


ORIGINAL ARTICLE

Accountability from cyberspace? Scandal exposure on the Internet and official governance in China

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Abstract

This article explores the effects of social media on government accountability under authoritarian regimes. It examines whether online discussions have a disciplining effect on officials' scandals. We use a unique dataset containing records of scandals discussed on microblogs in China to systematically study their effects on the government response process and officials' disciplining. We find that the government employs clear strategies: higher levels of online discussion lead to quicker government responses and more severe punishment of the officials involved. Scandals involving sexual and economic factors, which initially capture more attention, involve quicker responses and more severe punishments. Even when we exploit rainfall as the instrumental variable to mitigate the endogeneity, the results are still robust. Our findings highlight the accountability mechanism facilitated by social media and the power of social media empowerment.

Keywords: China; government accountability; official governance; scandal; social media

1. Introduction

Although authoritarian regimes are usually less responsive to citizen demands than democracies (Dahl, 1973; Fearon, 1999), an increasing number of studies have found that autocracies strategically respond to societal actors through quasi-democratic institutions in order to solve the principle-agent problem (Gandhi and Lust-Okar, 2009; Malesky and Schuler, 2010). Recently such institutions have broadened its scope to the role of media and the Internet (Deibert, 2015; Gunitsky, 2015). For instance, work on China reveals how autocrats use partially free media outlets and strategic communications methods such as censorship, delegating, deliberation, consultation, and astroturfing to monitor officials, respond to social tension, and increase regime legitimacy (Cai, 2008; Stockmann and Gallagher, 2011; King *et al.*, 2013, 2017; Noesselt, 2014). The extensive apparatus uncovered by these studies suggests that authoritarian regimes do not simply restrict all negative information about the government. This study is the first to explore (1) whether authoritarian governments respond to leaks of negative information in social media and (2) whether they do so in measurable and predictable ways.

This article investigates how the Chinese government responds to scandals exposed online and the effects of online discussion on government accountability. We focus on the impact of online discourse on the government's response process and the disciplinary measures to which officials are subjected. Based on about 27 million posts randomly crawled from China's most popular social media channel, Weibo (a Twitter-like microblog service), we established a unique dataset containing 441 records of political scandals discussed online from 1 January 2011 to 30 June 2012. For each case, we calculated the number of times that related posts were reposted to capture

the degree of online exposure and its effect on government officials' disciplining. We investigate the effects of online exposure of four types of scandals—economic crimes (i.e., bribery, embezzlement, misappropriation, and illicit kickbacks), dereliction of duty, sex scandals, and inappropriate speech and behavior.

Our empirical results show that China's government indeed pursues a strategic approach to responding to leaks of negative information: the level of public attention significantly affects the speed of its response and the severity of the punishments administered. The results are robust to controlling for the amount of bribery involved in cases of corruption and different types of sex scandal exposure (text, images, and videos). We then argue that these estimated results are not driven by the sample bias of censorship or the truncation problem of the dependent variable. To address the endogeneity problem derived from the bias of omitted variables and reverse causality, we use an instrumental variable (IV) approach. We use daily rainfall to instrument for the scale of online discussion. The results corroborate the baseline estimation that more online discussion accelerates the government response process and increases the likelihood that officials will be punished.

Examining the heterogeneous effects of political scandals further strengthens our argument. Officials involved in sex scandals and economic crimes, which initially attract more attention, generally receive more severe punishments. We use another online scandal dataset between 2009 and 2014 to test the generalization of these findings beyond Weibo and obtain a similar conclusion: online discussion significantly increases the speed of the government's response and the severity of the officials' punishment.

This article contributes to the literature in four main ways. First, conventional theory holds two standard strategies to reduce the officials' misconducts and increase government accountability: to find malefactors and punish them and to advance the notion of a more transparent political structure (Rose-Ackerman, 1999). Developing countries, which are often regarded fragile, lack the capacity to monitor and enforce officials' malfeasance and even tolerate the misconduct as a kind of concession or rent (Lambsdorff, 2002; Bueno de Mesquita *et al.*, 2003; Zhu and Zhang, 2017). Previous literature demonstrates the ICT helps reduce official misconduct via disclosing more information and making government transparent (Bertot *et al.*, 2010; Elbahnasawy, 2014) and discusses the complex of monitoring and the related manipulation in the digital era (Pan and Chen, 2018). This article highlights the social media can not only help to detect misconduct but also increase the number of "voices" to make the government accountable from enforcement side.

Second, this article contributes to the literature by highlighting the role of empowerment. Although governments have set up different e-channels for public participation, research on social media consistently shows that social media were rarely used for consultation purposes but just informing the public (Norris and Reddick, 2013; Medaglia and Zhu, 2017). China's experience indicates that empowering to social media can stimulate effective two-way communication and therefore monitor the civil servants to increase downward accountability, that is, the voices created by the social media tend to create pressure for institutional responsiveness. This kind of co-governance enhances our understanding of the conventional claim of the new public management movement that empowerment promotes accountability.

Third, this article contributes to the literature on government responsiveness in authoritarian regimes. We argue that political scandals provide a unique opportunity to understand the political dynamics of authoritarian regimes. In contrast to recent experimental research which has submitted fictitious requests to government-managed websites (Distelhorst and Hou, 2014, 2017; Chen *et al.*, 2016), our study investigates how the Chinese government responds to real, widely discussed online scandals. We find a delicate balance between monitoring subordinates' misconduct and reducing negative public beliefs about government accountability. The selective rectification of certain officials' wrongdoings is highly strategic and complex, which suggests that authoritarian regimes deal flexibly with governance threats and new technology.

Finally, previous studies of the impact of media on political outcomes were mainly conducted in developed countries (DiTella and Franceschelli, 2011; Mergel and Bretschneider, 2013; Prat and Strömberg, 2013). A nascent number of research has recognized social media plays a critical role in improving public accountability in developing countries (Lynch, 2011; Hassid, 2015; Hassid and Brass, 2015), yet there is limited systematic empirical evidence to support this claim. The strategies and tactics uncovered in this article offer empirical and systematic evidence on the impacts of social media, a topic for which anecdotal evidence of cases is difficult to capture. Social media fundamentally shifts the communication approach between government and citizens in a more convenient and cost-effective way. In this sense, all governments on social media remain at the street level. The sanctioned loops from citizens and their collective intelligence therefore require further study.

The remainder of this article proceeds as follows. Section 2 reviews the related literature. Research design is described in Section 3. The empirical analysis is presented in Sections 4 and 5. Section 6 concludes.

2. Literature review

It is widely acknowledged that governments need to be agile and respond faster to citizen demands. Research on potential effects of social media on political accountability falls into three streams of literature: the information problem in authoritarian regimes, the role of social media, and official governance. Each is discussed here briefly.

2.1 Information problem in authoritarian regimes

A growing number of studies has found that quasi-democratic institutions such as elections, parties, and legislatures can help reinforce authoritarian rule (Gandhi, 2008; Shirk, 2010; Boix and Svobik, 2013). Studies of China provide empirical support for many of these accounts, and reveal how national and local congresses (Manion, 2014; Truex, 2016), partially free media outlets (Lei, 2011; Stockmann, 2014), public hearings (Ergenc, 2014), online policy toolkits (Meng *et al.*, 2014; Chen *et al.*, 2016; Kornreich, 2019), etc., could facilitate responsiveness and help governments learn from citizens. This strand of literature assumes that the informational asymmetry between principals and agents is the key obstacle to monitoring lower-level officials, improving government accountability, and consolidating the regime. According to this line of thinking, quasi-democratic institutions provide communication channels to solve the informational asymmetry problem by either co-opting the potential opposition or providing information about local officials' performance.

Consistent with this assumption, the ways in which authoritarian regimes use censorship also vary in strategic ways. The seminal works by King *et al.* (2013, 2014) empirically demonstrate that censorship in China seeks to curtail collective action by silencing comments that may spur social mobilization and permit "vitriolic criticism" of the state and its policies. Similarly, the theoretical literature also explores the impact of collective action on censorship strategies (Lorentzen, 2014; Chen and Xu, 2015; Shadmehr and Bernhardt, 2015; Huang *et al.*, 2016). For example, Shadmehr and Bernhardt (2015) emphasize the uncertain payoffs of participating in collective action; they find that lower levels of censorship and a freer press make citizens less likely to revolt and thereby benefit the rulers. Lorentzen (2014) examines a model based on the premise that the degree of investigative reporting that is allowed is based on how dangerous the government believes collective action would be.

Research on censorship tactics suggests that authoritarian regimes will not simply restrict all negative information. Does the government respond to the negative information it does allow to be released, and does it hold the government accountable? Little existing research consists of case studies of government responsiveness, some of which involved officials who were punished. Since

such qualitative studies often choose influential cases, we are not sure whether government responsiveness also applies to less important cases. If the government handles various scandals differently, a more important question remains unanswered: does this variation represent a deliberate government strategy? This article provides the first quantitative evidence to address this question by examining the effects of Chinese political scandals exposed on the Internet on officials' disciplining and underlying government strategies.

2.2 The role of social media in public sector

Social media are expected to be a panacea to facilitate public participation and solve the information asymmetry between government and citizens (Clark *et al.*, 2013; Noveck, 2015; Feeney and Porumbescu, 2021). It usually plays two roles: to collaborate and coproduce and to monitor. For the former, through social media, citizens can collaborate with the public sector or coproduce in public services and actively involved in jointly tackling social problems and issues (Linders, 2012; Li *et al.*, 2020). For the latter, social media improve citizens' access to government information and decrease information asymmetry between government functionaries and citizens. It also lowers the barriers for citizens to participate the public discussion. Therefore, it is believed that social media can monitor the government in many aspects such as functionaries' corruption, the process of designing, implementation, and evaluation of public policies, etc. Literature in this field shed lights on how more discussion on public affairs improve the culture and demand of transparency (Bertot *et al.*, 2010, 2012), how online-exposed corruption cases facilitate the sanction on market performance (Enikolopov *et al.*, 2018), whether the government responds to the complaints expressed online (Su and Meng, 2016), etc.

Even though scholars expect the significant role of social media played in collaboration and monitoring, current literature focuses largely on the realm of policy making and public services delivery rather than the core realm of the political arena—power. We still lack systematic and empirical evidence on the effects of social media on the officials. This subject is closely related to the government accountability and official governance, which is outlined in the next section.

2.3 Government accountability and official governance

As the key dimension of good governance, all governments require accountability to maintain its claim to be acting in ways that are broadly approved by the community that it governs. It is one of the pillars of sustainable development, as underscored in Agenda 21 in 1992 and target 16 in the agenda of Sustainable Development Goal (SDG)—“Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.” Although accountability can be seen as a virtue that “a set of substantive norms for the behavior of actors” (Bovens, 2010: 949), current scholars pay more attention to another dimension of accountability—accountability as a mechanism. The focus of studies in this mode is not whether the agents have acted in an accountable way, but rather whether and how they are or can be held to account *ex post facto* by accountability forum. Thus, in this sense, accountability means sanction and punishment (Behn, 2001; Stokes, 2006; Bovens *et al.*, 2014).

Public officials everywhere have substantial power and can control a lot of money. Any misconduct by public officials may erode public support and trust (Wilson, 1887; Rose-Ackerman, 1999). Although many nations and international organizations have tried to implement transparency or accountability initiatives to reduce government misconduct, developing countries, which are regarded as fragile, still lack the capacity to monitor officials (Olken and Pande, 2012; World Bank, 2020). The obstacle is all rulers encounter a dilemma when disciplining officials. On one hand, any punishment of subordinates could make the ruler lose political support from the ruling

coalition, which is essential to regime survival (Shirk, 1993; Bueno de Mesquita *et al.*, 2003). On the other hand, punishing malfeasant officials could moderate public grievances and enhance the government's reputation and legitimacy.

A few studies have shown that developing countries tend to employ selective punishment strategies as a remedy (Manion, 1998; Fan and Grossman, 2001; Cai and Zhu, 2013; Zhu, 2015). Punishments should thus be targeted at cases that effectively redress public grievances, such as malfeasant high-ranking officials, or cases that attract more public attention. Therefore, the scandals exposed and discussed online provide an identification pool for the government to monitor subordinates. Responding to online discussions quickly and severely punishing the officials involved restricts the disciplinary measures to officials who receive more public attention. In this way, the ruler will not lose internal political support for punishing too many people and reduce negative public beliefs about government capacity so that to maintain regime legitimacy. We therefore hypothesize that:

Hypothesis: The government responds more quickly to scandals that receive more public attention and punishes the officials involved more severely.

3. Research design

3.1 Sampling method

We assembled the dataset as follows. We begin with social media posts by crawling about 27 million Weibo posts from 1 January 2011 to 30 June 2012. We selected this time period because before that Weibo developed rapidly, and afterwards it was highly supervised. This period was stable, and the supervision was loose. We randomly crawled the active users' posts and the related information for each post, including the number of reposts and the number of comments (for details, see Appendix A.1).

After gathering the raw data, we randomly selected 100,000 posts and assigned three research assistants (RAs) to independently annotate to build scandal-related corpus. Scandals are defined as negative information that violates Chinese Communist Party (CCP) discipline and state laws. We only kept posts that all three RAs classified as scandals to extract the keywords. Table A1 of Appendix A.2 presents the full list of corpus. We employed a keywords matching method based on the corpus on 26.6 million posts to identify the scandal-related posts and got around 271,000 scandal-related posts. We then again employed the human annotation to identify specific cases of scandals and finally identified 441 scandal cases (Appendix A.2 provides the coding details). According to the CCP's Criminal Law and Regulations on Disciplinary Sanctions (for details on the penalties and examples of scandals, see Appendix B), scandals are divided into four categories—economic crimes (i.e., bribery, embezzlement, and misappropriation), dereliction of duty, sex scandals, and inappropriate speech and behavior. An additional 39 cases involve two or more kinds of scandals. Table C1 of Appendix C defines the types of scandals and the number of observations in our dataset.

3.2 Key independent variables from social media

Online discussion of the scandals, measured by the number of times posts were reposted, is our key variable of interest. Based on the officials' names and positions, we performed a content analysis of the raw data to identify all posts that mentioned the involved officials' names (for details about the coding, see Appendix A.3). Then we calculated the total number of times the posts related to each scandal were reposted.

3.3 Dependent variables

After obtaining the names of the involved officials, we conducted an Internet search of their names and related keywords for each scandal to determine the approximate date of the

government response. We calculated the speed of the government response as a dichotomous variable that is coded 1 if the government responded to the scandal within one month,¹ and 0 otherwise. Panel A of [Figure 1](#) displays the distribution of government responsiveness across scandal types. To measure the severity of officials' disciplining, we use an ordinal variable ranging from -1 to 10: promotion (-1), no action (0), (serious) warning and record a (serious) demerit (1), suspension from post (2), resignation (3), removal from post (4), dismissal from post (5), expulsion from party and discharge (6), fixed-term imprisonment (7), life imprisonment (8), death sentence with reprieve (9), and death sentence (10). Panel B of [Figure 1](#) plots the distribution of punishments across scandal types. We distributed these cases into four categories based on the severity of the punishment: promotion (-1), no action (0), administrative penalty (1–6), and judicial penalty (7–10).

3.4 Other control variables

Previous studies have demonstrated that the penalties imposed on officials are closely related to their personal characteristics, especially their administrative levels and positions (Zhu, 2015). Therefore, we collect data on officials' positions and corresponding administrative levels and control for these variables in the empirical analysis. Table C2 of Appendix C presents the summary statistics of the control variables.

4. Empirical analysis

4.1 Baseline results

[Table 1](#) reports the effects of online discussion on the speed of government response to scandals and the severity of the punishment. Column 1 reports the baseline estimates of the effects of the number of reposts on the speed of government response, and column 2 controls for the personal characteristics of the officials involved. As expected, a one-standard-deviation increase in the volume of online discussion increases the probability that the government will respond to a scandal within one month by 7.9 percent (column 1). Taking officials' administrative levels and positions into account (column 2), the point estimator is positive, which is statistically significant and substantively meaningful. We also control for GDP per capita, population density, and government expenditure to capture regional variations that the time-invariant fixed effects cannot capture. The results remain significant. In order to capture administrative characteristics that may influence both the volume of online discussion and the response process, we add a dummy variable indicating the level of government to which the involved officials belong. The results are consistent with our expectations. Sex scandals are sensitive to both the speed of the government response and the severity of the punishment, while economic crimes are statistically significant only for the severity of the punishment.² Scandals related to the dereliction of duty and inappropriate speech have no statistical effect on the speed of government response.

To examine whether online discussion has the effect of holding the government accountable, we adjust for the dependent variable as the severity of punishment that the officials involved received in columns 3 and 4 of [Table 1](#). In line with our hypothesis, the results indicate that online discussion makes it more likely that officials involved in a scandal will be punished severely: the coefficient of online discussion is positive and statistically significant at the 10 percent level (column 3). After controlling for officials' characteristics, the results still demonstrate

¹The date of the response for each case is only available for monthly data. We choose one month as the threshold since 95 percent of online hot topics will be discussed within one month according to the *Annual Report on Development of New Media in China* (2013: 50). We also re-ran the analysis using two months as the threshold, and the results are still consistent with our expectations.

²For the discussion of the results, see Appendix B.

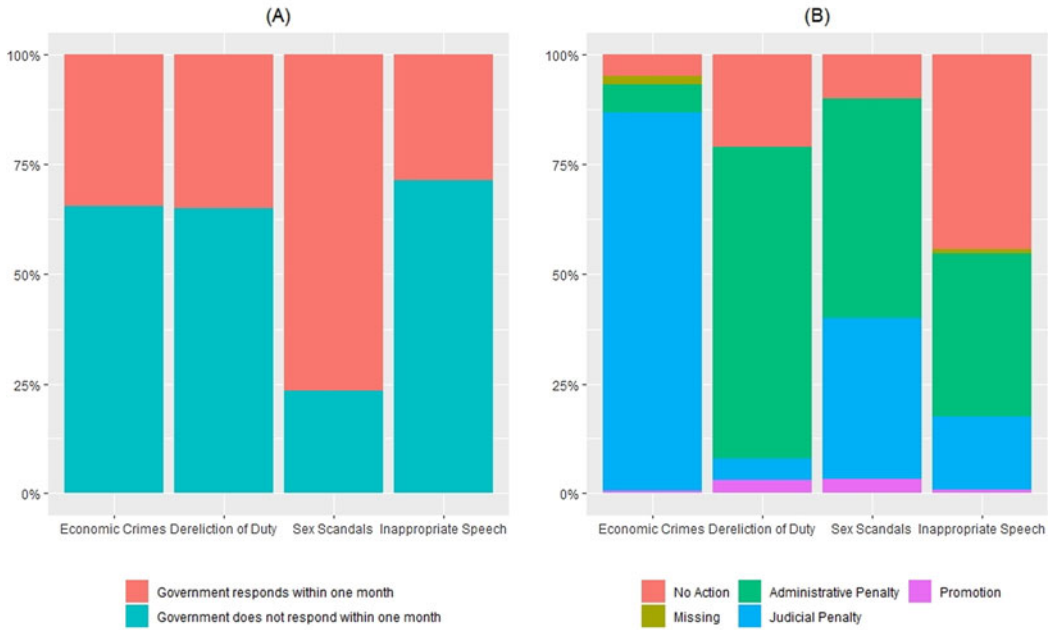


Figure 1. Distribution of government responsiveness and punishment across scandal types.

Table 1. Effects of online discussion on the speed of government response and the severity of punishment

Variables	(1)	(2)	(3)	(4)
	Respond within one month	Respond within one month	Disciplining	Disciplining
Repost(ln)	0.059*** (0.019)	0.066*** (0.021)	0.029* (0.016)	0.037** (0.017)
Dereliction of duty	0.056 (0.160)	0.080 (0.169)	-1.943*** (0.166)	-1.945*** (0.170)
Sex scandals	1.125*** (0.285)	1.103*** (0.295)	-1.218*** (0.291)	-1.313*** (0.292)
Inappropriate speech	-0.204 (0.157)	-0.229 (0.172)	-2.077*** (0.183)	-2.164*** (0.195)
Officials' position	No	Yes	No	Yes
Officials' administrative levels	No	Yes	No	Yes
Constant	-0.872*** (0.183)	-1.120*** (0.383)		
Observations	441	435	436	430

Note: Scandals related to economic crimes represent the omitted reference category. Standard errors clustered at the official level in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

the sanctioned effects of online discussion (column 4). A one-standard-deviation increase in online discussion increases the punishment by 0.079 of a standard deviation. The results also corroborate our expectation after controlling for GDP per capita, population density, government expenditure, and level of government.

We then control for the level of officials' ranks, which allows us to draw the following conclusions. Officials at the highest level (leading roles of ministries or provinces or above) always receive a quicker government response and significantly harsher punishment, indicating that the central government uses such cases to demonstrate its determination to curb malfeasance and build up a clean civil service environment. We find no pattern in low-level officials.

Table 2. Online discussion and the severity of punishment: concerning the properties of scandals

Variables	(1)	(2)	(3)	(4)
	Economic crimes	Economic crimes	Sex scandals	Sex scandals
Repost (ln)	0.078*** (0.024)	0.076** (0.027)	0.157* (0.104)	0.350*** (0.108)
Amount of bribe (ln)	0.152*** (0.042)	0.138*** (0.044)		
Exposure with image			0.302 (0.583)	1.536** (0.634)
Exposure with video			0.845* (0.592)	1.898*** (0.707)
Officials' position	No	Yes	No	Yes
Officials' administrative levels	No	Yes	No	Yes
Observations	164	163	40	40

Note: The omitted reference category is sex scandals with image exposure. Standard errors clustered at the official level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Certain types of negative news could generate a flood of publicity and negative emotions, and bring about different serious consequences (Patterson, 2000; Baum, 2002). For instance, corruption cases involving large bribes and sex scandals with more detailed information are likely to attract more public attention. Therefore, we expect high-profile scandals to receive more severe punishment. We collect data on the amount of bribes accepted for each case of economic crime and different forms of exposure for sex scandals. The nominal variable “forms of exposure for sex scandals” differentiates between three forms of exposure (video, image, and text). In Table 2, we examine the value of the bribes accepted in economic crimes (columns 1 and 2) and introduce different forms of exposure for sex scandals (columns 3 and 4). The results reveal that, as expected, the characteristics of the scandals are significantly related to the severity of the punishment. Regarding the key variable of interest, the coefficients of online discussion are positive and statistically significant across all specifications.

4.2 Discussion of censorship

One possible concern related to sample selection bias is censorship. Since censored information is not available, we discuss—rather than accurately evaluate—the impact of censorship. Some research has found that the government tends to censor posts related to high-level officials or cases with greater influence since such discourse increases public grievances and threatens regime stability (He, 2008; Sullivan, 2014).³ King *et al.* (2013, 2014) argue that China permits more online criticism of its government and policies than other governments, which suggests it would be less likely to censor online discussions about officials working in government branches.

Therefore, we restrict our sample to low-level officials (below the municipal level) and officials working in the executive and functional branches of the government, and then compare the difference in the estimated coefficients between the subsample and full sample. A significant difference between the two would indicate that censorship is driving our results to some extent.

Figure 2 plots the coefficients of online discussion based on these restricted samples. Panel A shows the estimation for low-level officials, confirming the hypothesis that online discussion increases the speed of government response (0.045) and the severity of punishment (0.036); both coefficients are statistically significant. We also ran Hausman specification tests, and the results between the full and restricted samples of low-level cases consistently suggest that there

³While some scholars argue that local officials seeking promotions have greater incentives to censor or cover up negative news within their jurisdictions (Tai, 2014; Wallace, 2016), we believe this does not affect our sample since Weibo is a nationwide platform rather than a local website, and local governments do not have the capacity to censor its content.

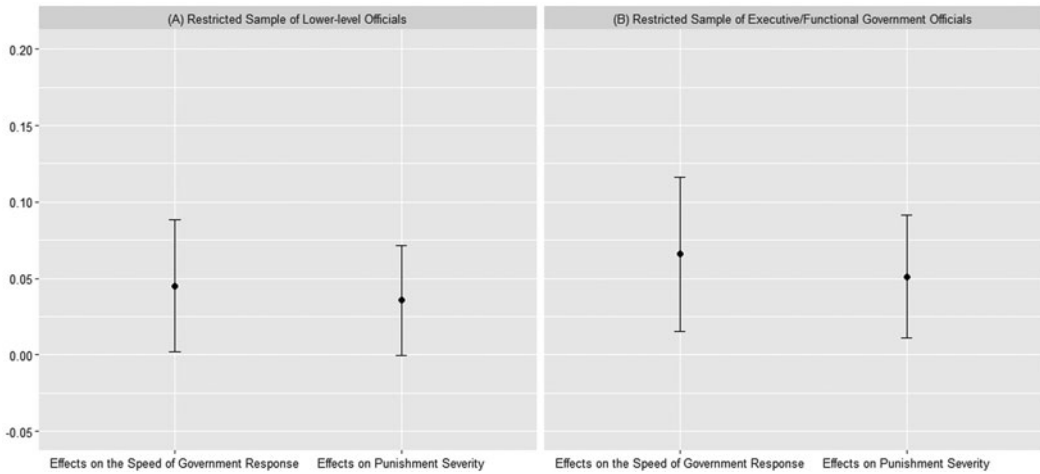


Figure 2. Estimated effects of online discussion.

are no systematic differences between the coefficients estimated. Panel B displays the estimation of online discussion for officials working in executive and functional government branches. The results still support our expectations that the coefficients for both the speed of government response and the severity of punishment are positive and statistically significant. The results of the Hausman tests between the full and restricted samples also show no systematic differences between the two. This evidence suggests that our baseline estimation is not driven by the censorship. We believe it resonates with King *et al.*'s (2013, 2014) research that CCP allows the criticism toward the governments to some extent. Since our data are about officials' scandals, it is less likely to be censored.

In addition, the non-disclosure of information about the punishment of officials involved in certain scandals may lead to a truncated sample of the dependent variable, in which some observations equal 0 due to unknown punishments.⁴ The failure to take this phenomenon into account may result in selection bias. We exploit two strategies to mitigate this potential problem. First, we use the Tobit model to re-estimate the effect of online discussion on officials' punishment. Column 1 of Table C3 of Appendix C reports the related results, which are consistent with the baseline estimation. The coefficient of online discussion is significant at the 5 percent level. Officials involved in economic crimes or sex scandals still receive more severe punishments than those implicated in other types of scandals. Second, we restrict the sample to observations for which the values of the dependent variable are greater than 0. The estimated results, shown in column 2 of Table C3, corroborate our expectation that the coefficient of online discussion is significant at the 5 percent level.

4.3 Instrumental variable results

4.3.1 Rainfall as an instrumental variable

We have discussed and tried to mitigate the problem of omitted variables such as the properties of scandals in specifications and censorship. The baseline model may not capture other possible omitted variables that affect both online discussion and officials' punishment.⁵ To make valid

⁴We believe this phenomenon does not affect the estimates of the effects of online discussion on the speed of government response since the non-disclosure of information about the response equates to not responding, which is consistent with our definition of government responsiveness.

⁵Someone may concern that the news that officials are being disciplined can itself attract public attention. In order to mitigate the problem, we restrict the number of reposts in each case to the posts that were posted before punishment, the results are still robust.

inferences, we therefore exploit the amount of daily rainfall to instrument for the scale of the online discussion. Several studies have shown that inclement weather significantly affects people's decisions about whether to spend time outdoors or stay in a climate-controlled house (Harries and Stadler, 1988). Individuals are more likely to choose indoor activities such as surfing the Internet and watching TV when the weather is bad (Starr-McCluer, 2000; Gomez *et al.*, 2007). Therefore, heavier rainfall will make people more likely to read and repost information online. More importantly, bad weather will not affect officials' discipline measures directly or through any other channels.⁶ The positive relationship between the two suggests that daily rainfall can serve as a suitable excluded instrument for online discussion.

4.3.2 2SLS specification setting

We first use daily rainfall to predict the number of daily online posts about certain officials in the first-stage regression. The variation in the scale of online discussion in this stage stems from the exogenous variable—local rainfall. Next, we put the estimated values into the second-stage regression as the key explanatory variable and obtain the final estimation. The weather dataset compiles China Meteorological Administration (CMA) daily rainfall estimates from 824 weather stations across the country. We use estimates of the daily rainfall of the municipalities where the government officials involved in the scandals worked during the study period. Although it is possible that residents living elsewhere reposted information about local scandals, we believe our method is valid: local rainfall increases the probability that a local scandal will be reposted on the Internet. As mentioned above, 84 percent of the scandals are at the local level, and local residents generally tend to repost local news rather than events happening elsewhere (Tong and Zuo, 2014).

Table 3 reports the two-stage least squares (2SLS) results. Column 1 reports the results of the first-stage regression specification, describing the effects of rainfall on the scale of online discussion. The coefficient estimate of 1.47 implies that a 10 percent increase in rainfall raises the scale of online discussion by 0.14. This coefficient is significant at the 1 percent level. The rainfall instrument is not strong enough (the *F*-statistic is 4.47 in column 1) but is acceptable, suggesting that the point estimator of 2SLS is approximately median unbiased (Angrist and Pischke, 2009). Columns 2 and 3 report IV-2SLS estimations of the effects of online discussion, which provide strong evidence of our main hypothesis that instrumented online discussion exhibits a positive and highly statistically significant effect on the likelihood of receiving a quicker government response (column 2) and a more severe punishment (column 3). The point estimates are slightly larger than the results reported in Table 1, suggesting that the previous results are biased downward. This downward bias is likely attributable to measurement error, in particular for censorship, which tends to be underreported.

One concern about the exclusion restriction of IV validity is that online discussion of certain scandals may be affected by increasing protest activities when there is less rain. As an identification check, we add an interaction term between the instrumented online discussion and a dummy variable indicating whether there was moderate or heavier rain during the daytime as an additional explanatory variable (columns 4 and 5). The rationale is that when there is heavier rain with less collective action, people tend to spend more time on the Internet, and therefore rainfall should have a greater effect on online discussion. Thus, the coefficients of the interaction terms should be positive and significant. The results are in line with our

⁶One possible concern about IV validity of rainfall is it might simultaneously affect both netizens' behavior and government behavior. For instance, when it rains, bureaucrats might also stay indoors to work, thereby increasing the degree of censorship. We believe such influence is limited for two reasons: (1) bureaucrats' daily work is relatively regular and less sensitive to the weather compared with that of ordinary people. (2) Although we cannot exclude the possibility of such an effect on censorship, the positive relationship between rainfall and online discussion revealed in the first stage indicates that even if this is the case, rainfall still increases online discussion.

Table 3. IV-2SLS estimations of the effects of online discussion

Variables	(1)	(2)	(3)	(4)	(5)
	First-stage Repost	Second-stage Respond within one month	Second-stage Punishment severity	Second-stage Respond within one month	Second-stage Punishment severity
Rainfall (ln)	1.470** (0.684)				
Repost (ln)		0.052*** (0.008)	0.057*** (0.012)	0.033*** (0.009)	0.029** (0.013)
Dereliction of duty	703.908*** (175.659)	0.009 (0.014)	-3.525*** (0.313)	0.034* (0.015)	-3.473*** (0.314)
Sex scandals	81.501 (280.109)	1.683*** (0.023)	-1.653*** (0.495)	1.685*** (0.023)	-1.650*** (0.495)
Inappropriate speech	38.758 (178.081)	-0.296*** (0.013)	-3.855*** (0.314)	-0.296*** (0.013)	-3.858*** (0.314)
Interaction term				0.017*** (0.002)	0.012*** (0.003)
Constant	72.564 (341.722)	-0.862*** (0.087)	4.625*** (0.597)	-0.796*** (0.088)	4.752*** (0.598)
Officials' position	Yes	Yes	Yes	Yes	Yes
Officials' administrative level	Yes	Yes	Yes	Yes	Yes
Time fixed effects		Yes		Yes	
Observations	160,957	110,780	109,565	110,780	109,565
Number of ID	436		429		429

Note: Scandals related to economic crimes serve as the omitted reference category. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

expectation, indicating that the effect of rainfall on online discussion is greater on rainier days than on less rainy days.

Although online discussions have a considerable effect on scandals related to the dereliction of duty, the effects for economic crimes and sex scandals are relatively large and statistically significant, as expected. Considering the public attention generated by sex scandals and economic crimes, the findings indicate that social media attention can put pressure on the government beyond the court to remedy the issue.

5. External validity

We use another online scandal dataset between 2009 and 2013 to test the generalization of the above conclusion. The data were selected from the *Annual Report on Public Opinion in China (2010–2014)*, which covered the main online topics during this period. We use data from the Baidu Index, based on data from China's largest search engine, to measure the degree of each scandal's online exposure, and supplement the analysis with data about the punishments received by the officials involved. We also use rainfall data to instrument for the Baidu Index in Table C4 of Appendix C and obtain a similar conclusion: online discussion significantly increases the speed of the government response and the severity of the punishment of the involved officials.⁷

⁷Someone may concern that the cases selected from the public opinion dataset tend to receive a response from the government. We check the public opinion dataset and our Weibo scandal dataset and find 27 overlapping cases during the study period. We restrict the sample to the overlapping cases and still use the Baidu Index as the online attention to explore its effects. The estimated results corroborate our argument. We thank the anonymous referees' suggestion.

6. Conclusion

In this article, we use a unique dataset of records of scandals discussed on China's most popular microblog to systematically study their effects on the speed of government response and the severity of officials' punishments. We find that Beijing indeed employs dedicated strategies: more online discussion leads to quicker government responses and more severe punishments. In particular, the government handles prominent sexual and economic scandals more quickly, and the officials involved receive more severe punishments. By exploiting rainfall as the IV for online discussion in order to mitigate the endogeneity problem, the results still corroborate the baseline estimation. Our findings suggest that authoritarian regimes' information management strategies involve deciding *what kind of information* can be released (i.e., censorship) as well as *how to respond* to leaks of negative information.

We believe our results are robust in a dynamic sense. Although the Chinese government cracked down social media after Xi came to power and censorship became heavy, social media platforms still show a significant role in monitoring government behaviors and improving government performance. On the one hand, responding to the demands of netizens on online platforms such as Weibo, etc., has been gradually institutionalized, and has even become a standard for evaluating government performance. On the other hand, recent research also support that scandals or criticisms against government lead to the response and punishment of involved officials (Qiaoan and Teets, 2020; Dai *et al.*, 2021). Generally, we expect that the basic pattern and interaction between netizens' attention and accountability still exists today's China. In this sense, our findings could be seen as an assessment of what freer social media could achieve in autocracies.

The findings of this article prompt us to rethink the government accountability and the role of social media. Current efforts on promoting public accountability focus on the proactive information disclosure of the government while evidence is limited for its effectiveness (Lindstedt and Naurin, 2010; Malesky *et al.*, 2012; Cucciniello *et al.*, 2017). Only very few citizens use the disclosed information to call public organizations to account. This indicates that the ways in which misconduct being more likely to be detected, such as online reports or complaints, might be a more effective way for government be less corrupt and better developed. While scholars have shown that the local government in China can conceal those online complaints (Pan and Chen, 2018). Our findings are complementary to Pan and Chen (2018) and highlight that the social media facilitate accountability and enforcement via disseminating "voices." Only when those online grievance or complaints become a scandal, the story is more likely to be as what we said. These findings help us better understand the deep dynamics of cyberspace governance in China. More generally, even if the investigation and prosecution arms are main focuses of anti-malfeasance activities, having the extra arm such as more "voices" from social media adds another dimension especially in developing countries, where the law enforcement capacity is weak.

Moreover, the empowered social media can be regarded as a kind of direct public participation. Such co-governance via social media indicates the effective two-way communication between the government and citizens. One key concern has been that social media are not necessarily conducive to rational discussion that meets the criteria of deliberative or representative policymaking process. The heterogeneous effects of social media based on different issues indicate that government has tried to avoid the lowest-common-denominator politics. This indicates that a holistic approach that is value-driven and institutionalized across all levels of government is needed. The government needs to be agile to respond to citizens' demand, be open to call on the citizenry through crowdsourcing to participate more effectively, pay attention to the interactions between social media platform and the various levels of government, and put in place monitoring mechanism for continuous improvement.

Finally, scandals of government can be regarded as a kind of crisis and will undermine the political support and trust (Bowler and Karp, 2004; Daniele *et al.*, 2020; Dziuda and Howell,

2021). The Watergate scandal exposed by reporters of the Washington Post is a key example of how media held government accountable (Bernstein and Woodward, 2014). With the development of ICT and the highly interactive characteristics of social media platforms, the number of accounts and users involved in monitoring networks can increase the number of “voices” in communicating when scandals happened. Misconduct is always secret and difficult to detect. The traditional approach such as conducting administrative reform is difficult to achieve since it requires an iterative process of review, reflection, and redesign to strengthen the performance of watchdog agencies and structure under urgent stress. China’s experience of delicate balance between monitoring misconduct and reducing public grievance provides a less costly and more effective way to better understand the bureaucratic capacities and architecture of governing for official governance.

Our study also suggests several avenues of research. First, the study only examines one key dimension of government accountability—the sanction and punishment of public officials. It does not consider the other dimensions of accountability. It also does not consider the different monitoring effects of social media between normal periods and special periods such as periods that the government perceived with more social tension (Lorentzen, 2014). Building accountable government does not mean replacing a not perfectly accountable system with another perfect one. Although in traditional model, democratic countries have a system of accountability based on the election, in practice, the theory may not as well as it usually assumed. Building accountability is an incremental process that needs to be compared. China’s experience offers an alternative to achieve accountability when the traditional model is weak. Future research should examine the potential synergies of accountability network with respect to government scandals or misconduct, the heterogeneous performances of accountability over time and across the country, and the interactions between the accountability from cyberspace and the formal judiciary accountability, etc.

Moreover, the study shows that China has strategies to respond to the release of negative information. While being responsive to societal demands will enhance the regime’s legitimacy, it may also ultimately erode the fairness and authority of the judiciary, which is another important dimension of legitimacy (Tyler and Fagan, 2008; Hough *et al.*, 2010). The effects of this kind of double-edged sword merit further study.

In addition, our study does not consider the ecology of social media platform. How do netizens disseminate the scandal-related information? What kind of characteristics do citizens who prefer to repost scandal information have? What’s role of opinion leaders on social media play? Are citizens satisfied with the sanctioned loop? What are the interactions between such informal sanctioned mechanism and other mechanisms? Is it much more effective than others? Future research should continue to probe more deeply into the nature and consequences of the fast-changing and increasingly important environment of social media.

Finally, the data we used in this study are a little bit old. We selected this study period because before that Weibo developed rapidly, and afterwards it was highly supervised. This period was stable, and the supervision was limited. Although we have discussed the effects of social media in Xi era, the flexibility and resilience of the accountability facilitated by social media with the sometimes-loose-sometimes-tight information control policies are worthy of further exploration.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/psrm.2023.13>. To obtain replication material for this article, <https://doi.org/10.7910/DVN/WF7TLZ>.

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