influence					
BRD_STOCK	0.9371	0.1071	1.0000	0.9091	1.0000
GOV_POLICY	0.9110	0.2848	1.0000	1.0000	1.0000
Board power-sharing					
BRD_EXPERT	0.1394	0.1149	0.1250	0.0000	0.2308
BRD_IND	0.5899	0.1342	0.6000	0.5000	0.6899
GOV_IND	0.7208	0.4174	1.0000	0.5000	1.0000
COMP_IND	0.6889	0.4318	1.0000	0.0000	1.0000
NOM_IND	0.6274	0.4539	1.0000	0.0000	1.0000
FINCOM_INSIDE	0.2722	0.0937	0.2609	0.2143	0.3182
Board structure					
BOARDSIZE	14.1570	4.7649	13.0000	11.0000	17.0000
CEOCOUNT	1.0254	0.1937	1.0000	1.0000	1.0000
DUALITY	0.0013	0.0366	0.0000	0.0000	0.0000
CEOBUSYNESS	0.3156	0.5238	0.0000	0.0000	1.0000
DIROVER70	0.1956	0.1300	0.1818	0.1053	0.2857
Financial transparency					
AUD_IND	0.8591	0.2974	1.0000	1.0000	1.0000
FIN_EXPERT	0.4408	0.4966	0.0000	0.0000	1.0000
REIT characteristics					
LEV	0.4775	0.1640	0.4852	0.3877	0.5761
ROA	0.0130	0.0550	0.0134	0.0023	0.0314
LOSS	0.1660	0.3722	0.0000	0.0000	1.0000
INT_COV	5.2744	22.4443	1.8152	0.3000	4.7823
SIZE	8.3680	0.9260	8.3110	7.7088	5.8544
DY	9.6096	26.0689	0.0000	0.0000	9.6740

Notes: See Table 1 for numeric coding for credit ratings.
See Table 2 for other variable definitions.

Table 5: Pearson pair-wise correlation matrix

Panel A: REIT characteristics

	CRSCORE	LEV	ROA	LOSS	INT_COV	SIZE	DY
CRSCORE	1.0000						
LEV	**-0.3022***	1.0000					
ROA	**0.3618***	-0.214*	1.0000				
LOSS	**-0.4551***	0.1541*	**-0.6115***	1.0000			
INT_COV	0.2650*	**-0.4051***	**0.5249***	-0.2925*	1.0000		
SIZE	0.1979*	-0.0537*	0.0451*	-0.0989*	-0.0363*	1.0000	
DY	0.2396*	-0.1772*	0.1213*	-0.1140*	**0.3609***	0.2112*	1.0000

Panel B: Corporate governance variables

	A	B	C	D	E	F	G	H	I	J	K	L	M	O	P	Q
A. CRSCORE	1.00															
B. BRD_STOC	0.10*	1.00														
C. GOV_POLICY	-0.00*	0.15*	1.00													
D. BRD_EXPERT	0.17*	-0.24*	-0.08*	1.00												
E. BRD_IND	0.08*	0.00	0.13*	0.01	1.00											
F. GOV_IND	0.11*	0.04	0.20*	0.28*	**0.35***	1.00										
G. COMP_IND	0.00	-0.18*	-0.02	**0.43***	0.25*	**0.52***	1.00									
H. NOM_IND	0.15*	-0.12*	-0.01	**0.37***	0.25*	**0.68***	**0.34***	1.00								
I. FINCOM_INSIDE	-0.25*	-0.05*	-0.05*	0.02	**-0.54***	-0.09*	-0.06*	-0.03	1.00							
J. BOARDSIZE	-0.13*	0.09*	0.25*	**-0.50***	-0.05*	-0.19*	-0.21*	-0.24*	-0.07*	1.00						
K. CEOCOUNT	-0.02	-0.09*	-0.04	-0.00	-0.09*	-0.14*	0.07*	-0.11*	0.03	0.22*	1.00					
L. DUALITY	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.03	-0.03	0.01	-0.00	1.00				
M. CEOBUSYNESS	0.01	-0.09*	-0.06*	0.17*	-0.11*	0.00	0.16*	0.04	-0.00	-0.11*	0.01	0.05*	1.00			
O. DIROVER70	-0.22*	-0.03	0.05*	-0.19*	-0.16*	-0.27*	-0.16*	-0.28*	0.08*	0.18*	0.14*	-0.06*	0.06*	1.00		
P. AUD_IND	-0.04	-0.06*	--0.02	0.21*	0.23*	**0.50***	**0.47***	**0.38***	-0.04	-0.06*	0.05*	0.02	0.09*	-0.13*	1.00	
Q. FIN_EXPERT	0.15*	-0.24	0.15*	**0.69***	0.12*	**0.30***	**0.47***	**0.39***	-0.07*	-0.24*	0.10*	-0.03	0.15*	-0.17*	0.24*	1.00

Notes: * indicates significance at the 0.01 level or better. Bold text indicates correlations with values higher than 0.30. Correlations between pairs of REIT characteristics are based on REIT-quarter observations. Correlations between pairs of corporate governance variables are based on REIT-year observations. Correlations between credit rating and other variables are based on actual number of credit ratings observations.

Table 6A - Ordered logit regression of credit ratings

CRSCORE	Impact on governance	Model (1)	Model (2)	Model (3)	Model (4)
brd_stock	(+)	1.9006***	1.6854***	1.9802***	1.7457***
		(0.356)	(0.393)	(0.356)	(0.391)
gov_policy	(+)	-0.4928***	-0.3189*	-0.4931***	-0.3048
		(0.154)	(0.185)	(0.156)	(0.186)
brd_expert	(+)	3.0872***	2.4691***	3.0623***	2.3945***
		(0.557)	(0.661)	(0.559)	(0.667)
brd_ind	(+)	-0.7559*	-1.0868**	-0.8119**	-1.1452**
		(0.399)	(0.485)	(0.405)	(0.487)
gov_ind	(+)	0.7715***	1.1131***	0.7835***	1.1216***
		(0.169)	(0.208)	(0.169)	(0.209)
comp_ind	(+)	-0.7265***	-1.1162***	-0.7271***	-1.1445***
		(0.138)	(0.239)	(0.139)	(0.238)
nom_ind	(+)	-0.0352	-0.2222	-0.0541	-0.2264
		(0.115)	(0.166)	(0.115)	(0.167)
fincom_inside	(-)	-5.7389***	-6.1073***	-5.7132***	-6.0712***
		(0.586)	(0.648)	(0.593)	(0.651)
boardsize	(+)	0.2579***	0.1989***	0.2514***	0.1921***
		(0.041)	(0.042)	(0.041)	(0.043)
boardsizesq	(-)	-0.0097***	-0.0083***	-0.0095***	-0.0081***
		(0.001)	(0.001)	(0.001)	(0.001)
ceocount	(-)	0.3559***	0.3143**	0.3274***	0.2852*
		(0.125)	(0.144)	(0.126)	(0.146)
duality	(-)	0.2681	0.4751*	0.2963	0.4915
		(0.195)	(0.277)	(0.225)	(0.303)
ceobusyness	(-)	-0.2428***	-0.2334***	-0.2409***	-0.2364***
		(0.090)	(0.090)	(0.090)	(0.091)
dirover70	(-)	-2.8264***	-3.0038***	-2.8290***	-2.9964***
		(0.356)	(0.372)	(0.360)	(0.377)
aud_ind	(+)	-0.5537***	-0.0357	-0.5464***	-0.0191
		(0.170)	(0.234)	(0.170)	(0.234)
fin_expert	(+)	0.1971	0.0487	0.2096*	0.0523
		(0.121)	(0.167)	(0.121)	(0.168)
lev	(-)	-2.8480***	-2.6962***	-2.9020***	-2.7516***
		(0.312)	(0.308)	(0.313)	(0.309)
roa	(+)	3.2447***	3.7007***	3.0879***	3.5591***
		(0.673)	(0.740)	(0.679)	(0.743)
loss	(-)	-1.6132***	-1.6263***	-1.6476***	-1.6648***
		(0.117)	(0.121)	(0.117)	(0.122)
int_cov	(+)	0.0055**	0.0064***	0.0052**	0.0060***
		(0.002)	(0.002)	(0.002)	(0.002)
size	(+)	0.6433***	0.6512***	0.6451***	0.6516***
		(0.062)	(0.064)	(0.061)	(0.064)
dy	(+)	0.0178***	0.0172***	0.0177***	0.0171***
		(0.004)	(0.004)	(0.004)	(0.004)
Observations		2,883	2,883	2,883	2,883
Year FE		No	Yes	No	Yes
Quarter FE		No	No	Yes	Yes
Pseudo R2		0.232	0.238	0.233	0.239

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 6B - Pooled regression of credit ratings

CRSCORE	Impact on governance	Model (1)	Model (2)	Model (3)	Model (4)
brd_stock	(+)	0.6841***	0.6590***	0.7145***	0.6820***
		(0.137)	(0.145)	(0.136)	(0.145)
gov_policy	(+)	-0.1264***	-0.0416	-0.1251***	-0.0368
		(0.047)	(0.056)	(0.047)	(0.056)
brd_expert	(+)	1.1817***	0.9791***	1.1747***	0.9562***
		(0.176)	(0.204)	(0.177)	(0.206)
brd_ind	(+)	-0.1732	-0.1943	-0.1792	-0.1998
		(0.129)	(0.153)	(0.129)	(0.153)
gov_ind	(+)	0.2996***	0.4006***	0.3028***	0.4024***
		(0.056)	(0.067)	(0.056)	(0.067)
comp_ind	(+)	-0.2882***	-0.4014***	-0.2876***	-0.4095***
		(0.045)	(0.070)	(0.045)	(0.069)
nom_ind	(+)	-0.0248	-0.1112**	-0.0337	-0.1141**
		(0.041)	(0.056)	(0.041)	(0.056)
fincom_inside	(-)	-1.7059***	-1.7229***	-1.6948***	-1.7092***
		(0.181)	(0.205)	(0.183)	(0.206)
boardsize	(+)	0.0994***	0.0800***	0.0972***	0.0777***
		(0.014)	(0.015)	(0.014)	(0.015)
boardsizesq	(-)	-0.0037***	-0.0032***	-0.0037***	-0.0031***
		(0.000)	(0.000)	(0.000)	(0.000)
ceocount	(-)	0.1777***	0.1461***	0.1662***	0.1347***
		(0.041)	(0.045)	(0.042)	(0.046)
duality	(-)	0.0205	0.0790	0.0381	0.0909
		(0.053)	(0.076)	(0.063)	(0.084)
ceobusyness	(-)	-0.0843***	-0.0809***	-0.0826***	-0.0806***
		(0.027)	(0.027)	(0.027)	(0.027)
dirover70	(-)	-0.9580***	-0.9961***	-0.9543***	-0.9881***
		(0.111)	(0.117)	(0.112)	(0.118)
aud_ind	(+)	-0.2205***	-0.1013	-0.2136***	-0.0929
		(0.054)	(0.073)	(0.054)	(0.073)
fin_expert	(+)	0.0556	0.0298	0.0605	0.0307
		(0.038)	(0.053)	(0.038)	(0.053)
lev	(-)	-1.1038***	-1.0657***	-1.1190***	-1.0794***
		(0.105)	(0.102)	(0.105)	(0.102)
roa	(+)	1.6162***	1.6621***	1.5636***	1.6169***
		(0.241)	(0.253)	(0.240)	(0.252)
loss	(-)	-0.6211***	-0.6168***	-0.6307***	-0.6274***
		(0.043)	(0.043)	(0.042)	(0.043)
int_cov	(+)	-0.0004	-0.0001	-0.0005	-0.0001
		(0.001)	(0.001)	(0.001)	(0.001)
size	(+)	0.2179***	0.2162***	0.2190***	0.2170***
		(0.021)	(0.022)	(0.021)	(0.021)
dy	(+)	0.0033***	0.0032***	0.0033***	0.0032***
		(0.001)	(0.001)	(0.001)	(0.001)
Observations		2,883	2,883	2,883	2,883
Year FE		No	Yes	No	Yes
Quarter FE		No	No	Yes	Yes
R-squared		0.447	0.455	0.450	0.458

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 7 – Binary logistic regression using investment grade

INVGRADE	Impact on governance	Model (1)	Model (2)	Model (3)	Model (4)
brd_stock	(+)	5.3010***	5.4952***	5.3149***	5.4746***
		(0.647)	(0.697)	(0.643)	(0.691)
gov_policy	(+)	-0.2452	0.3041	-0.2358	0.3473
		(0.199)	(0.270)	(0.199)	(0.268)
brd_expert	(+)	3.1894***	1.9655**	3.1726***	1.8971**
		(0.675)	(0.794)	(0.676)	(0.797)
brd_ind	(+)	-0.7900*	-1.3189**	-0.7668*	-1.3270**
		(0.454)	(0.543)	(0.456)	(0.544)
gov_ind	(+)	0.7630***	1.1449***	0.7677***	1.1344***
		(0.180)	(0.226)	(0.181)	(0.225)
comp_ind	(+)	-0.5426***	-1.1395***	-0.5409***	-1.1605***
		(0.158)	(0.326)	(0.159)	(0.322)
nom_ind	(+)	-0.0733	-0.2428	-0.1010	-0.2575
		(0.140)	(0.200)	(0.141)	(0.201)
fincom_inside	(-)	-7.2243***	-7.8633***	-7.1883***	-7.8448***
		(0.685)	(0.711)	(0.685)	(0.709)
boardsize	(+)	0.1725***	0.0698	0.1703***	0.0665
		(0.051)	(0.053)	(0.051)	(0.053)
boardsizesq	(-)	-0.0071***	-0.0044***	-0.0071***	-0.0043***
		(0.001)	(0.002)	(0.002)	(0.002)
ceocount	(-)	-0.9352***	-1.0442***	-0.9605***	-1.0736***
		(0.236)	(0.253)	(0.236)	(0.254)
ceobusyness	(-)	-0.3148***	-0.3202***	-0.3119***	-0.3229***
		(0.104)	(0.103)	(0.103)	(0.102)
dirover70	(-)	-1.8845***	-2.0240***	-1.9015***	-2.0432***
		(0.395)	(0.408)	(0.399)	(0.412)
aud_ind	(+)	-0.1619	0.4854*	-0.1516	0.5215*
		(0.181)	(0.272)	(0.183)	(0.272)
fin_expert	(+)	-0.0877	-0.1450	-0.0833	-0.1354
		(0.154)	(0.255)	(0.153)	(0.257)
lev	(-)	-1.6331***	-1.5101***	-1.6830***	-1.5652***
		(0.338)	(0.346)	(0.341)	(0.349)
roa	(+)	3.5348**	3.8668***	3.3884**	3.7117**
		(1.431)	(1.471)	(1.431)	(1.479)
loss	(-)	-1.7809***	-1.7552***	-1.8208***	-1.8047***
		(0.166)	(0.172)	(0.167)	(0.175)
int_cov	(+)	0.0110	0.0120	0.0107	0.0116
		(0.007)	(0.007)	(0.007)	(0.007)
size	(+)	0.5304***	0.5571***	0.5355***	0.5610***
		(0.066)	(0.067)	(0.065)	(0.067)
dy	(+)	0.0106***	0.0096***	0.0101***	0.0091**
		(0.004)	(0.004)	(0.004)	(0.004)
Observations		2,883	2,883	2,883	2,883
Year FE		No	Yes	No	Yes
Quarter FE		No	No	Yes	Yes
Pseudo R2		0.291	0.302	0.292	0.304

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 8 - Sub-period ordered logit regressions

CRSCORE	Impact on governance	Model (1) Precrisis	Model (2) Crisis	Model (3) Postcrisis
brd_stock	(+)	4.7134***	-1.3224	0.2322
		(0.561)	(0.829)	(1.520)
gov_policy	(+)	0.2586	-2.8425***	-0.0678
		(0.272)	(0.820)	(0.497)
brd_expert	(+)	6.2989***	3.4874**	1.2030
		(1.153)	(1.645)	(1.467)
brd_ind	(+)	-5.5746***	-1.2802	2.2787***
		(0.879)	(1.468)	(0.666)
gov_ind	(+)	0.9636***	3.1235***	-0.0449
		(0.340)	(0.751)	(0.373)
comp_ind	(+)	-1.5085***	-2.3578***	1.7539**
		(0.388)	(0.663)	(0.722)
nom_ind	(+)	1.0806***	-1.3919***	-0.0490
		(0.325)	(0.351)	(0.306)
fincom_inside	(-)	-5.1525***	-4.4873**	-9.0032***
		(1.066)	(1.834)	(1.114)
boardsize	(+)	0.2463**	0.5818***	0.0601
		(0.116)	(0.148)	(0.059)
boardsizesq	(-)	-0.0062*	-0.0173***	-0.0064***
		(0.004)	(0.005)	(0.002)
ceobusyness	(-)	-0.3109**	-0.1068	-0.1906
		(0.143)	(0.197)	(0.157)
dirover70	(-)	0.6661	-3.1378***	-4.4655***
		(0.690)	(0.891)	(0.637)
aud_ind	(+)	1.8615***	0.7884	-1.0281***
		(0.501)	(0.695)	(0.339)
fin_expert	(+)	0.8214***	0.1493	-0.1781
		(0.287)	(0.296)	(0.624)
lev	(-)	-1.7241***	-3.3087***	-4.6311***
		(0.608)	(0.576)	(0.644)
roa	(+)	0.9503	5.0418***	8.5447***
		(3.010)	(1.428)	(2.303)
loss	(-)	-2.1411***	-2.9613***	-0.7123***
		(0.439)	(0.279)	(0.170)
int_cov	(+)	0.0113*	-0.0360***	0.0011
		(0.007)	(0.010)	(0.003)
size	(+)	0.3722***	0.4563***	1.0481***
		(0.110)	(0.156)	(0.120)
dy	(+)	0.0326***	0.0404***	0.0060**
		(0.007)	(0.009)	(0.003)
Observations		1,076	671	1,136
Year FE		Yes	Yes	No
Quarter FE		Yes	Yes	Yes
Pseudo R2		0.311	0.289	0.271

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 9 - Ordered logit regression of credit ratings with subgroups

CRSCORE	Impact on governance	Model (1) High DY	Model (2) High DY	Model (3) Low DY	Model (4) Low DY
brd_stock	(+)	5.5770***	5.7338***	0.9718**	0.8585*
		(0.684)	(0.707)	(0.402)	(0.444)
gov_policy	(+)	0.0892	0.9691***	-0.5874***	-0.4649*
		(0.288)	(0.367)	(0.216)	(0.255)
brd_expert	(+)	1.9463**	1.2359	3.5974***	2.0873**
		(0.918)	(1.145)	(0.784)	(0.922)
brd_ind	(+)	-2.6114***	-4.0571***	1.7830***	3.1498***
		(0.783)	(0.963)	(0.555)	(0.701)
gov_ind	(+)	-0.4690	-0.1495	0.4831**	0.8714***
		(0.360)	(0.427)	(0.220)	(0.293)
comp_ind	(+)	0.6261***	0.4574	-1.0060***	-2.2019***
		(0.241)	(0.465)	(0.172)	(0.365)
nom_ind	(+)	0.5503**	0.1903	0.1004	-0.3242
		(0.215)	(0.289)	(0.162)	(0.258)
fincom_inside	(-)	-14.3261***	-14.7125***	-1.1360	-0.1502
		(1.233)	(1.431)	(0.850)	(1.010)
boardsize	(+)	-0.2327**	-0.2525**	0.2510***	0.1606***
		(0.095)	(0.113)	(0.052)	(0.055)
boardsizesq	(-)	0.0088***	0.0096***	-0.0093***	-0.0072***
		(0.003)	(0.004)	(0.001)	(0.001)
ceobusyness	(-)	-0.6852***	-0.7565***	0.0708	0.0621
		(0.183)	(0.179)	(0.100)	(0.100)
dirover70	(-)	-1.1118*	-1.7046**	-1.5084***	-1.6920***
		(0.610)	(0.706)	(0.489)	(0.527)
aud_ind	(-)	-0.1368	0.6886	-0.7365***	-1.0622***
		(0.360)	(0.551)	(0.199)	(0.272)
fin_expert	(-)	-0.0132	0.0664	0.2160	-0.2007
		(0.230)	(0.368)	(0.151)	(0.196)
lev	(+)	-1.5739*	-1.1610	-4.5967***	-4.7684***
		(0.822)	(0.788)	(0.437)	(0.432)
roa	(+)	13.6195***	18.2926***	2.8840***	3.6566***
		(4.345)	(5.168)	(0.719)	(0.864)
loss	(-)	-2.6753***	-2.7864***	-1.1547***	-1.2645***
		(0.277)	(0.296)	(0.134)	(0.146)
int_cov	(+)	0.0519***	0.0602***	0.0026	0.0016
		(0.012)	(0.011)	(0.003)	(0.003)
size	(-)	1.2458***	1.1807***	0.5261***	0.5479***
		(0.122)	(0.125)	(0.082)	(0.086)
dy	(+)	-0.0076**	-0.0066*	0.4695***	0.4216***
		(0.004)	(0.004)	(0.081)	(0.088)
Observations		1,183	1,183	1,700	1,700
Year FE		No	Yes	No	Yes
Quarter FE		No	Yes	No	Yes
Pseudo R2		0.376	0.399	0.205	0.223

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 10 – Impact of dividend yields across time periods

CRSCORE	Impact on governance	Model (1) Precrisis	Model (2) Crisis	Model (3) Postcrisis
brd_stock	(+)	4.2885***	-1.4001*	-1.3239
		(0.529)	(0.842)	(1.566)
gov_policy	(+)	0.3941	-3.0867***	-0.3489
		(0.274)	(0.865)	(0.505)
brd_expert	(+)	6.3583***	3.7910**	2.4031*
		(1.114)	(1.708)	(1.396)
brd_ind	(+)	-5.2193***	-0.4990	3.1009***
		(0.860)	(1.467)	(0.714)
gov_ind	(+)	0.2544	3.0252***	-0.2604
		(0.365)	(0.765)	(0.384)
comp_ind	(+)	-1.4189***	-2.4978***	2.1474***
		(0.396)	(0.676)	(0.625)
nom_ind	(+)	1.5596***	-1.5227***	0.1027
		(0.362)	(0.352)	(0.318)
fincom_inside	(-)	-5.0935***	-4.0196**	-8.0582***
		(1.064)	(1.859)	(1.202)
boardsize	(+)	0.2573**	0.5608***	0.1475**
		(0.110)	(0.153)	(0.066)
boardsizesq	(-)	-0.0062*	-0.0164***	-0.0078***
		(0.003)	(0.005)	(0.002)
ceobusyness	(-)	-0.2388	-0.1145	-0.1761
		(0.145)	(0.205)	(0.175)
dirover70	(-)	0.3462	-3.5233***	-3.1115***
		(0.712)	(0.877)	(0.655)
aud_ind	(+)	1.7266***	0.6580	-1.2106***
		(0.556)	(0.734)	(0.347)
fin_expert	(+)	0.6393**	0.0846	0.4157
		(0.301)	(0.300)	(0.628)
lev	(-)	-2.3010***	-3.7333***	-5.6211***
		(0.684)	(0.604)	(0.663)
roa	(+)	0.2100	3.4041**	7.8895***
		(2.989)	(1.437)	(2.383)
loss	(-)	-1.9939***	-2.7098***	-0.8417***
		(0.467)	(0.305)	(0.175)
int_cov	(+)	0.0151**	-0.0210*	0.0025
		(0.007)	(0.011)	(0.003)
size	(+)	0.4822***	0.5302***	0.8439***
		(0.120)	(0.157)	(0.123)
dy	(+)	0.0144***	0.0264***	-0.0051*
		(0.006)	(0.008)	(0.003)
highdy	(+)	1.2057***	0.7076***	1.7061***
		(0.220)	(0.261)	(0.155)
Observations		1,076	671	1,136
Year FE		Yes	Yes	No
Quarter FE		Yes	Yes	Yes
Pseudo R2		0.328	0.293	0.308

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10