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Messages in Online Stock Forums and Stock Price Synchronicity: Evidence from China

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Conflict of Interest Statement

We declare that we have no financial and personal relationship with other people or organizations that can inappropriately influence our work, there is no professional or other personal interest of any nature of kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled.

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Abstract

Online stock forums allow investors to share information and exchange opinions, which facilitates the incorporation of firm-specific information into prices and reduces stock price synchronicity. However, prior research presents mixed evidence as to the value of messages in online forums. Using the information of the Eastmoney Guba online forum in China, we find a causal and negative relation between Guba messages and stock price synchronicity. The finding is robust after accounting for media reports and firm fixed effects and using both an instrumental variable analysis and an experimental design that exploits exogenous changes in the authenticity of Guba messages. We find the impact of Guba information is attributed to its roles in both information dissemination and investor interaction and is more pronounced for messages with a negative narrative tone. Additional tests suggest Guba messages improve firm information disclosure quality, reduce stock price crash risk and decrease stock return volatility synchronicity.

Keywords: Online stock forums; Guba messages; stock price synchronicity; China

JEL classification: G12, G14

1. Introduction

With the rapid development of Internet technology, various social media platforms have emerged and seen their popularity explode during recent decades, which has given rise to changes in the ways information about capital markets and listed firms is collected, processed, and diffused. For example, social media platforms such as online stock forums have facilitated interaction among investors by creating an environment where any investor can participate and act as an information intermediary (Drake et al., 2017). Instead of passively receiving information, investors can now take a more active role in producing and acquiring information.

In this study, we examine whether messages in Chinese online stock forums facilitate the incorporation of firm-specific information into share prices.¹ We focus on an online stock forum called Eastmoney Guba (Guba hereafter), which was established in 2006 and has become the most popular and largest financial social media platform in China (Meng et al., 2010). Existing research presents mixed evidence on the information role of messages in online stock forums. Several studies document that the information on online stock forums is found to predict future stock returns and market activities (Ackert et al., 2016; Antweiler and Frank, 2004). However, Kim and Kim (2014) and Tumarkin and Whitelaw (2001) find that information on Internet stock message boards may fail to function well as an information intermediary and have no impact on stock price informativeness. In fact, Drake et al. (2017) document that messages in online stock forums can be detrimental because they introduce noise into the market and hinder price formation. Messages in online forums can also be

¹Besides the availability of data for online stock forums, we examine the issue in the Chinese stock market for several reasons: (a) Given that China is the second largest economy worldwide with its investor protection and information environment being in the development stage, the Chinese market serves as an ideal experimental setting to test the effectiveness of the Guba online forum as an alternative information acquisition channel for investors (Jiang and Kim, 2020); (b) the level of stock price synchronicity in China's capital market ranks among the highest in the world, as Morck et al. (2000) highlighted the significance to investigate the substitutive effects of Guba in disseminating information; and (c) according to the 45th "Statistical Report on Internet Development in China" issued by the China Internet Network Information Center, as of March 2020, there were 904 million Internet users in China, with an Internet penetration rate of 64.5%. The ever-increasing popularity of the Internet has fueled the rapid growth of the number of users on online stock forums in China. Thus, it is of great importance to investigate the informativeness of Guba messages in China's capital market.

manipulated by some influential investors engaging in illegal practices (Sabherwal et al., 2011). Despite the importance of online stock forums, the impact of its information on stock price synchronicity remains largely unexplored.

There are two competing explanations of the relation between messages in Chinese online stock forum and stock price synchronicity. On the one hand, since retail investors account for the majority of the investor population in the Chinese share market, messages in online forums function as an important information channel supplement to traditional information channels for Chinese investors. More importantly, by facilitating investor interaction and allowing a wide range of diverse opinions to be publicly available, online stock forums foster individual investigation to verify the available information and better equip investors to determine the authenticity of postings, which facilitates the discovery of firm-specific information. In addition, the activities on online forums (e.g., posting, reading, and commenting) can increase investor attention and promote information acquisition by acting as a “reminder” to investors, stimulating them to seek more firm-specific information (Zhou et al., 2017). Thus, messages in online forums are expected to facilitate more firm-specific information to be imputed into stock prices and thus lower stock price synchronicity.

On the other hand, messages in online forums can also undermine the corporate information environment and increase stock price synchronicity. First, although online forums disseminate a large amount of information about a firm, the quality and reliability of this information are often questionable, which attracts substantial attention from regulators.² In fact, online messages can introduce noise rather than new information, thereby hindering price formation (Drake et al., 2017). Second, because the authenticity of online information can hardly be guaranteed, a significant portion of investors may be misled by false information due to their lack of sophisticated

² For example, the Securities and Exchange Commission (SEC) has continuously expressed concerns about the reliance of individual investors on messages and recommendations from online stock forums that do not convey value-relevant information (SEC, 2016, 2017). Similar concerns are also expressed by regulators from other countries (e.g., Financial Conduct Authority, 2018; Pinnuck and Stevenson, 2021; Troshani and Rowbottom, 2021; Hao and Pham, 2022).

professional knowledge and capabilities of assessing the trustworthiness of such information (Ammann and Schaub, 2020). Further, there is a possibility that immoral investors engaging in pump-and-dump schemes will post false rumors online in an attempt to artificially boost share prices and mislead other investors (Sabherwal et al., 2011). Thus, it remains unclear as to whether and how messages in online stock forums affect stock price synchronicity. This study aims to fill this void.

Using a sample of Chinese A-share listed firms over the period of 2008–2020, we first find evidence that the number of Guba messages is negatively associated with stock price synchronicity. This finding indicates that Guba messages allow more firm-specific information to be impounded into stock prices, resulting in lower co-movements of stock prices. The impact of Guba messages is economically significant. When the number of Guba messages increases by one standard deviation, the proportion of total return variations characterized by the market-wide and industry-level information reduces by 6%–7%. This finding is robust to a battery of robustness checks, including a regression model with firm fixed effects, an analysis of the sample based on propensity score matching, the first-difference regression model, a two-stage regression using the instrumental variable approach, and a placebo test.

Having established the main finding, we then investigate two possible mechanisms through which Guba postings affect stock price synchronicity: information dissemination and investor interaction. Using firm-specific proxies for the information environment, we find that the reduction in synchronicity is more pronounced among firms that are followed by fewer analysts or have a lower level of institutional ownership. In addition, we find that the effect of Guba messages on stock price synchronicity is mainly concentrated in Guba messages with negative tone. To the extent that negative Guba messages reflect more firm-specific information than positive messages due to managers' tendency of withholding bad news (Kothari et al., 2009; Bertomeu et al., 2020), this implies that Guba messages can influence stock price synchronicity via information dissemination. Thus, the results suggest that Guba messages can function as a substitute for other information dissemination channels,

which lends empirical support to the information dissemination view that Guba messages can lower stock price synchronicity through delivering increased firm-specific information.

Regarding the investor interaction mechanism, we capture the degree of investor interaction using the number of comments per Guba post (*read*) made by investors. We find that the negative effect of Guba messages is more pronounced among firms with high investor interaction. The findings thus support the view that, besides directly delivering firm-specific information, Guba messages generated by posters can also act as a stimulus to investor interaction and communication online, which facilitates the incorporation of more firm-specific information into share prices.

We also provide more direct evidence on the causal effect of Guba messages on stock price synchronicity by exploiting two exogenous shocks. The first exogenous shock is the Interpretation of the Supreme People's Court and the Supreme People's Procuratorate on Several Issues Concerning the Application of Law in Handling Criminal Cases of Using Information Networks to Commit Defamation and Other Such Criminal Offences implemented in September 2013. The Interpretation is expected to improve the authenticity of Guba messages because it clearly defines the standards of conviction and punishment of posting and reprinting false information online. The second exogenous shock is the launch of Eastmoney Guba stock forum in 2006. The launch of Guba stock forum leads to the availability of Guba messages and accordingly enhances the accessibility of information and investor interaction via Guba messages. We find that, after the passages of the Interpretation and the launch of Guba stock forum, investors are better able to acquire firm-specific information embedded in the posts, leading to a stronger synchronicity-reducing effect.

Finally, we conduct several additional tests to provide further insights. First, we control for the confounding impact of media reports and find that the role of Guba is not limited to transmitting the information provided in financial media; rather, Guba messages have an incremental effect beyond media reports and play an information-production role that further lowers stock price synchronicity. Second, we provide

evidence that Guba messages also improve the quality of firm information disclosure and reduce stock price crash risk. Third, we show that our results continue to hold after controlling for investor, market and management sentiment. Finally, we extend the analysis to a firm's stock *return volatility synchronicity* and find that Guba messages lower the co-movement of stock return volatility.

This study makes several important contributions. First, it contributes to the ongoing debate on the informational role of online stock forums or Internet stock message boards. Although some studies report a significant association between posts in online stock forums and future market activities (Ackert et al., 2016; Antweiler and Frank, 2004), others find no significant relation (Kim and Kim, 2014; Tumarkin and Whitelaw, 2001) and suggest that messages in online stock forums can introduce noise into the market and hinder price formation (Drake et al., 2017) or be manipulated by influential investors (Sabherwal et al., 2011). In support of the informational role of messages in online forum, our study provides novel evidence on the causal link between Guba messages and stock price synchronicity.

In addition, we extend the existing research on online stock forums by exploring the role of investor online interaction in facilitating firm-specific information incorporated into share prices. We find that Guba messages stimulate investor interaction online and better equip them to investigate and assess the authenticity of the postings, thereby enriching the information environment and reducing synchronicity. We also find that Guba messages improve the quality of firm information disclosure and reduce stock price crash risk.

Finally, our study adds to the extant literature on stock price synchronicity. Prior studies document that stock price synchronicity is associated with a firm's information disclosure and transparency (Hutton et al., 2009; Jin and Myers, 2006; Kim et al., 2018), median reports (Dang et al., 2020), top executives' social media (Feng and Johansson, 2019), information conveyed from block trades (Meng et al., 2020) or derivative markets (Bai et al., 2017), institutional shareholders (Gul et al., 2010), agency conflicts (Boubaker et al., 2014), and culture-based factors (Eun et al., 2015; Qiu et al., 2020).

Our focus on messages in online stock forums differs from Dang et al. (2020) in that Guba is featured by a strong two-way interaction, whereas media reports are mostly one-way information transmissions. It is also distinguished from Feng and Johansson (2019) on executive microblogging in that the interaction on Weibo accounts is minimal, compared to online stock forums, and social media of corporate executives is less likely to provide *new* value-relevant information ahead of corporate announcements due to the regulation of information disclosure. Thus, our study contributes to the literature by presenting evidence that Guba functions as an online community where investors can share information and exchange opinions, which facilitates the exploration of more firm-specific information and reduces stock price synchronicity.

The rest of the paper is organized as follows. Section 2 discusses the related literature and develops the hypotheses. Section 3 describes the data, sample, and research methodology. Section 4 presents the empirical results on Guba messages and stock price synchronicity. Section 5 explores the possible mechanisms through which Guba messages affect synchronicity. Section 6 conducts additional analyses. Section 7 concludes the paper.

2. Literature review and hypothesis development

2.1 Relevant literature

2.1.1 Stock price synchronicity

Stock return synchronicity reflects the extent to which individual stocks co-moves with the market. In his seminal work, Roll (1988) finds that only less than 40% of the price fluctuations of individual stocks can be explained by systematic factors (i.e., market- and industry-level factors), with the rest being driven by firm-specific factors. He also proposes an information-efficiency view to explain the association between stock price synchronicity and informativeness; that is, the lower the stock price synchronicity, the more firm-specific information incorporated into stock prices. Specifically, with more firm-specific information available to the public and incorporated into stock prices, there will be more return variations related to firm-

specific factors, which correspondingly results in a lower level of co-movements between stock prices and market- or industry-level factors and will be manifested by a lower stock price synchronicity. Building on the work of Roll (1988), stock price synchronicity has long been utilized as an important measure of the amount of firm-specific information contained in stock prices in the literature (e.g., Bai et al., 2017; Chue et al., 2019).

A considerable body of research has examined the influential factors of stock price synchronicity. For example, Jin and Myers (2006) demonstrate that stock prices are more synchronous in firms with less information transparency because the increased firm opacity makes it more difficult for investors to collect firm-specific information. Similar evidence can be found in Hutton et al. (2009) that stock price synchronicity is negatively related to firm transparency. Kim et al. (2018) also find that when firms have stronger shareholder coordination capabilities, the information about these firms is more likely to be capitalized into stock prices.

Trading information from the share and derivative markets also affects stock price synchronicity. Meng et al. (2020) demonstrate that block trades can help reduce price synchronicity as it provides more firm-specific information to the equity market. Bai et al. (2017) find that the credit default swap (CDS) market helps lower share price co-movements through providing market participants with more firm-specific information.³

Various stakeholders within and outside a firm also play an important role in determining stock price synchronicity. Gul et al. (2010) find that synchronicity decreases with the degree of foreign institutional ownership and the quality of auditors, suggesting that foreign investors and auditors can accelerate the flow of firm-specific information into stock markets. Xu et al. (2013) show that by providing additional firm-

³ Extending the work of Bai et al. (2017), Zhao and Zhu (2020) investigate the externalities of CDS trading and demonstrate that the CDS transactions of customer firms will have spillover effects on the disclosure of the supplier firms' information. Specifically, the customer information conveyed from the CDS market enriches the suppliers' information environment and thus leads to a reduction in the suppliers' stock price synchronicity.

level information to investors, star analysts can help reduce stock price synchronicity. Boubaker et al. (2014) focus on the conflict between controlling and minority shareholders and show that the separation of control and cash flow rights has an adverse effect on a firm's information environment, resulting in a higher degree of synchronicity.⁴

In addition to firm-level factors, there is an emerging literature considering whether culture-based factors can also explain stock price synchronicity. For example, Qiu et al. (2020) claim that social trust can reduce the synchronicity of stock prices because a higher level of social trust can bring more firm-specific information to the market, leading to lower synchronicity.⁵ In a cross-country analysis, Eun et al. (2015) find that stock prices are more (less) synchronized in countries with tighter(looser) cultures and collectivism (individualism). This finding indicates that, in culturally tighter countries, the higher degree of homogeneity within individual behaviors impedes the collection of firm-specific information, thereby resulting in an increase in synchronicity.

Overall, previous empirical studies suggest that the key to lowering the synchronicity of stock prices lies within the enhancement of the flow and integration of firm-specific information into stock prices, which can be accompanied by improving corporate governance and/or a firm-specific information environment. Better governance and a better information environment can strengthen investor protection and encourage investors to gather more firm-specific information, thereby reducing stock price synchronicity. Well-governed firms are more likely to disclose firm-level information to the public.

⁴ Boubaker et al. (2014) argue that the separation of the two rights will be detrimental to corporate governance. In such an environment, to cover up their opportunistic behaviour, controlling shareholders tend to withhold more information from outsiders or adopt poor disclosure policies, preventing firm-specific information from being impounded into stock prices. By contrast, an increase in the cash flow rights of the controlling shareholder tends to reduce synchronicity due to the resulting improvement of corporate governance.

⁵ Qiu et al. (2020) suggest two reasons that social trust may affect stock price synchronicity. First, firms located in high-trust regions are perceived to disclose relatively more credible information, which will encourage investors' information collection activities. Second, because these firms are more likely to have better corporate governance and managers are more willing to behave honestly, investors tend to be further motivated to gather the information of these firms.

2.1.2 Messages in online stock forums

Guba, as a stock exchange communication platform, is a cyber space where investors can share their investment experience, express opinions, and communicate with other interested investors. The typical form of Guba communication is the stock forum, which has two main features. First, Guba is dominated by nonprofessional individual investors whose qualities vary significantly, which leads to doubt as to the quality and authenticity of the information on Guba. Hence, it is necessary for investors on Guba to assess and make judgements about the reliability of the posting content. Second, Guba provides a valuable interaction platform where any investor can participate and act as an information intermediary. This may enable investors to make more informed investment decisions (Drake et al., 2017).

Existing research has not reached a consensus on the value of messages in online stock forums. One stream of research asserts that the information on online stock forums can convey valuable information. For instance, Antweiler and Frank (2004) document that information from Internet stock message boards helps forecast market fluctuations. Similarly, Ackert et al. (2016) show that posts made by influential investors on online stock forums can predict subsequent stock trends. However, an alternative view is that information in online stock forums may fail to function well as an information intermediary, and thus, it does not have any effect on stock price informativeness. For example, Kim and Kim (2014) and Tumarkin and Whitelaw (2001) find no causal relationship between information on Internet stock message boards and the subsequent stock returns. In addition, messages in online stock forums can be detrimental because they may introduce noise into the market. Drake et al. (2017) find that coverage by nonprofessional Internet intermediaries, such as online stock forums, hinder price formation. By analyzing the data of stock message boards, Sabherwal et al. (2011) provide evidence for some influential investors running “pump-and-dump” schemes to manipulate the market. In light of the mixed evidence documented in prior studies, our examination of the impact of messages in online stock forums on stock

price synchronicity adds to existing research by further clarifying the informational role of information from online forum and its economic consequences.

2.1.3 The impact of media news and microblogging on stock price synchronicity

Our paper is closely related to two strands of the literature. The first strand mainly studies the impact of media news on stock prices synchronicity. For example, Kim et al. (2014) find that stock prices are more synchronized in countries with less press freedom. Dang et al. (2020) document a negative relation between media coverage and stock price synchronicity, suggesting that media reports allow more firm-specific information to be incorporated into stock prices. Kim et al. (2016) report similar evidence for Chinese listed firms. Furthermore, Li et al. (2019) find that the CEO media exposure can help in providing additional firm-level information to investors and thus result in a reduction in stock price synchronicity. Our study relates to but differs from these studies in that media reports are mostly one-way information transmissions, whereas Guba is characterized by a strong two-way interaction. Guba functions as an online community of investors where they can share information and exchange opinions, which facilitates the exploration of more firm-specific information.

The second strand of relevant literature examines the influence of microblogging on synchronicity. For example, Feng and Johansson (2019) use the data from the microblogging website (e.g., Sina Weibo) and find supportive evidence that the usage of social media by a firm's top executives improves the information environment and delivers more information to investors, thereby reducing stock price synchronicity. Our study differs from the microblogging literature in that Guba messages are substantially different from the information posted on the social media of a firm's executives in at least two ways. First, compared to the Guba forum, the interaction on Weibo accounts is relatively insufficient and restrictive, leading the executive's social media posts to be a form of voluntary disclosure. More importantly, due to the regulation of information disclosure, social media of corporate executives is unlikely to provide *new* price-sensitive information in addition to or ahead of corporate announcements.

2.2 Guba messages and stock price synchronicity

Guba messages can improve the firm information environment and reduce stock price synchronicity via several channels. First, Guba messages can function as an important information channel supplement to traditional information channels for investors in China. For Chinese investors, there are two primary channels through which they can obtain information: (a) corporate information disclosure and (b) reports from financial media and financial analysts research. However, compared to developed markets, the less stringent disclosure requirements and enforcements in China adversely affect firms' willingness to disclose information in a timely and unbiased manner, and hence, they also affect the quality and quantity of firm-specific information incorporated into stock prices (Meng et al., 2020). For the latter, it is costly for retail investors to obtain information from media or financial analysts' reports. Meanwhile, the fact that retail investors account for the majority of investor population in the Chinese share market further enhances the importance of the online stock forum, given the relatively restricted information access channels available to retail investors.⁶

Second and more importantly, the interactive communication activities on the Guba forum can better equip investors to determine the authenticity of the postings and at the same time attract more investor attention, thereby contributing to investors' discovery of firm-specific information. For example, investors post messages on Guba after processing the information they received. By doing so, they can help not only save time and effort for readers to digest the information but also strengthen investors' judgments on the firm, thereby contributing to the incorporation of firm-specific information into stock prices. In addition, because the investor posting the initial message plays the role of "throwing out a minnow to catch a whale", the interactive communication among investors on the Guba forum fosters individual investigation to verify the authenticity of information, thereby facilitating the discovery of firm-specific

⁶ Zhou et al. (2017) show that, as of the end of 2014, the number of individual investor accounts accounted for 99.53% of the total number of accounts opened with the Shanghai Stock Exchange, and the trading activities run by individual investors accounted for 85.19% of the total trading volume of the Shanghai Stock Exchange.

information. For example, the interactive behavior of investors can help improve an investor's ability to distinguish fake news or stale information from genuine information, given the presence of informed investors.

Finally, the process of "throwing out a minnow to catch a whale" also increases investor attention. After reading the information initially posted, investors can search comments from other interested investors and seek further clarification and investigation via interactive online communication. Accordingly, the activities on Guba (e.g., posting, reading, and commenting) can promote information acquisition by acting as a reminder to investors, prompting them to explore more firm-specific information. Consistent with this view, Zhou et al. (2017) show that new research reports from star analysts attract more investor attention, and investors who are reminded by the report would be stimulated to seek more firm-specific information, thereby reducing stock price synchronicity. According to the above discussions, we predict a negative association between Guba messages and stock price synchronicity. This leads to our first hypothesis:

H1a: Guba messages decrease stock price synchronicity.

However, it is also possible that Guba messages undermine the corporate information environment, thereby increasing stock price synchronicity. First, the overwhelming majority of the participating investors on Guba are individual investors who generally do not possess sophisticated professional knowledge or strong abilities to assess information credibility (Zhou et al., 2017). Second, the low participation threshold of Guba inevitably results in the uneven quality of the posters on Guba (Drake et al., 2017). Accordingly, despite the fact that Guba can disseminate a large amount of information about the firm, Guba messages might introduce noise rather than genuinely new information. Because the authenticity of Guba information can hardly be guaranteed, a significant portion of investors may be misled by false information due to their lack of capabilities to assess the trustworthiness and reliability of such information.

In addition, Guba messages can be manipulated by some posting investors through engaging in certain immoral or illegal practices, such as pump-and-dump schemes (Sabherwal et al., 2011). These investors may establish positions in certain stocks in advance and attempt to artificially boost share prices by posting false rumors on Guba and misleading other investors. Thus, the noisy information on Guba messages and the lack of professionalism of participating investors can hinder the incorporation of firm-specific information into stock prices, resulting in higher stock price synchronicity. Therefore, the second hypothesis is formalized as follows:

H1b: Guba messages increase stock price synchronicity.

3. Research design and summary statistics

3.1 The sample

Our sample consists of all Chinese A-share listed firms for the period of 2008–2020. Financial and stock prices are sourced from the China Stock Market & Accounting Research Database and the Wind Economic Database. Guba data are from the Chinese Listed Company Guba Review Database in Chinese Research Data Services (CNRDS). The Guba Review Database is a specialized database of financial text constructed based on the statistical analysis of the post comments of Chinese listed firms posted in the Eastmoney Guba online forum since 2008. It also uses a word list specifically designed to classify the positive and negative tone of financial texts and provides corresponding statistics.⁷ We exclude special treatment firms under financial distress, firms in the financial service industries, and firms whose financial leverage is greater than one. We remove observations with missing values in the main variables from the sample. To mitigate the effects of outliers, all continuous variables are

⁷ Loughran and McDonald (2011), in their influential study, have developed a dictionary used to capture finance sentiment. In the Chinese context, Jiang et al. (2021) have provided a Loughran-MacDonald style dictionary in Chinese. Given that the Guba Review Database in CNRDS is widely used in the literature, our study relies on the sentiment dictionary and approach used by CNRDS and uses the statistics of Guba posts and sentiment directly from CNRDS.

winsorized at the bottom and top 1% levels. Our final sample includes 28,438 firm-year observations.

3.2 Methodology

To measure stock price synchronicity, we follow prior studies (e.g., Chan and Chan, 2014; Gul et al., 2010; Meng et al., 2020; Zhao and Zhu, 2020) and construct two variables: *synch1* and *synch2*. In particular, for each listed firm, we obtain the goodness of fit R^2 in year t by estimating Equation (1) and (2), respectively:

$$Ret_{i,w,t} = \alpha_0 + \alpha_1 * R_{M,w,t} + \alpha_2 * R_{M,w-1,t} + \alpha_3 * R_{I,w,t} + \alpha_4 * R_{I,w-1,t} + \varepsilon_{i,w,t} \quad (1)$$

$$Ret_{i,w,t} = \beta_0 + \beta_1 * R_{M,w,t} + \beta_2 * R_{I,w,t} + \varepsilon_{i,w,t} \quad (2)$$

where $Ret_{i,w,t}$ denotes weekly return of stock i in week w of year t adjusted for the cash dividend reinvestment. $R_{M,w,t}$ is the market return in week w of year t . $R_{I,w,t}$ is the industry return in week w of year t . Because the R^2 from Equations (1) and (2) is positive and lower than one, we compute the measures of stock price synchronicity (i.e., *synch1* and *synch2*) by estimating Equation (3) based on a logistic transformation to R^2 . Accordingly, a lower value of synchronicity indicates lower stock price co-movement and that more firm-specific information is impounded into share prices.

$$synch = \log(R^2 / (1 - R^2)) \quad (3)$$

To examine whether Guba messages affect stock price synchronicity, we estimate the following regression model:

$$synch_{i,t} = \gamma_0 + \gamma_1 * post_{i,t} / read_{i,t} + \delta * controls + \varepsilon_{i,t} \quad (4)$$

where the dependent variable *synch* is the stock price synchronicity, including *synch1* and *synch2*. The independent variable *post* is the number of firm-related posts on Guba for a particular stock i , which captures the posting behavior on Guba. We also use an alternative measure, *read*, as the number of Guba post reads for a particular firm to capture the behavior of readers on Guba. *Controls* represents control variables. Following prior research (e.g., Gul et al., 2010; Meng et al., 2020), we control for the return on assets (*roa*), financial leverage (*lev*), firm size (*size*), market-to-book ratio (*mb*), the ownership of the controlling shareholder (*large*), institutional ownership (*inst*), the indicator of state-owned enterprises (*soe*), the indicator of the big 4 auditors (*big4*),

and earnings volatility (*stdroa*) in Equation (4). We also include industry- and year-fixed effects. The definitions of all variables are provided in Table 1.

[Table 1 about here]

3.3 Descriptive statistics

Panel A of Table 2 presents the summary statistics of the key variables used in the analysis. The mean values of the two measures of stock price synchronicity (*synch1* and *synch2*) are -0.230 and -0.387 , respectively, comparable to those reported in prior studies (Gul et al., 2010; Meng et al., 2020; Zhao and Zhu, 2020). The mean value of the number of Guba postings (*post*) and Guba reads (*read*) is 8.681 and 15.661, respectively.

[Table 2 about here]

Panel B of Table 2 reports the result of the univariate analysis by comparing the mean values of stock price synchronicity (*synch1* and *synch2*) between firms with more Guba messages and those with fewer messages. We classify firms with more Guba messages (fewer) as those whose number of Guba postings above (below) the median value of the sample in a particular year. The result shows that the average *synch1* (*synch2*) is -0.245 (-0.407) for the firms having more posts on Guba, significantly lower than those with more posts on Guba (-0.216 and -0.368 , respectively). This indicates that stock price synchronicity is negatively related to the number of Guba posts. We also analyze stock price synchronicity between firms with higher number of Guba reads and those with less read and find similar results. Overall, the results in Panels B and C provide preliminary supportive evidence for H1a.

4. Guba messages and stock price synchronicity

4.1 Baseline results

The estimation results of our baseline regression are presented in Table 3, with stock price synchronicity measures (*synch1* and *synch2*) as the dependent variable. The results show that the coefficients of Guba messages (*post*) are -0.122 for *synch1* and -0.140 for *synch2*, respectively. These are statistically significant at the 1% level across

all specifications. The negative coefficients on *post* imply that, when the number of Guba messages increases by one standard deviation, stock price synchronicity for an average firm reduces from -0.230 to -0.352 for *synch1* (from -0.387 to -0.527 for *synch2*). This implies the proportion of total return variations characterized by the market-wide and industry-level information reduces by 6.7% for *synch1* and 8.2% for *synch2*. When using the number of Guba post reads (*read*) to capture the behavior of Guba readers, we find similar results. Overall, the result suggests that the higher the number of Guba messages, the lower the co-movements of stock prices. In other words, Guba messages can lower stock price synchronicity, which supports H1a and confirms the positive role of Guba messages in improving the informativeness of stock prices.

[Table 3 about here]

4.2 Identification: The instrumental variable approach

The baseline results suggest that Guba messages help facilitate the incorporation of firm-specific information into stock prices, thereby lowering stock price synchronicity. However, we acknowledge that the negative relation between Guba messages and synchronicity is subject to endogeneity for several reasons. First, omitted correlated variables can introduce bias into our results. Firms with more Guba messages may differ substantially from those with fewer messages in terms of firm, governance, or financial characteristics. Failure to sufficiently control for these potential omitted correlated variables leads to incorrect statistical inference. For example, it could be argued that better corporate governance may bring about changes in both the amount of Guba information and the level of stock price synchronicity. Specifically, well-governed firms are likely to attract more attention from investors, resulting in more firm-specific information disseminated on Guba. These firms, simultaneously, tend to exhibit lower stock price synchronicity. Second, the negative relation between Guba messages and synchronicity can be driven by reverse causality. For example, although higher number of Guba messages can reduce stock price synchronicity, it is also possible that firms with lower stock price synchronicity draw more attention from investors, thereby increasing its coverage and the relevant messages on Guba.

To mitigate the endogeneity concern, we conduct the analysis using the instrumental variable approach. In the spirit of prior studies (e.g., Hann et al., 2013; Hasan et al., 2014; Demerjian et al., 2020), we employ two instrumental variables. The first instrumental variable is the industry average of the number of Guba postings or reads after excluding the focal firm (*post_ind* or *read_ind*). The second one is the average of the number of Guba postings or reads for firms located in the same city after excluding the focal firm (*post_province* or *read_province*). It is noted a valid instrumental variable should satisfy both relevance and exogeneity conditions. The relevance condition states that the instrumental variable should be related to Guba posts. The exogeneity condition states that the instrumental variable is uncorrelated with the error term, implying that the channel through which the instrumental variable affects stock price synchronization is through Guba posts and the instrument should not be directly related to stock price synchronicity. To the extent that investor attention on a particular industry (or firms in a particular province) due to capital inflow or market performance affects most firms in the industry (a particular province), the industry (province) average of Guba messages is likely to affect the focal firm's Guba posts, which satisfies the relevance condition. By contrast, industry (province) Guba messages can be a valid instrument and meet the exclusion condition because they are determined at the industry level (at the province level) and are less likely to directly affect firm-specific stock price synchronicity.

The results are reported in Table 4. The first stage regression in columns (1) shows the industry and province average of the number of Guba postings are positively correlated with the number of firm-level postings on Guba (*post*), and the *F*-statistic is greater than 10. This rejects the null hypothesis of weak instruments and confirms the relevance of the instrument based on the Staiger and Stock (1997) rule of thumb. The *J*-statistic also passes the over-identification test with a *p*-value higher than 0.3. Columns (2) and (3) present the regression results of the second stage. It shows that the coefficients on the number of postings (*post*) is still significantly negative, supporting our earlier finding that Guba messages have a synchronicity-reducing effect. We find

similar results for the number of Guba post reads in Columns (4) to (6). Overall, the results based on the two instrumental variables confirm the robustness of our findings.

[Table 4 about here]

4.3 Further tests on endogeneity and robustness

To further alleviate these endogeneity issues, in this subsection, we conduct a series of robustness tests. First, we estimate Equation (4) with firm fixed effects to control for unobserved firm-specific but time-invariant confounding factors. The results reported in Panel A of Table 5 confirm that the coefficients on the number of Guba posts and reads continue to be significantly negative.

[Table 5 about here]

Second, we use first-difference estimation to address the problem of omitted variables (Wooldridge, 2010), since it mitigates the omitted variable problem caused by unobservable factors that do not vary over time. For each variable, we change to the first-difference form for each variable, where the difference between the current period value and the value in the previous period is used as the new variable in the regression. As shown in Panel B of Table 5, our main finding remains similar when using the first-difference estimation method.

Third, we run the analysis using a matched sample obtained through the propensity score matching (PSM) approach to address the concern that firms with more Guba messages may differ systematically in firm characteristics from those with fewer messages. In particular, we follow prior studies (e.g., Kim et al., 2016) and construct a dummy variable *post_75* that takes the value of one for firms with *post* higher than the 75th percentile of the sample in a given year and 0 otherwise. For each sample firm-year in the *post_75* sample, we then generate a control sample by using the PSM approach. In particular, we generate a propensity score for each observation through estimating the logistic regression in which all the firm-specific control variables in Equation (4) are included as matching variables. Employing the estimated propensity scores, we select and obtain the control group of firms by carrying out nearest neighbor matching. Using the PSM matched sample, we re-estimate the baseline regression. The results in

Panel C of Table 4 are consistent with our main finding, and we continue to find significant and negative coefficients on *post* and *read* for stock price synchronicity.

For robustness, we also examine the relationship between *post* and *read* and stock price synchronicity, where synchronicity is measured using daily stock returns. The results presented in Panel D of Table 5 suggests that Guba messages are not affected by the frequency of stock returns used to measure stock price synchronicity.

Finally, we conduct a placebo test for the baseline regression to further control for potentially unobserved omitted variables. First, a *placebo* independent variable (*post*) is artificially constructed by randomly assigning the values of the independent variable (i.e., the number of postings) to each observation. Based on the simulated sample, we then re-estimate Equation (4). We repeat the simulation process 500 times. The untabulated result of the placebo test shows that for the 500 regressions of stock price synchronicity (*synch1* and *synch2*), the mean coefficients of the placebo independent variable (*post* and *read*) are all close to zero, suggesting that the coefficients of the placebo independent variable are statistically insignificant.⁸ Figure 1 presents the *t*-value distribution of the 500 regressions of the dependent variable *synch1* on the placebo independent variable (*post*). As illustrated in Figure 1, the *t*-value in the placebo test is concentrated around 0, demonstrating that the issue related to omitted variables is unlikely to affect the estimation results. Overall, the placebo results indicate that the negative relation between the number of Guba messages and stock price synchronicity is unlikely to be caused by other confounding factors.

[Figure 1 about here]

⁸ In particular, the coefficient on *post* is 0.0003 for *synch1* and 0.0006 for *synch2*, with a *t*-statistic of 0.0468 and 0.0979 respectively. The coefficient on *read* is 0.0000 for *synch1* and 0.0002 for *synch2*, with a *t*-statistic of 0.0109 and 0.0356 respectively.

5. Guba messages and stock price synchronicity: Possible mechanisms

5.1 The role of information dissemination

Having established the association between Guba messages and stock price synchronicity, in this section, we explore the possible mechanisms through which Guba messages lower stock price synchronicity. Specifically, we examine two plausible mechanisms proposed in Section 2, namely, information dissemination and investor interaction. Regarding information dissemination, if the synchronicity-reducing effect of Guba messages is attributed to the Guba's role in delivering firm-specific information, then the effect is expected to be more pronounced for firms with weaker information environments.

We use firm-specific measures to capture a firm's external information environment. At the firm level, financial analysts and institutional investors, as important participants in the capital market, play essential roles in information collection and dissemination (Cao et al., 2021; Chen et al., 2021; Li et al., 2021; Liang et al., 2021). Accordingly, analyst coverage and the presence of institutional shareholders enhance a firm's information environment by providing more firm-specific information and thus are expected to influence the role of Guba messages in reducing stock price synchronicity. We define the extent of analyst coverage (*analyst*) as the natural logarithm of one plus the number of analysts following the firm. We measure institutional ownership (*inst*) as the percentage of shares held by institutional investors. We include the interaction term between Guba messages and analyst coverage (institutional ownership) in Equation (4) and rerun the regression.

Consistent with our expectation, Panel A of Table 6 shows that the coefficients of the interaction term *post*analyst* and *read*analyst* are significantly positive, indicating that the synchronicity-reducing effect of Guba messages is attenuated for firms followed by more financial analysts. Similarly, Panel B of Table 6 show that the interaction term *post*inst* and *read*inst* has positive and statistically significant coefficients, which indicates that the role of Guba messages in lowering stock price synchronicity is more pronounced for firms with lower institutional ownership.

[Table 6 about here]

In addition, we explore the effect of Guba messages is conditional on the narrative tone of the messages to further substantiate their role of information dissemination. Negative narrative tone in corporate disclosures and media reports are found to contain more information contents and thus have significantly higher effect on share price performance, compared to messages with positive tone (Ahmad et al., 2016; An et al., 2020; Jiang et al., 2016; Lu et al., 2020; Zhai et al., 2021). Similarly, negative Guba messages can reflect more firm-specific information than positive messages since managers tend to release good news immediately but withhold bad news (Kothari et al., 2009; Bertomeu et al., 2020). The results in Panel C of Table show that the effect of Guba messages on stock price synchronicity is mainly concentrated in Guba messages with negative tone. This result indicates that, to the extent that negative Guba messages are more likely to contain new firm-specific information, Guba messages can influence stock price synchronicity via information dissemination.

Collectively, the results in this subsection suggest that the reduction in synchronicity is more pronounced among firms that are followed by fewer analysts and with lower levels of institutional ownership. These findings imply that Guba messages can function as a substitute for other information dissemination channels, which is in line with our expectation and lends empirical support to the view that Guba messages can lower stock price synchronicity through delivering more firm-specific information.

5.2 The role of investor interaction

Compared to microblogging and financial media, one distinguishing feature of Guba is strong interaction among investors. We argue that not only can readers obtain firm-specific information directly from Guba messages, but, perhaps more importantly, the interactive activities on Guba inspire investors to make greater efforts on their information acquisition subsequent to the viewing of the initial posts. This indirectly allows more firm-specific information to be made available to market participants and eventually incorporated into share prices.

Our analysis so far focuses mainly on the behavior of Guba posters and readers, which is captured by the number of Guba posts and reads respectively. It examines whether Guba messages reduce the co-movements of stock prices through information dissemination. However, the number of Guba messages cannot capture the possible impact of readers' interaction. Thus, in this subsection, we conduct additional analyses to provide further insights into the role of investor interaction in influencing stock price synchronicity.

To capture investor interaction on Guba, we use the ratio of comments over posts (reads) related to a firm in a given year, and divide the sample into firms with high and low investor interaction based on the percentage of posted comments. To the extent that the impact of Guba messages on stock price synchronicity is attributed to investor interaction, we would expect that the negative effect of Guba messages is more pronounced among firms with high investor interaction. Consistent with this expectation, the results in Table 7 show that all the estimated coefficients on *post* and *read* are negatively significant for firms with high investor interaction only. Overall, the findings support the view that investor interaction on Guba contributes to the reduction of stock price synchronicity. Besides directly delivering firm-specific information, Guba messages generated by posters can also act as a stimulus to the interactive communication of investors, which facilitates more firm-specific information incorporated into share prices.

[Table 7 about here]

5.3 Guba messages and stock price synchronicity: Two exogenous shocks

Our analyses provide evidence on the mechanisms of information dissemination and investor interaction through which Guba messages affect stock price synchronicity. However, both mechanisms, especially the role of information dissemination, are largely constrained by noisy and even false messages on Guba, which can be highly subjective and arbitrary. Thus, the authenticity of the information in Guba messages directly affects readers' ability to obtain firm-specific information, thereby changing stock price synchronicity. In this section, we exploit two exogenous shocks due to a

regulatory change and provide more direct evidence on the causal effect of Guba messages on synchronicity.

On September 10, 2013, the Interpretation of the Supreme People’s Court and the Supreme People’s Procuratorate on Several Issues Concerning the Application of Law in Handling Criminal Cases of Using Information Networks to Commit Defamation and Other Such Criminal Offences (the Interpretation hereafter) entered into effect. The Interpretation clearly defines the standards of conviction and punishment for the behavior of posting and reprinting false information on social media platforms. For example, according to the Interpretation, when there is any defamatory information that is clicked and viewed more than 5,000 times or reposted more than 500 times, it will be determined as the “serious circumstances,” which is prescribed in the first paragraph of Article 246 of the Criminal Law of the People’s Republic of China. Because Guba falls into the category of the “information networks” defined in the Interpretation, it is expected that, after the passages of the Interpretation, the authenticity of Guba messages should be improved, which would enhance the roles of information dissemination for Guba messages.

Since the Interpretation was released in September 2013, we define 2014 as the implementation year of the Interpretation. Accordingly, we construct a dummy variable y_{2014} that takes the value of one when the firm-year is after 2013 and zero otherwise. We follow Acemoglu et al. (2004) and Qian (2008), and use a continuous variable for Guba messages ($post$ and $read$) in the difference-in-differences approach by including the interaction term $post*y_{2014}$ and $read*y_{2014}$ in Equation (4), respectively. The results in Panel A of Table 8 show that the coefficients of the interaction term $post*y_{2014}$ and $read*y_{2014}$ are significantly negative for both $synch1$ and $synch2$. This suggests that the implementation of the Interpretation has enhanced the authenticity of Guba messages, which allows readers to better acquire firm-specific information embedded in the posts and thus leads to a stronger synchronicity-reducing effect of Guba messages. For robustness, we also exclude observations in the year of 2013 from the sample, since the Interpretation came into effect in September 2013. The results

(untabulated) after removing the observations in 2013 remain qualitatively and quantitatively similar.

[Table 8 about here]

The second exogenous shock we consider is the launch of Eastmoney Guba stock forum in 2006. The launch of Eastmoney Guba leads to the availability of Guba messages and accordingly increases the ability of individual investors to search for information on the Guba forum and interact to other investors. To examine whether the launch of Eastmoney Guba stock forum and accordingly the availability of Guba messages have a causal impact on stock price synchronicity, we use the sample over 2004-2007, which is different from the sample we employ for most above analyses. In this setting, our focus is whether the launch of Eastmoney Guba stock forum has a significant impact on stock price synchronicity instead of the interaction between Guba postings and the launch of the forum.⁹

We follow Xu et al. (2021) and conduct the following analysis. In particular, we define y_{2006} as the indicator of the launch of Eastmoney Guba, which is equal to one when the firm-year is in 2006 or 2007, and zero otherwise. We define the treatment firms as those whose number of shareholders in 2005 is higher than the median value of all firms. The number of shareholders captures a firm's overall visibility with investors (Grullon et al., 2004; Ding and Hou, 2015; Wen et al., 2019; Chia et al., 2020). Firms with more shareholders are more likely to be followed and influenced by retail investors, who can benefit from Guba messages since its launch in 2006. Thus, *Treat* is an indicator variable that takes the value of one when a firm's number of shareholders in 2005 is higher than the median value of all firms, and zero otherwise.

Our analysis examines the sample period that includes two years before and after the launch of Eastmoney Guba (i.e., 2004-2007) to understand the impact of the launch of Guba stock forum on stock price synchronicity. The results are presented in Panel B

⁹ Our tests of the effect of the launch of Eastmoney Guba stock forum use the sample around the launch year (i.e., 2004-2007), different from most tests in the paper using a sample period of 2008-2020. This is because our examination of the launch of Eastmoney Guba stock forum on synchronicity does not require the data of Guba messages, which are only available from 2008 in the CNRDS database.

of Table 8. We find that the coefficients of the interaction term $Treat*y2006$ are significantly negative for both $synch1$ and $synch2$. This suggests that the launch of Guba stock forum has enhanced the accessibility of information and investor interaction via Guba messages, thereby leading to a reducing effect of Guba messages on synchronicity.

6. Additional Analyses

6.1 Do Guba messages contain information beyond media reports?

In this subsection, we further consider the influence of media news on our finding. One concern is that instead of producing incremental information, Guba messages are merely an information channel that repeats the information disclosed by the financial media. For example, Dang et al. (2020) show that the higher the firm's media coverage, the lower stock price synchronicity. In addition, higher media coverage is likely to trigger more investor discussion of the firm, which will also give rise to a higher number of Guba messages.

To address this concern, we include an index of media news ($medianews$) that is equal to the natural logarithm of one plus the number of media reports covering the firm by eight main financial medias in China in a given year as the control variable in all the above analyses.¹⁰ This indicates that, after controlling for the impact of media reports, the number of Guba messages reduces stock price synchronicity.

To provide further insight, we examine separately the firms without media coverage from eight main financial medias in China (i.e., $medianews = 0$). In the absence of major media coverage, we would expect that Guba messages plays a more significant role in facilitating information dissemination and discovery. Consistent with this view, we find that the coefficients on $post$ and $read$ continue to be negatively significant and are larger in magnitude compared to those in Table 3. Thus, the results

¹⁰ The data of media news are sourced from the CNRDS database. The number of media reports for a firm in a given year is calculated as the number of news articles during the year whose titles include the firm's name. The eight main financial medias in China include China Securities Journal, Shanghai Securities News, China Business News, 21st Century Business Herald, China Business Journal, The Economic Observer, Securities Daily, and Securities Times.

indicate that the role of Guba is not limited to transmitting the information that has been released by media reports; rather, Guba messages have an incremental effect beyond media reports, which plays an information production role and furthers lower stock price synchronicity.¹¹

[Table 9 about here]

6.2 The impact of Guba messages on information disclosure quality and stock price crash risk

Our measure of stock price synchronicity is grounded on the information-efficiency view, proposed by Roll (1988), that the lower the stock price synchronicity, the more that firm-specific information is incorporated into stock prices. Although supporting empirical evidence for this view has been documented in an extensive literature, there are several studies holding the opposite view. These studies claim that stock price synchronicity is positively related to stock price informativeness (e.g., Chan and Chan, 2014). They contend that a lower stock price synchronicity represents more noise trading. To distinguish from this alternative view, we conduct the following analysis with different dependent variables.

First, we examine the impact of Guba messages on the quality of information disclosure. If Guba messages can accelerate the flow of firm-specific information into the market, then an important and direct impact would be to improve the quality of information disclosure. Following Kim and Verrecchia (2001), we construct the KV index to measure the quality of information disclosure. Control variables are the same as those defined in Equation (4). The larger the KV , the lower the quality of information disclosure. As expected, the result reported in Columns (1) and (2) of Table 10 shows

¹¹ We also employ the approach in Eun et al. (2015) to further isolate the influence of Guba messages from that of media reports. In particular, we regress the number of postings on Guba (*post*) on the number of media reports (*medianews*) and include both the fitted value and residual of Guba messages in Equation (4). The fitted value of *post* represents the portion of Guba messages that can be explained by the number of media reports, which reflects the information dissemination role of Guba. The residual value of *post* captures the part of Guba information that cannot be explained by media reports, indicating the information production role of Guba. In untabulated results, we find that both the fitted value and residual are significantly negatively associated with stock price synchronicity, suggesting that Guba messages play both information dissemination and production roles.

that the coefficients of Guba postings and reads are significantly negative, indicating that Guba messages can enhance firm disclosure quality.

[Table 10 about here]

Next, we explore the impact of Guba messages on stock price crash risk. As documented in the extant literature (e.g., An et al., 2020; Cao et al., 2019; Kim and Zhang, 2014), the concealment of bad news by executives is one of major reasons for crash risk. If Guba messages can provide extra firm-specific information, then it will make it more difficult for executives to withhold bad news, thereby reducing stock price crash risk. Following Cao et al. (2019) and Kim and Zhang (2014), we use the negative skewness coefficient (*NCSKEW*) and the down-to-up volatility (*DUVOL*) of firm-specific weekly returns in the following year to measure stock price crash risk, and we include a set of control variables, including the mean and standard deviation of firm-specific weekly returns of individual stocks, returns on assets, financial leverage, firm size, market-to-book ratio, average monthly stock turnover, and financial reporting opacity. The results in columns (3) to (6) show that the coefficients on Guba posts and reads are significantly negative, consistent with the view that Guba messages lower stock price crash risk.

6.3 Controlling for management and market sentiment

Prior studies suggest that investment sentiment can play an important role in explaining stock return synchronicity. Chue et al. (2019) show that individual stocks have higher return synchronicity during periods of high investor sentiment, especially small and volatile stocks. Huang et al. (2015) show that aggregate investor sentiment predicts both market and cross-sectional stock returns, and its predictability largely stems from investors' biased beliefs about future cash flows. Jiang et al. (2019) use an index of management sentiment based on corporate financial disclosures and show its predictive power in explaining market and cross-sectional returns. Thus, market and management sentiment can potentially affect stock return synchronicity and our documented relationship between Guba messages and synchronicity.

To address this concern, we include two sentiment measures as additional controls in our regression analysis. First, the measure of management sentiment (*MDA_tone*) captures the aggregated textual tone of management discussion and analysis (MD&A) within a firm's annual report. The *MDA_tone* is sourced from CNRDS and calculated as the difference between the number of positive words in the MD&A section of a firm's annual report and the number of negative words scaled by the sum of both positive and negative words. Since a firm's annual report is disclosed within four months after the financial year-end, we use *MDA_tone* in the prior year in the regression.

Second, we measure market sentiment using the China Investors Sentiment Index (*CISI*) from CSMAR, which follows Baker and Wurgler (2006) and Yi and Mao (2009) and uses the principal component analysis approach to construct a composite index of market sentiment based on six indicators: market turnover, closed-end fund discount, average first-day returns on IPOs, number of IPOs, number of newly opened brokerage accounts, and consumer confidence. A higher value of *CISI* indicates higher market sentiment.¹² The figures in Panel A of Table 11 show that our results continue to hold after controlling for market and management sentiment.

[Table 11 about here]

6.4 Controlling for Guba investment sentiment

Our findings suggest that the negative effect of Guba messages on stock return synchronicity is mainly concentrated in Guba messages with negative tones. It is possible that investment sentiment among Guba investors affects both the number of Guba messages posted and the general tone of the messages, leading to a spurious relation between Guba messages and stock return synchronicity. To mitigate this concern, we control for the investment sentiment of Guba investors (*Guba_sentiment*) in our regression. *Guba_sentiment* is measured as the difference between Guba

¹² While two of the six indicators in *CISI* (i.e., number of newly opened brokerage accounts and consumer confidence) are not included in the sentiment index by Baker and Wurgler (2006), *CISI* is found to better capture market sentiment of the Chinese market after including these two additional indicators (Cao et al., 2021; Yi et al., 2022).

messages with positive and negative tones divided by the sum of Guba messages for a particular firm in a year. The results in Panel B of Table 11 show that the coefficients on *post* and *read* remain significantly negative after controlling for investor sentiment.

6.5 Guba messages and stock return volatility synchronicity

Finally, we explore the effect of Guba messages on stock return volatility synchronicity. Similar to the approach of measuring stock price synchronicity, we calculate return volatility synchronicity as follows. First, we obtain the goodness of fit R^2 in year t by estimating the following Equation (5) for each firm in a particular year.

$$SD_{i,w,t} = \eta_0 + \eta_1 * SD_{M,w,t} + \eta_2 * SD_{I,w,t} + \varepsilon_{i,w,t} \quad (5)$$

where $SD_{i,w,t}$ denotes weekly return volatility (measured by the standard deviation of daily stock returns) for stock i in week w of year t . $SD_{M,w,t}$ is the market return volatility in week w of year t . $SD_{I,w,t}$ is the industry return volatility in week w . Because the R^2 from Equations (5) is positive and lower than one, we compute the measures of stock return volatility synchronicity (i.e., *synch_sd*) as $\log(R^2 / (1 - R^2))$. Accordingly, a lower value of synchronicity indicates lower volatility co-movement with the market and industry. The empirical results are presented in Table 12. We find that a firm's stock return volatility synchronicity reduces when the number of Guba messages increases, indicating that Guba messages lower the co-movement of stock return volatility.

7. Conclusion

This study provides empirical evidence on the informational role of online stock forums by examining their effect on stock price synchronicity. Using the data for a sample of Chinese A-share listed firms, we find that Guba messages can allow more firm-specific information to be incorporated into share prices, thereby reducing stock price synchronicity. We also investigate the possible mechanisms through which Guba messages affect stock price informativeness. Specifically, we find that the negative impact of Guba messages is more pronounced when a firm's information environment is worse, lending support to the substitutive effects of Guba in disseminating information. We also find that, compared with their direct information acquisition via reading Guba posts, readers contribute significantly more to the reduction of stock price

synchronicity through their follow-up online interactive activities, which supports Guba's role in facilitating investor interaction and communication.

In addition, we exploit two exogenous shocks that enhances the availability and authenticity of online information. We find that the negative association between the number of Guba messages and stock price co-movements is stronger after the legislation is more stringent or the launch of Guba stock forum. Finally, our additional analyses suggest that Guba information improves the quality of firm information disclosure and reduces stock price crash risk.

Overall, this study provides evidence on the positive role of Guba in improving the informativeness of stock prices and two mechanisms through which Guba affects stock price synchronicity: namely, information dissemination and investor interaction. Our study contributes to the mixed evidence on the value of investment opinions in online stock forums. Our findings have important implications for regulators and investors. Although regulators are concerned that opinions in online stock forums can be manipulated (Ackert et al., 2016; SEC, 2016, 2017), the evidence in this study provides insights for policymakers in revisiting the standards and regulations for information disclosure on online forums and improving the information environment via encouraging corporate communication and interaction with investors on social media, thereby enhancing the efficiency of capital markets.

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Figure 1 The distribution of t -values of the placebo test

This figure shows the distribution of t -values for 500 iterations of regressing stock price synchronicity (*synchl*) on the placebo Guba messages (*post*).

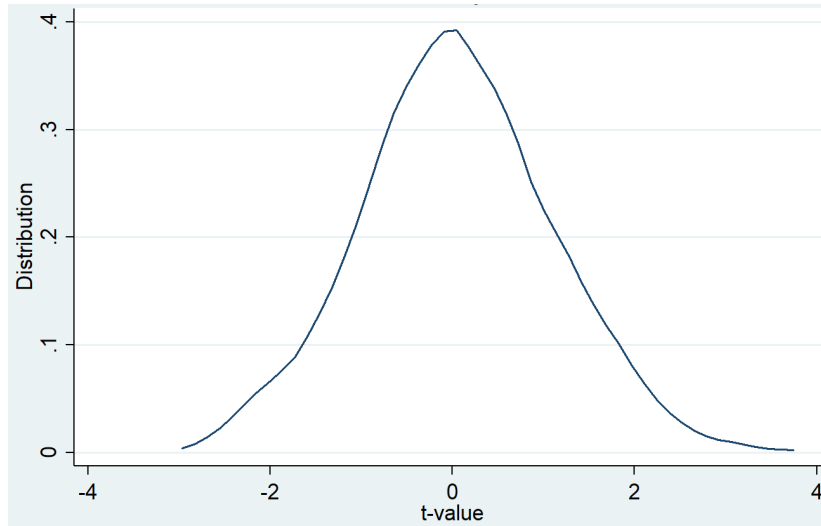


Table 1 Variable definitions

Variable	Symbol	Definition
Stock price synchronicity	<i>synch1</i>	The logistic transformation of the R squared of Equation (1) estimated for each firm and year using weekly market and industry returns in the current and previous period
Stock price synchronicity	<i>synch2</i>	The logistic transformation of the R squared of Equation (2) estimated for each firm and year using weekly market and industry returns in the current period
Guba post	<i>post</i>	The number of firm-related posts on Guba, calculated as the natural logarithm of 1 plus the number of Guba posts for a particular firm in a year
Guba read	<i>read</i>	The number of firm-related post reads on Guba, calculated as the natural logarithm of 1 plus the number of Guba post reads for a particular firm in a year
Return on assets	<i>roa</i>	The ratio of net profit over total assets
Financial leverage	<i>lev</i>	Total liability divided by total assets
Firm size	<i>size</i>	The natural logarithm of total assets
Market-to-book ratio	<i>mb</i>	Total market capitalization divided by total net assets at the end of the fiscal year
Largest shareholder ownership	<i>largest</i>	The percentage of shares held by the largest shareholders at the beginning of the year
Institutional ownership	<i>inst</i>	The percentage of shareholdings held by institutional shareholders
The indicator of state-owned enterprises	<i>soe</i>	An indicator variable that equals to one if the majority of a firm's voting rights are controlled by government or government-related firms and 0 otherwise
Auditing quality	<i>big4</i>	An indicator variable equal to one if the firm is audited by a Big 4 auditor and 0 otherwise
Earnings volatility	<i>stdroa</i>	The standard deviation of a firm's return on assets over the preceding three-year period, including the current year
Media reports	<i>medianews</i>	The natural logarithm of one plus the number of media reports covering the firm by eight main financial medias in China in a given year

Table 2 Summary statistics

Panel A: Summary statistics of key variables

This table presents the summary statistics of the key variables used in the analysis. All variables are defined in Table 1.

Variable	Mean	Std	p25	Median	p75
<i>synch1</i>	-0.230	0.849	-0.772	-0.173	0.371
<i>synch2</i>	-0.387	0.942	-0.948	-0.300	0.273
<i>post</i>	8.681	0.851	8.123	8.688	9.243
<i>read</i>	15.661	1.041	14.911	15.665	16.443
<i>roa</i>	0.033	0.064	0.012	0.033	0.062
<i>lev</i>	0.448	0.204	0.289	0.446	0.604
<i>size</i>	22.225	1.287	21.317	22.057	22.957
<i>mb</i>	0.622	0.252	0.427	0.621	0.816
<i>largest</i>	34.433	14.958	22.610	32.230	44.69
<i>inst</i>	0.063	0.072	0.009	0.037	0.092
<i>soe</i>	0.398	0.489	0	0	1
<i>big4</i>	0.060	0.238	0	0	0
<i>stdroa</i>	0.028	0.041	0.007	0.015	0.031
<i>medianews</i>	1.097	0.994	0	1.099	1.792

Panel B: Univariate analysis based on Guba posts

This table shows the mean values of stock price synchronicity between firms having more Guba posts and those with fewer Guba posts. We classify firms with more (fewer) Guba posts as those whose number of Guba postings above (below) the median value of the sample in a particular year. All variables are defined in Table 1. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	Firms with fewer Guba posts		Firms with more Guba posts		Difference in mean	
	Mean	Std	Mean	Std	Mean	<i>t</i> -value
<i>synch1</i>	-0.216	0.824	-0.245	0.873	0.029***	2.887
<i>synch2</i>	-0.368	0.913	-0.407	0.971	0.039***	3.436

Panel C: Univariate analysis based on Guba reads

This table shows the mean values of stock price synchronicity between firms having more Guba reads and those with fewer Guba reads. We classify firms with more (fewer) Guba reads as those whose number of Guba post reads above (below) the median value of the sample in a particular year. All variables are defined in Table 1. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	Firms with fewer Guba reads		Firms with more Guba reads		Difference in mean	
	Mean	Std	Mean	Std	Mean	<i>t</i> -value
<i>synch1</i>	-0.206	0.825	-0.255	0.872	0.049***	4.835
<i>synch2</i>	-0.355	0.913	-0.420	0.971	0.065***	5.798

Table 3 Guba messages and stock price synchronicity

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>		<i>synch2</i>	
	(1)	(2)	(3)	(4)
<i>post</i>	-0.122*** (-13.595)		-0.140*** (-13.889)	
<i>read</i>		-0.121*** (-13.972)		-0.143*** (-14.701)
<i>roa</i>	0.143 (1.498)	0.141 (1.476)	0.209* (1.917)	0.203* (1.860)
<i>lev</i>	-0.457*** (-13.523)	-0.461*** (-13.644)	-0.496*** (-12.997)	-0.502*** (-13.146)
<i>size</i>	0.165*** (17.672)	0.172*** (18.022)	0.186*** (17.674)	0.195*** (18.194)
<i>mb</i>	0.554*** (14.592)	0.527*** (13.672)	0.618*** (14.457)	0.582*** (13.413)
<i>largest</i>	-0.003*** (-8.238)	-0.004*** (-8.681)	-0.004*** (-8.116)	-0.004*** (-8.656)
<i>inst</i>	-0.760*** (-8.240)	-0.754*** (-8.186)	-0.826*** (-8.011)	-0.828*** (-8.036)
<i>soe</i>	0.144*** (10.662)	0.144*** (10.704)	0.165*** (11.061)	0.166*** (11.118)
<i>big4</i>	-0.064** (-2.038)	-0.068** (-2.168)	-0.076** (-2.216)	-0.081** (-2.372)
<i>stdroa</i>	-0.379*** (-2.739)	-0.351** (-2.539)	-0.584*** (-3.556)	-0.545*** (-3.323)
<i>medianews</i>	-0.084*** (-12.600)	-0.082*** (-12.285)	-0.103*** (-13.737)	-0.100*** (-13.362)
<i>Constant</i>	-1.800*** (-11.385)	-1.092*** (-6.678)	-2.131*** (-12.122)	-1.296*** (-7.146)
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	28,438	28,438	28,438	28,438
<i>R</i> ²	0.340	0.340	0.334	0.334

Table 4 Guba messages and stock price synchronicity: Two-stage instrumental variable regression

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). In the first stage, the variable of Guba messages (*post*) is regressed on the industry and province average of the number of Guba postings after excluding the focal firm (*post_province* and *post_ind*) and all the control variables in Equation (4). The variable of Guba reads (*read*) is regressed on the industry and province average of the number of Guba reads after excluding the focal firm (*read_province* and *read_ind*) and controls. *post_ind* (*read_ind*) is the industry average of the number of Guba postings (reads) after excluding the focal firm. *post_province* (*read_province*) is the average of the number of Guba postings (reads) for firms located in the same city after excluding the focal firm. All other variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>post</i> (1) First stage	<i>synch1</i> (2) Second stage	<i>synch2</i> (3) Second stage	<i>read</i> (4) First stage	<i>synch1</i> (5) Second stage	<i>synch2</i> (6) Second stage
<i>post_ind</i>	0.713*** (29.937)					
<i>post_province</i>	0.569*** (23.563)					
<i>post</i>		-0.115*** (-4.000)	-0.130*** (-4.077)			
<i>read_ind</i>				0.677*** (29.241)		
<i>read_province</i>				0.550*** (23.005)		
<i>read</i>					-0.079*** (-2.848)	-0.082*** (-2.687)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	28,431	28,431	28,431	28,431	28,431	28,431
<i>R</i> ²	0.559	0.340	0.334	0.678	0.339	0.333
<i>F-stat</i>	587***			1174***		

Table 5 Guba messages and stock price synchronicity: Further tests

Panel A: Guba messages and stock price synchronicity using firm fixed effects

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	(1)	(2)	(3)	(4)
	Firm fixed effects		Firm fixed effects	
<i>post</i>	-0.221*** (-26.371)	-0.253*** (-27.067)		
<i>read</i>			-0.220*** (-27.150)	-0.256*** (-28.363)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	28,438	28,438	28,438	28,438
<i>R</i> ²	0.303	0.296	0.304	0.298

Panel B: Guba messages and stock price synchronicity using first-difference model

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). Δ *synch*, Δ *post* and Δ *read* are the change in stock price synchronicity (*synch1* and *synch2*), Guba posts (*post*) and Guba reads (*read*), respectively. All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	Δ <i>synch1</i>	Δ <i>synch2</i>	Δ <i>synch1</i>	Δ <i>synch2</i>
	(1)	(2)	(3)	(4)
	First-difference model		First-difference model	
Δ <i>post</i>	-0.400*** (-31.722)	-0.454*** (-31.003)		
Δ <i>read</i>			-0.411*** (-26.446)	-0.474*** (-26.529)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	26,743	26,750	26,743	26,750
<i>R</i> ²	0.289	0.278	0.293	0.284

Panel C: Guba messages and stock price synchronicity using PSM matching analysis

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	(1)	(2)	(1)	(2)
	PSM matched analysis		PSM matched analysis	
<i>post</i>	-0.134*** (-11.278)	-0.155*** (-11.612)		
<i>read</i>			-0.106*** (-9.070)	-0.129*** (-9.828)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	14,214	14,214	14,218	14,218
<i>R</i> ²	0.334	0.324	0.344	0.335

Panel D: Guba messages and stock price synchronicity using an alternative measure of synchronicity

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). Δ *synch* and Δ *post* are the change in stock price synchronicity (*synch1* and *synch2*) and Guba posts (*post*), respectively. All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch3</i>	<i>synch3</i>
	(1)	(2)
	Synchronicity measured using daily stock returns	
<i>post</i>	-0.108*** (-13.050)	
<i>read</i>		-0.113*** (-13.892)
<i>Controls</i>	Yes	Yes
<i>Industry FE</i>	Yes	Yes
<i>Year FE</i>	Yes	Yes
<i>N</i>	28,438	28,438
<i>R</i> ²	0.540	0.541

Table 6 Guba messages and stock price synchronicity: The role of information dissemination

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). The extent of analyst coverage (*analyst*) is defined as the natural logarithm of one plus the number of analysts following the firm. Institutional ownership (*inst*) is the percentage of shares held by institutional investors. The narrative tone of Guba messages is defined as the difference between messages with positive tone and those with negative tone, divided by the number of all messages for a firm in a given year. *Positive tone* refers to firms whose narrative tone of Guba messages is positive for a given year. *Negative tone* refers to firms whose narrative tone of Guba messages is negative for a given year. All other variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Further tests on the role of the information environment shaped by analyst coverage

Variables	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	<i>Analyst coverage</i>		<i>Analyst coverage</i>	
	(1)	(2)	(3)	(4)
<i>post</i>	-0.183*** (-16.999)	-0.206*** (-16.746)		
<i>post*analyst</i>	0.047*** (9.399)	0.051*** (9.370)		
<i>read</i>			-0.150*** (-14.942)	-0.176*** (-15.440)
<i>read*analyst</i>			0.024*** (5.906)	0.028*** (6.234)
<i>analyst</i>	-0.372*** (-8.598)	-0.401*** (-8.367)	-0.340*** (-5.371)	-0.392*** (-5.577)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	28,438	28,438	28,438	28,438
<i>R</i> ²	0.344	0.338	0.342	0.337

Panel B: Further tests on the role of the information environment shaped by institutional ownership

Variables	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	<i>Institutional ownership</i>		<i>Institutional ownership</i>	
	(1)	(2)	(3)	(4)
<i>post</i>	-0.168*** (-17.151)	-0.192*** (-17.246)		
<i>post*inst</i>	0.722*** (9.991)	0.802*** (10.009)		
<i>Read</i>			-0.147*** (-15.906)	-0.173*** (-16.469)
<i>read*inst</i>			0.405*** (6.635)	0.455*** (6.715)
<i>inst</i>	-6.873*** (-11.244)	-7.617*** (-11.248)	-7.046*** (-7.445)	-7.908*** (-7.522)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	28,438	28,438	28,438	28,438
<i>R</i> ²	0.343	0.337	0.342	0.336

Panel C: Guba messages and stock price synchronicity conditional on the narrative tone of Guba messages

	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Positive tone</i>		<i>Negative tone</i>		<i>Positive tone</i>		<i>Negative tone</i>	
<i>post</i>	-0.018 (-1.499)	-0.025* (-1.841)	-0.202*** (-16.408)	-0.230*** (-16.351)				
<i>read</i>					-0.024** (-2.100)	-0.036*** (-2.792)	-0.196*** (-16.621)	-0.225*** (-16.886)
<i>Controls</i>	Y	Y	Y	Y	Y	Y	Y	Y
<i>Industry FE</i>	Y	Y	Y	Y	Y	Y	Y	Y
<i>Year FE</i>	Y	Y	Y	Y	Y	Y	Y	Y
<i>N</i>	14,217	14,217	14,221	14,221	14,217	14,217	14,221	14,221
<i>R</i> ²	0.344	0.340	0.352	0.344	0.344	0.340	0.353	0.345
<i>Difference in coefficients</i>			(1)vs(3): $\chi^2 = 148.76^{***}$	(2)vs(4): $\chi^2 = 144.54^{***}$			(5)vs(7): $\chi^2 = 143.12^{***}$	(6)vs(8): $\chi^2 = 137.95^{***}$

Table 7 Guba messages and stock price synchronicity: The role of investor interaction

Panel A: Further tests on the role of investor interaction captured by comments on Guba messages
 This table presents the results of regressing stock price synchronicity on Guba posts for firms with high vs. low degree of investor interaction measured by *comment* divided by *post*. The number of comments (*comment*) is the natural logarithm of one plus the total number of comments of the posts related to a firm in a given year. Firms with high (low) investor interaction are those whose ratio of *comment* over *posts* higher (lower) than the median value of all firms. All other variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>		<i>synch2</i>	
	<i>High comment/post</i> (1)	<i>Low comment/post</i> (2)	<i>High comment/post</i> (3)	<i>Low comment/post</i> (4)
<i>post</i>	-0.160*** (-12.846)	-0.024** (-1.982)	-0.185*** (-13.230)	-0.025* (-1.817)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	14,217	14,221	14,217	14,221
<i>R</i> ²	0.349	0.344	0.344	0.337
<i>High vs. Low</i>	$\chi^2=77.37***$		$\chi^2=85.44***$	

Panel B: Further tests on the role of investor interaction captured by comments and reads on Guba messages

This table presents the results of regressing stock price synchronicity on Guba reads for firms with high vs. low degree of investor interaction measured by *comment* divided by *read*. The number of comments (*comment*) is the natural logarithm of one plus the total number of comments of the posts related to a firm in a given year. Firms with high (low) investor interaction are those whose ratio of *comment* over *reads* is higher (lower) than the median value of all firms. All other variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>		<i>synch2</i>	
	<i>High comment/read</i> (1)	<i>Low comment/read</i> (2)	<i>High comment/read</i> (3)	<i>Low comment/read</i> (4)
<i>read</i>	-0.167*** (-13.962)	-0.004 (-0.346)	-0.200*** (-14.947)	-0.007 (-0.505)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	14,217	14,221	14,217	14,221
<i>R</i> ²	0.343	0.355	0.335	0.351
<i>High vs. Low</i>	$\chi^2=121.61***$		$\chi^2=138.96***$	

Table 8 Guba messages and stock price synchronicity: Two exogenous shocks

Panel A: This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). The variable y_{2014} is an indicator variable that takes the value of one when the firm-year is after 2013 and zero otherwise. All other variables are defined in Table 1. Robust t -statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i> <i>synch2</i>		<i>synch1</i> <i>synch2</i>	
	Full sample		Full sample	
	(1)	(2)	(3)	(4)
<i>post</i>	-0.076*** (-6.182)	-0.090*** (-6.726)		
<i>post</i> * y_{2014}	-0.088*** (-5.969)	-0.093*** (-5.741)		
<i>read</i>			-0.082*** (-7.100)	-0.099*** (-7.850)
<i>read</i> * y_{2014}			-0.085*** (-6.092)	-0.096*** (-6.290)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	23,623	23,623	23,623	23,623
<i>R</i> ²	0.3349	0.3280	0.3361	0.3301

Panel B: This table presents the results of regressing stock price synchronicity around the launch of Guba stock forum in 2006, using the sample over 2004-2007. The variable y_{2006} is an indicator variable that takes the value of one when the firm-year is in 2006 or 2007, and zero otherwise. *Treat* is an indicator variable that takes the value of one when a firm's number of shareholders in 2005 is higher than the median value of all firms, and zero otherwise. All other variables are defined in Table 1. Robust t -statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i> <i>synch2</i>	
	Full sample	
	(1)	(2)
<i>Treat</i> * y_{2006}	-0.086** (-2.186)	-0.099** (-2.272)
<i>Treat</i>	0.145*** (4.414)	0.171*** (4.711)
<i>Controls</i>	Yes	Yes
<i>Industry FE</i>	Yes	Yes
<i>Year FE</i>	Yes	Yes
<i>N</i>	3,960	3,960
<i>R</i> ²	0.187	0.208

Table 9 Guba messages and stock price synchronicity: Firms without major media coverage

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). The variable *medianews* is the natural logarithm of one plus the number of media reports covering the firm in a given year. All other variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	(1)	(2)	(1)	(2)
	The sample without major media coverage		The sample without major media coverage	
<i>post</i>	-0.183*** (-12.356)	-0.205*** (-12.410)		
<i>read</i>			-0.172*** (-12.032)	-0.198*** (-12.343)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	9,297	9,297	9,297	9,297
<i>R</i> ²	0.316	0.306	0.315	0.306

Table 10 The impact of Guba messages on information disclosure quality and stock price crash risk

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). The KV index is constructed following Kim and Verrecchia (2001) and measures the quality of information disclosure. $NCSKEW_{t+1}$ is the negative skewness coefficient of firm-specific weekly returns in the following year. $DUVOL_{t+1}$ is the down-to-up volatility of firm-specific weekly returns in the following year. The regression in column (1) includes all the controls in Equation (4). The regression models in columns (2) and (3) include the following controls as in Cao et al. (2019): the mean and standard deviation of firm-specific weekly return of individual stocks, return on assets, financial leverage, firm size, market-to-book ratio, average monthly stock turnover, and financial reporting opacity. All other variables are defined in Table 1. Robust t -statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	KV (1)	KV (2)	$NCSKEW_{t+1}$ (3)	$NCSKEW_{t+1}$ (4)	$DUVOL_{t+1}$ (5)	$DUVOL_{t+1}$ (6)
<i>post</i>	-0.080*** (-39.738)		-0.094*** (-12.216)		-0.060*** (-11.993)	
<i>read</i>		-0.080*** (-38.126)		-0.083*** (-11.402)		-0.052*** (-11.161)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	28,326	28,326	28,301	28,301	28,296	28,296
<i>R²</i>	0.326	0.335	0.062	0.061	0.066	0.065

Table 11 Guba messages and stock price synchronicity: Controlling for investment sentiment and management sentiment

Panel A: Guba messages and stock price synchronicity: Controlling for market and management sentiment

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). Management sentiment (*MDA_tone*) is calculated as the the difference between the number of positive words in a firm's MD&A section of its annual report and the number of negative words scaled by the sum of both positive and negative words. Market sentiment is the China Investors Sentiment Index (*CISI*) from CSMAR following Baker and Wurgler (2006) and Yi and Mao (2009). All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	(1)	(2)	(3)	(4)
<i>post</i>	-0.119*** (-13.207)	-0.137*** (-13.491)		
<i>read</i>			-0.118*** (-13.560)	-0.139*** (-14.281)
<i>MDA_tone</i>	0.132*** (3.303)	0.182*** (4.074)	0.130*** (3.251)	0.178*** (4.004)
<i>CISI</i>	-0.071*** (-42.384)	-0.076*** (-40.909)	-0.078*** (-48.678)	-0.084*** (-47.412)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	28,296	28,296	28,296	28,296
<i>R</i> ²	0.340	0.334	0.340	0.335

Panel B: Guba messages and stock price synchronicity: Controlling for Guba investor sentiment

This table presents the results of regressing stock price synchronicity on Guba messages and control variables as in Equation (4). Investment sentiment of Guba investors (*Guba_sentiment*) is measured as the difference between Guba messages with positive and negative tones divided by the sum of Guba message for a particular firm in a year. All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch1</i>	<i>synch2</i>	<i>synch1</i>	<i>synch2</i>
	(1)	(2)	(3)	(4)
<i>post</i>	-0.106*** (-11.358)	-0.123*** (-11.693)		
<i>read</i>			-0.107*** (-12.001)	-0.127*** (-12.787)
<i>Guba_sentiment</i>	0.245*** (5.459)	0.272*** (5.468)	0.254*** (5.727)	0.277*** (5.642)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	28,438	28,438	28,438	28,438
<i>R</i> ²	0.341	0.335	0.341	0.336

Table 12 Guba messages and stock return volatility synchronicity

This table presents the results of regressing stock return volatility synchronicity on Guba messages and control variables. Stock return volatility synchronicity (*synch_sd*) is the logistic transformation of the R squared of Equation (5) estimated for each firm and year using weekly market and industry return volatility in the current period. All variables are defined in Table 1. Robust *t*-statistics clustered by firm are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	<i>synch sd</i>	
	(1)	(2)
<i>post</i>	-0.076*** (-6.309)	
<i>read</i>		-0.074*** (-6.446)
<i>Controls</i>	Yes	Yes
<i>Industry FE</i>	Yes	Yes
<i>Year FE</i>	Yes	Yes
<i>N</i>	28,438	28,438
<i>R</i> ²	0.382	0.382