Corporate Social Responsibility and the Cost of Corporate Bonds

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Abstract

This study examines how a firm's corporate social responsibility (CSR) performance is associated with the cost of its new bond issues. Using credit ratings as an *ex ante* cost of debt, we find that better CSR performance is associated with better credit ratings. After controlling for credit ratings, our results show that better CSR performance is associated with lower yield spreads but some of the effect is absorbed by credit ratings. When we examine CSR strengths and concerns separately, we find that a higher CSR strength (concern) score is associated with lower (higher) yield spreads. Our results on the effect of firm performance on seven individual CSR dimensions are generally consistent with our main findings. Our results indicate that firms with better CSR performance are able to issue bonds at lower cost and that both CSR strengths and concerns are considered by bondholders. Additional subsample test results suggest that the association between CSR performance and bond yield spreads is more pronounced in investment-grade and non-Rule 144a bonds, for financially healthier bond issuers, for issuers with weaker corporate governance and higher information asymmetry, and for issuers operating in environmentally sensitive industries.

Key words: Corporate Social Responsibility; Information Asymmetry; New Corporate Bond Issue; Cost of Debt

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1. Introduction

The World Bank Council for Sustainable Development defines corporate social responsibility (CSR) as "the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large." CSR has received increasing attention in the business and political world. A recent survey by Lacy et al. (2010) finds that 93% of 766 chief executive officers (CEOs) from all over the world believe that issues related to CSR are critical to the future success of their businesses.[1] Even the current economic downturn has not weakened corporate commitment to CSR activities. About 74% of CEOs report that the economic downturn has led their corporations to align CSR more closely with core business. In the past two decades, a growing number of corporations have dedicated considerable resources to CSR activities. According to the Forum for Sustainable and Responsible Investment (formerly the Social Investment Forum), social responsibility-related investment in the United States grew dramatically from 1995 to 2010, from $639 billion to $3.07 trillion. In 2010, social responsibility investment accounted for 12% of total U.S. asset investment.

Trends in CSR activities have also attracted academic attention, particularly the rationale behind CSR activities (Barnea and Rubin, 2010; Cespa and Cestone, 2007; Elfenbein et al., 2012; Jensen, 2001). There are two opposing theories about CSR: the shareholder theory and the stakeholder theory. According to Friedman's (1962) shareholder theory, a corporation's top priority is to maximize firm value. Some shareholder theorists argue that CSR activities consume corporate resources that should be allocated to generating profit. Thus, they predict a negative relation between shareholder value maximization and CSR activities. In contrast, the stakeholder

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[1] Klaus Kleinfeld, chairman and CEO of Alcoa, one of the world's largest aluminum producers, comments that CSR issues now have to be on everyone's agenda, and that represents a fundamental change (Lacy et al. 2010).

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theory suggests that corporations should go beyond the interests of shareholders and consider the interests of a broader group of stakeholders (Freeman, 1984). Jones (1995) extends stakeholder theory by indicating that CSR is essential for corporations in obtaining necessary resources and stakeholder support.

A KPMG survey finds that the most common reason for disclosing CSR is the belief that social responsibility will provide potential economic benefits to the firm due to a positive reputation effect (Verschoor, 2005). Recent studies provide mixed evidence of the effect of CSR performance on the cost of financing. Dhaliwal et al. (2011) and Ghoul et al. (2011) show that U.S. firms with superior CSR performance obtain cheaper equity financing. Using a sample of loans to U.S. firms, however, Goss and Roberts (2011) find that banks do not reward the CSR investments of borrowers. Until now, little evidence has been uncovered on how U.S. public bondholders value CSR performance. To fill this void, this study examines the economic consequences of CSR performance on the cost of public debt financing. Specifically, we investigate the association between CSR performance (strengths and concerns) and the cost of new corporate bond issues in the U.S. bond market.

We obtain CSR data from the RiskMetrics Group KLD STATS database. We collect bond data from the Mergent Fixed Income Securities Database and accounting data from Compustat. We assign the value of one for each item related to CSR strength or concern and then define each firm's overall CSR performance score as the difference between its total strength and total concern scores. A higher CSR performance score indicates better CSR performance.

Our results indicate the following. First, we find that a higher overall CSR performance score is associated with better credit ratings. After controlling for credit ratings, we find that a higher overall CSR performance score is associated with lower bond yield spreads. This result is

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robust to the use of instrumental variables generalized method of moments (GMM) estimators to address potential endogeneity issues and a variety of other robustness tests.

Second, by examining CSR strengths and concerns separately, we find that a higher CSR strength score is significantly associated with better credit ratings but the estimated coefficient of the CSR concern score is not statistically significant. We also find that the CSR strength score is negatively associated with bond yield spreads and the CSR concern score is positively associated with bond yield spreads.

Third, focusing on firm performance in seven CSR dimensions, we find that higher firm overall performance scores in four CSR dimensions (i.e., community, product, employee relations, and governance) are significantly associated with lower bond yield spreads. Our results also show that the strength scores in three CSR dimensions—environment, community, and governance—are significantly associated with lower bond yield spreads, while the concern scores in three CSR dimensions, including product, diversity, and employee relations, are significantly associated with higher bond yield spreads.

Fourth, our subsample analyses show that the association between CSR performance and the cost of debt is more pronounced in investment-grade bonds and non-Rule 144a bonds, for financially healthier bond issuers, for issuers with weaker corporate governance and higher information asymmetry, and for issuers operating in environmentally sensitive industries.

Last, we also examine whether CSR performance affects bond maturity and the intensity of using covenants, two measures of the indirect cost of debt financing. We find that CSR performance is not significantly associated with bond maturity but negatively associated with covenant intensity. The results suggest that firms with better CSR performance face fewer covenant restrictions. Taken together, our results suggest that bondholders perceive that firms

with better CSR performance are more creditworthy and that both CSR strengths and concerns are considered. Our findings also imply that rating agencies are efficient at incorporating a firm's CSR performance information into credit ratings, but the intangible nature of CSR performance valued by the market may not be fully captured by credit ratings.

Our study is related to but distinct from recent research on CSR and the cost of equity capital (Chava, 2014; Dhaliwal et al., 2011; Ghoul et al., 2011; Sharfman and Fernando, 2008). First, shareholders and debtholders have different claims on a firm's net assets and thus tend to have conflicting interests (Ahmed et al., 2002). Shareholders have residual claims on firm net assets and thus the upside potential of their equity investments is unlimited, while debt providers have no right to claim an extra payoff when the value of the borrowing firm's assets exceeds its contractual debt obligations. However, when firm assets are insufficient to cover contractual firm obligations, lenders may receive less than the promised payments. Due to this asymmetric payoff with respect to firm net assets, debt providers are naturally more interested in the downside risk of their debt investments (Ge et al., 2012). Accordingly, the interests of shareholders and debtholders can diverge. In addition, Merton's (1974) theoretical bond pricing model indicates that shareholders and bondholders value a firm's operating volatility in different ways. On the one hand, CSR activities consume resources that could otherwise help generate profits, so CSR-related expenditure may be considered a poor use of shareholder money. The reduced profits also mean reduced interest-paying ability and increased distress risk. On the other hand, CSR activities can reduce environmental violation and litigation risk and help build firm reputation. Given that debtholders are more sensitive to the downside risk, despite there is evidence that shareholders view CSR performance positively, it is not clear how public bondholders trade off the costs and benefits of CSR activities.

Second, corporate bond financing represents the major source of external funding for U.S. corporations (Denis and Mihov, 2003). The total value of U.S. corporate bond issuance between 1992 and 2009 amounted to about $11.2 trillion, while the total value of equity issuance (including common and preferred stock) for the same period was only about $3.1 trillion.[2] Therefore, understanding the bond market consequences of CSR is important and interesting in its own merit.

Goss and Roberts (2011) investigate the impact of CSR performance on the cost of private bank loans. Their findings suggest that banks charge more for loans to firms with social responsibility concerns; however, banks do not reward firms for their CSR strengths. Our study focuses on public debt financing, which differs substantially from private debt financing in terms of monitoring efficiency (Diamond, 1984) and private information availability (Fama, 1985). As delegated monitors, banks are given access to information about the borrowing firm that may not be available to outsiders. Because banks are able to engage in more detailed monitoring as well as tailor loan terms to strengthen monitoring effectiveness, they may be more finely attuned to any impact of CSR than public lenders are (Goss and Roberts, 2011). On the other hand, since public bondholders may not be able to obtain firm information through private channels as private debtholders do, the information asymmetry problem is more severe in the public bond markets than in the private debt markets. Bondholders may therefore require more voluntary disclosure channels to overcome the limitations of mandatory disclosures. In this sense, bondholders are more likely to use all publically available information, including CSR disclosures, to assess the bond issuer's litigation and credit risk. Therefore, whether the findings in the loan markets are applicable to the bond markets is an empirical question. Thus, our study complements that of Goss and Roberts (2011) and studies on the association between CSR

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[2] Data source: Securities Industry and Financial Markets Association (http://www.sifma.org).

performance and the cost of equity (e.g., Dhaliwal et al. 2011; Ghoul et al. 2011). The findings from all these studies together will provide a comprehensive picture of the consequences of CSR activities on the cost of debt and equity capital.

Our study is related to Menz (2010), which examines the relation between the valuation of euro corporate bonds and the CSR standards of European companies; the author finds that CSR has not yet been incorporated into the pricing of euro corporate bonds. Our study differs from Menz (2010) in two important ways. First, Menz (2010) examines European firms, while we study U.S. firms. Legal institutions in the United States differ from those of European countries and U.S. firms are subject to considerably higher litigation risk related to information disclosure (Fulbright and Jaworski, 2005; Seetharaman et al., 2002). Other studies suggest that there are significant variations in CSR disclosure across countries and that institutional factors, including culture, are significant in explaining cross-national differences in the level and quality of CSR disclosure (van der Laan Smith et al., 2005). Maignan and Ferrell (2003) find significant differences in consumer evaluation of corporate responsibility between the United States, France, and Germany. Van der Laan Smith et al. (2010) also report systematic cross-national differences in investment response to CSR disclosure. Thus, the significant differences in institutional environment and culture between the United States and European countries suggest that the results of Menz (2010) do not necessarily hold in the U.S. bond market. Second, Menz (2010) focuses on the effect of CSR disclosure on the cost of corporate debt, while our study examines the potential impact of CSR performance on U.S. corporate bond issues.

A concurrent study by Oikonomou et al. (2014) also examines the effects of CSR strengths and concerns on the cost of U.S. corporate bonds and credit ratings. Although that study's findings are generally consistent with ours, the two have significant differences with

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regard to sample construction and research design. First, Oikonomou et al. (2014) use data from the primary and secondary bond markets, while our study focuses only on the primary bond market, which provides a clean setting to investigate the effect of CSR performance on initial bond offerings. Second, focusing on a smaller set of CSR dimensions, Oikonomou et al. (2014) consider CSR strengths and concerns separately and remain silent on the effect of a firm's overall CSR performance. Prior literature indicates that the equity market observes overall CSR performance, considering both strengths and concerns together, and thus the joint or net effect is more important (Dhaliwal et al., 2011). In addition to examining the effect of CSR strengths and concerns on a larger set of CSR dimensions, our study provide insights into the effect of a firm's overall CSR performance on its cost of public debt financing. Third, there is a concern about the endogeneity between CSR performance and bond yield spreads and the joint determination of bond yield spreads, maturity, and covenants. We use an instrumental variables approach to address the potential endogeneity issue, which is not studied by Oikonomou et al. (2014). Furthermore, we perform a battery of additional tests to illustrate the variations across different subsamples (investment-grade vs. non–investment-grade bonds; Rule 144a vs. non-Rule 144a bonds; issuers with high financial distress vs. those with low financial distress; issuers with high information asymmetry vs. those with low information asymmetry; issuers with strong governance vs. those with weak governance; and issuers operating in environmentally sensitive industries vs. those operating in other industries), which enlarges the contributions of our study.

Our study contributes to the literature in the following ways. First, our study extends the CSR literature by providing initial evidence of how a firm's overall CSR performance is related to its public debt financing in the U.S. primary bond market. Although there is no evidence that CSR has been incorporated into the pricing of euro corporate bonds (Menz, 2010), our results

suggest that corporate commitment to CSR activities receives public bondholder support in the United States. Our findings complement those of Goss and Roberts (2011) and suggest that public debtholders and private lenders may value CSR activities differently. Our study also complements that of Oikonomou et al. (2014) and suggests that public debtholders incorporate information about a firm's overall CSR performance into their initial bond pricing. Furthermore, we provide evidence that CSR performance is also associated with the indirect cost of debt, that is, bonds issued by firms with better CSR performance are subject to fewer covenant restrictions.

Second, this study extends the literature on corporate bond financing. Prior research focuses largely on using *financial* attributes to explain corporate bond financing patterns (Bharath et al., 2008; Jiang, 2008; Mansi et al., 2011). Our study focuses instead on the relation between bond pricing and *non-financial* information, that is, corporate CSR performance. Our findings suggest that the information of corporate CSR performance is value relevant to the corporate bond market and that bondholders value good CSR performance positively. Therefore, this study provides insight into how the U.S. bond market prices non-financial CSR information.

Finally, our findings have important practical implications. Prior studies show that CSR performance reduces the cost of equity capital and our findings indicate that firms committed to good CSR performance have lower costs of public debt financing. These findings suggest that even though CSR activities consume corporate resources, they also bring benefits to corporations. Therefore, CSR investments are beneficial not only to society, but also to the corporations themselves because they reduce the cost of equity and debt capital. Managers make trade-offs in the costs and benefits of CSR investment. Our evidence could be helpful in making managers aware of the potential benefits of CSR activities.

The remainder of this study proceeds as follows. Section 2 reviews the related literature and develops our hypotheses. Section 3 describes the sample and methodology. Section 4 presents the main results and subsample test results. Section 5 summarizes the results of robustness tests. Section 6 sets forth our conclusions.

2. Literature review and hypothesis development

Until recently, there have been relatively few studies on the importance of non-financial CSR information to the capital markets. The shareholder theory holds that a firm's top priority is to maximize firm value. Accordingly, CSR-related expenditure is considered a poor use of shareholder money and this practice deviates from shareholder value maximization (Friedman, 1962). According to this theory, CSR activities consume resources that could otherwise help generate profits for shareholders; hence a higher CSR performance could hurt shareholders' interest. Reduced profits also mean reduced interest-paying ability and increased distress risk, both of which can be related to higher costs of public debt financing.

On the other hand, the stakeholder theory suggests that corporations should go beyond the interests of shareholders and consider the interests of a broader group of stakeholders (Freeman, 1984). Jones (1995) extends the stakeholder theory by indicating that CSR is essential for corporations in obtaining necessary resources and stakeholder support. From the stakeholder theory perspective, CSR performance may reduce the cost of capital for two reasons. First, CSR-related information captures the dimension of a corporation's environmental risk and decreases information asymmetry, which could eventually affect the cost of equity (e.g., Heinkel et al., 2001; Hong and Kacperczyk, 2009; Jones, 1995; Orlitzky et al., 2003). Jensen and Meckling (1976) indicate that any information that mitigates information asymmetries between contracting parties, thereby reducing adverse selection and moral hazard problems, would be value relevant.

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A large body of literature documents that financial disclosures provide value-relevant information and thus reduce the cost of capital (e.g., Botosan, 1997; Diamond and Verrecchia, 1991; Graham et al., 2005; Healy and Palepu, 2001; Leuz and Verrecchia, 2000). Consistent with this argument, Orlitzky et al. (2003) suggest that CSR-related information is value relevant. Hong and Kacperczyk (2009) find that socially irresponsible firms may have higher litigation risk, such as from lawsuits regarding environmental pollution, unsafe products, and employee benefits. Litigation risk is likely to result in negative future cash flows and decrease a firm's interest-paying ability. Accordingly, investors, including bondholders, will discount the value of irresponsible firms. In other words, the cost of bond financing may be lower for firms with good CSR performance, compared to that for irresponsible firms.

Second, CSR performance can increase the size of the investor base. Heinkel et al. (2001) argue that socially conscious investors prefer to exclude firms with low CSR performance from their investment portfolios. In other words, firms with high CSR performance can increase the relative size of their investor base. The larger the relative size of the investor base, the lower the cost of capital and the higher the market valuation (Merton, 1987).

A few recent studies investigate the relation between CSR performance and the cost of capital.[3] Overall, their findings are consistent with the stakeholder theory. For example, Dhaliwal et al. (2011) find that better CSR performers enjoy a significant reduction in the cost of equity capital when they issue standalone CSR reports for the first time. Ghoul et al. (2011) and Plumlee et al. (2014) find that firms with better environmental performance have lower costs of

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[3] Several studies examine the association between social disclosures and the cost of capital and the findings are mixed. Using a sample of Canadian firms, Richardson and Welker (2001) find that social disclosure increases the cost of equity capital. However, other studies do not find an association between social disclosure and the cost of capital or firm reputation. For example, Clarkson et al. (2013) do not find evidence that voluntary environmental disclosures affect the cost of equity capital. Linthicum et al. (2010) document that CSR did not mitigate negative market reactions to the corporate reputations of Arthur Andersen clients following the Enron audit failure. Unlike these studies, our study focuses on CSR performance.

equity capital. Focusing on private debt financing, Goss and Roberts (2011) find that the cost of bank loans for firms with social responsibility concerns is higher than for more responsible firms; however, banks do not reward the CSR investments of borrowers.

Public debt financing differs from private debt financing in terms of monitoring efficiency (Diamond, 1984; Rajan, 1992) and private information availability (Bhattacharya and Chiesa, 1995; Fama, 1985). Diamond (1984) indicates that a bank, as a financial intermediary, can solve the information duplication and free-rider problems by monitoring borrowers. In addition, Rajan (1992) argues that concentrated bank debt lenders have more incentive to monitor borrowers compared to dispersed, "arm's length" debtholders. Fama (1985) argues that private debt lenders are more efficient and effective in obtaining private information about borrowers than public bondholders are. Similarly, Bhattacharya and Chiesa (1995) develop an analytical model that supports the view that borrowers share proprietary information with a concentrated group of private lenders but not with diffuse public lenders. These findings imply that private debt financing mitigates the information asymmetry between borrowers and lenders, whereas public bondholders may not be able to obtain firm information through private channels. Due to these monitoring and information disadvantages, information about corporate CSR performance is likely more value relevant to public debtholders than to private lenders. More specifically, from the stakeholder theory perspective, we expect bondholders to require lower risk premiums for firms with better CSR performance, in general, and we expect CSR strengths to be associated with lower bond yield spreads and CSR concerns to be associated with higher bond yield spreads, in particular. We state our hypotheses in alternative form, as follows,

H1: *Ceteris paribus, CSR performance is negatively associated with bond yield spreads.*

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H2: *Ceteris paribus, CSR strengths (concerns) are negatively (positively) associated with bond yield spreads.*

As mentioned earlier, if the shareholder theory holds, we will observe CSR performance to be associated with higher bond yield spreads. If bondholders do not use CSR information in their bond pricing, we will observe no association between CSR performance and bond yield spreads.

3. Research design

3.1. Sample selection

We obtain CSR rating scores from the KLD STATS database, which provides ratings for 13 dimensions of corporate CSR performance: environment, community, product, diversity, employee relations, human rights, governance, alcohol, gambling, firearms, military, nuclear power, and tobacco. The KLD STATS database provides ratings for strengths and concerns in qualitative issue areas (the first seven dimensions); controversial business issues (the last six dimensions) are exclusionary screens, with only ratings for concerns available. Following prior studies (e.g., Dhaliwal et al., 2011), our analysis focuses on the first seven dimensions.[4] Sharfman (1996) checks the construct validity of the KLD ratings and confirms that they represent the core of the social performance construct. The KLD STATS database is recognized as one of the largest and most influential databases for CSR measures and it has been used extensively in academic research (e.g., Dhaliwal et al., 2011; Ghoul et al., 2011; Goss and Roberts, 2011).[5]

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[4] We exclude firm's strength and concern scores for compensation (in the governance dimension) because these items are not related to CSR. The results are qualitatively similar when these items are included.

[5] However, the KLD STATS database has limitations. For example, it does not cover detailed information about the length of CSR reports.

We collect bond-specific information from the Mergent Fixed Income Securities Database. We retrieve bond issuer financial information from the Compustat North America database. We eliminate variable coupon and zero coupon bonds, as well as perpetual bonds, because these bonds tend to be unique and behave more like equities (Bessembinder et al., 2009). Since financial firms operate under different regulations and have different debt financing characteristics than industrial firms (Jiang, 2008; Khurana and Raman, 2003), we exclude bonds issued by public financial firms (Standard Industrial Classification codes 6000–6999). After merging the data collected from the above three databases and eliminating observations with missing values, we obtain 4,260 observations from 2,317 firms that disclosed CSR information during the period 1992–2009 to test our hypotheses.[6] To control for the effect of outliers, we winsorize all continuous variables at the top and bottom 1%.

3.2. Empirical models

Based on prior research (Jiang, 2008; Khurana and Raman, 2003; Mansi et al., 2011; Sengupta, 1998; Shi, 2003; Ziebart and Reiter, 1992), we use the following empirical models to test the association between CSR performance and the yield spreads of new corporate bond issues:

$$YieldSpread_{ijt} = \beta_0 + \boldsymbol{\beta_1 CSRT_{it}} + \beta_2 IssuerSize_{it} + \beta_3 ROA_{it} + \beta_4 Leverage_{it} + \beta_5 Big4_{it} + \beta_6 Z\text{-}score_{ijt} + \beta_7 lnMaturity_{ijt} + \beta_8 Covenant_{ijt} + \beta_9 IssueSize_{ijt} + \beta_{10} lnRating_{ijt} + \beta_{11} BusiCycle_{ijt} + \beta_{12} RedeemD_{ijt} + \beta_{13} PutD_{ijt} + \beta_{14} ConvertD_{ijt} + \beta_{15} 415RegD_{ijt} + \beta_{16} 144aRegD_{ijt} + Industry \ \& \ Year \ Indicators + \varepsilon_{ijt} \qquad (1)$$

$$YieldSpread_{ijt} = \beta_0 + \boldsymbol{\beta_1 STR_{it}} + \boldsymbol{\beta_2 CON_{it}} + \beta_3 IssuerSize_{it} + \beta_4 ROA_{it} + \beta_5 Leverage_{it} + \beta_6 Big4_{it} + \beta_7 Z\text{-}score_{ijt} + \beta_8 lnMaturity_{ijt} + \beta_9 Covenant_{ijt} + \beta_{10} IssueSize_{ijt} + \beta_{11} lnRating_{ijt} + \beta_{12} BusiCycle_{ijt} + \beta_{13} RedeemD_{ijt} + \beta_{14} PutD_{ijt} + \beta_{15} ConvertD_{ijt} + \beta_{16} 415RegD_{ijt} + \beta_{17} 144aRegD_{ijt} + Industry \ \& \ Year \ Indicators + \varepsilon_{ijt} \qquad (2)$$

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[6] Relatively small sample sizes are common for studies pertaining to bond markets (Dhillon and Johnson, 1994; Shi, 2003). One possible explanation is that a large portion of bond issuers are non-public firms.

Dependent variable

Following previous studies, we measure the dependent variable *YieldSpread* as the difference between the corporate bond yield at issuance and a Treasury bond yield with comparable maturity [7] (Jiang, 2008; Shi, 2003; Wang and Zhang, 2009). The subscript *ijt* indicates bond *j* for firm *i* in year *t*. Bond yield spreads capture the risk premiums that bond issuers pay to bond investors to raise funds from the corporate bond market. Treasury bonds are issued by national governments. Because government bonds are backed by the high-quality credit and taxing power of a nation, they bear very little credit risk. Thus, the variable *YieldSpread* is a direct and accurate measure of issuers' incremental cost of a bond over a comparable risk-free Treasury bond. By subtracting comparable Treasury bond yields from corporate bond yields, we also control for the effect of economy-wide information.

Test variables

The test variables include proxies for CSR performance, strengths, and concerns. In model (1), the variable *CSRT* is a corporation's overall CSR performance score. It is measured as the total CSR strength score (*STR*) minus the total CSR concern score (*CON*). We use model (1) to test H1. Model (2) includes *STR* and *CON* as test variables. We use model (2) to test H2.

Firm-level control variables

IssuerSize: This is the natural logarithm of an issuer's assets at the fiscal year-end immediately prior to the corporate bond issuance date. Issuers with larger assets are perceived to be less risky (lower default risk) than those with smaller assets. Hence, we expect *IssuerSize* to be negatively related to the risk premium.

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[7] If the benchmark Treasury bond yield with a certain maturity is not available, we use an interpolation approach to construct it. For example, suppose we have only a Treasury bond yield with maturities of five years (2.2%) and seven years (2.4%) but we need a Treasury bond yield with a maturity of six years as a benchmark to calculate the yield spreads of corporate bonds with a maturity of six years. In this case, we construct the benchmark Treasury bond yield with a maturity of six years as follows: $(2.2\% + 2.4\%)/2 = 2.3\%$.

ROA: This is an issuer's return on assets, defined as net income divided by total assets at the fiscal year-end immediately prior to the corporate bond issuance date. A higher return on assets generally implies greater profitability. Thus, we expect *ROA* to be negatively related to the risk premium.

Leverage: This is long-term debt divided by total assets at the fiscal year-end immediately prior to the corporate bond issuance date. We predict that *Leverage* will be positively related to the risk premium.

Big4: This is an indicator variable for auditor type. It takes the value of one for Big Four auditors and zero otherwise. The variable *Big4* is a common proxy for audit quality or earnings quality; thus we expect its coefficient to be negative.

Z-score: This is the Altman (1968) Z-score, a measure of a corporation's financial strength. The Altman Z-score is calculated as follows: $1.2 \times$ (working capital/total assets) + $1.4 \times$ (retained earnings/total assets) + $3.3 \times$ (earnings before interest and taxes/total assets) + $0.6 \times$ (market value of equity/book value of total debt) + $1.0 \times$ (sales/total assets). The higher *Z-score* is, the lower the default risk. Hence, we expect *Z-score* to be negatively related to the risk premium.

Bond-level control variables

lnRating: This is the natural logarithm of Standard & Poor's bond ratings. We convert Standard & Poor's bond ratings sequentially to numbers, with one for AAA through 27 for no rating. For issues without Standard & Poor's ratings, we use Moody's or Fitch ratings instead. A bond rating indicates an issue's creditworthiness; so we expect it to be positively related to the risk premium (Jiang, 2008; Shi, 2003).

lnMaturity: This is the natural logarithm of the number of years to bond maturity. Usually, bond issues with longer maturities are riskier than issues with shorter maturities (Khurana and Raman, 2003; Shi, 2003). Thus, we expect the variable *lnMaturity* to be positively related to the risk premium.

Covenant: This is a covenant index. Following Nikolaev (2010), we consider 36 covenant restrictions (payout related, investment related, financing related, accounting related, and other covenants) and count the number of bondholder protective covenants in a bond issue. Consistent with Billett et al. (2007), we divide the number of bondholder protective covenants in a bond issue by the maximum number of bondholder protective covenants in our sample to create an index (*Covenant*) that varies from zero to one. Bondholders can charge higher yield spreads and impose more restrictive covenants to bonds issued by less trustworthy firms; so we predict a positive relation between *YieldSpread* and *Covenant*.

IssueSize: This is the natural logarithm of the par value of an initially issued bond, in millions of dollars. A larger issue size can enjoy a lower risk premium due to economies of scale in underwriting (Sengupta, 1998). However, Khurana and Raman (2003) point out that a large issue size also increases underwriters' difficulty in placing the issue with investors. On the basis of cross-sectional observations spanning 20 years, Wang and Zhang (2009) find that issue size is positively associated with bond yield spreads. Thus, we do not make predictions for the sign of *IssueSize*.

BusiCycle: This is the business cycle variable, that is, the difference between the average yield of Moody's Aaa bonds and the average yield of 10-year U.S. Treasury bonds for the month of issue. This variable controls for the time-series variation of risk premiums over the business

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cycle. Prior studies predict that the variable *BusiCycle* will be positively related to the risk premium (Jiang, 2008; Sengupta, 1998; Shi, 2003).

RedeemD: This is an indicator variable for a bond's call feature. It equals one for bonds that have a call option and zero otherwise. A redeemable bond offers issuers the option to repurchase the bond before maturity. It increases the potential interest risk for bondholders, so we expect the variable *RedeemD* to be positively related to the risk premium.

PutD: This is an indicator variable for a bond's put feature. It equals one for bonds with a put option and zero otherwise. Putable bonds offer bondholders the option to retire the bond before maturity and thus we expect this variable to be negatively related to the risk premium.

ConvertD: This is an indicator variable for a bond's convertible feature. It equals one for convertible bonds and zero otherwise. Mayers (1998) suggests that reducing the interest rate is an incentive for firms to issue convertible bonds. We expect this variable to be negatively related to the risk premium.

415RegD: This is an indicator variable for U.S. Securities and Exchange Commission (SEC) Rule 415 shelf registration bonds. We assign the value of one for bonds issued under a shelf registration and zero otherwise. According to Rule 415, issuers are allowed to pre-register a certain securities (e.g., equities and bonds). In the case of bonds, issuers have the option to take bonds "off the shelf" and offer them to the public at a favorable time up to two years into the future. Therefore, we expect the coefficient of this variable to be negative.

144aRegD: This is an indicator variable for U.S. SEC Rule 144a private placement bonds. It equals one for bonds issued through private placements that are exempt from registration and zero otherwise. Rule 144a issues are generally offered to a limited number of institutional investors, known as qualified institutional buyers. Since institutional investors have stronger

negotiation power than public investors regarding the coupon rate, we expect this variable to be positively related to the risk premium. On the other hand, similar to private lenders, institutional investors could have some informational advantages; therefore, this variable can be negatively associated with the risk premium. We do not make a prediction for this variable.

Industry and year indicator variables

In line with the literature, we include Fama and French's 48 industry indicators and year indicators in the above regression models to further control for potential differences in issuer and issue features across industries and over time (e.g., Fama and Fench, 1997; Shi, 2003).

4. Empirical results

4.1. Univariate analysis

Table 1 provides descriptive statistics for our sample observations by year. The sample period is from 1992 to 2009. Our sample contains 4,260 distinct new bond issues from 2,317 firms.

[Insert Table 1 about here]

Table 2 summarizes descriptive statistics of the key variables. Since our analyses require firm- and bond-level variables, the number of observations used to calculate the descriptive statistics differs between firm- and bond-level variables. The average yield spread is 154.13 basis points (about 1.54%).[8] On average, there are three covenants in a bond issue. The median credit rating is 12, which means that more than half of new bond issues are non-investment grade, as rated by Standard & Poor's. About 7% and 14% of new bond issues have a put or convert option,

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[8] We have 502 observations with negative yield spreads. The negative yield spread could be justified by the putable, convertible, or other features of the new bond issues. For example, putable bonds give bondholders the option to retire the bond before maturity, an additional benefit for them. Thus, issuers can sometimes issue putable bonds by offering yields that are lower than the comparable U.S. Treasury yield. In addition, Mayers (1998) suggests that reducing the interest rate is one incentive for firms to issue convertible bonds. After removing putable and convertible bonds from our sample, only 70 observations with negative yield spreads remain. The negative yield spreads may be a result of some other bond features that are favorable to bondholders.

respectively. In addition, 70% of new bond issues are issued under shelf registration and 24% are issued through private placement. The average scores for the three CSR performance proxies—*CSRT*, *STR*, and *CON*—are 0.05, 2.28, and 2.23, respectively. The average *ROA* and leverage ratio of the bond issuer are 3% and 26%, respectively. The majority of our sample firms (98%) are audited by Big Four auditors.

[Insert Table 2 about here]

Table 3 presents a correlation matrix of the key variables used in the regression analyses. As expected, the variable *YieldSpread* is negatively correlated with the total CSR performance score (*CSRT*) and strength score (*STR*) and positively correlated with the CSR concern score (*CON*). Unexpectedly, the strength and concern scores are positively correlated. Many firms have multidimensional performance goals. The use of a firm's resources to engage in CSR activities always has an opportunity cost. Implementing a strategy for social issue participation may come at the cost of forgone opportunities to increase shareholder value (Hillman and Keim, 2001). Therefore, a firm may do better in some CSR dimensions than in others. A firm with more CSR concerns may be more likely to commit to improving its CSR performance and developing strengths in some dimensions but may not have enough resources to address concerns in other dimensions. This could be the reason why we observe a positive correlation between *STR* and *CON*. In terms of the other control variables, consistent with our predictions, *YieldSpread* correlates negatively with *ROA*, *Big4*, *Z-score*, and *lnMaturity* and positively with *Leverage*. Inconsistent with our predictions, *YieldSpread* correlates positively with *lnRating*, *Covenant*, and *IssuerSize*.

[Insert Table 3 about here]

4.2. Main results

In our model specifications, we use the initial bond yield spread as a proxy for the cost of public debt. The bond yield spread represents the risk premium that a firm must pay for bond financing and is thus a direct measure of the firm's incremental cost of public debt. The cost of debt is a function of default risk and a firm's credit rating reflects its default risk and is therefore used in prior studies as a proxy for the *ex ante* cost of public debt (e.g., Jiang, 2008; Ge and Kim, 2014). Ideally, credit rating agencies are efficient in incorporating the information of a firm's CSR performance. If credit ratings fully reflect all available and relevant information pertaining to a bond issue's default risk, then CSR performance should have no incremental explanatory power after credit ratings are controlled for in our models. To investigate this issue, we carry out our tests in the following steps. First, we examine the effect of CSR performance on bond ratings; second, we examine our hypotheses by estimating our models excluding bond ratings; and, third, we re-examine our hypotheses including bond ratings.

Table 4 summarizes the ordinary least squares (OLS) regression results. According to Petersen (2009), the standard errors calculated by an OLS regression for panel data may be biased due to residual correlations. Thus, we correct the standard errors of the OLS regression coefficients for firm-level clustering, as well as for heteroskedasticity.

Panel A of Table 4 reports the results of testing the effect of overall CSR performance. Column (1) reports the results when bond rating (*lnRating*) is the dependent variable. By construction, the lower value of *lnRating* represents a better bond rating. The coefficient of the overall CSR performance score (*CSRT*) is negative (-0.01) and significant at the 5% level, suggesting that bond ratings incorporate information about a firm's CSR performance. Column (2) of Panel A reports the results of testing the effect of CSR performance on yield spreads,

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without controlling for bond ratings. The coefficient of *CSRT* is 3.67, significant at the 1% level, consistent with H1, that firms with better CSR performance can issue bonds at lower yield spreads. Column (3) of Panel A presents the results of testing H1 including bond ratings, as specified in model (1). The coefficient of *CSRT* is negative and significant at the 1% level, but its magnitude becomes smaller (-3.20) than -3.67 in column (2). The difference is statistically significant at the 5% level (Chi-square = 3.77). The results indicate that good CSR performance is valued by bondholders, but some effect of CSR performance on yield spreads is absorbed by bond ratings. The results also imply that the intangible nature of good CSR performance is appreciated by the markets but may not be fully captured in credit ratings. The result is economically significant as well. Table 2 shows that mean offering amount is \$432.80 million and average maturity is about 12 years. Thus, holding other variables unchanged, on average, a one-point increase in the overall CSR performance score is associated with a decrease of 3.20 basis points in the yield spread, which can save a firm a total interest cost of \$1.66 million per bond issue ($432.80 \times 3.20 \div 10000 \times 12 = 1.66$).

Furthermore, we follow Ashbaugh-Skaife et al. (2006) and collapse bond ratings into a seven-point scale, with one for a AAA rating; two for AA+, AA, and AA-; three for A+, A, and A-; four for BBB+, BBB, and BBB-; five for BB+, BB, and BB-; six for B+, B, and B-; and seven for CCC+, CCC, CC, C, D, and SD. We perform an ordered logistic regression of bond rating groups (*RatingGroup*) on the same set of explanatory variables. The results for *CSRT* (-0.09, $p < 0.01$; not tabulated here for brevity) are consistent with the OLS results as reported in column (1). We also re-estimate model (1) by replacing *lnRating* with *RatingGroup* (column 3 in Panel A). After controlling for *RatingGroup*, the coefficient of *CSRT* is -2.91 ($p = 0.01$) and the

difference between this coefficient without and with *RatingGroup* in the model (-3.67 vs. -2.91) is statistically significant (Chi-square = 5.73; $p < 0.05$).

Panel B of Table 4 summarizes the results of testing the effect of CSR strengths and concerns separately (H2). As shown in column (1) of Panel B, the results indicate that a higher CSR strength score (*STR*) is associated with a better bond rating, but there is no significant association between the CSR concern score (*CON*) and bond ratings. In column (2), the coefficient of *STR* is negative and significant and the coefficient of *CON* is positive and significant. Column (3) presents the results after controlling for bond ratings. The coefficient of *STR* becomes smaller and the coefficient of *CON* remains significantly positive. By comparing the results in columns (2) and (3), the difference in the coefficient of *STR* is statistically significant (Chi-square = 6.93; $p < 0.01$), while the difference in the coefficients of *CON* is not significant (Chi-square = 0.83; $p = 0.36$). The results are robust when an ordered logit regression model is used and when we replace *lnRating* in column (3) with *RatingGroup*. The results in column (3) of Panel B suggest that, after bond ratings and other control variables are controlled for, on average, a one-point increase in the total CSR strength score is associated with a decrease of 2.42 basis points in the yield spread and a one-point increase in the total CSR concern score is associated with an increase of 4.45 basis points in the yield spread.

In Table 4, most firm- and bond-level control variables have the expected signs for their coefficients. For brevity, our discussion focuses on the coefficients in column (3) of Panel A. The coefficients of *IssuerSize*, *ROA*, *Big4*, and *Z-score* are negative and significant at the 1% level, suggesting that larger firms, more profitable firms, clients of Big Four auditors, and firms with lower default risk can issue bonds at lower cost. The coefficient of *Leverage* is positive and

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statistically significant. Overall, the results for these control variables are consistent with prior studies (e.g., Jiang, 2008; Khurana and Raman, 2003; Shi, 2003).

As for the bond-level controls, the coefficient of credit rating (*lnRating*) is significantly positive (46.71; $p < 0.01$). This finding reinforces Jiang's (2008) argument that the credit rating captures the creditworthiness of an issue. Unexpectedly, the coefficient of *IssueSize* is negative but not statistically significant. Consistent with prior studies (e.g., Jiang, 2008; Sengupta, 1998), the coefficient of the business cycle variable (*BusiCycle*) is positive and significant, suggesting that issuers pay higher risk premiums for new bond issues when there is a larger difference between Moody's Aaa bond yields and the 10-year U.S. Treasury bond yield for the same month. As predicted, the coefficient of the redeemable indicator variable (*RedeemD*) is significantly positive, while the coefficients of the putable (*PutD*), convertible (*ConvertD*), and 415 regulation (*415RegD*) indicators are significantly negative. These results suggest that bond issuers pay higher risk premiums for bonds that have redeemable features but pay lower risk premiums for bonds that have putable and convertible features and for bonds that are issued under shelf registration. The positive coefficient of *144aRegD* suggests that the bonds issued through private placements have a higher coupon rate.

Overall, the independent variables in these two model specifications (column 3 of Panels A and B in Table 4) explain about 62% of the variance of the dependent variable (*YieldSpread*), and both models are significant at the 1% level.

[Insert Table 4 about here]

4.3. Relation between firm scores in individual CSR dimensions and yield spreads

As mentioned in Section 3.1, the KLD STATS database provides ratings for strengths and concerns in seven qualitative issue areas: environment (pollution prevention, recycling, clean

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energy, etc.), the community (charitable giving, innovative giving, community engagement, widespread or egregious community impacts due to company operations, etc.), the product (product quality and safety, customer relations, etc.), diversity (women and minority contracting, gay and lesbian policies, the employment of underrepresented groups, etc.), employee relations (union relations, cash profit sharing, employee involvement, health and safety, etc.), human rights (human rights policies and initiatives, operations in Burma or Sudan, etc.), and governance (reporting quality, public policy, governance structure, business ethics, etc.).

To provide more insight on how firm performance in individual CSR dimensions relates to bond yield spreads, we replace *CSRT* in model (1) with the firm score in each of these seven CSR dimensions. The firm score in each individual CSR dimension is equal to the difference between the total strength score and the total concern score on the items included in each dimension. The results, reported in Panel A of Table 5, show that six out of seven dimension scores (the exception being human rights) are negatively associated with bond yield spreads, but only four of these associations (Community, Product, Employee Relations, and Governance) are statistically significant at the 5% or 10% level. These results suggest that the association between overall CSR performance and yield spreads as reported in Table 4 is primarily driven by a firm's overall performance in four dimensions, namely, community, product, employee relations, and governance.

Next, we test the association between strengths and concerns by subcategory and yield spreads. Panel B of Table 5 summarizes the results. We find that the estimated coefficients of the strength scores in all dimensions are negative but only three strength scores on environment, community, and governance are significant at the 5% or 10% level. The estimated coefficients of the concern scores (except for human rights) are positive and the concern scores in three

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dimensions—product, diversity, and employee relations—are significant at the 5% or 10% level. For human rights, neither the coefficient of the strength score nor the coefficient of the concern score is statistically significant. The descriptive statistics (not tabulated here) show that 99% of our sample has no human right strengths and more than 87% of our sample has no human right concerns. Thus, our sample may lack the power to detect the effect of human rights strengths and concerns on the cost of debt.

Hillman and Keim (2001) suggest that building better relations with primary stakeholders—such as government, employees, customers, suppliers, and communities—could help firms develop intangible, valuable assets that can be sources of competitive advantage. Consistent with this proposition, our results suggest that bondholders reward bond issuers that demonstrate their legal responsibility to the government (captured by the environment dimension), discretionary responsibility to the community, and their commitment to improving corporate governance and penalize bond issuers that have employment concerns (captured by two dimensions, diversity and employee relations) and product safety and quality concerns. Bondholders may view product quality and safety, good customer relations, unbiased employment, and good employee relations as a "must-have" of any corporation and thus they are not surprised by an issuer's strengths in these dimensions. This could explain why the strength scores on product, diversity, and employee relations are not statistically significant. However, it is surprising that the coefficients of environment and community concerns are not statistically significant, since environment and community concerns could imply some litigation risk.

[Insert Table 5 about here]

The results reported in Tables 4 and 5 are generally consistent with the stakeholder theory.[9] Taken together, our results indicate that both CSR strengths and concerns are considered by bondholders and overall CSR performance matters in initial bond pricing.

4.4. Issues related to corporate governance

Ghoul et al. (2011) argue that CSR performance measures should not include conflicts of interest between insiders and shareholders, so they exclude CSR strength and concern scores that relate to corporate governance to construct CSR measures. As a robustness check, we reconstruct the CSR performance measures (*CSRT*, *STR,* and *CON*) after excluding the governance dimension. We repeat our analyses using these new measures. Overall, the results (not tabulated here for brevity) are consistent with those reported in Table 4, except that the negative coefficient of the strength score becomes significant at the 10% level.

Several studies find that a firm's CSR performance incorporates its governance quality (e.g., Coffey and Wang, 1998; Haniffa and Cooke, 2005; Stephen et al., 2010), which is one of the determinants of the cost of debt (e.g., Anderson et al., 2004; Ashbaugh-Skaife et al., 2006; Klock et al., 2005). As an additional test, we examine whether the effect of CSR performance on yield spreads still holds after controlling for conflicts of interest between insiders and shareholders. Gompers et al. (2003) developed a governance index (*G-index*) of agency conflicts between managers and shareholders using various anti-takeover–related activities that restrict shareholder rights. We obtain G-index data from Andrew Metrick's website.[10] Since *G-index* is available only for some of our sample firms in certain years (1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006), we assume that the G-index remains unchanged until it is updated; adding G-

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[9] Untabulated results show that CSR performance is positively associated with *ROA*, cash flows from operations, and the Z-score in year $t + 1$, suggesting that better CSR performance in year t is associated with higher profitability and fewer financial risks in the future. This could explain why CSR performance is associated with lower yield spreads.

[10] See http://faculty.som.yale.edu/andrewmetrick/data.html, last accessed April 2, 2014.

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index data reduces our sample size from 4,260 to 3,797 observations. We re-estimate models (1) and (2) for the reduced sample. The results (not tabulated for brevity) show that the coefficient of *G-index* is not statistically significant and, after controlling for *G-index*, the results on all our CSR performance measures are consistent with our main findings. When we use alternative measures of CSR (excluding the governance dimension), the results are consistent, except that the negative coefficient of the strength score is significant at the 10% level.

After the passage of the Sarbanes–Oxley Act (SOX), a firm's governance quality has received more attention and many U.S. public firms have improved their corporate governance to comply with SOX. Firms with weaker corporate governance have a worse information environment than those with stronger corporate governance and thus creditors are more likely to use all publically available information, including CSR disclosures, to assess bond issuers' litigation and credit risk. Next, we examine whether the effect of CSR performance is more pronounced in firms with weaker governance in the pre-SOX (1992–2001) and post-SOX (2002–2009) periods.

We partition our samples based on the median value of *G-index* in the pre- and post-SOX periods. A higher *G-index* value indicates weaker shareholder rights, that is, poor corporate governance; so, the subsample with weak (strong) governance contains firms whose *G-index* is above (below) the median value. We focus on overall CSR performance and re-estimate model (1) for these paired subsamples. As shown in Table 6, in the pre-SOX period, the coefficient of *CSRT* is negative and significant in both subsamples, but the result is stronger in the subsample with weak governance. In the post-SOX period, the coefficient of *CSRT* is negative and significant in the subsample with weak governance only. The results are robust when we use alternative measure of *CSRT* that excludes the governance dimension (not tabulated here for

brevity). Our results indicate that bondholders are more likely to incorporate CSR performance into their assessment of default risk of bonds issued by firms with weaker corporate governance, especially since the passage of SOX.

[Insert Table 6 about here]

4.**5. Additional subsample analyses**

In this subsection, we perform further analyses to provide corroborative evidence regarding the cross-sectional variation of the association between a firm's CSR performance and bond yield spreads. All the subsample analyses focus on overall CSR performance.

First, we examine whether there is a variation in the association between CSR performance and bond yield spreads between investment-grade bonds (BBB or higher) and non–investment-grade bonds (BB or lower). Specifically, we estimate model (1) for these two subsamples excluding bond ratings first and then re-estimate model (1) including bond ratings. As shown in columns (1) and (2) of Table 7, the coefficient of *CSRT* is negative and significant for investment-grade bonds, which is consistent with the findings in Oikonomou et al. (2014), while the negative coefficient of *CSRT* is not significant for non–investment-grade bonds. The results, after controlling for bond ratings, are consistent but not tabulated here for brevity. Oikonomou et al. (2014) argue that the issuers of low-rated bonds can benefit most from the significant reductions in the cost of debt that can materialize mainly through proactive involvement in CSR practices. Their findings on very low-rated bonds are consistent with this argument. As an additional analysis, we run the regression for highly speculative-grade bonds (B+ or lower). The results indicate that better CSR performance is associated with lower yield spreads when bond ratings are excluded from the model; however, such an association becomes insignificant after controlling for bond ratings (not tabulated for brevity). Our results suggest that

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CSR performance is especially important for investment-grade bonds and credit ratings absorb the effect of CSR performance for highly speculative-grade bonds.

Second, we separate bond issuers based on their level of financial distress as proxied by Altman's (1968) Z-score and re-estimate model (1) (excluding *Z-score* as a control variable) for subsamples with *Z-score* below the median value versus subsamples with *Z-score* above the median value, respectively. The variable *Z-score* captures a firm's financial strength. The higher the *Z-score*, the lower the financial distress. As reported in columns (3) and (4) of Table 7, we find that the effect of *CSRT* on the bond yield spread is slightly stronger in the subsample with high *Z-score* (-3.43, $p < 0.01$) than in the subsample with low *Z-score* (-2.89, $p < 0.10$). CSR activities consume a corporation's economic resources. Since CSR-related expenditures may increase the default risk of firms in greater financial distress (lower *Z-score*), bondholders would value CSR performance less for such bond issuers. Financially healthier firms usually have fewer constraints when participating in CSR-related activities and the market may attach a higher value to their CSR commitments. Consistent with this argument, our findings indicate that bondholders pay more attention to the CSR performance of financially healthier bond issuers.

Third, we run the regression for Rule 144a and non-Rule 144a bonds, respectively. Rule 144a bond issues are generally offered to a limited number of institutional investors. Institutional investors have informational advantages over other public bondholders, so a firm's CSR performance could be less value relevant to institutional investors. We generate two subsamples, one with Rule 144a bonds and the other one without Rule 144a bonds, and run model (1) (excluding the indicator variable *144aRegD*) for each subsample. As shown in columns (5) and (6) of Table 7, we find that the coefficient of *CSRT* for non-Rule 144a bonds is consistent with our primary results. For Rule 144a bonds, the coefficient of *CSRT* is not statistically significant.

The results indicate that, compared with institutional investors investing in Rule 144a bonds, bondholders investing in other bonds are more likely to use information about a firm's CSR performance in their bond pricing to overcome their informational disadvantages.

Fourth, we analyze whether the association between CSR performance and the cost of debt is more pronounced for issuers with higher information asymmetry. Similar in spirit to Gu and Li (2007) and Huddart and Ke (2007), we measure firm-level information asymmetry using the amount of intangible assets scaled by total assets (*Intangible*). The cost of developing intangible assets is not capitalized but, rather, expensed, according to accounting standards, which prevents firms from communicating the value of intangible assets through selective capitalization. We expect that firms with many intangible assets are growth firms and use the variable *Intangible* as a proxy for information asymmetry. We split our sample based on the median value of *Intangible*. A higher *Intangible* value represents informational opaqueness and a higher level of information asymmetry; so firms in the high-information (low-information) asymmetry subsample are those whose *Intangible* is above (below) the median. Columns (7) and (8) of Table 7 present the results. We find that the coefficient of *CSRT* is negative and significant in the subsample with high information asymmetry and not significant in the subsample with low information asymmetry. The results suggest that when a firm has worse information environment, bondholders are more likely to incorporate information about its CSR performance into the assessment of its credit risk.

Last, we separate bond issuers based on whether they are operating in environmentally sensitive industries or in non-environmentally sensitive industries and perform the regression analysis for each subsample. Firms operating in environmentally sensitive industries face greater environment-related exposure to and scrutiny by the markets than firms from non-

environmentally sensitive industries (Cho and Patten 2007). According to Clarkson et al. (2004), firms from environmentally sensitive industries are more likely to have latent environmental liabilities due to future capital spending obligations to comply with more stringent environmental policies. Accordingly, we expect that positive CSR performance would be more value relevant to offsetting the negative valuation of environmentally sensitive industries by the markets. Following prior literature, we categorize a bond issuer as being in the environmentally sensitive industry subgroup if it operates in one of the following industries: oil and gas; forestry, pulp, and paper; energy; chemicals and drugs; mining and resources; and utilities; otherwise, we categorize bond issuers as being in the non-environmentally sensitive industry subgroup (e.g., Aerts et al. 2006; Cho and Patten 2007). As summarized in columns (9) and (10) of Table 7, the coefficient of *CSRT* for the environmentally sensitive industry subsample is consistent with our primary results, while the coefficient of *CSRT* for the non-environmentally sensitive industry subsample is not statistically significant. The results indicate that bondholders pay more attention to the CSR performance of bond issuers operating in environmentally sensitive industries and are more likely to use this information in their bond pricing.

[Insert Table 7 about here]

5. Robustness checks

5.1. Instrumental variables approach

Our test models have a potential endogeneity problem. For example, if firms with better performance are more active in CSR activities, the association between CSR performance and bond yields may be a simple manifestation of a latent variable's effect. It is possible that other omitted variables may be driving the observed associations. Another concern is that bond yield,

bond maturity, and covenants could be simultaneously determined. We use instrumental variable regression GMM estimators to address these concerns.

Our choice of instrumental variables for CSR performance follows Deng et al. (2013). Angelidis and Ibrahim (2004) find that the degree of religiousness is positively correlated with attitudes toward CSR. Rubin (2008) finds that firms with high CSR ratings tend to be located in Democratic or blue states. Consistent with Deng et al. (2013), we use a religion rank (*ReligionRank*) and a blue state indicator (*Blue*) as instrumental variables for the overall CSR performance score (*CSRT*). The variable *ReligionRank* measures the religion ranking of the state in which the acquirer's headquarters is located, which ranges between one and 50. The ranking is based on the ratio of the number of religious adherents in the acquirer's state to the total population in that state in 2000. A higher ranking indicates greater religiosity. The variable *Blue* is a dummy variable that equals one if a firm's headquarters are located in a blue or Democratic state and zero otherwise.[11]

Our choice of instrumental variables for yield spread and bond maturity follows Bharath et al. (2011). Specifically, given that contemporaneous default spreads (*DefaultSpread*) should affect yield spreads at the time of pricing and the average yield spread of bonds issued over the previous six months (*AvgYieldSpread*) captures the recent evolution in bond pricing and is a significant factor in pricing of new bonds, we use *DefaultSpread* and *AvgYieldSpread* as two instruments for the observed yield spreads. Prior studies show that asset maturity (Barclay and Smith, 1995; Hart and Moore, 1994) and term spread (Brick and Ravid, 1985, 1991) are two key factors that determine debt maturity, so we choose asset maturity (*AssetMaturity*) and term spread (*TermSpread*) as instruments for bond maturity (the definitions of these two variables are

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[11] Since CSR strengths and concerns are more likely jointly determined, it is difficult to find appropriate instrumental variables for strengths and concerns, respectively. Therefore, we perform the instrumental variable test for model (1) only.

provided in the Appendix). We use the average number of covenants of bonds issued over the previous six months scaled by the maximum number of covenants in our sample (*AvgCovenant*) as an instrumental variable for the covenant index.

Greene (2002) and Kennedy (2003) observe that the GMM estimates of instrumental variables regression models are efficient when the regression errors are heteroskedastic and/or autocorrelated. Prior studies (e.g., Billett et al., 2007; Brockman et al., 2010) use GMM to address the endogeneity or simultaneity problem. Thus, we estimate model (1) using instrumental variables GMM estimators, with statistics robust to heteroskedasticity and clustering on issuer ID.[12] We find that when *YieldSpread* is the dependent variable, the estimated coefficient of *CSRT* is negative and significant, consistent with our findings reported in Panel A of Table 4. As for two measures of the indirect cost of bonds—maturity and covenants—we find that CSR performance is not significantly associated with maturity but is negatively associated with covenant intensity. This result suggests that bonds issued by firms with better CSR performance contain fewer covenant restrictions. Given that the average number of covenants in a bond issue is 2.93 as shown in Table 2, this result lacks economic significance (the instrumental variables regression results are not tabulated here for brevity).

5.2. Hierarchical linear models

Our data sets contain multiple new bond issues for a single firm in the same fiscal year. Since multi-level observations violate the assumption of residual independence at the lower bond

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[12] Because some instrumental variables are missing, our sample reduces to 4,205 observations using the instrumental variables regression approach. Given that there are so many indicator variables in the model, when we perform the instrumental variables GMM regression, the estimated covariance matrix of moment conditions is not of full rank, so the optimal weighting matrix for the GMM estimation cannot be calculated. Therefore, we use the Fama–French 10-industry classification in the instrumental variables GMM approach. The main results reported in Table 4 are robust when we replace the 48 Fama–French industry indicators with the 10 Fama–French industry indicators. Since the variables *BusiCycle* and *DefaultSpread* capture a similar concept and are highly correlated (the correlation is 0.90), we use instrumental variables GMM to estimate model (1) without *BusiCycle*. We also use instrumental variables GMM to estimate model (1) with *BusiCycle*. The results are consistent.

level, the standard errors from the OLS regression may be biased. Hierarchical linear models, which use maximum likelihood estimation, are widely used in social science research to address potential multi-level observation problems (Ang et al., 2002; Seibert et al., 2004). We repeat our analyses of models (1) and (2) using hierarchical linear models regression. Overall, the results (not tabulated here for brevity) are qualitatively similar to our main test results.

As an additional robustness test, for firms with multiple bond issues during a fiscal year, we keep only the bond issue with the largest offering amount. The regression results (not tabulated for brevity) for this reduced sample are consistent with our main test results. The magnitudes of the coefficients of *CSRT*, *STR*, and *CON* are larger.

5.3. Excluding convertible bonds

A small percentage of new corporate bond issues have convertible features. Convertible bonds differ from straight bonds and linear regression models may not be appropriate to explore the relation between yield spreads and convertible features (Khurana and Raman, 2003). As another robustness check, we delete new bond issues with convertible features and re-run models (1) and (2). The main findings still hold (the results are not tabulated).

6. Conclusion

This study complements the bond financing literature by using non-financial attributes encompassed in CSR performance to explain the price and non-price terms of corporate bond financing. The shareholder theory suggests that CSR activities consume cash and thus increase a firm's distress risk, while the stakeholder theory suggests that CSR performance benefits capital markets through the reduction of information asymmetry between contracting parties and a decreased perceived litigation risk on the part of issuers. In this study, we investigate how CSR performance is related to the cost of new bond issues.

Our sample comprises 4,260 new public bond issues in the U.S. market in the period 1992–2009. Consistent with the stakeholder theory, we find that overall CSR performance is associated with better credit ratings and lower yield spreads in new corporate bond issues. We also find that the CSR strength score is associated with lower bond yield spreads, while the CSR concern score is associated with higher bond yield spreads. In addition, using the number of covenants as a measure of the indirect cost of debt, we find that overall CSR performance is associated with less covenant intensity. Taken together, our results suggest that firms with better CSR performance can raise public debt at lower cost. We further find that the association between CSR performance and the cost of debt is more pronounced in investment-grade bonds and non-Rule 144a bonds. Our results also indicate that bondholders value CSR performance more for financially healthy firms than for financially distressed firms and that bondholders are more likely to use CSR performance information to assess the creditworthiness of issuers with weaker corporate governance and worse information environments and those operating in environmentally sensitive industries.

Our findings have several practical implications. First, from standard-setting and regulatory perspectives, the finding that the U.S. bond market values CSR performance further supports policies emphasizing CSR commitment. Second, from the bond issuer perspective, our findings can help issuers understand the association between the non-financial aspects of firm performance and the cost of debt. Our findings may encourage firms to disclose non-financial information voluntarily, thus providing a better information environment for external users.

The literature provides evidence of the effect of CSR disclosure and performance on the cost of equity capital (e.g., Chava, 2014; Dhaliwal et al., 2011; Ghoul et al., 2011; Sharfman and Fernando, 2008) and the cost of private debt (Goss and Roberts, 2011). Our study, along with the

concurrent study of Oikonomou et al. (2014), complements this line of research by providing empirical evidence on the association between CSR performance and the cost of public debt. Future research could examine how the costs of these three sources of capital are affected by CSR performance and how they are influenced by each other. If data allow, future research could also focus on CSR initiators and examine whether they are more likely to issue debt in the future and, conditional on issuing debt, whether their cost of debt financing is lower.

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Table 1. Descriptive statistics of number of new corporate bond issues by year

Year	Frequency	Percentage
1992	137	3.22
1993	199	4.67
1994	147	3.45
1995	159	3.73
1996	161	3.78
1997	192	4.51
1998	229	5.38
1999	152	3.57
2000	228	5.35
2001	345	8.1
2002	252	5.92
2003	309	7.25
2004	285	6.69
2005	212	4.98
2006	237	5.56
2007	352	8.26
2008	221	5.19
2009	443	10.39
Total	**4260**	**100**

This table presents the annual distributions of the number of new corporate bond issues in our study. Our sample contains 4,260 new bond issues from 2,317 firms during the period 1992–2009.

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Table 2. Descriptive statistics of key variables

Variable	N	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
Bond-level variables						
YieldSpread	4260	154.13	211.31	62.61	131.64	247.16
Rating	4260	11.67	7.39	6	9	14
lnRating	4260	2.27	0.62	1.79	2.20	2.64
RatingGroup	4260	3.56	1.56	2	4	5
Number of covenants	4260	2.93	3.28	0	2	5
Covenant	4260	0.14	0.16	0	0.10	0.24
Maturity in years	4260	11.81	10.02	5	10	11
lnMaturity	4260	2.22	0.69	1.61	2.30	2.40
Offering amount	4260	432.80	2681.95	100	250	500
IssueSize	4260	11.80	2.05	11.51	12.43	13.12
RedeemD	4260	0.66	0.47	0	1	1
PutD	4260	0.07	0.25	0	0	0
ConvertD	4260	0.14	0.35	0	0	0
415RegD	4260	0.70	0.46	0	1	1
144aRegD	4260	0.24	0.43	0	0	0
Firm-level variables						
CSRT	2323	0.05	2.97	-2	0	1
STR	2323	2.28	2.83	0	1	3
CON	2323	2.23	2.27	1	2	3
IssuerSize	2323	8.46	1.37	7.55	8.45	9.47
ROA	2323	0.03	0.09	0.01	0.05	0.08
Leverage	2323	0.26	0.17	0.15	0.24	0.35
Big4	2323	0.98	0.14	1	1	1
Z-score	2323	3.24	2.54	1.61	2.70	4.16

This table reports the descriptive statistics of key variables. The definitions of all the variables are provided in the Appendix.

Table 3. Correlation matrix

	YieldSpread	CSRT	STR	CON	IssuerSize	ROA	Leverage	Big4	Z-score	lnMaturity	IssueSize	Rating
CSRT	-0.14***											
STR	-0.02	0.69***										
CON	0.16***	-0.47***	0.31***									
IssuerSize	0.13***	0.02	0.46***	0.54***								
ROA	-0.11***	0.15***	0.18***	0.03*	0.14***							
Leverage	0.21***	-0.04***	-0.18***	-0.17***	-0.03**	-0.30***						
Big4	-0.05***	0.03**	0.07***	0.04**	0.17***	0.03*	0.02					
Z-score	-0.26***	0.25***	0.12***	-0.18***	-0.22***	0.39***	-0.29***	-0.04***				
lnMaturity	-0.15***	0.02	0.01	-0.02	-0.07***	0.06***	-0.10***	0.03*	0.07***			
IssueSize	0.00	0.06***	0.26***	0.24***	0.18***	0.13***	-0.51***	-0.01	0.08***	0.14***		
lnRating	0.04***	-0.17***	-0.38***	-0.24***	-0.46***	-0.37***	0.28***	-0.12***	-0.14***	-0.05***	-0.17***	
Covenant	0.14***	0.04**	0.13***	0.11***	0.13***	0.15***	-0.19***	0.05***	0.03**	0.10***	0.39***	-0.16***

This table reports the correlation matrix of some key variables used in our primary tests. The definitions of all variables are provided in the Appendix. The superscripts *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Association between CSR performance and the cost of corporate bonds
Panel A: Association between overall CSR performance and the cost of corporate bonds

Variables	Prediction	(1) DV: *lnRating*		(2) DV: *YieldSpread*		(3) DV: *YieldSpread*		(2) vs. (3)	
		Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value	Chi-square	p-value
CSRT	-	**-0.01**	**-2.18****	**-3.67**	**-2.97*****	**-3.20**	**-2.62*****	**3.77****	**0.05**
IssuerSize	-	-0.13	-8.75***	-18.76	-5.51***	-13.97	-3.88***		
ROA	-	-0.81	-5.98***	-287.11	-5.98***	-258.44	-5.35***		
Leverage	+	0.28	3.36***	136.89	5.81***	126.84	5.24***		
Big4	-	-0.10	-1.64*	-93.71	-2.86***	-90.31	-2.75***		
Z-score	-	-0.02	-3.12***	-6.68	-3.08***	-5.92	-2.74***		
lnMaturity	+	-0.07	-4.78***	-4.29	-1.04	-1.74	-0.43		
Covenant	+	0.30	3.15***	145.19	5.46***	134.61	5.17***		
IssueSize		-0.05	-4.54***	-2.36	-1.04	-0.75	-0.32		
lnRating	+	-	-	-	-	35.52	3.84***		
BusiCycle	+	0.00	0.10	1.32	10.48***	1.33	10.62***		
RedeemD	+	0.06	2.61***	21.77	3.10***	19.68	2.85***		
PutD	-	0.06	1.31*	-137.45	-9.55***	-139.43	-9.75***		
ConvertD	-	0.48	13.08***	-281.74	-17.68***	-298.64	-17.90***		
415RegD	-	-0.06	-1.89**	-46.40	-2.81***	-44.11	-2.67***		
144aRegD		0.12	2.82***	46.24	2.49**	41.88	2.22**		
Industry indicators		Yes		Yes		Yes			
Year indicators		Yes		Yes		Yes			
No. of observations		4260		4260		4260			
Model fit (F-value)		98.11***		107.61***		130.95***			
Adjusted R^2		56.99%		61.76%		62.23%			

Table 4 (continued)
Panel B: Association between CSR strengths and concerns and the cost of corporate bonds

Variables	Prediction	(1) DV: *lnRating*		(2) DV: *YieldSpread*		(3) DV: *YieldSpread*		(2) vs. (3)	
		Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value	Chi-square	p-value
STR	**-**	**-0.03**	**-3.16*****	**-3.34**	**-2.21****	**-2.42**	**-1.60***	**6.93*****	**0.01**
CON	**+**	**-0.01**	**-0.89**	**4.22**	**2.03****	**4.45**	**2.18****	**0.83**	**0.36**
IssuerSize	-	-0.10	-7.35***	-19.60	-4.73***	-15.83	-3.78***		
ROA	-	-0.85	-6.26***	-285.94	-5.94***	-255.19	-5.26***		
Leverage	+	0.27	3.21***	137.31	5.82***	127.60	5.28***		
Big4	-	-0.10	-1.72**	-93.57	-2.85***	-89.93	-2.74***		
Z-score	-	-0.02	-2.92***	-6.72	-3.08***	-6.00	-2.76***		
lnMaturity	+	-0.07	-4.71***	-4.33	-1.05	-1.79	-0.44		
Covenant	+	0.25	2.77***	146.38	5.42***	137.16	5.18***		
IssueSize		-0.04	-4.32***	-2.47	-1.08	-0.96	-0.42		
lnRating	+	-	-	-	-	36.20	3.89***		
BusiCycle	+	0.00	0.29	1.33	10.44***	1.32	10.56***		
RedeemD	+	0.06	2.68***	21.72	3.09***	19.53	2.82***		
PutD	-	0.05	1.24	-137.37	-9.54***	-139.28	-9.74***		
ConvertD	-	0.47	13.15***	-281.60	-17.64***	-298.65	-17.90***		
415RegD	-	-0.06	-1.85**	-46.43	-2.80***	-44.13	-2.66***		
144aRegD		0.11	2.54**	46.58	2.51**	42.58	2.27**		
Industry indicators		Yes		Yes		Yes			
Year indicators		Yes		Yes		Yes			
No. of observations		4260		4260		4260			
Model fit (F-value)		140.32***		105.42***		126.79***			
Adjusted R^2		57.44%		61.77%		62.25%			

This table reports the OLS regression results of the association between CSR performance and the cost of corporate bonds. The definitions of all the variables are provided in the Appendix. The standard errors of the estimated coefficients are corrected for firm-level clustering and heteroskedasticity. The superscripts *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively (two-tailed test if the sign is not predicted).

Table 5. Association between firm scores on individual CSR dimensions and bond yield spreads
Panel A: Association between subcategories of overall CSR performance and bond yield spreads

Variables	Prediction	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Environment	-	-3.58						
Community	-		-9.38**					
Product	-			-9.17**				
Diversity	-				-2.55			
Employee Relations	-					-5.77**		
Human Rights	-						0.26	
Governance	-							-8.60*
IssuerSize	-	-14.49***	-13.33***	-15.25***	-12.84***	-13.43***	-13.64***	-13.61***
ROA	-	-263.17***	-263.14***	-266.20***	-265.39***	-260.57***	-265.29***	-261.14***
Leverage	+	123.22***	122.62***	121.82***	119.91***	126.91***	121.06***	122.42***
Big4	-	-91.10***	-91.91***	-90.16***	-90.43*	-90.79***	-90.97***	-91.28***
Z-score	-	-6.36***	-6.30***	-6.13***	-6.34***	-5.94***	-6.39***	-6.38***
lnMaturity	+	-1.75	-1.64	-1.96	-1.68	-1.52	-1.67	-1.66
Covenant	+	138.32***	136.68***	139.87***	137.20***	138.18***	139.24***	137.57***
IssueSize		-1.03	-0.74	-1.68	-1.06	-0.97	-1.21	-1.17
lnRating	+	36.62***	35.67***	38.11***	36.61***	36.85***	37.19***	37.09***
BusiCycle	+	1.32***	1.32***	1.32***	1.32***	1.32***	1.32***	1.32***
RedeemD	+	19.95***	19.35***	19.31***	19.67***	19.74***	19.66***	19.65***
PutD	-	-139.72***	-139.66***	-139.71***	-139.58***	-140.24***	-139.85***	-139.74***
ConvertD	-	-298.54***	-298.54***	-297.68***	-298.66***	-297.34***	-298.30***	-298.72***
415RegD	-	-44.62***	-44.28***	-44.92***	-44.21***	-44.18***	-44.48***	-44.43***
144aRegD		43.28***	43.67**	42.84**	43.51**	44.03***	44.08***	-43.60**
Industry indicators		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year indicators		Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations		4260	4260	4260	4260	4260	4260	4260
Model fit (F-value)		118.12***	140.72***	104.90***	113.80***	121.24***	110.52***	110.86***
Adjusted R^2		62.11%	62.17%	62.18%	62.10%	62.14%	62.08%	62.11%

Table 5 (continued)
Panel B: Association between subcategories of CSR strengths and concerns and bond yield spreads

Subcategories	STR & CON	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Environment	*Strengths*	-6.38*						
	Concerns	1.81						
Community	*Strengths*		-9.96**					
	Concerns		7.76					
Product	*Strengths*			-2.10				
	Concerns			11.11**				
Diversity	*Strengths*				-0.05			
	Concerns				16.28**			
Employee Relations	*Strengths*					-3.97		
	Concerns					7.87*		
Human Rights	*Strengths*						-23.18	
	Concerns						-1.44	
Governance	*Strengths*							-15.10*
	Concerns							2.11
Control variables		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicators		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year indicators		Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations		4260	4260	4260	4260	4260	4260	4260
Model fit (F-value)		119.16***	138.53***	101.63***	114.37***	116.35***	108.20***	108.65***
Adjusted R^2		62.12%	62.17%	62.19%	62.18%	62.15%	62.09%	62.12%

This table reports the OLS regression results of the tests related to firm scores on individual CSR dimensions. Specifically, Panel A reports the results of the association between overall CSR performance for each category and bond yield spreads. Panel B reports the results of the association between subcategories of CSR strengths and concerns and bond yield spreads. The definitions of all the variables are provided in the Appendix. The standard errors of the estimated coefficients are corrected for firm-level clustering and heteroskedasticity. The superscripts *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively (two-tailed test if the sign is not predicted).

Table 6. Association between overall CSR performance and bond yield spreads: Weak and strong governance subsamples

Variables	Prediction	Pre-SOX		Post-SOX	
		Strong governance	Weak governance	Strong governance	Weak governance
CSRT	**-**	**-3.90***	**-5.05***	**0.84**	**-5.38***
IssuerSize	-	-10.82**	-27.74***	-7.39	-14.60*
ROA	-	-366.17***	35.00	-290.01***	-553.99***
Leverage	+	7.83	229.66***	165.73	46.72
Big4	-	56.96*	-77.41**	-98.16**	13.23
Z-score	-	-3.27*	-5.01	-3.32	-9.77**
lnMaturity	+	21.85***	18.56***	-13.19*	-16.84**
Covenant	+	73.89*	190.79***	126.77***	148.92***
IssueSize		-5.16	-1.82	-2.16	4.68
lnRating	+	37.91***	16.66	48.05***	70.10***
BusiCycle	+	0.62***	0.45**	1.72***	1.57***
RedeemD	+	26.53***	7.48	16.59	42.13***
PutD	-	-120.05***	-102.11***	-157.29	-150.44***
ConvertD	-	-244.68***	-195.15***	-292.25	-234.78***
415RegD	-	-6.66	42.00*	-139.08***	-67.44***
144aRegD		59.80**	64.65*	39.38	-1.14
Industry indicators		Yes	Yes	Yes	Yes
Year indicators		Yes	Yes	Yes	Yes
No. of observations		1028	861	1190	718
Model fit (F-value)		624.44***	721.33***	115.86***	53.01***
Adjusted R^2		66.63%	49.90%	66.97%	63.38%

This table reports the results of the association between CSR performance and bond yield spreads for strong corporate governance and weak corporate governance subsamples in the pre- and post-SOX periods. The observations in the strong (weak) governance subsample are those whose *G-index* is below (above) the median. The definitions of all the variables are provided in the Appendix. The standard errors of the estimated coefficients are corrected for firm-level clustering and heteroskedasticity. The superscripts *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively (two-tailed test if the sign is not predicted).

Table 7. Association between overall CSR performance and bond yield spreads: Subsample analyses

Variables	Bond rating		Z-score		Rule 144a bond		Information asymmetry		Environmentally sensitive industry	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Investment grade	Non-investment grade	High	Low	Rule 144a bonds	Non-rule 144a bonds	High	Low	Sensitive	Non-sensitive
CSRT	**-3.31***	**-2.08**	**-3.43***	**-2.89***	**1.61**	**-2.54****	**-4.28***	**-1.82**	**-7.60***	**-0.97**
IssuerSize	-20.21***	-16.17***	-24.70***	-7.90**	-3.46	-3.34	-22.94***	-6.23	-13.25**	-19.64***
ROA	-305.51***	-249.31***	-260.40***	-242.98***	-297.47	-120.14**	-462.87***	-97.69*	-22.09	-420.82***
Leverage	-51.95*	125.11***	98.66***	129.01***	77.26**	121.19***	121.20***	147.79***	131.54**	117.07***
Big4	-30.94*	-76.36***	-80.55**	-87.69**	-65.90**	-53.01	-6.6	-179.62***	-49.78	-87.90**
Z-score	-9.74	-3.3	-	-	-3.42	-5.91**	-3.22	-7.72***	-6.59**	-6.37***
lnMaturity	16.53***	55.33***	5.50	-5.83	-22.73**	8.30**	2.98	-4.82	-11.78**	4.54
Covenant	131.70***	61.38*	83.08**	141.28***	34.53	270.72***	90.21***	173.60***	199.72***	92.26***
IssueSize	-3.07	10.28**	-0.50	-0.45	-5.21	-9.06***	2.55	-1.97	-3.74	3.88
lnRating	-	-	12.82*	92.49***	133.58***	22.18***	37.36***	29.48**	21.93*	43.64***
BusiCycle	1.35***	1.59***	1.30***	1.57***	1.54***	1.36***	1.68***	0.93***	1.31***	1.35***
RedeemD	-0.91	49.33***	25.99***	14.26	58.38***	0.95	15.87*	22.91**	8.37	23.74***
PutD	-150.15***	-98.34***	-123.38***	-147.10***	-72.56***	-184.22***	-148.68***	-144.07***	-182.92***	-127.41***
ConvertD	-150.47***	-348.31***	-317.33***	-301.11***	-468.58***	-110.29	-335.12***	-249.62***	-208.90***	-335.60***
415RegD	-7.29	-71.31**	3.56	-63.82***	67.08	-15.76	-36.81**	-36.06	-31.66	-46.91***
144aRegD	19.01	-6.1	51.06***	33.26	-	-	35.97*	42.47*	83.34**	25.10*
Industry indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2456	1804	2128	2132	1030	3230	2006	2005	1561	2699
Model fit (F-value)	35.88***	130.34***	482.63***	244.59***	330.38***	60.42***	461.67***	132.98***	55.49***	93.71***
Adjusted R^2	58.25%	72.50%	63.90%	62.95%	80.39%	55.77%	68.25%	61.41%	61.94%	64.52%

This table reports the results of the association between overall CSR performance and bond yield spreads for the following five subgroups: investment-grade bonds versus non–investment-grade bonds; issuers with a high and a low *Z-score*; Rule 144a bonds versus non-Rule 144a bonds; bond issuers with high and low information asymmetry; and bond issuers operating in environmentally sensitive and non-environmentally sensitive industries. Bond issuers with high (low) information asymmetry are those whose intangible ratio (*Intangible*) is above (below) the median. Firms in environmentally sensitive industries operate in the following industries: oil and gas; forestry, pulp, and paper; energy; chemicals and drugs; mining and resources; and utilities. The definitions of all the variables are provided in the Appendix. The standard errors of the estimated coefficients are corrected for firm-level clustering and heteroskedasticity. The superscripts *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively (two-tailed test if the sign is not predicted).

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Appendix. Variable definitions

Variable	Definition
YieldSpread	Initial corporate bond yield minus Treasury bond yield with comparable maturity.
CSRT	A corporation's total CSR strength score minus the total CSR concern score (proxy for overall CSR performance).
STR	A corporation's total CSR strength score (proxy for CSR strengths).
CON	A corporation's total CSR concern score (proxy for CSR concerns).
IssuerSize	The natural logarithm of the issuer's assets at the fiscal year-end immediately prior to the new corporate bond issuance date.
ROA	Return on assets of the issuer, defined as net income divided by total assets at the fiscal year-end immediately prior to the new corporate bond issuance date.
Leverage	Long-term debt divided by total assets of the issuer at the fiscal year-end immediately prior to the new corporate bond issuance date.
Big4	An indicator variable that equals one if a firm is audited by a Big Four auditor and zero otherwise.
Z-score	Altman's Z-score is calculated as follows: $1.2 \times$ (working capital/total assets) $+ 1.4 \times$ (retained earnings/total assets) $+ 3.3 \times$ (earnings before interest and taxes/total assets) $+ 0.6 \times$ (market value of equity/book value of total debt) $+ 1.0 \times$ (sales/total assets).
BusiCycle	Difference between the average yield of Moody's Aaa bonds and the average yield of 10-year U.S. Treasury bonds for the month of issue.
lnMaturity	The natural logarithm of the number of years until the bond matures.
IssueSize	The natural logarithm of the par value of the bond initially issued, in millions of dollars.
Rating	Bond rating by Standard & Poor's, sequentially converted to numbers, with one for AAA through 27 for no rating. For issues without a Standard & Poor's rating, Moody's and Fitch ratings are used instead.
lnRating	The natural logarithm of *Rating*.
RatingGroup	Indicator variable that equals 1 for a AAA rating; 2 for AA+, AA, and AA-; 3 for A+, A, and A-; 4 for BBB+, BBB, and BBB-; 5 for BB+, BB, and BB-; 6 for B+, B, and B-; and 7 for CCC+, CCC, CC, C, D, and SD.
Covenant	The total number of bondholder protective covenants in a bond issue divided by the maximum number of bondholder protective covenants in our sample.
RedeemD	An indicator variable for the call feature of a bond. It equals one for bonds that have an embedded call option and zero otherwise.
PutD	An indicator variable for the put feature of a bond. It equals one for bonds that have an embedded put option and zero otherwise.
ConvertD	An indicator variable for the convertible feature of a bond. It equals one for bonds that have an embedded convertible option and zero otherwise.

415RegD	An indicator variable for the SEC Rule 415 shelf registration feature of a bond. It equals one for bonds issued under a shelf registration and zero otherwise.
144aRegD	An indicator variable for the SEC Rule 144a private placement feature of a bond. It equals one for bonds issued through private placement exempt from registration and zero otherwise.
DefaultSpread	An instrumental variable for *YieldSpread*. It is the difference between the yields on Moody's seasoned Baa-rated corporate bonds and 10-year U.S. government bonds in the month corporate bonds are issued.
AvgYieldSpread	An instrumental variable for *YieldSpread*. It is the average yield spread on bond issues completed over the previous six months.
AssetMaturity	An instrumental variable for *lnMaturity*. It is measured as the weighted average of maturity of current assets (*CA*) and net property, plant, and equipment (*NPPE*): $\frac{CA}{(CA+NPPE)} \times \frac{CA}{COGS} + \frac{NPPE}{(CA+NPPE)} \times \frac{NPPE}{Depreication}$.
TermSpread	An instrumental variable for *lnMaturity*. It is the difference between the yields on 10- and one-year U.S. Treasury bonds measured in the month corporate bonds are issued.
AvgCovenant	An instrumental variable for *Covenant*. It is the average number of covenants of bonds issued over the previous six months divided by the maximum number of bondholder protective covenants for our sample.
Blue	An instrumental variable for *CSRT*. It equals one if the bond issuer's headquarters is located in a blue or Democratic state and zero otherwise. A state is considered a blue state if it is listed as a blue state at both of the following websites: http://en.wikipedia.org/wiki/File:Red_state,_blue_state.svg and http://azpundit.com/list-of-the-most- democratic-republican-states/
ReligionRank	An instrumental variable for *CSRT*. It is the ranking of the state in which the bond issuer's headquarters are located and ranges between one and 51. The ranking is based on the ratio of the number of religious adherents in the issuer's state over the total population in that state in 2000. The data on religiosity were obtained from the Association of Religion Data Archive.
G-index	Governance index developed by Gompers et al. (2003).
Intangible	Intangible ratio, defined as intangible assets divided by total assets.