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Media Coverage and Bond Covenants: Evidence from China

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Media Coverage and Bond Covenants: Evidence from China

Abstract

While existing studies on bond covenants have focused primarily on firm-level factors, they have largely overlooked the influence of the external environment, including the media. Furthermore, previous research on media coverage has failed to consider its impact on the bond market. This study attempts to fill these gaps by examining the impact of media coverage on bond covenants for a sample of Chinese corporate bonds from 2007 to 2017. Our findings reveal a negative relationship between media coverage and the number of bond covenants. Further analysis demonstrates that this negative impact is more pronounced for non-state-owned firms, in highly competitive industries, and in regions with a weak legal environment. Additionally, media coverage with a non-negative tone leads to a reduction in the number of bond covenants. Notably, government-controlled media exerts a more significant influence than market-oriented media on bond covenants. Furthermore, both media coverage and bond covenants contribute to lower debt costs and are found to be interchangeable in their effects. Our analysis is robust to corrections for the endogeneity of the relationship between media coverage and bond covenants.

Keywords: Bond Covenants; Media Coverage; Media Tone; Government-controlled Media; Market-oriented Media

Introduction

The agency problem between shareholders and debtholders, first examined by Jensen and Meckling (1976), has garnered considerable attention in the literature. Scholars, building on Smith and Warner's (1979) costly contracting hypothesis, have conducted extensive research on the factors influencing bond covenants. These determinants encompass various factors, such as firm financial status (Begley, 1994; Malitz, 1986), the information environment (Begley and Chamberlain, 2005; Chava, Kumar and Warga, 2010), growth (Billett, King and Mauer, 2007; Bradley and Roberts, 2015; Nash, Netter and Poulsen, 2003), internal governance structure (Begley and Feltham, 1999; Chava, Kumar and Warga, 2010; Li, Tuna and Vasvari, 2014), social responsibility (Shi and Sun, 2015), and the legal environment (Miller and Reisel, 2012; Qi, Roth and Wald, 2011). However, the majority of the existing literature has primarily focused on firm-level determinants, paying little attention to the external environment.

Among the various external governance mechanisms available to firms, information reported in the media is recognized as a crucial tool for social monitoring, operating independently of the legal system. Particularly in developing countries with relatively weak legal systems, the media has gained significant attention in recent years. Although media outlets may face criticism for occasional inaccuracies and a tendency to publish sensational news (Ahern and Sosyura, 2015; Core, Guay and Larcker, 2008), existing literature highlights the vital role of media coverage in corporate governance (e.g., Core, Guay and Larcker, 2008; Dai, Parwada and Zhang, 2015; Dyck, Volchkova and Zingales, 2008; Joe, Louis and Robinson, 2009; Okhmatovskiy and Shin, 2019). Surprisingly, few studies have explored the impact of media coverage on the bond market. Existing literature indicates that covenants protect lenders from

informational asymmetry (Garleanu and Zwiebel, 2009) and provide them with incentives to monitor (Park, 2000; Rajan and Winton, 1995). If media coverage helps mitigate information asymmetry between shareholders and bondholders, thus deterring issuing firms' opportunistic behavior, it is reasonable to anticipate that firms subjected to more media coverage will have fewer bond covenants. Therefore, our study begins by examining the influence of media coverage on bond covenants, and subsequently explores whether this influence is affected by state ownership, industry competition, and the legal environment.

This study aims to test the aforementioned questions empirically using a sample of 596 corporate bonds issued by 491 listed firms during the period from 2007 to 2017. To measure media coverage, we utilize media reports on the issuing firms by eight major Chinese business newspapers from one year prior to the issuance date. The data are obtained from the Chinese National Knowledge Infrastructure's (CNKI's) database of full-text newspaper articles. Information on bond covenants is manually collected from the prospectuses of the respective bonds. Our empirical findings demonstrate robustly that media attention has a significant and negative influence on the number of bond covenants. Furthermore, we provide evidence that this negative impact is more pronounced in non-state-owned firms, highly competitive industries, and regions characterized by a weak legal environment.

We investigate the impact of different 'media tones' on the role of media coverage in affecting covenant issuance. We find that the higher is the media's non-negative inclination, the fewer bond covenants there are. Furthermore, our analysis reveals that government-controlled media exerts a more substantial influence in this regard. Additionally, we present compelling evidence

that both media coverage and bond covenants contribute to a reduction in the cost of debt, highlighting their interchangeability as substitutes for each other.

There is a concern regarding the potential endogeneity of the relationship between media coverage and bond covenants. It is possible that certain unobservable factors influence both. Additionally, reverse causality poses a possible issue, as companies with greater corporate information transparency and higher profitability are more likely to attract media attention (Cahan *et al*., 2015; Miller, 2006). These companies tend to have fewer restrictive covenants when issuing bonds (Chava, Kumar and Warga, 2010; Malitz, 1986). To address these concerns, we utilize the development level of provincial media as an instrumental variable (IV) and employ a two-stage least squares (2SLS) regression analysis. We use GDP per capita at the provincial level (*GDP*) as another IV. Further, we conduct a three-stage least squares (3SLS) regression analysis using simultaneous equation models. The results from these analyses consistently indicate a negative relationship between media coverage and the presence of bond covenants.

Our study makes several notable contributions to the existing literature. Firstly, we expand upon the research on media coverage by exploring its impact on corporate debt financing. Our study aims to provide valuable insights into the influence of media coverage on bond-related dynamics and is distinct from other empirical work in this area that primarily focuses on the effects of media coverage on the stock market or governance.

Secondly, our study expands the research on the factors influencing bond covenants. With previous studies, including those by Begley and Feltham (1999), Chava, Kumar and Warga (2010), and Nash, Netter and Poulsen (2003), focusing predominantly on internal determinants

at the corporate level, there has been limited exploration of external perspectives such as the legal environment (Miller and Reisel, 2012; Qi, Roth and Wald, 2011) in relation to bond covenants. This study contributes to the existing literature by revealing a negative impact of media coverage on bond covenants, thus broadening the understanding of their determinants.

Thirdly, we utilize the unique characteristics of the Chinese market to expand our analysis of the influence of media coverage on bond covenants. Specifically, we leverage the distinct media landscape in China, which features a mix of government-controlled and market-oriented media outlets (You, Zhang and Zhang, 2018). Interestingly, our analysis reveals that government-controlled media exerts a more substantial impact on bond covenants. Furthermore, we explore the differential effect of media coverage on bond covenants between state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), given the prevalence of state ownership in Chinese firms. The results demonstrate that the negative impact of media coverage on bond covenants is more pronounced for non-SOEs. This finding aligns with existing studies, which highlight that non-SOEs are subject to greater uncertainty and perceived as carrying higher risk.

Literature review and hypothesis development

Bond covenant determinants

Jensen and Meckling (1976) noted that there is an agency conflict between shareholders and creditors. The conflict of interests between debtholders and shareholders arises from information asymmetry. Bondholders, in comparison to shareholders and managers, often find themselves disadvantaged in terms of access to information (Chava, Kumar and Warga, 2010; Malitz, 1986). Since bondholders are not directly involved in the day-to-day management of

companies, they rely on company disclosures to gain insights into the firm's operations. Unfortunately, this information gap can create opportunities for opportunistic behavior that undermines the interests of creditors. Rational bond investors anticipate such behavior, leading to increased costs of corporate debt financing. Consequently, bondholders are motivated to impose covenants on firms, such as limitations on dividend payments and new debt financing, in order to mitigate the conflicts of interests between shareholders and creditors. These bond covenants serve to define the rights and obligations of both parties within a debt contract. Moreover, studies have shown that the intensity of financial covenants correlates with higher uncertainty, characterized by a lack of ex ante information (Demerjian, 2017). As the relationship between lender and borrower evolves, the tightness of covenants may be relaxed (Prilmeier, 2017).

In an investigation of whether bond covenants can enhance the value of a company, Smith and Warner (1979) proposed the irrelevance and costly contracting hypotheses. The latter hypothesis posits that covenants can mitigate agency problems between shareholders and creditors, leading to an increase in company value. This hypothesis further states that covenants limit the flexibility of a company in terms of future business decisions and that shareholders will bear the cost. Therefore, shareholders must carefully consider the trade-offs between potential gains and costs when determining the optimal set of covenants. It is crucial to tailor these covenants to the unique characteristics of each firm.

Significant variations exist in the bond covenants employed by different companies. Existing studies primarily use information asymmetry and agency theory to investigate the determinants under the framework of the costly contracting hypothesis. Research has focused primarily on

agency conflicts between shareholders and creditors, emphasizing a company's financial situation (Begley, 1994; Malitz, 1986), information environment (Begley and Chamberlain, 2005; Chava, Kumar and Warga, 2010), growth (Billett, King and Mauer, 2007; Bradley and Roberts, 2015; Nash, Netter and Poulsen, 2003), and other company-level features that influence covenant specifications. Further research has comprehensively considered the interests of shareholders, management, and creditors. This strand of research highlights the important role played by management and examines areas such as management incentives (Begley and Feltham, 1999), managerial entrenchment, and fraud (Chava, Kumar and Warga, 2010). Recognizing the costliness of covenants, some studies have explored the influence of alternative mechanisms that protect creditors' interests in the covenant-setting process, including internal corporate governance mechanisms. These mechanisms encompass board and shareholder governance efficiency (Li, Tuna and Vasvari, 2014), bank supervision (Ma, Stice and Williams, 2019), corporate social responsibility performance (Shi and Sun, 2015), and the extent of creditors' legal protection (Miller and Reisel, 2012; Qi, Roth and Wald, 2011).

The roles of the media in the stock market

The media generally plays two roles in the market: reducing information asymmetry and monitoring. Firstly, media reports are an important source of information for investors and can influence investor behavior and the performance of a company's stock price in the capital markets. With specialized teams and techniques, the media packages and disseminates information, as well as creating new information through journalism activities, hence shaping firms' information environments. Research by Bushee, Core, Guay and Hamm (2010) indicates that greater press coverage reduces information asymmetry (i.e., leading to lower bid-ask

spreads and greater market depths) around earnings announcements. Fang and Peress (2009) found that companies with less media attention tend to yield higher returns, as coverage attracts more attention from investors and reduces uncertainty, consequently enhancing stock liquidity and reducing stock risk premiums. Media coverage also plays a pivotal role in lowering the cost of information acquisition for investors and reduce the mispricing of accounting information (Drake, Guest and Twedt, 2014). In addition, the media's inclination significantly influences investors' perceptions of a company. Negative media tone correlates with lower company earnings and stock returns (Tetlock, Saar-Tsechansky and Macskassy, 2008), along with higher costs of capital and increased return volatility (Kothari, Li and Short, 2009). Companies receiving positive media coverage are valued more highly (Gurun and Butler, 2012).

Second, media attention plays a monitoring role and enhances the governance of listed firms. Mass media outlets, such as newspapers, can accelerate the broad dissemination of information (Fang and Peress, 2009), package information from multiple sources, and create new information through journalism practices (Bushee, Core, Guay and Hamm, 2010; Miller, 2006). This improves the information environment of a company and serves to push it into the spotlight. As the media aims to capture public attention and expand its market share, it tends to cover hot-button topics that concern the public in order to maintain its relevance and influence. Examples of such issues are financial fraud (Miller, 2006), executive compensation (Core, Guay and Larcker, 2008), social responsibility performance (Cahan *et al*., 2015; Jia *et al*., 2016), organizational corruption, and mistreatment of business stakeholders (Okhmatovskiy and Shin, 2019). As the public commonly pays close attention to such disclosures, reports can easily shape public opinion, thereby affecting a company's reputation in the capital markets and the

level of intervention by administrative and regulatory authorities. This, in turn, acts as a constraint on misconduct and enhances corporate governance efficiency (Dai, Parwada and Zhang, 2015; Dyck, Volchkova and Zingales, 2008; Dyck and Zingales, 2002; Joe, Louis and Robinson, 2009; Liu and McConnell, 2013).

The research noted above focuses mainly on corporate governance or stock returns in the capital markets. However, limited attention has been paid to the role of media coverage in the bond market. China's corporate bond market is relatively young and differs greatly from the stock market in terms of information disclosure and supervision. It remains unclear whether the role of media as observed in the stock market is similar to that in the bond market, and especially how media coverage impacts the setting of bond covenants.

Research hypotheses

As suggested by agency theory (Jensen and Meckling, 1976), the media may serve as an external monitor, alleviating potential agency issues. Therefore, greater media coverage would be expected to result in fewer bond covenants. Smith and Warner's (1979) costly contracting theory supports this argument. A firm with greater media coverage should have fewer bond covenants if media coverage improves the firm's external information environment.

The media has become a vital source of information for investors and affects their decisions substantially. Media coverage enhances corporate governance efficiency by impacting companies' reputations and forcing regulators into action (Dyck, Volchkova and Zingales, 2008). The literature provides evidence that bond covenants protect against information asymmetries (Garleanu and Zwiebel, 2009) and provide monitoring incentives (Park, 2000; Rajan and Winton, 1995). Because the media is widely believed to reduce information

asymmetry and limit the opportunistic behavior of issuing firms, it is reasonable to expect that media coverage will have an impact on bond covenants.

Compared to creditors like banks, bond purchasers typically invest small amounts and have more diversified ownership. Their motivation to collect information and monitor bond-issuing companies is weaker than that of banks. When making investment decisions, bond investors often rely on publicly disclosed corporate information (Nikolaev, 2010; Shi and Sun, 2015) or information provided by financial intermediaries, such as analysts (Fracassi, Petry and Tate, 2016) and auditors (Chen *et al*., 2015; Gong *et al*., 2019). As a key source of information, media coverage offers bond investors convenient access to relevant details about a company, enabling them to assess the company's opportunistic motives before entering into a debt contract. This, in turn, reduces the risk of information uncertainty.

On the other hand, media coverage can act as a deterrent against a company's opportunistic behaviors that might harm creditors' interests by providing monitoring of the issuer. In the bond market, a company's reputation holds significant importance as it enables access to low-cost debt financing (Diamond, 1991; Malitz, 1986). When the media reports negative information about an issuing firm, it becomes difficult for that firm to secure financing (Nikolaev, 2010). Consequently, firms with substantial media coverage are more likely to be mindful of their reputations and, as a result, avoid harmful opportunistic actions. Therefore, firms with heightened media coverage are expected to display fewer instances of misconduct, which, in turn, should prompt bondholders to impose fewer restrictive bond covenants.

Drawing from these arguments, we believe that investors' demand for bond covenants will be lower with the existence of a strong media monitoring environment. Bond covenants will play

a relatively smaller role in reducing corporate financing costs and improving corporate value in situations where there is strong media monitoring. Balancing the costs and benefits of covenants, firms are likely to include fewer restrictive covenants in their issued bonds under these circumstances. Accordingly, we present the following hypothesis:

H1: The more media coverage a company receives, the fewer restrictive covenants it will place on the bonds it issues.

If media coverage effectively reduces the number of restrictive covenants by mitigating information asymmetry, its role may be even more crucial when information asymmetry is more pronounced. In such situations, the media's ability to alleviate informational frictions and provide transparent insights becomes increasingly valuable. At the firm level, we propose that state ownership could moderate the relationship between media coverage and bond covenants. SOEs are generally perceived to have lower information asymmetry and smaller risk due to their close relationships with banks (Brandt and Li, 2003; Cull and Xu, 2005) and implicit government guarantees (Borisova *et al*., 2015; Ge *et al*., 2020). A study by You, Zhang and Zhang (2018) indicates that the external media has a weaker governance effect on SOEs. Consequently, the role played by media is expected to be less significant for SOEs and more for non-SOEs.

The market competition influences firms' capital structure and credit provisions. In fiercely competitive market environments, companies are more likely to provide trade credits to customers as a strategic tool to retain existing customers and attract new ones from competitors (Fisherman and Raturi, 2004; Van Horen, 2005). Consequently, companies operating in highly

competitive industries often face substantial demand for capital (Hoberg, Phillips and Prabhala, 2014). However, the presence of information asymmetry leads investors to demand higher risk premiums, resulting in increased financing costs for companies. To reduce these costs arising from information asymmetry among stakeholders, companies often disclose more extensive and higher-quality information to external parties. Such proactive information disclosure reduces uncertainty and fosters trust among investors, ultimately leading to lower capital costs and improved ease in raising funds. Thus, compared to companies in less competitive industries, those operating in highly competitive environments tend to be more proactive in disclosing information (Darrough and Stoughton, 1990).

These studies indicate that industry competition affects the information disclosure practices of companies. As competition intensifies, companies become more proactive in disclosing information, leading to higher-quality disclosures that enhance market transparency. In a highly transparent information environment, bond investors gain access to relevant information about the company, effectively mitigating the information asymmetry between the parties. Consequently, the role of media in alleviating information asymmetry and reducing investors' demand for bond covenants may be less significant in such situations. Based on these arguments, we anticipate that the media's negative impact on bond covenants will be more pronounced in less competitive industries, while its influence will be comparatively weaker in highly competitive industries.

Formal institutions, such as the legal system, play a crucial role in shaping a company's external regulatory environment, influencing the cost of corporate debt financing. In countries where legal protection for creditors is effective, firms generally experience lower financing

costs and higher ratings (Boubakri and Ghouma, 2010). Miller and Reisel (2012) examined restrictive covenants with a cross-country sample and found that bond contracts are more likely to include covenants in countries where credit protection is weak. Dyck and Zingales (2002) argued that a better legal environment improves firms' information transparency and enhances corporate governance efficiency, thus mitigating agency problems. In such environments, the role of the media may be less pronounced as a supplementary regulatory mechanism. A well-established legal structure can effectively deter companies from acting against the interests of their creditors and provide creditors greater protection. In such systems, the need to protect investor interests through external media mechanisms becomes less crucial. Additionally, a strong legal system promotes the development of enterprises' information disclosure systems and the provision of high-quality audit information. This allows bond investors to access information more efficiently, thereby reducing their dependence on media sources. Based on the preceding discussions, we put forth the following hypothesis:

H2: The negative impact of the media on bond covenants is stronger for non-SOEs, in more competitive industries, and in regions with weak a legal environment.

Media tone can significantly impact bond investors' risk assessments. Negative reports often expose problems within an enterprise, leading to increased risk perceptions among investors regarding a company's management performance. Consequently, investors may be hesitant to purchase bonds issued by companies with a significant number of negative media reports. To protect investors and encourage them to purchase more bonds, bond covenants are often imposed. Therefore, bond issuers facing more negative media coverage may be inclined to

impose more bond covenants. On the other hand, non-negative media reports generally confirm or even praise a company's current performance or future prospects by showcasing its current operating situation. This helps to improve investors' understanding of the company's situation (Gurun and Butler, 2012; Kothari, Li and Short, 2009) and fosters a positive information environment, hence reducing investors' perception of risk. As a result, investors may demand fewer restrictions on the firm's operations. Hence, companies with more non-negative media coverage are likely to use fewer bond covenants. Based on these arguments, we propose the following hypothesis:

H3: A non-negative media tone reduces the number of bond covenants.

One unique feature of the media market in China is the presence of two types of media: government-controlled and market-oriented. Following You, Zhang and Zhang (2018), we classify the eight largest nation-wide business newspapers into two categories: government-controlled newspapers and market-oriented newspapers. Specifically, we classify four of them (*China Securities Journal*, *Securities Daily*, *Securities Times*, and *Shanghai Securities News*) as government-controlled newspapers, and the other four (*China Business Journal*, *First Financial Daily*, *The Economic Observer*, and *21st Century Business Herald*) as market-oriented newspapers. The four government-controlled newspapers were founded by newspaper offices, which are nonprofit organizations directly owned and controlled by the government. The official regulatory body, the China Securities Regulatory Commission (CRSC), has designated the government-controlled newspapers as the outlets through which publicly listed firms should disclose news. The four market-oriented newspapers are either owned or

controlled by financial institutions, public companies, or wealthy individuals. None are directly owned or controlled by the government. Therefore, all the market-oriented newspapers have profit-driven objectives.

Whether the media will take the initiative to supervise firms is influenced by the external regulatory environment of the media itself, on the one hand, and the commercial interests served by media reports on the other. In the external environment faced by the media, government intervention is a key factor affecting the media's supervisory role. Government control and entry restrictions in the media market may hinder market competition among media enterprises, reducing the media's incentives to influence public opinion and build a reputation for quality, consequently weakening its supervisory role (Gentzkow and Shapiro, 2006). With China's rapid economic development since the 1990s, the media industry has undergone marketization, witnessing an increase in private media firms and comprehensive market-oriented reforms. The rise of private media has intensified competition between government-controlled and market-oriented media outlets.

Compared to government-controlled media, the market-oriented media are more independent and reader driven. You, Zhang and Zhang (2018) found that articles written by the market-oriented media are more critical, accurate, comprehensive, and timely. In order to increase market share and gain revenue, the market-oriented media outlets also tend to report societal *hot spots.* As a result, the market-oriented media has gradually taken on a social monitoring function. If the market-oriented media is more effective in monitoring bond issuers and reducing companies' opportunistic behaviors and misconduct, firms with greater coverage from

market-oriented media are likely to face less demand from investors to introduce restrictions in the form of bond covenants.

In contrast, government-controlled newspapers predominantly publish official and regular disclosures by firms. They are perceived as more authoritative by public investors and have a greater impact on public opinion. Reports from government-controlled media may, therefore, receive more attention from investors. The authority of government-controlled media may reduce investors' assessment of bond risk and, in turn, lead to fewer bond covenants. In consequence, we posit the following two competing hypotheses:

H4a: The market-oriented media, as compared to the government-controlled media, plays a more significant role in reducing the number of bond covenants.

H4b: The government-controlled media, as compared to the market-oriented media, plays a more significant role in reducing the number of bond covenants.

Research design

Data and sample

We select all corporate bonds issued in the Chinese corporate bond market from 2007 to 2017 as the initial research sample. We exclude bonds issued by financial companies and non-initial corporate bonds. We drop records with incomplete financial data. Our final sample consists of 596 general corporate bonds issued by 491 companies.

Media-related data are obtained from the CNKI's full-text newspaper database, which contains academic and news-related documents published in important domestic newspapers since 2000 and is continuously updated. It covers more than 700 major newspapers published

in China, making it highly authoritative and representative. Data on provincial legal environments are derived from the "Market Intermediary Organization Development and Law System Environment" sub-index of the "China Sub-provincial Marketization Index Report" prepared by Wang, Fan and Yu (2017). Data related to bond issuance characteristics and the financial information of issuing companies are retrieved from the China Stock Market & Accounting Research (CSMAR) database.

Definitions of variables

Measurement of bond covenants

Covenant-related data are collected manually from each bond's published prospectus. Referring to the classifications of bond covenants provided by Smith and Warner (1979) and Billett, King and Mauer (2007), together with the characteristics of existing contract clauses for Chinese corporate bonds, we divide the covenants into four categories: covenants that restrict the distribution of earnings, those restrict investment, those restrict subsequent financing, and event-driven covenants. As shown in Appendix A of the online Supplementary Material, amongst all bond covenants, bondholders use the following most frequently: restriction of investment and merger and acquisition (93.46%), restriction of compensation in terms of default (93.29%), restriction of dividend payments (92.95%), and restriction of compensation of executives (91.44%).

Following previous studies, our bond covenant measures are as follows:

Total covenants. Following Li, Tuna and Vasvari (2014) and Shi and Sun (2015), this measure is equal to the total number of covenants for each bond plus 1, expressed as its logarithm. Since there are four categories of bond covenants, we also use *Cov_Div*, *Cov_Inv*, *Cov_Fin*, and

Cov_Eve to measure the number of covenants in each category, using the same calculation method.

Covenants index. Following Billett, King and Mauer (2007), for each corporate bond, and for each category of covenant, 1 is recorded if there is at least one covenant in that category in the bond prospectus, and 0 is recorded otherwise. As a result, each of the four categories of covenants has a 0–1 binary variable. Then, we sum these four binary variables and divide the total by 4, the number of categories, thereby obtaining a basic covenants index for each bond.

Weighted covenants index. With reference to Billett, King and Mauer (2007), the weighted covenants index is constructed by weighting the number of covenants within each covenant category as follows:

First, each company's bonds are rated based on the covenant involved. That is, each bond is given a score based on the specific categories of covenants it has. The four categories of covenants form four dimensions that are used in the calculation. The formula used to calculate this score is as follows:

$$P_{i,j} = \begin{cases} \frac{x_{i,j}}{\sum_{i=1}^{l} x_{i,j}}, & \sum_{i=1}^{l} x_{i,j} \neq 0 \\ 0 \quad , & \sum_{i=1}^{l} x_{i,j} \neq 0 \end{cases} \qquad (1)$$

In this formula, $P_{i,j}$ represents the score of bond i in dimension j, $x_{i,j}$ represents the number of dimensions j in the covenants of bond i, and $\sum_{i=1}^{l} x_{i,j}$ indicates the number of dimensions j in the covenants of all bonds.

We then calculate the weighted covenants index for each corporate bond. According to the score of each bond for a certain dimension, we obtain the weighted covenants index score for the bond using the following formula:

$$cov3 = \frac{\sum_{j=1}^{J} P_{i,j}}{J} \qquad (2)$$

Media coverage

Based on Dyck, Volchkova and Zingales (2008), Fang and Peress (2009), and You, Zhang and Zhang (2018), the media reports used in this study come from the eight most highly ranked finance journals and newspapers in China, namely the *China Securities Journal*, *Securities Daily*, *Securities Times*, *Shanghai Securities News*, *China Business Journal*, *First Financial Daily*, *The Economic Observer*, and *21st Century Business Herald*. The data are obtained from the prestigious CNKI full-text newspaper database. We adopt a topic search to retrieve news reports that contain a company's full name or stock abbreviation. The search interval is one year before the bond issuance date, and media coverage (*Media*) is represented as *log* (1+ the number of company-related news items).

Media tone

To measure the inclination of media reports, we refer to literature on sentiment analysis methods (Loughran and McDonald, 2011; Tetlock, Saar-Tsechansky and Macskassy, 2008). A sentiment dictionary scoring method is used to analyze media tone in the coverage. Initially, this analysis is based on HowNet, the Tsinghua Lijunzhong Semantic Dictionary, and the National Taiwan University Semantic Dictionary. Since the dictionary lacks some specialized financial vocabulary, we select 50 positive reports and 50 negative reports and extract positive and negative words to supplement the vocabulary. A sentiment dictionary (including a positive word list, a negative word list, degree adverbs lists in six levels, and a negation word list) that consists of nine vocabulary lists, is then created. For each news report, the JieBa word

segmentation tool from the Python software is used for word segmentation. Then, for each positive and negative word appearing in the news article, the system initially assigns a simple score of 1, then calculates the weight of preceding adverbs and negation words. The adverbs are assigned different weights for each of the six levels. The negation words are assigned a value of -1. The final score of each positive and negative word is the product of positive or negative word, adverbs, and negation words. Finally, the scores of positive and negative sentiment words are aggregated to construct the inclination indicator as follows:

$$Senti = (Pos-Neg)/(Pos+Neg) \quad (3)$$

Pos represents the total score for the positive words in each report, while Neg represents the total score for the negative words. "Senti" indicates the net positive tone, with a value between -1 and 1. The greater the surplus of positive word scores relative to negative word scores in each news report, the higher the "Senti", indicating a higher non-negative inclination in the media coverage. The average value of media coverage inclination in the year before the issuance of each company's bonds is taken as the overall media coverage inclination.

Control variables

Following the methodologies of existing studies, we control for factors at the company and bond levels as well as for macro-level variables. Industry and year fixed effects are included in all regressions. Specific control variables at the company level include total asset size (*Size*), defined as the natural logarithm of total assets (in millions of Chinese Yuan); market-to-book ratio (*MB*), defined as total debt plus the market value of total equity divided by total assets; leverage ratio (*Lev*), defined as total liabilities divided by total assets; total return on assets

(*ROA*), defined as net profit divided by total assets; state ownership (*State*), which takes the value of 1 if the company is state-owned, and 0 otherwise; tangible-assets ratio (*Tangible_ratio*), defined as total assets minus intangible assets and net goodwill, divided by total assets; cash holdings (*Cash*), defined as cash and cash equivalents divided by total assets; cash flow volatility (*CashFlow_Vol*), defined as the standard deviation of the ratio of EBITDA (earnings before interest, taxes, depreciation, and amortization) to total assets, computed using up to five years (as available) of historical data; current ratio (*Current_Ratio*), which is current assets divided by current liabilities in natural logarithm form; interest coverage (*Interest_Coverage_Ratio*), defined as EBIT (earnings before interest and taxes) divided by interest expense; and firm's financial risk (*Z_Score*), which is based on the *Z*-value from Altman (1968). It takes the value of 0 if the financial risk is low (*Z*-value is greater than 1.8), and 1 otherwise.

Earlier studies on bond covenants have consistently identified the effect of asset size on bond covenants (Begley, 1994; Billett, King and Mauer, 2007; Bradley and Roberts, 2015; Chava, Kumar and Warga, 2010; Malitz, 1986). There is evidence that the market-to-book ratio, leverage, current ratio, and interest coverage ratio also influence bank performance (Billett, King and Mauer, 2007; Malitz, 1986). Existing studies have documented the influence of the ROA (Ge and Liu, 2015), tangible ratio (Bradley and Roberts, 2015; Reisel, 2014), cash, and cash flow volatility (Bradley and Roberts, 2015) on bond covenants. Finally, recent studies have evidenced that bond covenants are related to financial risk, as measured by the Z-score (Huang and Petkevich, 2016).

We control for equity volatility, following Reisel (2014), including the standard deviation and mean of the daily stock return (*Std of stock return* and *Mean of stock return*); that is, the standard deviation and mean of daily excess returns, relative to the market index, for each firm's equity over the 180 days that precede the offering date of the bond.

We further control for bond-level variables, including bond amount (*Amount*), defined as the logarithm of the bond issuance scale (100 million yuan); bond term (*Maturity*), which is the logarithm of the bond term; bond rating (*Rating*), which takes the value 4, 3, 2, or 1 when the bond rating is AAA, AA+, AA, or AA-, respectively; and bond collateral (*Secured*), which takes the value 1 if the bond has collateral, and 0 otherwise.

Finally, we control for benchmark interest rate spreads including the risk-free rate (*Rf*), defined as the yield of the government bond with the same maturity; and yield spread (*Term_Spread*), which is the yield spread between 10-year government bond and 3-year government bonds. The definitions of the variables are given in Appendix B of the online Supplementary Material. The correlation matrixes are presented in Appendix C1 and C2 of the online Supplementary Material.

Empirical results and analysis

Summary statistics

Table 1 presents the summary statistics for the primary variables. The mean value of total bond covenants is 9.525. This implies that, on average, each corporate bond contains more than nine covenants. The minimum in the sample is 3, and the maximum is 19, which indicates a relatively large difference in the number of bond covenants in different bonds. The mean value of media attention is 8.599, with a minimum of 0 and a maximum of 162, suggesting that the

media attention received by different companies varies considerably. Firm size, measured by the logarithm of total assets (in millions of Chinese Yuan), averages at 9.363 and has a standard deviation of 1.351. The market-to-book ratio has a mean of 1.941 and ranges from 0.769 to 12.167, indicating a large variation. Debt accounts for 53.6% of total assets, and an average firm earns an ROA of 9.7%. Tangible assets account for 92.6% of total assets on average. The statistics for cash and cash flow volatility suggest that cash holdings and cash flow differ significantly among firms and across different years. The *Z*-score has a mean of 0.386, suggesting that over 38% of the issuers have high financial risk.

[Insert Table 1 about here]

The average bond issuance amount and maturity are 0.865 billion yuan and 4.84 years respectively. Approximately 40% of issuers have collateral. Almost half of the bonds are issued by SOEs. The yield of a government bond with the same maturity is 3.268%, and the yield spread between a 10-year government bond and a 3-year government bond is, on average, 0.571.

Media coverage and bond covenants: Main analysis

We posit that media coverage plays a crucial role in reducing information asymmetry and providing monitoring mechanisms for bond-issuing firms. Thus, companies receiving greater media attention may have fewer constraints on their bond covenants. The regression results for media attention and bond covenants are presented in Table 2. Columns (1), (2), and (3), respectively, depict the outcomes for the total covenants, covenants index, and weighted covenants index. In all regressions, the coefficient for *Media* exhibits significant negative values at the 1% level. This strongly indicates that higher media attention is associated with fewer bond covenants and more relaxed restrictions on issuer behavior. Companies subjected

to increased media scrutiny experience reduced information asymmetry, benefit from heightened supervision, and are less likely to engage in opportunistic actions that would infringe upon creditors' interests. Consequently, such firms have fewer covenants embedded in their contracts. These findings provide support for Hypothesis 1.

[Insert Table 2 about here]

Furthermore, we find that more profitable firms and firms with more cash, alongside those with larger issuance amounts and collateral, tend to have fewer bond covenants. This observation aligns with intuition since these firms exhibit greater financial security and therefore face fewer restrictions. Conversely, firms with higher market-to-book ratios and larger financial and equity risks have more covenants. This finding can be attributed to the elevated uncertainty and increased information asymmetry associated with such firms. Given their higher risk profiles, creditors may seek to impose additional protection to mitigate potential losses.

As noted in the 'Measurement of bond covenants' section, our analysis includes four types of bond covenants. It is valuable to examine whether the media plays different roles for different types of bond covenant. These results are reported in columns (4)–(7) of Table 2, focusing on the impact of media coverage on covenants that restrict the distribution of earnings, those restrict investment, those restrict subsequent financing, and event-driven covenants. The coefficients of media coverage in columns (5)–(7) are significant at the 1% level, indicating that media coverage has a similar influence on covenants for investment, financing, and special events. However, an exception arises with covenants restricting the distribution of earnings. The underlying reason is that bondholders express concerns about the potential impairment of

their prior claims due to earnings distribution. Therefore, to protect the interests of bondholders, over 90% of firms incorporate covenants restricting earnings distribution. Consequently, media attention does not exert a significant impact on this crucial and fundamental covenant. Overall, our empirical findings provide initial evidence supporting our argument regarding the relationship between media coverage and bond covenants. In particular, they underscore the role of the media in reducing the number of bond covenants imposed in bond contracting.

Addressing endogeneity

The analysis above indicates that there are fewer restrictive covenants in bonds issued by companies subjected to higher levels of media attention. One possible explanation for this finding is that companies with higher corporate information transparency and better profitability are more likely to attract media attention (Cahan *et al*., 2015; Miller, 2006). Such companies are subject to fewer binding covenants when issuing bonds (Chava, Kumar and Warga, 2010; Malitz, 1986). Thus, reverse causality may pose a potential concern. In addition, despite controlling for variables that represent a company's features and operating conditions in the regression model, there may still be omitted variables that simultaneously influence both media coverage and bond covenants.

To address the endogeneity concern, we introduce an IV, *Develop*, which measures the development level of provincial media by considering the ratio of printed newspapers to the total population in a given province. We use *Develop* as an IV because we suggest that the level of media development in a province will affect news reports on local firms but not the setting of corporate bond covenants directly. Consequently, the variable will be associated with the extent of media coverage on local firms, while being unrelated to the actual number of bond

covenants. Employing this IV, we conduct a 2SLS regression analysis. The data on provincial media development are obtained from the *China Statistical Yearbook*, which provides provincial-level information released annually since 2007.

Table 3 presents the results of the 2SLS regression using the provincial media development level (*Develop*) as an IV. Firstly, the DWH (Durbin–Wu–Hausman) statistic significantly rejects the null hypothesis at the 1% level, indicating that media attention is indeed endogenous with respect to the IV. The F-value is 13.561, suggesting that the IV is not weak based on the significance test. Secondly, the 2SLS regression results show that the coefficients of media attention are significantly negative in most columns, confirming our previous findings.

We also use GDP per capita at the provincial level (*GDP*) as another IV. Our rationale is that the local economic development level correlates with the amount of media coverage on local firms, because a higher development level corresponds to a higher media presence and thus increased media coverage. However, we expect GDP to have no direct influence on the number of bond covenants. The 2SLS results support our hypothesis, indicating that, even after accounting for the potential endogeneity of the relationship, the negative association between media coverage and bond covenants remains robust.

[Insert Table 3 about here]

To address the potential endogenous relationship between media coverage and bond covenants, we further explore simultaneous equation models through a 3SLS regression analysis. The regression model we employ is as follows:

$$\text{Media coverage} = \alpha_0 + \alpha_1 Covenants + \alpha_1 Controls1 + \delta \quad (4)$$

$$\text{Covenants} = \beta_0 + \beta_1 Media\ coverage + \beta_1 Controls2 + \gamma \quad (5)$$

Equation (4) incorporates some control variables to account for various factors that may influence the relationship between media coverage and bond covenants. These control variables include firm size, the market-to-book ratio, firm leverage and profitability, state ownership, firms' financial risk, the mean and standard deviation of stock returns, firm age, analyst coverage, whether the firm is audited by Big 4 auditors, board size, board independence, and CEO duality. We use the same control variables in Equation (5) as in the main analysis to ensure consistency. The results are reported in Table 4. Columns (1) and (2) display the regression results for total bond covenants, using Equations (4) and (5), respectively. The remaining four columns present the results for the covenants index and weighted covenants index. The findings obtained from these equations align closely with those from the 2SLS regression, which further confirms that our findings on the relationship between media coverage and bond covenants are robust to corrections for endogeneity.

[Insert Table 4 about here]

Media attention and bond covenants: Moderating effects

The analysis in the previous section has highlighted the role of media coverage in reducing the imposition of bond covenants. In this section, we examine moderating effects at three distinct levels: enterprise, industrial, and institutional. We use three variables, state ownership (*State*), industry competition (*HHI*), and the legal environment (*Law*), to proxy for our three moderators. *State* takes the value 1 if the company is an SOE, and 0 otherwise. *HHI* refers to the Herfindahl-Hirschman index, which serves as a measure of industry competitiveness. The higher value of

HHI, the less competitive an industry is. *Law* corresponds to the sub-index "Market Intermediary Organization Development and Law System Environment" in the report on China's provincial marketization index prepared by Wang, Fan and Yu (2017). This index measures the provincial law environment and is comprised of three sub-indicators: the development of market intermediaries, the level of the legal system in place to maintain the market, and the level of intellectual property protection. It reflects the extent of legal protection for investors' rights across different regions of China and has gained wide acceptance. Because the data have been updated only to 2014, data for 2015 onwards are estimated based on growth trends.

The results are reported in Table 5. The findings suggest that the negative impact of media coverage on bond covenants is more pronounced in non-SOEs, as indicated by the positive coefficients of the interactions between media coverage and SOEs, which are significant at the 5% level when bond covenants are measured by total covenants and the weighted covenants index, respectively (columns 1 and 3). This is consistent with the existing literature, suggesting that non-SOEs exhibit a higher level of uncertainty and are perceived to carry greater risk due to elevated information asymmetry (Brandt and Li, 2003; Cull and Xu, 2005). In such circumstances, the media assumes a more significant role in reducing information asymmetry. The coefficients of the interactions between media coverage and *HHI* are negative and significant for two of the three bond covenant measures (columns 4 and 6), suggesting that the negative impact of media coverage is amplified in less competitive industries. This finding is in line with our argument that highly competitive industries have better information

transparency. In these situations, the media plays a smaller incremental role in alleviating information asymmetry and reducing investors' demands on bond covenants.

[Insert Table 5 about here]

The coefficients of the interactions between media attention and the provincial level of law (*Media*Law*) are positive and significant for all three bond covenant measures, indicating that a better provincial legal environment weakens the negative relationship between media attention and bond covenants. The presence of a strong legal framework protects the interests of creditors by increasing the cost associated with companies' opportunistic behaviors. In case of harm, creditors can safeguard their interests via lawsuits. In addition, a robust regional legal system can promote information disclosure and enhance the quality of company audits (Leuz, Nanda and Wysocki, 2003). Therefore, in areas where the legal system is well-developed, the scope for media supervision of governance practices and information dissemination is relatively limited. On the contrary, in regions characterized by a weaker legal environment, the influence of the media becomes more pronounced. Based on our findings in this section, H2 is supported.

Media attention and bond covenants: Media tone

We proceed to investigate the impact of different media tones on bond covenants. To test H3, we conduct regressions of bond covenants on media tone. The results are presented in Table 6, focusing on the relationship between non-negative reporting inclination and bond covenants. When considering the total number of covenants as the dependent variable, the regression reveals a negative coefficient for media reporting inclination that is significant at the 5% level. When examining the covenants index as the dependent variable, the coefficient for media

reporting inclination is negative, but fails to reach statistical significance. Lastly, using the weighted covenants index as the dependent variable, the coefficient of media coverage is negative and significant at the 5% level.

[Insert Table 6 about here]

These findings indicate that non-negative media report inclination has a notable negative impact on bond covenants, particularly evident when considering the total number of covenants and the weighted covenants index. This indicates that a positive media tone contributes to enhancing a company's information environment and reducing investors' perception of risk. As a result, companies are faced with fewer covenant restraints when issuing bonds. These results provide support for H3, highlighting the role of media tone in influencing the use of bond covenants.

Media coverage and bond covenants: Media type

As mentioned earlier, a notable characteristic of the media market in China is the coexistence of government-controlled and market-oriented media (You, Zhang and Zhang, 2018). Accordingly, we categorize the eight newspapers into two groups: government-controlled and market-oriented.

To examine the influence of each type of media, we calculate media coverage separately for government-controlled media (*Govn_Media*) and market-oriented media (*Market_Media*). Specifically, *Govn_Media* is the logarithm of the number of company-related news items in government-controlled media plus 1. *Market_Media* is calculated similarly. We then rerun our main analysis using the coverage by government-controlled and market-oriented media respectively, in place of total media coverage. Our results are reported in Table 7. Remarkably,

the results demonstrate that government-controlled media coverage has a more pronounced negative impact on bond covenants. This empirical evidence supports H4b. The results shed light on the nuanced roles played by different types of media in the context of bond covenants, underscoring the significance of considering the distinct influences of government-controlled and market-oriented media in the Chinese media landscape.

[Insert Table 7 about here]

To gain further insights into the underlying narrative, we compare the media tone of the two different media types. The results, presented in Table 8, indicate that government-controlled media exhibits a higher inclination towards non-negative reporting, both prior to the bond issuance and throughout the entire period. Our results are consistent with the study by You, Zhang and Zhang (2018), which finds that market-oriented media outlets issue more negative articles. As we have demonstrated earlier, a greater non-negative media inclination corresponds to a lower number of bond covenants. Therefore, due to its significantly higher non-negative media inclination, government-controlled media is expected to reduce the number of bond covenants more substantially. This can be attributed to the fact that media reports not only help alleviate information asymmetry in the market but also influence bond investors' risk assessments associated with bond-issuing companies. When official media outlets provide more confirmatory reports, bond investors tend to form more positive assessments of bond issuers, leading to a reduction in restraints through bond covenants. The findings underscore the role of media coverage in shaping investor sentiment and influencing the contractual arrangements in bond issuances.

While the study by You, Zhang and Zhang (2018) find that market-oriented media affects forced CEO turnover through negative reports, our findings suggest that government-oriented media has a stronger impact in reducing bond covenants due to its non-negative reporting inclination. These findings underscore the substantial role of media tone in shaping media's influence on various outcomes.

[Insert Table 8 about here]

Robustness tests

To ensure the robustness of our analysis, we perform additional checks by employing different variable definitions, sample periods, and regression models. Firstly, we recalculate our bond covenant variable by excluding the four most commonly observed covenant types, which are utilized by over 90% of firms (see Appendix A for details). These covenants are those that (1) "restrict dividend payment," (2) "restrict compensation of executives," (3) "restrict investment and merger and acquisition," and (4) "restrict compensation in case of default." The prevalence of these covenants may contribute to minimal variations among firms' use of bond covenants. After excluding these four covenant categories, we recalculate our measures and present the results in the first three columns of Table 9, Panel A. Our primary findings still hold.

[Insert Table 9 about here]

Secondly, we consider internet media reports as an alternative measure of media coverage. With the development in information technology, internet media has emerged as a prominent channel through which investors can access information, while companies can readily attract the attention of the public and regulatory authorities. Our initial analysis having focused on

traditional print media, with the selection of eight newspapers, we now delve into the influence of internet media on bond covenants. To gauge the attention received from internet media, we construct a network media attention index (*Media_Net*) using media report data from the market information series in the CSMAR database. The results are shown in columns (4)–(6) of Table 9, Panel A. The overall results remain consistent with our previous findings, indicating that the impact of media coverage on bond covenants is robust even when considering internet media as an alternative measure.

Furthermore, we conduct analyses using different reporting intervals as our third robustness check. Recognizing that the influence of media reports is time-sensitive, hence their impact on corporate and investor behavior may be transient, we shorten the interval of media coverage. Specifically, we examine the impact of media reports on bond covenants during the nine months and six months prior to the bond issuance date respectively. The results of regressions, presented in columns (1)–(6) of Table 9, Panel B, consistently align with our previous analyses. These findings suggest that the effects of media coverage on bond covenants remain consistent even when considering shorter reporting intervals.

Lastly, to further validate the robustness of our findings, we conduct a Poisson regression since the total covenants variable is a count variable that is not continuous. The results of this analysis are reported in the last column of Table 9, Panel B, and consistently support our earlier results. The analyses conducted in this section demonstrate the robustness of our findings across various models, alternative definitions of key variables, and different sample periods. These comprehensive tests provide additional evidence supporting the reliability and validity of our conclusions.

Further analysis: Media coverage, bond covenants, and cost of debt

There has been extensive research on the relationship between bond covenants and bond pricing (e.g., Reisel, 2014; Simpson and Grossmann, 2017). While it is widely acknowledged that such covenants can lower debt costs, there remains limited evidence regarding the influence of media coverage on debt financing. Gao *et al.* (2020) explored the effect of media coverage on the cost of debt and found that firms experiencing significant media attention tend to enjoy lower debt financing costs. Cheng, Jiang and Song (2020) observed comparable consequences of media coverage in the debt market. Building upon their research, we further investigate the interaction between media coverage and bond covenants. Our study reveals that media coverage and bond covenants can be considered external and internal mechanisms, respectively, in reducing the cost of debt. This distinction underscores the complementary roles they play in shaping debt financing dynamics, providing a comprehensive understanding of the multifaceted factors influencing the cost of debt.

To investigate the relationship between media coverage, bond covenants, and the cost of debt, we perform an analysis wherein we examine the interaction between media coverage and bond covenants while employing the cost of debt as the dependent variable. We use the credit spread (*CS*) to measure the cost of debt, defined as a corporate bond's offering yield minus the yield of the government bond with the same maturity. The results, presented in the first three columns of Table 10, demonstrate that both media coverage and bond covenants significantly influence the cost of debt. Notably, the coefficients of the interaction term are positive, indicating that bond covenants' reduction of the cost of debt is amplified when media coverage is low. This suggests that, in situations with limited external monitoring due to lower media coverage, bond

covenants play a more prominent role in mitigating information asymmetry and reducing the cost of debt. We not only highlight the monitoring role of the media in reducing information asymmetry, but also provide direct evidence in support of the costly contracting hypothesis of Smith and Warner (1979). Our analysis offers valuable insights into the interplay among media coverage, bond covenants, and the cost of debt.

[Insert Table 10 about here]

To address concerns regarding possible endogeneity in the relationship between bond covenants and bond pricing, we adopt a self-selectivity or treatment effects model, following the approach employed by Reisel (2014). This model is similar to Heckman's two-stage model. In the first stage, we utilize a probit model with the covenant dummy variable as the dependent variable, to obtain the selectivity variable (*lambda*). The covenant dummy takes the value 1 if the number of bond covenants exceeds the sample median, and 0 otherwise. In the second stage, we use cost of debt as the dependent variable and control for endogeneity by adding the selectivity variable obtained in the first stage. The results are presented in columns (4) and (5). Notably, our findings remain robust even after accounting for potential endogeneity issues.

Conclusion

By analyzing a sample of Chinese corporate bonds issued between 2007 and 2017, we investigate the impact of media coverage on the bond market. Our findings provide strong evidence that companies receiving greater media attention tend to have fewer bond covenants. This negative relationship highlights the role of the media in reducing information asymmetry during bond issuance and effectively monitoring bond issuers.

Furthermore, our in-depth analysis reveals that the negative effect of media coverage on bond covenants is particularly pronounced in non-state-owned enterprises (non-SOEs), firms operating within highly competitive industries, and regions characterized by a weak legal environment. This heightened impact can be attributed to the inherent uncertainty and elevated risk levels faced by non-SOEs and companies operating in competitive sectors. Firms operating in a weaker legal environment often suffer from inadequate investor protection, exacerbating the importance of the media as a crucial governance mechanism. As a result, the media assumes a significantly more influential role in such contexts.

In addition, we explore the influence of media tone and different types of media on bond covenant settings. Our findings indicate that, as media reports display a higher inclination towards non-negative coverage, the number of bond covenants decreases. Moreover, government-controlled media exerts a more substantial impact on bond covenants, attributed to its authoritative nature and higher non-negative inclination in its reporting. Finally, we examine the interactive relationship between media coverage and bond covenants in terms of their impact on bond pricing. Our results demonstrate that both contribute to reducing the cost of debt and can serve as interchangeable factors in this regard.

Our analysis exhibits robustness across various variable definitions, sample periods, and regression models, assuring the reliability of our findings. Furthermore, we address concerns related to the endogeneity of the relationship between media coverage and bond covenants through appropriate corrections. In light of these robust results, we draw the conclusion that media reports play a crucial role in mitigating information asymmetry and agency problems

between shareholders and bond investors in the market. This, in turn, protects the interests of investors, while reducing the contractual constraints faced by bond issuers.

Our study has some limitations. First of all, we focus on the influence of traditional print media on bond covenants. We consider internet media as an alternative measure of media coverage, but mainly as a robustness test, and our measure of internet media is relatively simple. We admit that new forms of media such as social media (e.g., message boards, X – formerly Twitter) may also impact financial markets. The influence and credibility of social media is relatively weaker compared to that of traditional print media. However, it would be an interesting field worth researching in the future. Future analysis could extend the dimensions of the research by investigating how social media influences the setting of bond covenants. Secondly, our sample is restricted to corporate bonds issued in the Chinese bond market. Chinese corporate bonds have a large scale and great variability, making them interesting to investigate. However, the impact of media coverage on global bond markets is as yet unclear. A cross-border analysis could be considered in the future to assess the role of media in global bond markets.

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Table 1. Summary statistics

Variables	N	mean	SD	Min	P25	Median	P75	Max
Total Covenants (raw number)	596	9.525	3.731	3.000	6.000	10.000	13.000	19.000
Covenants Index	596	0.823	0.124	0.250	0.750	0.750	1.000	1.000
Weighted Covenants Index	596	0.148	0.075	0.050	0.080	0.121	0.235	0.469
Media (raw number)	596	8.599	16.046	0.000	1.000	4.000	10.000	162.000
Size	596	9.363	1.351	6.555	8.376	9.164	10.111	14.690
MB	596	1.941	1.252	0.769	1.186	1.514	2.221	12.167
Lev	596	0.536	0.166	0.060	0.413	0.546	0.668	0.906
ROA	596	0.097	0.054	-0.001	0.062	0.089	0.123	0.351
Tangible_ratio	596	0.926	0.113	0.160	0.916	0.961	0.985	1.000
Cash	596	0.125	0.084	0.006	0.065	0.109	0.163	0.559
CashFlow_Vol	596	0.031	0.025	0.001	0.015	0.027	0.036	0.221
Current_Ratio	596	0.197	0.614	-2.869	-0.153	0.235	0.573	2.468
Interest_Coverage_Ratio	596	1.841	1.179	-3.246	1.016	1.608	2.529	8.459
Z_Score	596	0.386	0.487	0.000	0.000	0.000	1.000	1.000
Mean of stock return	596	0.000	0.002	-0.009	-0.001	0.000	0.001	0.015
Std of stock return	596	0.021	0.008	0.006	0.015	0.020	0.025	0.059
Amount	596	2.158	0.823	-0.693	1.609	2.110	2.705	5.075
Maturity	596	1.577	0.285	0.405	1.609	1.609	1.609	2.303
Rating	596	2.718	0.851	1.000	2.000	3.000	3.000	4.000
Secured	596	0.401	0.491	0.000	0.000	0.000	1.000	1.000
State	596	0.497	0.501	0.000	0.000	0.000	1.000	1.000
HHI	596	0.111	0.109	0.014	0.055	0.072	0.133	1.000
Law	596	1.888	0.747	-0.371	1.404	2.020	2.497	2.996
Rf	596	3.268	0.629	2.230	2.900	3.150	3.530	7.000
Total Covenants (raw number)	596	9.525	3.731	3.000	6.000	10.000	13.000	19.000

This table presents the summary statistics for the key variables. All variables are defined in Appendix B of the online Supplementary Material. We report the mean, standard deviation, minimum, 25th percentile, median, 75th percentile and maximum of these variables.

Table 2. Media coverage and bond covenants: Main results

Variables	(1) Total covenants	(2) Covenants index	(3) Weighted covenants index	(4) Cov_Div	(5) Cov_Inv	(6) Cov_Fin	(7) Cov_Eve
Media	-0.048***	-0.018***	-0.011***	-0.001	-0.055***	-0.055***	-0.054***
	(-3.39)	(-3.85)	(-4.57)	(-0.00)	(-2.91)	(-4.63)	(-3.27)
Size	0.093***	0.026***	0.025***	-0.038*	0.166***	0.131***	0.046*
	(4.01)	(3.32)	(6.34)	(-1.73)	(5.26)	(7.58)	(1.70)
MB	0.072***	0.026***	0.018***	0.004	0.090***	0.084***	0.063***
	(4.47)	(5.31)	(6.19)	(0.30)	(4.02)	(6.16)	(3.35)
Lev	-0.052	0.040	-0.003	0.156	-0.221	-0.004	0.043
	(-0.36)	(0.89)	(-0.12)	(1.41)	(-1.08)	(-0.04)	(0.26)
ROA	-0.822**	-0.231**	-0.169***	0.275	-1.297***	-0.786***	-0.661*
	(-2.53)	(-2.38)	(-3.10)	(1.25)	(-2.95)	(-3.00)	(-1.68)
State	-0.045	-0.032**	-0.015**	-0.046*	-0.089*	-0.081***	0.019
	(-1.29)	(-2.55)	(-2.42)	(-1.75)	(-1.82)	(-2.97)	(0.50)
Tangible_ratio	-0.221*	-0.078*	-0.052**	0.095	-0.204	-0.277**	-0.312**
	(-1.66)	(-1.75)	(-2.33)	(0.72)	(-1.10)	(-2.58)	(-2.23)
Cash	-0.544***	-0.108*	-0.099***	0.443	0.001	0.181	-0.540
	(-2.82)	(-1.83)	(-3.06)	(1.02)	(0.00)	(0.36)	(-0.72)
CashFlow_Vol	-0.125	0.115	0.028	0.014	0.118**	0.026	0.128***
	(-0.20)	(0.56)	(0.25)	(0.46)	(2.08)	(0.78)	(2.99)
Current_Ratio	0.109***	0.016	0.012*	-0.038	-0.768***	-0.383**	-0.454*
	(2.82)	(1.24)	(1.72)	(-0.24)	(-2.73)	(-2.48)	(-1.87)
Interest_Coverage_Ratio	-0.066***	-0.012***	-0.009***	-0.001	-0.082***	-0.029***	-0.063***
	(-4.82)	(-2.93)	(-3.98)	(-0.05)	(-4.63)	(-2.72)	(-3.91)
Z_Score	0.136***	0.023*	0.018***	0.034	0.146***	0.045	0.135***
	(3.43)	(1.93)	(2.69)	(1.17)	(2.65)	(1.53)	(3.10)
Mean of stock return	1.496	-2.389	-0.803	-3.561	-0.074	-5.870	4.111
	(0.19)	(-0.92)	(-0.57)	(-0.62)	(-0.01)	(-0.84)	(0.45)
Std of stock return	4.442**	2.930***	1.516***	2.916	4.977*	7.713***	2.908
	(2.29)	(4.22)	(4.03)	(1.38)	(1.84)	(3.88)	(1.37)
Term	0.001	-0.001	-0.008	0.059	0.003	-0.066*	-0.013
	(0.01)	(-0.08)	(-0.92)	(1.31)	(0.04)	(-1.67)	(-0.19)
Amount	-0.043*	-0.006	-0.012***	0.031	-0.076**	-0.071***	-0.023
	(-1.66)	(-0.70)	(-2.72)	(1.13)	(-2.17)	(-3.58)	(-0.80)
Rating	0.053**	0.017**	0.011***	-0.018	0.067*	0.054***	0.052*
	(2.14)	(2.16)	(2.63)	(-0.79)	(1.95)	(2.79)	(1.81)
Secured	-0.151***	-0.062***	-0.037***	0.002	-0.204***	-0.186***	-0.125***
	(-4.13)	(-5.89)	(-6.39)	(0.07)	(-4.11)	(-6.87)	(-2.91)
Rf	-0.053**	-0.038***	-0.014***	-0.065	-0.074**	-0.058***	-0.008
	(-2.22)	(-4.11)	(-3.01)	(-1.58)	(-2.27)	(-2.69)	(-0.35)
Term_Spread	0.093**	0.044***	0.033***	0.022	0.158***	0.215***	0.078*
	(2.34)	(3.49)	(4.79)	(0.26)	(2.87)	(6.21)	(1.83)
Constant	1.863***	0.725***	0.016	1.300***	0.666*	-0.483**	1.295***
	(6.18)	(8.26)	(0.33)	(5.57)	(1.72)	(-2.39)	(3.73)
Industry and Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled

Observations	596	596	596	596	596	596	596
Adjusted R-squared	0.346	0.342	0.457	0.216	0.347	0.460	0.222

This table presents regressions of media coverage on bond covenants. The dependent variable is bond covenants. We use three measurements for bond covenants in the first three columns: total covenants, covenants index, and weighted covenants index. In the last four columns, we use *Cov_Div*, *Cov_Inv Cov_Fin*, and *Cov_Eve* to measure the number of covenants in the categories of covenants that restrict distribution of earnings, restrict investment, restrict subsequent financing, and event-driven covenants, respectively. The major independent variable is media coverage. All variables are defined in Appendix B of the online Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 3. Endogenous tests based on 2SLS

Variables	First Stage	Second Stage		
	(1)	(2)	(3)	(4)
	Media	Total Covenants	Covenants Index	Weighted Covenants Index
Media		-1.077	-0.289**	-0.196*
		(-1.55)	(-1.93)	(-1.84)
Develop	0.002*			
	(1.89)			
Size	0.259***	0.371*	0.100**	0.075**
	(3.84)	(1.90)	(1.97)	(2.41)
MB	0.208***	0.284*	0.081**	0.056**
	(3.44)	(1.83)	(2.06)	(2.28)
Lev	0.050	-0.077	0.034	-0.008
	(0.11)	(-0.17)	(0.27)	(-0.10)
ROA	3.267***	2.607	0.668	0.446
	(2.99)	(1.01)	(1.01)	(1.10)
State	0.011	-0.047	-0.032	-0.015
	(0.10)	(-0.45)	(-1.13)	(-0.81)
Tangible_ratio	-0.031	-0.222	-0.081	-0.052
	(-0.07)	(-0.47)	(-0.68)	(-0.63)
Cash	1.150*	0.672	0.215	0.119
	(1.82)	(0.64)	(0.78)	(0.69)
CashFlow_Vol	-0.920	-1.123	-0.154	-0.152
	(-0.47)	(-0.54)	(-0.28)	(-0.40)
Current_Ratio	-0.414***	-0.327	-0.099	-0.066
	(-3.50)	(-1.01)	(-1.18)	(-1.28)
Interest_Coverage_Ratio	-0.016	-0.083*	-0.017*	-0.012*
	(-0.37)	(-1.75)	(-1.66)	(-1.67)
Z_Score	-0.180	-0.064	-0.030	-0.018
	(-1.47)	(-0.35)	(-0.62)	(-0.57)
Mean of stock return	-42.770*	-41.084	-13.527	-8.421
	(-1.67)	(-1.07)	(-1.37)	(-1.34)
Std of stock return	5.041	9.103	4.099**	2.358**
	(0.80)	(1.34)	(2.23)	(1.99)
Term	0.475***	0.503	0.129	0.081
	(3.01)	(1.34)	(1.32)	(1.34)
Amount	0.328***	0.294	0.082	0.048
	(4.03)	(1.19)	(1.32)	(1.25)
Rating	0.022	0.072	0.022	0.014
	(0.30)	(0.94)	(1.05)	(1.05)
Secured	0.151	0.028	-0.015	-0.005
	(1.36)	(0.17)	(-0.34)	(-0.17)
Rf	0.003	-0.057	-0.040**	-0.015
	(0.05)	(-0.93)	(-2.35)	(-1.40)
Term_Spread	0.063	0.160	0.060	0.045*
	(0.48)	(1.12)	(1.58)	(1.80)
Constant	-2.442***	-0.673	0.070	-0.439
	(-2.88)	(-0.37)	(0.15)	(-1.50)
Industry and Year	Controlled	Controlled	Controlled	Controlled
Observations	593	593	593	593
Adj.R^2	0.290	0.323	0.341	0.412
IV F-stat	13.561			
DWH p-value		0.0029***	0.0199**	0.0002***

This table presents the results of a 2SLS regression using the regional media development level (*Develop*) as the instrumental variable. The dependent variable is bond covenants. The instrumental variable is the ratio of the number of printed newspapers in the region to the total population. All other variables are defined in Appendix B of the online Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 4. Endogenous tests based on simultaneous equations

Variables	(1) Media	(2) Total Covenants	(3) Media	(4) Covenants _Index	(5) Media	(6) Weighted Covenants Index
Total Covenants	-1.175***					
	(-3.32)					
Media		-0.079		-0.092***		-0.048***
		(-1.01)		(-2.63)		(-2.77)
Covenants Index			-2.345**			
			(-2.22)			
Weighted Covenants Index					-5.371***	
					(-3.33)	
Size	0.417***	0.121***	0.395***	0.063***	0.458***	0.043***
	(6.65)	(4.06)	(5.94)	(4.94)	(6.67)	(6.73)
MB	0.240***	0.075***	0.228***	0.040***	0.253***	0.024***
	(4.17)	(3.21)	(3.85)	(3.85)	(4.33)	(4.70)
Lev	0.311	0.019	0.456	0.075	0.374	0.017
	(0.80)	(0.15)	(1.23)	(1.36)	(1.01)	(0.61)
ROA	2.395**	-0.637	3.609***	0.140	2.926***	0.001
	(2.00)	(-1.53)	(3.35)	(0.75)	(2.67)	(0.01)
State	-0.006	-0.036	-0.026	-0.024*	-0.036	-0.012*
	(-0.06)	(-1.16)	(-0.25)	(-1.74)	(-0.36)	(-1.73)
Z_Score	0.051	0.130***	-0.064	0.011	-0.008	0.013
	(0.41)	(3.40)	(-0.56)	(0.65)	(-0.07)	(1.50)
Mean of stock return	-36.995	0.992	-47.351*	-5.498	-44.443*	-2.290
	(-1.46)	(0.11)	(-1.91)	(-1.41)	(-1.81)	(-1.18)
Std of stock return	14.278**	4.724**	16.471**	3.592***	16.507***	1.791***
	(2.28)	(2.35)	(2.47)	(3.97)	(2.62)	(3.99)
Tangible_ratio		-0.191*		-0.061*		-0.037**
		(-1.72)		(-1.84)		(-2.22)
Cash		-0.526***		-0.084		-0.069**
		(-2.73)		(-1.40)		(-2.23)
CashFlow_Vol		0.048		0.119		0.036
		(0.09)		(0.79)		(0.48)
Current_Ratio		0.130***		0.023		0.014
		(2.84)		(1.38)		(1.59)
Interest_Coverage_Ratio		-0.050***		-0.007*		-0.005***
		(-4.07)		(-1.86)		(-2.79)
Term		-0.056		-0.016		-0.013
		(-0.98)		(-0.79)		(-1.25)
Amount		-0.067**		-0.013		-0.012*
		(-2.08)		(-1.06)		(-1.96)
Rating		0.039**		0.011*		0.007**
		(1.98)		(1.80)		(2.26)
Secured		-0.142***		-0.049***		-0.028***
		(-4.34)		(-3.74)		(-4.25)
Rf		-0.043**		-0.026***		-0.009***
		(-2.32)		(-3.77)		(-3.15)
Term_Spread		0.064*		0.025**		0.020***
		(1.90)		(2.33)		(3.55)
Age	-0.024		-0.049		-0.052	
	(-0.41)		(-1.27)		(-1.32)	
Analyst	0.170***		0.150***		0.133***	
	(3.42)		(3.02)		(2.75)	
Big4	0.190		0.149*		0.157*	
	(1.60)		(1.84)		(1.91)	
Board size	0.378*		0.437***		0.318**	
	(1.80)		(2.64)		(2.12)	
Board independence	0.195		0.701		0.487	
	(0.27)		(1.43)		(1.03)	
Dual	-0.067		-0.098		-0.084	
	(-0.60)		(-1.37)		(-1.18)	
Constant	-1.500	1.680***	-2.396**	0.433***	-3.707***	-0.133*
	(-1.45)	(5.20)	(-2.41)	(3.07)	(-5.38)	(-1.91)
Industry and Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	594	594	594	594	594	594
Chi2	307.81***	405.83***	322.10***	316.03***	329.82***	441.97***

This table presents the results of tests using simultaneous equations and 3SLS regression. The dependent variable is bond covenants. All variables are defined in Appendix B of the online Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Media coverage and bond covenants: Moderating effects

Variables	Firm state ownership (state)			Industry competition (HHI)			Provincial law environment(law)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total covenants	Covenants index	Weighted covenants index	Total covenants	Covenants index	Weighted covenants index	Total covenants	Covenants index	Weighted covenants index
Media	-0.078***	-0.022***	-0.016***	-0.074***	-0.018***	-0.015***	-0.155***	-0.043***	-0.026***
	(-4.03)	(-3.23)	(-5.07)	(-3.76)	(-2.78)	(-4.69)	(-4.46)	(-3.57)	(-4.62)
Media*State	0.056**	0.008	0.010**						
	(2.18)	(0.89)	(2.27)						
Media*HHI				-0.276**	-0.010	-0.047**			
				(-2.09)	(-0.24)	(-2.30)			
HHI				0.701**	0.107	0.152***			
				(2.37)	(1.24)	(3.29)			
Media*Law							0.059***	0.014**	0.008***
							(3.37)	(2.41)	(2.89)
Law							-0.074**	-0.009	-0.005
							(-2.37)	(-0.75)	(-0.83)
State	-0.131**	-0.043**	-0.029***	-0.043	-0.031**	-0.014**	-0.043	-0.030**	-0.014**
	(-2.57)	(-2.42)	(-3.17)	(-1.23)	(-2.51)	(-2.35)	(-1.27)	(-2.47)	(-2.28)
Size	0.086***	0.025***	0.024***	0.088***	0.026***	0.024***	0.081***	0.021***	0.022***
	(3.74)	(3.15)	(6.05)	(3.83)	(3.30)	(6.15)	(3.52)	(2.72)	(5.65)
MB	0.069***	0.026***	0.017***	0.070***	0.025***	0.017***	0.067***	0.025***	0.017***
	(4.33)	(5.23)	(6.07)	(4.30)	(5.17)	(5.98)	(4.18)	(5.10)	(6.03)
Lev	-0.019	0.044	0.003	-0.046	0.037	-0.003	-0.043	0.050	0.003
	(-0.13)	(0.98)	(0.12)	(-0.32)	(0.85)	(-0.11)	(-0.30)	(1.11)	(0.15)
ROA	-0.793**	-0.227**	-0.164***	-0.817**	-0.231**	-0.168***	-0.784**	-0.225**	-0.166***
	(-2.40)	(-2.32)	(-2.98)	(-2.57)	(-2.40)	(-3.17)	(-2.44)	(-2.34)	(-3.10)
Tangible_ratio	-0.245*	-0.081*	-0.056**	-0.206	-0.075*	-0.048**	-0.243*	-0.082*	-0.054**
	(-1.87)	(-1.81)	(-2.52)	(-1.54)	(-1.70)	(-2.20)	(-1.87)	(-1.81)	(-2.46)
Cash	-0.537***	-0.107*	-0.098***	-0.508***	-0.100*	-0.090***	-0.542***	-0.108*	-0.099***
	(-2.77)	(-1.80)	(-2.99)	(-2.63)	(-1.67)	(-2.77)	(-2.83)	(-1.85)	(-3.10)
CashFlow_Vol	-0.125	0.115	0.028	-0.027	0.116	0.044	-0.117	0.135	0.040
	(-0.20)	(0.56)	(0.26)	(-0.04)	(0.56)	(0.40)	(-0.19)	(0.68)	(0.37)
Current_Ratio	0.108***	0.016	0.012*	0.107***	0.015	0.011	0.106***	0.015	0.012*
	(2.77)	(1.22)	(1.68)	(2.77)	(1.16)	(1.63)	(2.80)	(1.21)	(1.70)
Interest_Coverage_Ratio	-0.067***	-0.012***	-0.009***	-0.067***	-0.012***	-0.009***	-0.066***	-0.012***	-0.009***
	(-4.80)	(-2.93)	(-4.01)	(-4.91)	(-2.93)	(-4.10)	(-4.87)	(-2.97)	(-4.08)
Z_Score	0.135***	0.023*	0.018***	0.133***	0.022*	0.018***	0.136***	0.023**	0.019***
	(3.45)	(1.93)	(2.71)	(3.38)	(1.89)	(2.64)	(3.48)	(2.01)	(2.80)
Mean of stock return	0.380	-2.540	-0.991	0.443	-2.418	-0.978	1.046	-2.788	-1.042
	(0.05)	(-0.98)	(-0.70)	(0.06)	(-0.94)	(-0.70)	(0.13)	(-1.07)	(-0.73)
Std of stock return	4.285**	2.909***	1.490***	4.557**	2.926***	1.533***	4.128**	2.845***	1.467***
	(2.19)	(4.17)	(3.92)	(2.34)	(4.22)	(4.11)	(2.16)	(4.14)	(3.95)
Term	0.013	3E-04	-0.006	0.011	-0.001	-0.007	-0.005	-0.001	-0.008
	(0.24)	(0.01)	(-0.70)	(0.21)	(-0.05)	(-0.72)	(-0.08)	(-0.06)	(-0.93)
Amount	-0.042	-0.006	-0.012***	-0.048*	-0.007	-0.013***	-0.040	-0.004	-0.011**

	(-1.63)	(-0.69)	(-2.69)	(-1.87)	(-0.75)	(-2.96)	(-1.53)	(-0.48)	(-2.47)
Rating	0.054**	0.017**	0.011***	0.055**	0.017**	0.011***	0.056**	0.017**	0.011***
	(2.22)	(2.19)	(2.72)	(2.24)	(2.17)	(2.73)	(2.32)	(2.21)	(2.69)
Secured	-0.153***	-0.062***	-0.038***	-0.155***	-0.063***	-0.038***	-0.143***	-0.059***	-0.036***
	(-4.22)	(-5.91)	(-6.48)	(-4.23)	(-5.97)	(-6.57)	(-4.03)	(-5.82)	(-6.20)
Rf	-0.057**	-0.039***	-0.015***	-0.054**	-0.039***	-0.014***	-0.046**	-0.037***	-0.013***
	(-2.46)	(-4.19)	(-3.22)	(-2.25)	(-4.10)	(-3.04)	(-1.97)	(-3.90)	(-2.83)
Term_Spread	0.089**	0.043***	0.033***	0.092**	0.043***	0.033***	0.077*	0.042***	0.033***
	(2.23)	(3.42)	(4.67)	(2.28)	(3.42)	(4.67)	(1.93)	(3.29)	(4.67)
Constant	1.952***	0.737***	0.031	1.936***	0.735***	0.031	2.138***	0.784***	0.049
	(6.36)	(8.26)	(0.63)	(6.48)	(8.41)	(0.66)	(7.29)	(8.60)	(1.07)
Industry and Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	596	596	596	596	596	596	596	596	596
Adjusted R-squared	0.352	0.342	0.461	0.352	0.342	0.464	0.360	0.353	0.468

This table presents regressions of media coverage on bond covenants with moderating effects at the firm level (*State*), industrial level (*HHI)*, and provincial level (*Law*). The dependent variable is bond covenants. We use three measurements for bond covenants: total covenants, covenants index, and weighted covenants index. All variables are defined in Appendix B of the online Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Media tone and bond covenants

Variables	(1) Total Covenants	(2) Covenants Index	(3) Weighted Covenants Index
Senti	-0.137**	-0.014	-0.022**
	(-2.44)	(-0.68)	(-2.28)
Size	0.091***	0.022***	0.024***
	(3.51)	(2.62)	(5.64)
MB	0.071***	0.019***	0.015***
	(3.89)	(3.22)	(4.78)
Lev	0.011	0.083	0.012
	(0.07)	(1.62)	(0.44)
ROA	-1.232***	-0.340***	-0.260***
	(-3.50)	(-3.24)	(-4.39)
State	-5E-04	-0.031**	-0.008
	(-0.01)	(-2.07)	(-1.13)
Tangible_ratio	-0.288*	-0.070	-0.061**
	(-1.92)	(-1.36)	(-2.42)
Cash	-0.673***	-0.112*	-0.102***
	(-2.94)	(-1.67)	(-2.71)
CashFlow_Vol	-0.442	0.158	0.045
	(-0.58)	(0.69)	(0.36)
Current_Ratio	0.124***	0.023	0.014*
	(2.89)	(1.55)	(1.86)
Interest_Coverage_Ratio	-0.066***	-0.013***	-0.010***
	(-4.18)	(-2.75)	(-3.74)
Z_Score	0.142***	0.024*	0.019**
	(3.21)	(1.78)	(2.49)
Mean of stock return	2.527	-1.586	-0.419
	(0.28)	(-0.53)	(-0.26)
Std of stock return	2.001	2.406***	1.146***
	(0.87)	(2.98)	(2.65)
Term	0.063	-0.001	-0.001
	(1.09)	(-0.03)	(-0.08)
Amount	-0.075**	-0.011	-0.017***
	(-2.54)	(-1.15)	(-3.39)
Rating	0.031	0.014	0.007
	(1.07)	(1.53)	(1.43)
Secured	-0.160***	-0.061***	-0.038***
	(-3.73)	(-5.03)	(-5.65)
Rf	-0.057**	-0.041***	-0.016***
	(-2.12)	(-3.95)	(-2.93)
Term_Spread	0.063	0.030**	0.026***
	(1.38)	(2.09)	(3.27)
Constant	1.864***	0.718***	0.017
	(5.47)	(8.23)	(0.35)
Industry and Year	Controlled	Controlled	Controlled
Observations	462	462	462
Adjusted R-squared	0.346	0.344	0.469

This table presents the regressions of media tone on bond covenants. All variables are defined in Appendix B of the online Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Media coverage and bond covenants: Media type

Variables	(1) Total Covenants	(2) Covenants Index	(3) Weighted Covenants Index	(4) Total Covenants	(5) Covenants Index	(6) Weighted Covenants Index
Govn_Media	-0.064***	-0.022***	-0.014***			
	(-4.31)	(-4.60)	(-5.71)			
Market_Media				-0.024	-0.011*	-0.006*
				(-1.18)	(-1.77)	(-1.69)
Size	0.095***	0.026***	0.025***	0.087***	0.024***	0.023***
	(4.12)	(3.36)	(6.50)	(3.62)	(3.02)	(5.72)
MB	0.075***	0.027***	0.018***	0.065***	0.023***	0.016***
	(4.64)	(5.50)	(6.41)	(4.12)	(4.80)	(5.69)
Lev	-0.059	0.037	-0.004	-0.052	0.039	-0.003
	(-0.41)	(0.84)	(-0.18)	(-0.36)	(0.89)	(-0.12)
ROA	-0.773**	-0.219**	-0.160***	-0.946***	-0.273***	-0.198***
	(-2.38)	(-2.26)	(-2.93)	(-2.91)	(-2.82)	(-3.57)
State	-0.044	-0.031**	-0.014**	-0.046	-0.032**	-0.015**
	(-1.26)	(-2.52)	(-2.40)	(-1.32)	(-2.58)	(-2.43)
Tangible_ratio	-0.229*	-0.081*	-0.054**	-0.214	-0.075	-0.050**
	(-1.73)	(-1.83)	(-2.43)	(-1.63)	(-1.64)	(-2.23)
Cash	-0.522***	-0.102*	-0.095***	-0.580***	-0.119**	-0.107***
	(-2.71)	(-1.73)	(-2.93)	(-3.00)	(-2.02)	(-3.30)
CashFlow_Vol	-0.061	0.139	0.043	-0.140	0.104	0.024
	(-0.10)	(0.68)	(0.39)	(-0.22)	(0.49)	(0.21)
Current_Ratio	0.103***	0.014	0.011	0.126***	0.022*	0.016**
	(2.68)	(1.11)	(1.54)	(3.26)	(1.69)	(2.29)
Interest_Coverage_Ratio	-0.067***	-0.012***	-0.009***	-0.066***	-0.012***	-0.009***
	(-4.87)	(-2.96)	(-4.03)	(-4.75)	(-2.87)	(-3.88)
Z_Score	0.131***	0.021*	0.017***	0.143***	0.025**	0.020***
	(3.34)	(1.84)	(2.59)	(3.59)	(2.12)	(2.89)
Mean of stock return	1.160	-2.448	-0.864	2.801	-1.984	-0.511
	(0.15)	(-0.96)	(-0.62)	(0.36)	(-0.76)	(-0.36)
Std of stock return	4.383**	2.902***	1.501***	4.410**	2.943***	1.512***
	(2.30)	(4.22)	(4.07)	(2.18)	(4.08)	(3.79)
Term	0.005	-4E-04	-0.008	-0.017	-0.007	-0.012
	(0.10)	(-0.02)	(-0.83)	(-0.31)	(-0.41)	(-1.35)
Amount	-0.038	-0.005	-0.011**	-0.056**	-0.011	-0.015***
	(-1.46)	(-0.55)	(-2.49)	(-2.17)	(-1.25)	(-3.40)
Rating	0.051**	0.017**	0.011**	0.054**	0.018**	0.011***
	(2.09)	(2.10)	(2.58)	(2.17)	(2.21)	(2.64)
Secured	-0.145***	-0.060***	-0.036***	-0.160***	-0.065***	-0.039***
	(-3.97)	(-5.70)	(-6.17)	(-4.35)	(-6.18)	(-6.68)
Rf	-0.053**	-0.038***	-0.014***	-0.053**	-0.038***	-0.014***
	(-2.26)	(-4.10)	(-3.07)	(-2.15)	(-4.02)	(-2.88)
Term_Spread	0.097**	0.045***	0.034***	0.087**	0.041***	0.032***
	(2.44)	(3.58)	(4.95)	(2.16)	(3.29)	(4.52)
Constant	1.851***	0.724***	0.014	1.920***	0.739***	0.028

	(6.24)	(8.33)	(0.30)	(6.13)	(8.00)	(0.55)
Industry and Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	596	596	596	596	596	596
Adjusted R-squared	0.355	0.350	0.468	0.333	0.327	0.437

This table presents the regressions of government-controlled media coverage and market-oriented media coverage on bond covenants. All variables are defined in Appendix B of the online Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 8. Media tone difference: Government-controlled media vs. market-oriented media

Panel A：Differences between media tone by different media in the 1 year prior to the bond issuance				
	Market-oriented media	Government-controlled media	Mean of Difference	Chi2
No. of Observations	274	436		
Mean	0.192	0.389	-0.196***	
Median	0.203	0.417		57.079***
Panel B: Differences between media tone by different media over the whole period				
	Market-oriented media	Government-controlled media	Mean of Difference	Chi2
No. of Observations	1288	3837		
Mean	0.167	0.363	-0.196***	
Median	0.146	0.405		241.367***

This table presents the results for media tone difference between government-controlled and market-oriented media in the bond pre-issue period (Panel A) and over the whole period (Panel B).

Table 9. Robustness checks

Panel A: Use of different calculations of media coverage

Variables	(1) Total Covenants	(2) Covenants Index	(3) Weighted Covenants Index	(4) Total Covenants	(5) Covenants Index	(6) Weighted Covenants Index
Media	-0.098***	-0.048***	-0.019***			
	(-3.49)	(-4.19)	(-4.72)			
Media_Net				-0.037**	-0.010	-0.010***
				(-1.97)	(-1.59)	(-3.20)
Size	0.180***	0.092***	0.045***	0.067***	0.016*	0.018***
	(4.21)	(5.39)	(7.05)	(2.61)	(1.88)	(4.26)
MB	0.143***	0.060***	0.030***	0.062***	0.022***	0.015***
	(4.87)	(4.84)	(6.33)	(3.93)	(4.54)	(5.35)
Lev	-0.171	-0.058	-0.017	-0.042	0.042	-0.002
	(-0.61)	(-0.51)	(-0.42)	(-0.27)	(0.91)	(-0.10)
ROA	-1.944***	-0.959***	-0.311***	-0.909***	-0.291***	-0.189***
	(-3.03)	(-3.67)	(-3.42)	(-2.60)	(-2.80)	(-3.23)
State	-0.059	-0.047*	-0.020**	-0.043	-0.031**	-0.014**
	(-0.90)	(-1.74)	(-2.09)	(-1.16)	(-2.31)	(-2.21)
Tangible_ratio	-0.456*	-0.206**	-0.093**	-0.153	-0.090*	-0.052**
	(-1.89)	(-2.33)	(-2.57)	(-1.08)	(-1.83)	(-2.09)
Cash	-1.075***	-0.420***	-0.163***	-0.614***	-0.133**	-0.109***
	(-2.91)	(-2.79)	(-2.96)	(-3.13)	(-2.22)	(-3.29)
CashFlow_Vol	-0.439	0.127	-0.001	0.354	0.257	0.104
	(-0.39)	(0.27)	(-0.01)	(0.56)	(1.22)	(0.91)
Current_Ratio	0.209***	0.067**	0.020*	0.146***	0.027**	0.020***
	(3.05)	(2.16)	(1.83)	(3.63)	(2.01)	(2.75)
Interest_Coverage_Ratio	-0.127***	-0.043***	-0.015***	-0.065***	-0.011**	-0.008***
	(-4.76)	(-3.99)	(-4.03)	(-4.62)	(-2.51)	(-3.68)
Z_Score	0.249***	0.079***	0.028**	0.125***	0.023*	0.016**
	(3.38)	(2.73)	(2.51)	(2.94)	(1.81)	(2.19)
Mean of stock return	7.491	1.429	-1.069	6.319	-0.254	0.221
	(0.49)	(0.23)	(-0.47)	(0.76)	(-0.09)	(0.15)
Std of stock return	4.781	3.121**	2.202***	3.949*	2.607***	1.424***
	(1.30)	(2.04)	(3.59)	(1.78)	(3.36)	(3.41)
Term	-0.020	-0.022	-0.020	-0.028	-0.016	-0.016
	(-0.18)	(-0.47)	(-1.33)	(-0.44)	(-0.77)	(-1.53)
Amount	-0.090*	-0.044**	-0.024***	-0.039	-0.006	-0.010**
	(-1.85)	(-2.34)	(-3.22)	(-1.38)	(-0.58)	(-2.10)
Rating	0.100**	0.051***	0.019***	0.059**	0.021**	0.012***
	(2.14)	(2.66)	(2.80)	(2.28)	(2.49)	(2.91)
Secured	-0.267***	-0.143***	-0.062***	-0.147***	-0.065***	-0.037***
	(-3.88)	(-5.44)	(-6.44)	(-3.61)	(-5.63)	(-5.97)
Rf	-0.080*	-0.044**	-0.018**	-0.068**	-0.040***	-0.018***
	(-1.77)	(-2.29)	(-2.35)	(-2.34)	(-3.47)	(-2.95)

Term_Spread	0.168**	0.114***	0.061***	0.071	0.041***	0.029***
	(2.21)	(3.77)	(5.22)	(1.53)	(2.88)	(3.66)
Constant	1.083**	0.361*	-0.076	2.163***	0.858***	0.113**
	(1.99)	(1.82)	(-0.97)	(6.70)	(9.02)	(2.18)
Industry and Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	596	596	596	532	532	532
Adj.R^2/ Pse R^2	0.353	0.419	0.471	0.333	0.326	0.450

Panel B: Shortening of media coverage period and use of Poisson regression

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Covenants	Covenants Index	Weighted Covenants Index	Total Covenants	Covenants Index	Weighted Covenants Index	COV
Media							-0.047***
							(-3.49)
Media_9	-0.045***	-0.017***	-0.011***				
	(-3.05)	(-3.65)	(-4.31)				
Media_6				-0.054***	-0.022***	-0.013***	
				(-3.30)	(-4.22)	(-4.82)	
Size	0.091***	0.026***	0.025***	0.094***	0.027***	0.025***	0.095***
	(3.87)	(3.23)	(6.16)	(3.98)	(3.37)	(6.33)	(4.37)
MB	0.070***	0.026***	0.017***	0.071***	0.026***	0.018***	0.075***
	(4.41)	(5.26)	(6.16)	(4.48)	(5.45)	(6.30)	(5.16)
Lev	-0.047	0.041	-0.002	-0.047	0.041	-0.002	-0.061
	(-0.32)	(0.94)	(-0.07)	(-0.33)	(0.95)	(-0.07)	(-0.42)
ROA	-0.830**	-0.232**	-0.169***	-0.821**	-0.225**	-0.167***	-0.789**
	(-2.54)	(-2.37)	(-3.09)	(-2.54)	(-2.33)	(-3.08)	(-2.41)
State	-0.043	-0.031**	-0.014**	-0.045	-0.032**	-0.015**	-0.055*
	(-1.21)	(-2.46)	(-2.31)	(-1.29)	(-2.56)	(-2.42)	(-1.65)
Tangible_ratio	-0.226*	-0.080*	-0.053**	-0.221*	-0.078*	-0.052**	-0.198
	(-1.70)	(-1.80)	(-2.37)	(-1.66)	(-1.74)	(-2.30)	(-1.64)
Cash	-0.544***	-0.107*	-0.098***	-0.526***	-0.099*	-0.094***	-0.529***
	(-2.82)	(-1.81)	(-3.03)	(-2.72)	(-1.67)	(-2.90)	(-2.72)
CashFlow_Vol	-0.132	0.112	0.026	-0.156	0.101	0.020	-0.102
	(-0.21)	(0.54)	(0.23)	(-0.25)	(0.49)	(0.18)	(-0.17)
Current_Ratio	0.115***	0.018	0.013*	0.115***	0.017	0.013*	0.090**
	(2.98)	(1.39)	(1.90)	(3.01)	(1.38)	(1.93)	(2.39)
Interest_Coverage_Ratio	-0.066***	-0.012***	-0.009***	-0.064***	-0.012***	-0.009***	-0.062***
	(-4.80)	(-2.91)	(-3.96)	(-4.67)	(-2.76)	(-3.78)	(-4.38)
	0.139***	0.024**	0.019***	0.137***	0.023*	0.018***	0.137***
Z_Score	(3.49)	(2.02)	(2.77)	(3.44)	(1.95)	(2.70)	(3.52)
	2.305	-2.115	-0.631	2.685	-1.986	-0.542	-1.227
Mean of stock return	(0.30)	(-0.82)	(-0.45)	(0.34)	(-0.76)	(-0.38)	(-0.17)
	4.410**	2.924***	1.512***	4.606**	3.008***	1.561***	5.971***
Std of stock return	(2.24)	(4.18)	(3.97)	(2.34)	(4.29)	(4.09)	(3.28)
	-0.007	-0.004	-0.010	-0.006	-0.003	-0.010	-0.030
Term	(-0.13)	(-0.21)	(-1.08)	(-0.11)	(-0.18)	(-1.06)	(-0.58)
	-0.044*	-0.006	-0.012***	-0.045*	-0.006	-0.012***	-0.038
Amount	(-1.69)	(-0.71)	(-2.72)	(-1.70)	(-0.71)	(-2.75)	(-1.57)

	0.049**	0.016**	0.010**	0.050**	0.016**	0.010**	0.052**
Rating	(1.99)	(1.99)	(2.42)	(2.02)	(2.02)	(2.45)	(2.14)
	-0.154***	-0.063***	-0.038***	-0.153***	-0.062***	-0.038***	-0.172***
Secured	(-4.20)	(-5.99)	(-6.48)	(-4.19)	(-5.92)	(-6.45)	(-4.67)
	-0.053**	-0.039***	-0.014***	-0.051**	-0.038***	-0.014***	-0.057**
Rf	(-2.20)	(-4.09)	(-2.98)	(-2.12)	(-4.06)	(-2.91)	(-2.29)
	0.096**	0.045***	0.034***	0.091**	0.043***	0.033***	0.112***
Term_Spread	(2.39)	(3.55)	(4.87)	(2.31)	(3.49)	(4.81)	(2.88)
Constant	1.884***	0.731***	0.019	1.831***	0.708***	0.006	1.804***
	(6.12)	(8.19)	(0.39)	(5.88)	(7.82)	(0.12)	(6.09)
Industry and Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	596	596	596	596	596	596	596
Adj.R^2/ Pse R^2	0.343	0.340	0.454	0.345	0.346	0.459	0.112

This table presents results for various robustness checks. In Panel A, the first three columns provide the results when using the redefined bond covenants measures after dropping four kinds of covenants that are popular and used by over 90% of firms. The last three columns show the results when using media report data from the internet (*Media_Net*). We also shorten the interval of media coverage to consider the impact of media reports on bond covenants in the nine months before and six months before the bond issuance date, and the results are reported in columns (1)–(6) of Panel B. The last column of Panel B provides the Poisson regression results. All variables are defined in Appendix B of the online Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 10. Media coverage, bond covenants, and cost of debt

Variables	OLS			Treatment effect	
	(1)	(2)	(3)	(4)	(5)
	CS	CS	CS	Covenants _Dummy	CS
Media	-0.478**	-0.005	-0.169**		-0.084
	(-2.52)	(-0.06)	(-2.24)		(-1.41)
Total Covenants	-0.860***				
	(-4.48)				
Media*Total covenants	0.226***				
	(2.86)				
Covenants Index		-2.087***			
		(-5.35)			
Media*Covenants index		0.009			
		(0.35)			
Weighted Covenants Index			-6.153***		
			(-6.26)		
Media*Weighted covenants index			1.254***		
			(2.89)		
Covenants Dummy				.	-1.554***
					(-2.88)
Media*Covenants dummy					0.216***
					(3.18)
lamda					0.552*
					(1.77)
Size	-0.173***	-0.169***	-0.114*	0.576***	-0.041
	(-2.77)	(-2.74)	(-1.83)	(5.14)	(-0.39)
MB	-0.085	-0.080	-0.042	0.298***	-0.001
	(-1.46)	(-1.39)	(-0.73)	(4.11)	(-0.01)
Lev	0.358	0.446	0.379	-0.505	0.273
	(0.91)	(1.15)	(0.99)	(-0.77)	(0.68)
ROA	-1.081	-1.167	-1.298	-2.645*	-1.408
	(-1.10)	(-1.24)	(-1.36)	(-1.80)	(-1.30)
State	-0.401***	-0.403***	-0.437***	0.029	-0.370***
	(-4.11)	(-4.12)	(-4.52)	(0.19)	(-3.78)
Tangible_Ratio	0.360	0.331	0.224	-1.427**	-0.080
	(0.89)	(0.86)	(0.58)	(-2.22)	(-0.17)
CashFlow_Vol	4.318**	4.337**	4.445**	-0.647	3.906*
	(2.18)	(2.20)	(2.31)	(-0.23)	(1.86)
Current_Ratio	-0.010	-0.032	-0.020	0.388**	0.088
	(-0.10)	(-0.32)	(-0.20)	(2.16)	(0.75)
Interest_Coverage_Ratio	-0.037	-0.026	-0.044	-0.368***	-0.133*
	(-0.83)	(-0.60)	(-1.00)	(-5.75)	(-1.88)
Z_Score	0.127	0.126	0.139	0.204	0.161
	(1.16)	(1.13)	(1.29)	(1.22)	(1.37)
Mean of stock return	-3.853	-11.598	-7.687	23.234	-3.758
	(-0.15)	(-0.48)	(-0.32)	(0.64)	(-0.15)
Std of stock return	-2.278	0.376	1.735	19.344**	3.049
	(-0.37)	(0.06)	(0.29)	(2.10)	(0.49)
Term	-0.157	-0.155	-0.203	-0.345	-0.286*
	(-1.17)	(-1.13)	(-1.53)	(-1.51)	(-1.93)
Amount	-0.088	-0.091	-0.122	-0.449***	-0.191*
	(-1.10)	(-1.13)	(-1.54)	(-3.04)	(-1.87)
Rating	-0.476***	-0.471***	-0.456***	0.110	-0.442***
	(-6.52)	(-6.38)	(-6.38)	(1.00)	(-5.94)
Secured	0.313***	0.247**	0.234**	-0.496***	0.185
	(3.03)	(2.35)	(2.28)	(-3.16)	(1.55)
Rf	-0.066	-0.117	-0.098	-0.158	-0.100
	(-0.70)	(-1.21)	(-1.04)	(-1.57)	(-1.03)
Term_Spread	0.227*	0.226*	0.331***	0.593***	0.403***
	(1.89)	(1.93)	(2.77)	(3.18)	(2.75)
Constant	7.822***	7.620***	6.433***	-2.196*	6.217***
	(8.47)	(8.40)	(7.80)	(-1.81)	(7.39)
Industry and Year	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	596	596	596	562	562
Adj.R^2/ Pse R^2	0.461	0.468	0.482	0.265	0.442

This table presents the results of how media coverage and bond covenants interactively determine the cost of debt. The OLS regression results are shown in columns (1)–(3), and treatment effect model results are shown in columns (4) and (5). The dependent variable is cost of debt. All variables are defined in Appendix B of the online

Supplementary Material. We report *t*-statistics in parentheses. Our standard errors are robust and clustered at the firm level. Industry and year fixed effects are controlled for. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.