Media Coverage and Cost of Debt

Haoyu Gao, Junbo Wang, and Chunchi Wu*

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Abstract

This paper investigates the impact of media coverage on firms' cost of issuing public debt. Using a comprehensive sample of 5,388 industrial bonds issuing during 1990 to 2011, we find that media coverage significantly reduces firms' cost of debt. The decline is attributable to alleviating information asymmetry and increasing investor recognition. The benefit of an increase in media coverage is greater for smaller and younger firms and firms with higher return volatility and lower turnover. Consistent with information disseminating role, this impact is stronger for firms with better operating performance and lower analysts' forecast dispersion.

* Haoyu Gao and Junbo Wang are at City University of Hong Kong and Chunchi Wu is at State University of New York at Buffalo. Junbo Wang acknowledges financial support from the City University Strategic Research Grant (Project 7004258 and 7004525) and from the Research Grants Council (RGC) research grant [Project 9041965, equivalent to CityU 194913] of Hong Kong Special Administration Region, China.

1. Introduction

How the information is disseminated to investors can have important implications for asset pricing. Past studies on the effects of media coverage have focused on stocks, investment funds, and IPOs in the equity market (Dyck and Zingales, 2003; Fang and Peress, 2009; Solomon, Soltes and Sosyura, 2014; Liu, Sherman and Zhang, 2014). The effects of media coverage on bond pricing or cost of debt have been largely unexplored. This paper provides explorative evidence on this issue by investigating whether the media coverage on firms can significantly reduce cost of debt and exploring the mechanism(s) through which the media effect takes place.

Within the context of capital market with imperfections, premiums always exist to compensate for investor's participation. For example, the classical investor-based theory of Merton (1987) suggests that in an incomplete market, investors only have information for a limited number of securities. As a consequence, they merely invest in a subset of securities, which results in imperfect diversification in their investment portfolio. Securities that have a lower investor base must therefore offer a higher return premium to compensate investors for suboptimal diversification. Besides, securities with less available information should offer additional premium to attract more uninformed investors (Rock, 1986; Easley and O'Hara, 2004).

The media reporting can collect, select, verify, repackage and disseminate the information of the firm fundamentals from a variety of sources, including company press, public relations departments, managers, analyst, and other market participants (Dyck, Volchkova and Zingales, 2008; Fang and Peress, 2009). All these functions substantially increase the investor recognition and reduce information asymmetry.

Past studies have shown that by disseminating information to wide audience or a specific group of investors, media coverage can have a significant effect on equity premiums. For

example, Dyck and Zingales (2003) examine stock price reactions to earnings announcements publicized by the press and find that the impact of media coverage on prices is larger when investors have fewer alternative sources of information. Chan (2003) finds that stocks with public news, measured as the headlines released by Dow Jones Newswire, are more likely to experience momentum. Some recent studies start to investigate the effect of linguistic content of media coverage (Tetlock, 2007; Tetlock, Saar-Tsechansky and Macskassy, 2008).

The role of media outlets in reducing the cost of capital has been examined in equity market (Fang and Peress, 2009). A related question that naturally arises is whether the media coverage of a firm can affect corporate bond prices. Corporate bonds and stocks are contingent claims on the same firm's assets. If media coverage enhances investor recognition, reduces information asymmetry, and lower the firm's equity risk premium, this benefit should be carried over to bonds. On the other hand, corporate bonds are different from stocks in several aspects. First, corporate bonds are fixed-income securities which do not share firms' earnings as stocks. Thus, if the firm's default risk is low, bond value will likely not be sensitive to the earnings-related information disseminated by the media. Second, corporate bonds are much less liquid than stocks. Whenever there is news, by nature, investors will be more interested in trading stocks which are more liquid. As such, stock prices would tend to be more responsive to the information disseminated by the media. Third, in theory, corporate bond prices can behave differently from stock prices. According to the contingent claims theory, the stock resembles a call option whereas the corporate bond is similar to a portfolio long in a riskless bond and short in a put option. When there is news of higher earnings volatility, bond price will fall and stock price will rise as option values are positively related to volatility. Thus, media information can have

differential impacts on stock and bond prices. How media coverage affects bond prices depends on the relative effects of different factors and is essentially an empirical issue.

Using a large dataset consisting of corporate bonds over a long span, we document convincing evidence that media coverage can significantly lower the cost of debt. This finding is consistent with the hypothesis that public information dissemination alleviates information acquisition cost, widens the investor recognition, and reduces bond risk premium. The effect of media coverage remains highly significant even after controlling for bond- and firm-characteristics and other information-relevant proxies. The effect of media coverage on cost of debt is also of economic significance. On average, the offering yield spread for the bonds with no media coverage are 142 basis points higher than that for the bonds issued by the firms in the highest quartile of media coverage.

To show the mechanism(s) through which the media effect takes place, we provide evidence that the effect of media coverage varies across firms with different characteristics. Inspired by prior findings, we hypothesize that the media effect can be amplified among firms with lower degree of investor recognition or firms with more information asymmetry (Fang and Peress, 2009). Similarly, as addressed by Dyck and Zingales (2003), the fewer alternative sources of information about a company are available, the more demand for information there is. Additionally, studies on the value of information disclosure also indicate that higher degree of information asymmetry will increase the value of new information production (Grossman and Stiglitz, 1980; Chung, McInish, Wood, and Wyhowski, 1995; Veldkamp, 2006; Vlastakis and Markellos, 2012).

Our empirical evidence shows that the media coverage effect is stronger for smaller and younger firms, firms with higher stock return volatility and lower turnover. Since the contents to

be distributed are materially coming from company press, public relations departments, and managers the tone of media reporting should be influenced by firm fundamentals (Tetlock, 2007; Tetlock, Saar-Tsechansky and Macskassy, 2008). In this respect, we expect that the magnitude of cost reduction from media coverage is larger for firms with better operating performance and lower analyst forecast dispersion. Our empirical findings show that the media effect is stronger among firms with better rating, better past stock performance, higher market-to-book ratio, higher return on assets (ROA) and lower financial analysts' forecast dispersion.

The negative association between media coverage and yield spreads may suffer from endogeneity concerns. We use following several method to address this issue. First, we regress the bond offering yield spreads against different lagged media coverage. Second, we employ the Heckman selection model to correct the potential estimate bias. And last, we use the propensity score matching (PSM) to pick the control group. All these results are qualitatively unchanged.

There is a growing literature on the economic role of media coverage in asset pricing. Our paper expands this literature by exploring the informational role of mass media in affecting the cost of debt. Understanding how information dissemination affects valuation of bonds is essential. Compared with the equity market, several unique characteristics of the corporate bond market make this research issue an important one. First, the corporate bond market is one of the most important financing venues for firms. In terms of size, the bond market is much larger than the stock market.[1] Second, unlike equity, the cost of debt or bond risk premium is better defined and easier to measure (Dhaliwal, Hogan, Trezevant and Wilkins, 2011). Expected returns or cost of debt capital can be precisely measured by yield spreads whereas cost of equity or expected

[1] Based on one of the largest U.S. securities brokerages, Securities Industry and Financial Markets Association (SIFMA), in 2014, the total capital proceeds from all the equity issues is 100.7 billion dollars while the amount from corporate bond issues is 1430.6 billion dollars, nearly fifteen times larger. From 1990 to 2013, the average value of outstanding corporate bonds is 3936.8 billion dollars, while the average amount of the whole equity market is only 175.9 billion dollars. Thus, the bond market is much larger than the equity market by various accounts.

stock return is estimated by betas which are measured with more noise. Corporate bonds thus provide an attractive setting to study the effect of media coverage on risk premiums. Third, the bond market is dominated by institutional investors, whereas a large proportion of investors in stock market are individuals or households (Cai, Helwege and Warga, 2007). Different investors possess heterogeneous information sets and may react to the media information differently. From the perspective of investment, it is important to understand the effect of the information dissemination mechanism by the mass media on bond prices. Understanding the effect of information dissemination on cost of debt also aids in financing decisions. For example, an important implication of our findings is that financial managers can lower the firm's cost of debt by devoting more efforts to improve the relation with the media.

By investigating the role of media coverage in debt financing, this paper contributes to the current literature in several unique ways. First, to our knowledge, this paper provides the first comprehensive evidence to show that media coverage can exert a significant economic impact on the pricing of corporate bonds. Previous studies have examined the impact of media coverage on the pricing of stocks (Fang and Peress, 2009; Liu and McConnell, 2013; Liu, Sherman and Zhang, 2014; Drake, Guest and Twedt, 2014). We find that the media coverage has a significant negative effect on bond offering yield spreads even after controlling for the effects of firm/bond characteristic and other information variables. This finding strongly suggests that the media coverage can increase firm visibility, enhance investor recognition, mitigate information asymmetry, and affect risk premiums not only for stocks but also for bonds. Our paper also complements the extant literature showing that the improvement of information disclosure can decrease credit spreads (see Francis, Khurana and Pereira, 2005; Andrade, Bernile and Hood, 2014; and Cassar, Ittner and Cavalluzzo, 2014).

Second, we contribute to the understanding of mechanism(s) through which the media effect takes place. Our results reveal that the impact of media coverage is more pronounced for smaller and younger firms, and for the firms with higher return volatility and lower turnover, showing that the information disseminating role of media is more pronounced for firms with lower degree of investor recognition or firms with more information asymmetry. These findings support prior studies that the value of information production in financial market is conditional on investor's information demand (Dyck and Zingales, 2003; Fang and Peress, 2009).

Third, our results on the interactive effects of firms' operating performance and media coverage on cost reduction of borrowing suggest that there exists a more significant role of the media when the media reporting covers firms underlying with consistent superior operating performance. These findings are in line with previous studies using linguistic analyses (Tetlock, 2007; Tetlock, Saar-Tsechansky and Macskassy, 2008).

The rest of the paper is organized as follows. Section 2 develops the hypotheses for empirical tests. Section 3 describes the sample selection procedure and the variables used in empirical tests. Section 4 analyzes the determinants of media coverage and Section 5 tests the effect of media coverage on cost of debt. Section 6 performs additional robustness tests. Finally, Section 7 summarizes the main findings and concludes the paper.

2. Hypothesis development

In an incomplete market, the literature suggests that valuation of a security can be affected by firm's information environment in at least two aspects. First, as modeled by Merton (1987), securities that have lower investor recognition must offer a higher return premium to compensate investors for suboptimal diversification. Diamond and Verrecchia (1991) show that revealing private information to the public reduces the firm's cost of capital by increasing the demand of

investors through lowering transaction costs. Second, securities with less available information should offer additional premium to attract more uninformed investors (Rock, 1986). Easley and O'Hara (2004) show that differences in the composition of public and private information affect cost of capital and that investors require a higher return when holding stocks with more private (and correspondingly less public) information.

The media plays an important role in disseminating information. By soliciting quotes from corporate managers and the financial analysts, news agencies summarize the comments and interpretations from the perspective of shareholders on firms' operating developments (Dyck, Volchkova and Zingales, 2008; Fang and Peress, 2009; Bushee, Core, Guay and Hamm, 2010). Studies on the informational role of business press have shown that media reports facilitate information gathering, reduce costs of information acquisition, and improve firms' information disclosure environment. Thus, the media substantially increases the investor recognition and reduces the information asymmetry. Both of them will decrease the cost of information acquisition into security price and thus significantly lower the cost of capital.

The principal mechanism by which the media exert an economic effect is to collect, select, certify and repackage information to the public. This mechanism enriches a firm's information environment.[2] However, studies on the effects of media coverage have focused almost exclusively on the issues related to equity pricing (Duarte, Han, Harford and Young, 2008; Fang and Peress, 2009; Bushee, Core, Guay and Hamm, 2010). Much less is known about the effects of media coverage on corporate bond pricing.

The literature has suggested that media coverage can enlarge investor recognition and meanwhile reduce information asymmetry, thereby lowering the cost of raising capital. As bonds

[2] Previous studies have shown that the front-page media coverage affects the pricing of stocks and closed-end funds, return volatility, momentum, and trading volume of individual stocks (Chan, 2003).

and stocks are claims for the same underlying assets of the firm, information dissemination by media should affect not only cost of equity but also debt. This leads to our first hypothesis.

H1: *The media coverage helps reduce firms' cost of debt. Yield spreads for bonds issued by firms with higher media coverage are expected to be lower than for bonds issued by firms with lower media coverage.*

Prior studies document that since there is relatively less information available on smaller and younger firms, investors depend more heavily on the disclosure to evaluate their future prospect. For example, Dyck and Zingales (2003) point out that the fewer alternative sources of information about a company are available, the more demand for information there is. Stiglitz and Weiss (1981) suggest that information frictions exert greater economic impacts on younger firms. Easley and O´Hara (2004) show that information asymmetry has a greater impact on the cost of capital of firms with less publicly available information. The literature has also documented that stock return volatility reflects information uncertainty about future earnings (Chen, DeFond and Park, 2002; Zhang, 2006). Fang and Peress (2009) confirm that the media coverage effect is stronger among stocks that have a lower degree of investor recognition. Tetlock (2010) find that media coverage has a much greater impact on illiquid firms.

We characterize the intensity of investor information demand using firm size, age, stock return volatility and turnover rates. Smaller and younger firms usually suffer more from information asymmetry due to limited amount of available disclosure. Information production is much more costly and time consuming for firms with higher stock return volatility and lower liquidity as these firms are typically less transparent and have smaller investor base. Prior studies suggest that increased information provision will reduce the benefits of further information production (Grossman and Stiglitz, 1980; Chung, McInish, Wood, and Wyhowski, 1995; Veldkamp, 2006; Vlastakis and Markellos, 2012). These studies indicate that by alleviating

information frictions, the media coverage has greater impacts on firms with larger information asymmetry or firms with lower degree of investor recognition, which motivates our second hypothesis.

H2: *The benefit of media coverage for reducing cost of debt is larger for smaller firms, younger firms, firms with higher stock return volatility and lower liquidity.*

Recent studies have shown importance of the sentiment in media coverage. For example, Tetlock (2007) finds that the linguistic content of media coverage affects future stock price movements. Tetlock, Saar-Tsechansky and Macskassy (2008) find that the fraction of negative words in media coverage signals firms' future earnings and stock prices. Li (2008) documents evidence that lexical properties of annual report are linked to firms' performance and earnings persistence. Loughran and McDonald (2010) develop a negative word list to measure the tone of 10-K filings and link their textual analyses to returns, trading volume, volatility, fraud, material weakness and unexpected earnings of firms. These findings reveal that the tone of media reporting does play a role.

Also, we perceive that the tone of media reporting should be influenced by firm fundamentals since the contents to be distributed are materially coming from company press, public relations departments, and managers. Chen, De, Hu and Hwang (2014) show that opinions expressed in social-media platforms reveal firms' fundamentals and find that firms with better performance have more preferable and friendly information coverage. It is arguable that firms with lower ratings, worse past stock returns, negative ROA and lower growth opportunities, are more likely to confront media reports with more negative tones. Thus, for these firms, the cost reduction effect of media coverage will be significantly reduced or even reverse due to the negative tone of media coverage. This leads to our third hypothesis.

H3: *The cost reduction benefit of media coverage is smaller for firms with poorer performance. That is, the effect of media coverage on cost of debt is weaker for firms with lower rating, lower past stock returns, negative ROA and lower growth opportunities.*

3. Data

3.1 Sample description

Data for new bond issues are collected from Thomson Financial's Securities Data Company (SDC) database. To measure a firm's media exposure, we search the LexisNexis database for the number of newspaper articles written about the firm. This database includes monthly reports of news coverage.[3]

For the bonds issued between January 1990 and January 2011, we remove those observations with obvious recording errors, and bonds issued by financial and utility firms. To avoid confounding effects associated with embedded options and variable rates, we restrict the sample to straight bonds with fixed coupon rates. Further, we eliminate those bonds with missing rating information from the SDC or FISD. We primarily employ the Moody's bond ratings, and when such ratings are unavailable, we use the Standard and Poor's bond ratings. This results in 5,559 issues with media coverage information. In addition, we obtain financial statement information from Compustat, stock prices and returns from the Center for Research in Security Prices (CRSP), and analyst coverage and opinions dispersions from the I/B/E/S database. The final matched sample includes 5,338 bonds issued by 741 firms and the sample period runs from January 1990 to January 2011.

Figure 1 shows the distribution of the number of bonds issued by a firm. The vertical axis denotes the number of firms that issue a certain number of bonds indicated on the horizon axis

[3] To maintain that the newspaper articles collected from LexisNexis do provide reports on a given company, we filter those articles reporting one firm with small "relevance score". Following the strategy by Fang and Peress (2009), the criteria we use in this paper is also greater than or equal to 90%.

For example, the first bar indicates that 140 firms (or 18% of the sample) issue only one bond over the sample period and right-most bar indicates that less than 20 firms or 3% of the firms issue more than 30 bonds.

[Insert Figure 1 here]

3.2 Media coverage and bond yield spreads

The most important variable in our empirical analysis is media coverage, *Media*, measured by the total number of newspaper articles about a firm in a month prior to the offering day of a new bond issue.[4] In regression analysis, we take the natural logarithm of one plus the number of articles, denoted by *LMedia* as the explanatory variable. This variable has been commonly used in prior studies to proxy for media attention (e.g., Fang and Peress, 2009; Liu and McConnell 2013; Liu, Sherman and Zhang, 2014).

For robustness, we use three measures of the media variable. The first measure is the average number of newspaper articles over the three months period (six months or twelve months) prior to the bond offering date, denoted by *Lag3M* (*Lag6M* or *Lag12M*). The second measure is the adjusted media coverage which is the residuals (denoted by *Residuals*) from the regression of *LMedia* against bond and firm characteristic variables suggested by the literature that are related with the firm's information environment. By construction, this residual variable is orthogonal to variables related to the firm's information environment. The third measure is *AdjMedia* which is the natural logarithm of one plus the number of newspaper articles one month prior to the bond issuance in excess of that for the two-digit industries. *AdjMedia* measures the

[4] Instead of using simple average, prior studies such as Fang and Peress (2009), also use the weighted sum of articles, in which the weights equal the newspapers' circulation. Our results remain unchanged if we use circulation weighted average of newspaper coverage. We refer to http://auditedmedia.com/ for the circulation information. Regarding the circulation weights for each newspaper is quite persistent across time, we use the average circulation number for the six months ending March, 2012. That is, WSJ (*Wall Street Journal*), NYT (*New York Times*), WP (*Washington Post*), and USAT (*UAS Today*) had average daily circulations of 2.1, 1.6, 0.5, and 1.8 million paid copies, respectively (from October 1, 2011 to March 31, 2012).

media coverage on a firm relative to the industrial average.

Since bonds are issued with different maturities, offering yields are not directly comparable across bonds. Thus, we adjust each bond's offering yield by the Treasury yield with equivalent maturity (Anderson, Mansi and Reeb, 2004). To calculate bond offering yield spreads, we first obtain the risk-free term structure of interest rates from the Federal Reserve Board, including the monthly Treasury benchmark yields with two, three, five, seven, ten, twenty, and thirty-year maturities. We then interpolate the Treasury yields at six-month intervals from two years to 30 years (see also Kecskés, Mansi and Zhang, 2012). The bond at-issue yield spreads are calculated as the bond offering yields minus the Treasury yield of the closest maturity in the offering month.

3.3 Controlling variables

We use firm- and bond-specific characteristics as control variables in regression analysis. Firm-specific controls include firm size, leverage, intangibility and market-to-book. Firm size (*Asset*) is the total amount of assets in billion dollars and we use its log value, *LAsset*, in regression. Firm leverage (*Leverage*), a proxy for financial conditions, is the total liability divided by the total asset. Following Ambrose and Megginson (1992) and Myers (1984), we use firm intangibility (*IntanRatio*) as a proxy for the asset structure in terms of collateralizable capability, which is the intangible asset divided by total asset. The market-to-book ratio (*MB*), a proxy for growth opportunities, is measured as (market capitalization + total asset – book equity value) / total asset.

We also employ firm age and dividend amount to control the firm's maturity stage as suggested by the lifecycle theory (Anthony and Ramesh, 1992; Dickinson, 2011). Firm age (*Age*) is measured as the number of years since its initial offering. *Dividend* is the total amount of dividend payments in billion dollars. We use the log value of these two variables *LAge* and

LDivid in regression analysis. To control for the operating performance, we employ return-on-asset (*ROA*), which is the ratio of net income to total asset (see Core, Guay and Rusticus, 2006; Kotter and Lel, 2011). To control for stock risk and past return performance, we use past equity return volatility (*Volatility*) measured by standard deviation, and average of daily stock returns (*Return*) over the past 250 trading days (see Campbell and Taksler, 2003).

We use analyst coverage as controls for the firm's information disclosure environment. Botosan (1997) parse the sample by the number of stock analysts and find that for low analyst following, more disclosure is associated with lower cost of equity capital whereas for high analyst following, there is no significant relation. Mansi, Maxwell and Miller (2011) find that the number of analysts and forecast dispersion are good proxies for information available to investors. To assess the informational role of media attention, we control for the effects of these variables. We denote the number of stock analysts issuing earnings forecasts as *Analyst* and use its log value, *LAnalyst*, in regression analysis. *Dispersion* is measured by standard deviation of analyst forecasts for one-year EPS.

Lastly, we use bond-specific characteristic variables, including credit ratings (*Rating*), offering proceeds (*Amount*), bond maturity (*Maturity*) to control for the effects of default risk, issue size and maturity on yield spreads. Following Blume, Lim and MacKinlay (1998) and Livingston, Naranjo and Zhou (2007), we convert ratings from an alphanumerical system to a number rating ranging from zero for AAA bonds to 20 for C bonds. *Amount* is the total proceeds in billions of dollars of a bond issuance. *Maturity* is years to maturity. We use log value of these variables (*LAmount* and *LMaturity*) in regressions. Table A1 in the Appendix provides definitions for all variables used in our analysis.

Table 1 shows the distribution for the newspaper coverage (*Media*) or the number of articles

for the firm one month before the issuing date by year. A total of 5,338 bonds are issued by 741 firms in the sample and about 36% of the bond issues has no media coverage.[5] The columns under "Non-Covered" show the number of bond issues and corresponding issuers that do not have any newspaper coverage over the one-month period prior to the bond issuing date. The columns under "Covered" report the number of bonds and issuers with at least one newspaper article covered in the month prior to bond issuance. For these issuers, the average number of newspaper articles is around 10 over the sample period.[6] Figure 2 displays the proportion of bond issues (the vertical axis) that have media coverage in each calendar year (the horizontal axis). As shown, the majority of bond issuances in the sample are covered by newspapers.

[Insert Table 1 and Figure 2 here]

Table 2 reports summary statistics. Panel A shows descriptive statistics for all variables used in empirical analysis. Panel B reports the distribution of offering yields and yield spreads by maturity for four rating categories: AAA/AA, A, BBB, and junk bonds. Offering yields and yield spreads increase as the rating decreases. The offering yield spreads of junk bonds is 2.59% higher than that of AAA/AA bonds (1.72%). When dividing the sample into maturity terciles where the corresponding maturities of shorter than or equal to 7 years, longer than 7 years and shorter than or equal to 10 year, and longer than 10 years, the yield spread is higher for longer maturity bonds.[7]

[Insert Table 2 here]

[5] This finding is similar to the IPO study by Liu, Sherman and Zhang (2014). In the sample of long horizon role of media attention on IPOs, Liu, Sherman and Zhang (2014) also find the skewed distribution of media coverage for the IPO firms and nearly 33% of the observations do not have any media coverage.
[6] The distribution is skewed with a median of 4.00 and stand deviation of 14.63.
[7] See also Guedes and Opler (1996) and Stohs and Mauer (1996).

Table 3 reports the correlation matrix of variables. There is a significant negative correlation between media coverage (*LMedia*) and yield spreads (*AdjYield*), indicating that media attention is negatively associated with cost of debt. Consistent with previous findings, yield spreads are negatively correlated with firm size (see Bhojraj and Sengupta, 2003; Anderson, Mansi and Reeb, 2004), firm age (Pittman and Fortin, 2004), analyst following (Mansi, Maxwell and Miller, 2011), and positively correlated with leverage (Borisova and Megginson, 2011), analyst forecast dispersion (Gebhardt, Lee and Swaminathan, 2001; Diether, Malloy, and Scherbina, 2002; Mansi, Maxwell and Miller, 2011) and equity return volatility (Bekaert and Harvey, 1997). In line with the mass media literature, we find that larger and older firms, and firms with higher credit ratings, more analysts, and lower volatility are more likely to attract newspaper coverage (Hayward, Rindova and Pollock, 2004; Fang and Peress, 2009; Liu, Sherman and Zhang, 2014). Correlations among key explanatory variables are generally moderate. The VIF tests suggest that multicollinearity is not a serious concern in multiple regressions.

[Insert Table 3 here]

4. Determinants of media coverage

We begin our analysis by examining what determines the cross-sectional variation in media coverage across firms. Understanding this issue helps explain why some firms have more media coverage than others. The literature suggests that media coverage performs two important functions: information dissemination and reputation building. Media coverage disseminates the information for firms. The information about a firm comes from multiple sources, e.g., company press, public relations departments, stakeholders and media workers. Information disclosure tends to have better quality when more outsiders work together to write stories and record what happens for the firm. Information dissemination by media coverage for firms' operating

activities helps improve information efficiency.[8] Moreover, the media themselves are not only the vehicles for advertising and reporting firms' activity, but also active agents conveying strategic tone through editorials and feature articles. In the reputation building process, the information propagated by the media to the public, through press articles or mass media representations, shape the firm's reputation.[9] It has been shown that reputation building is a powerful source of discipline, and media pressure can be an effective deterrent (Dyck, Volchkova and Zingales, 2008).

In light of the literature, we explore the relation between media coverage and firms' characteristics closely related to disclosure incentives and information environment. The characteristic variables include firm size (*Asset*), firm age (*Age*), external credit rating (*Rating*) and the amount of capital proceeds raised (*Amount*). Also, we consider variables relevant to information environment, such as the number of analysts following (*Analyst*) and dispersion in financial analysts' earnings forecasts (*Dispersion*), which may affect media coverage for the firm.

We first perform univariate sorts on the media coverage by *Asset*, *Amount*, *Analyst*, *Dispersion*, *Age*, and *Rating*. Portfolio sorts provide a direct and intuitive picture for the relation between media coverage and characteristic variables. For each variable, we divide the whole sample into quartiles and calculate the average number of articles for each group.

Panel A of Table 4 reports the results of portfolio sorts. The last two columns report the difference between the highest and lowest quartiles and the associated *t*-statistic. All high-low

[8] As documented in the literature, as a watchdog, media can reveal private information, e.g. illegal or unethical activities in running firms, to public investors (Hamilton and Zeckhauser, 2004). Bushee, Core, Guay and Hamm (2010) show that business press can serve as information intermediary to impact firms' information environment by aggregating and disseminating information to the investors in the capital markets.

[9] Fombrun and Shanley (1990) develop hypotheses and provide empirical evidence on the fact that firms' exposure through the media will significantly influence reputational judgments. Deephouse (2000) presents a theoretical and empirical support for the conjecture that media reputation is a strategic resource. Dyck, Volchkova and Zingales (2008) examine the crucial role played by media coverage in influencing the corporate governance using Russia's data over the period of 1999 to 2002.

differences are significant at the one percent level. Firms with larger assets, more analysts, higher dispersion of analysts' forecasts, and higher ratings (lower rating scores), and also those raising more money through debts and being more mature tend to have more media coverage. The relations between the number of media coverage and these characteristic variables are monotonic from the lowest to highest quartiles in most cases. Results show that cross-sectional variations in media coverages are strongly correlated with firm characteristics.

[Insert Table 4 here]

To see the effect of each characteristic relative to other variables, we conduct the following cross-sectional regression:

$$LMedia_{i\,t} = \alpha_0 + \alpha_1 LAsset_{i\,t} + \alpha_2 LAge_{i\,t} + \alpha_3 LAmount_{i\,t} + \alpha_4 Rating_{i\,t} + \alpha_5 LAnalyst_{i\,t} + \alpha_6 Dispersion_{i\,t} + \beta Controls + IndustryDummy + YearDummy + \varepsilon_{i\,t} \quad (1)$$

Besides all variables used in portfolio sorts, the right hand side adds control variables for individual firms and dummy variables that capture industry and year fixed effects.

Panel B of Table 4 reports regression results. We run different specifications of multiple regressions in columns (1) to (6) and include all variables in the last column. Results show that most explanatory variables are significant at the conventional levels. Media coverage has a significantly positive relation with firm size, age, and the amount of bond issuance, suggesting that the mass media tends to follow large, mature and influential firms. This is consistent with the findings of Deephouse (2000) and Ailawadi, Lehmann and Neslin (2003) that larger and more dominant firms have greater influence and better access to the media. In addition, results show that firms with a higher rating, more analysts following and larger dispersion of analysts' forecast are more likely to be covered by the media (Fang and Peress, 2009). This finding is also consistent with the literature in the equity market studies.

Comparing the R^2 of different specifications, we find that without including control variables (columns (1)-(3)), the analyst coverage variables have relatively high explanatory power. The coefficients of these variables are highly significant and the largest adjusted R^2 is 0.41. Analyst variables remain highly significant even after we incorporate all explanatory variables (with controls) in the regression. The significance in the variables of disclosure incentives and information environment suggests that media coverage reflects important information related to firms' fundamentals.

5. Effect of media coverage

In this section, we examine the role of media coverage in affecting the cost of borrowing in the corporate bond market. We show that the media coverage prior to the bond issuance has a significantly negative effect on bond offering yield spreads. Furthermore, motivated by our hypotheses developed in Section 2, we expect that the media effect is much stronger among firms with less information available for investors, firms with lower degree of investor recognition, and firms with better operating fundamentals.

5.1. Effect of media coverage on cost of borrowing

There is substantial evidence that the market efficiently incorporates the media information.[10] The literature has documented several important effects of media coverage in the equity market. Busse and Green (2002) find that stock prices and trading intensity reflect new information disseminated by the media in a short window. Tetlock, Saar-Tsechansky and

[10] Urrutia and Vu (1999) present empirical tests on the impact of being the cover page of Business Week on stock price, volatility, and trading volume and conclude that this kind of particular media coverage surprisingly brings in negative price effects in terms of good news and no significant effects in terms of bad news. They also reveal that being the cover page can significantly increase the liquidity of the stock while show little impact on stock volatility. Dyck and Zingales (2003) examine stock reactions to earning announcements emphasized by the press and find that the impact of media on asset prices is larger when investors have fewer alternatives sources of information to turn to. Tetlock (2007) provides empirical evidence that the media content can predict movements in stock market. Peress (2008) shows that earning announcements with media coverage can generate stronger price and trading volume reactions.

Macskassy (2008) examine the role of the linguistic media content and find that firm-specific news has predictive power for accounting earnings and stock returns. Dyck and Zingales (2004) find that the media pressure shapes corporate policy. Dyck, Volchkova and Zingales (2008)[11] and Dyck, Morse and Zingales (2010) find that the media have an incentive to bring the fraud to light and their reports help improve corporate governance.[12] These studies investigate the effects of media coverage on stock market performance. In this section, we examine the effect of media coverage on bond offering yield spreads.

We begin our analysis of the relation between media coverage and yield spreads using portfolio sorts. We first separate the observations based on whether there are newspaper articles published in the month prior to the bond issuance and then sort bonds with at least an article for the issuing firm into quartiles based on the number of articles. Panel A of Table 5 reports the results of portfolio sorts. We report mean, median and standard deviation for each quartile portfolio. The first column shows the results for bonds with no media coverage and the next four columns show results for bonds with varying media coverage. Results show a clear pattern for the relation between offering yield spreads and the media coverage from the group with no coverage to the group with the most coverage. The offering yield spread decreases monotonically with media coverage. The difference in the offering yield spreads between the bonds with the most media coverage (Large) and no coverage is 142 basis points which is highly significant (t = 20.15). The difference in the offering yield spreads between the bonds with the most (Large) and the least media (Small) coverage is 89 basis points, which is also highly significant (t = 12.15).

[11] They study the role of media coverage on shaping the corporate governance using the Russia over the 1999 to 2000 period and find that one more report in the Financial Times or the Wall Street Journal significantly increases the probability of reversing a corporate governance violation by five percent.

[12] Other papers have studied the economic role of media. Engelberg and Parsons (2011) focus on the causal impact of media coverage and find that the presence or absence of local media coverage is strongly related to the probability and magnitude of local trading. Solomon (2012) finds significant support for spin hypotheses that firms generate more positive press releases, and the positive media coverage increases returns around news announcements.

Results strongly suggest that media coverage has a significant impact on firms' cost of borrowing.

[Insert Table 5 here]

We next run the regression of offering yield spreads against media coverage and control variables including firm and bond characteristics:

$$AdjYield_{i\,t} = \alpha_0 + \alpha_1 LMedia_{i\,t-1} + \alpha_i Bond_{Characteristics_{i\,t}} + \beta_j Firm_{Characteristics_{j\,t-1}} + \gamma Controls + IndustryDummy + YearDummy + \varepsilon_{i\,t} \quad (2)$$

The dependent variable is the bond yield spread, and the key explanatory variable is the media attention, measured by the natural logarithm of one plus the number of newspaper articles in the month prior to the bond issuance. We incorporate various bond and firm characteristics as controls and perform the panel regression with the industry and year fixed effects.

Panel B of Table 6 reports the results of panel regressions with fixed effects. Columns (1) to (5) report results with different control variables and column (6) reports results with all variables. Our primary interest here is the *LMedia* coefficient α_1 in the regression. As shown, α_1 is always significantly negative across the models with different controls. In the base regression with no control variables (column (1)), the media attention is negatively related to yield spreads with a *t* statistic of -15.09, which again strongly supports hypothesis H1. The effect of media attention is of economic significance. Given the point estimate of the media coverage coefficient, on average one more newspaper article published in the month before the bond issuance leads to a drop of 32 bps in the offering yield spread. The effect of media coverage remains highly significant with inclusion of control variables. Results show that media coverage has a significant negative effect on cost of debt over and beyond the traditional financial variables that are perceived to be important determinants of borrowing cost. This finding is consistent with the results of portfolio sorts in Panel A where the effect of media coverage also remains highly significant after

controlling for the effects of firm characteristics. There is strong evidence that media coverage significantly reduces cost of debt.

Consistent with the corporate finance literature, cost of borrowing depends on firm characteristics. Bonds with worse credit ratings, longer maturities and larger issuance amount have higher offering yield spreads. Bonds issued by higher leverage and fledgling firms have higher cost of borrowing due to the high risk nature for these firms. Also, borrowing cost is negatively related with operating performance and dividends, and positively related with the ratio of intangible assets. The yield spreads are negatively related to the number of analysts and positively related to analysts' forecast dispersions. Moreover, stock performance has a significant impact on cost of borrowing. The yield spreads are negatively related with past stock returns, and positively related with stock return volatility. All of these findings are perfectly in line with the prediction of the traditional capital structure theory in a perfect market that many factors can affect the cost of debt. More importantly, we still find that media coverage has a significant effect on cost of borrowing over and beyond the effects of these traditional factors. Results strongly suggest that in a market with imperfect information, media plays an important role in the determination of cost of debt.

5.2. Addressing the endogeneity concerns

Our results suggesting the negative association between media coverage and yield spreads may suffer from endogeneity concerns since the newspaper reporting is unlikely to be random. Bushee, Core, Guay and Hamm (2010) also reveal that media coverage is greater for larger firms, firms with more analysts following, more number of employees, and more number of shareholders. Within the context of corporate bond offering in this study, the number of newspaper reporting prior to the bond offering has a significantly positive relation with firm size,

age, and the amount of bond issuance.

From the results presented in Panel B of Table 4, we can find that media coverage always tends to follow large, mature and influential firms. This is consistent with the findings of Deephouse (2000) and Ailawadi, Lehmann and Neslin (2003) that larger and more dominant firms have greater influence and better access to the media. In addition, results show that firms with a higher rating, more analysts following and larger dispersion of analysts' forecast are more likely to be covered by the media (Fang and Peress, 2009).

To addressing this, our main regression analyses rely upon the level of media coverage at the month prior to the offering date and our robustness tests also introduce more lags in media coverage variable. Besides, we employ the Heckman selection model to correct the potential estimate bias and use the propensity score matching (PSM) to show consistent results.

The first stage of our Heckman selection model consists of a broad set of bond- and firm-characteristics that should impact the likelihood of having media coverage (Heckman, 1979). To begin with, we use Probit regression model to derive the inverse Mills ratio and the dependent variable is a dummy indicating whether the issuer has any newspaper reporting prior to the bond offering. Further, we replicate the model (6) in Panel B of Table 5 and put the inverse Mills ratio as additional controls. We find that our variable of interest, *LMedia*, is still negative and significant, showing that our results on the negative association between media coverage and borrowing cost remains unchanged after considering the effect of potential selection bias. The regression results are reported in Table 6.

[Insert Table 6 here]

We also conduct matching analyses based on propensity score matching methodology suggested by Rosenbaum and Rubin (1983). The goal of matching is to obtain "twin" firms that

have approximate likelihood of having media coverage. And we can undertake statistical tests on matched samples to uncover whether there exists a significant difference in yield spreads between firms with media reporting and those without. As shown in Table 7, we can observe that the differences in bond- and firm-characteristics between with-media group and without-media group are statistically and economically significant before matching. However, after matching, it is interesting to find that these characteristics looks approximate but the difference in yield spreads are still significant (i.e. the mean difference is 21 bps and the absolute value of *t*-statistic is 2.73). Results based on PSM approach again confirm that the media coverage do play a role in reduction of cost of debt.

[Insert Table 7 here]

5.3. Impact of Information Asymmetry and Investor Recognition

Media coverage is correlated with some firm characteristics and this raises the question whether its effect is robust. Our second hypothesis also implies that the media coverage has greater impacts on firms with larger information asymmetry or firms with lower degree of investor recognition. To see whether media coverage has an effect independent of firm characteristics, we perform bivariate sorts. We characterize the intensity of investor information demand by firm size, age, return volatility, and turnover. Panel A of Table 8 reports results for the portfolios sorted by media coverage and firm characteristics such as size, age, return volatility and turnover.

For each characteristic variable, we sort the bonds into two groups based on the median value of firm characteristics. For each characteristic group, we first single out the bonds with no media coverage prior to their issuance dates and then divide the remaining bonds with media coverage into small and large groups based on the median value of news articles. Results can be

summarized as follows. First, the yield spread differences between the bonds with the most coverage and no-coverage (N-L) or the least coverage (S-L) are all significant at the one percent level. The difference in yield spreads of N-L is much larger than the difference in yield spreads of S-L.

Second, there remains a monotonic relationship between media coverage and yield spreads even after controlling firm characteristics. Results continue to show that the more media coverage, the lower the offering yield spread.

Third, bond yield reduction due to media coverage is larger for small and young firms, and firms with high equity volatility and low turnover. The incremental benefit of the media coverage is much larger for these firms. These findings strongly support both hypothesis H1 and hypothesis H2 on the cost reduction role of media coverage. Results also conclude that the effect of media coverage varies across firms with different characteristics, showing that the cost reduction benefit is larger for firms with higher asymmetric information.

[Insert Table 8 here]

Next, we use multiple regression analyses to investigate whether these firm characteristics relevant with the level information asymmetry or the degree of investor recognition impact the media coverage effect. In line with our H2, the media coverage effect is expected to be stronger for smaller and younger firms. Smaller firms are less known and perceived to be riskier by bondholders and so are younger firms with short track records (Stiglitz and Weiss, 1981; Harris and Raviv, 1996). Bond investors depend more heavily on information disclosure to evaluate the future performance of these firms. Also, the information production process is more time consuming for firms with higher volatility (Chen, DeFond and Park, 2002; Zhang, 2006) and lower turnover (Tetlock, 2010). Therefore, it is reasonable to predict that smaller, younger firms

and firms with higher volatility and lower turnover are more likely to confront with high information asymmetry problems or low degree of investor recognition. And if so, the effect of media information dissemination would tend to have larger for these firms too.

To test whether the effect of media coverage is conditional on firm characteristics, we allow the response coefficient of media coverage to depend on these variables in the panel regression. We first sort the firms into high and low groups based on their asset value, age, return volatility and turnover and then set a dummy variable D for each of firm characteristic variables in the regression. For the dummy variables of total asset (*DAsset*), age (*DAge*), and turnover (*DTurnOver*), it takes a value of one if a characteristic variable is larger than the median. For return volatility, the dummy variable (*DVolatility*) takes a value of one if its value in the past year is lower than the median. We include these dummy variables with interaction terms in the following regression:

$$\begin{aligned} AdjYield_{i,t} = {} & \alpha_0 + \alpha_1 LMedia_{i,t-1} + \alpha_{11} LMedia_{i,t-1} * DAsset_{i,t-1} + \alpha_{12} LMedia_{i,t-1} * DAge_{i,t-1} \\ & + \alpha_{13} LMedia_{i,t-1} * DVolatility_{i,t-1} + \alpha_{14} LMedia_{i,t-1} * DTurnOver_{i,t-1} \\ & + \alpha_j Other_{Characteristic\,j,t-1} + \beta Controls + IndustryDummy + YearDummy + \varepsilon_{i,t} \end{aligned} \quad (3)$$

The coefficients of interactive dummy variables are expected to be positive as suggested by our hypotheses. Again, the regression is run with controls for industry and year fixed effects.

Panel B of Table 8 reports the results with dummy interactive and other control variables. All interactive variables have significantly positive coefficients. Results strongly suggest that the effect of media coverage is conditional on firm size, age, return volatility and turnover. For smaller and younger firms and firms with higher return volatility and lower turnover (liquidity), the benefit of media coverage for reducing cost of borrowing is stronger. This finding provides strong evidence in supporting of H2, the media effect of reducing cost of debt is more pronounced for firms with limited information availability or low degree of investor recognition.

Our proxies of information asymmetry or investor recognition can also be the instruments for default risk since smaller firms, younger firms, firms with higher return volatility and lower stock liquidity are more likely to default (Campbell and Taskler, 2003; Campbell, Hilscher and Szilagyi, 2008). Therefore, the stronger media effect among these firms can be interpreted as evidence is not unique to an information relevant story, and instead, it is also consistent with a default risk channel. To preclude this, actually we examine whether media coverage effect can be impacted by bond rating since the rating is very unique and accurate proxy for default risk. If the default risk channel is rightly identified, we should observe that the media coverage is stronger for firms with lower rating category. However, as shown in next section on the interaction analyses between rating and media coverage, the media effect in cost reduction is stronger for issuers with better ratings. The findings again confirm the information disseminating role of media in financial markets.

5.4. Impact of Firm Performance on Media Effect

While the main function of information production process is to reveal useful information, the content of media coverage can influence the sentiment of public information and affect securities prices. Tetlock (2007) shows that the linguistic content of media coverage affects future price movements and Tetlock, Saar-Tsechansky and Macskassy (2008) find that the fraction of negative words in media coverage can predict the firms' earnings. As the tone of articles is often correlated with firm fundamentals and operating performance, we employ firm-level characteristics as proxies for the sentiment in public media. As an example, if a firm releases a satisfactory earnings announcement, the media coverage will tend to have a positive tone. This positive message can change the perception of investors about the future performance and default probability of the firm, and lower their returns required for compensating risk

bearing. Conversely, for firms with negative operating performance, the tone of the media coverage tends to be negative and has an adverse impact on investors' perception.

To explore this possible link, we perform bivariate sorts on media coverage and operating characteristics. We use the *Rating*, *Return*, market-to-book ratio (*MB*), and *ROA* (Solomon, Soltes and Sosyura, 2014; Deephouse, 2000) to proxy firms' credit quality, stock and operating performance. In addition, we use *Dispersion* as a proxy for professionals' dispersed attitude to see if noisy public opinions may weaken the effect of media attention.

For each category variable, we first divide the whole sample into two subsamples: *Investment* if the rating is BBB or above and *High Yields*, otherwise; *Losers* if the average stock returns in the past year is negative and *Winners*, otherwise (Grinblatt and Moskowitz (2004)); *High Growth* if the firm's market to book ratio (*MB*) is larger than the median value and *Low Growth*, otherwise; *Good Performer* if the ROA is greater than zero and *Bad Performer*, otherwise; and *Large* if the dispersion of the financial analysts' forecasts is larger than the median value and *Small*, otherwise.[13] For each subsample, we further divide the observations into three subgroups (Non-Covered, Small, and Large) based on the number of newspaper articles one month prior to the bond issuance. Finally, for each group, we calculate average yield spreads and tests the differences between them.

Panel A of Table 9 reports results of these portfolio sorts. The last four columns report the mean differences and the corresponding *t*-statistics. Results show that firms with no media coverage always have the highest yield spreads while firms with high coverage always have the lowest yield spreads. In all, 18 out of 20 N-L and S-L pairs are significant at the one percent level.

[13] The results are qualitatively and quantitatively stable if the median value is employed to differentiate firms in stock performance (*Return*) and operating performance (*ROA*).

[Insert Table 9 here]

Results also reveal that the effect of media coverage depends on characteristics. Relative to the firms without media coverage (N) or lower media coverage (S), the yield spreads reductions for firms with higher media coverage are larger when bonds have investment-grade, and are issued by firms with better past stock performance, higher growth opportunity, better earnings performance and lower analysts' forecast dispersion. Results strongly suggest that the effect of media is greater for high-quality/growth firms and the firms with more precise information disclosure.

We next run the regression with interactive dummy variables for firm characteristic variables:

$$\begin{aligned} AdjYield_{i\,t} = {} & \alpha_0 + \alpha_1 LMedia_{i\,t-1} + \alpha_{11} LMedia_{i\,t-1} * DRating_{i\,t-1} + \alpha_{12} LMedia_{i\,t-1} \\ & * DReturn_{i\,t-1} + \alpha_{13} LMedia_{i\,t-1} * DDispersion_{i\,t-1} + \alpha_{14} LMedia_{i\,t-1} * DMB_{i\,t-1} \\ & + \alpha_{15} LMedia_{i\,t-1} * DROA_{i\,t-1} + \alpha_j Other_{Characteristic_j\,t-1} + \beta Controls \\ & + IndustryDummy + YearDummy + \varepsilon_{i\,t} \end{aligned} \quad (4)$$

We split the whole sample into two groups based on credit ratings, past one-year stock returns, market-to-book value ratios (growth), profitability and dispersion of analysts' forecast, and assign each group a dummy variable which has value one for the bonds with a speculative grade, issued by firms with lower growth, stock returns (past losers), and profitability (negative ROA), or higher analysts' forecast dispersion.

Panel B of Table 9 reports results of panel regressions with interactive dummy variables and different control variables. These regressions are estimated with controls for the industry/year fixed effects. The coefficients of interactive dummy variables are all significant and positive. Results show that the effect of media coverage is weaker for bonds issued by firms with a speculative grade, lower past stock returns and ROA, lower growth, and higher analyst forecast dispersion. This finding suggests that the cost reduction effect of media coverage is higher for

firms with good performance and high quality of information disclosure. More importantly, the effect of media coverage continues to be negative and significant and this effect is robust to different controls. Results strongly support our hypothesis H3.

6. Robustness Tests

For robustness, we conduct additional tests. First, we perform the robustness tests by introducing lagged media coverage variables to capture the possible effect of the slow information dissemination process. Second, we investigate the robustness of results by using the orthogonal (unexplained) media coverage variables to proxy for information dissemination. Third, we perform a robustness check for the cost reduction effect of media coverage with an adjustment of media coverage at industry level. Fourth, we conduct the regression analysis at the firm-month aggregate level on the relationship between the media coverage and bond yield spreads.

6.1. Robustness to lagged information effects

To investigate the possibility of lagged effects due to low information dissemination speed, we use the log value of one plus the number of newspaper articles over the three-month period prior to the bond issuance, *Lag3M*, as the variable of media coverage to examine its effect and interaction with firm characteristics. Table 10 shows that there remains a significant negative relation between media coverage and yield spreads. Also, the coefficients of interactive dummy variables are all positive and mostly significant. Results show that our findings are robust to lagged effects of media information dissemination.[14]

[14] We also run similar analyses on different lagged periods, i.e., Lag6M (the average of the natural logarithm of one plus the number of newspaper articles during the six months prior to bond issue offering day) and Lag12M (the average of the natural logarithm of one plus the number of newspaper articles during the twelve months prior to bond issue offering day). The results are robustly stable and the results are not tabulated for the sake of brevity. The results are available upon request.

[Insert Table 10 here]

6.2. Robustness to the firm characteristics

As shown earlier, firm characteristics such as size, age, return volatility and turnover are correlated with media coverage. To address the potential problem of collinearity, we use the orthogonal or unexplained media coverage as an explanatory variable. *Residuals* is the orthogonal media coverage variable taken from the residuals in the last regression (model (7)) in Panel B of Table 4. We use the residuals an alternative measure for media coverage in the spread regression. By construction, the residual variable is orthogonal to firms' characteristics.

[Insert Table 11 here]

Table 11 reports the results of regressions using the orthogonal media coverage variable. All coefficients associated with the orthogonal media coverage variable are highly significant. Moreover, most coefficients of the interactive dummy media coverage variables are significant with predicted signs, confirming that the strength of the media coverage effect is conditional on the firm characteristics. Results show that the effect of media coverage is robust to effects of firm characteristics and different controls.

6.3. Robustness to the adjusted media coverage at industry level

We next adjust media coverage by the industry average. We construct the *AdjMedia* as the natural logarithm of one plus the number of newspaper articles in excess of the value of same variable for the two-digit industries and use this industry-adjusted measure as a media coverage variable.

[Insert Table 12 here]

Table 12 reports the results of regressions using the industry-level adjusted media coverage variable. Results continue to show that all coefficients associated with the adjusted media

variables are highly significant. Moreover, most coefficients of the interactive dummy media coverage variables are significant, confirming that the strength of the media coverage effect depends on firm characteristics.

6.4. Robustness to the firm-invariant characteristics

Firms may issue more than one bond in a month. To further address this, we next perform the firm-month aggregate level analysis on the relationship between the media coverage and bond yield spreads. If a firm has more than one bond issue in a given month, we compute the equal-weighted average yield spread for all bonds issued by the firm in that month.[15] The sample consists of 3,953 firm-month aggregate observations. The dependent variable is the average of bond yield spreads for all the bonds that are issued by the firm in the month. For bond-specific factors, we employ their equal-weighted average. Year and industry fixed effects are controlled in all regressions.

Table 13 reports the results of regressions. The coefficient of *LMedia* continues to be negative and highly significant, indicating that our results are robust to firm-month level aggregation and the firm-fixed effect. Overall, results strongly suggest that media coverage has a significant effect on the cost of debt.

[Insert Table 13 here]

7. Conclusions

The mass media performs a very important function for disseminating information to investors. Previous studies have investigated the information dissemination role of the media and its effects on stock returns, corporate policy, investment decisions and corporate governance.

[15] In the unreported results, we also employ the proceeds value weighted yield spreads and similar results are observed. The results are available upon request.

The role of the media coverage in affecting corporate financing decisions is much less known. This paper attempts to fill this gap by assessing the effect of media attention on the firm's cost of debt.

We document strong evidence that media coverage significantly reduces firms' cost of debt. This finding supports that media coverage alleviates information frictions, enhances the investor recognition, and thus reduce the bond offering yield spreads. Another important finding is that firm characteristics matter for the effect of media coverage on borrowing cost. Consistent with the prediction of information demand hypotheses, the benefit of media coverage is lower for larger and mature firms, and firms with lower stock return volatility and higher turnover. In addition, in line with the information disseminating role, the effect of media coverage is greater for firms with better operating performance, stock returns and information quality. Overall, results strongly suggest that media coverage plays an important role for firm's cost of debt. The findings are robust to different model specifications.

Appendix

Table A1. Variables Definitions

Variables	Definitions
	Data from SDC
AdjYield	The spread (in percentage) between the bond offering yield and the yield of Treasure security with an equivalent maturity.
RawYield	The bond offering yield (in percentage).
Rating	An ordinal number ranging from zero for AAA bonds to 20 for C bonds (if Moody does not give the rating, we use the rating from S&P).
DRating	An indicator variable taking a value of one if the rating is worse than the BBB and zero otherwise.
Maturity	The years to maturity of the bond. We take the natural logarithm transformation in the regression, denoted by *LMaturity*.
Amount	The total amount of capital proceeds from bond issuance in billions of dollars. The natural logarithm of the total proceeds is used in the regression, denoted by *LAmount*.
	Data from LexisNexis
Media	The total number of newspaper articles in the month prior to the bond issuance day. We take the natural logarithm of one plus the total number of newspaper articles in the regression, denoted by *LMedia*.
	Data from I/B/E/S
Analyst	The number of stock analysts issuing earnings forecasts. We take the natural logarithm of one plus the number of analysts in the regression, denote by *LAnalyst*.
Dispersion	The dispersion of analysts' forecasting values of one-year EPS, measured by standard deviation of analyst forecasting values.
DDispersion	A binary variable that takes a value of one if the dispersion of analysts' forecasting values is larger than the median and zero otherwise.
	Data from Compustat & CRSP
Asset	The total amount of assets in billion dollars. The natural logarithm of one plus the total asset is used in the regression, denoted by *LAsset*.
DAsset	An indicator variable taking a value of one if the total asset is larger than the median and zero otherwise.
Liability	The total amount of liabilities in billion dollars.
Leverage	The ratio of the total liability divided by the total asset.
Age	The number of years elapsed since the year of the company's IPO. We take the natural logarithm of one plus the age in the regression, denoted by *LAge*.
DAge	An indicator variable that takes a value of one if the firm's listing years are larger than the median and zero otherwise.
ROA	The ratio of net income over total asset.
DROA	A dummy variable that takes a value of one if the *ROA* is negative and zero otherwise.
IntanRatio	The proportions of the intangible asset scaled by the total asset.
Dividend	The total amount of dividend payments in billion dollars. We take the natural logarithm of one plus the total amount of dividend payments in the regression, denoted by *LDivid*.
TurnOver	The ratio of trading volume divided by the outstanding shares.
DTurnOver	A binary variable that equals to one if the *TurnOver* is larger than the median and zero otherwise.
MB	The ratio of market capitalization + total asset – book equity value over total asset.
DMB	A dummy variable that equals to one if the firm's market to book ratio is smaller than the median value and zero otherwise.
Return	The average of stock returns over the past 250 trading days (in percentage).
DReturn	A dummy variable that takes a value of one if the average of stock returns over the past 250 trading days is negative and zero otherwise.
Volatility	Standard deviation of daily stock returns over the past 250 trading days.
DVolatility	A binary variable that takes a value of one if the equity volatility of the past-one year is smaller than the median and zero otherwise.

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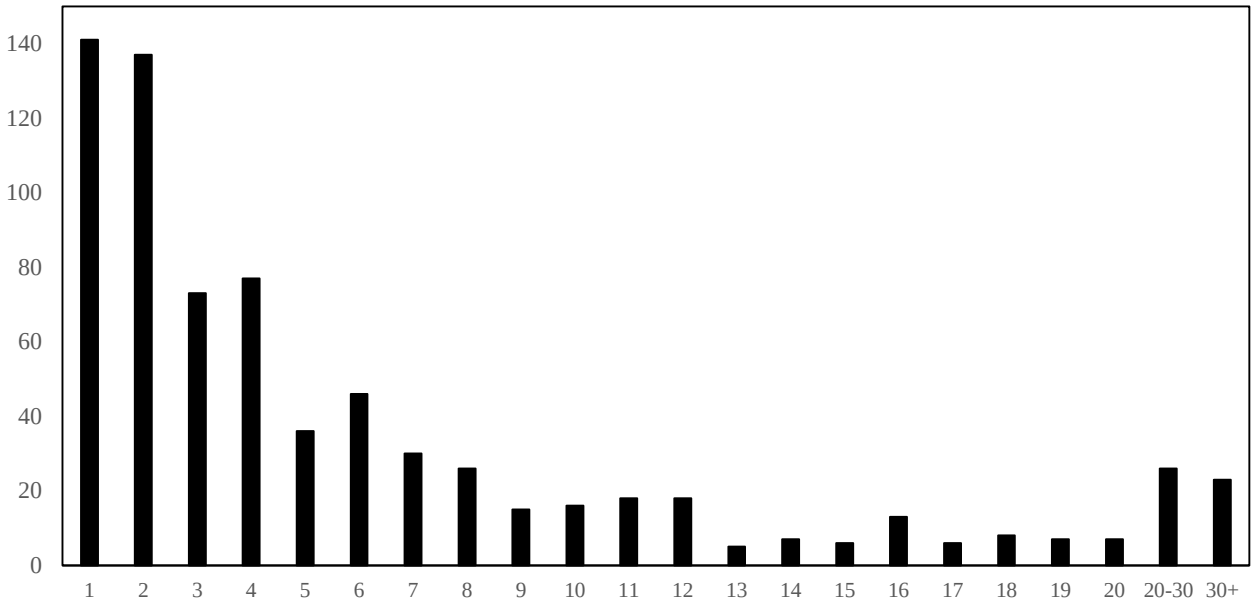

Figure 1. Distributions of the Number of Bonds Issued. The histogram shows the distribution of the number of bond issues by firm. The sample consists of 5,538 bonds issued by 741 firms over the period 1990-2011. The vertical axis represents the number of firms that issue a certain number of bonds shown on the horizontal axis.

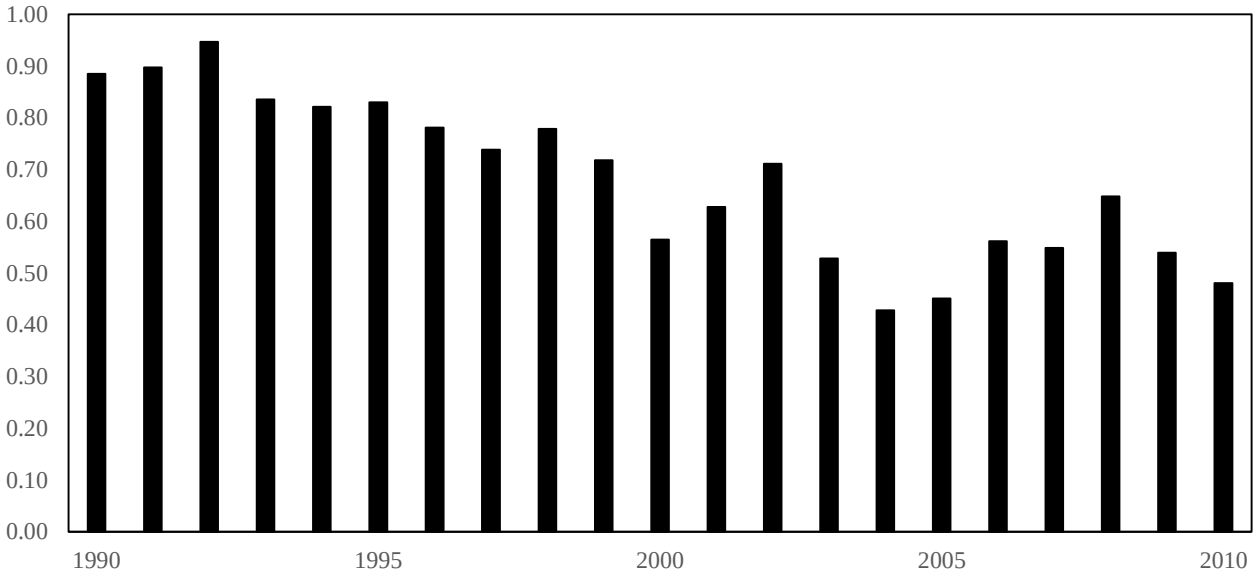

Figure 2. Temporal Distributions of Frequency of Bond Issues with Media Coverage. The histogram shows the time trend of the proportion of issues with media coverage in the month prior to the offering-day. The vertical axis represents the proportion of bond issues that have media coverage and the year is indicated on the horizontal axis.

Table 1. Distribution of Media Coverage

This table presents summary statistics for the newspaper coverage for each year during our sample period. The sample consists of 5,338 observations after merging the SDC data set and the media coverage dataset, and the sample period spans from 1990 through 2011. The column "Non-Covered" lists the total number of bond issues and corresponding firms without any newspaper coverage in the month prior to the bond issuing, and the column "Covered" refers to the firms with at least one newspaper articles in the month prior to the bond issuing. Mean, standard deviation, Q1, median and Q3 of the number of newspaper articles for covered firms are reported.

	Overall		Non-Covered		Covered						
	N		N		N		No. of Newspaper Articles				
Year	Issues	Issuers	Issues	Issuers	Issues	Issuers	Mean	Std. Dev	Q1	Median	Q3
1990	52	31	6	6	46	27	19.48	28.08	4.00	8.00	14.00
1991	146	67	15	14	131	55	23.08	26.23	4.00	14.00	30.00
1992	149	67	8	6	141	63	14.70	18.62	4.00	7.00	17.00
1993	164	89	27	25	137	67	13.01	17.69	3.00	7.00	15.00
1994	95	48	17	14	78	35	10.44	9.61	3.00	8.00	13.00
1995	135	76	23	19	112	61	10.04	14.81	2.00	5.00	10.00
1996	187	84	41	30	146	58	14.67	20.28	3.00	8.00	18.00
1997	256	125	67	50	189	82	9.15	13.29	2.00	4.00	10.00
1998	375	159	83	58	292	110	8.72	14.78	2.00	3.00	8.00
1999	280	138	79	57	201	84	9.42	11.99	2.00	3.00	15.00
2000	179	86	78	47	101	49	7.36	9.08	2.00	4.00	10.00
2001	403	198	150	102	253	107	7.16	11.30	1.00	3.00	5.00
2002	360	172	104	76	256	106	9.91	12.88	2.00	5.00	12.00
2003	324	201	153	107	171	106	10.18	17.03	1.00	3.00	11.00
2004	236	151	135	97	101	59	6.70	7.77	1.00	3.00	10.00
2005	222	144	122	83	100	65	7.01	10.78	1.00	2.00	8.00
2006	244	146	107	75	137	73	8.58	13.90	1.00	3.00	7.00
2007	321	169	145	93	176	78	7.10	9.49	2.00	4.00	8.00
2008	267	129	94	63	173	72	7.40	8.35	2.00	4.00	9.00
2009	462	241	213	142	249	113	8.12	9.13	2.00	5.00	11.00
2010	458	264	238	168	220	106	8.30	11.59	1.00	3.00	10.00
2011	23	19	19	15	4	4	3.25	2.22	1.50	3.00	5.00
Total	5338	741	1924	582	3414	444	9.90	14.63	2.00	4.00	11.00

Table 2. Summary Statistics

This table reports the descriptive statistics of variables. The sample period runs from 1990 through 2011. Summary statistics of variables for the whole sample are reported in Panel A. All variables are defined in Table A1. Panel B presents the descriptive statistics of offering yields and yield spreads for four rating and three maturity sub-groups. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

Panel A: Descriptive statistics

Variables	Mean	Median	Std.	Q1	Q3
AdjYield	1.63	1.36	1.87	0.68	2.76
Media	6.33	2.00	12.63	0.00	6.00
Rating	7.74	7.00	3.95	5.00	10.00
Maturity	10.78	10.00	7.51	5.50	10.08
Amount	0.54	0.30	0.55	0.17	0.75
Asset	15.58	6.44	21.35	2.16	20.10
Liability	10.06	4.32	14.33	1.33	12.24
Leverage	0.63	0.62	0.14	0.53	0.73
Age	34.10	31.00	23.79	13.00	52.00
ROA	0.05	0.05	0.05	0.02	0.08
IntanRatio	0.18	0.12	0.17	0.03	0.30
Dividend	0.30	0.08	0.48	0.04	0.35
Analyst	19.80	19.00	10.04	12.00	27.00
Dispersion	0.23	0.12	0.28	0.05	0.28
TurnOver	0.14	0.11	0.10	0.06	0.18
MB	1.69	1.51	0.62	1.19	2.13
Return	0.07	0.06	0.12	-0.02	0.14
Volatility	2.30	2.06	0.97	1.55	2.76

Panel B: Yields by rating and maturity

Category		Obs.	Offering yields			Offering yield spreads		
			Mean	Median	Std.	Mean	Median	Std.
Rating	AAA/AA	633	5.62	5.82	2.26	0.34	0.52	1.27
	A	1610	5.94	6.12	1.82	0.87	0.82	1.17
	BBB	1594	6.32	6.42	1.67	1.69	1.48	1.28
	Junk	1501	7.35	8.11	2.83	2.93	3.46	2.34
	Junk - AAA/AA		1.72***			2.59***		
	t		4.87			2.97		
Maturity	≤ 7 years	1753	5.75	5.89	2.34	1.20	0.91	1.89
	$7-10$ years	1688	6.79	7.00	2.35	2.11	2.00	2.07
	>10 years	1897	6.70	6.81	1.92	1.61	1.41	1.52
	Long-short		0.95***			0.41***		
	t		13.30			7.07		

Table 3. Correlation Matrix

This table presents the Pearson correlation coefficients for the main variables used in this study. The sample consists of 5,338 observations, and the sample period spans 1990 through 2011.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Adjyield	1	1.00															
LMedia	2	-0.28	1.00														
LAsset	3	-0.23	0.66	1.00													
LAge	4	-0.20	0.32	0.38	1.00												
LAmount	5	0.15	0.11	0.36	0.05	1.00											
Rating	6	0.51	-0.52	-0.61	-0.42	0.04	1.00										
LAnalyst	7	-0.28	0.52	0.69	0.24	0.24	-0.56	1.00									
Dispersion	8	0.20	0.10	0.13	0.05	0.17	0.16	0.05	1.00								
TurnOver	9	0.34	-0.25	-0.06	-0.11	0.25	0.38	-0.01	0.35	1.00							
LMaturity	10	0.07	-0.06	-0.04	-0.06	0.09	0.02	0.00	0.04	0.02	1.00						
Leverage	11	0.11	0.02	-0.02	0.06	-0.06	0.20	-0.17	0.07	0.03	-0.09	1.00					
ROA	12	-0.23	0.03	0.06	0.08	0.03	-0.42	0.20	-0.20	-0.04	-0.01	-0.15	1.00				
MB	13	-0.26	0.12	0.04	0.13	0.07	-0.37	0.26	-0.30	-0.12	-0.06	-0.06	0.60	1.00			
Return	14	0.01	-0.07	-0.14	-0.06	-0.05	0.14	-0.11	-0.03	0.07	0.02	0.03	-0.03	0.06	1.00		
Volatility	15	0.41	-0.20	-0.22	-0.21	0.06	0.45	-0.21	0.30	0.41	-0.07	0.16	-0.25	-0.23	0.21	1.00	
IntanRatio	16	0.09	-0.04	0.06	-0.17	0.21	0.12	-0.05	-0.07	-0.01	-0.01	-0.04	-0.09	-0.07	0.01	0.00	1.00
LDivid	17	-0.31	0.51	0.67	0.43	0.11	-0.71	0.48	-0.03	-0.27	-0.02	-0.12	0.28	0.23	-0.15	-0.37	-0.08

Table 4. Determinants of Media Coverage

This table reports results of portfolio sorts and multiple regressions. The sample consists of 5,338 observations, and the sample period is from 1990 to 2011. Panel A reports portfolio sorts of the number of newspaper articles by firm- or bond- characteristics. For each category variable, we divide the whole sample into four groups and compute the average number of articles. Small groups mean smaller assets, smaller capital proceeds, lower analysts' number, smaller dispersion, younger firms and higher ratings while the large groups are the opposite. To show the statistical significance, the last two columns report the mean difference between small and large groups and the *t* statistic. Panel B presents the results of multivariate regressions. The dependent variable is measured by the natural logarithm of one plus the total number of newspaper articles in the month prior to the bond issuance date. The other variables included in regressions are defined in Table A1. Year and industry fixed effects are accounted for in all regressions. The numbers in the parentheses are *t*-statistic values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

Panel A: Univariate sorts

	Small	2	3	Large	L-S	*t*
Asset	2.63	1.95	6.07	15.21	12.57***	21.81
Amount	5.52	4.64	6.10	9.03	3.51***	7.07
Analyst	0.87	3.26	6.66	15.21	14.33***	26.32
Dispersion	6.29	5.47	4.86	8.70	2.41***	4.14
Age	1.92	4.26	8.18	11.16	9.24***	18.75
Rating	14.23	10.39	3.99	1.13	-13.09***	-20.45

Panel B: Regressions on the determinants of media coverage

	Dependent Variable: Media Coverage						
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-3.16***	-1.44***	-1.82***	-3.38***	-1.49***	-1.84***	-3.62***
	(-33.10)	(-6.02)	(-20.06)	(-22.47)	(-5.76)	(-11.92)	(-15.31)
LAsset	0.44***			0.49***			0.35***
	(44.70)			(51.70)			(25.03)
LAge	0.18***			0.11***			0.07***
	(11.24)			(7.16)			(4.79)
LAmount		0.19***			0.20***		0.04***
		(17.11)			(18.26)		(3.50)
Rating		-0.14***			-0.16***		-0.02***
		(-38.75)			(-37.26)		(-4.59)
LAnalyst			1.03***			1.01***	0.30***
			(46.23)			(41.44)	(10.08)
Dispersion			0.75***			0.66***	0.57***
			(15.41)			(12.77)	(12.27)
LMaturity				-0.05***	-0.11***	-0.11***	-0.07***
				(-2.75)	(-5.62)	(-5.90)	(-4.23)
Leverage				-0.52***	0.95***	0.66***	-0.10
				(-6.16)	(10.13)	(7.30)	(-1.04)
MB (market to book)				0.09***	-0.12***	0.02	0.05**
				(4.49)	(-4.45)	(0.68)	(2.23)
Return				-0.11	-0.08	-0.28***	0.10
				(-1.05)	(-0.70)	(-2.62)	(1.03)
Volatility				0.02*	0.04**	-0.12***	-0.01
				(1.76)	(2.42)	(-7.96)	(-1.04)
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES
No. Obs.	5,338	5,338	5,338	5,338	5,338	5,338	5,338
Adjusted R^2	0.383	0.353	0.409	0.487	0.374	0.420	0.518

Table 5. Media Coverage and Offering Yield Spreads

The sample consists of 5,338 observations, and the sample period is from 1990 to 2011. Panel A reports univariate portfolio analyses of the average of bond yield spreads. The first column reports the summary statistics of yield spreads for bonds with no media coverage. Based on the number of media articles, we divide the sample with media coverage into four groups and present summary statistics for each group. Panel B shows the regression analyses on the relationship between the media coverage and bond yield spreads. The dependent variable is bond yield spreads. *LMedia* is the main explanatory variable, defined as the natural logarithm of one plus the number of newspaper articles during one month prior to bond issuing. The other variables included in regressions are defined in Table A1. Year-fixed effect and industry fixed effect are included in all regressions. The numbers in the parentheses are *t*-statistic values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

Panel A: Univariate portfolio sorts

	Non-Covered	Small	2	3	Large	N-L	*t*	S-L	*t*
No. Obs.	1924	1177	565	843	829				
Mean	2.24	1.71	1.30	1.15	0.82	1.42***	20.15	0.89***	12.15
Median	2.26	1.36	1.08	0.90	0.77				
Std.	2.06	1.75	1.44	1.60	1.52				

Table 5 (*continued*)
Panel B: Multiple regression analyses

	Dependent Variable: Yield Spreads					
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	3.58***	-4.01***	3.12***	2.33***	2.80***	-3.23***
	(32.22)	(-11.62)	(14.34)	(8.29)	(16.33)	(-7.06)
LMedia	-0.32***	-0.07***	-0.29***	-0.32***	-0.14***	-0.07**
	(-15.09)	(-3.06)	(-11.16)	(-11.00)	(-5.85)	(-2.39)
Rating		0.23***				0.16***
		(35.29)				(13.56)
LMaturity		0.12***				0.21***
		(3.87)				(6.24)
LAmount		0.18***				0.13***
		(10.58)				(6.05)
LAsset			-0.10***	0.03		-0.04
			(-4.86)	(1.21)		(-1.08)
Leverage			1.73***	1.25***		0.41**
			(10.29)	(6.52)		(2.25)
LAge			-0.18***	-0.15***		-0.02
			(5.90)	(-4.30)		(-0.55)
ROA				-7.27***		-0.29
				(-11.93)		(-0.40)
IntanRatio				0.79***		0.43***
				(5.07)		(2.97)
LDivid				-0.05***		0.08***
				(-3.58)		(5.38)
LAnalyst					-0.52***	-0.18***
					(-10.76)	(-2.94)
Dispersion					0.20**	-0.04
					(2.22)	(-0.38)
TurnOver					3.23***	1.97***
					(12.22)	(6.87)
MB					-0.31***	-0.19***
					(-7.59)	(-3.55)
Return					-1.41***	-1.75***
					(-7.52)	(-8.91)
Volatility					0.51***	0.42***
					(19.63)	(14.71)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	5,338	5,338	5,338	4,676	5,338	4,676
Adjusted R^2	0.174	0.280	0.134	0.184	0.288	0.344

Table 6. Estimation Results Using Two-stage Heckman Model

This table reports the coefficient estimations on the relationship between the media coverage and bond yield spreads using a Heckman two-stage regression model. The first stage obtains inverse Mill's ratio from the probit regression in the first column. The second stage estimated with ordinary least squares, adds inverse Mill's ratio as an additional control to obtain consistent estimates on the remaining variables. The sample consists of 5,338 observations and the sample period spans 1990 through 2011. The dependent variable of the first stage is *Media Dummy*, indicating whether the firm is covered by newspaper prior to the bond offering. And the dependent variable of the second stage is still bond yield spreads. *LMedia* is the main explanatory variable, defined as the natural logarithm of one plus the number of newspaper articles during one month prior to bond issuing. The other variables included in regressions are defined in Table A1. Year-fixed effect and industry fixed effect are included in all regressions. The numbers in the parentheses are *t*-statistic values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

	First-stage Regression	Second-stage Regression
Variable	Dependent Variable: Media Dummy	Dependent Variable: Yield Spreads
Intercept	-3.40***	-6.41***
	(-4.93)	(-4.56)
LMedia		-0.10***
		(-2.65)
Rating	-0.07***	0.14***
	(-7.49)	(8.52)
LMaturity	0.02	0.20***
	(0.65)	(5.89)
LAmount	-0.14***	0.16***
	(-6.30)	(6.01)
LAsset	0.45***	-0.01
	(15.99)	(-0.16)
Leverage	1.13***	0.65**
	(6.82)	(2.46)
LAge	0.04	0.03
	(1.38)	(0.85)
ROA		-2.40***
		(-2.84)
IntanRatio		0.37**
		(2.13)
LDivid		0.04**
		(2.38)
LAnalyst	0.24***	-0.10
	(5.38)	(-1.19)
Dispersion	0.13	0.15
	(1.53)	(1.39)
TurnOver		3.03***
		(8.84)
MB	0.15***	-0.18***
	(3.45)	(-2.81)
Return	-0.03	-0.91***
	(-0.31)	(-7.54)
Volatility	0.23**	0.62***
	(1.97)	(2.87)
Inverse Mill's Ratio		-0.02
		(-0.06)
Industry fixed effect	No	Yes
Year fixed effect	No	Yes
No. Obs.	5,338	4,676
Adjusted R^2	0.243	0.316

Table 7. Estimation Results Using PSM

This table compares the yield spreads for issuers that have media coverage with a matched sample of issuers without media coverage prior to bond offering using propensity score matching approach. More specifically, we firstly obtain the propensity scores of having media coverage calculated with the logit model on the bond- and issuer- characteristics used in first stage regression of Table 7. And then, we match each bond issue without media coverage to the closest bond issue observations using the nearest-neighbor matching with caliper smaller than 0.001, and test for the difference in means of yield spreads and other characteristics between the matched firms. All variables included in regressions are defined in Table A1. The numbers in the parentheses are *t*-statistic values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

	Before Matching				After Matching			
Variables	With Media	Without Media	Diff	*t*	With Media	Without Media	Diff	*t*
AdjYield	1.29	2.24	-0.95	-18.49	1.69	1.90	-0.21	-2.73
Rating	6.41	10.11	-3.7	-36.74	8.65	8.63	0.02	0.16
Maturity	11.21	10.02	1.19	5.63	10.75	10.53	0.22	0.74
Amount	0.62	0.41	0.21	13.04	0.49	0.48	0.01	0.70
Asset	21.43	5.21	16.22	28.61	7.64	7.46	0.18	0.43
Leverage	0.63	0.62	0.01	0.90	0.63	0.62	0.01	0.59
Age	39.01	25.38	13.63	20.90	30.66	31.59	-0.93	-0.97
Analyst	23.18	14.14	9.04	32.25	17.06	17.11	-0.05	-0.14
Dispersion	0.23	0.25	-0.02	1.92	0.21	0.21	0.00	-0.16
MB	1.74	1.59	0.15	8.55	1.68	1.64	0.04	1.00
Return	0.18	0.20	-0.02	-3.71	0.20	0.20	0.00	0.32
Volatility	4.74	4.69	0.05	5.24	4.73	4.72	0.01	0.47

Table 8. Impact of Information Asymmetry and Investor Recognition on Media Effect

The sample consists of 5,338 observations and the sample period runs from 1990 to 2011. Panel A reports the bivariate analyses for the media coverage effect on offering yield spreads sorted by *Asset, Age, Volatility* and *TurnOver*. First, all samples are sorted into two groups based on the median value of each sorting variable. Second, for each group, we separate out bonds with no media coverage as Non-Covered, and for the other bonds, we further split the sample based on the median value of newspaper articles into two groups. Mean differences and corresponding *t*-test statistics are reported in the last four columns. Panel B reports results of regressions with the interactive effects of information disclosure quality on the relationship between the media coverage and bond yield spreads. The dependent variable is bond yield spreads. *LMedia* is the main explanatory variable, defined as the natural logarithm of one plus the number of newspaper articles in the month prior to bond issuing. The other variables included in regressions are defined in Table A1. Year and industry fixed effect are included in all regressions. The numbers in the parentheses are *t*-statistics. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

Panel A: Bivariate portfolio sorts

		Non-Covered	Small	Large	N-L	*t*	S-L	*t*
Asset	Large	1.71	1.44	0.85	0.86***	9.40	0.59***	8.89
	Small	2.38	1.78	1.14	1.23***	14.16	0.63***	6.64
Age	Mature	1.77	1.38	0.83	0.94***	10.71	0.55***	8.29
	Young	2.48	1.88	1.12	1.37***	15.76	0.76***	8.22
Volatility	High	2.68	2.19	1.49	1.19***	12.13	0.70***	7.16
	Low	1.58	0.97	0.65	0.93***	13.14	0.31***	5.70
TurnOver	High	2.49	2.09	1.77	0.72***	8.00	0.33***	3.54
	Low	1.85	1.02	0.53	1.32***	15.54	0.49***	8.20

Table 8 (*continued*)
Panel B: Multiple regression analyses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	4.43***	3.57***	1.04***	2.22***	-2.94***	-3.23***	-3.36***	-3.17***
	(19.29)	(26.58)	(8.09)	(18.95)	(-6.28)	(-7.05)	(-7.31)	(-6.90)
LMedia	-0.46***	-0.41***	-0.32***	-0.39***	-0.18***	-0.07**	-0.12***	-0.09***
	(-11.36)	(-11.98)	(-12.59)	(-15.90)	(-3.83)	(-2.00)	(-3.54)	(-2.76)
LMedia*DAsset	0.20***				0.15***			
	(4.30)				(3.00)			
LMedia*DAge		0.07*				0.01*		
		(1.95)				(1.81)		
LMedia*DVolatility			0.06*				0.09***	
			(1.86)				(2.88)	
LMedia*DTurnOver				0.18***				0.04*
				(5.53)				(1.70)
Rating					0.15***	0.16***	0.16***	0.16***
					(13.25)	(13.52)	(13.60)	(13.58)
LMaturity					0.22***	0.21***	0.21***	0.21***
					(6.39)	(6.25)	(6.27)	(6.13)
LAmount					0.13***	0.13***	0.13***	0.13***
					(6.07)	(6.05)	(6.05)	(5.86)
LAsset	-0.18***				-0.08**	-0.04	-0.03	-0.04
	(-6.77)				(-2.16)	(-1.09)	(-0.97)	(-1.04)
Leverage					0.42**	0.41**	0.41**	0.42**
					(2.30)	(2.23)	(2.23)	(2.27)
LAge		-0.22***			-0.01	-0.02	-0.01	-0.02
		(-6.65)			(-0.34)	(-0.62)	(-0.43)	(-0.56)
ROA					-0.26	-0.28	-0.31	-0.32
					(-0.36)	(0.39)	(-0.43)	(-0.45)
IntanRatio					0.44***	0.43***	0.43***	0.42***
					(3.05)	(2.98)	(2.96)	(2.86)
LDivid					0.07***	0.08***	0.08***	0.08***
					(5.16)	(5.36)	(5.25)	(5.45)
LAnalyst					-0.16***	-0.18***	-0.19***	-0.18***
					(-2.66)	(-2.90)	(-3.06)	(-2.87)
Dispersion					-0.05	-0.04	-0.04	-0.05
					(-0.53)	(-0.40)	(-0.37)	(-0.55)
TurnOver				4.29	2.03***	1.97***	1.99***	1.83***
				(15.59)	(7.07)	(6.87)	(6.94)	(6.08)
MB (market to book)					-0.19***	-0.19***	-0.18***	-0.18***
					(-3.63)	(-3.57)	(-3.36)	(-3.50)
Return					-1.75***	-1.75***	-1.80***	-1.73***
					(-8.96)	(-8.91)	(-9.17)	(-8.78)
Volatility			0.73		0.42***	0.42***	0.45***	0.42***
			(26.32)		(14.76)	(14.70)	(14.59)	(14.73)
Industry Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	5,338	5,338	5,338	5,338	4,676	4,676	4,676	4,676
Adjusted R2	0.115	0.115	0.229	0.172	0.345	0.344	0.345	0.344

Table 9. Impact of Firm Performance on Media Effect

The sample consists of 5,338 observations, and the sample period runs from 1990 to 2011. Panel A examines the media effect on yield spreads by *Rating, Return, MB, ROA and Dispersion*. For variables of *MB* and *Dispersion*, we firstly group the whole sample into two subsamples based on the median value. For variable of *Rating*, we split the whole sample into two subsamples: investment grade and speculative grade (high-yield). For variables of *ROA* and *Return*, we follow the literature to use positive *ROA* and positive past-year stock return (*Return*) to measure profitability and past stock performance. For each subsample, we further divide the observations into three media groups: Non-Covered, Small, and Large based on the number of media articles. Finally, for each cell, we calculate the corresponding yield spreads and provide the difference tests. The last four columns are the mean differences and *t*-statistics. Panel B shows the regression analyses on the interaction effects of operating characteristics on the relationship between the media coverage and bond yield spreads. The sample consists of 5,338 observations and the sample period spans 1990 through 2011. The dependent variable is bond yield spreads. The other variables included in regressions are defined in Table A1. Year-fixed effect and industry fixed effect are also included in all regressions. The numbers in the parentheses are *t*-values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

Panel A: Bivariate portfolio sorts

		Non-Covered	Small	Large	N-L	*t*	S-L	*t*
Rating	Investment	1.47	1.14	0.86	0.61***	10.64	0.28***	5.50
	High yields	3.02	2.76	2.81	0.20	1.14	-0.11	-0.26
Return	Losers	2.70	1.80	1.53	1.17***	9.75	0.28***	2.63
	Winners	2.08	1.45	0.74	1.35***	19.48	0.72***	11.33
MB	High Growth	1.90	1.18	0.50	1.40***	17.99	0.68***	10.60
	Low Growth	2.53	1.90	1.57	0.96***	10.52	0.33***	3.78
ROA	Good Performer	2.06	1.44	0.80	1.26***	20.47	0.64***	11.64
	Bad Performer	3.06	2.49	2.07	0.99***	5.53	0.42**	2.32
Dispersion	Large	2.49	1.86	1.43	1.06***	11.94	0.43***	5.15
	Small	1.98	1.31	0.54	1.44***	18.51	0.77***	11.39

Table 9 (*continued*)
Panel B: Multiple regression analyses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.22	3.09***	2.68***	3.81***	3.25	-3.20***	-3.24***	-3.22***	-3.30***	-3.34***
	(1.58)	(27.13)	(23.84)	(28.71)	(-0.41)	(-6.94)	(-7.07)	(-7.00)	(-7.19)	(-7.26)
LMedia	-0.04*	-0.49***	-0.50***	-0.43***	-0.41***	-0.07**	-0.06**	-0.07**	-0.10***	-0.08***
	(-1.88)	(-20.71)	(-18.97)	(-15.54)	(-18.62)	(-2.46)	(-2.00)	(-2.32)	(-3.24)	(-2.89)
LMedia*DRating	0.12*					0.04				
	(1.89)					(1.59)				
LMedia*DReturn		0.23***					0.02			
		(6.69)					(0.60)			
LMedia*DDispersio			0.11***					0.01*		
			(3.34)					(1.71)		
LMedia*DMB				0.13***					0.08**	
				(3.71)					(2.39)	
LMedia*DROA					0.15***					0.13***
					(3.49)					(2.69)
Rating	0.22***					0.15***	0.16***	0.16***	0.16***	0.16***
	(28.51)					(12.87)	(13.54)	(13.53)	(13.65)	(13.61)
LMatur						0.21***	0.21***	0.21***	(0.20***	0.21***
						(6.23)	(6.26)	(6.22)	(5.94)	(6.16)
LAmount						0.13***	0.13***	0.13***	0.13***	0.14***
						(6.03)	(6.06)	(6.01)	(6.02)	(6.31)
LAsset						-0.04	-0.04	-0.04	-0.04	-0.04
						(-1.06)	(-1.09)	(-1.09)	(-1.05)	(-1.20)
Leverage						0.41**	0.41**	0.41**	0.38**	0.41**
						(2.21)	(2.23)	(2.25)	(2.08)	(2.21)
LAge						-0.02	-0.02	-0.02	-0.02	-0.02
						(-0.58)	(-0.55)	(-0.56)	(-0.48)	(-0.52)
ROA					-8.32***	-0.29	-0.31	-0.29	-0.13	0.42
					(14.79)	(-0.41)	(0.43)	(-0.40)	(-0.18)	(0.55)
IntanRatio						0.44***	0.43***	0.43***	0.44***	0.44***
						(3.00)	(2.99)	(2.97)	(3.00)	(3.04)
LDivid						0.08***	0.08***	0.08***	0.08***	0.08***
						(5.41)	(5.36)	(5.37)	(5.38)	(5.49)
LAnalyst						-0.18***	-0.18***	-0.18***	-0.18***	-0.18***
						(-2.95)	(-2.95)	(-2.95)	(-3.00)	(-2.87)
Dispersion			1.22***			-0.04	-0.04	-0.05	-0.06	-0.10
			(12.06)			(-0.38)	(-0.35)	(-0.50)	(-0.63)	(-0.97)
TurnOver						1.96***	1.98***	1.96***	1.96***	1.93***
						(6.82)	(6.88)	(6.86)	(6.86)	(6.76)
MB				-0.57***		-0.19***	-0.19***	-0.19***	-0.13**	-0.21***
				(-11.53)		(-3.55)	(-3.55)	(-3.50)	(-2.34)	(-3.88)
Return		-0.46**				-1.75***	-1.81***	-1.74***	-1.72***	-1.71***
		(-2.01)				(-8.93)	(-14.68)	(-8.88)	(-8.76)	(-8.72)
Volatility						0.42***	0.42***	0.42***	0.42***	0.41***
						(14.69)	(14.68)	(14.68)	(14.77)	(14.64)
Industry Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	5,338	5,338	5,338	5,338	5,338	4,676	4,676	4,676	4,676	4,676
Adjusted R^2	0.259	0.120	0.148	0.154	0.163	0.345	0.344	0.344	0.344	0.345

Table 10. Robustness check—lagged effects

This table shows the first robustness tests on the relationship between the media coverage and bond yield spreads. The sample consists of 5,338 observations and the sample period spans 1990 through 2011. The dependent variable is bond yield spreads. We perform the robustness tests by introducing more lagged media coverage to proxy for the information dissemination. *Lag3M* is the average of the natural logarithm of one plus the number of newspaper articles during the three months prior to bond issue offering day. The other variables included in regressions are defined in Table A1. Year-fixed effect and industry fixed effect are also included in all regressions. The numbers in the parentheses are *t*-values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	-3.37***	-3.10***	-3.35***	-3.49***	-3.27***	-3.31***	-3.36***	-3.20***	-3.40***	-3.45***
	(-7.39)	(-6.55)	(-7.26)	(-7.54)	(-7.07)	(-7.11)	(-7.27)	(-6.91)	(-7.36)	(-7.47)
Lag3M	-0.08**	-0.19***	-0.08***	-0.14***	-0.11***	-0.09***	-0.09**	-0.10***	-0.12***	-0.10***
	(-2.46)	(-3.41)	(-2.67)	(-3.88)	(-3.18)	(-2.75)	(-2.45)	(-3.13)	(-3.31)	(-3.13)
Lag3M*DAsset		0.13**								
		(2.29)								
Lag3M*DAge			0.02*							
			(1.89)							
Lag3M*DVolatility				0.10***						
				(3.06)						
Lag3M*DTurnOver					0.06*					
					(1.83)					
Lag3M*DRating						0.05*				
						(1.67)				
Lag3M*DReturn							0.02			
							(1.49)			
Lag3M*DDispersion								0.20***		
								(3.44)		
Lag3M*DMB									0.07**	
									(2.04)	
Lag3M*DROA										0.14***
										(2.71)
Rating	0.16***	0.15***	0.15***	0.15***	0.15***	0.15***	0.15***	0.15***	0.16***	0.15***
	(13.75)	(12.93)	(13.21)	(13.24)	(13.27)	(12.52)	(13.23)	(13.11)	(13.33)	(13.31)
LMaturity	0.22***	0.22***	0.22***	0.22***	0.21***	0.22***	0.22***	0.21***	0.21***	0.21***
	(6.62)	(6.41)	(6.30)	(6.34)	(6.20)	(6.31)	(6.33)	(6.28)	(6.06)	(6.22)
LAmount	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.14***
	(6.22)	(6.12)	(6.09)	(6.10)	(5.88)	(6.10)	(6.13)	(5.93)	(6.06)	(6.38)
LAsset	-0.02	-0.07*	-0.03	-0.03	-0.03	-0.03	-0.03	-0.04	-0.03	-0.04
	(-0.69)	(-1.73)	(-0.89)	(-0.72)	(-0.88)	(-0.90)	(-0.90)	(-1.01)	(-0.84)	(-0.99)
Leverage	0.40**	0.45***	0.45**	0.44**	0.45**	0.44**	0.44**	0.47***	0.42**	0.43**
	(2.18)	(2.45)	(2.42)	(2.39)	(2.47)	(2.36)	(2.41)	(2.53)	(2.26)	(2.35)
LAge	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-1.04)	(-0.22)	(-0.30)	(-0.22)	(-0.40)	(-0.42)	(-0.39)	(-0.37)	(-0.30)	(-0.36)
ROA	0.02	-0.49	-0.51	-0.55	-0.53	-0.50	-0.52	-1.24	-0.36	0.25
	(0.03)	(-0.68)	(-0.70)	(-0.76)	(-0.74)	(-0.68)	(-0.72)	(-1.64)	(-0.50)	(0.32)
IntanRatio	0.51***	0.46***	0.45***	0.46***	0.43***	0.46***	0.46***	0.48***	0.46***	0.47***
	(3.52)	(3.14)	(3.10)	(3.13)	(2.95)	(3.15)	(3.13)	(3.27)	(3.14)	(3.20)
LDivid	0.08***	0.07***	0.08***	0.07***	0.08***	0.08***	0.08***	0.08***	0.08***	0.08***
	(5.21)	(4.97)	(5.17)	(4.99)	(5.26)	(5.21)	(5.16)	(5.28)	(5.16)	(5.27)
LAnalyst	-0.19***	-0.15**	-0.17***	-0.18***	-0.17***	-0.17***	-0.17***	-0.16***	-0.18***	-0.17***
	(-3.11)	(-2.45)	(-2.76)	(-2.90)	(-2.65)	(-2.79)	(-2.78)	(-2.49)	(-2.82)	(-2.71)
Dispersion	-0.03	-0.07	-0.07	-0.07	-0.09	-0.07	-0.06	-0.08	-0.09	-0.13
	(-0.26)	(-0.75)	(-0.66)	(-0.68)	(-0.92)	(-0.70)	(-0.65)	(-0.79)	(-0.89)	(-1.30)
TurnOver	2.00***	2.01***	1.97***	1.98***	1.79***	1.96***	1.98***	1.97***	1.96***	1.93***
	(6.94)	(6.89)	(6.74)	(6.81)	(5.83)	(6.71)	(6.77)	(6.75)	(6.74)	(6.62)
MB	-0.20***	-0.18***	-0.18***	-0.17***	-0.18***	-0.18***	-0.18***	-0.20***	-0.13**	-0.20***
	(-3.75)	(-3.44)	(-3.40)	(-3.17)	(-3.37)	(-3.44)	(-3.41)	(-3.75)	(-2.29)	(-3.75)
Return	-1.70***	-1.74***	-1.72***	-1.79***	-1.69***	-1.73***	-1.78***	-1.71***	-1.70***	-1.69***
	(-8.52)	(-8.73)	(-8.64)	(-8.92)	(-8.46)	(-8.66)	(-7.80)	(-8.59)	(-8.54)	(-8.49)
Volatility	0.43***	0.42***	0.42***	0.46***	0.42***	0.42***	0.42***	0.41***	0.42***	0.42***
	(15.13)	(14.57)	(14.57)	(14.51)	(14.64)	(14.56)	(14.55)	(14.36)	(14.64)	(14.53)
Industry Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	4,625	4,625	4,625	4,625	4,625	4,625	4,625	4,625	4,625	4,625
Adjusted R2	0.346	0.347	0.346	0.347	0.347	0.346	0.346	0.348	0.347	0.347

Table 11. Robustness check—firm characteristics

This table shows the second robustness tests on the relationship between the media coverage and bond yield spreads. The sample consists of 5,338 observations and the sample period spans 1990 through 2011. The dependent variable is bond offering yield spreads. We perform the robustness tests by introducing unexplained media coverage variable, *Residuals*, to proxy for the information dissemination. *Residuals* is the residuals in the last regression specification in Panel B of Table 4. The other variables included in regressions are defined in Table A1. Year-fixed effect and industry fixed effect are controlled in all regressions. The numbers in the parentheses are *t*-statistic values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	-3.16***	-3.26***	-3.20***	-3.14***	-3.15***	-3.16***	-3.19***	-3.17***	-3.14***	-3.19***
	(-6.92)	(-7.13)	(-6.99)	(-6.88)	(-6.89)	(-6.91)	(-6.99)	(-6.93)	(-6.87)	(-6.97)
Residuals	-0.07**	-0.20***	-0.14***	-0.14***	-0.06*	-0.18***	-0.19***	-0.07**	-0.10***	-0.08***
	(-2.41)	(-4.02)	(-3.21)	(-3.77)	(-1.71)	(-2.69)	(-4.01)	(-2.41)	(-2.80)	(-2.65)
Residuals*DAsset		0.19***								
		(3.23)								
Residuals*DAge			0.12**							
			(2.19)							
Residuals*DVolatility				0.15***						
				(2.96)						
Residuals*DTurnOver					-0.02					
					(-0.36)					
Residuals*DRating						0.13*				
						(1.85)				
Residuals*DReturn							0.18***			
							(3.22)			
Residuals*DDispersion								0.04*		
								(1.72)		
Residuals*DMB									0.08*	
									(1.69)	
Residuals*DROA										0.10
										(1.63)
Rating	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***
	(13.98)	(14.22)	(14.00)	(14.12)	(13.95)	(14.00)	(13.91)	(13.99)	(14.02)	(13.99)
LMaturity	0.22***	0.22***	0.22***	0.22***	0.22***	0.22***	0.22***	0.22***	0.21***	0.22***
	(6.39)	(6.53)	(6.49)	(6.43)	(6.40)	(6.41)	(6.57)	(6.36)	(6.27)	(6.39)
LAmount	0.13***	0.13***	0.14***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***
	(6.16)	(6.28)	(6.30)	(6.16)	(6.16)	(6.26)	(6.27)	(6.16)	(6.09)	(6.21)
LAsset	-0.05	-0.05	-0.06*	-0.05	-0.05	-0.06*	-0.05	-0.05	-0.05	-0.05
	(-1.60)	(-1.39)	(-1.75)	(-1.57)	(-1.62)	(-1.69)	(-1.62)	(-1.61)	(-1.54)	(-1.61)
Leverage	0.38**	0.35*	0.36**	0.37**	0.38**	0.38**	0.37**	0.38**	0.36**	0.36**
	(2.05)	(1.91)	(1.95)	(2.03)	(2.06)	(2.07)	(2.00)	(2.08)	(1.96)	(1.98)
LAge	-0.02	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(-0.68)	(-0.80)	(-0.54)	(-0.55)	(-0.68)	(-0.67)	(-0.68)	(-0.68)	(-0.65)	(-0.71)
ROA	-0.29	-0.28	-0.25	-0.31	-0.29	-0.29	-0.46	-0.26	-0.28	-0.27
	(-0.40)	(-0.39)	(-0.35)	(-0.43)	(-0.41)	(-0.41)	(-0.64)	(-0.36)	(-0.39)	(-0.38)
IntanRatio	0.43***	0.41***	0.46***	0.44***	0.43***	0.43***	0.44***	0.43***	0.43***	0.43***
	(2.97)	(2.84)	(3.14)	(3.00)	(2.97)	(2.97)	(3.01)	(2.97)	(2.92)	(2.95)
LDivid	0.08***	0.08***	0.08***	0.08***	0.08***	0.08***	0.08***	0.08***	0.08***	0.08***
	(5.38)	(5.44)	(5.46)	(5.27)	(5.37)	(5.42)	(5.29)	(5.38)	(5.38)	(5.41)
LAnalyst	-0.21***	-0.24***	-0.22***	-0.22***	-0.21***	-0.23***	-0.21***	-0.21***	-0.21***	-0.21***
	(-3.43)	(-3.81)	(-3.63)	(-3.64)	(-3.44)	(-3.67)	(-3.42)	(-3.41)	(-3.45)	(-3.41)
Dispersion	-0.07	-0.08	-0.07	-0.07	-0.06	-0.07	-0.07	-0.06	-0.07	-0.08
	(-0.67)	(-0.84)	(-0.72)	(-0.76)	(-0.66)	(-0.72)	(-0.69)	(-0.65)	(-0.71)	(-0.80)
TurnOver	1.97***	1.91***	1.95***	1.95***	1.96***	1.94***	2.00***	1.97***	1.97***	1.98***
	(6.87)	(6.68)	(6.83)	(6.83)	(6.85)	(6.76)	(7.00)	(6.86)	(6.89)	(6.91)
MB	-0.18***	-0.17***	-0.18***	-0.18***	-0.18***	-0.18***	-0.18***	-0.18***	-0.18***	-0.18***
	(-3.40)	(-3.25)	(-3.46)	(-3.30)	(-3.40)	(-3.30)	(-3.34)	(-3.39)	(-3.42)	(-3.41)
Return	-1.76***	-1.76***	-1.77***	-1.78***	-1.76***	-1.77***	-1.76***	-1.76***	-1.74***	-1.75***
	(-8.98)	(-9.00)	(-9.05)	(-9.08)	(-8.99)	(-9.04)	(-9.01)	(-8.99)	(-8.90)	(-8.93)
Volatility	0.42***	0.43***	0.42***	0.42***	0.42***	0.42***	0.41***	0.42***	0.42***	0.42***
	(14.79)	(15.05)	(14.88)	(14.67)	(14.79)	(14.90)	(14.53)	(14.79)	(14.82)	(14.80)
Industry Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676
Adjusted R2	0.344	0.345	0.344	0.345	0.344	0.344	0.345	0.367	0.344	0.344

Table 12: Robustness check—industry adjusted media coverage.

This table shows the third robustness tests on the relationship between the media coverage and bond yield spreads. The sample consists of 5,338 observations and the sample period spans 1990 through 2011. The dependent variable is bond yield spreads. We perform the robustness tests by introducing adjusted media coverage variables to proxy for the information dissemination. *AdjMedia* is the natural logarithm of one plus the number of newspaper articles in excess of the average number of newspaper articles of the two-digit industries during one month prior to bond issuing. The other variables included in regressions are defined in Table A1. Year-fixed effect is controlled in all regressions. The numbers in the parentheses are *t*-statistic values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	-3.24***	-3.24***	-3.18***	-3.21***	-3.11***	-3.14***	-3.18***	-3.18***	-3.15***	-3.17***
	(-7.07)	(-7.22)	(-6.87)	(-6.42)	(-6.67)	(-6.74)	(-6.78)	(-6.87)	(-6.78)	(-6.88)
AdjMedia	-0.06**	-0.21***	-0.17***	-0.15***	-0.09**	-0.18***	-0.19***	-0.07**	-0.11***	-0.09***
	(-1.97)	(-4.02)	(-3.19)	(-3.69)	(-1.99)	(-2.64)	(-4.13)	(-2.50)	(-2.83)	(-2.71)
AdjMedia*DAsset		0.17***								
		(3.14)								
AdjMedia*DAge			0.13**							
			(2.37)							
AdjMedia*DVolatility				0.14***						
				(2.98)						
AdjMedia*DTurnOver					0.04*					
					(1.68)					
AdjMedia*DRating						0.12*				
						(1.79)				
AdjMedia*DReturn							0.17***			
							(3.31)			
AdjMedia*DDispersion								0.05*		
								(1.71)		
AdjMedia*DMB									0.08*	
									(1.69)	
AdjMedia*DROA										0.11*
										(1.66)
Rating	0.16***	0.16***	0.16***	0.17***	0.15***	0.16***	0.16***	0.16***	0.16***	0.16***
	(13.45)	(14.15)	(14.11)	(14.32)	(13.44)	(14.13)	(13.87)	(13.79)	(13.87)	(13.89)
LMaturity	0.21***	0.20***	0.21***	0.22***	0.23***	0.22***	0.22***	0.22***	0.22***	0.22***
	(6.28)	(6.24)	(6.38)	(6.42)	(6.51)	(6.39)	(6.49)	(6.41)	(6.40)	(6.37)
LAmount	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***
	(6.13)	(6.12)	(6.25)	(6.20)	(6.22)	(6.17)	(6.30)	(6.20)	(6.11)	(6.32)
LAsset	-0.05	-0.06	-0.05*	-0.05	-0.05	-0.06*	-0.05*	-0.05*	-0.05	-0.05
	(-1.35)	(-1.41)	(-1.80)	(-1.45)	(-1.58)	(-1.71)	(-1.67)	(-1.70)	(-1.60)	(-1.60)
Leverage	0.39**	0.34*	0.35*	0.34*	0.39**	0.39**	0.37**	0.38**	0.37**	0.36**
	(2.14)	(1.89)	(1.93)	(1.75)	(2.27)	(2.18)	(2.04)	(2.11)	(1.98)	(1.97)
LAge	-0.02	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(-0.53)	(-0.67)	(-0.51)	(-0.51)	(-0.92)	(-0.70)	(-0.65)	(-0.63)	(-0.65)	(-0.70)
ROA	-0.23	-0.27	-0.30	-0.33	-0.30	-0.30	-0.43	-0.30	-0.31	-0.27
	(-0.31)	(-0.41)	(-0.66)	(-0.41)	(-0.42)	(-0.43)	(-0.70)	(-0.40)	(-0.49)	(-0.38)
IntanRatio	0.44***	0.43***	0.43***	0.45***	0.44***	0.43***	0.41***	0.44***	0.44***	0.43***
	(2.99)	(2.67)	(3.09)	(3.12)	(2.92)	(2.68)	(3.03)	(2.98)	(2.93)	(2.98)
LDivid	0.08***	0.08***	0.08***	0.08***	0.09***	0.09***	0.08***	0.09***	0.08***	0.09***
	(5.34)	(5.39)	(5.44)	(5.19)	(5.31)	(5.33)	(5.31)	(5.47)	(5.29)	(5.50)
LAnalyst	-0.19***	-0.23***	-0.23***	-0.22***	-0.23***	-0.23***	-0.22***	-0.21***	-0.22***	-0.21***
	(-3.03)	(-3.76)	(-3.71)	(-3.62)	(-3.65)	(-3.59)	(-3.50)	(-3.67)	(-3.70)	(-3.65)
Dispersion	-0.05	-0.08	-0.07	-0.07	-0.06	-0.07	-0.07	-0.06	-0.07	-0.08
	(-0.47)	(-0.89)	(-0.71)	(-0.75)	(-0.71)	(-0.78)	(-0.73)	(-0.71)	(-0.69)	(-0.84)
TurnOver	2.01***	1.93***	1.95***	1.96***	1.94***	1.95***	2.01***	1.97***	1.97***	1.98***
	(7.06)	(6.89)	(6.82)	(6.79)	(6.68)	(6.70)	(7.19)	(6.76)	(6.78)	(6.87)
MB	-0.19***	-0.19***	-0.19***	-0.18***	-0.18***	-0.19***	-0.19***	-0.19***	-0.18***	-0.18***
	(-3.61)	(-3.40)	(-3.45)	(-3.42)	(-3.41)	(-3.36)	(-3.39)	(-3.41)	(-3.37)	(-3.39)
Return	-1.75***	-1.77***	-1.75***	-1.74***	-1.75***	-1.77***	-1.77***	-1.76***	-1.74***	-1.75***
	(-8.93)	(-9.13)	(-9.10)	(-9.11)	(-8.87)	(-9.02)	(-9.12)	(-8.93)	(-8.81)	(-8.88)
Volatility	0.42***	0.43***	0.42***	0.42***	0.44***	0.43***	0.42***	0.41***	0.42***	0.42***
	(14.68)	(15.03)	(14.88)	(14.74)	(14.81)	(14.87)	(14.61)	(14.49)	(14.76)	(14.93)
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676	4,676
Adjusted R2	0.343	0.345	0.345	0.345	0.345	0.344	0.345	0.355	0.348	0.344

Table 13. Robustness check—firm-invariant characteristics

This table shows the firm-month aggregate level analyses on the relationship between the media coverage and bond yield spreads. The sample consists of 3,953 firm-month aggregate observations and the sample period spans 1990 through 2011. The dependent variable is equal weighted average of bond yield spreads for all the bonds that are issued by the same firm in one month. For those bond specific factors, we employ their equal weighted averages, e.g. *Rating*, *Maturity*, and *Amount*. *LMedia* is the natural logarithm of one plus the number of newspaper articles in previous month. The other variables included in regressions are defined in Table A1. Year-fixed effect and industry fixed effect are also included in all regressions. The numbers in the parentheses are *t*-statistic values. *, **, and *** indicate the significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	-3.26***	-2.98***	-3.26***	-3.44***	-3.20***	-3.14***	-3.29***	-3.28***	-3.26***	-3.28***
	(-5.21)	(-4.68)	(-5.21)	(-5.46)	(-5.10)	(-5.00)	(-5.25)	(-5.21)	(-5.21)	(-5.25)
LMedia	-0.07**	-0.19***	-0.07**	-0.13***	-0.09**	-0.10***	-0.10**	-0.07*	-0.11***	-0.09***
	(-2.15)	(-3.09)	(-2.52)	(-3.19)	(-2.41)	(-2.60)	(-2.27)	(-1.93)	(-2.76)	(-2.63)
LMedia*DAsset		0.15**								
		(2.26)								
LMedia*DAge			0.01							
			(0.08)							
LMedia*DVolatility				0.10**						
				(2.51)						
LMedia*DTurnOver					0.05					
					(1.09)					
LMedia*DRating						0.13*				
						(1.71)				
LMedia*DReturn							0.04**			
							(1.97)			
LMedia*DDispersion								0.02		
								(0.36)		
LMedia*DMB									0.08*	
									(1.81)	
LMedia*DROA										0.15**
										(2.35)
Rating	0.16***	0.16***	0.16***	0.16***	0.16***	0.15***	0.16***	0.16***	0.16***	0.16***
	(11.26)	(10.98)	(11.24)	(11.25)	(11.26)	(10.49)	(11.24)	(11.26)	(11.32)	(11.36)
LMaturity	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***	0.15***	0.15***
	(3.42)	(3.53)	(3.40)	(3.45)	(3.37)	(3.40)	(3.46)	(3.42)	(3.13)	(3.30)
LAmount	0.15***	0.15***	0.15***	0.16***	0.15***	0.15***	0.15***	0.15***	0.15***	0.15***
	(4.76)	(4.81)	(4.75)	(4.90)	(4.66)	(4.70)	(4.82)	(4.78)	(4.68)	(4.82)
LAsset	-0.07	-0.11**	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
	(-1.53)	(-2.29)	(-1.53)	(-1.51)	(-1.53)	(-1.48)	(-1.57)	(-1.53)	(-1.47)	(-1.51)
Leverage	0.39*	0.40*	0.39*	0.39*	0.40*	0.37	0.39*	0.39*	0.36	0.37*
	(1.76)	(1.79)	(1.76)	(1.74)	(1.78)	(1.63)	(1.74)	(1.76)	(1.59)	(1.65)
LAge	-0.03	-0.02	-0.02	-0.02	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-0.67)	(-0.56)	(-0.59)	(-0.58)	(-0.66)	(-0.78)	(-0.67)	(-0.66)	(-0.65)	(-0.67)
ROA	0.21	0.19	0.20	0.16	0.19	0.19	0.18	0.21	0.31	0.89
	(0.40)	(0.22)	(0.23)	(0.18)	(0.21)	(0.22)	(0.21)	(0.24)	(0.36)	(0.97)
IntanRatio	0.45**	0.46***	0.45**	0.45**	0.44**	0.47***	0.46**	0.45**	0.46**	0.46**
	(2.43)	(2.58)	(2.52)	(2.54)	(2.46)	(2.63)	(2.56)	(2.52)	(2.55)	(2.55)
LDivid	0.09***	0.09***	0.09***	0.09***	0.09***	0.09***	0.09***	0.09***	0.09***	0.09***
	(4.74)	(4.63)	(4.73)	(4.61)	(4.79)	(4.85)	(4.71)	(4.74)	(4.76)	(4.85)
LAnalyst	-0.14*	-0.13*	-0.14*	-0.14**	-0.13*	-0.14*	-0.14*	-0.14*	-0.14*	-0.14*
	(-1.88)	(-1.75)	(-1.88)	(-1.97)	(-1.82)	(-1.90)	(-1.88)	(-1.86)	(-1.95)	(-1.88)
Dispersion	-0.05	-0.07	-0.05	-0.05	-0.06	-0.05	-0.05	-0.03	-0.07	-0.11
	(-0.40)	(-0.53)	(-0.39)	(-0.43)	(-0.51)	(-0.42)	(-0.37)	(-0.25)	(-0.55)	(-0.89)
TurnOver	1.86***	1.94***	1.86***	1.89***	1.74***	1.82***	1.87***	1.86***	1.86***	1.83***
	(5.40)	(5.59)	(5.37)	(5.47)	(4.81)	(5.26)	(5.41)	(5.39)	(5.37)	(5.31)
MB	-0.22***	-0.22***	-0.22***	-0.21***	-0.22***	-0.22***	-0.22***	-0.22***	-0.17**	-0.23***
	(-3.39)	(-3.46)	(-3.37)	(-3.26)	(-3.35)	(-3.35)	(-3.40)	(-3.40)	(-2.38)	(-3.59)
Return	-1.50***	-1.51***	-1.50***	-1.55***	-1.49***	-1.51***	-1.61***	-1.50***	-1.48***	-1.48***
	(-6.37)	(-6.41)	(-6.37)	(-6.56)	(-6.30)	(-6.41)	(-6.13)	(-6.37)	(-6.28)	(-6.30)
Volatility	0.42***	0.42***	0.42***	0.46***	0.43***	0.42***	0.43***	0.42***	0.43***	0.42***
	(12.48)	(12.48)	(12.48)	(12.50)	(12.51)	(12.45)	(12.51)	(12.48)	(12.53)	(12.43)
Industry Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	3,466	3,466	3,466	3,466	3,466	3,466	3,466	3,466	3,466	3,466
Adjusted R2	0.335	0.336	0.335	0.336	0.335	0.335	0.335	0.335	0.336	0.336