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ERIM REPORT SERIES <i>RESEARCH IN MANAGEMENT</i>	
ERIM Report Series reference number	ERS-2010-025-F&A
Publication	October 2011
Number of pages	46
Persistent paper URL	http://hdl.handle.net/1765/19679
Email address corresponding author	schauten@ese.eur.nl
Address	Erasmus Research Institute of Management (ERIM) RSM Erasmus University / Erasmus School of Economics Erasmus Universiteit Rotterdam P.O.Box 1738 3000 DR Rotterdam, The Netherlands Phone: + 31 10 408 1182 Fax: + 31 10 408 9640 Email: info@erim.eur.nl Internet: www.erim.eur.nl

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REPORT SERIES *RESEARCH IN MANAGEMENT*

ABSTRACT AND KEYWORDS	
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Free Keywords	<p>corporate governance, cost of debt, disclosure, shareholder rights, interaction effect, agency costs, information risk</p>
Availability	<p>The ERIM Report Series is distributed through the following platforms:</p> <p>Academic Repository at Erasmus University (DEAR), DEAR ERIM Series Portal</p> <p>Social Science Research Network (SSRN), SSRN ERIM Series Webpage</p> <p>Research Papers in Economics (REPEC), REPEC ERIM Series Webpage</p>
Classifications	<p>The electronic versions of the papers in the ERIM report Series contain bibliographic metadata by the following classification systems:</p> <p>Library of Congress Classification, (LCC) LCC Webpage</p> <p>Journal of Economic Literature, (JEL), JEL Webpage</p> <p>ACM Computing Classification System CCS Webpage</p> <p>Inspec Classification scheme (ICS), ICS Webpage</p>

Corporate Governance and the Cost of Debt of Large European Firms*

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October 2011

Abstract

This paper examines the effects of different corporate governance mechanisms on the cost of debt for large European firms and documents a novel interaction effect between shareholder rights and disclosure. Improved disclosure leads to a lower credit spread only if shareholder rights are low. A possible explanation for this finding is the ‘share rights or disclose’ hypothesis. If shareholders have sufficient rights to monitor and influence management decisions, debt providers can rely upon shareholders to mitigate agency costs. Otherwise, bondholders require a premium to compensate for the information risk due to uncertainty about the true value of the firm.

Keywords: corporate governance, cost of debt, disclosure, shareholder rights, interaction effect, agency costs, information risk.

JEL Classification: G3, G32, G34

*We are grateful to Abe de Jong and Ingolf Dittmann for useful comments and suggestions. We further benefited greatly from detailed feedback from Ali Nejadmalayeri and other participants of the Symposium on ‘International Corporate Finance and Governance’ (University of Twente, October 2010).

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1 Introduction

The separation of ownership and control in modern firms leads to possible agency costs due to conflicts of interest between management and the providers of capital (Jensen and Meckling, 1976 and Jensen and Ruback, 1983). The presence of good corporate governance mechanisms at the firm level can help to reduce these agency risks. This holds in particular for shareholder rights, which enable providers of equity capital to exercise sufficient control in order to prevent that the firm's management pursues its own interests. Similarly, transparency may help to alleviate the tension between management and investors. An important reason for the occurrence of agency problems between management and investors is information asymmetry. In particular, (potential) capital providers may require a premium on equity and bonds to compensate for the fact that it is difficult (or even impossible) to assess the true value of the firm based on the information made available by the firm's management. Improved disclosure obviously can reduce this information risk (Sengupta, 1998 and Ashbaugh-Skaife *et al.*, 2006).

A substantial body of empirical literature indeed confirms that both the cost of equity and the cost of debt can be affected by the quality of various governance mechanisms, including not only shareholder rights and disclosure but also the composition of the board and takeover defences. While most studies consider different governance components in isolation, it is quite possible that interaction effects occur. For example, Cremers *et al.* (2007) document that shareholder control (proxied by large institutional blockholders) is associated with lower (higher) bond yields if the firm is protected from (exposed to) takeovers. Cremers and Nair (2005) find a similar complimentary effect of these shareholder governance mechanisms on equity returns. Cheng *et al.* (2006) find that a lower cost of equity is achieved only when both shareholder rights and financial transparency or disclosure are high. This is

explained by the reasoning that improved possibilities for shareholders to monitor and discipline the firm's management give managers incentives to disclose information more timely and accurately. Conversely, a higher level of disclosure enhances the ability of shareholders to effectively monitor the firm's management.

In this paper, we conduct a detailed empirical analysis of the relation between the quality of different components of corporate governance and the cost of debt. We distinguish between four governance mechanisms, namely (i) shareholder rights, (ii) takeover defences, (iii) board structure and functioning and (iv) disclosure. While we also examine the effects of these components in isolation, we focus on the possibility of interaction effects between the different governance mechanisms on the cost of debt.

The dataset consists of 542 new bond issues by large European firms during the period 2001-2009. The cost of debt is measured by the yield spread of these issues. The quality of corporate governance is measured by means of corporate governance ratings constructed by Deminor.

Our main findings can be summarized as follows. We find a strong interaction effect between the quality of disclosure and shareholder rights. Firms' cost of debt is negatively associated with the quality of disclosure but only if shareholder rights fall below a certain level. At the same time, the cost of debt is always reduced by an increase in shareholder rights, independent of its level and independent of the quality of disclosure. The effects of disclosure on the cost of debt are not only statistically but also economically significant. We find that the credit spread for firms with shareholder rights lower than 6 (on a scale from 0-10) decreases with more than 40 basis points if we move from the lower quartile to the upper quartile of disclosure.

The negative interaction effect between disclosure and shareholder rights that we find contradicts the complimentary effect for the cost of equity as documented

by Cheng *et al.* (2006). A possible explanation for our finding is that for the cost of debt, these governance mechanisms act more like substitutes. More precisely, we formulate the hypothesis that the effect of disclosure on the cost of debt crucially depends on the level of shareholder rights. This ‘share rights or disclose’ hypothesis states that a high level of disclosure only has a beneficial effect on the cost of debt if shareholder rights are low. If shareholder rights are high and thus agency costs between capital providers and management are low, the economic relevance of information risk for debt holders is low as well. If management misallocates capital, shareholders will - sooner or later - intervene and enforce corrective action in case they have sufficient possibilities to do so. However, if shareholder rights are low, debt providers must be able to estimate the healthiness of the firm properly themselves, requiring a sufficient level of disclosure. The less rights shareholders have to monitor and discipline management, the more important disclosure is for the providers of debt. Put differently, the firm’s management should ‘share rights or disclose.’

Bradley and Chen (2010) suggest that the effect of shareholder rights on the cost of debt depends on a firm’s creditworthiness since the interests of shareholders and bondholders are more aligned if credit quality is high. When a firm is financially distressed, however, stronger power of shareholders would exacerbate the conflict with bondholders, and may therefore even be associated with a higher cost of debt. Our results show that not only the effects of shareholder rights and disclosure on the cost of debt but also their interaction effects are stronger for bonds issued by firms with higher credit quality. This confirms the idea that agency problems between different categories of capital providers are low if the firm’s creditworthiness is high.

A further empirical finding that is of interest is that the substitution effect between shareholder rights and disclosure is relevant only for short-term debt, with maturities less than approximately seven years. This is consistent with the structural credit risk model of Duffie and Lando (2001), in which uncertainty about the

true firm value has a notable effect on credit spreads at short maturities, but is irrelevant at long maturities. Correspondingly, Yu (2005) finds that the quality of disclosure is an effective mechanism to reduce this ‘transparency spread’ for short-term bonds, while disclosure has no effect for long-term debt. We document that this maturity effect continues to apply when we allow for the interaction of disclosure with shareholder rights.

Finally, in the empirical analysis we find no relation between takeover defences or the board structure and the cost of debt. Hence, the quality of these governance mechanisms does not seem relevant for debt providers. We also do not find evidence for the presence of any other interaction effects between different governance components, apart from the substitution effect between shareholder rights and disclosure.

Previous literature on the effects of corporate governance on the cost of debt (which is discussed in more detail in Section 3) includes Sengupta (1998), Bhojraj and Sengupta (2003), Anderson *et al.* (2004), Klock *et al.* (2005), Yu (2005), Ashbaugh-Skaife *et al.* (2006), and Cremers *et al.* (2007). Most of these studies only consider the effects of a specific aspect of corporate governance, such as shareholder rights or board structure. In this paper we make two contributions to the literature. First, our governance measures concern four different components of corporate governance constructed by a single independent source. The availability of four different measures makes it possible to determine the relevance of each component as well as their interaction for the cost of debt, which makes our analysis more comprehensive than studies that take one aspect into account only. Second, we introduce the ‘share rights or disclose’ hypothesis as a possible explanation for the interaction effect we reveal between the quality of disclosure and shareholder rights.

The structure of the paper is as follows. In Section 2 we present the Deminor governance data. We discuss related prior empirical research on the effects of corporate governance on the cost of debt in Section 3. Section 4 describes our econometric

methodology based on linear and threshold regression models, as well as our data set of bond issues by large European firms during the period 2001-2009. We present the main empirical results in Section 5 and conduct further analysis and robustness checks in Section 6. We conclude in Section 7.

2 Governance data

We measure the quality of different dimensions of firm-level corporate governance by means of Deminor ratings. These ratings cover firms included in the FTSEurofirst 300 Index for the years 2000-2008. The Deminor ratings are based on 300 different governance indicators that refer to internationally accepted standards, as outlined by the International Corporate Governance Network (ICGN), the World Bank, the Organisation for Economic Co-operation and Development (OECD) and the Conference Board (Deminor Rating, 2004).^{1,2} The different indicators or criteria can be classified into four categories: (i) rights and duties of shareholders (referred to as Shareholder rights in the remainder of the paper); (ii) range of takeover defences (Takeover defences); (iii) board structure and functioning (Board); and (iv) disclosure on financial matters and corporate governance (Disclosure). For each category a rating is available on a scale from 0 to 10, where a score of 10 (0) corresponds to the best (worst) possible governance quality. The total governance score is simply the sum of the rating scores for the four categories.

The first category of governance criteria, Shareholder rights, concerns the question whether shareholders can exert sufficient power to determine corporate action

¹The Deminor rating methodology further takes into consideration the main orientations chosen by national Codes of Best Practice, among which: the Combined Code in the UK (2003); the Vienot reports and the Bouton report in France (1995, 1999 and 2002); the Kodex in Germany (2002); the Preda Code in Italy (1999); and the Tabaksblat Code in The Netherlands (2003).

²About the same criteria are used by Standard & Poor's for their corporate governance score (Standard & Poor's, 2002). This, taken together with the fact that all of these institutions have more or less the same ideas concerning good corporate governance, leads us to conclude that the Deminor rating is a representative measure for the quality of a firm's corporate governance.

and to steer management in the right direction and away from decisions that harm shareholder value. The score is based on a) the ‘one share - one vote - one dividend’ principle; b) access to and voting procedures at general meetings; and c) maintenance of pre-emptive rights. Firms that respect the shareholders’ roles of control and ownership score high on the ‘one share - one vote - one dividend’ principle. Deminor evaluates whether companies submit voting issues that are perceived as particularly significant to the general meeting of shareholders and assesses the voting structure. Furthermore, companies should respect the pre-emptive rights of the existing shareholders as these stakeholders would like to prevent dilution of their voting or economic power.

The second category, Takeover defences, examines the extent to which the firm attempts to limit the possibility of a hostile takeover through the adoption of anti-takeover provisions. Deminor examines the presence and strength of anti-takeover devices such as poison pills, golden parachutes, core shareholdings and extensive cross-shareholdings. To achieve a high score for this aspect of governance, the range of takeover defences should lead to a favourable bidding process and not preclude the success of a takeover attempt per se. For the purpose of our analysis it is useful to note that the presence of major (institutional) shareholders is also considered to offer protection against hostile takeovers and as such it affects the Takeover defences score negatively.

The third category, Board, measures issues relating to the structure and functioning of the Board, such as the presence of independent directors, the division between the role of Chairman and Chief Executive and the election of the board.

The fourth category, Disclosure, measures whether shareholders and bondholders are able to obtain convenient and comprehensive information about the company’s financial matters as well as its governance characteristics. Deminor analyses for instance the quantity and quality of non-financial information, such as the diversity

and independence of board members, board committees, accounting standards and information on major shareholders of the company.

We obtain Deminor ratings for all firms that were included in the FTSEurofirst 300 Index at some point during the period 2000-2008. In our empirical analysis, we only include year t ratings (which are published at the beginning of year $t + 1$) for a particular firm in case a new bond was issued in year $t + 1$. Furthermore, we exclude financial firms (Worldscope Industry Group code 4300) as their financing decisions are affected by different factors than those of industrial firms (Sengupta, 1998) and some accounting variables of financial firms are difficult to compare to those of non-financial firms.

Table 1 presents descriptive statistics of the governance scores for the resulting sample, comprising 542 firm-year observations (from 186 unique firms).³ We observe a positive trend in the overall score, as well as in the sub-scores for the different corporate governance dimensions. The average total score in 2000 is equal to 19.36, which gradually increases by about 45 percent to 28.19 in 2007. This upward trend is in line with the increased attention paid to governance structures by policymakers, see footnote 1 for a list of National Codes of Best Practice, and the subsequent firm actions to improve their corporate governance. In 2008 a decrease of 8 percent from 28.19 to 25.88 is observed, which is mostly caused by a substantial drop in the average subscore for Takeover defences from 5.60 in 2007 to 3.90 in 2008. The financial crisis might have had an impact on the anti-takeover devices implemented by firms. It is further interesting to note that the changes in average scores vary considerably across the different governance components. Disclosure shows the most pronounced increase by almost 56 percent from 5.20 to 8.09 between 2000 and 2008.

³For the complete set of all firms covered by Deminor, irrespective of whether they issued any bonds during the sample period, we find very similar patterns in the average governance scores across years, countries and industries as those reported here for the sample that is used in our subsequent analysis. Detailed statistics are available upon request.

The governance mechanisms related to the board improve by about 45 percent, from 4.61 to 6.70, comparable to the increase in Takeover defences from 3.77 in 2000 to 5.60 in 2007 (prior to the decline to 3.90 in 2008). The increase in Shareholder rights is much more modest at 24 percent from 5.78 to 7.19.⁴

- insert Table 1 about here -

Tables 2 and 3 present the governance scores by country and industry, respectively. The extensive investor rights in common law countries such as the United Kingdom and Ireland (LaPorta *et al.*, 1998) are confirmed by the relatively high governance scores for firms in these countries. At a level of almost 30, the average scores for the United Kingdom and Ireland are more than 20 percent higher than the average scores for the ‘next best’ countries Sweden, France and Finland.⁵ The average scores for the UK are higher than the overall European average for all four categories, with the difference being most pronounced for Takeover defences. In fact, the only average scores comparable to the UK are those for Germany and Italy on Shareholder rights and Disclosure, respectively.⁶

Across industries, we observe from Table 3 that Beverages, Metal producers, Metal product Manufacturers, Recreation and Tobacco have relatively high total governance scores. These relatively high scores are (at least partly) due to the UK country effect given that 12 of the 18 Beverages observations, 12 of 12 Metal producers observations, 4 of the 6 Metal product manufacturers observations, 8 of the 9 Recreation observations and 14 of the 18 Tobacco observations concern UK firms. If we control for country (and year effects), we find only very little evidence

⁴To some extent this is of course due to the fact that the scores of Shareholder rights were at a higher level at the start of our sample period in 2000.

⁵Note that the number of observations for Ireland is only four, so that the average governance scores for this country have to be interpreted with caution.

⁶The relatively high Shareholder rights scores for Greece and Norway are based on only one and seven observations respectively, hence we refrain from drawing strong conclusions from those.

that average governance scores in particular industries differ significantly from the overall average.⁷

- insert Tables 2 and 3 about here -

3 Prior empirical research

Prior empirical research documents a link between the quality of different corporate governance mechanisms and the cost of debt or the credit rating of the firm. Sengupta (1998) shows a negative relation between the quality of a firm's disclosure and its cost of debt.⁸ This finding would suggest that governance mechanisms can affect bond yields indirectly through a reduction in 'information risk'.⁹ The measure for the quality of disclosure used by Sengupta (1998) is a rating of the firm by financial analysts (AIMR disclosure ratings), while the yield to maturity and the total interest expenses on new bond issues are used to measure the cost of debt. Results show that both measures are negatively related to the quality of disclosure, taking other possible determinants of the cost of debt into account. Moreover, Sengupta (1998) documents that disclosure is particularly important for the cost of debt for firms with insecure future prospects, using the standard deviation of daily stock returns as a measure of future insecurity.

⁷To control for country and year effects we regress the governance scores on country dummies and year dummies and compute industry averages for the residuals.

⁸The relation between disclosure and the cost of equity is analyzed by e.g. Welker (1995), Botosan (1997) and Cheng *et al.* (2006). Welker (1995) documents a negative association between financial analysts' disclosure measurement and the bid-ask spread set by market makers. Botosan (1997) finds for the machinery industry a negative association between disclosure in annual reports and firms' cost of equity, but only for firms with low analyst following. Cheng *et al.* (2006) find a negative relation between the cost of equity and financial transparency as well as shareholder rights. These relations are strengthened by a higher level of the other factor.

⁹Related empirical research on information risk is Mansi *et al.* (2011). They argue that analyst disagreement about future earnings represents a measure of uncertainty about firm value and find that firms with more diverse analysts forecasts of future earnings have lower credit ratings. Francis *et al.* (2008) investigate the relations among voluntary disclosure, earnings quality, and cost of capital.

Yu (2005) examines the relation between the quality of a firm’s information disclosure and the term structure of its bond yield spreads. Using the same AIMR rating as Sengupta (1998), Yu (2005) documents that the credit spread is negatively related to the quality of disclosure. This relation is stronger if the maturity of debt is short, consistent with the structural credit risk model of Duffie and Lando (2001).

Bhojraj and Sengupta (2003) find that bond yields are negatively associated with the percentage of shares held by institutions and the fraction of the board made up by non-officers. Bhojraj and Sengupta (2003) assume that governance mechanisms reduce potential conflicts of interest between management and providers of capital through effective monitoring management’s actions (‘active monitoring’ hypothesis). However they find that *concentrated* institutional ownership has an adverse impact on bond yields as the decisions made by the firm could be influenced by these institutions to their own advantage (‘private benefits’ hypothesis).¹⁰ In particular, large shareholders may exercise their influence over management to expropriate wealth from (minor shareholders and) bondholders.¹¹

Anderson *et al.* (2004) relate the cost of debt to characteristics of the board

¹⁰Many hypotheses in literature refer to (partly) the same effects or actions. We list a few hypotheses here: the ‘active monitoring’ hypothesis states that the existence of large shareholders leads to better monitoring of managers (Agrawal and Mandelker, 1990, see also Demsetz, 1983 and Shleifer and Vishny, 1986), while according to the ‘passive monitoring’ hypothesis large investors have limited incentives to monitor management actions due to the free-riding problem among large investors (Bhojraj and Sengupta, 2003). The ‘management disciplining’ hypothesis refers to the role governance plays in mitigating the agency conflicts between management and all stakeholders (Ashbaugh-Skaife *et al.*, 2006). The ‘wealth redistribution’ hypothesis states that certain governance features can be beneficial for shareholders but potentially harmful to bondholders and vice versa (Ashbaugh-Skaife *et al.*, 2006). The ‘private benefits’ hypothesis states that *concentrated ownership* “...allows the blockholder to exercise undue influence over the management to secure benefits that are to the detriment of the other providers of capital (shareholders and bondholders).” (Bhojraj and Sengupta, 2003, p.457.) Finally, the ‘shared benefits’ hypothesis suggests that concentrated ownership leads to more efficient monitoring and that benefits are shared by all stockholders (*ibid*).

¹¹Examples of wealth expropriation of bondholders are the approval of mergers and acquisitions that only serve the interests of shareholders (Asquith and Wizman, 1990; Warga and Welch, 1993; and Billet *et al.*, 2004) and asset substitution (Jensen and Meckling, 1976). See King and Wen (2010) for an examination of the relation between the overall corporate governance structure and managerial risk-taking behavior.

and document a negative relation between the cost of debt and board independence and board size. They also find that “...fully independent audit committees are associated with a significantly lower cost of debt financing. Similarly, yield spreads are also negatively related to audit committee size and meeting frequency. Overall, these results provide market-based evidence that boards and audit committees are important elements affecting the reliability of financial reports.” (ibid, p.315).¹²

Klock *et al.* (2005) examine the relation between the Gompers *et al.* (2003) governance index and firm value from the perspective of bondholders.¹³ According to Klock *et al.* (2005) the expected relation is not straightforward as anti-takeover provisions might influence the value of debt in several different ways. First, takeovers could reduce the cost of debt as a result of co-insurance (see Billet *et al.*, 2004). Anti-takeover provisions could in this perspective be negative for the value of debt, since this co-insurance effect (which is positive for the debtholders of the target) is prohibited by the use of the anti-takeover provisions. Second, a takeover could have a negative effect on bondholders’ wealth and increase the cost of debt if, for example, management increases leverage or increases the payout (excess cash) to shareholders (on behalf of the shareholders) after the takeover. Third, anti-takeover provisions could improve capital investment decisions,¹⁴ which have a positive influ-

¹²According to John and Senbet (1998) the effectiveness of the board in its monitoring function is determined by its independence, size, and composition. Millstein and MacAvoy (1998) find that firms that have a higher quality structure and performance of the supervisory board overall perform better than firms that have a low quality structure and performance.

¹³Gompers *et al.* (2003) study the influence of corporate governance on stock returns. Using 24 anti-takeover indicators, the authors compose a governance index, which is used to estimate the shareholders rights for approximately 1500 US firms in the period 1990-1999. A low index score implies stronger shareholder rights (weak antitakeover provisions) and a high score vice-versa. The authors find a significantly negative relation between this index and stock returns. Furthermore firms with stronger shareholder rights have higher firm value, higher profits, higher sales growth, lower capital expenditures, and made fewer acquisitions. Bauer *et al.* (2004) perform the same kind of analysis for Europe (EMU countries versus UK). Instead of using anti-takeover indicators, Bauer *et al.* (2004) use the Deminor corporate governance rating (total score) for 2000 and 2001 instead. Bauer *et al.* (2004) find some evidence that governance affects stock returns positively for UK firms but not for EMU countries. The impact of corporate governance on firm value is rather strong for EMU firms but not for the UK.

¹⁴Stein’s (1988) model suggests that managers of sheltered firms are more likely to invest in R&D

ence on shareholder *and* bondholder wealth and decrease the cost of debt. Fourth, if takeover defences make managers invulnerable to the market for corporate control (Jensen and Ruback, 1983), this could have a negative impact on firm performance (because of e.g. shirking of effort) as well as on the wealth of the shareholders and bondholders. This would increase the cost of debt. Fifth, anti-takeover provisions may decrease the risk of the firm and cost of debt if managers invest less in risky projects to protect their job and to reduce their human capital risk (Amihud and Lev, 1981). In sum, takeover defences may have both positive and negative effects on the cost of debt. The empirical results in Klock *et al.* (2005) suggest that the positive effects dominate, as the cost of debt of firms with the strongest management rights (strongest anti-takeover provisions) is found to be 34 basis points lower on average than the cost of debt for firms with the strongest shareholder rights (weakest anti-takeover provisions).

Cremers *et al.* (2007) document a complimentary interaction effect between shareholder control and takeover defences. They find that shareholder control (proxied by large institutional block holders) is associated with lower (higher) yields if the firm is protected from (exposed to) takeovers. Chava *et al.* (2009) find that lower takeover defences significantly increase the cost of bank loans. Banks would charge a higher loan spread to firms with higher takeover vulnerability mainly because of their concern about a substantial increase in financial risk after a takeover.¹⁵

Ashbaugh-Skaife *et al.* (2006) structure their analysis by using a framework developed by Standard & Poor's.¹⁶ They find that firms' overall credit ratings are 1) negatively associated with the number of blockholders that own at least 5% own-

like projects. Harris (1990) shows that e.g. golden parachutes positively influences managerial investment in specialized human capital beneficial for the shareholders.

¹⁵For an evaluation of the impact of alternative ownership models on the profitability, cost efficiency and risk of European banks, see Iannotta *et al.* (2007).

¹⁶This framework focuses on four major components of governance: Ownership Structure and Influence, Financial Stakeholder Rights and Relations, Financial transparency and Board Structure and Processes (Standard & Poor's, 2002).

ership in the firm; 2) positively related to weaker shareholder rights in terms of takeover defences; 3) positively related to the quality of 'working capital accruals' and the 'timeliness of earnings'; and 4) positively related to overall board independence, board stock ownership, board expertise and negatively related to CEO power on the board. These relations are explained by the effect of the selected variables on agency conflicts between external stakeholders (bondholders and shareholders) and management ('management disciplining' hypothesis) and potential conflicts between bondholders and shareholders ('wealth redistribution' hypothesis).

The prior empirical research discussed above documents - in general - a negative relation between the cost of debt and the quality of different corporate governance mechanisms, possibly with the exception of Takeover defences. Based on these findings we expect a negative relation between the cost of debt and the quality of Shareholder rights, Board, and Disclosure, and a positive relation between the cost of debt and the Takeover defences score. Following the management disciplining hypothesis, we expect that - as long as the interests of shareholders and bondholders are aligned - firms with high scores for Shareholder rights have lower costs of debt. A negative relation between Board and the cost of debt may be expected due to the beneficial effects of a sound board composition, board size, and independence of committees. For disclosure, improved transparency would lead to a lower cost of debt through the reduction of information risk. The relation between Takeover defences and the cost of debt is expected to be positive based on Klock *et al.*'s (2005) finding that a higher probability of a successful takeover increases the cost of debt.

As argued by Cremers and Nair (2005), different corporate governance mechanisms do not operate in isolation but work together in a system. Hence, it is not unlikely that different components interact to affect the cost of (equity and) debt. In fact, as discussed before, Cremers and Nair (2005) and Cremers *et al.* (2007) document a complimentary effect of shareholder control and takeover defences for the cost

of equity and the cost of debt, respectively. Similarly, Cheng *et al.* (2006) demonstrate that both shareholder rights and disclosure lead to a lower cost of equity, with each of these effects being more pronounced when also the other governance mechanism is of high quality. Given the limited evidence in the empirical literature on interaction effects between governance mechanisms and the cost of debt we refrain ourselves from predicting signs of these interactions. Governance mechanisms might strengthen each other, but could also work as substitutes.

4 Models and data

4.1 Models

We examine the influence of a firm's corporate governance quality on its cost of debt and in particular the possible interactions between the four governance characteristics by means of regression analysis. Specifically, following Sengupta (1998), we relate the cost of debt issued in year $t + 1$ to the quality of corporate governance in year t and a number of control variables. As proxy for the cost of debt we use the yield spread (SPREAD), defined as the yield to maturity of a newly issued corporate bond (YIELD) minus the yield to maturity of a government bond issued at the same date, in the same currency and of similar maturity. The SPREAD is measured on the first day of the bond issue.

For the quality of corporate governance we use the Deminor ratings for Shareholder rights, Takeover defences, Board structure and Disclosure, or the total governance score, as discussed in Section 2.

We include several control variables in our regression models, comprising issue characteristics (issue size, maturity, and special features of the debt), issuer characteristics (leverage, profitability, interest coverage, size, and risk), and market

characteristics (the yield spread of Moody’s Aaa bonds), which have been found to be important determinants of bond yields and ratings in previous literature.¹⁷ To correct for the relatively high governance scores of UK firms we include a UK country dummy. Finally, we also include year dummies to avoid that the positive trend in governance ratings (see Section 2) and the negative trend in yields and spreads during the sample period may lead to spurious results.

Our regression analysis involves two types of models. Specifically, we consider linear specifications of the form

$$y_{i,t+1} = \alpha + \beta'x_{i,t} + \gamma'z_{i,t} + \varepsilon_{i,t+1}, \quad (1)$$

where $y_{i,t+1}$ is the SPREAD on a bond issued by firm i in year $t + 1$, $x_{i,t}$ is a vector of governance scores, $z_{i,t}$ is a vector of control variables. We do not impose strict assumptions on the shocks $\varepsilon_{i,t+1}$. In particular, we allow for general forms of heteroskedasticity across firms and over time by using White’s heteroskedasticity-consistent standard errors. Furthermore, since bonds issued by different firms in the same country may be subject to the same macroeconomic shocks, we cluster the standard errors at the country level.

The vector $x_{i,t}$ contains the Deminor scores for the specific governance dimensions Shareholder rights, Takeover, Board and Disclosure. In order to examine the presence of interaction effects between the four different governance mechanisms, we estimate models that include a single interaction term as well as a model that includes all six possible interaction terms.¹⁸ As discussed in Section 3, we expect negative coefficients for Shareholder rights, Disclosure and Board individually and a

¹⁷See Fisher (1959), Jaffee (1975), Sorensen (1979), Boardman and McEnally (1981), Kidwell *et al.* (1984), Wilson and Howard (1984), Fung and Rudd (1986), Lamy and Thompson (1988), Feroz and Wilson (1992), Ziebart and Reiter (1992), Sengupta (1998), and Bhojraj and Sengupta (2003), among others.

¹⁸We do not include squares of the individual governance scores due to high collinearity with the scores themselves.

positive coefficient for Takeover defences. We leave the interaction terms unsigned.

Significant coefficients for the interaction terms in the linear regression (1) may arise for different reasons. For example, a negative coefficient for the interaction term between Shareholder rights and Takeover defences may be due to the fact that these governance mechanisms mutually reinforce each other. However, it may also be the case that Shareholder rights become an effective mechanism for lowering the cost of debt only when a certain level of Takeover defences is in place, as suggested by Cremers *et al.* (2007). In order to examine the nature of the interaction effects between different corporate governance mechanisms in more detail, we apply threshold models of the form

$$y_{i,t+1} = \alpha + \beta_1' x_{i,t} I[q_{i,t} \leq r] + \beta_2' x_{i,t} I[q_{i,t} > r] + \gamma' z_{i,t} + \varepsilon_{i,t+1}, \quad (2)$$

where $I[A]$ is an indicator function that is equal to 1 in case the event A occurs and 0 otherwise. The specification in (2) allows the coefficients of the governance scores to be different depending on whether the variable $q_{i,t}$ takes a value below or above the threshold r .

We use this threshold model as an alternative way to examine the presence of interaction effects between different governance mechanisms. This is achieved by using each of the four governance scores as the threshold variable $q_{i,t}$, where we test the null that the coefficients of the governance scores, both individually and simultaneously, are the same for values of $q_{i,t}$ above and below the threshold r . The attractive feature of the threshold regression approach is that the threshold value r need not be specified a priori, but can be estimated along with the other model parameters using least squares. The estimation boils down to a grid search across different values of r , making use of the fact that the model is linear in the remaining coefficients when the threshold is fixed. In all cases, we limit the grid search by the

15th and 85th percentiles of the empirical distribution of the threshold variable.

The estimation procedure also allows us to construct a Wald test of the null hypothesis that the coefficients of the governance scores do not depend on the value of $q_{i,t}$, i.e. $H_0 : \beta_1 = \beta_2$. Due to the fact that the threshold value r is not identified under the null hypothesis, the asymptotic distribution of this Wald statistic is not standard, see Andrews (1993) and Hansen (1996) for a general treatment. Here we use the fixed regressor bootstrap procedure of Hansen (2000) to obtain appropriate p -values, which are robust to the presence of heteroskedasticity and instability in the governance scores $x_{i,t}$.

4.2 Data

Information on bond issues in 2001-2009 is obtained from Bloomberg. Companies that issued bonds in either Japanese Yen (JPY) or a Floating Rate Note (FRN) are removed because of their strongly deviating yields. The yield of JPY-denominated bonds is low throughout the sample period, and the yield of the FRN fluctuates along with the market interest rate. This complicates a comparison to the other observations in our sample. We further exclude a few specific bond issues for which no reliable data could be obtained about the identity of the issuing entity. Taken together, these data screens result in a sample of 542 bond issues by 186 unique firms from 17 European countries.¹⁹

For the control variables, the issue characteristics of the 542 bonds (size, maturity, callable, convertible and subordinated) are obtained from Bloomberg. All the issue amounts (size) are converted to euros, using exchange rates on the issue date. The issuer characteristics are obtained from various sources. Precise definitions of the control variables and their expected relations with the cost of debt are listed

¹⁹Austria (5 issues), Belgium (8), Switzerland (26), Denmark (1), Finland (9), France (127), Germany (72), Greece (1), Ireland(4), Italy (23), Luxembourg (3), The Netherlands (37), Norway (7), Portugal (3), Spain (26), Sweden (32), and United Kingdom (158).

in Table A.1 in the Appendix. For the market condition variables we obtain the yield of a comparable government bond (same maturity) in the same currency as the issued bond. European government bonds are used for bond issues in euros (source: Ecwin). In addition, Moody's Aaa-rated bonds are used as well as U.S. government bonds with the longest maturity. For each observation in the sample, the TREASURY and BC variables are calculated for the day of the particular debt issue.

We winsorize all variables except the governance ratings in order to mitigate the effect of outliers in our regression models. Observations exceeding the mean plus or minus three times the standard deviation are set to this value.

Table A.2 in the Appendix provides descriptive statistics for all variables used in the analysis, including the mean, median, standard deviation and the 25th and 75th percentiles. The table shows that the mean SPREAD is 0.50%, whereas the mean YIELD is 4.33%. The median issue size is 500 million and the median time to maturity is 7 years. Twelve percent of the observations are bonds that are callable or convertible, while only seven percent of the issues concern subordinated debt. The median size of the firms (total assets in book value) is about 24 billion.

Table A.3 in the Appendix shows Pearson correlation coefficients among the variables. The correlation coefficients between the independent variables are all fairly small, with the exception of the Disclosure and Board scores. The correlation between these governance measures is 0.83.²⁰ Obviously, of particular interest are the correlations between the SPREAD as our proxy for the cost of debt and the corporate governance scores. We observe that all these correlations are negative, although their magnitude is quite modest. Board and Disclosure have the strongest link with the SPREAD variable, with correlations of -0.17 and -0.18 .

²⁰Accounting for year effects and the UK effect, the correlation declines to 0.62.

5 Main results

5.1 Linear regression model

The estimation results for the linear regression model as given in (1) are shown in Table 4.²¹ Columns [1] and [2] contain results for the model without interaction terms between the governance variables. Strikingly, these results do not show any relation between the cost of debt and the total governance score or the scores for individual governance components. However, including all six interaction terms - in addition to the individual governance measures - we find significant coefficients for the governance measures Shareholder rights and Disclosure individually as well as for their interaction term. The coefficients for Board and Takeover defences are not significant, just like any of the (five other) interaction terms involving one of these governance components.^{22,23} The same findings are obtained with the regression models that include a single interaction term only.

Focusing on the interaction term between Disclosure and Shareholder rights column [3] in Table 4 shows the estimation results of the more parsimonious specification that only includes this interaction term. The coefficients for Disclosure and Shareholder rights have the expected negative sign, while the coefficient of the interaction term between Disclosure and Shareholder is positive. All three coefficients

²¹To save space, we do not show the estimated coefficients for the year dummies and the UK dummy. These are available upon request.

²²The estimated coefficients for Board and Takeover defences are 0.145 and 0.079. For the interaction terms of Takeover defences and Shareholder rights, Board and Shareholder rights, Board and Takeover defences, Disclosure and Takeover defences, and Disclosure and Board the estimates are -0.002 , -0.021 , -0.006 , -0.004 , 0.000 , all being insignificant at the 10% level. The smallest p-value for the interaction terms is 0.58.

²³To further check the robustness of the linear regression results we estimate the model omitting utility firms (which tend to be regulated and may have different features of governance mechanisms), and omitting firms that issue either convertible, callable or subordinated bonds. In both cases, the (untabulated) results show significant coefficients for Shareholder rights, Disclosure and their interaction. If we use the YIELD instead of the SPREAD - as in Sengupta (1998)- we again find negative coefficients for Shareholder rights and Disclosure that are significant at the 1% level, while the interaction term itself has a significantly positive coefficient of 0.033.

are significantly different from zero even at the 1% level (based on a two-sided test). Thus, while higher scores for Disclosure and Shareholder rights individually lead to a reduction in the cost of debt, their interaction appears to increase the cost of capital.²⁴

The magnitudes of the coefficient estimates for Shareholder rights (-0.255), Disclosure (-0.300) and for their interaction term (0.040) can be used to assess the economic significance of the interaction between these corporate governance measures on the cost of debt. For example, on average the spread on bond issues is approximately 6.8 basis points lower ($-0.300 + 5.81 \times 0.040$) for each point increase in the Disclosure score for firms at the lower quartile of the Shareholder rights scores.²⁵ By contrast, for firms at the upper quartile of the Shareholder rights scores, each point increase in Disclosure leads to an increase in the spread of 1.0 basis point ($-0.300 + 7.76 \times 0.040$). Firms with relatively weak shareholder rights can reduce their cost of debt by improving their disclosure, while this is not the case for firms with strong shareholder rights. Conversely, firms at the lower quartile of Disclosure (5.91) can reduce the spread on bond issues by approximately 1.9 basis points ($-0.255 + 5.91 \times 0.040$) for each point increase in their Shareholder rights score. For firms at the upper quartile of the Disclosure scores, each point increase in Shareholder rights leads to an increase in the spread of no less than 7.1 basis points ($-0.255 + 8.16 \times 0.040$).

- insert Table 4 about here -

As discussed in the previous section, the significant interaction term between

²⁴Including additional industry dummies does not affect the results. In this case the estimated coefficients for Shareholder rights, Disclosure and the interaction term are -0.297 , -0.310 and 0.044 , with all three coefficients again being significant at the 1% level. As only two of the 23 industry coefficients are significant, we do not consider industry effects in the remainder of the analysis.

²⁵The 25th percentile observation for the governance measure Shareholder rights is 5.81, see Table A.2.

Shareholder rights and Disclosure may be due to different mechanisms. It may be that the substitution effect is two-way, as just described. On the other hand, it may also reflect a unidirectional effect, with increased Shareholder rights reducing the cost of debt only if Disclosure is low or vice versa. In the next subsection we estimate threshold models to determine the nature of the interaction between Disclosure and Shareholder rights more precisely.

Finally, all significant coefficients for the included control variables have their expected signs. Bond issues with a longer maturity have a higher cost of debt, as well as subordinated bonds and non-convertible bonds. The fact that a debt issue involves subordinated bonds, increases the credit spread by 42 basis points, on average, see column [3] of Table 4. The spread for convertibles is 2.450% lower compared with non-convertible bonds.²⁶ Concerning the issuer characteristics, we confirm previous findings that the cost of debt increases with leverage and risk of equity, while it declines with profitability and size.

5.2 Threshold regression model

We use the threshold regression model given in (2) to obtain more insight into the nature of the interaction between Disclosure and Shareholder rights. In addition we again explore the possibility of other interaction effects by testing the null hypothesis $\beta_1 = \beta_2$ in (2) using each of the four governance measures as threshold variable. We conduct the test for all four governance measures jointly and for each of them individually (while assuming that the coefficients of the other three governance characteristics do not change according to the value of the threshold variable). In order to account for the gradual increase of the governance scores over time as well as

²⁶Excluding the convertible, callable and subordinated bonds from the estimation sample does not affect the results for the corporate governance characteristics. In column [3], we find that the coefficient for Shareholder rights in this case is -0.225 (t-value -1.801), for Disclosure -0.327 (t-value -2.996) and for the interaction term 0.040 (t-value 2.253).

the high scores for UK firms, the governance variables are cleaned from these effects when they are used as threshold variable.²⁷

Table 5 presents p -values of the heteroskedasticity-consistent Wald test of the relevant null hypothesis. The p -values are obtained by means of the fixed regressor bootstrap procedure with 999 bootstrap replications.

- insert Tables 5 and 6 about here -

The only significant test statistics (at the 5% level) occur when Shareholder rights is used as threshold variable. Testing equality of the coefficients of all four governance variables jointly results in a test statistic with a p -value of 0.024. Testing the specific governance scores individually, we reject the null hypothesis of linearity for Disclosure but also for Shareholder rights and for Board. We return to this issue below. Concentrating first on the interaction between Shareholder rights and Disclosure, we note that no evidence for a changing effect on the cost of debt is obtained for Shareholder rights in case Disclosure is the threshold variable. This suggests that the significant interaction term in the linear regression is due to the fact that the level of Shareholder rights influences the relation between Disclosure and the cost of debt but not the other way around.

Table 6 shows estimation results for the threshold model when the coefficients of all four corporate governance measures are allowed to vary with Shareholder rights acting as the variable $q_{i,t}$. The effect of Disclosure indeed depends remarkably on the level of Shareholder rights, in the sense that the coefficient estimate for Disclosure

²⁷We remove the time and UK effects from the governance scores by estimating the auxiliary regression

$$x_{i,t} = \delta_0 + \sum_{j=1}^8 \delta_j (D_{it}(1999+j) - D_{it}(2008)) + \delta_{UK} (D_{it}(\text{UK}) - D(\text{non-UK})) + \eta_{i,t}, \quad (3)$$

where $x_{i,t}$ is the governance score for firm i in year t , $D_{it}(1999+j)$ are dummy variables for the year $1999+j$ ($j = 0, 1, \dots, 9$), and $D_{it}(\text{UK})$ and $D(\text{non-UK})$ are dummy variables for UK and non-UK firms, respectively. We then use $\hat{\delta}_0 + \hat{\eta}_{ij,t}$ as the threshold variable $q_{i,t}$.

is significantly negative at -0.186 when Shareholder rights is below the threshold level of around 6, while it is equal to -0.014 and not significant for higher values of Shareholder rights. Testing the null hypothesis that the two coefficients are equal by means of a heteroskedasticity-consistent Wald test renders a p -value of 0.088. In economic terms, the estimation results imply that for firms with shareholder rights below the threshold the credit spread decreases with 42 basis points if we move from the lower quartile to the upper quartile of disclosure ($-0.186 \times (8.16 - 5.91)$). As indicated in Table 6, the estimate of the threshold r is such that Shareholder rights is below this value for 119 observations. Hence, the effect of disclosure is relevant for about one quarter of the firms in our sample.

It is also interesting from Table 6 to note the changing effects of Shareholder rights and Board. The coefficient for Shareholder rights is -0.229 for firms with low Shareholder rights and -0.149 for firms with high Shareholder rights. A heteroskedasticity-consistent Wald test of the null that these coefficients are equal renders a p -value of 0.251. Hence, we cannot reject the null that the relation of Shareholder rights with the cost of debt is linear. The relation between the cost of debt and Board also is not influenced by the level of Shareholder rights, in the sense that the effect of Board on the cost of debt is insignificant under both regimes. At first sight, it may seem that the conclusions drawn here concerning the effects of Shareholder rights and Board on the cost of debt are inconsistent with the results of the linearity tests reported in Table 5. The small p -values of 0.010 and 0.034 for Shareholder rights and Board, respectively, suggest that linearity can be rejected in favor of a nonlinear relation that depends on the level of Shareholder rights. Note however that these tests are conducted under the assumption that the effects of the other three governance mechanisms are linear. Apparently, neglecting the nonlinear effects of Disclosure on the cost of debt leads to a spurious rejection of linearity for Shareholder rights and Board.

In sum, the threshold regression analysis together with the fact that the test results in Table 5 confirm a unidirectional interaction effect between Shareholder rights and Disclosure and do not indicate the presence of threshold effects for other variables.

5.3 A possible explanation: The ‘share rights or disclose’ hypothesis

In order to explain the unidirectional interaction effect between Shareholder rights and Disclosure we introduce the ‘share rights or disclose’ hypothesis. This hypothesis states that the relation between the cost of debt and Disclosure is nonlinear and crucially depends on the quality of shareholder rights. In particular, an increased level of disclosure reduces the cost of debt only when the level of shareholder rights is low.

More specifically, the reasoning is as follows. If the quality of shareholder rights is high, agency risk and information risk are relatively low. The high level of shareholder rights enforces better managerial decision making, which should benefit all providers of capital, holders of equity and debt. In this case the need for a high quality of disclosure for the providers of debt is as such reduced. Shareholders take care. In other words, the more rights shareholders have to discipline management, the less important disclosure becomes for the providers of debt. However if agency risk is high because of a low quality of shareholder rights, there is more need for a high quality of Disclosure. In this situation providers of debt should be able to estimate the value and risks of the assets in place and growth opportunities of the firm by themselves. We expect that firms that score low on Shareholder rights face a higher credit spread if their score for Disclosure also is low, as providers of debt would require compensation for the uncertainty about the true value of the firm,

cf. Duffie and Lando (2001). Firms that do not share rights with shareholders but communicate relatively well, and thereby reduce information risk, are rewarded with a lower cost of debt.

6 Further analysis and robustness checks

6.1 The role of credit quality

We examine the influence of the credit quality of the issuer on the relevance of the ‘share rights or disclose’ hypothesis. This is motivated by the idea that the level of agency problems between shareholders and the holders of debt depends on a firm’s creditworthiness (see Bradley and Chen, 2010). If a firm is of high quality, the interests of shareholders and bondholders are more aligned with each other and, therefore, stronger shareholder rights may lead to lower costs of debt. However, when a firm is financially distressed more power for shareholders would exacerbate a possible conflict with bondholders. For this purpose we estimate the linear regression model with the interaction term between Shareholder rights and Disclosure for subsamples formed according to the value of the issuer’s interest coverage ratio and volatility being below or above its median. We assume a positive relation between the creditworthiness of the firm and the interest coverage ratio and a negative relation with equity’s volatility.

- insert Table 7 about here -

The results are reported in Table 7.²⁸ The results in columns [1]-[4] show that the magnitudes of the coefficients of shareholder rights, disclosure, and their interaction

²⁸To save space, in Table 7 (and all subsequent tables with results of robustness checks) we only show the coefficient estimates for the corporate governance variables. The estimates for the control variables are similar to those in the corresponding models in Table 4. Detailed results are available upon request.

are significant for high (low) levels of interest coverage (volatility) and not significant for low (high) levels. This is in line with the hypothesis of Bradley and Chen (2010) and suggests that the share rights or disclose hypothesis is valid especially for firms of high credit quality.

6.2 The role of maturity

As stated in Section 3, using secondary market yields Yu (2005) finds that the relation between the credit spread and disclosure is influenced by the maturity of debt. The influence of transparency on the spread is especially large if the maturity of debt is short, consistent with the structural credit risk model of Duffie and Lando (2001). We examine whether a similar maturity effect is present for the interaction between Shareholder rights and Disclosure for the spreads of newly issued bonds. Following Yu (2005), we estimate the linear regression model as given in (1) but now including additional interaction terms with the maturity of debt. In particular, starting from model [3] in Table 4, we add an interaction term between the logarithm of the bond maturity and Disclosure or Shareholder rights, while we also consider a model that includes both interaction terms plus a threefold interaction term between log maturity, Shareholder rights and Disclosure. Finally, we estimate the original specification but for subsamples of observations for which maturity is below and above the median.

The results are reported in Table 8. In column [1], the coefficient for the interaction between Disclosure and Maturity is positive and significant at the 5% level. This implies that the negative relation between the spread and disclosure becomes weaker as the maturity of the newly issued bond increases, in line with the findings of Yu (2005). The results in column [2] suggest that the influence of Shareholder rights does not depend on maturity, as the coefficient of their interaction term is not significant even at the 10% level. The interaction term between maturity and Share-

holder rights is significantly positive in column [3] though, when the interaction term between maturity and Disclosure also is included as well, together with the threefold interaction term between maturity, Shareholder rights and Disclosure. For the latter we find a negative coefficient of -0.057 . This negative coefficient is consistent with the results for Disclosure and Shareholder rights separately and suggests that the interaction between Disclosure and Shareholder rights weakens for debt with longer maturities. The results in columns [4] and [5] convincingly demonstrate that this indeed is the case. Limiting the estimation sample to observations with a maturity below its median (which is equal to 7 years), we find highly significant negative coefficients for Shareholder rights and Disclosure separately and a significantly positive coefficient for their interaction term. The coefficient of the interaction term is equal to 0.064, or 60 percent larger in magnitude than for the full sample, see column [3] in Table 4. By contrast, none of the governance variables is significant if the model is estimated for the subsample of observations with maturity above its median. Note that the coefficient of the interaction term between Shareholder rights and Disclosure is equal to zero up to the third decimal.

In sum, our results confirm Yu's (2005) findings that the impact of governance on the cost of debt is stronger for shorter maturities than for longer maturities. We document that this is not limited to the effect of Disclosure itself, but applies equally well to its interaction effect with Shareholder rights. Hence, the 'share rights or disclose' hypothesis seems relevant especially for short-term debt.

- insert Table 8 about here -

6.3 The role of the board structure

As noted in Section 4, the correlation between Disclosure and the governance measure Board structure is rather high at 0.83. This raises the question whether our

previous results on the role of Disclosure might in fact be due to the (interaction) effects of Board structure (with Shareholder rights). In order to address this issue we estimate the linear regression model in (1) again i) without the Board structure variable and ii) including an (additional) interaction term between Board structure and Shareholder rights. The results, shown in Table 9, confirm our previous findings. In column [2], we observe negative coefficients for Shareholder rights and Board and a positive coefficient for their interaction term, mimicking the results in column [3] in Table 4, with the difference that here the coefficient for Board is insignificant. Including both interaction terms (column [3] in Table 9), we again find significantly negative coefficients for Shareholder rights and Disclosure and a significantly positive coefficient for their interaction term. Furthermore, the magnitudes of the coefficients are comparable to those in column [3] in Table 4. In addition, the interaction term between Board structure and Shareholder rights is not significantly different from zero. Hence, we conclude that our findings are not due to neglected effects of Board structure.

- insert Table 9 about here -

7 Conclusion

We examine the effects of four corporate governance mechanisms, namely (i) shareholder rights, (ii) takeover defences, (iii) board structure and functioning and (iv) disclosure on the cost of debt for large European firms, focusing on the possibility of interaction effects between the different governance mechanisms. We document a significant negative relation between the quality of disclosure and the cost of debt, but only if shareholder rights are low. No other interaction effects have been revealed. The interaction between shareholder rights and disclosure is possibly explained by our ‘share rights or disclose’ hypothesis, which states that a high quality of share-

holder rights lowers the possibility of agency conflicts between management and the providers of capital (following the ‘management disciplining’ hypothesis), resulting in a lower level of information risk and a reduced need for disclosure. Information risk is lower then, because shareholders will prevent managers to make decisions that will shift firm’s distribution of future cash flows downward and they can make corrective actions afterwards, if needed. On the other hand, if shareholder rights are low, information risk increases and providers of debt reward firms with a lower cost of debt if they give them more insight in their financial situation, that is, if they reduce the uncertainty about the true firm value by means of a high quality of disclosure. Alternatively, if shareholder rights are low and the quality of disclosure also is low, the firm is like a black box and the perceived information risk by the bondholders is relatively high. This interaction effect between these governance mechanisms is relevant mostly for bonds with a short maturity and for firms with a high creditworthiness. We do not find evidence for any relation between takeover defences nor the board structure and the cost of debt.

Appendix A Descriptive statistics and correlations

Table A.1: Control variable definitions and expected signs of relation with the cost of debt

Variable	Definition and predicted sign
<i>Issue characteristics</i>	
LNSIZE	Logarithm of the issue amount; as a result of the size-effect the measure for the cost of debt is expected to be negatively related to the issue amount.
LNMATUR	Logarithm of the maturity; bonds with a longer maturity are expected to have a higher yield, because of the increased exposure to interest rate risk.
CALL	Dummy variable which is equal to 1 if the obligation is callable and 0 if the bond is not callable from the date of issue. The issuer of the bond will have to pay extra if the bond is callable; therefore a positive relation between CALL and the spread is expected.
CONVERT	Dummy variable which is equal to 1 if the obligation is convertible into shares, otherwise 0; convertible bonds are expected to have a lower spread, because part of the compensation for investors comes from the value of the option.
SUBORD	Dummy variable which is equal to 1 if the bond is subordinated, otherwise 0; subordinated bonds are expected to have a higher spread.
<i>Issuer characteristics</i>	
DE	Book value of long term interest bearing debt divided by the market value of equity at the end of year t ; firms with a higher DE ratio are expected to have a higher spread.
MARGIN	Net income before preferred dividends in year t divided by net sales or revenues in year t ; firms with a higher profit margin are expected to have a lower spread.
TIMES	The sum of net income before interest and tax expense of year t divided by interest expense in year t ; firms with a higher ratio are expected to have a lower spread.
LNASSET	Natural logarithm of the total assets at the end of year t ; larger firms are expected to have a lower spread.
STDRETN	Standard deviation of the daily stock return in year t corrected for dividends and stock splits. Standard deviation is a measure of total risk of equity. We assume a positive relation with the spread.
<i>Market characteristics</i>	
TREASURY	Yield to maturity of a government bond at the same date, in the same currency and of similar maturity; we expect a positive relation between the yields of the issued bonds and the treasury bonds.
BC	Yield (on the date of the company's bond issue) on Moody's US Aaa-bonds minus the yield on US government bonds with the longest maturity (also on the date of issue); the yield and spread of the issued bond are expected to increase with an increase of BC. We assume this U.S. risk spread is related to the European risk spread.

Table A.2: Summary statistics

Variable	Mean	St.dev.	Median	25%	75%
SPREAD	0.50	1.31	0.65	0.00	1.14
YIELD	4.33	1.54	4.33	3.23	5.36
RATE	3.47	0.91	3.00	3.00	4.00
LNSIZE	20.05	0.98	20.21	19.73	20.72
LNMATURITY	1.96	0.49	1.95	1.61	2.30
CALL	0.12	0.32	0.00	0.00	0.00
CONVERT	0.07	0.25	0.00	0.00	0.00
SUBORD	0.03	0.17	0.00	0.00	0.00
D/E	0.43	0.44	0.29	0.14	0.58
MARGIN	7.04	9.52	6.47	3.38	11.09
TIMES	6.66	7.83	4.93	2.97	8.90
LNASSET	23.90	1.02	23.84	23.14	24.57
STDRETN	2.20	0.99	2.02	1.40	2.70
TREASURY	3.83	0.92	3.93	3.21	4.59
BC	1.01	0.46	0.92	0.61	1.28
Governance total	23.80	6.49	23.52	18.94	28.99
Shareholder rights	6.68	1.32	7.01	5.81	7.76
Takeover defences	4.42	3.65	4.00	1.00	8.00
Board structure	5.78	1.67	6.09	4.51	7.17
Disclosure	6.92	1.61	7.31	5.91	8.16

Note: This table provides summary statistics for the variables employed in the analysis for the cost of debt of 542 bond issues over the period 2001-2009. The variables are defined as follows: SPREAD is the difference between YIELD and TREASURY; YIELD is the yield to maturity at issue date; RATE is the credit rating of the issue (on a scale from 1-9, with a higher value indicating a lower rating); LNSIZE is natural log of the issue amount in euros; LNMATURITY is the natural log of number of years to maturity of the issued bonds; CALL = 1 if the bonds are callable, 0 otherwise; CONVERT = 1 if the bonds are convertible, 0 otherwise; SUBORD = 1 if the debt is subordinate, 0 otherwise; D/E is the book value of long term interest bearing debt at the end of year t divided by the market value of common stock at the end of year t ; MARGIN the sum of net income before extraordinary items and equity income of year t divided by net sales in year t ; TIMES is the sum of net income before interest and tax expense of year t divided by interest expense in year t ; LNASSET is the natural log of book value of total assets at the end of year t in euros; STDRETN is the standard deviation of daily stock returns in year t corrected for dividends and stock splits; TREASURY is the yield (on the bond issue date) of government bonds in the same currency and with approximately the same maturity as the issued bond; BC is the yield (on the date of the company's bond issue) on Moody's Aaa-bonds minus the yield on U.S. government bonds with the longest maturity (also on the date of issue); Shareholder rights, Takeover defences, Board and Disclosure are Deminor's corporate governance scores for the four categories; Governance total is the sum of the four governance scores.

Table A.3: Summary statistics

Variable	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
SPREAD	1.00																			
YIELS	0.80	1.00																		
RATE	0.22	0.20	1.00																	
LNSIZE	0.01	-0.03	0.15	1.00																
LNMATURITY	0.21	0.42	0.03	0.09	1.00															
CALL	0.00	0.04	0.10	0.01	0.22	1.00														
CONVERT	-0.28	-0.21	0.17	0.00	0.05	0.11	1.00													
SUBORD	0.18	0.24	0.07	-0.07	0.07	0.00	-0.01	1.00												
D/E	0.33	0.22	0.21	0.00	0.00	-0.02	0.01	0.13	1.00											
MARGIN	-0.21	-0.19	-0.19	0.02	0.03	-0.10	-0.26	-0.08	-0.26	1.00										
TIMES	-0.23	-0.28	-0.24	0.06	-0.07	0.04	-0.19	-0.10	-0.35	0.53	1.00									
LNASSET	-0.06	-0.16	-0.17	0.21	-0.13	-0.01	-0.21	-0.08	0.22	-0.10	0.11	1.00								
STDRETN	0.36	0.23	0.19	0.14	-0.11	-0.01	0.30	0.10	0.27	-0.39	-0.28	0.02	1.00							
TREASURY	-0.08	0.53	0.02	-0.05	0.40	0.07	0.03	0.14	-0.12	-0.01	-0.13	-0.19	-0.14	1.00						
BC	0.14	0.06	-0.04	0.14	-0.16	-0.06	-0.13	0.00	-0.07	0.12	0.07	0.19	0.19	-0.11	1.00					
Governance total	-0.12	-0.15	0.14	0.07	-0.02	0.15	-0.08	-0.04	-0.17	0.09	0.14	-0.02	-0.16	-0.08	0.00	1.00				
Shareholder rights	-0.04	-0.12	0.00	0.10	0.01	0.10	-0.03	-0.05	-0.01	0.02	0.08	0.03	-0.09	-0.13	0.02	0.64	1.00			
Takeover defences	-0.05	0.00	0.14	-0.03	-0.03	0.11	-0.01	0.02	-0.17	-0.01	0.04	-0.08	-0.07	0.08	0.01	0.87	0.48	1.00		
Board structure	-0.17	-0.23	0.12	0.11	0.00	0.15	-0.13	-0.05	-0.21	0.21	0.19	-0.01	-0.23	-0.15	-0.01	0.79	0.31	0.47	1.00	
Disclosure	-0.18	-0.29	0.10	0.17	-0.01	0.14	-0.12	-0.10	-0.10	0.17	0.17	0.10	-0.19	-0.24	-0.03	0.72	0.32	0.35	0.83	1.00

References

- Agrawal, A. and G.N. Mandelker (1990), Large shareholders and the monitoring of managers: The case of antitakeover charter amendments, *Journal of Financial and Quantitative Analysis* 25, 143-161.
- Amihud, Y. and B. Lev (1981), Risk reduction as managerial motive for conglomerate mergers, *Bell Journal of Economics* 12, 605-617.
- Anderson, R.C., S.A. Mansi and D.M. Reeb (2004), Board characteristics, accounting report integrity, and the agency cost of debt, *Journal of Accounting and Economics* 37, 315-342.
- Andrews, D.W.K. (1993) Tests for parameter instability and structural change with unknown change point, *Econometrica* 61, 821-856.
- Ashbaugh-Skaife, H., D.W. Collins and R. LaFond (2006), The effects of corporate governance on firms' credit ratings, *Journal of Accounting and Economics* 42, 203-243.
- Asquith, P. and T.A. Wizman (1990), Event risk, covenants, and bondholder returns in leveraged buyouts, *Journal of Financial Economics* 27, 195-213.
- Bauer, R., N. Guenster and R. Otten (2004), Empirical evidence on corporate governance in Europe: The effect on stock returns, firm value and performance, *Journal of Asset Management* 5, 91-104.
- Bhojraj, S. and P. Sengupta (2003), Effect of corporate governance on bond ratings and yields: The role of institutional investors and outside directors, *Journal of Business* 76, 455-475.
- Billet, M.T., T.-H.D. King and D.C. Mauer (2004), Bondholder wealth effects in mergers and acquisitions: New evidence from the 1980s and 1990s, *Journal of Finance* 59, 107-135.
- Boardman, C.M. and R.W. McEnally (1981), Factors affecting seasoned corporate bond prices, *Journal of Financial and Quantitative Analysis* 16, 207-226.
- Botosan, C.A. (1997), Disclosure level on the cost of equity capital, *The Accounting Review* 72, 323-349.
- Bradley, M. and D. Chen (2010), Corporate governance, credit conditions, and the cost of debt, working paper, university of Baltimore.
- Chava, S., D. Livdan, and A. Purnanandam (2009), Do shareholder rights affect the cost of bank loans?, *The Review of Financial Studies* 22, 2973-3004.
- Cheng, C.S.A., D.Collins and H.H. Huang (2006), Shareholder rights, financial disclosure and the cost of equity capital, *Review of Quantitative Finance and Accounting* 27, 175-204.
- Cremers, K.J.M. and V.B. Nair (2005), Governance mechanisms and equity prices, *Journal of Finance* 60, 2859-2894.
- Cremers, K.J.M., V.B. Nair and C. Wei (2007), Governance mechanisms and bond prices, *Review of Financial Studies* 20, 1359-1388.

- Deminor Rating (2004), Corporate governance research & rating service, version 2004-1.
- Demsetz, H. (1983), The structure of ownership and the theory of the firm, *Journal of Law and Economics* 26, 375-390.
- Duffie, D., D. Lando (2001), Term structures of credit spreads with incomplete accounting information, *Econometrica* 69, 633-664.
- Feroz, E. and E. Wilson (1992), Market segmentation and the association between municipal financial disclosure and net interest costs, *The Accounting Review* 67, 480-495.
- Fisher, L. (1959) Determinants of risk premiums on corporate bonds, *Journal of Political Economy* 67, 217-237.
- Francis, J., D. Nanda and P. Olsson (2008), Voluntary disclosure, earnings quality, and cost of capital, *Journal of Accounting Research*, 46, 53-99.
- Fung, W.K.H. and A. Rudd (1986), Pricing new corporate bond issues: An analysis of issue cost and seasoning effects, *Journal of Finance* 41, 633-643.
- Gompers, P.A., J.L. Ishii and A. Metrick (2003), Corporate governance and equity prices, *Quarterly Journal of Economics* 118, 107-155.
- Hansen, B.E. (1996), Inference when a nuisance parameter is not identified under the null hypothesis, *Econometrica* 64, 413-430.
- Hansen, B.E. (2000), Testing for structural change in conditional models, *Journal of Econometrics* 97, 93-115.
- Harris, E.G. (1990), Anti-takeover measures, golden parachutes, and target firm shareholder welfare, *Rand Journal of Economics* 21, 614-625.
- Iannotta, G., Nocera, G. and A. Sironi (2007), Ownership structure, risk and performance in the European banking industry, *Journal of Banking and Finance* 31, 2127-2149.
- Jaffee, D.M. (1975), Cyclical variations in the risk structure of interest rates, *Journal of Monetary Economics* 1, 309-325.
- Jensen, M.C. and W.H. Meckling (1976), Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, 305-360.
- Jensen, M.C. and R.S. Ruback (1983), The market for corporate control: The scientific evidence, *Journal of Financial Economics* 11, 5-50.
- John, K. and L.W. Senbet (1998), Corporate governance and the board effectiveness, *Journal of Banking and Finance* 22, 371-403.
- Kidwell, D.S., M.W. Marr and G.R. Thompson (1984), SEC rule 415: The ultimate competitive bid, *Journal of Financial and Quantitative Analysis* 19, 183-195.
- King, T.-H.D. and M.-M. Wen (2010), Shareholder governance, bondholder governance, and managerial risk-taking, *Journal of Banking and Finance*, forthcoming.
- Klock, M.S., S.A. Mansi and W.F. Maxwell (2005), Does corporate governance matter to bondholders, *Journal of Financial and Quantitative Analysis* 40, 693-719.
- Lamy, R.E. and G.R. Thompson (1988), Risk premia and the pricing of primary issue

- bonds, *Journal of Banking and Finance* 12, 585-601.
- LaPorta, R.A., F. Lopez-de-Silanes and A. Shleifer (1998), Law and finance, *Journal of Political Economy* 106, 1113-1155.
- Leland, H.E. (1998), Agency costs, risk management and capital structure, *Journal of Finance* 53, 1213-1243.
- Mansi, S.A., W.F. Maxwell and D.P. Miller (2011), Analyst forecast characteristics and the cost of debt, *Review of Accounting Studies* 16 116-142.
- Millstein, I. and P. MacAvoy (1998), The active board of directors and the performance of the large publicly traded companies, *Columbia Law Review* 98, 1283-1322.
- Sengupta, P. (1998), Corporate disclosure quality and the cost of debt, *The Accounting Review* 73, 459-474.
- Shleifer, A. and R.W. Vishny (1986), Large shareholders and corporate control, *Journal of Political Economy* 94, 461-488.
- Sorensen, E.H. (1979), The impact of underwriting method and bidder competition upon corporate bond interest cost, *Journal of Finance* 34, 863-870.
- Standard & Poor's (2002), *Standard & Poor's Corporate Governance Scores: Criteria, Methodology and Definitions*, McGraw-Hill Companies Inc., New York.
- Stein, J.C. (1988), Takeover threats and managerial myopia, *Journal of Political Economy* 96, 61-80.
- Warga, A. and I. Welch (1993), Bondholder losses in leveraged buyouts, *Review of Financial Studies* 6, 959-982.
- Welker, M. (1995), Disclosure policy, information asymmetry and liquidity in equity markets, *Contemporary Accounting Research* 11, 801-827.
- Wilson, E.R. and T.P. Howard (1984), The association between municipal market measures and selected financial reporting practices: Additional evidence, *Journal of Accounting Research* 22, 207-224.
- Yu, F. (2005), Accounting transparency and the term structure of credit spreads, *Journal of Financial Economics* 75, 53-84.
- Ziebart, D.A. and S. Reiter (1992), Bond ratings, bond yields and financial information, *Contemporary Accounting Research* 9, 252-282.

Table 1: Corporate governance scores per year

Year	Total	Shareholder rights	Takeover defences	Board structure	Disclosure	N
2000	19.36 (6.24)	5.78	3.77	4.61	5.20	61
2001	21.93 (6.71)	6.50	5.07	4.74	5.62	62
2002	21.05 (6.25)	6.31	3.80	4.87	6.07	96
2003	22.98 (6.00)	6.54	4.02	5.50	6.91	48
2004	24.06 (5.38)	6.76	4.05	6.01	7.24	52
2005	27.13 (5.83)	7.10	5.52	6.74	7.77	42
2006	26.71 (5.53)	6.93	5.02	6.73	8.03	49
2007	28.19 (5.07)	7.37	5.60	6.98	8.24	52
2008	25.88 (5.31)	7.19	3.90	6.70	8.09	80
All	23.80 (6.49)	6.68	4.42	5.78	6.92	542

Note: The table presents the mean of the Deminor corporate governance scores per year for Shareholder rights, Takeover defences, Board and Disclosure, with the standard deviation in parentheses. The rightmost column shows the number of observations N .

Table 2: Corporate governance scores by country

Year	Total	Shareholder rights	Takeover defences	Board structure	Disclosure	<i>N</i>
Austria	18.07 (2.74)	6.40	1.09	4.28	6.31	5
Belgium	19.27 (4.90)	6.25	2.08	5.31	5.63	8
Switzerland	20.59 (6.81)	6.24	3.47	5.15	5.73	26
Denmark	17.79 (–)	5.48	1.00	5.13	6.18	1
Finland	22.32 (4.03)	6.72	2.17	6.32	7.11	9
France	22.82 (4.98)	6.52	3.83	5.82	6.65	127
Germany	20.07 (4.31)	7.19	3.01	3.85	6.02	72
Greece	18.52 (–)	7.16	1.00	3.99	6.37	1
Ireland	29.93 (1.71)	6.89	8.35	7.08	7.61	4
Italy	20.89 (3.35)	6.19	1.16	5.67	7.88	23
Luxembourg	15.75 (7.40)	5.18	0.67	4.59	5.32	3
Netherlands	20.82 (7.02)	5.59	2.37	5.86	7.01	37
Norway	19.52 (4.23)	7.48	2.71	4.24	5.08	7
Portugal	14.71 (6.20)	4.34	0.67	3.76	5.94	3
Spain	17.13 (3.39)	5.32	0.81	5.04	5.95	26
Sweden	23.91 (5.21)	6.33	5.30	5.41	6.87	32
United Kingdom	29.94 (4.53)	7.35	7.56	7.07	7.96	158
All	23.80 (6.49)	6.68	4.42	5.78	6.92	542

Note: The table presents the mean of the Deminor corporate governance scores by country for Shareholder rights, Takeover defences, Board and Disclosure, with the standard deviation in parentheses. The rightmost column shows the number of observations *N*.

Table 3: Corporate governance scores by industry

Year	Total	Shareholder rights	Takeover defences	Board structure	Disclosure	N
Aerospace	19.95 (3.12)	5.45	0.50	6.50	7.51	6
Apparel	20.79 (5.19)	6.89	4.50	3.85	5.56	2
Automotive	20.94 (5.30)	6.46	3.66	4.61	6.20	45
Beverages	27.29 (5.03)	7.46	5.41	6.79	7.63	18
Chemicals	23.37 (5.87)	6.96	4.51	5.33	6.58	37
Construction	25.47 (4.78)	6.43	5.79	6.21	7.04	30
Diversified	23.16 (5.67)	6.56	4.31	5.57	6.73	36
Drugs, cosmetics and health care	25.38 (7.91)	6.82	5.02	6.31	7.22	21
Electrical	23.76 (3.10)	6.14	4.25	6.09	7.28	8
Electronics	22.92 (5.67)	6.53	4.85	5.19	6.35	21
Food	24.74 (6.81)	6.38	4.85	6.33	7.18	19
Metal producers	30.31 (6.60)	7.05	7.31	7.55	8.40	12
Metal product manufacturers	30.33 (4.42)	7.28	8.15	6.82	8.08	6
Machinery and equipment	23.58 (5.93)	7.06	6.00	4.66	5.86	19
Oil, gas, coal	25.36 (6.24)	6.60	4.33	6.57	7.86	38
Paper	20.90 (1.68)	5.69	2.25	5.93	7.03	4
Printing and publishing	20.32 (8.94)	5.53	3.44	5.00	6.34	11
Recreation	27.45 (5.26)	7.37	6.03	6.52	7.53	9
Retailers	24.05 (7.12)	6.94	4.85	5.81	6.45	35
Tobacco	29.51 (4.52)	7.42	7.21	7.02	7.86	18
Transportation	19.81 (4.05)	6.07	1.19	5.64	6.92	15
Utilities	22.43 (6.95)	6.63	3.32	5.59	6.89	107
Miscellaneous	23.45 (6.60)	6.94	4.04	5.64	6.82	25
All	23.80 (6.49)	6.68	4.42	5.78	6.92	542

Note: The table presents the mean of the Deminor corporate governance scores by industry for Shareholder rights, Takeover defences, Board and Disclosure, with the standard deviation in parentheses. The rightmost column shows the number of observations N .

Table 4: Linear regression model

Variable	Expected Sign	[1]	[2]	[3]
<i>Corporate Governance</i>				
Governance total	–	–0.003 (0.007)		
Shareholder rights	–		0.000 (0.023)	–0.255*** (0.092)
Takeover defences	+		0.007 (0.010)	0.006 (0.009)
Board structure	–		–0.005 (0.088)	–0.013 (0.090)
Disclosure	–		–0.064 (0.091)	–0.300*** (0.088)
Disclosure × Shareholder rights	+			0.040*** (0.015)
<i>Issue characteristics</i>				
LNSIZE	–	0.004 (0.054)	0.009 (0.055)	0.012 (0.056)
LNMATUR	+	0.681*** (0.128)	0.693*** (0.123)	0.687*** (0.123)
CALL	+	0.097 (0.186)	0.093 (0.180)	0.074 (0.182)
CONV	–	–2.446*** (0.459)	–2.452*** (0.460)	–2.450*** (0.461)
SUBORD	+	0.398 (0.355)	0.393 (0.350)	0.419 (0.357)
<i>Issuer characteristics</i>				
DE	+	0.649*** (0.121)	0.652*** (0.127)	0.642*** (0.126)
MARGIN	–	–0.021*** (0.004)	–0.020*** (0.004)	–0.022*** (0.004)
TIMES	–	0.002 (0.005)	0.001 (0.004)	0.001 (0.004)
LNASSETS	–	–0.268*** (0.035)	–0.261*** (0.041)	–0.263*** (0.044)
STDRETN	+	0.410*** (0.072)	0.412*** (0.072)	0.411*** (0.070)
<i>Market characteristics</i>				
BC	+	0.277 (0.205)	0.284 (0.190)	0.292 (0.187)
Adj. R^2		0.501	0.500	0.504
No. of obs.		542	542	542

Note: The Table presents estimation results for the linear regression model in (1) with different contents of the vector of governance scores $x_{i,t}$. Coefficient estimates are obtained with ordinary least squares, with standard errors that are heteroskedasticity-consistent and clustered at the country level shown in parentheses. *, **, and *** denote statistical significance at the (two-sided) 0.10, 0.05, and 0.01 level, respectively.

Table 5: Testing for threshold effects

	Threshold variable			
	Shareholder rights	Takeover defences	Board structure	Disclosure
All	0.024	0.794	0.701	0.543
Shareholder rights	0.010	0.737	0.703	0.874
Takeover defences	0.920	0.966	0.838	0.880
Board structure	0.034	0.806	0.609	0.605
Disclosure	0.012	0.707	0.575	0.381

Note: The table presents p -values of the heteroskedasticity-consistent Wald test of the null hypothesis $\beta_1 = \beta_2$ in the threshold regression model (2). The p -values are obtained by means of the fixed regressor bootstrap procedure with 999 bootstrap replications. The different columns correspond to different choices of the threshold variable q_{it} , while different row correspond to different governance measures for which linearity is tested.

Table 6: Threshold regression model

	$q_{i,t} \leq \hat{r}$	$q_{i,t} > \hat{r}$
Shareholder rights	-0.229*** (0.061)	-0.149*** (0.049)
Takeover defences	0.018 (0.020)	0.011 (0.011)
Board structure	0.120* (0.064)	-0.060 (0.088)
Disclosure	-0.186*** (0.066)	-0.014 (0.097)
\hat{r}	5.952	
Adj. R^2	0.512	
No. of obs.	119	423

Note: The table presents coefficient estimates for the corporate governance scores in the threshold regression model (2) with Shareholder rights as the threshold variable $q_{i,t}$. Standard errors that are heteroskedasticity-consistent and clustered at the country level are shown in parentheses. The final row shows the number of observations for which Shareholder rights is below and above the threshold estimate \hat{r} . *, **, and *** denote statistical significance at the (two-sided) 0.10, 0.05, and 0.01 level, respectively.

Table 7: Robustness checks: The role of credit quality

Variable	Expected Sign	[1]	[2]	[3]	[4]
<i>Corporate Governance</i>					
Shareholder rights	–	–0.022 (0.187)	–0.410*** (0.064)	–0.151 (0.097)	–0.319 (0.296)
Takeover defences	+	–0.004 (0.011)	0.007 (0.021)	–0.011 (0.019)	0.027** (0.013)
Board structure	–	–0.026 (0.128)	0.029 (0.063)	0.020 (0.083)	–0.023 (0.113)
Disclosure	–	–0.072 (0.182)	–0.479*** (0.109)	–0.297*** (0.075)	–0.310 (0.309)
Disclosure × Shareholder rights	+	0.004 (0.028)	0.067*** (0.015)	0.036* (0.019)	0.039 (0.041)
Adj. R^2		0.524	0.495	0.708	0.644
No. of obs.		271	271	271	271

Note: Models [1] and [2] ([3] and [4]) are linear regression models as given in (1) where $y_{i,t+1}$ is the SPREAD of a bond issued by firm i in year $t + 1$, based on the sub-sample of observations for which for which TIMES (STDRETN) is below and above its median value, corrected for year and UK effects. Coefficient estimates are obtained with ordinary least squares, with standard errors that are heteroskedasticity-consistent and clustered at the country level shown in parentheses. *, **, and *** denote statistical significance at the (two-sided) 0.10, 0.05, and 0.01 level, respectively.

Table 8: Sensitivity analysis: The role of Maturity

Variable	Expected Sign	[1]	[2]	[3]	[4]	[5]
<i>Corporate Governance</i>						
Shareholder rights	–	–0.220** (0.102)	–0.433*** (0.141)	–0.975 (0.642)	–0.354*** (0.122)	–0.030 (0.115)
Takeover defences	+	0.007 (0.009)	0.006 (0.009)	0.008 (0.009)	–0.005 (0.015)	0.023 (0.015)
Board structure	–	–0.007 (0.085)	–0.010 (0.089)	–0.010 (0.085)	–0.041 (0.078)	–0.015 (0.071)
Disclosure	–	–0.645*** (0.101)	–0.290*** (0.102)	–1.364** (0.697)	–0.477*** (0.122)	0.005 (0.152)
Disclosure × Shareholder rights	+	0.035** (0.016)	0.039** (0.016)	0.145 (0.104)	0.064*** (0.021)	0.000 (0.018)
LNMATUR × Disclosure	+	0.193** (0.087)		0.564 (0.354)		
LNMATUR × Shareholder rights	+		0.094 (0.089)	0.387 (0.287)		
LNMATUR × Disclosure × Shareholder rights	–			–0.057 (0.052)		
Adj. R^2		0.514	0.505	0.514	0.610	0.412
No. of obs.		542	542	542	271	271

Note: Model [1] is the linear regression model as given in (1), where the additional interaction term LNMATUR × Shareholder rights included. Model [2] includes the additional interaction term LNMATUR × Disclosure. Model [3] includes both additional interaction terms *and* the interaction term LNMATUR × Shareholder rights × Disclosure. Model [4] ([5]) is based on the sub-sample of observations for which LNMATUR is below (above) its median value, corrected for year and UK effects. Coefficient estimates are obtained with ordinary least squares, with standard errors that are heteroskedasticity-consistent and clustered at the country level shown in parentheses. *, **, and *** denote statistical significance at the (two-sided) 0.10, 0.05, and 0.01 level, respectively.

Table 9: Sensitivity analysis: The role of Board structure

Variable	Expected			
	Sign	[1]	[2]	[3]
<i>Corporate Governance</i>				
Shareholder rights	–	–0.252*** (0.082)	–0.126*** (0.039)	–0.260*** (0.091)
Takeover defences	+	0.005 (0.012)	0.006 (0.009)	0.007 (0.010)
Board structure	–		–0.169 (0.130)	0.181 (0.146)
Board × Shareholder rights	+		0.024*** (0.008)	–0.030 (0.022)
Disclosure	–	–0.307*** (0.077)	–0.051 (0.094)	–0.462** (0.180)
Disclosure × Shareholder rights	+	0.040*** (0.014)		0.065** (0.031)
Adj. R^2		0.505	0.501	0.504
No. of obs.		542	542	542

Note: Model [1] is the linear regression model as given in (1), but with Board structure excluded. Model [2] includes the interaction term Board structure × Shareholder rights instead of the interaction term Disclosure × Shareholder rights. Model [3] includes both interaction terms. Coefficient estimates are obtained with ordinary least squares, with standard errors that are heteroskedasticity-consistent and clustered at the country level shown in parentheses. *, **, and *** denote statistical significance at the (two-sided) 0.10, 0.05, and 0.01 level, respectively.

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