The Bond Market Benefits of Corporate Social Capital

Abstract

We investigate whether a firm's social capital, and the trust that it engenders, are viewed favorably by bondholders. Using firms' corporate social responsibility (CSR) activities to proxy for social capital, we find no relation between CSR and bond spreads over the period 2005-2013. However, during the 2008-2009 financial crisis, which represents a shock to trust and default risk, high-CSR firms benefited from lower bond spreads. These effects are stronger for firms with higher expected agency costs of debt. During the crisis, high-CSR firms were also able to raise more debt at lower spreads, better credit ratings, and longer maturities.

1. Introduction

Financial contracts are the "ultimate trust-intensive" transactions: the capital provider exchanges a sum of capital today for a promise of a future payment (Guiso, Sapienza, and Zingales (2004)). While the legal enforceability of the contract and the financier's ability to monitor the financee's actions are crucial in determining whether such an exchange can take place, trust is also an important factor.

Social capital, and the trust it engenders, can facilitate financial contracting by mitigating adverse selection and moral hazard problems.[1] When trust prevails, counterparties in economic transactions need to spend less time, effort, and resources in protecting themselves from the risk of being exploited. In exchanges characterized by mutual trust, demand for formal written contracts is lower, and written contracts that do exist need not specify every possible contingency. Extending this notion to agency relationships, principals need to engage in less stringent monitoring of agents. These factors lead to broad economic benefits such as increased stock market participation and greater economic and financial development.[2]

Recent evidence shows that the benefits of social capital and trust also accrue to individual firms. *Endowed trust*, which we define as externally "acquired" trust that a firm enjoys from being located in a high-trust society/environment, is associated with less-intensive formal contracting, better financial performance, higher stock valuations (Hilary and Huang (2016)), and moderately better terms in private loan deals (Hasan, Hoi, Wu, and Zhang (2017)). *Earned trust*, which is internally "generated" through a firm's own investment in social capital, also pays off: during crisis-of-trust

[1] Social capital can be defined in terms of generalized trust, civic norms, beliefs, and dispositions which affect agents' propensity to cooperate (e.g., Putnam (1993, 2000); Knack and Keefer (1997); La Porta et al. (1997)), or as cooperative networks that exist among agents (e.g., Coleman (1988, 1990); Lin (2001)).

[2] See, for example, Guiso, Sapienza, and Zingales (2004, 2008), Putnam (1993), Fukuyama (1995), Knack and Keefer (1997), La Porta Lopez-de-Silanes, Shleifer, and Vishny (1997).

periods, firms with higher earned trust earn higher stock returns (Lins, Servaes, and Tamayo (2017)). Studying the economic effects of earned trust is particularly interesting because it is discretionary in nature: endowed social capital is not something a firm can easily modify, whereas a firm can choose its own level of internally-generated social capital to a large extent.

In this paper, we investigate the role of earned trust in a setting where managerial moral hazard is of particular concern: the corporate bond market. Debtholders, in general, are mainly concerned with downside risk, given their lack of upside potential. Bond investors, however, are more susceptible to agency frictions than banks in private loan agreements. This is largely due to the arm's length nature of bond contracts and structural differences between private and public debt in terms of lenders' monitoring ability, their information costs, and recontracting flexibility (Smith and Warner (1979), Rajan (1992), Roberts and Sufi (2009)). In this setting, we anticipate that trust, defined as "the expectation that another person will perform actions that are beneficial, or at least not detrimental, to us regardless of our capacity to monitor those actions" (Gambetta (1988)), will play a more pronounced role. However, since corporate bonds are typically held by financially savvy, informed institutional investors, the benefits of earned trust in the corporate bond market may be less prominent than in a setting with greater heterogeneity in investor sophistication, such as the equity market.[3]

Given that the corporate bond market is the most important source of external capital for many large corporations (see, e.g., Philippon (2009)),[4] understanding the determinants of bond contracting terms is of key importance. We postulate that an individual firm's social capital, and the trust it earns, can affect the design and pricing of its bond contracts through both a direct and an indirect channel.

[3] Guiso et al. (2008) show that the effect of social capital on stock market participation is weaker for individuals with more education.

[4] According to the Securities Industry and Financial Markets Association (SIFMA), US bond issues originated between 1996 and 2017 averaged $940 billion per year and the size of the total US corporate bond market as of the second quarter of 2017 exceeded $8.6 trillion. (See: https://www.sifma.org/resources/research/us-bond-market-issuance-and-outstanding/).

The direct channel is via a reduction in activities that benefit shareholders at the expense of bondholders, broadly known as the agency costs of debt. Managers, acting in the interest of shareholders, have incentives to expropriate bondholders by investing in risky projects as the firm becomes financially distressed (Jensen and Meckling (1976)), even if these projects reduce firm value. Similarly, managers of distressed firms have an incentive to pay out cash to shareholders in the form of dividends or repurchases prior to bankruptcy if they are allowed to do so. Bondholders anticipate this potential for asset substitution and/or cash diversion and demand higher rents, thus raising the firm's cost of debt capital. These moral hazard concerns are alleviated, however, when trust is higher; if bondholders believe that stakeholder-focused managers are unlikely to engage in risk shifting or cash diversion, thereby potentially jeopardizing the firm's survival, they will demand lower rents. Thus, by mitigating the agency costs of debt, social capital can lower the firm's cost of debt capital, particularly for those firms more prone to asset substitution and cash diversion.

The indirect channel is a result of externalities. Recent evidence suggests that a firm's social capital helps build stakeholder cooperation, which delivers economic benefits in the form of higher cash flows and/or a reduction in risk. For example, firms that pay more attention to employees and other stakeholders exhibit higher stock returns and valuations ((Edmans (2011), Servaes and Tamayo (2013), Guiso, Sapienza, and Zingales (2015), Ferrell, Liang, and Renneboog (2016)). Stakeholder cooperation is particularly beneficial for bondholders when companies face financial difficulties. In such times, stakeholders of high-social-capital firms are more likely to exert additional effort to ensure the recovery of the firm. This is the reciprocity concept often discussed in studies of social capital (Fehr and Gächter (2000)): I will be good to you with the expectation that you will be good to me when I need it. Thus, reciprocity may also lead to a lower cost of debt for all firms investing in CSR, regardless of their potential for asset substitution and cash diversion.

We hypothesize that these channels are more relevant to bondholders when the overall level of trust in companies is low, particularly for bondholders of firms that are more able to increase asset risk or divert cash flows to shareholders. In low-trust periods, bondholders are more likely to believe that companies will not protect their interests unless the firms themselves are deemed trustworthy, something they can signal by investing in social capital. When overall trust is high, a firm's level of social capital matters less for bondholders, as they do not expect to be expropriated in the first place. In other words, when overall trust is high, firm-level trust is less likely to matter.

Of course, a competing argument to those noted above is that stakeholder-oriented firms are merely wasting the firm's resources by diverting cash flows to invest in activities that benefit some stakeholders but do not necessarily add value to the firm (e.g., Friedman (1970), Masulis and Reza (2015); Cheng, Hong, and Shue (2016)). If true, bondholders will demand higher compensation to lend to these firms.

To capture an individual firm's social capital, we follow recent academic work in economics and finance (Aoki (2011); Sacconi and Degli Antoni (2011); Lins et al. (2017); Servaes and Tamayo (2017)) and use a firm's Corporate Social Responsibility (CSR) activities as a proxy for its investment in social capital. The view that CSR activities generate social capital and earned trust is also widely held by practitioners and corporations. In fact, practitioners have long held the view that CSR helps build trust (Fitzgerald (2003)) but following the financial crisis, this view has become even more widespread (see PricewaterhouseCoopers (2013, 2014) for global surveys of CEOs). Thus, we test whether, and to what extent, firms that take into account the interests of a broad set of stakeholders, i.e., high-CSR firms, reap financial benefits in the corporate bond market.

We investigate both secondary market bond trades and primary market bond originations. Our main analyses are conducted using a large sample of publicly-traded, non-financial, U.S. domiciled

firms with bond trade data available between 2005 and 2013. We also identify a sample of corporate bond issues that were offered on the primary market over the period 2007-2013.

We start by analyzing the relation between secondary market bond spreads and firms' CSR ratings over the full sample period. While endogeneity concerns make it difficult to draw causal inferences from such an estimation, our results indicate a modest negative CSR-credit spread relation, consistent with Goss and Roberts (2011), who study private debt and conclude that "CSR is at most a second-order determinant of yield spreads" (p.1795). However, when we control for time fixed effects, the modest relation between CSR and bond spreads disappears entirely. Thus, on average, there is no relation between corporate bond spreads and CSR. Moreover, when we consider firms more prone to asset substitution or cash diversion, we do not find any relation either.

Next, we turn to the financial crisis of 2007-2009. The crisis combines an exogeneous shock to firms' default risk and an erosion of overall trust in firms, markets, and institutions, thereby increasing the potential importance of firm-level social capital for bondholders. Following prior work (e.g., Duchin, Ozbas, and Sensoy (2010); Ivashina and Scharfstein (2010); Sapienza and Zingales (2012); Lins et al. (2017)), we identify two distinct periods: the credit crunch – the period of July 2007 through July 2008, when the supply of credit suffered a shock but general trust had not yet eroded; and the trust crisis – the period of August 2008 through March 2009, when a shock to trust occurred. The characterization of this period as one during which trust declined is also consistent with survey evidence. For example, Edelman (the world's largest independent public relations firm) reports that trust in business in the U.S. remained stable until early 2008 (it was 53% in early 2007 and 58% in early 2008), but declined precipitously to 38% in early 2009. Thus, we are able to isolate the corporate bond market effects of social capital when overall trust was severely eroded compared to a period when credit market access was constrained.

We conduct multiple difference-in-differences tests using the shock to trust as a quasi-experimental setting. For our empirical tests, we rely on pre-crisis levels of CSR because it is unlikely that firms could have adjusted their CSR spending in anticipation of the financial crisis. Since the crisis is a plausibly exogenous event with respect to firms' pre-crisis CSR decisions, we can also circumvent endogeneity concerns that arise in studies on the relation between firms' CSR and financial performance.

Our results are unambiguous: during the crisis of trust, secondary market credit spreads of high-CSR firms did not rise as much as the spreads of low-CSR firms. Further, we find that the effect of CSR on bond spreads during the crisis is stronger for non-investment grade firms, for firms with fewer tangible assets and for firms incorporated in states that do not impose dividend restrictions on insolvent firms. These are firms that have more opportunity to engage in asset substitution (see Williamson (1988) and Johnson (2003)) or to divert cash to shareholders when in distress (see Wald and Long (2007)). For these firms, the implicit commitment that these activities are unlikely to occur, as captured by CSR investments, is most valuable. In addition, high-CSR firms were able to raise more capital on the primary bond market during the trust crisis, and those (high-CSR firms) that did access the bond market benefited from lower at-issue spreads relative to treasuries, better initial credit ratings, and longer debt maturities. These effects are economically substantial as well. For example, a one standard deviation increase in our measure of CSR is associated with 34 basis points lower credit spreads in the secondary market during the financial crisis. For firms more able to either engage in asset substitution or diversion of cash to shareholders when in distress, the effect increases to 43 and 52 basis points, respectively. For non-investment firms, the impact is 62 basis points.

We conclude that corporate social capital affects bond contracting and pricing when it matters most: when there is a crisis of trust and bondholders seek reassurance that they will not be

expropriated. In such periods, a firm's social capital is perceived as an insurance policy against excessive risk taking that can harm stakeholders and bondholders.[5]

Our findings contribute to three strands of literature. First, we extend the nascent literature on the role of social capital in financial contracting by highlighting its importance for the corporate bond market, particularly for those firms more susceptible to asset substitution and/or cash diversion when distressed. Lins et al. (2017) report that firms with higher pre-crisis social capital had higher crisis-period stock returns. It is not at all obvious, however, that these findings would carry over to the bond market. In fact, these superior stock returns could, in principle, come at the expense of bondholders due to increased asset substitution or diversion. Our evidence illustrates that this is not the case given that bondholders more exposed to potential agency frictions are those who benefited the most during the crisis. Moreover, we show that our results continue to hold after controlling for stock returns, suggesting that the bond market benefits we document are complementary to and cannot be subsumed by the stock returns results. These findings are novel to the literature and add to our understanding of the importance of perceived agency costs of debt in debt pricing. In addition, as noted previously, bond investors are typically characterized as more sophisticated, and the work by Guiso et al. (2008) suggests that more educated investors rely less on social capital in their decision making. Our evidence indicates that even sophisticated investors rely on social capital measures when allocating capital.

Second, we provide new evidence on the determinants of corporate bond spreads. Extant studies in this area show that bond spreads can be explained by default risk, liquidity, systematic risk, and

[5] Our paper documents the role of social capital, as measured by CSR activities, in mitigating the perception of risk taking when there is an economy-wide shock to trust. Other papers have examined the role of CSR in mitigating the consequences of firm-specific shocks. Using prosecutions of the Foreign Corrupt Practices Act, Hong and Liskovich (2016) report that more socially responsible firms pay lower fines for bribery when violating the Foreign Corrupt Practices Act. Jeffers (2015) finds that officials are more lenient with penalties for OSHA violations ascribed to high-CSR firms. Albuquerque, Koskinen, and Zhang (2017) model CSR as a product differentiation strategy allowing firms to benefit from higher profit margins which lessens systematic risk.

market frictions (e.g., Duffee (1999); Elton, Gruber, Agrawal, and Mann (2001); Collin-Dufresne, Goldstein, and Martin (2001); Longstaff, Mithal, and Neis (2005); and Dick-Nielsen, Feldhütter, and Lando (2012)). These are mostly factors that firms cannot directly control. In addition, the explanatory power of models of the determinants of debt spreads continues to be limited. We extend this literature by documenting the credit relevance of firms' social capital, as proxied by CSR, primarily in times when overall trust in corporations and markets is low. Importantly, firms do have, to some extent, control over their CSR investments and can thus adjust them over time, thereby influencing their cost of debt.

Third, our results add to the literature on the determinants of firms' contractual arrangements with creditors in the primary market (e.g., Berger and Udell (1990); Billett, King, and Mauer (2007); Chava, Kumar, and Warga (2010)) and on firms' credit ratings (e.g., Mansi, Maxwell, and Miller (2004); Becker and Milbourn (2011); and Baghai, Servaes, and Tamayo (2014)). Our evidence on high-CSR firms' ability to attract more debt capital at more favorable terms during the crisis suggests that internally-generated social capital contributes to establishing trust and mitigating agency frictions between contracting parties. These features, in turn, exert a positive influence on credit ratings.

The remainder of the paper proceeds as follows. In Section 2, we describe the sample and present summary statistics. Section 3 reports preliminary results for secondary market spreads while Section 4 presents the results using the financial crisis as an exogenous shock. In Section 5, we expand our analyses to the primary market. Section 6 concludes the paper.

2. Sample and summary statistics

2.1. Sample construction

To construct our sample of corporate bonds on the secondary market, we start with the universe of bonds covered in the TRACE database from 2005 to 2013.[6] As in Dick-Nielsen, et al. (2012), we exclude variable- and zero-coupon, perpetual, foreign currency, preferred, puttable, and exchangeable issues as well as private placements and Yankee and Canadian bonds. We further restrict our selection to include only corporate debentures and corporate medium-term notes with a time-to-maturity of more than one month and 30 years or less. We also exclude issuers from the financial sector (SIC codes 6000-6999) as these firms received government support during the 2008-2009 crisis, which could affect our inferences. To be included in our sample, we further require that data on relevant bond contract attributes (i.e., issue size, offering and maturity dates, coupon, collateral, and covenants) are available on Mergent FISD. Merging the two databases, we obtain a sample of bond trades comprising 2,212 bonds issued by 342 firms. To account for liquidity biases and erroneous entries in TRACE, we follow the method in Dick-Nielsen (2009).[7] We further apply the price-based filters used in Edwards, Harris, and Piwowar (2007) and Han and Zhou (2016) to remove outliers and observations with likely data errors.[8] Applying these refinements reduces our sample to 2,177 bonds issued by 338 firms.

[6] Our selection of 2005 as the starting point of the sample period is driven by data availability on TRACE. The Financial Industry Regulatory Authority (FINRA) is responsible for the collection and reporting of over-the-counter (OTC) bond trades. Before 2005, data on bond trades were disseminated in phases, beginning in July 2002 with Phase I requiring the reporting of investment-grade securities of $1 billion in face value or greater. Over the course of Phases II and III in late 2004, trade reporting was expanded to cover approximately 99% of all OTC transactions. As of July 2005, FINRA requires all its members to report their trades within 15 minutes of the transaction.

[7] The procedure removes retail-sized non-institutional trades (i.e., those with a value below $100,000), dirty prices that include dealer commissions, trades with missing execution time or date or missing trade size, genuine duplicates, trade reversals along with the original trade that is being reversed, trades with missing or negative yields, as well as same-day trade corrections and cancellations.

[8] Specifically, we exclude trades with prices less than $1 or greater than $500, and trades with prices that are 20 percent away from the median of the reported prices in the day or 20 percent away from the previous trading price.

We merge this sample with CSR ratings data from the MSCI ESG Stats Database, which contains yearly environmental, social, and governance ratings of large, publicly-listed companies. This database has been used in a number of studies examining the effect of CSR on firm value and performance (e.g., Hong and Kostovetsky (2012); Deng, Kang, and Low (2013); Servaes and Tamayo (2013); Albuquerque et al. (2017)) and covers roughly the 3,000 largest U.S. companies. Finally, we obtain annual fundamentals and daily stock market data from Compustat and CRSP, respectively.

Merging these databases yields a final sample of 1,989 corporate bonds issued by 296 firms with secondary market trade data from 2005 to 2013, as noted in Panel A of Table 1. Panel B outlines the industry composition, where manufacturing constitutes the largest proportion of bond issues (14.2%), while the other sectors have a fairly balanced representation in the overall sample.

2.2. CSR variable construction and descriptive statistics

Our main independent variable is the CSR index, which we construct following Servaes and Tamayo (2013). We concentrate on five of the 13 categories that ESG Stats uses to classify a firm's environmental, social, and governance performance: community, diversity, employee relations, environment and human rights. We do not consider the six ESG Stats categories that penalize firms' participation in controversial industries (alcohol, gaming, firearms, military, nuclear and tobacco), as there is nothing that firms can do about industry concerns, except change industries.[9] We further exclude the ESG Stats product category because it contains a number of elements that we consider to be outside the scope of CSR, such as product quality and innovation. Finally, we leave out the ESG Stats corporate governance category because governance is usually considered to be outside a firm's CSR remit. However, since strong governance may also be beneficial to bondholders (e.g., Bhojraj

[9] In addition, in all of our estimations, we control for either industry or firm fixed effects.

and Sengupta (2003); Klock, Mansi, and Maxwell (2005); Bradley and Chen (2011, 2015)), we control for governance in our regression specifications.

For each of the five categories we consider, ESG Stats constructs a number of indicators on both strengths and concerns. To combine this information into one CSR metric, we first divide the number of concerns and the number of strengths in each of the five categories by its possible maximum in a given year (as there is time-series variation in the number of indicators), and subtract the resulting scaled concerns number from the scaled strengths number. This procedure yields an index for each of the five categories ranging from -1 to +1. Our CSR metric is the sum of the individual measures across the five categories. Thus, it ranges from -5 to +5.

Our main dependent variable is a bond's credit spread, computed as the difference between the bond's yield to maturity from TRACE and the Treasury yield matched by maturity (e.g., Campbell and Taksler (2003); Chen, Desmond, and Wei (2007); Huang and Huang (2012)).[10] As in Becker and Ivashina (2015), we employ the median yield of all transactions taking place on the last active trading day of a given month to compute the spreads. We winsorize credit spreads to be no greater than 1000 basis points to alleviate the influence of outliers.[11]

Table 2 provides summary statistics on the characteristics of the bonds in our sample, the CSR index, credit spreads, and other control variables. All continuous control variables are winsorized at the 99th percentile and also at the 1st percentile unless their lower bound is zero. The Appendix contains detailed definitions of all the variables employed in our analyses. Panel A contains the bond characteristics that remain constant over the life of the bonds. As such, we count each bond once in the summary statistics. The mean issue size in our sample is $578 million. About 42 percent of the

[10] Maturity-matched risk-free yields are obtained by linearly interpolating benchmark Treasury yields contained in the Federal Reserve H-15 release for constant maturities.
[11] Our main results hold when we remove these bonds rather than winsorize them.

sample bonds are offered concurrently in global and domestic markets while 90 percent of the issues include an option for early redemption. The security rank captures the seniority of the bond and ranges from 1 for junior subordinate bonds to 5 for senior secured bonds, with subordinate, senior subordinate, and senior as the intermediate categories. The mean security rank is just below 4, while its 25th, 50th and 75th percentiles are all equal to 4, which indicates that the majority of issues in our sample are senior bonds. More than 50 percent of the bond indentures in our sample include at least six covenants.[12]

Panel B of Table 2 contains those bond characteristics that could potentially vary on a monthly basis. As such, we count each bond/month pair as a separate observation. The bonds in our sample have a mean time-to-maturity of just over 6.5 years (78.2 months). There is considerable cross-sectional variation in credit spreads, with an average of just under 200 basis points. Credit ratings are converted to numerical values, starting with 1 for AAA ratings through 21 for C ratings. The mean credit rating of 8.6 indicates that the bonds in our sample are rated between BBB and BBB+, on average.[13]

Panel C of Table 2 contains summary statistics on firm characteristics. All of them vary annually, except for stock return volatility, which we re-compute on a monthly basis. The firms in our sample are large (average market capitalization of $18.6 billion) and profitable (operating income to sales exceeds 22%). The median of our explanatory variable of interest, *CSR*, is -0.075, which indicates that more than half of the firms in our sample have more concerns than strengths, consistent with Deng et al. (2013), Servaes and Tamayo (2013), and Borisov, Goldman, and Gupta (2016).

[12] To measure covenant intensity, we follow Chava, et al. (2010) and Bradley and Roberts (2015) and count the number of covenants in the five main categories (payout, investment, financing, accounting, and event-related restrictions) reported on Mergent FISD.

[13] We obtain credit ratings issued by S&P, Moody's, and Fitch from Mergent FISD and Bloomberg. As in Ellul, Jotikasthira, Lundblad, and Wang (2015), to designate a representative rating when an issue is rated by multiple agencies, we first select the S&P rating; if missing, we use ratings from Moody's, and if both are missing, we use ratings from Fitch.

3. The CSR-credit spread relation

In this section, we examine whether there is a relation between CSR and bond spreads over the entire sample period from 2005 to 2013. We conduct this analysis by regressing bond spreads in the secondary market on firm CSR ratings and controls. As a firm's CSR policy is likely jointly determined with other firm characteristics, we are not able to draw any causal inferences from this analysis; our results should therefore be viewed as suggestive of correlations only.

Specifically, we estimate the following pooled regression model using monthly spread data:

$$Spread_{ijt}=\beta_1 CSR_{it-1}+\gamma' \boldsymbol{X}_{ijt-1} + \delta' \boldsymbol{Z}_{it-1}+FFE_i+\varepsilon_{ijt}\,, \quad (1)$$

where $Spread_{ijt}$ denotes the credit spread of firm i's bond j in month t, and CSR_{it-1} is firm i's total net CSR index measured at time $t-1$, our explanatory variable of interest. $\boldsymbol{X}_{ijt-1}$ is a (K×1) vector of bond-level controls measured at time $t-1$ and $\boldsymbol{Z}_{it-1}$ is a (L×1) vector of firm-level controls measured at time $t-1$. In addition, we include firm fixed effects, FFE_i, to control for unobservable time-invariant credit risk factors. We double cluster the standard errors at the firm and time (monthly) levels to control for cross-sectional and time-series dependence, respectively (Petersen (2009)).

As controls for bond characteristics, we include *Amount*, *Coupon*, *Time-to-maturity*, *Redeemable* (equal to one if the bond issue may be redeemed under conditions specified in the indenture agreements), *Fungible* (equal to one if the bond issue is, by virtue of its terms, equivalent, interchangeable, or substitutable), *Offering market* (equal to one if the bond offering is global), *Security* (i.e., collateral stringency), and *Covenant intensity*, following prior work on corporate bonds (e.g., Datta, Iskandar-Datta, and Patel (1999); Miller and Puthenpurackal (2005); Nini, Smith, and Sufi (2012); Bradley and Roberts (2015)). We further control for contemporaneous bond liquidity using the Amihud (2002) illiquidity measure that captures the price impact of trades. Because this measure requires multiple trades in a day, it is not available for all bonds.

Our issuer-level controls also follow prior research on corporate bonds (e.g., Campbell and Taksler (2003); Chen et al. (2007); Acharya, Davydenko, and Strebulaev (2012)): (i) *Ln*(*Size)* (Log market equity), (ii) *Profitability*, (iii) *Short-term leverage*, (iv) *Long-term leverage*, (v) *Cash holdings*, (vi) *Tangibility*, (vii) *Coverage ratio*, and (viii) *Stock return volatility*. We further control for *Capital expenditure* as Baghai, Servaes, and Tamayo (2014) document that this factor plays an important role in explaining issuers' credit ratings. Finally, we control for corporate governance as research suggests that debt investors demand lower spreads for bonds of better-governed firms (e.g., Klock, Mansi, and Maxwell (2005); Bradley and Chen (2015)). We use the entrenchment index (*E-index*) proposed by Bebchuk, Cohen, and Ferrell (2009) as a proxy for corporate governance quality. This index combines six provisions that capture managerial entrenchment and insulation from takeovers.[14] Thus a higher index implies worse governance. The data to construct the *E-index* are gathered from Institutional Shareholder Services. The accounting-based firm characteristics and CSR data are updated annually. To ensure that the accounting data are publicly available, we update these items three months after a firm's fiscal year-end. CSR is updated annually in April when the ratings for the previous year are released. *Volatility* is re-estimated each month based on the previous year's daily returns data. Finally, the *E-index* is available bi-annually and we keep it constant during the year for which data are not available.

Our findings from estimating model (1) are reported in Table 3. In Panel A, we first present the results from a simple regression of credit spreads on CSR, controlling for firm fixed effects (column (i)). The coefficient on CSR is -0.215, suggesting that high-CSR firms have lower spreads. We next control for bond-level attributes (column (ii)) and find that the coefficient on CSR is substantially lower at -0.138. As a gauge of economic significance, a one standard deviation increase in CSR of

[14] The E-index consists of the following six provisions: (i) a staggered board, (ii) limits to amend the charter, (iii) limits to amend bylaws, (iv) supermajority voting requirements, (v) golden parachutes for executives, and (vi) the presence of a poison pill.

0.644 (Table 2) is associated with an 8.9 basis points reduction in average credit spreads. This effect is modest, at best. The modest negative relation between CSR and credit spreads that we document in the first two models of Table 3 is consistent with prior work based on bank loans (e.g., Goss and Roberts (2011); Hasan et al. (2017)).

We next include time fixed effects (monthly dummies) in column (iii). This addition has a substantial impact on the explanatory power of the model, increasing the R-squared from 54% to 80%. Importantly, the coefficient on CSR becomes statistically (and economically) insignificant in this specification. This suggests that, on average, there is no relation between CSR and bond credit spreads, and highlights the importance of controlling for the overall time-series variation in spreads when estimating models of bond yields. In model (iv), we further control for firm-level characteristics that may vary over time; the addition of these controls has no additional impact on our results.

In Panel B of Table 3, we re-estimate these four models, but also control for credit ratings (see, e.g. Campbell and Taksler (2003)). Adding this additional control has little or no effect on the coefficient of CSR and its economic significance. Once time fixed effects are added to the regressions, as in models (iii) and (iv), there is no relation between credit spreads and CSR.

We also investigate whether the CSR-spread relation is stronger for firms with non-investment-grade debt, or with more intangible assets, or firms incorporated in states that provide less bondholder protection during insolvency. These are firms that have more of an opportunity to shift risk and divert cash to shareholders at the expense of bondholders. We do not find that these factors affect the CSR-spread relation (not reported in a table).[15]

[15] In Section 4.3, we motivate these tests in greater detail and discuss their relevance during the financial crisis.

4. CSR and credit spreads: Evidence from an exogenous shock to trust

4.1. CSR and credit spreads during the financial crisis

In this section, we seek to understand whether the bond market payoffs to firms' CSR activities are more pronounced when overall trust is low, and a firm's social capital may become more valuable. We focus on the financial crisis, which constituted an exogenous shock to public trust in corporations, capital markets and institutions, and led to a decline in stock prices and an increase in bond spreads for the vast majority of firms. The exogenous nature of this shock to trust also helps alleviate the endogeneity concerns associated with model (1). Our argument assumes that firms decide on the optimal level of CSR during normal times, when the probability of a crisis and decline in overall trust is relatively low. During these times, some firms do not engage in CSR because they do not view it as worth the cost, while others invest in CSR activities because they expect it to be beneficial. As such, the crisis is a plausibly exogenous event with respect to a firm's decision to engage in CSR. When a crisis hits, the value of social capital built through CSR investments becomes apparent, but for those firms that invested little in CSR during the pre-crisis period, it is too late to make such investments as corporate social capital cannot be generated on the spot. High-CSR firms, on the other hand, benefit.[16]

We start by plotting the time series of debt spreads of high- and low-CSR firms in Figure 1, where the cutoff between the two groups is based on the median CSR value of the year. Firms are included in a high/low portfolio in April of each year, when new CSR scores are released, and they remain in this portfolio until April of the following year. The variation in the spread differential

[16] The same arguments can be made about other corporate finance policies. If firms had been able to predict the crisis, they would have entered the crisis with more cash, less debt, and they would have ensured that their debt was not maturing during the crisis. Indeed, work by Duchin, et al. (2010) and Almeida, et al. (2012) indicates that high-cash firms, with less short-term debt, and less debt maturing during the crisis performed better during the crisis and were able to maintain higher levels of investment than other firms.

between high- and low-CSR firms over time is striking: up to August 2008 there is little difference between the two spreads. After August, the differential shoots up, and reaches its maximum level in November 2008. The differential remains high until March 2009, when the stock market hit its lowest point of the crisis; afterwards, there is still a marked difference between the spreads of high- and low-CSR firms, but the magnitude is notably smaller than during the crisis. The period of August 2008 to March 2009 (shaded region in the figure), when the difference becomes considerable, coincides with the crisis of trust described in Sapienza and Zingales (2012) and Lins et al. (2017), among others. This figure suggests that CSR is related to bond spreads mainly when a firm's social capital is more highly valued. In what follows, we examine this relation more formally.[17]

Our sample period for this analysis begins in 2007, prior to the onset of the crisis, and ends in 2013, several years into the economic recovery. We adopt a quasi-difference-in-differences approach and examine whether firms that entered the crisis period with higher CSR scores enjoyed relatively lower spreads during the crisis.[18] Specifically, we estimate the following model:

$$Spread_{ijt} = \beta_1 CSR_{i2006} * Crisis_t + \beta_2 CSR_{i2006} * Post\text{-}crisis_t + \gamma' \boldsymbol{X}_{ijt-1} + \delta' \boldsymbol{Z}_{it-1} + FFE_i + TFE_t + \varepsilon_{ijt}, \quad (2)$$

where, as before, $Spread_{ijt}$ denotes the spread of firm i's bond j at time t, $\boldsymbol{X}_{ijt-1}$ is a (K×1) vector of bond-level controls measured at time $t-1$, and $\boldsymbol{Z}_{it-1}$ is a (L×1) vector of firm-level controls measured at time $t-1$. We include firm fixed effects, FFE_i, to control for unobservable time-invariant credit risk factors, and time fixed effects, TFE_t, specified at the monthly level.[19] We measure CSR as of year-end 2006, well before the onset of the financial crisis, to eliminate the concern that firms might have

[17] The figure looks very similar if we divide firms into two groups based on their CSR scores for the year 2006 (prior to the onset of the financial crisis) and make no subsequent changes to the composition of these groups.
[18] We start this analysis in 2007 because we study credit spreads after observing the pre-crisis level of CSR in 2006.
[19] We also estimate this model without time fixed effects, but with dummies for the crisis and post-crisis periods. These indicator variables capture the change in spreads during and after the crisis for firms with a CSR score of zero. Our inferences remain unchanged when we employ this alternative specification.

adjusted their CSR activities in anticipation of the crisis.[20] $Crisis_t$ is an indicator variable that takes the value of 1 for the crisis of trust period, starting in August 2008 and ending in March 2009 (as in Lins, Volpin, and Wagner (2013) and Lins et al. (2017)), and $Post\text{-}crisis_t$ is an indicator variable that takes a value of 1 from April 2009 to December 2013. As before, we double cluster the standard errors at the firm and time (monthly) levels to control for cross-sectional and time-series dependence, respectively. Inclusion of firm fixed effects and firm and bond characteristics ensures that the crisis-CSR effect is not due to the fact that healthier firms that happened to spend more on CSR also performed better during the crisis.

In model (2), the coefficient on the interaction term $CSR_{i2006}*Crisis_t$, β_1, captures the difference between the effect of CSR on credit spreads in the crisis versus the pre-crisis period (the pre-crisis effect itself is captured by the time and firm fixed effects). The coefficient on the interaction variable $CSR_{i2006}*Post\text{-}crisis_t$, β_2, captures the difference between the effect of CSR on credit spreads in the post-crisis versus the pre-crisis periods. This coefficient could also be negative given that overall trust in companies, markets, and institutions continued to be low after the crisis for some time. However, in absolute terms, we expect β_1 to be larger than β_2, given that the most pronounced erosion of trust occurred during the crisis.

The results from estimating model (2) are reported in Panel A of Table 4. We first control for bond attributes in column (i) and then include firm characteristics in column (ii). Both models indicate that CSR has a statistically and economically significant impact on bond spreads during the crisis. Based on the regressions reported in model (ii), a one standard deviation increase in pre-crisis CSR is associated with 34 basis points lower spreads during the crisis period.[21] The benefit accrued to high-

[20] Our 2006 CSR measure is static and is thus absorbed by the firm fixed effects. In untabulated tests, we confirm that our results hold when we use a time-varying, lagged measure of CSR.
[21] The standard deviation of CSR for the 2007-2013 sub-period is 0.553, slightly smaller than the standard deviation of CSR for the whole period reported in Table 2.

CSR firms during the crisis disappears in the post-crisis period (the difference between β_1 and β_2 is statistically significant at the 1% level in both specifications).

Next, we also control for corporate governance using the firm's E-index. As discussed previously, better-governed firms have lower bond spreads. These firms also performed better during the crisis (Lins et al. (2013); Nguyen, Nguyen, and Yin (2015)); thus, if governance is correlated with our CSR measure, we could be suffering from an omitted variable bias. We report the results of the spreads regression after inclusion of the E-index in column (iii). The coefficient on CSR remains virtually unchanged in this specification, and, hence, the impact of CSR on spreads during the crisis cannot be attributed to better governance. The E-index itself is negatively related to bond spreads (after controlling for numerous factors, including firm characteristics and firm fixed effects), indicating that bond investors demand lower spreads from firms with worse governance. While counterintuitive, this relation might be caused by the fact that the E-index captures a firm's insulation from takeovers – if such takeovers were to be financed by debt, this would likely raise credit spreads (see Eisenthal, Feldhütter, and Vig (2017)).[22]

In our last specification reported in column (iv), we also control for credit ratings. As expected, firms with better ratings (those with lower credit rating scores) have lower spreads, but the CSR variable remains significant in this model. In fact, the economic importance of CSR increases somewhat in this specification: a one standard deviation increase in CSR is associated with 36 basis points lower spreads.

[22] We also construct an alternative governance measure from the governance information available on the ESG Stats database using the same approach as for the CSR elements. Specifically, for each firm, we divide the number of governance concerns by its possible maximum and subtract it from the number of governance strengths divided by its possible maximum. This approach yields a governance index that ranges from -1 to +1. The inclusion of this governance index has little effect on the magnitude or significance of the coefficient on CSR.

From these analyses, we conclude that the spreads of high-CSR firms' bonds increased less during the financial crisis relative to the spreads of low-CSR firms' bonds. This finding is consistent with bondholders valuing a firm's social capital and its "earned trust" more in periods when being trustworthy is particularly important, such as in a crisis of trust.

4.2. CSR and credit spreads during the credit crunch

Next, we conduct further analyses to corroborate that our results are indeed driven by a shock to market-wide trust rather than a shock to the supply of credit. In July 2007, LIBOR rates started to increase dramatically as the solvency of the banking sector weakened, which had a negative impact on the ability of firms to borrow (e.g., Duchin et al. (2010) and Ivashina and Scharfstein (2010)). This shock to the supply of credit persisted until at least March 2009, thereby overlapping partly with the period during which there was a shock to trust. If high-CSR firms were less affected by the credit crunch, the differential in the spreads that we document could be due to this phenomenon rather than a shock to trust. High-CSR firms may have been more able to borrow over the credit crunch given that the agency costs of debt argument that we describe can hold in any crisis in general. Our contention, however, is that if a firm's CSR investments engender trust, the effect of CSR on debt spreads should be particularly salient when trust is more valued. Furthermore, in a crisis of trust, the (perceived) reduction in the agency costs of debt for high-CSR firms is compounded with positive real effects derived from reciprocity.

Figure 1 suggests that the difference in spreads between high- and low-CSR firms only manifests itself starting in August 2008 and not earlier. To investigate debt spreads during the credit crunch more formally, we augment model (2) with an interaction term between CSR and the "pure" credit crunch period, which we define as the period of July 2007 through July 2008. During this period, the shock to credit supply had already happened, but the shock to trust had not yet occurred

(Sapienza and Zingales (2012); Lins et al. (2017)). As in Panel A of Table 4, we estimate various specifications of this augmented regression, starting with a more parsimonious model and adding additional controls in subsequent specifications. The findings are reported in Panel B of Table 4. Across all models, the impact of CSR on debt spreads is never significant during the credit crunch, but it is always highly significant during the trust crisis, and only marginally significant in one specification in the post-crisis period. Moreover, the effect of CSR on bond spreads is significantly different between the crisis and the credit crunch and between the crisis and the post-crisis periods under all specifications. In terms of economic importance, the effect of CSR on spreads during the crisis increases relative to the models reported in Panel A. For example, based on model (iv), increasing CSR by one standard deviation attenuates the overall rise in spreads by 42 basis points during the crisis. The magnitude of the post-crisis effect for the same change in CSR is a 13 basis point attenuation in the rise in spreads.

Overall, the results reported in Panel B of Table 4 indicate that the effect of CSR on debt spreads that we uncover does not occur during the credit crunch, but only during the shock to trust.

4.3. Determinants of bond market benefits

To better understand the mechanisms behind our findings, we conduct four additional tests. First, we split the sample into firms with investment-grade debt and those with speculative-grade debt (junk debt). Firms rated below investment-grade have much more debt and, therefore, have more of an incentive to engage in asset substitution to expropriate their bondholders. If CSR reduces the agency costs of debt, we would expect the influence of CSR on spreads to be particularly germane for this group of firms. The results are displayed in columns (i) and (ii) of Table 5. While the effect of CSR on debt spreads is significant for both groups of firms, the effect is much larger for non-investment-grade firms. Increasing CSR by one standard deviation reduces spreads of high-yield

grade firms by 62 basis points, compared to 24 basis points for investment-grade firms. These findings support the notion that our findings are due to the perception of reduced agency costs of debt in high-CSR firms.

Second, we examine whether the effect of CSR on spreads during the crisis is more pronounced in firms with low asset tangibility. Williamson (1988) and Johnson (2003) argue that these firms have more of an opportunity to engage in asset substitution when distress risk increases. If the spreads of high-CSR firms are lower during the crisis than those of low-CSR firms because bond investors expect less asset substitution from high-CSR firms, we would expect this effect to be more pronounced for firms that have more opportunities to shift risk.

We investigate this possibility by splitting the sample into two groups according to asset tangibility, defined as property, plant, and equipment (net) divided by assets. Firms are assigned to a group based on tangibility as of year-end 2006 and this grouping remains unchanged throughout the sample period. In model (iii) of Table 5, we show the results of the spreads regression for firms with tangibility below the median (<33.29%). The model includes all control variables, equivalent to model (iv) of Panel A of Table 4. For this group, CSR has a strong negative impact on spreads during the crisis period, but not afterwards. In terms of economic significance, increasing CSR by one standard deviation (which for this subset is 0.52), reduces spreads by 43 basis points. In model (iv), we report the results for the high tangibility group. The coefficient on the *CSR*Crisis* interaction for this subsample is less than half the coefficient of the low tangibility sample, and it is not statistically significant. The fact that our results are much stronger for the subgroup of firms that have more opportunities to engage in asset substitution supports our contention that bond investors believe that high-CSR firms are less likely to take advantage of that opportunity.[23]

[23] We have more observations in the regression for low tangibility firms because the sample is split based on median firm tangibility at the end of 2006 and it turns out that firms in the low tangibility subsample have more bonds

One could argue that partitioning the sample based on the median tangibility of 33.29% leaves a large number of firms in the high tangibility group that have room to increase firm risk. Therefore, we also change the low tangibility cutoff to the 75th percentile of the distribution (55.88%), and split the sample into two groups based this alternative cutoff. We then re-estimate the spreads regression for each subgroup (not reported in the table). CSR has a significant effect on crisis period spreads for all firms in the low tangibility group, which comprises the first three quartiles, while it is not significant for the top quartile. These results provide further support for the view that our results are partly due to a reduction in the perceived probability of asset substitution for high-CSR firms during the crisis.

Third, we examine whether our results are stronger for firms incorporated in states that provide weaker bondholder protection in case of insolvency. In particular, we use the classification of Wald and Long (2007) and Mansi, Maxwell, and Wald (2009) to divide states into two groups, depending on whether they allow firms with negative book equity to pay dividends or not. Mansi et al. (2009) find that bond yields are higher in states without payout restrictions, which indicates that bondholders penalize firms for the possibility that cash flows of distressed firms will be diverted to shareholders.

The results for this analysis are reported in model (v) of Table 5 for states with no restrictions and model (vi) of Table 5 for states with restrictions. The effect of CSR on spreads during the crisis is only significant in states where firms face no restrictions on dividend payments during insolvency. In states where bondholders have more protection, the coefficient on the *CSR*Crisis* interaction is also negative, but does not attain statistical significance. These findings suggest that CSR is particularly relevant in the crisis when there is less formal protection for bondholders. This is exactly when trust becomes more important. In terms of economic significance, increasing CSR by one

outstanding that trade for a longer period of time. Our inferences are unchanged if we split the sample such that both subsamples have the same number of observations.

standard deviation reduces spreads by 52 basis points during the crisis in states without dividend restrictions. This effect is only 16 percentage points in states with restrictions. We note that in states with no protection, the effect of CSR on spreads remains significant in the post-crisis period but its importance is reduced by more than 70% relative to the crisis effect. This is consistent with the fact that by the end of our sample period, trust had not entirely been restored to pre-crisis levels (for example, the trust component of the Global Competitiveness Index of the World Economic Forum was still lower in September 2013 than in September 2008).

In models (vii) and (viii) of Table 5, we combine both the tangibility and payout criteria. In model (vii), we focus on firms with either low tangibility or no payout restrictions, or both. These firms have higher agency costs of debt and for them social capital is likely more important during the crisis. This is exactly what we find. Model (viii) includes firms with high tangibility that also face payout restrictions. For these firms, agency costs of debt are low and social capital is less likely to influence bond spreads. The results support this notion as the coefficient on the CSR*Crisis interaction has the opposite sign from model (vii) and is not statistically significant.

Fourth, since Lins et al. (2017) find that high-CSR firms earned excess stock returns during the crisis compared to low-CSR firms, we seek to determine whether the bond spread effect we document is incremental to the stock return effect or whether the bond performance is just a reflection of superior stock market performance. To do so, we control for the firm's contemporaneous stock returns in the baseline spreads regression of model (2). Moreover, we allow the effect of returns to vary during the crisis- and post-crisis periods. Specifically, we estimate the following augmented regression model:

$$Spread_{ijt} = \beta_1 CSR_{i2006} * Crisis_t + \beta_2 CSR_{i2006} * Post\text{-}crisis_t + \beta_3 R_{it} + \beta_4 R_{it} * Crisis_t + \beta_5 R_{it} * Post\text{-}crisis_t + \gamma' \boldsymbol{X}_{ijt-1} + \delta' \boldsymbol{Z}_{it-1} + + FFE_i + TFE_t + \varepsilon_{ijt}, \quad (3)$$

where R_{it} is firm i's raw stock return during month t and all other explanatory variables follow earlier definitions. The findings from estimating this model are reported in Table 6. In model (i), the effect

of contemporaneous stock returns is held fixed throughout the period, while in model (ii) we allow the stock return effect to vary across subperiods. Both models illustrate that the effect of CSR on bond spreads during the crisis is incremental to the stock price effect, and therefore cannot be inferred from the work on stock returns. Moreover, the coefficient on CSR is similar to that in the models that do not control for stock returns. As expected, firms with higher stock returns have lower bonds spreads, especially during the crisis, but because stock returns are very noisy, this effect is estimated imprecisely.

Overall, the findings from these additional tests indicate that the effect of CSR on bond spreads during the crisis is not solely due to reciprocity, but also reflects bondholders' expectations of the likelihood of asset substitution or diversion taking place.

5. CSR, bond offerings, and contracting terms

Our results thus far show that high-CSR firms benefited from lower yields on their outstanding bonds during the crisis of trust that occurred in 2008-2009. In this section, we examine whether these benefits also carry over to the primary market. Specifically, we investigate whether high-CSR firms were able to raise more debt on the bond market, and whether they were able to do so with better contract terms.

5.1 CSR and bond offerings during the financial crisis

To investigate bond originations on the primary market during the financial crisis, we use sample selection criteria similar to those described in Section 2 for secondary market bond trades. From Mergent FISD we obtain the details of bonds that were issued between 2007 and 2013 by U.S. domiciled and incorporated publicly-listed non-financial firms, excluding bonds with uncommon

features (e.g., perpetual, preferred, private placements, Canadian, and Yankee bonds). This procedure yields 4,092 new issues by 1,424 firms. We require firms to have CSR ratings as of year-end 2006, reducing our sample to 2,117 bonds issued by 634 firms. After merging these data with annual fundamentals and market data from Compustat and CRSP respectively, our resulting bond-issuance sample contains 1,684 corporate bonds issued by 476 firms over the period from 2007 to 2013.

To examine whether high-CSR firms were able to raise more debt in the primary market during the crisis, we estimate the following regression for all issuing firms:

$$Issue_{ijt} = \beta_0 CSR_{i2006} + \beta_1 CSR_{i2006} * Crisis_t + \beta_2 CSR_{i2006} * Post\text{-}crisis_t + \delta' \mathbf{Z}_{it-1} + IFE_i + TFE_t + \varepsilon_{ijt}, \quad (4)$$

where $Issue_{ijt}$ is defined as the offering amount scaled by total assets and $\mathbf{Z}_{it-1}$ is a (L×1) vector of lagged firm-level controls that are typically used in studies on new debt issuance (e.g., Leary and Roberts (2005); Badoer and James (2016)). Specifically, we control for: (i) *Ln*(*Size*) (natural log of equity market capitalization), (ii) *Book-to-market* (iii) *Profitability*, (iv) *Leverage*, (v) *Tangibility*, (vi) *Capital expenditure*, (vii) *Asset maturity*, (viii) *Dividend indicator*, and (ix) *Investment-grade indicator*. As with earlier estimations, we update these variables three months after a firm's fiscal year-end.

We are unable to include firm fixed effects in this specification because the frequency with which firms access the bond market is relatively low and, as such, the addition of firm fixed effects would remove much of the variation in issuance. Instead, we include industry fixed effects, IFE_i, (based on two-digit SIC codes) to account for unobservable time-invariant industry-level factors associated with the demand for corporate bonds. Similarly, because the number of bonds issued on a monthly basis is low (17.65 on average) we include time fixed effects at the quarterly level instead of the monthly level. Therefore, we double cluster standard errors at the industry and quarterly level,

instead of at the firm and monthly level as in Tables 3 through 6. Because the model does not include firm fixed effects, we also include the firm's 2006 CSR measure as an explanatory variable.

We present summary statistics for the variables used in our bond offerings estimations in Panel A of Table 7. The average bond issue is 7.3% of assets with a median of 4% indicating that the increase in a firm's assets as a result of the bond issue is substantial.

Panel B of Table 7 contains the regression results. In model (i), we include crisis and post-crisis dummies, while model (ii) contains time dummies defined at the quarterly level. Both models indicate that, outside of the crisis period, CSR has no influence on the relative size of a firm's bond issues. During the crisis, however, the amount raised by high-CSR firms relative to low-CSR firms increases substantially, as indicated by the significant coefficient on the interaction between CSR and the crisis dummy. In terms of economic significance, based on model (ii), increasing CSR by one standard deviation increases the amount issued as a percentage of assets by 11 basis points before the crisis but by 98 basis points during the crisis. The crisis effect is substantial when compared to the average issuance of 7.3% of assets over the entire sample period and 3.6% (untabulated) of assets during the crisis months.

In unreported models, we also study debt market access; we find no evidence that the likelihood of accessing the debt market is related to a firm's CSR score during any of the subperiods. Thus, while the probability of access does not depend on CSR, the results reported in Panel B of Table 7 indicate that CSR has a significant impact on the amount raised during the crisis.

5.2. CSR and contracting terms during the financial crisis

Given the role of CSR in explaining the amount of public debt that firms were able to raise during the crisis, we now examine its effect on the pricing and contracting terms of new bond issues.

To the best of our knowledge, this is the first investigation of the effect of social capital on bond contracting terms. We adopt a similar approach as in the prior tests on the amount raised. Due to the nature of our tests, however, we impose additional restrictions on the sample, requiring data availability for credit ratings as well as for covenants and security structures stipulated in the indenture agreements. Applying these requirements yields a sample of 1,483 bonds issued by 381 firms between 2007 and 2013. We then estimate the following specification:

$$\begin{aligned} \textit{Issue term}_{ijt} = {} & \beta_0 CSR_{i2006} + \beta_1 CSR_{i2006} * Crisis_t + \beta_2 CSR_{i2006} * Post\text{-}crisis_t + \gamma' \boldsymbol{X}_{ijt-1} \\ & + \delta' \boldsymbol{Z}_{it-1} + IFE_i + TFE_t + \varepsilon_{ijt}, \end{aligned} \tag{5}$$

where $\textit{Issue term}_{ijt}$ is the dependent variable of interest. We study at-issue credit spreads, initial credit ratings, and maturity. The vectors of bond and firm controls, $\boldsymbol{X}_{ijt-1}$ and $\boldsymbol{Z}_{it-1}$, are the same as in model (2). As in model (4), we also control for industry fixed effects, IFE_i, to capture unobservable time-invariant industry-specific determinants of credit risk, and time fixed effects, TFE_t, defined at the quarterly level. Standard errors are again double clustered at the industry and quarterly level, and the firm's 2006 CSR level is also included as an explanatory variable.

We present bond-level descriptive statistics for bonds originated in the primary market over our test window in Table 8. The mean credit spread for new bond issues is 2.12%. As expected, there are large differences between the credit spreads of investment-grade and speculative-grade bonds (1.75% versus 4.30%). While 85 percent of the bonds are investment-grade issues (with ratings in the BBB category and above), a large fraction (44% of total issues) are concentrated in the bottom of the investment-grade credit rating category (BBB). The mean issue size is about $678 million with an average time to maturity of just over 8 years (99 months).

In Panel A of Table 9, we report the results from estimating model (5) for at-issue credit spreads for our sample of bonds issued from 2007-2013. We first control for bond-level variables (model (i)), and then add firm-level attributes (model (ii)) and governance controls (model (iii)). In all

specifications, the effect of CSR on offering spreads is negative and significant only during the crisis. During this period, the effect is also economically important. For instance, based on the estimation results presented in model (iii), a one standard deviation increase in pre-crisis CSR is associated with 31 basis points lower spread on bonds issued during the crisis period.[24] Because the coefficient on CSR itself is positive, albeit statistically insignificant, we verify that the sum of the *CSR* coefficient and the *CSR*Crisis* interaction is negative and significantly different from zero (not reported in the table). The effect of CSR on spreads during the post-crisis period is also negative, but not statistically significant, consistent with our findings for secondary market credit spreads. Finally, the difference between the coefficients for the crisis and post-crisis periods is always statistically significant.

We study two additional issue terms to assess the extent to which bond investors and rating agencies value the social capital built through CSR activities during a crisis of trust. First, we use initial credit ratings to capture the assessment of the rating agencies about the risk of bond issues. Panel B of Table 9 shows that at-issue credit ratings are better (as evidenced by a lower ratings number) for high-CSR issuers, but only during the crisis period; an increase in CSR by one standard deviation improves the bond's rating by over one third of a notch during the crisis period. While this effect appears modest, it holds after controlling for bond and firm characteristics normally associated with bond ratings.

Second, we assess the relation between CSR and bond maturity. Imposing a shorter maturity can be viewed as an extreme type of debt covenant given bondholders' limited flexibility in recontracting due to unanimous consent requirements (e.g., Rey and Stiglitz (1993) and Berger and Udell (1998)). If CSR engenders trust, high-CSR firms may be able to issue bonds with relatively longer maturities when prevailing trust levels have been eroded. To assess the impact of CSR on bond

[24] The standard deviation of CSR is 0.649 for the sample of bond issuers on the primary market.

maturity, we regress time-to-maturity, expressed in months, on bond- and firm-level controls as in model (5). The results from this estimation are reported in Panel C of Table 9 and show a significant positive relation between CSR and bond maturity during the crisis. According to model (iii), a one standard deviation increase in the pre-crisis level of CSR translates into a 10-month longer time-to-maturity (equivalent to approximately 10 percent of the mean level of maturity in the sample) during the crisis compared to the pre-crisis period. We also verify that the sum of the coefficients on *CSR* and the *CSR*Crisis* interaction is positive and significant, and find that this is the case for models (iii) and (iv).[25]

In sum, our primary bond market tests provide further evidence that bondholders value the trust earned from building social capital: during the crisis, high-CSR firms are able to raise more debt at more favorable interest rates, with better credit ratings, and for a longer period of time.

6. Conclusion

In this paper, we study the importance of social capital, and the trust that it engenders, in the corporate bond market. We employ a firm's investments in CSR as a proxy for social capital and find that when the market and the economy faced a severe shock to overall trust during the 2008-2009 financial crisis, high-CSR firms had bond spreads that were substantially lower than those of low-CSR firms. These effects are more pronounced for firms with high-yield debt, lower asset tangibility, and firms incorporated in states that provide less bondholder protection during insolvency – these are exactly the firms that would have a higher propensity to engage in asset substitution or diversion. We further show that high-CSR firms were able to raise more capital on the bond market during the crisis

[25] The results on spreads, ratings, and maturity in the primary market also remain virtually unchanged when we add the issue size relative to assets as an additional explanatory variable to our regression models.

period. Among those firms that did access the market, high-CSR firms issued bonds with lower offering spreads, longer maturities, and better initial credit ratings, holding everything else constant. During normal times, on the other hand, social capital has no influence on bond spreads even for firms more prone to asset substitution and diversion.

Our results suggest that *earned* trust, generated through a firm's investments in social capital, pays off for bondholders when general levels of trust are low. Since firms can enhance their social capital through investments in CSR, they can exert some influence on their cost of debt, particularly when potential agency frictions with debtholders investors are higher. In addition, credit rating agencies, which are important intermediaries in bond markets, take social capital into account into their determination of the default risk of the firm. Our findings highlight the importance of firm-level trust in a market where downside risk matters most and managerial moral hazard is of particular concern: the corporate bond market.

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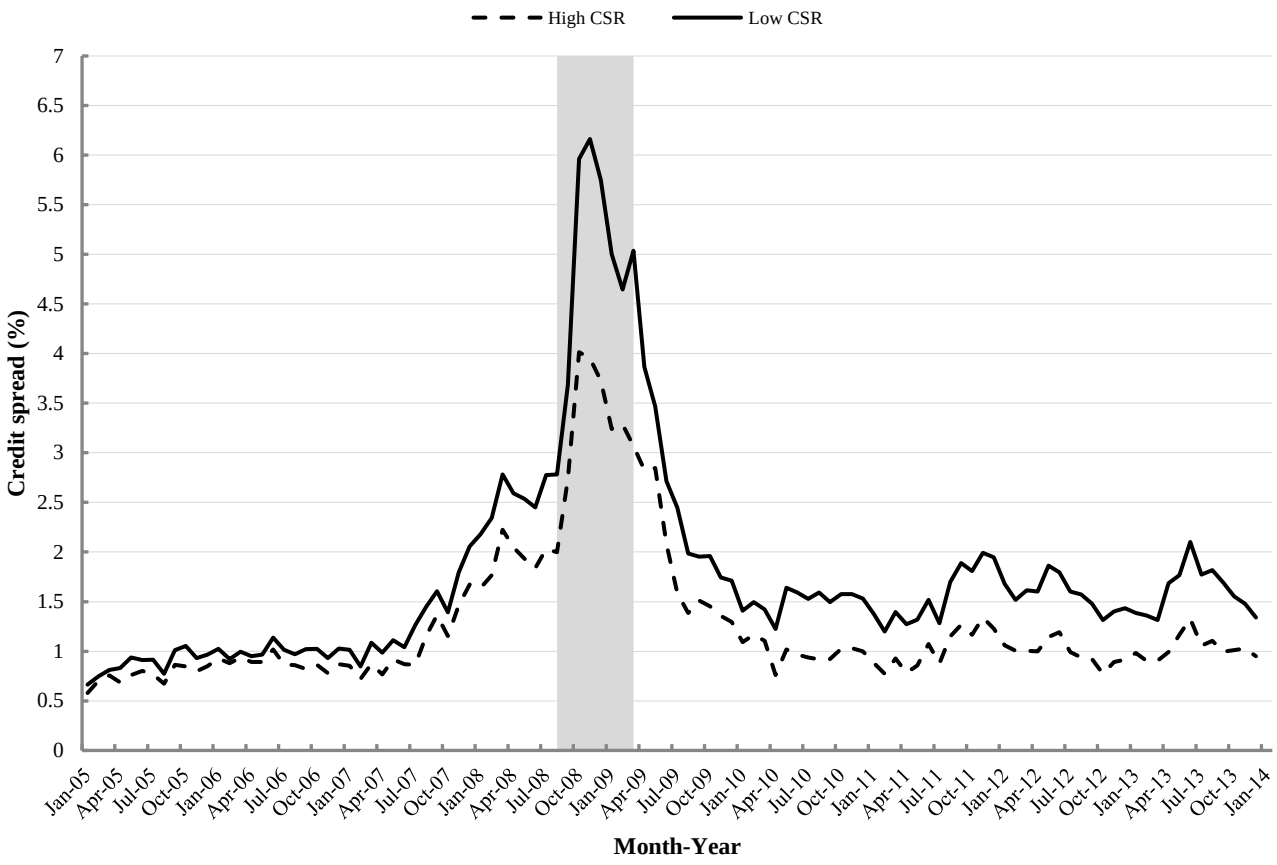
Figure 1
Secondary market credit spreads (2005 - 2013)
High- versus low-CSR bond issuers



This figure plots the average credit spread of corporate bonds of high- and low-CSR firms over the 2005-2013 period. High-CSR (low-CSR) firms are defined as those firms with CSR scores above (below) the median CSR value of the year. For each portfolio, the spread is equally weighted across all the outstanding bonds. The period of August 2008 to March 2009 (shaded area) coincides with the crisis of trust described in Sapienza and Zingales (2008) and Lins et al. (2017).

Appendix: Variable Definitions

Bond Characteristics		
Amount	=	Face (nominal) value of the bond issue.
Issue	=	Face (nominal) value of the bond issue scaled by total assets (AT).
Coupon	=	Applicable annual interest rate that the issuer is obligated to pay the bondholders.
Redeemable	=	Indicator variable, equal to 1 if the bond may be redeemed under certain conditions, and 0 otherwise.
Fungible	=	Indicator variable, equal to 1 if the bonds are, by virtue of their terms, equivalent, interchangeable, or substitutable, and 0 otherwise.
Offering market	=	Indicator variable, equal to 1 if the bond issue is offered globally and 0 if the offering is made to the domestic market only.
Security	=	Rank variable that takes the value of 1 to 5 for junior subordinate, subordinate, senior subordinate, senior, and senior secured bonds, respectively.
Covenant intensity	=	Count of the number of covenants in the five main categories (payout, investment, financing, accounting, and event-related restrictions) reported on Mergent FISD.
Credit spread	=	Difference between the yield-to-maturity and the maturity-matched Treasury yield. Monthly credit spreads are based on the median yield of all transactions taking place on the last active trading day of a given month. Maturity-matched risk-free yields are obtained by linearly interpolating benchmark Treasury yields contained in the Federal Reserve H-15 release for constant maturities of 1/12, 3/12, 6/12, 1, 2, 3, 5, 7, 10, 20, and 30 years.
Illiquidity	=	Amihud (2002) measure of illiquidity that is defined based on the price impact of a secondary market bond trade per unit traded, implemented after filtering out trading days with less than two trades and measuring monthly illiquidity as the median of the daily price impact estimators.
Time-to-maturity	=	Time difference (in months) between a bond's issue date (in the case of new issues on the primary market) or trade date (in the case of outstanding issues on the secondary market) and its fixed maturity date.
Credit rating	=	Rank variable based on the conversion of alphabetical ratings to numerical values (e.g., AAA=1 …, C=21). If an issue is rated by multiple credit rating agencies, the representative rating is from S&P. When this is not available, credit ratings are from Moody's and if this is not available, the rating is from Fitch.
Investment-grade indicator	=	Indicator variable, equal to 1 if the credit rating for the bond issue (issuer) is from (AAA=1) to (BBB-=10), and 0 otherwise.

Firm Characteristics and Equity Market Variables		
CSR	=	Total net (strengths minus concerns) corporate social responsibility rating computed based on the sum of the net CSR indices for the following categories: environment, employees, human rights, community, and diversity, available from the MSCI ESG Stats database.
Size	=	Market value of equity (CSHO multiplied by PRCC_F).
Book-to-market	=	Book value of equity (CEQ) divided by the market value of equity (CSHO multiplied by PRCC_F).
Profitability	=	Operating income before depreciation (OIBDP) divided by net sales (SALE).
Leverage	=	Total debt in current (DLC) and long-term (DLTT) liabilities scaled by total assets (AT).
Short-term debt	=	Debt in current liabilities (DLC) scaled by total assets (AT).
Long-term debt	=	Debt in long-term liabilities (DLTT) scaled by total assets (AT).
Cash holdings	=	Cash and short-term investments (CHE) scaled by total assets (AT).
Tangibility	=	Property, plant and equipment total, net (PPENT) scaled by total assets (AT).
Capital expenditure	=	Capital expenditures (CAPX) scaled by total assets (AT).
Coverage ratio	=	Interest coverage ratio defined as operating income after depreciation (OIADP) plus interest expense (XINT) scaled by interest expense. Following Blume, Lim, and MacKinlay (1998), the maximum value of the ratio is truncated at 100 and its negative values are set to zero. Four indicator variables are then identified based on the ratio's boundaries at 5, 10, and 20.
Asset maturity	=	Book-value-weighted average maturity of current assets and long-term assets following the methodology of Stohs and Mauer (1996). The maturity of current assets is measured as current assets (ACT) divided by costs of goods sold (COGS) and the maturity of long-term assets is measured as net property, plant, and equipment (PPENT) divided by depreciation expense (DP).
Dividend indicator	=	Indicator variable, equal to 1 if common dividends (DVC) is greater than zero, and 0 otherwise.
E-index	=	Entrenchment index from Bebchuk et al. (2009) and is the sum of six anti-takeover indicators from the Institutional Shareholder Service (ISS) including: (i) classified (staggered) board, (ii) poison pill, (iii) golden parachutes for executives, (iv) limited ability to amend charter, (v) limited ability to amend bylaws and (vi) supermajority voting requirements.
Volatility	=	Standard deviation of daily stock returns (RET) from CRSP re-estimated in each month based on the previous 252 trading days' data.

Table 1: Sample of Secondary Market Bond Trades

Panel A describes the sample selection process for our secondary market bond spreads analysis of 1,989 publicly traded bonds for 296 U.S. domiciled and incorporated non-financial firms that are at the intersection of the TRACE, CRSP, Compustat, MSCI ESG STATS, and Mergent FISD databases. The selection of bond issues is restricted to corporate debentures and corporate medium-term notes. All perpetual, foreign currency, preferred, exchangeable, puttable, convertible, private placement (Rule 144A), Yankee, and Canadian bonds are excluded from the sample. Panel B reports our sample distribution across industries.

Panel A: Sample selection

	Bonds	Issuers
Bonds with trade data on TRACE and issue data on FISD	2,212	342
Refinements for liquidity biases in TRACE	(35)	(4)
	2,177	338
Issuers not covered by MSCI ESG STATS	(182)	(41)
Issuers not covered by CRSP and Compustat	(6)	(1)
	1,989	296

Panel B: Industry composition

Industry	Bonds	Issuers
Consumer non-durables	189	24
Consumer durables	33	7
Manufacturing	282	46
Oil, gas, and coal extraction and products	250	41
Chemicals and allied products	156	19
Business equipment	171	20
Telephone and television transmission	141	16
Utilities	210	46
Wholesale, retail, and some services	119	15
Healthcare, medical equipment, and drugs	186	28
Other	252	34
	1,989	296

Table 2: Summary Statistics

Panel A presents the characteristics of the 1,989 bonds in our sample that remain unchanged over the life of the bond. Each bond is counted as one observation. Panel B contains monthly data on bond spreads and other characteristics that could potentially change on a monthly basis. Each bond/month is counted as one observation. Panel C contains annual data on firm characteristics where each firm/year is counted as one observation, with the exception of volatility which is computed monthly and each firm/month represents one observation. The sample comprises corporate debentures (CDEB) and corporate medium-term notes (CMTN) with a time-to-maturity over one month and less than 30 years. Detailed definitions of the variables are presented in the Appendix. All continuous firm-level variables are winsorized at the 1st and 99th percentiles, except for variables than cannot take on negative values, which are winsorized at the 99th percentile.

Panel A: Bond contract features						
	N	Mean	SD	25th pcntl	50th pcntl	75th pcntl
Amount (USD bn)	1,989	0.578	0.543	0.275	0.450	0.750
Coupon	1,989	5.541	2.163	4.000	5.750	7.000
Redeemable	1,989	0.899	0.301	1	1	1
Fungible	1,989	0.762	0.426	1	1	1
Offering market	1,989	0.419	0.493	0	0	1
Security	1,989	3.992	0.235	4	4	4
Covenant intensity	1,945	6.757	3.154	5	6	8
Panel B: Bond secondary market attributes (monthly)						
Credit spread (%)	72,638	1.921	1.736	0.769	1.326	2.463
Illiquidity	63,780	0.009	0.015	0.001	0.004	0.010
Time-to-maturity (months)	72,638	78.24	62.63	38.00	67.00	101.00
Credit rating	72,334	8.559	2.993	6	9	10
Panel C: Firm characteristics (annual and monthly)						
CSR	2,198	-0.015	0.644	-0.381	-0.075	0.226
Size (USD bn)	2,198	18.587	32.190	2.949	6.914	18.675
Profitability	2,197	0.223	0.158	0.122	0.187	0.293
Short-term debt	2,198	0.034	0.044	0.004	0.019	0.046
Long-term debt	2,198	0.265	0.136	0.169	0.251	0.329
Cash holdings	2,198	0.076	0.076	0.019	0.049	0.109
Tangibility	2,198	0.374	0.258	0.145	0.317	0.577
Capital expenditure	2,198	0.062	0.066	0.024	0.041	0.074
Coverage 1	2,198	4.271	1.234	3.786	5	5
Coverage 2	2,198	2.249	2.234	0	1.581	5
Coverage 3	2,198	1.849	3.396	0	0	1.928
Coverage 4	2,198	1.924	9.222	0	0	0
E-index	2,044	3.342	1.375	2	3	4
Volatility	71,480	0.019	0.010	0.012	0.017	0.023

Table 3: CSR and Bond Pricing in the Secondary Market

This table reports various specifications of regression models of secondary market bond credit spreads as a function of CSR and bond- and firm-level control variables. Panel A presents the base-case results. Panel B includes credit ratings as an additional control variable. Detailed definitions of the variables are presented in the Appendix. Numbers reported in parentheses are heteroscedasticity-robust standard errors based on two-dimensional clustering at the firm- and month-level (significance at the 10, 5, and 1 percent level is indicated by *, **, and ***, respectively).

Panel A: CSR and credit spreads

	Credit spread			
	(i)	(ii)	(iii)	(iv)
CSR	-0.215***	-0.138***	0.025	0.017
	(0.061)	(0.050)	(0.046)	(0.038)
Illiquidity		23.37***	5.998***	5.095***
		(3.251)	(0.699)	(0.649)
Ln(Amount)		0.055**	-0.033	-0.021
		(0.034)	(0.025)	(0.023)
Coupon		0.121***	0.064***	0.044***
		(0.014)	(0.009)	(0.009)
Time-to-maturity		0.001***	0.002***	0.003***
		(0.000)	(0.000)	(0.000)
Redeemable		0.175**	-0.024	-0.021
		(0.070)	(0.058)	(0.056)
Fungible		0.063	-0.076**	-0.051*
		(0.047)	(0.035)	(0.032)
Offering market		0.109**	0.028	0.004
		(0.050)	(0.033)	(0.031)
Security		-0.471***	-0.484***	-0.407**
		(0.159)	(0.155)	(0.186)
Covenant intensity		0.021**	0.017**	0.012*
		(0.009)	(0.008)	(0.007)
Ln(Size)				-0.292***
				(0.111)
Profitability				0.134
				(0.307)
Short-term debt				-2.103***
				(0.636)
Long-term debt				-0.170
				(0.415)
Cash holdings				0.196
				(0.450)
Tangibility				0.755
				(0.489)
Capital expenditure				-0.223
				(0.972)

Table 3 (Continued)

Panel A continued

Coverage 1				-0.077*
				(0.041)
Coverage 2				-0.063***
				(0.022)
Coverage 3				0.001
				(0.010)
Coverage 4				-0.001
				(0.002)
Ln(Volatility)				0.632***
				(0.136)
E-index				-0.059*
				(0.032)
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	No	No	Yes	Yes
Observations	72,638	62,693	62,693	58,909
R-squared	0.48	0.54	0.80	0.81

Panel B: CSR and credit spreads – Sensitivity to default risk				
	Credit spread			
	(i)	(ii)	(iii)	(iv)
CSR	-0.214***	-0.138***	0.032	0.020
	(0.059)	(0.049)	(0.045)	(0.038)
Credit rating	0.097***	0.069**	0.105***	0.042*
	(0.029)	(0.032)	(0.025)	(0.025)
Bond controls	No	Yes	Yes	Yes
Firm controls	No	No	No	Yes
Governance controls	No	No	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	No	No	Yes	Yes
R-squared	0.48	0.55	0.81	0.81
Observations	72,334	62,438	62,438	58,675

Table 4: CSR and Bond Pricing in the Secondary Market during the Financial Crisis

This table presents the results from regressions of secondary market bond credit spreads as a function of CSR/time period interactions and control variables. *CSR* is measured at the end of 2006. Panel A reports regression estimates of credit spreads on CSR during the crisis and post-crisis periods. *Crisis* is an indicator variable that captures the time period from August 2008 to March 2009. *Post-crisis* is an indicator variable that reflects the time period from April 2009 to December 2013. In Panel B, we re-estimate the models but report separate results on the role of CSR during the credit crunch. In this Panel, *Crunch* is an indicator variable that represents the time period from July 2007 to July 2008. Detailed definitions of the variables are presented in the Appendix. Numbers reported in parentheses are heteroscedasticity-robust standard errors based on two-dimensional clustering at the firm- and month-level (significance at the 10, 5, and 1 percent level is indicated by *, **, and ***, respectively).

Panel A: CSR and credit spreads during the financial crisis

	Credit spread			
	(i)	(ii)	(iii)	(iv)
*CSR*Crisis*	-0.577**	-0.619**	-0.644***	-0.654***
	(0.259)	(0.255)	(0.249)	(0.250)
*CSR*Post-crisis*	-0.033	-0.069	-0.091	-0.118
	(0.097)	(0.082)	(0.082)	(0.085)
Illiquidity	5.329***	4.864***	4.752***	4.765***
	(0.652)	(0.611)	(0.609)	(0.612)
Ln(Amount)	-0.018	-0.010	-0.011	-0.006
	(0.025)	(0.023)	(0.023)	(0.021)
Coupon	0.054***	0.043***	0.045***	0.041***
	(0.011)	(0.010)	(0.009)	(0.009)
Time-to-maturity	0.003***	0.002***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Redeemable	0.005	-0.009	-0.003	-0.014
	(0.061)	(0.058)	(0.059)	(0.056)
Fungible	-0.120***	-0.111***	-0.094***	-0.094***
	(0.033)	(0.032)	(0.030)	(0.031)
Offering market	0.057	0.037	0.027	0.024
	(0.035)	(0.032)	(0.032)	(0.031)
Security	-0.659***	-0.640***	-0.566***	-0.499**
	(0.160)	(0.172)	(0.214)	(0.212)
Covenant intensity	0.013*	0.009	0.014**	0.009
	(0.007)	(0.007)	(0.008)	(0.007)
Credit rating				0.064**
				(0.029)
Ln(Size)		-0.417***	-0.414***	-0.383***
		(0.122)	(0.125)	(0.124)
Profitability		0.312	0.297	0.192
		(0.268)	(0.277)	(0.263)
Short-term debt		-1.836**	-1.986**	-1.862**
		(0.748)	(0.783)	(0.789)

Table 4 (Continued)

Panel A continued

Long-term debt		0.711	0.708*	0.590
		(0.500)	(0.508)	(0.523)
Cash holdings		-0.173	-0.246	-0.262
		(0.485)	(0.496)	(0.498)
Tangibility		0.290	0.197	0.350
		(0.645)	(0.661)	(0.659)
Capital expenditure		-1.164	-0.829	-0.601
		(0.789)	(0.883)	(0.852)
Coverage 1		-0.041	-0.034	-0.022
		(0.041)	(0.046)	(0.045)
Coverage 2		-0.028	-0.029	-0.030
		(0.022)	(0.021)	(0.020)
Coverage 3		-0.005	-0.005	-0.003
		(0.010)	(0.010)	(0.009)
Coverage 4		-0.002	-0.001	-0.002
		(0.002)	(0.002)	(0.002)
Ln(Volatility)		0.411**	0.465***	0.440**
		(0.169)	(0.176)	(0.179)
E-index			-0.067*	-0.063*
			(0.035)	(0.035)
(*Crisis – Post-crisis*)**CSR*	-0.544***	-0.550***	-0.553***	-0.536***
(*p-value*)	(0.01)	(0.01)	(0.01)	(0.01)
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
R-squared	0.82	0.83	0.83	0.83
Observations	50,598	50,124	47,966	47,836

Table 4 (Continued)

Panel B: CSR and credit spreads during the credit crunch and financial crisis				
	Credit spread			
	(i)	(ii)	(iii)	(iv)
*CSR*Crunch*	-0.064	-0.111	-0.145	-0.159
	(0.094)	(0.099)	(0.109)	(0.108)
*CSR*Crisis*	-0.622**	-0.697**	-0.747***	-0.768***
	(0.311)	(0.308)	(0.301)	(0.300)
*CSR*Post-crisis*	-0.077	-0.147	-0.193	-0.231*
	(0.143)	(0.127)	(0.127)	(0.127)
Credit rating				0.065**
				(0.029)
(*Crisis –Crunch*)**CSR*	-0.558**	-0.586***	-0.602***	-0.609***
(*p-value*)	(0.02)	(0.01)	(0.01)	(0.01)
(*Crisis – Post-crisis*)**CSR*	-0.545***	-0.550***	-0.554***	-0.537***
(*p-value*)	(0.01)	(0.01)	(0.01)	(0.01)
(*Crunch – Post-crisis*)**CSR*	-0.013	0.036	-0.048	-0.094
(*p-value*)	(0.87)	(0.62)	(0.52)	(0.36)
Bond controls	Yes	Yes	Yes	Yes
Firm controls	No	Yes	Yes	Yes
Governance controls	No	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
R-squared	0.82	0.83	0.83	0.83
Observations	50,598	50,124	47,966	47,836

Table 5: CSR and Credit Spreads: Subsample Analysis

This table presents regressions of secondary market bond credit spreads as a function of CSR/time period interactions and control variables, estimated separately for firms with tangibility below and above the median and for firms incorporated in states with and without restrictions on payouts during insolvency. *CSR* is measured at the end of 2006. *Crisis* is an indicator variable that captures the time period from August 2008 to March 2009. *Post-crisis* is an indicator variable that reflects the time period from April 2009 to December 2013. Detailed definitions of the variables are presented in the Appendix. Numbers reported in parentheses are heteroscedasticity-robust standard errors based on two-dimensional clustering at the firm- and month-level (significance at the 10, 5, and 1 percent level is indicated by *, **, and ***, respectively).

	Credit rating		Tangibility		Payout restrictions		Potential agency costs of debt	
	High-yield	Inv. grade	Low	High	No	Yes	High	Low
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
*CSR*Crisis*	-1.123***	-0.434*	-0.824**	-0.319	-1.077***	-0.358	-0.935***	0.324
	(0.304)	(0.229)	(0.359)	(0.370)	(0.313)	(0.372)	(0.298)	(0.562)
*CSR*Post-crisis*	-0.336	-0.025	-0.139	0.075	-0.319***	-0.058	-0.240**	0.308
	(0.419)	(0.069)	(0.112)	(0.162)	(0.102)	(0.134)	(0.094)	(0.16)
(*Crisis – Post-crisis*)**CSR*	-0.787*	-0.409**	-0.685**	-0.394	-0.758***	-0.300	-0.695**	0.016
(*p-value*)	(0.08)	(0.04)	(0.03)	(0.14)	(0.00)	(0.35)	(0.01)	(0.97)
Bond controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governance controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Credit rating	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.82	0.79	0.81	0.85	0.83	0.82	0.83	0.84
Observations	7,600	40,236	25,031	22,805	29,300	18,536	38,385	9,451

Table 6: CSR, Credit Spreads, and Stock Returns during the Financial Crisis

This table presents the results from a regression of secondary market bond credit spreads as a function of pre-crisis CSR, CSR/time period interactions, contemporaneous stock returns, and stock return/time period interactions. *CSR* is measured at the end of 2006. *Crisis* is an indicator variable that captures the time period from August 2008 to March 2009. *Post-crisis* is an indicator variable that reflects the time period from April 2009 to December 2013. Detailed definitions of all other variables are presented in the Appendix. Numbers reported in parentheses are heteroscedasticity-robust standard errors based on two-dimensional clustering at the firm- and month-level (significance at the 10, 5, and 1 percent level is indicated by *, **, and ***, respectively).

	(i)	(ii)
*CSR*Crisis*	-0.651***	-0.639***
	(0.249)	(0.249)
*CSR*Post-crisis*	-0.121	-0.121
	(0.084)	(0.084)
Stock returns	-0.348	-0.263
	(0.222)	(0.288)
*Stock returns*Crisis*		-0.954
		(0.924)
*Stock returns*Post-crisis*		0.103
		(0.377)
(*Crisis – Post-crisis*)**CSR*	-0.530***	-0.518***
(*p-value*)	(0.01)	(0.01)
Bond controls	Yes	Yes
Firm controls	Yes	Yes
Governance controls	Yes	Yes
Credit rating	Yes	Yes
Firm fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
R-squared	0.83	0.83
Observations	47,822	47,822

Table 7: CSR and Bond Offerings during the Financial Crisis

This table reports the results from regressions of the relative size of bond issues as a function of CSR, CSR/time period interactions, and control variables. The models are estimated from 2007 to 2013, and CSR is measured at the end of 2006. *Issue* is the dependent variable of interest and is defined as total offering amount scaled by total assets. Panel A reports the descriptive statistics for variables used in the estimations. In Panel B, *Crisis* is an indicator variable that captures the time period from August 2008 to March 2009. *Post-crisis* is an indicator variable that reflects the time period from April 2009 to December 2013. Detailed definitions of all other variables are presented in the Appendix. Numbers reported in parentheses are the values of heteroscedasticity-robust standard errors based on two-dimensional clustering at the industry- and quarter-level (significance at the 10, 5, and 1 percent level is indicated by *, **, and ***, respectively).

Panel A: Descriptive statistics

	N	Mean	St. dev.	25th pcntl	50th pcntl	75th pcntl
CSR	1,684	-0.056	0.575	-0.412	-0.075	0.258
Issue	1,684	0.073	0.116	0.019	0.040	0.086
Size (USD bn)	1,681	33.508	51.602	3.810	12.077	32.227
Book-to-market	1,681	0.453	0.333	0.248	0.389	0.598
Profitability	1,684	0.229	0.149	0.127	0.203	0.302
Leverage	1,684	0.284	0.156	0.174	0.262	0.373
Tangibility	1,684	0.344	0.258	0.125	0.275	0.563
Capital expenditure	1,684	0.059	0.062	0.021	0.041	0.072
Asset maturity	1,621	6.085	5.671	2.217	3.993	7.889
Dividend indicator	1,684	0.779	0.414	1	1	1
Investment-grade indicator	1,684	0.755	0.430	1	1	1

Table 7 (continued)

Panel B: CSR and bond offerings during the financial crisis		
	Issue	
	(i)	(ii)
Crisis	-0.002	
	(0.006)	
Post-crisis	-0.001	
	(0.006)	
CSR	0.002	0.002
	(0.007)	(0.008)
*CSR*Crisis*	0.016***	0.015***
	(0.004)	(0.004)
*CSR*Post-crisis*	-0.003	-0.004
	(0.007)	(0.008)
Ln(Size)	-0.047***	-0.047***
	(0.007)	(0.006)
Book-to-market	-0.082***	-0.074***
	(0.025)	(0.024)
Profitability	0.034	0.021
	(0.039)	(0.033)
Leverage	-0.088*	-0.077*
	(0.045)	(0.043)
Tangibility	-0.029	-0.036
	(0.037)	(0.035)
Capital expenditure	0.204*	0.272**
	(0.110)	(0.113)
Asset maturity	-0.001	0.001
	(0.001)	(0.001)
Dividend indicator	-0.012	-0.012
	(0.014)	(0.014)
Investment-grade indicator	-0.035**	-0.032*
	(0.015)	(0.017)
(*Crisis – Post-crisis*)**CSR*	0.019***	0.019***
(*p-value*)	(0.00)	(0.00)
Industry fixed effects	Yes	Yes
Time fixed effects	No	Yes
R-squared	0.42	0.44
Observations	1,619	1,619

Table 8: Summary Statistics on New Bond Issues

This table reports the main attributes of 1,483 bonds issued from 2007 to 2013 by 381 U.S. domiciled and incorporated non-financial firms that are at the intersection of the CRSP, Compustat, MSCI ESG STATS, and Mergent FISD databases. The selection of bond issues is restricted to corporate debentures and corporate medium-term notes. All perpetual, foreign currency, preferred, exchangeable, putable, convertible, private placement (Rule 144A), Yankee and Canadian bonds are excluded from the sample. Panel A presents the bond characteristics. Panel B reports the distribution of at-issue credit ratings. All variables are defined in the Appendix.

Panel A: Bond characteristics

	N	Mean	St. dev.	25th pcntl	50th pcntl	75th pcntl
Credit spread (%):						
Full sample	1,483	2.119	1.614	0.963	1.604	2.857
Investment-grade	1,270	1.753	1.294	0.866	1.424	2.193
Speculative-grade	213	4.302	1.611	3.166	4.094	5.353
Amount (USD bn)	1,483	0.678	0.598	0.350	0.500	0.850
Time-to-maturity (months)	1,483	98.97	46.23	60	120	120
Redeemable	1,483	0.979	0.143	1	1	1
Fungible	1,483	0.903	0.296	1	1	1
Offering market	1,483	0.701	0.458	0	1	1
Security	1,483	4.995	0.144	5	5	5
Covenant intensity	1,460	7.232	2.996	6	7	9

Panel B: At-issue credit ratings

	Frequency	Percentage
AAA	31	2.09
AA	88	5.94
A	493	33.29
BBB	657	44.36
BB	144	9.72
B	65	4.39
CCC and below	3	0.20

Table 9: The Impact of CSR on Primary Market Spreads, Ratings, and Maturity during the Financial Crisis

This table presents the results of regressions of at-issue bond credit spreads, credit ratings and maturity as a function of CSR, CSR/time period interactions, and control variables. The models are estimated from 2007 to 2013. *CSR* is measured at the end of 2006. Panel A reports regressions of at-issue credit spreads on CSR during the crisis and post-crisis periods. Panel B reports regressions of credit ratings. In Panel C, we report regressions of time-to-maturity in months. *Crisis* is an indicator variable that captures the time period from August 2008 to March 2009. *Post-crisis* is an indicator variable that reflects the time period from April 2009 to December 2013. All other variables are defined in the Appendix. Numbers reported in parentheses are the values of heteroscedasticity-robust standard errors based on two-dimensional clustering at the industry- and quarter-level (significance at the 10, 5, and 1 percent level is indicated by *, **, and ***, respectively).

Panel A: CSR and at-issue credit spreads during the financial crisis

	At-issue credit spread		
	(i)	(ii)	(iii)
CSR	0.053	0.113	0.123
	(0.162)	(0.148)	(0.143)
*CSR*Crisis*	-0.559***	-0.459*	-0.484**
	(0.154)	(0.241)	(0.243)
*CSR*Post-crisis*	-0.173	-0.065	-0.071
	(0.138)	(0.087)	(0.079)
Ln(Amount)	-0.188***	0.357***	0.339***
	(0.072)	(0.087)	(0.082)
Time-to-maturity	0.002***	0.001	0.001
	(0.001)	(0.001)	(0.001)
Redeemable	0.126	-0.158	-0.128
	(0.213)	(0.136)	(0.127)
Fungible	0.046	-0.157	-0.144
	(0.141)	(0.112)	(0.106)
Offering market	-0.249*	0.014	0.012
	(0.149)	(0.085)	(0.091)
Security	0.082	-0.289	-0.399
	(0.473)	(0.433)	(0.441)
Covenant intensity	0.222***	0.069***	0.055**
	(0.026)	(0.024)	(0.025)
Ln(Size)		-0.490***	-0.496***
		(0.059)	(0.060)
Profitability		0.228	0.405
		(0.274)	(0.262)
Short-term debt		0.206	0.186
		(0.489)	(0.484)
Long-term debt		0.980***	0.617
		(0.348)	(0.364)

Table 9 (continued)

Panel A (continued)

Cash holdings		0.126	0.006
		(0.337)	(0.310)
Tangibility		-0.501	-0.492
		(0.504)	(0.483)
Capital expenditure		2.226**	1.535
		(0.933)	(1.070)
Coverage 1		-0.177**	-0.172***
		(0.079)	(0.065)
Coverage 2		-0.076**	-0.079**
		(0.032)	(0.033)
Coverage 3		0.026	0.021
		(0.022)	(0.023)
Coverage 4		-0.001	-0.001
		(0.003)	(0.002)
Ln(Volatility)		0.951***	0.927***
		(0.162)	(0.250)
E-index			-0.040
			(0.033)
(*Crisis – Post-crisis*)**CSR*	-0.386***	-0.394**	-0.413**
(*p-value*)	(0.01)	(0.02)	(0.05)
Industry fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.63	0.79	0.78
Observations	1,459	1,322	1,263

Table 9 (continued)

Panel B: CSR and at-issue credit ratings during the financial crisis			
	At-issue credit rating		
	(i)	(ii)	(iii)
CSR	-0.263	-0.032	0.019
	(0.446)	(0.259)	(0.262)
*CSR*Crisis*	-0.567***	-0.563***	-0.589***
	(0.188)	(0.129)	(0.114)
*CSR*Post-crisis*	-0.274	0.022	-0.005
	(0.245)	(0.152)	(0.137)
(*Crisis – Post-crisis*)**CSR*	-0.318	-0.585***	-0.584***
(*p-value*)	(0.35)	(0.01)	(0.01)
Bond controls	Yes	Yes	Yes
Firm controls	No	Yes	Yes
Governance controls	No	No	Yes
Industry fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.61	0.83	0.81
Observations	1,457	1,320	1,261

Panel C: CSR and time-to-maturity of bond issues during the financial crisis				
	Time-to-maturity			
	(i)	(ii)	(iii)	(iv)
CSR	-8.687	-9.541	-7.182	-7.839
	(5.477)	(6.794)	(5.636)	(4.567)
*CSR*Crisis*	8.410*	17.104***	15.686***	13.546***
	(4.500)	(3.821)	(3.411)	(3.529)
*CSR*Post-crisis*	1.957	6.014	3.516	4.522
	(5.959)	(7.512)	(7.361)	(6.742)
Credit rating				-4.801***
				(1.418)
(*Crisis – Post-crisis*)**CSR*	6.453*	11.090**	12.170**	9.024*
(*p-value*)	(0.09)	(0.05)	(0.05)	(0.09)
Bond controls	Yes	Yes	Yes	Yes
Firm controls	No	Yes	Yes	Yes
Governance controls	No	No	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
R-squared	0.09	0.11	0.11	0.12
Observations	1,459	1,322	1,263	1,291