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Social connections between media and firm executives and the properties of media reporting

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Abstract

We study how social connections between top executives of media and listed firms affect the properties of media reporting. We find that socially connected media are significantly more likely to cover a firm than their unconnected counterparts. Their reporting is significantly more optimistically toned and contains significantly less information, and both of these effects are significantly mitigated when the firm has better information environment as represented by greater analyst coverage and larger firm size. Additional analyses show that characteristics of the underlying news, firm, or media also affect the effects of social connections on media reporting properties. Collectively, our evidence suggests the impairment of media independence when media and firms have social connections and the importance of alternative information sources in mitigating this effect.

Keywords Social ties · Media coverage · Media tone · Information

JEL classifications G14 · L82 · M41 · Z13

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"If news is clean, the society would be dirty; if news is dirty, the society would be clean."
—A popular quote on the Internet in China

1 Introduction

The media play important roles in the capital market, and the foundation of these roles lies in media independence. A media watchdog group, Fairness and Accuracy in Reporting (FAIR), notes that the independence of media can be undermined by conflicts of interest inherent in commercial, political, religious, and social connections.[1] The literature focuses on the implications of conflicts of interest related to the media's readers, advertisers, and the government (e.g. Reuter and Zitzewitz 2006; Gentzkow and Shapiro 2006, 2010; Gurun and Butler 2012; Piotroski et al. 2017; You et al. 2018). What has received much less attention is the effect of the media's social connections on its reporting. Thus, we study how the social connections between executives of media and firms influence media reporting.

Social connections may affect media reporting in one of two ways. On the one hand, social connections give the media greater access to value-relevant information about the connected firm, and, at the same time, firms may feel more comfortable providing private or proprietary information to connected media. Either way, connected media are likely to have an information advantage that can generate news reports that are more precise and informative about the firm. We label this effect the *information hypothesis*. On the other hand, social connections can induce favoritism or even collusion and erode the media's professional ethics and independence, subjecting the media outlets to the firm's incentives to manipulate public opinion and resulting in biased reporting. We term this mechanism the *favoritism hypothesis*. The two hypotheses are not necessarily mutually exclusive, and it is not clear which effect will be observed in the data.[2] Furthermore, it is also important to note that media often have other considerations when making their coverage decisions, such as catering to the needs of their readers or advertisers to maximize economic interest, as documented by Gentzkow and Shapiro (2006, 2010), Reuter and Zitzewitz (2006), and Gurun and Butler (2012). Alternatively, media outlets may want to maintain their standing among fellow journalists and may not want to damage their reputations and sacrifice professionalism and independence for social considerations. To the extent that these considerations dominate the influence of social connections, social connections between the firm and the media might not meaningfully affect the properties of media reporting, especially in terms of fostering favoritism. Thus the effect of social connections on the media's reporting is an empirical question.

[1] See FAIR Reports for examples of different kinds of conflicts of interest: https://fair.org/extra/14th-annual-fear-and-favor-review/, https://fair.org/article/media-coverage-of-religion/, and https://fair.org/extra/new-conflict-of-interest-at-nyt-jerusalem-bureau/.

[2] For example, connected media can have access to private information that is otherwise unavailable, but such information may be communicated to the public with bias. Similarly, research on financial analysts has found that analysts bias their forecasts to obtain access to managers and issue more informative forecasts (e.g., Chen and Matsumoto 2006).

We focus on the Chinese market, which is an ideal testing ground to examine this question, for the following reasons. First, Chinese society, compared with those of developed countries in the Western world, is distinctly relationship-oriented, and the impact of social ties there is more palpable, due to market frictions and a weak legal enforcement system (Allen et al. 2005). Faced with high transaction costs, many economic agents would resort to alternative nonmarket channels to explore business opportunities. Against such a background, social networks have become the major impetus for almost every conflict of interest and unfair behavior in the Chinese capital market (Guan et al. 2016; He et al. 2017; Gu et al. 2019). Second, unlike developed capital markets, the Chinese stock market has more retail investors and relatively fewer institutional investors. Because retail investors rely more on public news than other types of news as their information source, the media would have a relatively larger influence on retail investors in the Chinese stock market, which strengthens firms' incentive to exert pressure on connected media to report favorable news. Third, the Chinese media industry lacks well-developed governance, allowing greater opportunities for firms to press connected media to compromise themselves. For example, corruption, such as "paid-for news," red-envelope taking, or even institutional profit seeking is popular in the Chinese media industry (Li 2013). Recently, some media institutions and government officials in China have publicly voiced their concerns over this problem.[3] For these reasons, the effect of social connections on media behavior is likely to be more pronounced in China than in developed markets, providing a higher testing power for our analyses.

Among the many forms of social connections in China, school and hometown ties are two of the most important. A shared educational experience constitutes a vital part of individuals' social networks, because the school's history and culture, captured in its motto, anthem, and spirit can shape students' perspective on the world and their life and values (Massa and Simonov 2011; Guan et al. 2016). In addition, given the massive cultural diversity in China, largely based on geographic location, Chinese society is deeply entrenched with hometown identity; people from the same hometown share the same dialect, cuisine style, and culture. People naturally trust and rely more on people from the same school or hometown. These connections affect not only people's personal lives but also their professional activities. There are also organizations that can formalize or deepen these social connections, such as alumni associations or Tong Xiang Hui (associations of people from the same hometown).

We define social connections based on common educational background or hometown between top executives of media and firms. Our sample is based on Chinese news coverage of firms listed in China stock exchanges between 2005 and 2016. As our analysis is based largely on the pairing of firms and the media, we require that, for a firm-media pair to be considered, the firm should be covered by the media outlet at least once during our sample period. To increase comparability and mitigate the concern that connected and unconnected media or firms differ fundamentally, we further require that for each firm (media) during our sample period, there is at least one connected media

[3] For example, see http://news.ifeng.com/a/20180730/59504361_0.shtml (in Chinese) for a report by the editor of *China Youth Daily*, titled "Many places have begun to taste the evil effects of the lack of media independence," and http://news.ifeng.com/a/20180725/59398656_0.shtml (in Chinese) for guidelines by Party Secretary of Shandong Province that required the media in Shandong Province to strengthen their monitoring role.

(firm) and at least one unconnected media (firm). We find that in 5.3% (7.9%) of the 559,589 firm-media-years (2,011,597 news articles) analyzed in our sample, at least one top executive (chairman or CEO) of the firm has a social tie with the chief editor or CEO of the media outlet.[4] To ensure the robustness of our results and address potential endogeneity concerns, we also adopt propensity-score matching in carrying out our analyses. Our results are generally consistent between the broad full sample and the propensity-score-matched sample.

We first examine coverage decisions of the media. We find that connected media significantly more frequently cover a firm than do unconnected media. This result itself, however, cannot distinguish between the *information hypothesis* and the *favoritism hypothesis*. For example, the connected media can cover the underlying firm due to better access to private information of the underlying firm or due to the mere publicity needs of the firm without substantive information.

We further examine the tone of the articles. The *favoritism hypothesis* predicts that the news reports about connected firms are likely to be optimistic, whereas the *information hypothesis* offers no systematic prediction on the direction of the tone bias. We find strong and robust evidence that connected media tend to have significantly more positive abnormal tone in a news article than do unconnected media after controlling for various firm and media characteristics, including the underlying event and advertising relationship between the firm and the media, supporting the *favoritism hypothesis*. The incremental abnormal optimistic tone in the news articles by connected media, relative to unconnected media, is about 11.2% of the absolute sample median. We also examine market responses to the tone of the news articles. Consistent with the articles by connected media being optimistically biased and investors seeing through the biases, we find that the market responses to the tone are significantly lower if the news article is published by connected media than if it is by unconnected media. This result further reinforces the support for the *favoritism hypothesis.*

As we explain earlier, however, the *information* and *favoritism* hypotheses are not necessarily mutually exclusive. While the bias result is consistent with the *favoritism hypothesis*, this does not preclude the possibility that connected media can provide information that unconnected media cannot access, at least in specific settings. Following prior research (Cready and Hurtt 2002; Cheng et al. 2019), we use the standardized absolute value of cumulative abnormal returns around the publication of the new article to proxy for the amount of information in the articles overall. We find that, on average, articles by connected media are significantly (42.6% of the absolute sample median of the standardized measure) less informative than those by unconnected media. This result again suggests that social connections between media and firms are costly for the capital market.

We perform several additional analyses to further our understanding of the social connections between firms and media. First, we find that the greater optimism and lower information content in news articles by connected media, relative to unconnected media, are significantly mitigated when the firm has a richer information environment (as reflected by greater analyst coverage and larger firm size). This suggests market forces, such as financial analysts, can discourage connected media from exercising favoritism, resulting in greater professionalism and less bias. Second, we find that the

[4] Media CEOs are sometimes referred to with other titles, such as proprietors.

effects of social connections on media tone and information content are more salient for bad news firms, for nonstate-owned enterprises or for regional (as opposed to central) media, suggesting that firm or media incentives also influence the extent of media favoritism. Third, our results on coverage decision, optimism, and information content are also robust when we analyze a sample of news coverage during the earnings announcement window, providing further support to the *favoritism hypothesis*. Finally, research has shown that considerations of advertising business influence media reporting properties. We show that social connections are significantly associated with future advertising relations, suggesting that social connections not only can affect reporting properties directly but can also affect reporting properties indirectly by facilitating advertising relations with the underlying firms. Importantly, our results suggest that the effects of social connections and of advertising relations on reporting properties are distinct from and incremental to each other.

Our study contributes to the literature in several important ways. First, it enriches the literature on social connections and their economic consequences. The literature has examined the economic consequences of social connections of analysts, fund managers, auditors, and bank executives with firm executives (Bruynseels and Cardinaels 2014; Cohen et al. 2008, 2010; Engelberg et al. 2012; Fang and Huang 2017; Guan et al. 2016; He et al. 2017; Gu et al. 2019; Karolyi 2018; Li et al. 2020). Despite the important roles that the media play in the discovery and the dissemination of information in the capital market (e.g. Bushee et al. 2010; Engelberg and Parsons, 2011; Blankespoor et al. 2018), little attention has been paid to the implications of social connections between media and firm executives for media reporting behavior. News reports are not generated through a dispassionate, objective system but through personal reporting and editing by media personnel, the social connections of whom can directly affect news coverage. Ex ante, it is not clear how such connections could affect media reporting properties. This paper fills this gap by showing that social connections significantly undermine the independence and hence objectiveness of media outlets and decrease the information content of their reports.

Second, this paper adds to the literature on media coverage and reporting. The literature focuses on biases that arise from economic or political incentives of the media. For example, Reuter and Zitzewitz (2006), Gurun and Butler (2012), Gentzkow and Shapiro (2010), Piotroski et al. (2017), You et al. (2018), Qin et al. (2018), and Hope et al. (2020) examine media biases related to media advertisers or government agencies. Another related stream of research documents media biases that arise from firms' decisions in hiring investor relations firms or directors with media backgrounds (e.g., Bushee and Miller 2012; Gurun 2016). Taking a new perspective, our study finds that the private one-on-one connections between media and firm executives also undermine media independence, giving rise to biased news reports and impairing the informativeness of these reports. Our analysis of the relation between social connections and advertising relations also provides some initial insights about direct and indirect implications of social connections for media activities.

Moreover, our cross-sectional results shed important light on factors that affect the favoritism incentives of media so that investors can better assess the biases and informativeness associated with media reporting. In particular, we show that the information environment of a firm helps curb the biases and increases the informativeness of news coverage by connected media. This result suggests that market forces,

such as financial analysts, provide healthy "checks and balances" or competition for connected media to act more professionally and independently. This result has broader implications for the importance of maintaining a rich corporate information environment.

The remainder of the paper is organized as follows. Section 2 provides the literature review and develops our hypotheses. Section 3 describes the research design and sample. Section 4 presents our main results, and Section 5 additional analyses. Section 6 concludes.

2 Literature review and hypothesis development

2.1 Literature review

Recently, social connections in the capital market have been a topic of interest in the fields of finance and accounting. In particular, there has been emerging interest among researchers in the private relationships between analysts, auditors, fund managers, bank executives, outside directors, and firm executives, and the economic consequences thereof. Some researchers argue that social connections facilitate information sharing, thereby improving decision quality. For instance, Cohen et al. (2008) find that, when school connections exist between fund managers and company executives, the former invest more in those companies and perform better than they would otherwise. Similarly, Cohen et al. (2010) and Fang and Huang (2017) document that the forecasts of analysts who have social connections with firm executives are timelier and more accurate and that investors can enjoy a higher stock return by following their recommendations. Engelberg et al. (2012) show that, when banks and firms are connected through interpersonal relationships, interest rates are markedly reduced and subsequent firm performance improves following a deal between the two parties. Gu et al. (2019) also observe that fund managers are more likely to hold stocks followed by a connected analyst, which generally yield a higher return.

Some believe, however, that social connections induce favoritism or even collusion, resulting in decision bias and inefficiency. For instance, Bruynseels and Cardinaels (2014), Guan et al. (2016) and He et al. (2017) attribute the impairment of audit quality to the social connections between company CEOs and members of the audit committee, between company CEOs and auditors, and between auditors and members of the audit committee, respectively. Frankel et al. (2011) suggest that board independence is positively associated with the quality of non-GAAP earnings. Fracassi and Tate (2012) find that companies in which CEOs and directors are more closely connected to each other tend to carry out more value-destroying acquisitions and experience a decline in firm value.

Another line of research closely related to our study concerns media bias. This research suggests that media biases can arise due to the personal ability, incentives, and preferences of journalists, editors, and media owners. For instance, Ahern and Sosyura (2015) find that the accuracy of media coverage in the context of merger rumors can be predicted by the journalist's education and industry expertise.

Research also has examined media biases associated with various economic incentives related to profit maximization from media readers or advertisers.[5] For instance, Gentzkow and Shapiro (2006) find that firms slant their reports toward the beliefs of their consumers (i.e., readers), and Gentzkow and Shapiro (2010) show that media respond strongly to reader preferences for like-minded news. Reuter and Zitzewitz (2006) show that mutual fund recommendations are correlated with past advertising expenditures in personal finance publications. Gurun and Butler (2012) find that local media tend to use fewer negative words when covering local companies due to local advertising expenditures. As for political incentives, Piotroski et al. (2017) demonstrate that official (nonofficial) newspapers have become more concentrated on political (commercial) goals after newspaper conglomeration, and, according to You et al. (2018), news produced by market-oriented media is more informative, compared with state-controlled media. Qin et al. (2018) find that reduced economic competition between local governments increases the political media bias by increasing product specialization.

Researchers also have examined media biases that arise from firms' media management, as opposed to economic or political incentives of specific media outlets, relative to others. Bushee and Miller (2012) and Solomon (2012) document that hiring investor relations firms affects how the firm is portrayed in the media in general. Gurun (2016) shows that firms with directors who are media professionals with experience in a news organization (as an owner, executive, editor, etc.) receive more media coverage and that articles written about them include fewer negative words, as compared with articles on control firms.

2.2 Hypothesis development

Instead of focusing on the economic or political incentives of the media or the firm, we examine the private social connections between top executives of the two organizations. Individuals are expected to have more interactions and greater comfort when they interact with those with similar characteristics and experiences (McPherson et al. 2001). A shared experience is an important resource for social interaction, as it can shorten the social distance between individuals, promote a sense of belonging and recognition, and foster long-term relationships via social networks. As discussed above, some studies (Cohen et al. 2008, 2010; Engelberg et al. 2012; Fang and Huang 2017; Gu et al. 2019) have shown that social connections can facilitate the transfer of information, especially that of great subtlety and sensitivity, among economic agents by lowering the information-gathering costs. This type of information transfer can help agents to make better decisions.

In the setting of social connections between firms and media, we expect that firms are more likely to disclose to socially connected media their operational

[5] By "economic incentive," we refer to incentives associated with certain business transactional relations in which one party pays something of value in exchange for something else of value from another party, such as incentives associated with advertising relations. Social connections typically are not motivated by receiving things of value but by one party intrinsically value the well-being of the other party, which is attributable to some common social characteristic, such as hometown or school. In Section 5, we provide some preliminary analysis of possible relations between social connections and one type of transactional relationship, advertising.

information and future strategies as well as more sensitive information for several reasons. First, the social connections engender greater trust between the executives, and thus they are more comfortable in sharing information.[6] Second, social connections also provide greater opportunities for the executives to socialize or communicate with each other, resulting in more information exchange. Through this exchange, the media will have a better understanding of the firm's performance, plans, or newsworthy events. We refer to this effect the *information hypothesis*, under which connected media are expected to have an information advantage, relative to unconnected media.

It should also be recognized, however, that the personal sentiment and mutual trust between media and firm executives can compromise the independence of the media, preventing them from remaining truthful and dispassionate in their news reports. Bruynseels and Cardinaels (2014), Guan et al. (2016), and He et al. (2017) find similar results for social connections in the auditing industry. Extending their argument to the media industry, media-firm social connections may lead to media bias for at least three reasons. First, favoritism bias could be engendered unconsciously by the homophily developed between the two parties (Granovetter 1985; Uzzi 1996). This homophily may lower media executives' professional skepticism, resulting in their overreliance on evidence collected from connected firms. Second, social connections through education and hometowns are likely to give rise to sentiment connections, under which media executives are likely to cater to firm executives' objectives in portraying the firm more positively. Finally, social connections can facilitate business relations between the two parties. For example, connected firms are more likely to become the media's advertisers, which can further undermine the media's independence and increase bias. We term this effect of social ties the *favoritism hypothesis*.

Theoretically, both the *information hypothesis* and the *favoritism hypothesis* can affect connected media's coverage decisions. We examine three aspects related to media reporting: the decision to cover a specific firm in a news article, the bias of the news article, and the information content of the news article. Under the *information hypothesis*, connected media are more likely to cover the underlying firm if they have access to information unavailable to other media. Given the competition of the media industry, they are more likely to publish this information to profit from the information advantage and increase circulation. The *favoritism hypothesis*, however, may also predict greater extent of news coverage. To the extent that firms need publicity to gain investor recognition, they can capitalize on their social connections with media executives and obtain greater media coverage. The *favoritism hypothesis* may also predict lower coverage if the underlying firm has bad news, because the connected media can help keep the public image of the firm positive by intentionally omitting bad news. This discussion leads to an unclear prediction for our first hypothesis on media coverage decisions, which is stated in null form as follows.

[6] We note that, while social connections can foster personal relations, for social connections to affect media reporting properties, pre-existing personal relations between the executives are not a necessary condition. Mutual trust and empathy arising from the common background can influence media coverage even absent personal relations.

H1: Social connections between media and firm executives have no effect on the decision of media coverage.

Our second hypothesis relates to the tone of the news coverage. If the *information hypothesis* prevails, we expect the news to be more accurate with less optimistic bias, leading to a more balanced news tone. In contrast, under the *favoritism hypothesis*, the media news is expected to be more optimistic for connected media, given that the connected firms have an incentive to maintain a positive image in the public domain. We state our second hypothesis in null form as follows.

H2: Social connections between media and firm executives have no effect on the decision of media coverage.

Finally, we examine the information content of the news coverage by connected and unconnected media. The *information hypothesis* predicts that connected media are likely to have information advantages and hence publish more informative reports. The *favoritism hypothesis* does not provide unambiguous predictions, because the biases introduced by the favoritism do not preclude the possibility that the news reports themselves contain information. If the biases are so large that they overwhelmingly distort the underlying information, however, the news reports can be less informative. Our final hypothesis, stated in the null form, is as follows.

H3: Social connections between media and firm executives have no effect on the information content of news coverage.

Note that the *information hypothesis* and the *favoritism hypothesis* are not mutually exclusive and evidence of both hypotheses can be observed simultaneously. Furthermore, *information hypothesis* might dominate in certain settings, while the *favoritism hypothesis* prevails in others. To further our understanding of the implications of the social connections under different conditions, in testing our hypotheses, we also examine our sample along different cross-sections. Finally, note also that considerations other than social connections, such as catering to the needs of readers or advertisers or maintaining the standards and ethics for journalism, can help shape media coverage. To the extent that these considerations dominate the implications of social connections of the media, social connections may only have second-order effects that are not detectable by statistical tests.

3 Data, variable definitions, and descriptive statistics

3.1 Data and sample

Following Piotroski et al. (2017), we obtain information on media coverage from the Chinese News Analytics Database (CNAD) developed by Datago Technology Limited, which covers news reports about listed firms published in newspapers since 1998. We keep both business newspapers and other broad scoped newspapers (such as evening or metro newspapers) as long as they cover publicly listed firms.

We examine social connections between top executives of media and firms. Compared to lower level corporate employees, corporate executives are more likely to care about the firm's public image and possess significant information. Similarly, compared to journalists, media executives oversee the coverage decisions and are likely to exercise greater influence on the tone or information disclosed in the news articles (Call et al. 2020).[7] We consider CEOs or chief editors for media organizations and CEOs or chairmen for firms as our top executives. We obtain data about firm executives' education and birthplace from the Chinese Executives Profile Database (CEPD), also developed by Datago Technology Limited. For all listed firms in China, CEPD gathers and integrates the information available on websites, such as baike.baidu.com, renwu.hexun.com, finance.ifeng.com, as well as in corporate filings.

The list of media executives is collected from *China Journalism Yearbook*, compiled by the Institute of Journalism and Communication at the Chinese Academy of Social Sciences. The yearbook provides details of the establishment and development of journalism in China, from which we acquire a list of names of senior executives (i.e., CEOs and editors-in-chief) of each mainstream media outlet every year. We then complement this dataset with the birthplace and education of each media executive through a manual search in the aforementioned websites as well as interviews or other profiling, if available, of these media executives.[8] The data on other variables used in this study are all from CSMAR.

Our sample starts from 2005, before which the data on newspaper executives is scarce, and ends in 2016.[9] To further enhance the accuracy of our data, we remove executives with both educational background and birthplace information missing. We consider a media outlet and a firm to be connected if the CEO or editor-in-chief of the media outlet attended the same university or was born in the same city as the chairman or CEO of the firm.[10] For a specific firm-media pair to be included in our sample, we require that the firm has been covered by the media at least once during the sample period. To increase comparability and mitigate the concern that connected and unconnected firms differ fundamentally, we further require that for each firm (media) during

[7] Journalists may directly receive coverage assignments from their superiors, and their writeups are always subject to final approvals from media executives. This is particularly true in China, where media executives have dominating power in the organization. For example, in the *twenty-first Century Business Herald* blackmail scandal in 2014, the former leader of the newspaper played an important role in leading and coordinating the illegality.

[8] Since the yearbook is always published one year after the statistics are collected, information about media executives disclosed in the next calendar year is used for the current year.

[9] In 2005, in a spirit similar to the Regulation Fair Disclosure (Reg FD) in the United States, the China Securities Regulatory Commission issued a guideline that requires fair disclosure to all investors or other potential interested parties by publicly listed firms. Nearly all of our sample period starts after the issuance of this guideline. To the extent that the guideline completely prevents private communication, it should work against the *information hypothesis* (with limited implications for the *favoritism hypothesis*). However, research in the United States (e.g., Solomon and Soltes 2015) has shown that, even after Reg FD, there continues to be evidence of selective disclosures. Thus how this guideline affects the *information hypothesis* is an empirical question.

[10] We keep all observations as long as either educational background or birthplace can be identified. While there may indeed exist social ties that we could not identify due to missing information, we expect it to bias against finding results. As a robustness test, we keep only those observations for which both the educational background and birthplace information are available and find robust results. In addition, we also test the influence of school ties and hometown ties separately; the results are significant and consistent with our main results.

our sample period, there are at least one connected media (firm) and one connected unconnected media (firm). After removing observations with missing control variables, we obtain a full sample of 1427 distinct firms, 559,589 firm-media-years, 2,011,597 news articles, among which 158,611 news articles have executive social ties.

Table 1 provides a list of the top 10 universities and birthplaces affiliated with firm and media executives in the full sample. For ease of presentation, except for the four municipalities of Beijing, Shanghai, Tianjin, and Chongqing, we summarize all other birthplace cities by province. In Panel A, we identify 6234 firm executive-university pairs and 2452 firm executive-birthplace pairs separately in our sample. Not surprisingly, several elite universities, such as Tsinghua University, Peking University, and China Europe International Business School, account for a large percentage of the executive-university pairs. Additionally, Zhejiang and Shanghai are two provinces/cities with the most executive-birthplace pairs, followed by other economically advanced provinces, including Jiangsu, Shandong, and Guangdong.

In Panel B, 288 media executive-university pairs in our sample are identified, most represented by Fudan University, Renmin University of China, Jinan University, and Peking University, all of which are reputed for their journalism programs. As for their birthplace, Guangdong and Jiangsu account for most of the 223 media executive-birthplace pairs.

Because people cannot choose whom to become alumni or fellow townsmen with and firms (media) are unlikely to hire top executives for the mere reason of connections with a specific media (firm), we believe that the social connections between media and firm executives are largely exogenous to our setting. However, the possibility remains that social connections are more likely to exist in certain types of firms that tend to have specific properties in media coverage, resulting in self-selection bias for our sample. Furthermore, nonlinear impacts of our control variables could also bias our coefficients of interest in the direction we observe. To mitigate these concerns and increase the comparability between our connected firm-media pairs and unconnected firm-media pairs, in addition to our full sample, we also adopt a propensity-score-matched sample to test our hypotheses. We discuss the details of the matching in Section 4 when we discuss our tests.

3.2 Variable definitions

3.2.1 Social connections

Our key variable of interest is an indicator variable *Connected*, which equals to 1 if for a given year there exists at least one school or hometown tie between the media and the firm executives and 0 otherwise. Following Guan et al. (2016) and Gu et al. (2019), we identify a school tie if the executives attend the same university as undergraduates or post-graduates, regardless of the specific period, campus, or major. This is because, first, if the two studied at the same university at the same time, they might have already formed private relationship through their personal dealings on campus; second, even if their school years did not overlap, they are likely to establish personal ties via alumni associations or other activities after graduation; third, as mentioned before, the ideology and culture of a school can have a far-reaching impact on its students and can foster mutual trust and a sense of belonging among alumni.

Table 1 Top ten universities and birthplaces with firm-media affiliation

Panel A: Rank by firm executives

Rank	Universities ($N = 6234$)	Frequency	Percentage
1	Tsinghua University	318	5.10
2	Peking University	270	4.33
3	China Europe International Business School	174	2.79
4	Zhejiang University	165	2.65
5	Fudan University	155	2.49
6	Renmin University of China	155	2.47
7	Shanghai Jiao Tong University	106	1.70
8	Xi'an Jiaotong University	99	1.59
9	Huazhong University of Science and Technology	85	1.36
10	Cheung Kong Graduate School of Business	80	1.28

Rank	Provinces/Cities ($N = 2452$)	Frequency	Percentage
1	Zhejiang	276	11.26
2	Shanghai	214	8.73
3	Jiangsu	209	8.52
4	Shandong	199	8.12
5	Guangdong	188	7.67
6	Beijing	171	6.97
7	Hunan	133	5.42
8	Hubei	126	5.14
9	Hebei	91	3.71
10	Henan	88	3.59

Panel B: Rank by media executives

Rank	Universities ($N = 288$)	Frequency	Percentage
1	Fudan University	24	8.33
2	Renmin University of China	22	7.64
3	Jinan University	14	4.86
4	Sun Yat-sen University	13	4.51
5	Peking University	12	4.17
5	Graduate School of Chinese Academy of Social Sciences	12	4.17
7	Wuhan University	11	3.82
8	Sichuan University	10	3.47
9	Nanchang University	8	2.78
9	Zhejiang University	8	2.78

Rank	Provinces/Cities ($N = 223$)	Frequency	Percentage
1	Guangdong	23	10.31
1	Jiangsu	23	10.31
3	Hubei	20	8.97
4	Shandong	19	8.52
5	Zhejiang	16	7.17

Table 1 (continued)

6	Beijing	12	5.38
6	Henan	12	5.38
8	Jiangxi	10	4.48
9	Anhui	9	4.04
9	Hebei	9	4.04
9	Shaanxi	9	4.04
9	Sichuan	9	4.04

This table lists top 10 universities and top 10 provinces/cities represented by sample firm executives (Panel A) and media executives (Panel B)

Following Li et al. (2020) and Gu et al. (2019), we consider the executives from the firm and the media having birthplace-based social connections when they share the same birth city. We define this type of connection based on city as opposed to province to more precisely capture the potential connections, increasing the power of our test. For executives with only province-level but not city-level birthplace information, we impose a strict requirement and treat the birthplace information as missing.

3.2.2 Dependent variables

For H1, which tests on media coverage decisions, we perform the test at the firm-media-year level. We define coverage frequency *Coverage* as a continuous variable measured as the log (1+ number of news released by each media for the firm in a given year).

Our test of the news tone in H2 is performed at the news article level. Following Piotroski et al. (2017), we measure the tone (*Tone*) of each news report as follows: (number of positive sentences – number of negative sentences) / (number of positive sentences + number of negative sentences +1). Different from the word-list approach commonly used in research, the CNAD database uses a machine learning approach, which identifies the sentiment of each sentence as positive, neutral, or negative and eventually calculates a score indicating the overall tone of each sentence.

To increase the comparability in the sentiment across different news article, in our main tests we follow Tetlock et al. (2008) and use a standardized version of the tone variable (*ABN_Tone*), calculated as $(Tone\text{-}\mu_{Tone})/\ \sigma_{Tone}$, where μ_{Tone} and σ_{Tone} are the mean and standard deviation of *Tone* of all media articles on the firm over the prior calendar year. The standardized version of the tone measure controls for generic tone tendency or distribution of a media outlet during a specific period and is more likely to capture its strategic tone choices.

In H3, we test the information content of the news articles by connected and unconnected media. We measure the information content using the absolute value of cumulative abnormal returns (*ABSCAR*) in the two-day window [0, 1] around each news reporting date. Similar to our tone test, we use standardized absolute abnormal returns (*ABN_ABSCAR*), following Cready and Hurtt (2002) and Cheng et al. (2019), in our main test. Specifically, it is calculated as the difference between two-day *ABSCAR* and the mean value of the 125 two-day *ABSCAR* in the normal trading day period, [−250, −2], divided by the standard deviation of the two-day *ABSCAR* in the normal period.

3.2.3 Control variables

Our sample selection process already ensures that each firm in our sample has both connected and unconnected media and that each media outlet has both connected and unconnected firms, which should control for underlying differences between connected and unconnected firms or media. Furthermore, we also include both firm and media fixed effects in our regressions. Nevertheless, we include a number of control variables to mitigate further concerns that firm or media characteristics drive our results. Following Bushee et al. (2010), Dai et al. (2015), Hope et al. (2020), Piotroski et al. (2017), and You et al. (2018), we control for variables that could affect the properties of media coverage, including earnings decrease (*BNews*), return on assets (*ROA*), stock return (*Return*), firm size (*Size*), financial leverage (*Leverage*), market-to-book ratio (*MB*), the holding percentage of the largest shareholder (*Top1*), stock turnover (*TV*), variance in stock return (*STD*), the number of analysts following (*NAnalyst*), and whether the firm is a state-owned enterprise (*SOE*). We also control for whether the media and the firm are headquartered in the same city (*Local*) and whether the firm advertises with the media outlet in the year (*Advertising*), as research (e.g., Gurun and Butler 2012; Hope et al. 2020) finds that local media provide favored or biased news coverage for the underlying firms due to the pressure from local government or advertising relations.[11] To eliminate the effect of extreme values, all continuous control variables are winsorized at 1% and 99%. See Table 10 for detailed variable definitions.

3.3 Descriptive statistics

Table 2 presents descriptive statistics of our full sample by firm and news. Panel A suggests that most of our sample firms are from the manufacturing industry (53%), followed by information technology and real estate (about 8%). In Panel B, we classify our sample news articles into connected and unconnected groups and present their distribution over time. As is shown in the table, news articles by connected media constitute about 8% of our sample, suggesting that media outlets socially connected to a firm are still in the minority. An untabulated analysis shows that education- and birthplace-based connections each account for 5.5% and 2.7% of our sample, respectively, and sometimes overlap.

Panel C of Table 2 reports descriptive statistics of the main variables used in our regression models at the firm-media-year level and the news level, separately. At the firm-media-year level, the variable *Coverage* has a mean of 0.634. At the news level, the variable *Tone*, has a mean of 0.313 and a median of 0.490, suggesting that, on average, the news reports in the sample are relatively positive toward the firms they cover. The mean and median of *ABSCAR* are 0.028 and 0.017 respectively. The indicator for social connections, *Connected*, has a mean of 0.053 (0.079) at the firm-media-year (news) level. The distributions of other variables largely resemble those of prior research, and, for brevity, we omit discussing their descriptive statistics.

[11] In untabulated analyses, we also control for indicators for elite colleges and top four cities as hometowns for both firm and media executives to rule out the possibility that a few observations from these backgrounds drive our results. Our results are robust to these controls.

Table 2 Sample distribution and descriptive statistics

Panel A: The number of firms by industry

Industry	Total	Percentage
Manufacturing	758	53.12
Information technology	109	7.64
Real estate	109	7.64
Wholesale and retail trade	86	6.03
Social services	64	4.48
Utilities	61	4.27
Finance	55	3.85
Transportation	54	3.78
Construction	36	2.52
Mining	32	2.24
Communication	29	2.03
Agriculture	19	1.33
Comprehensive	15	1.05
Total	1427	100

Panel B: The number of news articles by year

Year	Unconnected	Connected	Total
2005	116,942	8398	125,340
2006	106,690	9434	116,124
2007	139,214	12,345	151,559
2008	205,997	17,384	223,381
2009	182,023	16,512	198,535
2010	187,981	15,822	203,803
2011	191,665	18,279	209,944
2012	188,957	15,646	204,603
2013	176,787	15,142	191,929
2014	148,809	11,954	160,763
2015	114,707	9464	124,171
2016	93,259	8186	101,445
Total	1,853,031	158,566	2,011,597

Panel C: Descriptive statistics of main variables

	Firm-media-year level			News article level (Full sample)		
Variables	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Coverage	0.634	0.000	0.924			
Tone				0.313	0.490	0.524
ABN_Tone				−0.040	0.250	1.169
ABSCAR				0.028	0.017	1.274
ABN_ABSCAR				0.166	−0.190	1.274
Connected	0.053	0.000	0.223	0.079	0.000	0.269
BNews	0.393	0.000	0.488	0.314	0.000	0.464
ROA	0.035	0.033	0.061	0.035	0.028	0.047

Table 2 (continued)

Return	0.370	0.118	0.880	0.322	0.065	0.863
Size	22.450	22.140	1.741	24.730	24.000	2.837
Leverage	0.520	0.525	0.223	0.629	0.623	0.228
MB	3.673	2.655	3.589	2.936	2.100	2.566
TV	4.846	3.945	3.515	3.174	2.341	2.976
STD	0.031	0.029	0.010	0.028	0.027	0.010
NAnalyst	1.666	1.792	1.206	2.615	2.890	1.131
SOE	0.585	1.000	0.493	0.750	1.000	0.433
Top1	0.368	0.347	0.161	0.379	0.349	0.194
Local	0.085	0.000	0.279	0.217	0.000	0.412
Advertising	0.040	0.000	0.196	0.322	0.000	0.467

This table presents the distribution of individual sample firms by industry (Panel A), sample news articles by year (Panel B), and descriptive statistics of our main variables at the firm-media-level and news article level respectively (Panel C)

4 Empirical analysis

4.1 Social connections and news coverage

As discussed earlier, we test our H1 about the relationship between social connections and news coverage at the firm-media-year level. We estimate the following model.

$$Coverage_{i,j,t} = \alpha + \beta_1\, Connected_{i,j,t} + \beta_2\, Controls + \varepsilon_{i,j,t} \quad (1)$$

In Model (1), $Coverage_{i,j,t}$ denotes the frequency at which media j releases news about firm i in year t, and $Connected_{i,j,t}$ denotes whether media j is connected with firm i in that year. *Controls* are the control variables discussed in Section 3.2.3. We also include firm, media, and year fixed effects in the regressions. Standard errors are clustered at the firm level.

If the media are more likely to cover connected firms, we should expect β_1 to be positive. The result in Column (1) of Table 3 is based on our full sample and shows that the coefficient on *Connected* is 0.104, significantly positive at 1%. This result suggests that connected media cover the underlying firms more frequently than their unconnected counterparts.[12]

As to control variables, the media are more inclined to cover firms with worse performance, larger size, higher risk, or larger analyst followings. These results are generally consistent with those of Call et al. (2020), who suggest that media prefer controversial topics and that sell-side analysts are an important source of information for media. In addition, consistent with prior research, a media outlet more frequently covers a firm when the former is geographically closer to the firm or when it has advertising engagement with the firm.

Because both firm and media characteristics are subject to potential endogeneity concerns, in Column (2) and (3), we implement the propensity-score matching to

[12] In untabulated tests, we also use a dummy variable, which equals to 1 if a media outlet releases at least one news article about a firm in a given year and 0 otherwise. The results are qualitatively similar.

Table 3 The effect of social connections on media coverage decision

	Full sample	PSM procedure	
		Selection model	Matched sample
	(1)	(2)	(3)
Dep. Var.=	*Coverage*	*Connected*	*Coverage*
∑*R*(*SCH*)		0.379***	
		(33.57)	
∑*R*(*HOM*)		0.147***	
		(8.30)	
Connected	0.104***		0.104***
	(11.13)		(10.32)
BNews	−0.009*	0.006	−0.017*
	(−1.71)	(0.51)	(−1.95)
ROA	−0.138*	−0.003	−0.307***
	(−1.83)	(−0.02)	(−2.78)
Return	−0.015***	−0.011	−0.019**
	(−2.74)	(−1.26)	(−2.05)
Size	0.101***	−0.036***	0.140***
	(9.22)	(−3.06)	(8.50)
Leverage	0.015	−0.033	−0.057
	(0.45)	(−0.63)	(−1.05)
MB	0.009***	0.001	0.009***
	(5.78)	(0.42)	(4.29)
TV	0.003***	0.003	0.003*
	(2.62)	(1.20)	(1.67)
STD	8.409***	0.331	8.359***
	(11.14)	(0.26)	(7.22)
NAnalyst	0.044***	−0.004	0.053***
	(7.69)	(−0.36)	(5.86)
SOE	−0.020	−0.063**	−0.035
	(−0.74)	(−2.31)	(−0.95)
Top1	−0.108	−0.123	0.100
	(−1.64)	(−1.54)	(0.99)
Local	0.460***	0.814***	0.534***
	(22.12)	(24.91)	(19.37)
Advertising	0.631***	0.094***	0.688***
	(32.07)	(4.25)	(22.67)
Constant	−1.585***	−2.059***	−2.674***
	(−6.94)	(−7.12)	(−7.61)
Industry FE	No	Yes	No
Firm FE	Yes	No	Yes
Media FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 3 (continued)

	Full sample	PSM procedure	
		Selection model	Matched sample
	(1)	(2)	(3)
Dep. Var.=	*Coverage*	*Connected*	*Coverage*
Observations	559,589	559,589	58,982
Adjusted R^2	0.556	0.184	0.611

This table examines the effect of social connections on media coverage decision at the firm-media level. Column (1) reports results based on the full sample. Columns (2) and (3) report propensity-score-matching estimation results for the selection model and the test regression respectively. *Coverage* equals to log (1 + number of news released for the underlying firm by each media in a given year). Our variable of interest is *Connected*, which takes the value of 1 if the media is socially connected with the firm in that year and 0 otherwise. See Table 10 for detailed variable definitions. The *t*-statistics are shown in parentheses based on standard errors adjusted for heteroscedasticity and clustered by firm. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

address these concerns. Specifically, we include all firm-media-years and estimate a probit selection model of *Connected* that uses the main control variables of both firm and media characteristics in our previous models as the independent variables. We control for industry, instead of firm fixed effects, so that the calculation process can converge. Furthermore, similar to Guan et al. (2016), we include two more important independent variables, $\sum R(SCH)$ and $\sum R(HOM)$, in our model, which denote the probability that the media and the firm executives are connected through school and hometown ties, separately. The greater $\sum R(SCH)$ or $\sum R(HOM)$ is, the more likely it is for the firm to have social ties with the media.[13]

Columns (2) of Table 3 report the regression results of the first-stage model. The coefficients on $\sum R(SCH)$ and $\sum R(HOM)$ are both significantly positive, consistent with the prediction that a higher $\sum R(SCH)$ or $\sum R(HOM)$ significantly increases the likelihood for the media and the firm to be socially connected. Untabulated results show that the matching is successful in that there is almost no significant difference on all control variables between the connected firm-media-years and the matched unconnected ones.

We next match each connected firm-media (without replacement) to an unconnected firm-media with the closest propensity score in the same year obtained from this first-stage estimation. We use the resulting firm-media-years to estimate Model (1) and report the results in Column (3) of Table 3. The results are consistent with the full-sample results, showing significantly positive coefficients on *Connected*, suggesting that, even after controlling for potential endogeneity, connected media are more likely to cover a firm than their unconnected counterparts.

[13] The variable $\sum R(SCH)$ is constructed as follows. First, we determine the percentile rank of each university in terms of the number of firm and media executives that it has graduated, respectively, which we denote as *R*(*SCH*)_*firm* and *R*(*SCH*)_*media*. We then define *R*(*SCH*) as the average of these two ranks. A higher *R*(*SCH*) suggests that more media and firm executives have graduated from a given university. In particular, for universities that have never graduated a firm or media executive, we set its *R*(*SCH*) to zero, as social ties between media and firm executives can never emerge from these universities. Finally, we add up the values of *R*(*SCH*) of all the universities attended by the executives of each firm-year and denote the sum as $\sum R(SCH)$. We calculate $\sum R(HOM)$ analogously for hometown ties for each firm.

4.2 Social connections and news tone

We employ the following model to test our hypothesis H2 on the effect of social connections on media reporting tone.

$$ABN\_Tone_{i,j,k,t} = \alpha + \beta_1\ Connected_{i,j,t} + \beta_2\ Controls + \varepsilon_{i,j,t}, \quad (2)$$

where subscripts *i*, *j*, *k*, and *t* denote firm, media, news article and year, respectively. $ABN\_Tone_{i,j,k,t}$ denotes the abnormal tone of news article *k* on firm *i* published by media *j* in year *t*, whereas $Connected_{i,j,t}$ indicates whether firm *i* has a social tie with media *j* in year *t*.[14] While higher tone does not necessarily reflect greater bias, we control for underlying firm performance and other characteristics described in Section 3.2.3 so the coefficient of *Connected* reflects the "excess" or "abnormal" degree of positive tone. We include firm, media and year fixed effects and cluster the standard errors at the firm and date level, following prior research (Petersen 2009; You et al. 2018).

Under the *favoritism hypothesis*, the news from the connected media would be more optimistic, and we expect β_1 to be positive in Model (2); under the *information hypothesis*, the connected news would be more informative but not systematically biased. In this case, β_1 should be insignificantly different from zero.

The regression results are reported in Table 4. In Column (1), with the full sample, the coefficient on *Connected* is 0.028 and significant at the 0.01 level. This result suggests that social connections bias the news tone upward, consistent with the *favoritism hypothesis*. The magnitude of the coefficient on abnormal tone translates to about 11.2% of absolute sample median.

The sample used in Column (1) includes all news articles and may contain two types of reporting biases induced by executive connections. First, for the same underlying event, the executives intentionally bias the tone upward in the published news article (content bias). Second, the executives can selectively cover events that are more positive in nature (i.e., selection bias; e.g., Piotroski et al. 2017). Since our tests based on the full sample yield results that are consistent with both types of bias, we cannot unambiguously identify which type is at play. As we cannot observe all newsworthy events that either connected or unconnected media have access to but decide not to cover, we cannot directly test for the selection bias. However, we can reasonably test for the content bias by restricting the sample to news articles on days when there are articles published by both connected and unconnected media about the same firm. The assumption is that both types of media have access to the events but may opt to cover them differently. We call this more comparative subsample "common sample" and present the corresponding results in Column (2) of Table 4. We continue to find significantly positive coefficients on *Connected*; furthermore, the coefficient is

[14] We perform several sensitivity tests for H2. We use alternative dependent variables: the nonstandardized tone and additional tone indicators, *Tone_pos* and *Tone_neg*, which represent the proportion of positive and negative sentences to all sentences in each news report. Our inferences remain unchanged. We also re-estimate our model using firm-media-year (firm-media-month) observations in which we average *Tone* on a yearly (monthly) basis to account for the different numbers of reports that a media outlet might publish about a firm each year (month). Our results continue to be robust.

Table 4 The effect of social connections on media tone

	Full sample	Common sample	PSM procedure	
			Selection model	Matched sample
	(1)	(2)	(3)	(4)
Dep. Var.=	*ABN_Tone*	*ABN_Tone*	*Connected*	*ABN_Tone*
∑*R*(*SCH*)			0.337***	
			(24.07)	
∑*R*(*HOM*)			0.135***	
			(5.42)	
Connected	0.028***	0.048***		0.018***
	(7.63)	(11.77)		(3.54)
BNews	−0.070***	−0.084***	−0.024	−0.057***
	(−16.44)	(−8.86)	(−1.39)	(−6.58)
ROA	0.667***	0.446**	0.139	0.226
	(9.90)	(2.03)	(0.66)	(1.59)
Return	0.043***	0.024***	−0.013	0.038***
	(12.44)	(3.00)	(−1.02)	(5.79)
Size	−0.037***	−0.012	−0.045***	0.004
	(−6.85)	(−0.71)	(−2.99)	(0.31)
Leverage	0.060**	−0.004	0.008	0.050
	(2.53)	(−0.05)	(0.11)	(0.91)
MB	0.003**	0.023***	−0.003	0.008***
	(2.41)	(6.82)	(−0.81)	(3.19)
TV	−0.010***	−0.014***	0.003	−0.015***
	(−11.25)	(−5.13)	(0.74)	(−7.19)
STD	−7.271***	−10.339***	0.714	−9.495***
	(−15.24)	(−8.95)	(0.40)	(−10.32)
NAnalyst	0.014***	0.001	−0.027*	0.002
	(3.26)	(0.08)	(−1.75)	(0.26)
SOE	0.058***	0.166***	−0.037	0.116***
	(5.39)	(6.14)	(−0.94)	(4.99)
Top1	0.131***	0.194*	−0.132	0.173**
	(4.34)	(1.83)	(−1.25)	(2.40)
Local	0.116***	0.088***	0.783***	0.121***
	(38.13)	(19.65)	(17.94)	(17.37)
Advertising	0.060***	0.070***	0.077***	0.059***
	(25.43)	(18.02)	(2.72)	(9.49)
Constant	0.386***	−0.246	−1.703***	−0.603**
	(3.15)	(−0.66)	(−4.75)	(−2.08)
Industry FE	No	No	Yes	No
Firm FE	Yes	Yes	No	Yes
Media FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 4 (continued)

	Full sample	Common sample	PSM procedure	
			Selection model	Matched sample
	(1)	(2)	(3)	(4)
Dep. Var.=	*ABN_Tone*	*ABN_Tone*	*Connected*	*ABN_Tone*
Observations	2,011,597	723,227	161,070	268,052
Adjusted R^2	0.064	0.107	0.187	0.066

This table examines the effect of social connections on media tone bias. Columns (1) and (2) report results using the full sample and common sample respectively. Columns (3) and (4) report propensity-score-matched estimation results for the selection model and the test regression respectively. *ABN_Tone* is standardized tone of the news article. Our variable of interest is *Connected*, which takes the value of 1 if the media is socially connected with the firm in that year and 0 otherwise. See Table 10 for detailed variable definitions. All standard errors are adjusted for heteroscedasticity and clustered by firm and date. The t-statistics of each coefficient are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

higher for the common sample than for the full sample, with greater economic significance as well (20.3% relative to sample median).[15] Finally, similar to Table 3 for H1, we also employ propensity-score matching to address potential selection concerns.

For control variables, the coefficients generally have predicted signs and are in line with prior studies (You et al. 2018; Piotroski et al. 2017): media tone is more likely to be positive for firms with better accounting and stock performance, less financial leverage, lower risk, greater analyst followings, more geographical proximity from the media, and advertising engagement with the media.

Similar to Table 3, Columns (3) and (4) of Table 4 present the propensity-score-matching results for the selection model and the empirical test respectively. The selection model is estimated at the media-firm-year level and requires the media outlet to release at least one news report about the firm in a given year to be included in the estimation, because our test for H2 is performed at the news level. In Column (4), the coefficient on our variable of interest, *Connected*, continues to be significantly positive based on the matched sample, consistent with the full sample result. This lends further robustness to the finding that social connections increase the optimistic tone in the media coverage.

4.3 Social connections and news information content

News articles contain information beyond what is communicated through the tone of the articles. For example, an article may provide quantitative analysis of a firm's performance or describe a firm's strategy in toneless language. This information is not captured in our *Tone* measure. To provide a more comprehensive measure of the information content of the news articles, as explained in Section 3, we use a

[15] As a robustness test, we also construct another sample requiring that at least one unconnected media outlet covers the same firm as the connected media within [−7, 7] days of each reporting date by the connected media, and the results are qualitatively similar.

standardized version of the absolute value of *CAR* as our dependent variable and estimate the following model.[16]

$$ABN\_ABSCAR_{i,t} = \alpha + \beta_1\ Connected_{i,j,t} + \beta_2\ Controls + \varepsilon_{i,j,t} \quad (3)$$

Note that, for the common sample in which both connected and unconnected media release news articles about the same firm on the same day, it is impossible to estimate differential market reaction toward news from connected versus unconnected media, given the same *ABN_ABSCAR*. Therefore H3 can be meaningfully tested only with a "noncommon" sample, which excludes all articles released by connected and unconnected media on the same day. For the propensity-score matching, in the first stage we only include firm-media-years with at least one news release in the noncommon sample. We then analyze all news articles associated with the resulting matching firm-media-years in the second stage estimation.

We present the results in Table 5. In Columns (1) and (3) with the noncommon sample and the corresponding matched sample, respectively, the coefficient on *Connected* is significantly negative, suggesting that, on average, news reports from the connected media contain less information. In terms of economic significance, the difference between the information content of news articles by connected media and those by unconnected media amounts to about 42.6% of absolute median *ABN_ABSCAR* of the noncommon full sample. Overall, our results suggest that social connections significantly decrease the information content of news articles.

4.4 Cross-sectional analyses conditional on firm and media characteristics

4.4.1 Information environment

Our results so far are mostly consistent with the *favoritism hypothesis* and suggest that social connections introduce biases and dilute the information content of news coverage. Other market-based factors, however, can either mitigate or magnify the favoritism incentives. Gentzkow and Shapiro (2006) theoretically show that that media bias will be less severe when consumers receive independent evidence on the true state of the world. Accordingly, we expect the favoritism incentives and the associated undue effects to vary with the information environment of the firm. A rich information environment provides information independent of the media, reducing the information advantage and the favoritism incentives of the connected media. On the other hand, a richer information environment can also force the connected media to make full use of their private connections of firm executives to get access to private information to sustain their circulation level and remain competitive. Thus the effects of the information environment on coverage decisions and information content of the coverage are unclear. Their effects on the tone of the coverage, however, are expected to be negative, because, when information environment is relatively rich, investors are more likely to see through the optimistic bias of connected media, which then constrains the extent of that bias. This implies a monitoring role (intentional or unintentional) of the information environment for the media market.

[16] When we use *ABSCAR* as our dependent variable, the inferences are unchanged.

Table 5 The effect of social connections on the information content of media coverage

	Non-common sample	PSM procedure	
		Selection model	Matched sample
	(1)	(2)	(3)
Dep. Var.=	*ABN_ABSCAR*	*Connected*	*ABN_ABSCAR*
∑*R*(*SCH*)		0.336***	
		(21.58)	
∑*R*(*HOM*)		0.144***	
		(5.12)	
Connected	−0.080***		−0.052***
	(−8.85)		(−3.58)
BNews	0.023***	−0.029	0.008
	(2.90)	(−1.44)	(0.54)
ROA	−0.031	0.264	−0.056
	(−0.31)	(1.02)	(−0.26)
Return	0.096***	−0.009	0.095***
	(13.85)	(−0.62)	(6.72)
Size	−0.063***	−0.078***	−0.112***
	(−6.35)	(−4.09)	(−5.05)
Leverage	0.198***	0.034	0.412***
	(5.07)	(0.36)	(4.26)
MB	−0.008***	−0.010*	−0.008*
	(−4.00)	(−1.71)	(−1.92)
TV	−0.026***	0.000	−0.021***
	(−13.86)	(0.02)	(−5.55)
STD	18.089***	1.104	17.503***
	(18.91)	(0.49)	(9.22)
NAnalyst	0.006	−0.022	0.010
	(0.78)	(−1.30)	(0.72)
SOE	−0.125***	−0.022	−0.160***
	(−6.55)	(−0.51)	(−2.98)
Top1	−0.276***	−0.074	−0.247*
	(−5.21)	(−0.62)	(−1.65)
Local	−0.036***	0.881***	−0.033**
	(−8.73)	(19.81)	(−2.20)
Advertising	−0.017***	0.135***	0.012
	(−4.21)	(4.25)	(0.83)
Constant	1.436***	−1.044**	2.307***
	(6.60)	(−2.40)	(4.51)
Industry FE	No	Yes	No
Firm FE	Yes	No	Yes
Media FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 5 (continued)

	Non-common sample	PSM procedure	
		Selection model	Matched sample
	(1)	(2)	(3)
Dep. Var.=	*ABN_ABSCAR*	*Connected*	*ABN_ABSCAR*
Observations	1,273,194	147,207	75,866
Adjusted R^2	0.044	0.198	0.053

This table examines the effect of social connections on the information content of media news coverage using the noncommon sample. Column (1) reports results based on the noncommon sample. Columns (2) and (3) report corresponding propensity-score-matching estimation results for the selection model and the test regression respectively. *ABN_ABSCAR* is the standardized absolute value of the two-day cumulative abnormal returns around each reporting date. Our variable of interest is *Connected*, which takes the value of 1 if the media is socially connected with the firm in that year and 0 otherwise. See Table 10 for detailed variable definitions. All standard errors are adjusted for heteroscedasticity and clustered by firm and date. The t-statistics of each coefficient are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

We use two proxies for the richness of the information environment: analyst coverage and firm size (measured by total assets) respectively. We classify our sample into rich and poor information environments based on sample median of these two variables and use dummy variables, *DNAnalyst* and *DSize*, to indicate a richer information environment. We re-estimate Models (1)–(3) by interacting each of these variables with our connection variable *Connected*. The results, presented in Panel A of Table 6, show that, when there is higher analyst coverage (larger firm size), the positive effect of social connections on coverage frequency is more pronounced, while the higher optimism biases and the lower information content associated with connected media are reduced.[17] These results suggest that a richer information environment motivates connected media to more frequently cover the underlying the firm with less bias but more information, implying that the richer information environment introduces healthy competition to the media market and contributes to monitoring by alternative information sources and media intermediaries.[18]

4.4.2 Nature of news

We expect the incentives of firms and media regarding news coverage to differ, depending on the nature of the underlying news. On the one hand, to the extent that media executives

[17] For brevity, we report the results for the full sample only in Table 6. Propensity-score-matched results are qualitatively similar.

[18] These results are broadly consistent with the insights of Fischer and Verrecchia (2000) on managers' reports. Those authors suggest that managers' reports become less informative as the private cost to the manager of biasing reports falls and as the uncertainty about the manager's objective increases. In our setting, as information environment deteriorates, media bias is less likely to be detected, which decreases reputational costs to the media. The lower private cost of biased reports is expected to result in more biased and less informative news reports, which is what we observe. Our results in Panel D of Table 6 on central media versus regional media also comport with this argument.

Table 6 Cross-sectional analysis

Panel A: The effect of information environment

	H1: Media Coverage		H2: Media Tone Bias		H3: Information Content	
	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.=	*Coverage*	*Coverage*	*ABN_Tone*	*ABN_Tone*	*ABN_ABSCAR*	*ABN_ABSCAR*
Connected	0.068***	0.054***	0.085***	0.086***	−0.094***	−0.089***
	(5.79)	(4.89)	(12.89)	(12.91)	(−8.39)	(−8.36)
Connected×DNAnalyst	0.070***		−0.060***		0.045**	
	(4.12)		(−7.45)		(2.49)	
Connected×DSize		0.103***		−0.060***		0.032*
		(5.60)		(−7.33)		(1.65)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Media FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	559,589	559,589	723,227	723,227	1,273,194	1,273,194
Adjusted R^2	0.556	0.555	0.107	0.107	0.044	0.044

Panel B: Good news/bad news

	H1: Media Coverage	H2: Media Tone Bias	H3: Information Content
	(1)	(2)	(3)
Dep. Var.=	*Coverage*	*ABN_Tone*	*ABN_ABSCAR*
Connected	0.108***	0.031***	−0.061***
	(10.41)	(6.66)	(−5.47)
Connected×BNews	−0.009	0.066***	−0.053***
	(−0.77)	(7.50)	(−3.05)
Other Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Media FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	559,589	723,227	1,273,194
Adjusted R^2	0.556	0.107	0.044

Panel C: SOE vs non-SOE

	H1: Media Coverage	H2: Media Tone Bias	H3: Information Content
	(1)	(2)	(3)
Dep. Var.=	*Coverage*	*ABN_Tone*	*ABN_ABSCAR*
Connected	0.083***	0.086***	−0.127***
	(6.30)	(10.05)	(−8.89)
Connected×SOE	0.040**	−0.049***	0.073***
	(2.08)	(−5.20)	(3.99)
Other Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Media FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	559,589	723,227	1,273,194
Adjusted R^2	0.556	0.107	0.044

Table 6 (continued)

Panel D: Central media versus regional media			
	H1: Media Coverage	**H2: Media Tone Bias**	**H3: Information Content**
	(1)	**(2)**	**(3)**
Dep. Var.=	*Coverage*	*ABN_Tone*	*ABN_ABSCAR*
Connected	0.139***	0.055***	−0.085***
	(11.73)	(11.68)	(−8.37)
Connected×*Central*	−0.127***	−0.031***	0.020
	(−7.36)	(−3.26)	(3.99)
Other Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Media FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	559,589	723,227	1,273,194
Adjusted R^2	0.542	0.107	0.044

This table examines the cross-sectional variations in the relations between social connections and media coverage, tone, and information content, respectively. *DNanalyst* equals 1 if the number of analysts following the firm is above the sample median and 0 otherwise. *DSize* equals 1 if the total assets is above the sample median and 0 otherwise. *BNews* equals 1 if earnings of the year are less than the earnings of the prior year and 0 otherwise. *SOE* equals 1 if the firm is state-owned and 0 otherwise. *Central* equals 1 if the media outlet is a central media outlet and 0 otherwise. See Table 10 for detailed variable definitions. Samples for each test correspond to those in Tables 3–5 respectively; for H2, results based on the common sample are presented. All standard errors are adjusted for heteroscedasticity, clustered by firm in Column (1) and by firm and date in Columns (2)–(4). The *t*-statistics of each coefficient are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

share firm executives' goal of maintaining a positive image for the firm, they may be reluctant to cover a firm when there is bad news. However, when bad news arises, firm executives may also want news reports that portray the firm in a biased, positive way and urge connected media to provide those. In that case, bad news will lead to greater coverage and greater bias by connected media. Executives of bad news firms may also exclusively disclose firm strategies or other private information to connected media outlets to avoid misinterpretations of or overreactions to the bad news by the investors, with an aim of preventing the stock price from dropping too far (Lee et al. 2015). This type of strategy can increase the information content of news coverage by connected firms, relative to news coverage by unconnected firms, in the presence of bad news.

Accordingly, we examine whether the connected media's reporting properties differ based on whether the firm reports bad news or good news. According to the survey by Lu et al. (2019), Chinese investors place greater emphasis on increases versus decreases in earnings. Thus we use *BNews*, indicator of annual earnings decreases from prior year, to capture the nature of the underlying news. We add the interaction term between *BNews* and *Connected* into models (1)–(3).

The results are presented in Panel B of Table 6. In Column (1), the coefficient on *Connected* continues to be significantly positive, while the interaction term is negative but insignificant, which suggests that the coverage decision by connected media is not affected by the presence of bad news. The results presented in Columns (2) suggest that, when there is bad news in a year, the connected media are more likely to slant its news reports

with more positive tone, again consistent with the *favoritism hypothesis*. The magnitude of the incremental effect of bad news is 2.13 of the effects of good news, suggesting nontrivial incentives between the firm and the media in casting the firms with more optimistic light when there is bad news. Finally, in Column (3), where the dependent variable is *ABN_ABSCAR* for information content, the interaction term between *Connected* and *BNews* is also significantly negative, implying that the information content by connected media further deteriorates when the firm experiences bad news.

4.4.3 Other firm and media characteristics

A distinctive feature of China's economic system is that economic agents can resort to informal institutions to advance their private interests (Allen et al. 2005). Compared with SOEs, non-SOEs are less likely to be protected by the government and thus obtain less institutional legitimacy (Hope et al. 2020). In the context of the current study, social connections between media and firm executives can compensate for the lack of institutional legitimacy accorded to non-SOEs, so as to create more favorable public opinion. In other words, we expect the demand for media favoritism to be greater among non-SOEs than SOEs, who have alternative sources of institutional legitimacy. To test this prediction, we add an interaction term *Connected*× *SOE* to Models (1)–(3). The regression results are shown in Panel C of Table 6. We find that, even though the media are less likely to cover their connected non-SOEs, the news has a more positive tone and contains less information, indicating that social connections play a greater role in the public opinion management of non-SOEs.

The impact of social connections on media tone may also vary with the media's reputational concerns. Dyck et al. (2010) find that revealing firm fraud helps journalists to establish their reputations and advance their careers. A survey paper by Call et al. (2020) documents that journalists at top media outlets are less likely to cater to readers or company management. In China, the central media, under direct control of the central government, have larger nationwide circulation and are also more authoritative than regional media.[19] In contrast, executives of regional media face much less public scrutiny and are more likely to take advantage of close relationships with firm executives through social connections. On account of that, we associate regional media with lower reputational costs and a higher probability of releasing biased news. We construct the variable *Central* to capture the reputational cost, which equals to 1 for central media (as verified by the yearbook mentioned above) and 0 otherwise. We add to Models (1)–(3) the interaction term between *Connected* and *Central*, the latter of which is not included because all media characteristics have been absorbed by the media fixed effect. The results presented in Panel D of Table 6 are consistent with the notion that regional media face lower reputational cost and therefore are more likely to release biased reports due to social connections. We also find that connected regional media more frequently cover the underlying firms than the connected central media. However, we find no differences in their information content.[20]

[19] Central media are those affiliated with the Propaganda Department of the Central Committee of the CPC, the State Administration of Radio, Film and Television, or the General Administration of Press and Publication.

[20] We also perform a test that examines how our results differ between state-controlled media and other media based on the classification used in You et al. (2018). Untabulated results show no significant effects.

4.5 Robustness tests

4.5.1 Market response to tone of news coverage

While Section 4.3 shows that news coverage by connected media is more optimistic than that by unconnected media, it is not necessarily the case that the optimism reflects bias by the media outlets. For example, if the media honestly views the prospects of the firm to be more positive, that view can be reflected in the news coverage as well. To provide further evidence on the bias, we examine how market responds to the tone of the news articles published by connected and unconnected media. Rational investors are expected to understand the biases inherent in the news reports and penalize this behavior through stock prices. We focus on cumulative abnormal return (*CAR*) around the news announcement as our dependent variable. Specifically, *CAR* is measured as the daily stock return minus the value-weighted market return over the trading window of [0, +1]. We include *ABN_Tone*, *Connected*, and their interaction term in the regression, along with other control variables in our previous models, and cluster standard errors by firm and date. Consistent with our *ABN_ABSCAR* analysis, we focus on results of the noncommon sample, which includes news articles by connected versus unconnected media published on different days, although the results on the interaction terms are qualitatively similar if we use the full sample. The result in Column (1) of Table 7 shows that the coefficient on *Connected* is significantly negative, while the coefficient on *Tone* is significantly positive. Most importantly, the interaction term *ABN_Tone*× *Connected* has a significantly negative coefficient, implying that the market discounts news released by connected media. This result suggests that our finding of more optimistic tone of the news coverage by connected media is unlikely attributable to more positive underlying news but more likely reflects intentional bias by the connected media, further supporting the *favoritism hypothesis*.

Note, however, that an F-test shows that the sum of the coefficients on *Tone* and *Tone*×*Connected* is significantly greater than 0, indicating that, on the whole, investors still respond significantly positively to news reported by the connected media. This result implies that, despite the biases introduced by media that have social connections with the firm, on average the market still responds to their news reports.

4.5.2 Information content over annual horizon

In Section 4.4, we show that the information content, as reflected by *ABN_ABSCAR* around each news article is significantly lower for connected media than for unconnected media. However, in Section 4.1, we also show that the coverage frequency is significantly higher for connected media. It is possible that, because of their greater access to firm managers, connected media obtain information from the firm and publish it, regardless of its significance. In contrast, unconnected media are more likely to have access to major news only. It is not clear whether, in aggregate, connected media disclose more information than unconnected media. To address this issue, we aggregate all *ABN_ABSCAR* across each media outlet over the annual horizon and redo our tests.

Column (2) of Table 7 presents the results. The coefficient on *Connected* continues to be significantly negative, consistent with the results in Table 5. This suggests that, despite the more frequent coverage, the annually aggregated information content of all news articles by connected media is still significantly lower. This provides more robust

Table 7 Additional robustness tests

Dep. Var.=	(1) *CAR*	(2) *∑ABN_ABSCAR*
Connected	−0.001***	−0.430***
	(−3.22)	(−11.72)
ABN_Tone	0.002***	
	(14.46)	
Connected×ABN_Tone	−0.001***	
	(−5.05)	
BNews	0.000	0.019
	(0.03)	(0.35)
ROA	0.014***	−0.911
	(3.76)	(−1.49)
Return	0.007***	0.373***
	(25.68)	(7.94)
Size	−0.001***	−0.171***
	(−3.38)	(−2.84)
Leverage	0.003*	0.629***
	(1.81)	(2.64)
MB	0.000	−0.033***
	(1.03)	(−2.72)
TV	−0.000***	−0.065***
	(−6.80)	(−5.37)
STD	0.375***	73.901***
	(9.47)	(10.52)
NAnalyst	0.001***	0.041
	(3.88)	(1.21)
SOE	−0.002***	−0.365**
	(−2.64)	(−2.31)
Top1	−0.003*	−1.133***
	(−1.90)	(−3.00)
Local	−0.001***	0.404***
	(−5.84)	(8.15)
Advertising	0.000	0.408***
	(0.88)	(6.00)
Constant	0.023***	3.870***
	(2.89)	(3.00)
Firm FE	Yes	Yes
Media FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,273,905	235,071
Adjusted R^2	0.035	0.108

This table provides additional tests for media tone and information content. *CAR* is the cumulative abnormal return in trading days [0, 1], relative to the reporting date. *∑ABN_ABSCAR* is the sum of the *ABN_ABSCAR* of all news reports for each firm-media pair each year. Column (1) is based on a noncommon sample of news articles, and Column (2) is based on a sample of firm-media-years with at least one news article. See Table 10 for detailed variable definitions. All standard errors are adjusted for heteroscedasticity, clustered by firm and date in Column (1) and by firm in Column (2). The *t*-statistics of each coefficient are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

evidence that, despite their better communication with the firms, connected media are not providing more information to the market.

4.5.3 Other robustness tests

We include media fixed effect in the models in our tests and adopt propensity-score matching procedures to rule out the possibility that certain media characteristics may drive our results. To further control for different media characteristics, in additional analyses, we re-estimate our models with the following more restrictive samples separately. (i) We require the connected and unconnected media to have the same provincial location and have the same central versus regional and financial versus general media characteristics. (ii) We require that both groups of media cover the same firm at least once within a same year. Our inferences remain.

In additional to the propensity-score matching, we also use a difference-in-differences plus propensity-score matching approach. Specifically, we use the propensity function to identify the matching unconnected observations only for the year that the firm-media connection was first established during our sample period, and the identified matching firm-media pairs remain in the sample in all years. We then examine how the reporting properties of the treatment sample changes after the initiation of the connection, relative to unconnected firm-media pairs. Our results based on this approach are again qualitatively similar to our main results.

5 Additional analyses

5.1 Earnings announcement sample

In Section 4.2, in testing H2, we discuss that media biases can be attributable to media outlets or firms intentionally biasing the underlying news or to media outlets selectively covering (or firms selectively disclosing) positive news only. In our main tests, we use a common sample consisting of news published on the same day to test for the first type of biases. One potential problem with this sample is that one cannot be certain that articles published on the same day are about the same underlying news. In this subsection, we seek to identify news articles that are more likely to relate to the same underlying event. Specifically, we focus on a specific newsworthy event, namely quarterly corporate earnings announcements, and examine all news articles published from day 0 through day 7 of the earnings announcement date. Our maintained assumption is that news articles published during this window are more likely to cover the same underlying earnings announcements (Piotroski et al., 2017). This sample also allows us to test H1 and H3.

To test H1 on coverage frequency, for a firm-media pair to be included in our test, we require the media outlet to have at least one earnings announcement article (i.e., published during days [0, 7] of an earnings announcement) for the firm during our sample period. To test H2 for news tone, for an earnings announcement to be included in our test, we further require that it be covered with at least one article by connected media and at least one article by unconnected media. To test H3 for information content, to increase the power of our test of *ABN_ABSCAR*, we remove all news

articles published on a day when there is coverage by both connected and unconnected media for the same firm. We present the results for H1–H3 in Columns (1)–(3) of Table 8 based on the resulting samples. Our results based on the earnings announcements sample are qualitatively similar to the results based on our broader full sample, showing significantly more frequent, more optimistic, and less informative coverage by connected media compared to by unconnected media.

Examining the earnings announcement sample also allows us to examine the timeliness of news coverage for the same underlying news event, given that we can observe the actual event date. To the extent that connected media have private and early access to firm managers, we expect their coverage of the earnings announcements to be more prompt. We construct a new dummy variable, *Timeliness*, which indicates articles published on the first day with news coverage since the earnings announcement and regress it on *Connected* and our control variables. Our results, presented in Column (4) of Table 8, indeed show a significantly positive coefficient on *Connected*, which corresponds to about a 6.5% increase, relative to the sample average *Timeliness* for connected media, relative to unconnected media. This result is consistent with the expectation that connected media have early access to information related to earnings announcements.

It is important to note, however, that timeliness does not necessarily imply informativeness. In light of our earlier results that connected media cover earnings announcements with more bias and less information, the timeliness result may suggest that firms have incentives to convey optimistically biased information more promptly to the capital market via connected media, to have private gains in this process.[21]

5.2 Social connections and advertising

So far, our results show that coverage by connected media is more frequent, more optimistic, and less informative than coverage by unconnected media, suggesting that social connections between media and firms can harm the independence and objectiveness of media. One concern that can arise from our results is whether social connections can also influence economic connections, such as advertising relations, between media outlets and firms, which research has shown to affect media coverage as well (e.g., Reuter and Zitzewitz, 2006; Gurun and Butler, 2012). Our empirical analyses have already controlled for the existence of advertising relations between the media and the firm. Thus we can conclude with reasonable confidence that our results are not attributable to the effects of advertising relations.

Nevertheless, it is of interest to examine the dynamics between social connections and advertising relations so that we can better understand the mechanism underlying our results. While an extensive examination of this issue is beyond the scope of this study, we provide some preliminary analyses in this subsection. We first examine

[21] In addition to timeliness, we also examine the length of the news articles about the same underlying earnings announcements. We use log of the number of words (or sentences) in the news article to measure length and find that news articles by connected media contain significantly more words (or sentences). However, one should be cautious in interpreting this result. First, we find the economic significance of the difference is low (0.6% or 1.0% relative to sample mean). Second, when we regress *ABSCAR* or *ABN_ABSCAR* on the length of the article, we find that the coefficient on length is not statistically significant, suggesting that length may not be a good indicator of the informativeness of the news article.

Table 8 Earnings announcement sample

	H1: Media Coverage	H2: Media Tone Bias	H3: Information Content	Additional Test
	(1)	(2)	(3)	(4)
Dep. Var.=	*Coverage*	*ABN_Tone*	*ABN_ABSCAR*	*Timeliness*
Connected	0.019***	0.053***	−0.060*	0.015***
	(6.28)	(5.40)	(−1.72)	(3.22)
BNews	−0.005**	−0.137***	−0.056	−0.004
	(−2.18)	(−7.97)	(−1.23)	(−0.27)
ROA	−0.050	1.305***	−0.730	0.170
	(−1.27)	(3.27)	(−1.09)	(0.74)
Return	−0.008***	0.001	0.059	−0.004
	(−3.35)	(0.05)	(1.40)	(−0.34)
Size	0.030***	0.013	0.084	−0.008
	(5.68)	(0.52)	(1.27)	(−0.35)
Leverage	−0.029*	0.017	−0.592*	−0.025
	(−1.95)	(0.14)	(−1.68)	(−0.24)
MB	0.002***	0.025***	0.006	−0.004
	(3.59)	(4.19)	(0.48)	(−0.99)
TV	0.002***	−0.011**	−0.028***	−0.001
	(2.99)	(−2.53)	(−2.62)	(−0.35)
STD	1.485***	−2.540	14.258***	0.814
	(5.18)	(−1.48)	(2.85)	(0.53)
NAnalyst	0.009***	−0.021	−0.024	−0.016
	(4.53)	(−1.23)	(−0.50)	(−1.07)
SOE	−0.011	0.272***	−0.237*	0.027
	(−1.30)	(5.26)	(−1.78)	(0.58)
Top1	0.013	0.595***	−0.009	0.140
	(0.59)	(3.48)	(−0.02)	(1.12)
Local	0.090***	0.072***	−0.012	−0.006
	(11.12)	(7.87)	(−0.66)	(−1.60)
Advertising	0.153***	0.057***	0.004	−0.011**
	(13.46)	(6.77)	(0.24)	(−2.56)
Constant	−0.545***	−1.184**	−1.545	0.289
	(−4.77)	(−2.00)	(−0.94)	(0.58)
Firm FE	Yes	Yes	Yes	Yes
Media FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	636,627	124,830	45,763	124,830
Adjusted R^2	0.274	0.126	0.123	0.080

The table presents the tests based on news articles published over the window of [0, 7], relative to the earnings announcement date. *Timeliness* equals 1 if an article is published on the first day of news coverage since the earnings announcement. See Table 10 for detailed variable definitions. All standard errors are adjusted for heteroscedasticity, clustered by firm in Column (1) and firm and date in Columns (2)–(4). The *t*-statistics of each coefficient are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

Table 9 Social connections and advertising relations

Panel A: The effect of social connections on future advertising

	Based on H1 sample	**Requiring coverage in the year**
	(1)	**(2)**
VARIABLES	$Advertising_{t+1}$	$Advertising_{t+1}$
Connected	0.005***	0.008***
	(3.21)	(2.97)
BNews	−0.001	−0.002
	(−1.47)	(−1.11)
ROA	0.017**	0.040**
	(2.23)	(2.34)
Return	0.000	0.001
	(0.59)	(0.55)
Size	0.003***	0.005**
	(3.08)	(2.20)
Leverage	−0.002	−0.003
	(−0.45)	(−0.36)
MB	−0.000	−0.000
	(−0.27)	(−1.07)
TV	−0.000	−0.000
	(−0.95)	(−0.83)
STD	0.066	−0.039
	(0.93)	(−0.27)
NAnalyst	0.002***	0.003***
	(3.74)	(2.69)
SOE	−0.002	−0.002
	(−0.57)	(−0.37)

Table 9 (continued)

Top1	0.004	0.013
	(0.54)	(1.00)
Local	0.037***	0.048***
	(8.78)	(8.05)
Advertising	0.232***	0.238***
	(27.98)	(29.26)
Constant	−0.057***	−0.094*
	(−2.70)	(−1.78)
Firm FE	Yes	Yes
Media FE	Yes	Yes
Year FE	Yes	Yes
Observations	516,330	233,299
Adjusted R^2	0.210	0.237

Panel B: The effects of social connections and advertising relations on media reporting properties

	H1: Media Coverage			**H2: Media Tone Bias**			**H3: Information Content**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Dep. Var.=	*Coverage*	*Coverage*	*Coverage*	*ABN_Tone*	*ABN_Tone*	*ABN_Tone*	*ABN_ABSCAR*	*ABN_ABSCAR*	*ABN_ABSCAR*
Connected	0.109***		0.104***	0.050***		0.048***	−0.081***		−0.080***
	(11.15)		(11.13)	(12.36)		(11.77)	(−8.92)		(−8.85)
Advertising		0.632***	0.631***		0.072***	0.070***		−0.018***	−0.017***
		(32.08)	(32.07)		(18.33)	(18.02)		(−4.35)	(−4.21)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Media FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 9 (continued)

Observations	559,589	559,589	559,589	723,227	723,227	723,227	1,273,194	1,273,194	1,273,194
Adjusted R^2	0.541	0.556	0.556	0.107	0.107	0.107	0.044	0.044	0.044

The table examines the dynamics between social connections and advertising relations. Panel A examines the effects of social connections on advertising relations in the following year. Panel B examines how social connections and advertising affect media properties with *Connected* and *Advertising* included in the model individually and together respectively. See Table 10 for detailed variable definitions. All standard errors are adjusted for heteroscedasticity, clustered by firm in Panel A and Columns (1)–(3) of Panel B and by firm and date in Columns (4)–(9) of Panel B. The *t*-statistics of each coefficient are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

whether social connections indeed foster advertising relations by regressing *Advertising* for the next year on *Connected* and other control variables for the current year. We use both news-level sample (as used in testing H1) and firm-media-year level sample (as used in testing H2) to perform the analysis. We drop the observations of 2016 because of data availability of the advertising data**.** The results in Panel A of Table 9 show a significantly positive coefficient on *Connected*. Because social connections are generally formed prior to the establishment of any advertising relations between the firm and the media, this result supports the expectation that social connections facilitate and result in a higher likelihood of advertising relation between the two parties.

In Panel B, we present side-by-side estimation results of our main model with different combinations of *Connected* and *Advertising* as independent variables. The result shows that *Advertising* and *Connected* are both statistically significant and generally have the same sign in all three model specifications. Further, including *Advertising* as an additional independent variable only marginally decreases the magnitude of the coefficients on *Connected*. For example, the coefficient on *Connected* decreases from 0.109 to 0.104 when the dependent variable is *Coverage*. The inclusion of *Connected* also has only marginal effects on the coefficient on *Advertising*. These results suggest that, while both affect media reporting properties, social connections appear to have effects that are distinct from the effects of advertising relations documented in prior research; thus our results on social connections are not merely a manifestation of advertising relations.

6 Conclusion

This paper documents that social connections between media and firm executives have significant implications for media coverage decisions and the tone and information content thereof. Specifically, connected media tend to cover a firm more frequently, and their reporting is more optimistic in tone and less informative, compared with their unconnected counterparts. Further analyses document that the effects of social connections on reporting properties vary with various firm or media characteristics.

Our study illuminates the implications of social connections on the media industry. Private social connections undermine the independence and objectiveness of media, without providing incremental information. However, a rich information environment significantly mitigates these adverse implications of social connections between firm and media executives. These results have important implications for policymaking and monitoring of the media, which plays an important role in the corporate information environment. Greater transparency about the presence of social connections or conflicts of interest between the media and the firms they cover can help market participants better interpret news coverage and make investment decisions accordingly.

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Compliance with ethical standards

Conflict of interest Not applicable.

Appendix

Table 10 Variable definitions

Variables	Definitions
ABN_ABSCAR	(*ABSCAR* − mean *ABSCAR* during [−250, −2]) / standard deviation of the two-day *ABSCAR* in the same period, calculated for each news article
ABSCAR	Absolute value of the two-day cumulative abnormal returns around each news reporting date
ABN_Tone	(*Tone* - Mean of *Tone* in the previous year) / standard deviation of *Tone* in the previous year, measured for each news article
Advertising	Equals to 1 if a firm advertises on a media outlet in a given year and 0 otherwise
BNews	Equals to 1 if earnings of the year is less than the earnings of its prior year and 0 otherwise
CAR	The cumulative abnormal return over [0, 1] day around each news reporting date
Central	Equals to 1 if the media is directly administered by the central government and 0 otherwise
Connected	Equals to 1 if there exists at least one social connection between the media executives and the firm executives for a given year and 0 otherwise
Coverage	Log (1 + number of news articles released on a firm by a media outlet in a given year)
Leverage	Total liabilities / total assets
Local	Equals to 1 if the media and the firm are headquartered in the same city and 0 otherwise
MB	Market value / book value of equity
NAnalyst	Log (the number of analysts following the firm +1)
Return	Annual stock market return
ROA	Net income / total assets
Size	Log (total assets)
SOE	Equals to 1 if the firm is state-owned and 0 otherwise
STD	Standard deviation of stock return within a given year
Timeliness	Equals to 1 if a news article is the earliest one after the earnings announcement date within [0, 7] days and 0 otherwise.
Tone	(Number of positive sentences – number of negative sentences) / (number of positive sentences + number of negative sentences +1), measured for each news article
Top1	Percentage of stock held by the largest shareholder
TV	Trading volume / number of outstanding shares

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