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Does Foreign Media Entry Tempers Government Media Bias?

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Abstract

Using a two period agency model similar to Morris (2001), I analyze the change in government media bias when individual public has access to an imperfectly informed news outlet. I found that while greater information availability reduces the government's benefit from lying -- as more information limits government's ability to influence. It also lower its cost -- as it limits future ability to influence reducing the government's incentive to build reputation. Both effects counteract one another, reducing the decrease in government media bias.

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1. Introduction

It has become increasingly difficult for autocratic governments to effectively control information available to the general public when foreign news are easily accessible through the Internet. This has important implications on press freedom and government accountability [1], as officials are held accountable for inappropriate behaviors revealed by foreign presses. Yet despite recent research on the political economics of mass media [2], little is known about the behavior of state-controlled media in response to greater information availability from foreign presses.

To understand how the presence of foreign news affects domestic government's media bias, we must first consider a government's incentive to distort news. Government's credibility or reputation plays a central role in persuading the general public, as reports from a trustworthy government carries more weight than from a lying government. In turn, a government loses her reputation when citizens discover her past history of distorting news to achieve her political goals. Hence a lying government faces the following trade-offs: the gain from manipulating citizen's decision today comes with a loss in reputation that affects her future ability to influence. While greater information from foreign presses inhibits the government's ability to influence, it does not necessarily leads to a lower bias in state-controlled media. An often overlooked observation is that continual foreign media's presence also reduces the government's future ability to influence. This reverses some of the decrease in bias, as the incentive to maintain future reputation is now smaller.

2. Description of the Model

To model a government's incentive to lie, I follow Morris (2001) approach that consists of two periods $t = 1, 2$, two possible states $S_t \in \{0, 1\}$, and three players: a government (she), a representative citizen (he) and a foreign media. At the beginning of period 1, nature randomly decides the government's type, which can be either good (G) or bad (B). Nature also randomly determines the state S_1, where it is common knowledge that the state is 1 with probability $0 < \theta < 1$. While citizen is unsure of the government's true identity, he knows that the likelihood of the good government is $0 < \lambda < 1$. Here parameter λ represents the government's reputation since the good type government perfectly aligns with citizen's goal of choosing action $a_t \in [0, 1]$ that maximizes his two period utility of $-(a_1 - S_1)^2 - \delta(a_2 - S_2)^2$, where $0 < \delta \leq 1$ is a common discount rate. Conversely the bad type government always wants citizen to take the highest action possible and maximize her two period utility of $a_1 + \delta a_2$.

Once in power the government learns about the true state S_1. In contrast, foreign media is imperfectly informed about the state such that it receives signals $s_1 \in \{0, 1\}$ that matches the state with probability $0 < \pi < 1$, and receives a null signal $s_1 \in \{\phi\}$ with remaining probability $1 - \pi$. Foreign media's accuracy π is exogenous that represents a predetermined level of accuracy. While foreign media is assumed to truthfully report the state, I restrict attention to consider only equilibria where both types of governments truthfully report state 1, but only the bad type is willing to misrepresent state 0 and

[1] Representative literature includes Brunetti and Weder (2003) on the impact of press freedom on corruption, and Snyder and Strömberg (2008) on the impact of media on citizens' responsiveness to political issues.

[2] Prat and Strömberg (2010) provides a comprehensive review on this literature.

report it as 1 instead [3]. The likelihood that a bad government lies in state 0 equals σ which is known as the bias parameter. Both the government and the foreign media simultaneously make reports $r = \{r_g, r_f\}$ about the state.

After hearing reports r, citizen updates the likelihood of state 1 to $Prob(S_1 = 1|r)$, knowing that his utility equals $-(1 - a_1)^2$ with probability $Prob(S_1 = 1|r)$ and equals $-(0 - a_1)^2$ with remaining probability $(1 - Prob(S_1 = 1|r))$. In general, optimal action $a_t(r)$ that maximizes citizen's expected utility in period t:

$$\max_{a_t} -(1 - a_t)^2 Prob(S_t = 1|r) - (0 - a_t)^2(1 - Prob(S_t = 1|r)),$$

can be solved using a straightforward optimization method to obtain

$$a_t(r) = Prob(S_t = 1|r), \tag{1}$$

implying that optimal action $a_t(r_g, r_f)$ coincides with citizen's updated beliefs on the likelihood of state 1 after hearing reports $r = \{r_g, r_f\}$ from the government and the foreign media respectively. Note that when citizen has perfect knowledge of the current state, he will always choose action a_t that matches the state S_t.

Once citizen takes action $a_1(r)$, period 1 ends with returns realized. Citizen learns the state S_1 though realized returns, and updates the likelihood of good government λ_2. The second period begins in which nature only determines the state $S_2 \in \{0, 1\}$, and the events above are repeated. The games ends when period 2 returns are realized.

Realistically the bad type government values reputation aside from using it to manipulate citizen's decision. For example she enjoys having a good public opinion or requires sufficient credibility to maintain her power. It is reasonable that foreign media that hinders a government's ability to influence, will not alter her desire for higher reputation. To address this phenomena, I assume that foreign media's report plays a smaller influence on bad government's period 2 utility such that in that period 2 foreign media's accuracy is *effectively* $\gamma\pi$ where $0 \leq \gamma \leq 1$. As shown in appendix C, this 'modeling trick' is sufficient to mimic a government's behavior as described above in response to foreign media's entry. But it does not apply to the good government's utility since the good type perfectly aligns with citizen's utility, and does not enjoy additional rents from having a higher reputation.

3. Equilibrium Behavior

The model can be solved using backward induction. In period 2, I find it natural to restrict attention to equilibria where the good type government promotes citizen welfare by truthfully reporting the state, while the bad type government maximizes her utility by always reporting 1 [4]. This equilibrium behavior, together with equation (1) is sufficient to characterize citizen's period 2 action $a_2(r)$, based on his belief regarding the likelihood of state S_2 after hearing reports $r = \{r_g, r_f\}$. Since governments never lie when the state is 1, citizen knows that the state is 0 after hearing government report (r_g) of 0 ($a_2(0, r_f) = 0$). Second whenever a government reports $r_g = 1$, citizen learns the true state S_2 whenever foreign media accurately reports it ($a_2(1, 0) = 0$ and $a_2(1, 1) = 1$),

[3] The restriction ignores the babbling equilibrium where both governments provide uninformative reports about the state. In addition, the restriction also ignores the possibility that governments may lie in state 1 to improve her reputation (Morris (2001)). The proof is shown in appendix B.

[4] The existence of this equilibrium in shown in appendix A.

but only knows that the state is 1 with probability $\frac{\theta}{\theta+(1-\theta)(1-\lambda_2)}$ when foreign media reports a null signal of ϕ, $\left(a_2(1,\phi)=\frac{\theta}{\theta+(1-\theta)(1-\lambda_2)}\right)$. This is derived from observing that both governments truthfully reports state 1 (probability θ), and the bad government (probability $1-\lambda_2$) always report 1 in state 0.

The expressions for citizen's equilibrium behavior in period 2, $a_2(r_g, r_f)$, allows me to derive the good government's utility $V_2^G(\lambda_2)$ and the bad $V_2^B(\lambda_2)$ are as follows:

$$\begin{aligned} V_2^G(\lambda_2) &= -\left(1-a_2(1,\phi)\right)^2\theta(1-\pi) \\ &= -\left(1-\frac{\theta}{\theta+(1-\theta)(1-\lambda_2)}\right)^2\theta(1-\pi) \\ V_2^B(\lambda_2) &= \left[a_2(1,1)\,\theta + a_2(1,0)\,(1-\theta)\right]\gamma\pi + a_2(1,\phi)\,(1-\gamma\pi) \\ &= \theta\gamma\pi + \frac{\theta}{\theta+(1-\theta)(1-\lambda_2)}\,(1-\gamma\pi) \end{aligned} \tag{2}$$

Note that $V_2^G(\lambda_2)$ represents citizen's utility under a truthful government, who experiences disutility $-(1-a_2(1,\phi))^2$ whenever he hears $\{r_g=1, r_f=\phi\}$ with probability $\theta(1-\pi)$. In contrast $V_2^B(\lambda_2)$ reflects the average action $a_2(r_g, r_f)$ under a government that only reports $r_g = 1$. Both utility expressions $V_2^G(\lambda_2)$ and $V_2^B(\lambda_2)$ are increasing in period 2 government reputation λ_2. Intuitively citizen takes higher action in state 1 when he places greater trust on government's report. But greater trust also enables the bad government to more effectively influence citizen's action to her preferred direction.

Working back to the end of period 1, citizen updates government's reputation λ_2 based on reports $r=\{r_g, r_f\}$ and realized state S_1 in period 1, $\lambda_2 \equiv \Lambda(r_g, r_f, S_1)$. Restricting attention to equilibria the good government truthfully reports the state while the bad type is expected to misrepresent state 0 (and reports 1) with probability σ_E, there exist three possible reputation values [5]. First, a government that truthfully reports state 1 maintains her reputation at $\Lambda(1, r_f, 1) = \lambda_1$ because both types of governments are equally likely to truthfully report state 1. Second, citizen concludes that only a bad government would report 1 in state 0 $\Lambda(1, r_f, 0) = 0$. Finally, a government that truthfully reports state 0 gains a higher reputation at $\Lambda(0, r_f, 0) = \frac{\lambda_1}{\lambda_1+(1-\lambda_1)(1-\sigma_E)} > \lambda_1$ after observing that the good government (probability λ_1) honestly reports state 0, while the bad government (probability $1-\lambda_1$) truthfully reports 0 with probability $1-\sigma_E$.

Similar to the analysis in period 2, I use equation (1) to characterize citizen's equilibrium action $a_1(r)$ in period 1. In particular citizen takes action $a_1(0, r_f) = 0$ after hearing government report of 0, knowing that governments never lies in state 1. When the government reports 1, citizen takes action $a_1(1,0) = 0$ after hearing foreign media's report of 0, takes action $a_1(1,1) = 1$ after hearing foreign media's report of 1, and takes action $a_1(1,\phi) = \frac{\theta}{\theta+(1-\theta)(1-\lambda_1)\sigma_E}$ after hearing a null signal ϕ from foreign media.

After deriving equilibrium behaviors in both periods, I focus now on the bad government's decision to lie in state 0. By truthfully reporting the state, the government receives zero utility in period 1 $(a_1(0,0)\,\pi + a_1(0,\phi)\,(1-\pi) = 0)$, followed by a higher period 2 utility of

$$\delta V_2^B(\Lambda(0, r_f, 0)) = \delta\left(\theta\pi + \frac{\theta}{\theta+(1-\theta)(1-\Lambda(0, r_f, 0))}(1-\pi)\right)$$

[5]Since representative citizen does not expect a government to report 0 in state 1, the expression $\Lambda(0, r_f, 1)$ is not well defined in equilibrium.

If the government chooses to lie and reports 1 instead, she receives a higher period 1 utility of

$$a_1(0,0)\,\pi + a_1(1,\phi)\,(1-\pi) = \frac{\theta}{\theta + (1-\theta)(1-\lambda_1)\sigma_E}(1-\pi)\,,$$

followed by a lower period 2 utility of

$$\delta V_2^B(\Lambda(1, r_f, 0)) = \delta\,\theta\,.$$

In other words by lying, the government receives a benefit of

$$B(\pi, \sigma_E) = \frac{\theta}{\theta + (1-\theta)(1-\lambda_1)\sigma_E}\,(1-\pi) - 0 \tag{3}$$

from influencing citizen's decision in period 1. The benefit is decreasing in foreign media's accuracy π since greater information availability reduces the government's effectiveness to influence in period 1. The benefit is also decreasing bias σ_E because citizen puts less faith on a more biased government, thus a smaller gain from lying.

Lying in period 1 is costly because it tarnishes the government's reputation in period 2, diminishing her ability to influence. If the government chooses to truthfully report state 0, her reputation would have increased from λ_1 to $\Lambda(0, r_f, 0) = \frac{\lambda_1}{\lambda_1 + (1-\lambda_1)(1-\sigma_E)}$, increasing her ability to influence in period 2. If the government chooses to lie instead, her reputation falls from λ_1 to $\Lambda(1, r_f, 0) = 0$ revealing her identity and loses her ability to influence in period 2. Therefore the cost from lying in period 1, $C(\pi, \sigma_E)$, represents the net loss in government's ability to influence in period 2, equals

$$\begin{aligned} C(\pi, \sigma_E) &= \delta[V_2^B(\Lambda(0, r_f, 0)) - V_2^B(\Lambda(1, r_f, 0))] \\ &= \delta(1-\theta)\Lambda(0, r_f, 0)\frac{\theta}{\theta + (1-\theta)(1-\Lambda(0, r_f, 0))}(1-\gamma\pi) \end{aligned} \tag{4}$$

and is increasing in bias σ_E because at higher levels of reputation $\Lambda(0, r_f, 0)$, the payoff from influencing in period 2 is higher than in period 1. The cost from lying, $C(\pi, \sigma_E)$, is decreasing in foreign media's accuracy in period 2, π, because greater information availability in period 2 reduces the government's ability to influence in that period. Hence the (opportunity) cost from lying in period 1 is now smaller.

Before deriving the bad government's behavior in equilibrium σ^*, let $\sigma_R(\sigma_E)$ be the bad government's likelihood of reporting 1 in state 0 for a given level of bias expectation σ_E. Equilibrium bias σ^* takes on three possible cases:

1. *Truthful equilibrium* ($\sigma^* = 0$): When citizen expects the bad government to truthfully report state 0, ($\sigma_E = 0$), she chooses to do only if the cost from lying $C(\pi, 0) = \delta(1-\theta)\lambda_1 \frac{\theta}{\theta+(1-\theta)(1-\lambda_1)}(1-\gamma\pi)$ exceeds the gain of $B(\pi, 0) = 1-\pi$. As illustrated in the upper-left portion of figure 1, when this condition holds, the government's best response is to truthfully report state 0 *regardless of citizen's bias expectation* σ_E ($\sigma_R(\sigma_E) = 0$) because the benefit $B(\pi, \sigma_E)$ is decreasing in σ_E while the cost $C(\pi, \sigma_E)$ is increasing in σ_E.

2. *Always lying equilibrium* ($\sigma^* = 1$): When citizen expects the bad government to always report 1 ($\sigma_E = 1$), it chooses to do so only if the benefit from lying $B(\pi, 1) = \frac{\theta}{\theta+(1-\theta)(1-\lambda_1)}(1-\pi)$ exceeds the cost of $C(\pi, 1) = \delta(1-\theta)(1-\pi) = C(\pi, 1)$. As illustrated in the upper-right portion of figure 1, when this condition holds, the

government's best response is to always reports 1 *regardless of citizen's bias expectation* σ_E ($\sigma_R(\sigma_E) = 1$) because the benefit $B(\pi, \sigma_E)$ is decreasing in σ_E while the cost $C(\pi, \sigma_E)$ is increasing in σ_E.

3. *Interior lying equilibrium* ($0 < \sigma^* < 1$): Now suppose the opposite is true i.e. $B(\pi, 1) < C(\pi, 1)$. Since $B(\pi, \sigma_E)$ is monotonically decreasing in σ_E, while $C(\pi, \sigma_E)$ is monotonically increasing in σ_E, there exists a bias level $0 < \sigma^* < 1$ such that the government prefers reporting 1 for $\sigma_E < \sigma^*$, prefers reporting 0 for $\sigma_E > \sigma^*$, and is indifferent between reporting 0 or 1 for $\sigma_E = \sigma^*$. As shown in the lower-middle portion of figure 1, equilibrium bias occurs when the government's best response curve $\sigma_R(\sigma_E)$, coincides with citizen bias expectation σ_E ($45°$ line $\sigma_R = \sigma_E$) at σ^*. Note that at equilibrium $\sigma^* < 1$, the benefit from lying equals to its cost, $B(\pi, \sigma^*) = C(\pi, \sigma^*)$, which allows me to derive expression for bias σ^*.

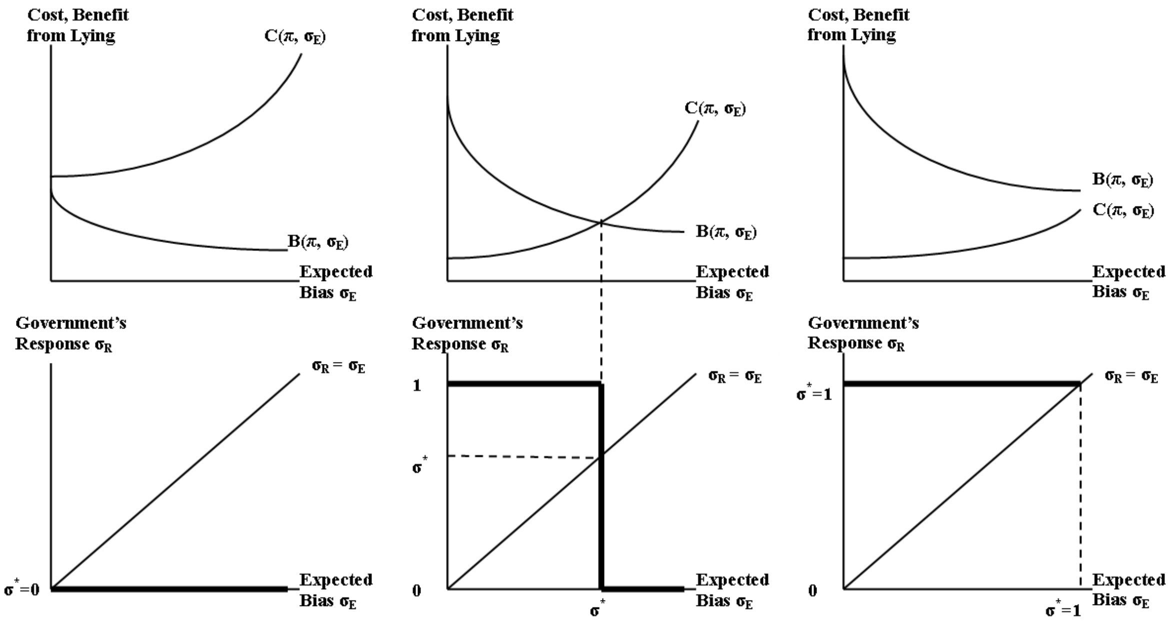

Figure 1: Determination of Equilibrium Bias σ^*

To summarize, let $\Pi = \frac{1-\pi}{1-\gamma\pi}$ be the inaccuracy ratio between period 1 and 2. Equilibrium bias equals

$$\sigma^* = \begin{cases} 0 & \text{if } \Pi \leq \frac{\delta\theta(1-\theta)\lambda_1}{\theta+(1-\theta)(1-\lambda_1)} \\ \frac{\Pi-(1-\theta)\lambda_1(\Pi+\delta\lambda)}{(1-\lambda_1)(\Pi+\delta\lambda_1(1-\theta)^2)} < 1 & \text{if } \Pi \in \left(\frac{\delta\theta(1-\theta)\lambda_1}{\theta+(1-\theta)(1-\lambda_1)}, \frac{\delta(1-\theta)(\theta+(1-\theta)(1-\lambda_1))}{\theta}\right) \\ 1 & \text{if } \Pi \geq \frac{\delta(1-\theta)(\theta+(1-\theta)(1-\lambda_1))}{\theta} \end{cases} \tag{5}$$

where bias σ^* is decreasing in discount rate (δ) because a higher value on period 2 ability to influence reduces the government's incentive to lie in period 1. Bias is increasing in probability of state 1 (θ) because representative citizen is more inclined to take higher action and thus a greater gain from lying. The relation between equilibrium bias σ^* and reputation λ_1 takes on a U-shaped curve, where bias is highest when reputation λ_1 approaches 0 or 1, and is lowest for moderate values of λ_1. Note that the gain in reputation from truthfully reporting state 0, $\left(\frac{\lambda_1}{\lambda_1+(1-\lambda_1)(1-\sigma_E)} - \lambda_1\right)$, is highest when citizen is unsure of government's identity (moderate λ_1) and is lowest when citizen is relatively certain of the government's identity.

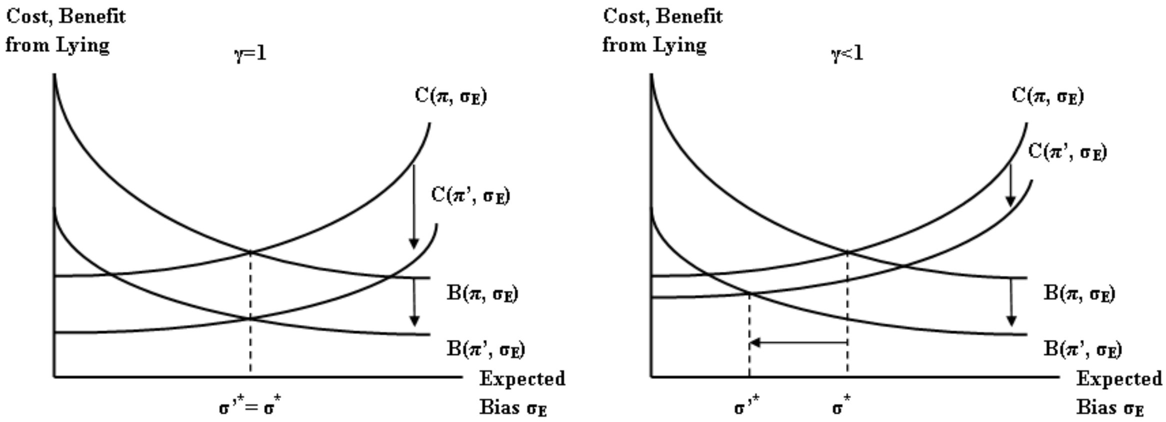

Figure 2: Change in Foreign Media's Accuracy π on Cost, Benefit from Lying

4. Foreign Media's Entry on Bias Behavior

In this model foreign media's entry represents an increase in foreign media's accuracy from $\pi = 0$ to $\pi' < 1$ in both periods. Greater information availability in period 1 lowers the benefit from lying $B(\pi, \sigma_E)$, reducing the government's ability to influence in period 1. However continual foreign media's presence in period 2 also lowers the government's ability to influence in period 2, as the incentive to maintain higher reputation is now smaller. In a special case where governments value reputation solely to manipulate citizen's action ($\gamma = 1$), foreign media's entry lowers both the benefit and cost from lying by the same proportion. This is illustrated in the left diagram of figure 2, where both effects perfectly counteracts one another, resulting in an unchanged equilibrium bias σ^*. In the general case where a government values reputation other than using it to influence citizen's decision ($\gamma < 1$), entry of foreign media causes the benefit from lying to fall by a greater proportion compared to the fall in the cost of lying. The combined effects results in a lower equilibrium bias at $\sigma^{'*}$, as illustrated in the right diagram of figure 2.

One can also incorporate varying levels of foreign media's accuracy between different time periods t. In a benchmark case where government values reputation solely to influence citizen's action ($\gamma = 1$), foreign media's report becomes equally influential on bad government's utility in both periods t. Now suppose that entry of foreign media causes period 2 accuracy to be higher than in period 1 i.e. $\pi_2 > \pi_1$. A government that anticipates this will increases equilibrium bias σ^* in period 1. What seems to be a counter-intuitive result potentially reflects the continuous improvements foreign press coverage that provides citizens with better information in the future. This greatly reduces the government's incentive to maintain her future reputation, resulting in higher domestic media bias today. On the other hand, Morozov (2012) argues that improving communication technology could provide governments with greater ability to control news information available to the public. In this case, one will expect a higher foreign media's accuracy in period 1 than in period 2 ($\pi_1 > \pi_2$), resulting in a lower equilibrium bias from foreign media's entry.

5. Conclusion

This paper challenges a seemingly intuitive prediction that greater information availability always lowers bias in government media as it reduces government's ability to influence. What is less obvious is that continual foreign media's presence in the future reduces the government's incentives to maintain a good reputation, this lowers the cost of lying, reversing some of the decrease in government's incentive to lie. This has important implications on public welfare. When foreign media's entry lowers government's media bias, it raises public welfare enabling citizens to make better decisions and limits the bad government's ability to influence. The results is less clear when foreign media's entry raises government's media bias. While greater information availability enables citizen to make better decision and reduces the government's ability to influence, it lowers the quality of information coming from the government's source. Whether the benefit from greater information availability outweighs its cost is a subject for future research. On a broader context, reducing a government's ability to influence through media control is not necessarily welfare enhancing if the government substitutes with less efficient methods to influence public action such as organized mass rallies.

Several potential avenues for future research as as follows. First, the model can be extended beyond the two periods framework to examine the government's decision to lie in response to entry of foreign media. It is worth noting that government's reputation may not survive indefinitely (Cripps Mailath and Samuelson (2004)). To induce persistent uncertainty in an infinite period framework, Mailath and Samuelson (2006) proposes that at the end of period t there is a small probability the incumbent government is replaced with a unknown new government. Second, despite recent attention towards media and government accountability in democratic governments (Besley (2007), Besley, Prat (2006)) more research is needed on media and government accountability in autocratic regimes. Third, Morozov (2012) argues that improvements in communication technology provides autocratic governments with new tools to track down dissenters and employ better methods to censor independent news. Currently not much is known about government's incentives to adapt new methods to control the press. Lastly, little attention is paid towards misinformation from foreign press even though it is very common for governments to justify media control "to prevent misinformation and to preserve social stability".

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6. Appendix

6.1 Appendix A

To avoid the possibility of a babbling equilibrium, I restrict analysis to equilibria where the likelihood of state 1 is higher after hearing $\{r_g = 1, r_f\}$ than after hearing $\{r_g = 0, r_f\}$. From equation (1), it implies that $(a_2(1, r_f) \geq a_2(0, r_f))$ for $r_f \in \{0, 1, \phi\}$. Let $\sigma_2^I(S_2)$ be the likelihood that the government of type $I \in \{G, B\}$ reports 1 in state $S_2 \in \{0, 1\}$. Consider first the good government's utility which can be written as follows:

$$\begin{aligned}\max_{\sigma_2^G(1),\sigma_2^G(0)} -\theta\Big\{&\sigma_2^G(1)\left[(1-a_2(1,1))^2\,\pi + (1-a_2(1,\phi))^2\,(1-\pi)\right] \\ &+ (1-\sigma_2^G(1))\left[(1-a_2(0,1))^2\,\pi + (1-a_2(0,\phi))^2\,(1-\pi)\right]\Big\} \\ -(1-\theta)\Big\{&\sigma_2^G(0)\left[(0-a_2(1,0))^2\,\pi + (0-a_2(1,\phi))^2\,(1-\pi)\right] \\ &+ (1-\sigma_2^G(0))\left[(0-a_2(0,0))^2\,\pi + (0-a_2(0,\phi))^2\,(1-\pi)\right]\Big\}.\end{aligned}$$

From inspection, the government's utility from truthfully reporting state 1: $-\big[(1-a_2(1,1))^2\,\pi + (1-a_2(1,\phi))^2\,(1-\pi)\big]$ exceeds the utility from lying and reporting 0: $-\big[(1-a_2(0,1))^2\pi + (1-a_2(0,\phi))^2\,(1-\pi)\big]$. Hence the government's utility in state 1 is maximized by truthfully reporting the state $(\sigma_2^G(1) = 1)$. Likewise, the government's utility from truthfully reporting state 0: $-\big[(0-a_2(1,0))^2\,\pi + (0-a_2(1,\phi))^2\,(1-\pi)\big]$ exceeds the utility from lying and reporting 1: $-\big[(0-a_2(0,0))^2\,\pi + (0-a_2(0,\phi))^2\,(1-\pi)\big]$. Hence the government's utility in state 0 is maximized by truthfully reporting the state $(\sigma_2^G(0) = 0)$.

Conversely, the bad government's utility can be written as follows:

$$\begin{aligned}\max_{\sigma_2^B(1),\sigma_2^B(0)} \theta\Big\{&\sigma_2^B(1)\left[a_2(1,1)\,\gamma\pi + a_2(1,\phi)\,(1-\gamma\pi)\right] \\ &+ \left(1-\sigma_2^B(1)\right)\left[a_2(0,1)\,\gamma\pi + a_2(0,\phi)\,(1-\gamma\pi)\right]\Big\} \\ +(1-\theta)\Big\{&\sigma_2^B(0)\left[a_2(1,0)\,\gamma\pi + a_2(1,\phi)\,(1-\gamma\pi)\right] \\ &+ \left(1-\sigma_2^B(0)\right)\left[a_2(0,0)\,\gamma\pi + a_2(0,\phi)\,(1-\gamma\pi)\right]\Big\}.\end{aligned}$$

From inspection, the government's utility from truthfully reporting state 1: $\big[a_2(1,1)\,\gamma\pi + a_2(1,\phi)\,(1-\gamma\pi)\big]$ exceeds the utility from lying and reporting 0: $\big[a_2(0,1)\,\gamma\pi + a_2(0,\phi)\,(1-\gamma\pi)\big]$. Hence the government's utility in state 1 is maximized by truthfully reporting the state ($\sigma_2^B(1) = 1$). However the government's utility from truthfully reporting state 0: $\big[a_2(1,0)\,\gamma\pi + a_2(1,\phi)\,(1-\gamma\pi)\big]$ is *smaller* than the utility from lying and reporting 1: $\big[a_2(0,0)\,\gamma\pi + a_2(0,\phi)\,(1-\gamma\pi)\big]$. Hence the government's utility in state 0 is maximized by always lying and reporting 1 ($\sigma_2^B(0) = 1$).

6.2 Appendix B

It is plausible, as discussed in Morris (2001), that governments lies in state 1 to improve its period 2 reputation λ_2. The key is to recognize that the common discount rate $\delta < 1$ is sufficiently small to deter the good government from reporting $r_g = 0$ in state 1. First, let $\Lambda(0, r_f, 1)$ be the likelihood of good government after hearing off equilibrium report $\{r_g = 0, r_f\}$ in state $S_1 = 1$. By lying in state 1, the good government's utility in both periods equals

$$\begin{aligned}
&-\big[(1-a_1(0,1))^2\,\pi + (1-a_1(0,\phi))^2\,(1-\pi)\big] + \delta V_2^G(\Lambda(0,r_f,1)) \\
&= -(1-\pi) - \delta\left(1 - \frac{\theta}{\theta + (1-\theta)(1-\Lambda(0,r_f,1))}\right)^2 \theta(1-\pi)\,,
\end{aligned}$$

where off-equilibrium action equals $a_1(0,1) = 1$ since citizen learns the actual state from foreign media's report $r_f = 1$. If the government chooses to truthfully report state 1 instead, the utility in both periods equals

$$\begin{aligned}
&-\big[(1-a_1(1,1))^2\,\pi + (1-a_1(1,\phi))^2\,(1-\pi)\big] + \delta V_2^G(\Lambda(1,r_f,1)) \\
&= -\left(1 - \frac{\theta}{\theta + (1-\theta)(1-\lambda_1)\sigma^*}\right)^2 (1-\pi) - \delta\left(1 - \frac{\theta}{\theta + (1-\theta)(1-\lambda_1)}\right)^2 \theta(1-\pi)\,.
\end{aligned}$$

Since $V_2^G(\lambda_2)$ is monotonically increasing in λ_2, the government has the largest incentive to lie at $\Lambda(0, r_f, 1) = 1$. Substituting $\Lambda(0, r_f, 1) = 1$ into the above equation, the good government strictly prefers to truthfully report state 1 if

$$\begin{aligned}
&\left[1 - \left(1 - \frac{\theta}{\theta + (1-\theta)(1-\lambda_1)\sigma^*}\right)^2\right](1-\pi) \\
&\qquad - \delta\left[\left(1 - \frac{\theta}{\theta + (1-\theta)(1-\lambda_1)}\right)^2 - (1-1)^2\right]\theta(1-\pi) > 0 \\
\Leftrightarrow &\left[\frac{\theta + 2(1-\theta)(1-\lambda_1)\sigma^*}{(\theta + (1-\theta)(1-\lambda_1)\sigma^*)^2} - \delta\left(\frac{(1-\theta)(1-\lambda_1)}{\theta + (1-\theta)(1-\lambda_1)}\right)^2\right]\theta(1-\pi) > 0
\end{aligned}$$

the last inequality holds because $\frac{\theta + 2(1-\theta)(1-\lambda_1)\sigma^*}{(\theta + (1-\theta)(1-\lambda_1)\sigma^*)^2} > 1 > \delta\left(\frac{(1-\theta)(1-\lambda_1)}{\theta + (1-\theta)(1-\lambda_1)}\right)^2$. Since the good government strictly prefers to truthfully report state 1 for any off equilibrium beliefs: $0 \geq \Lambda(0, r_f, 1) \geq 1$, citizen concludes that any off-equilibrium behavior comes from the bad type government $\Lambda(0, r_f, 1) = 0$. From here it is straightforward to show that the bad type government also strictly prefers to truthfully report state 1. This concludes the proof that both governments prefer to truthfully report state 1.

If the model is extended to allow foreign media's accuracy to vary between different time periods $\pi_1 \neq \pi_2$, the following condition is needed to ensure that the good government truthfully reports state 1

$$\frac{\theta + 2(1-\theta)(1-\lambda_1)\sigma^*}{(\theta + (1-\theta)(1-\lambda_1)\sigma^*)^2}(1-\pi_1) - \delta\left(\frac{(1-\theta)(1-\lambda_1)}{\theta + (1-\theta)(1-\lambda_1)}\right)^2 (1-\pi_2) > 0$$

A plausible restriction requires that period 2 foreign media's accuracy to be sufficiently large relative to accuracy in period 1. Let $\Pi \equiv \frac{1-\pi_1}{1-\pi_2}$ to be the inaccuracy ratio between period 1 and 2. The sufficient condition to ensure that the good type truthfully reports 1 is $\Pi > \frac{\delta(1-\theta)^2(1-\lambda_1)^2}{\theta+2(1-\theta)(1-\lambda_1)}$.

6.3 Appendix C

Our model uses $0 \leq \gamma \leq 1$ to approximate the behavior of the government that values reputation more than just to influence citizen's action. A more realistic period 2 bad government's expected utility takes the following functional form:

$$U^B(\lambda_2) = \delta\left[V^B(\lambda_2;\pi) + W(\lambda_2)\right] ,$$

where $W(\lambda_2)$ is increasing in period 2 reputation, and represents utility from having a good public opinion or rents from maintaining power, which requires a sufficient government credibility. Since it is unlikely that foreign media's report will alter the government's utility from higher reputation, I assume that $W(\lambda_2)$ is independent from foreign media's accuracy π.

The modified functional form alters the government's decision to lie as follows. By truthfully reporting state 0, utility in both period equals

$$\begin{aligned} &a_1(0,0)\,\pi + a_1(0,\phi)\,(1-\pi) + \delta\left[V_2^B(\Lambda(0,r_f,0)) + W(\Lambda(0,r_f,0))\right] \\ &= 0 + \delta\left[\left(\theta\pi + \frac{\theta}{\theta+(1-\theta)(1-\Lambda(0,r_f,0))}(1-\pi)\right) + W(\Lambda(0,r_f,0))\right] \end{aligned}$$

If the government chooses to lie and reports 1 instead, her two period utility equals

$$\begin{aligned} &a_1(0,0)\,\pi + a_1(1,\phi)\,(1-\pi) + \delta\left[V_2^B(\Lambda(1,r_f,0)), W(\Lambda(1,r_f,0))\right] \\ &= \frac{\theta}{\theta+(1-\theta)(1-\lambda_1)\sigma_E}(1-\pi) + \delta\left[\theta + W(0)\right] \end{aligned}$$

Hence the benefit from lying is

$$B(\pi,\sigma_E) = \frac{\theta}{\theta+(1-\theta)(1-\lambda_1)\sigma_E}\,(1-\pi) - 0$$

which is identical to equation 3. However the cost of lying now equals

$$\begin{aligned} C'(\pi,\sigma_E) &= \delta[V_2^B(\Lambda(0,r_f,0)) - V_2^B(\Lambda(1,r_f,0)) + W(\Lambda(0,r_f,0)) - W(\Lambda(1,r_f,0))] \\ &= \frac{\delta\theta(1-\theta)\Lambda(0,r_f,0)}{\theta+(1-\theta)(1-\Lambda(0,r_f,0))}(1-\pi) + [W(\Lambda(0,r_f,0)) - W(0)] \end{aligned}$$

Since expression $W(\Lambda(0,r_f,0)) - W(0)$ does not depends on foreign media's accuracy π, foreign media's entry causes a smaller decrease in cost from lying $C'(\pi,\sigma_E)$, compared to the standard expression $C(\pi,\sigma_E)$ (equation (4)) at $\gamma = 1$. Hence maintaining the assumption that $\gamma < 1$ in our model produces a similar result as the one described here.