Quarterly Journal of Political Science, 2011, 6: 235–274

Indirect Lobbying and Media Bias*

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ABSTRACT

This paper provides a model of indirect lobbying where special interest groups try to influence policy outcomes by targeting voters. Specifically, competing lobbies engage in influence activities to affect the information that a (possibly biased) media outlet collects on the public value of approving/rejecting a policy proposal. The media outlet acts as a *filter* between lobbies and voters. It has to decide what to communicate to voters based on the information it collects and its own idiosyncratic bias. The results show that the higher the idiosyncratic bias of the media outlet, the lower the lobbies' incentives to spend resources on influence activities. Conversely, the lower the cost of engaging in influence activities for lobbies, the higher the probability of *news-slanting* by the media outlet. Moreover, the more voters care about receiving

* The paper is adapted from a chapter of my Ph.D. dissertation at the University of Southern California. I am truly indebted to Andrea Mattozzi, Guofu Tan and Simon Wilkie for their generous support and advice and, especially, to Juan Carrillo for his precious guidance. I would like to thank Jonathan Aronson, David Balan, Jad Dagher, Mark Dincecco, Amit Gandhi, Daniela Iorio, Adam Kaufman, Morgan Llewellyn, Michael Magill, Salvatore Miglietta, Maria Petrova, Guillame Roger, Kenneth Wilbur and audience participants at several seminars and conferences for useful comments. I am also very grateful to the editors Scott Ashworth, Keith Krehbiel and Nolan McCarty and to an anonymous referee for their suggestions on how to improve the paper. All remaining errors are mine.

MS submitted 12 November 2010; *final version received 5 October 2011*
ISSN 1554-0626; DOI 10.1561/100.00010087

accurate information, the higher the expected distortion in the policy outcome. From a public policy perspective, increasing the cost of lobbies' influence activities would decrease the distortion in the policy outcome and increase voters' welfare. Finally, asymmetries between lobbies lead to different probabilities of *news-slanting* by different media outlet types.

Understanding the effects of lobbies' influence activities on political outcomes has been one of the main concerns of the political economy literature for a long time. In a seminal paper, Becker (1985) introduced the concept of ''influence function'', suggesting that by exerting some kind of political pressure interest groups are able to affect the tax or subsidy that they pay/receive. In the 20 years that have followed, many scholars have analyzed this issue by focusing on the relationships between lobbies and politicians. This extensive literature has shown that special interest groups may *directly* influence the policy outcome by targeting politicians.[1] Indeed, lobbies allocate large amount of resources in trying to influence politicians.[2] Nevertheless, such a direct channel of policy influence is not always feasible or effective for lobbies. First of all, in the case of direct democracy (i.e., referenda, ballots, propositions, etc.), politicians are simply not the policy-makers. Moreover, there are issues where the political cost that any politician would incur by endorsing a lobby and deviating from the median voter's preferred policy outcome would be extremely high. Examples of such ''non-pliable'' issues are abortion, the death penalty, gun control and same-sex marriage.[3] Hence, whenever lobbies cannot *directly* affect the policy outcome by influencing politicians, they have to try to do so *indirectly* by targeting voters. A clear example of special interest groups whose activities are explicitly focused on voters is represented by the 527 groups in the US.[4]

[1] See, among others, Austen-Smith (1993), Baron (1994), Grossman and Helpman (1994, 1996, 2001), Lohmann (1998), Prat (2002a, 2002b), Coate (2003), Bennedsen and Feldmann (2006).

[2] For example, in the 2004 US presidential elections, George W. Bush and John Kerry received around 274 and 227 million dollars, respectively, from individuals and Political Action Committees' contributions (Center for Responsive Politics, 2011a).

[3] Indeed, Matsusaka (2010) finds that the *congruence* (i.e., the correlation) between policy and public opinion in US states is 88% for same-sex marriage and higher than 70% for public funding of abortion and death penalty.

[4] A 527 group is "a tax-exempt group organized under section 527 of the Internal Revenue Code to raise money for political activities including voter mobilization efforts, issue advocacy and the like." (Center for Responsive Politics, 2011b).

This paper provides a stylized model of indirect lobbying to study the influence of interest groups on voters. At the same time, given that the media represent the main communication channel between interest groups and voters, the paper analyzes the relationship between lobbies' influence activities and media bias. More importantly, I study the implications of lobbies' influence activities and media bias on the efficiency of the policy outcome and on voters' welfare.

The model is characterized by a multistage game where legislators have to decide whether to approve a policy proposal or keep the status quo. Legislators are assumed to be responsive to public opinion and thus they always choose the policy outcome preferred by the majority of voters (i.e., the one preferred by the median voter). Voters' preferences are a combination of a private value component (i.e., their idiosyncratic preferences) and a state-dependent public value component (i.e., the expected net benefits of keeping the status quo or approving the policy proposal). In the first stage of the game, two opposing lobbies compete to influence the information that a media outlet collects on the public value of approving the policy proposal. The media outlet represents a *filter* between lobbies and the voters: it has to decide what to communicate to voters based on the information it collects and its own idiosyncratic bias. That is, the media outlet's report is the result of three different components: the true public value of approving the policy proposal, lobbies' influence activities and the media outlet's idiosyncratic bias. After having observed the report of the media outlet, voters update their beliefs on the state of the world and then decide whether they prefer the policy proposal to be approved or rejected.

By providing a micro-foundation for this influence mechanism, the model offers several insights on the effects of lobbies' influence activities and media bias on policy outcomes. First, the results show that even though voters and the media outlet are rational and take into account the presence of lobbies' influence activities, a distortion is still present in the policy outcome. Second, the lobbies' incentives to exert effort and the media outlet incentives to slant its reports show an asymmetric relationship. The higher the possible bias of the media outlet the lower lobbies' efforts are. This happens because lobbies' efforts are less productive when it is more likely that the media outlet will slant its reports. In fact, a very biased media outlet on the same ideological side as the lobby makes the lobby's efforts unnecessary. Instead, a very biased media outlet on the opposite ideological side simply makes the lobby's efforts unproductive. Either way, the greater the likelihood that

the media outlet slants its reports, the lower the incentives of lobbies to influence the information that the media outlet collects. Instead, the higher the lobbies' efforts the more likely the media outlet is to slant its reports.

From an *ex-ante* welfare point of view, voters experience a net expected loss from the policy distortion generated by the bias of the media outlet and/or lobbies' influence activities. More specifically, the more voters care about receiving accurate information, the nosier the information that they end up receiving is and the higher their expected utility loss is. The comparative statics results show that public policy measures aimed at increasing the cost of lobbies' efforts would reduce lobbies' influence activities and/or reduce *news-slanting* by the media (in a probabilistic sense). Thus, imposing a stricter tax regime on interest groups, or more closely regulating their influence activities, would reduce the distortion in the policy outcome and increase voters' welfare.

I also analyze several extensions of the benchmark model and show that asymmetries in media bias *do not* generate asymmetric incentives for lobbies to engage in influence activities. On the other hand, asymmetries in lobbies' influence activities *do* generate asymmetric incentives for different media outlet types to slant their reports. That is, asymmetries between lobbies lead to different probabilities of *news-slanting* by different media outlet types. More specifically, when only the leftist (rightist) lobby is present, for a given *ex-ante* bias, a rightist (leftist) media outlet has higher incentives to slant its reports than a leftist (rightist) one. This suggests that empirical studies aiming at measuring media bias should take into account the possible difference between the *ex-post* slant in a media outlet's reports and the *ex-ante* bias of the media outlet itself. I also show that a (not overly) biased media outlet may affect the policy outcome even in the presence of rational, Bayesian voters who know its bias. Finally, I analyze the case of direct communication between special interest groups and the voters and show that it represents a special case nested in the benchmark model. Therefore, the results of the model also provide theoretical insights for the case where there is no media outlet acting as a *filter* between lobbies and voters.

Empirical Evidence

The amount of evidence showing that special interest groups not only limit their activities to politicians but also seek to influence voters is considerable. In the US, lobbies use three main types of instruments to influence

voters: advocacy groups, issue advertising and think tanks.[5] According to the Center for Responsive Politics (2011c), in the 2004 election cycle advocacy groups (527 groups) spent more than 600 million dollars trying to influence how voters looked at the issues they were interested in. In particular, ideological and single issue advocacy groups spent between 400 and 500 million dollars.[6]

''Issue advertisements'' are ads run by political action committees (PACs), advocacy groups and other kinds of lobbies (e.g., private firms), about public policy issues (i.e., not products or candidates). Falk *et al.* (2006) estimate that between 2003 and 2004, more than 400 million dollars was spent on print and television issue advertisements in the Washington DC metropolitan area alone.[7]

Think tanks are non-profit research organizations which analyze public policy issues and advocate solutions.[8] The number and the importance of think tanks has been growing over time. Rich (2004) estimates that in 1996 there were 306 think tanks operating in the US.[9] While some think tanks are non-partisan, some others engage in ideologically oriented research. As depicted by a 2002 Note of the *Harvard Law Review*, ''think tanks often provide a platform for particular viewpoints by packaging and popularizing policy proposals''.[10] Out of the 306 think tanks listed by Rich (2004), 165 were identified as being ideologically oriented (i.e., either conservative or liberal).

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[5] In other countries (e.g., western Europe) the lobbying sectors are typically informal (i.e., not institutionalized). Thus, the evidence on lobbies' influence over voters is mostly anecdotal. See Beyers (2004) for EU-level evidence on grassroot activities.

[6] See also Kollman (1998) for compelling evidence on the presence of extensive grassroots campaigning in favor of and against the approval of the NAFTA by the US in 1993.

[7] More specifically, their estimates report that 79% of the total spending on issue ads was done by corporations. Notice that, issue advertisements are not regulated under federal campaign finance laws. Thus, it is not possible to exactly quantify the amount of resources spent on this type of political expenditure.

[8] Think tanks are tax exempt organizations (regulated under section 501(c)(3) of the IRS code). The main advantage of such exemption is to allow think tanks to receive unlimited contributions from private foundations. Moreover, contributions to think tanks are tax deductible. For a comprehensive description and discussion of think tanks' legal status and activities see "The Political Activity of Think Tanks: The Case for Mandatory Contributor Disclosure", *Harvard Law Review*, March 2002, 115(5): 1502–1524.

[9] Rich also shows that the 80% of the think tanks in existence in 1996 were formed after 1970 and their number has been steadily growing over time. Other studies use different classification of think tanks and report an even higher number of think tanks (e.g., Hellebust (1996) lists 1212 think tanks operating in 1996).

[10] Source: "The Political Activity of Think Tanks: The Case for Mandatory Contributor Disclosure." *Harvard Law Review* 2002: 15203.

While in the case of ''issue advertising'' the communication between lobbies and voters is *unfiltered* (i.e., direct), in other instances lobbies' influence activities are channeled through the media.[11] A clear example of such *filtered* communication is media reports covering think tanks' research. While an unbiased media outlet would report the research of different think tanks in a balanced way, a biased media outlet may slant its reports by *selectively omitting* relevant information (i.e., emphasizing the results of one think tank's research and hiding those of another). Indeed, recent empirical studies show the presence of this kind of bias in the media. Groseclose and Milyo (2005) propose a measure of media bias by comparing the number of times a media outlet cite a think tank with the number of times members of the congress cite the same think tank. They find that, with few exceptions, most of the US news media outlets are more leftist than the average member of the congress.[12] At the same time, the empirical literature on media has also shown that media bias matters. That is, the media do influence voters behavior (DellaVigna and Kaplan, 2007; Gerber *et al.*, 2009). DellaVigna and Kaplan (2007) study the effect of the entry of Fox News in the cable market and they find that about 3–8 percent of its viewers were indeed convinced to vote Republican. Gerber *et al.* (2009) conducted a natural field experiment to measure the effect of exposure to the Washington Times and Washington Post in the month before the 2005 Virginia Gubernatorial election. They find that individuals assigned to the Washington Post treatment group were eight percent more likely to vote for the democratic candidate than those belonging to the control group.[13] This emerging empirical literature thus highlights the importance of considering and analyzing the presence of biased news media acting as a *filter* between lobbies and voters.

Related Literature

The issue of grassroots activities and special interests' influence on voters has been largely overlooked by the formal literature on lobbying. At the same

[11] The case of direct communication between special interest groups and voters is formally analyzed in the section discussing the extensions to the benchmark model.

[12] For additional evidence on the presence of bias in the media see Ho and Quinn (2008) and Gentzkow and Shapiro (2010). See also Anderson and McLaren (2010) for anecdotal evidence and a discussion on the political motivations of media corporations and how media can bias their reports by *selectively omitting* information.

[13] See also Enikopolov *et al.* (2010) for evidence of the persuasive effects of TV in the context of Russia. DellaVigna and Gentzkow (2010) provide an extensive survey of the empirical literature on the effects and the drivers of persuasive communication.

time, the role played by the media in this context as a *filter* between special interests and voters has been mostly neglected. The works most closely related to the present paper are Baron (2005) and Yu (2005).[14]

Baron (2005) considers a model of hard information where an activist lobby and an industry search for evidence on the true state of nature, and then they have to decide whether to conceal it or report it to the media. Baron shows that the activist lobby has an incentive to conceal while the industry does not, moreover the media find it optimal to bias their report in favor of the policy preferred by the activist lobby. This model, while analyzing a more complex structure of the media market, restricts lobbies' strategic decisions to be binary (conceal/not conceal) while I construct a more general (and symmetric) framework where lobbies' influence activities are a continuous function of the incentives structure of the game and, in particular, of the idiosyncratic bias of the media. Moreover, such a framework provides a direct measure of the policy distortion arising from interest groups' influence activities and media bias and then to analyze the effects of such distortion on voters' welfare.

In Yu (2005), lobbies compete by influencing both politicians and voters. Yu shows that such influence activities are complementary. Moreover, an increase in the effectiveness of voters' persuasion or awareness induces a substitution effect between the influence activities targeted to politicians and the one aimed towards voters. However, unlike this paper, Yu assumes an exogenous relation between voters' posterior beliefs and lobbies' efforts and does not analyze the role played by the media.

My model is also related to that of Dewatripont and Tirole (1999) since both papers look at the issue of the production of information by agents and efficient decision making. However, the focus and thus the conclusions of the two papers are quite different. Dewatripont and Tirole analyze the problem of an organization which has to make a decision based on the information provided by agents engaging in moral hazard. They show that an advocacy system where two agents compete to produce favorable evidence is, in general, a more efficient system than one with a single nonpartisan agent. In my model there is no such moral hazard problem in information gathering given that interest groups want to produce favorable

[14] Formal models on special interests influence on voters are also present in Kollman (1998) and Grossman and Helpman (2005). In Kollman (1998) lobbies invest costly resources to signal the salience of the issue they are interested in. In Grossman and Helpman (2001) a lobby wants to educate the public by sending a costless message.

evidence to ensure a beneficial political outcome. This creates strong incentives to conceal unfavorable information. Therefore, in this setting, a single unbiased agent collecting information (e.g., academia) may lead to a more efficient policy outcome than when two lobbies advocate their respective positions.[15]

The analysis also contributes to the literature on media bias. This literature has, so far, shown that the bias present in media reports may come from two alternative types of sources. That is, the idiosyncratic preferences of journalists (Baron, 2006), owners (Djankov *et al.*, 2003; Anderson and McLaren, 2010), governments (Besley and Prat, 2006) or advertisers (Ellman and Germano, 2009; Germano and Meier, 2010; Blasco *et al.*, 2011; Petrova, 2011) may create a supply-driven bias in media reports. On the other hand, the endogenous demand of slanted news by viewers may result in a demand-driven bias in news reports (Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006; Chan and Suen, 2008; Sobbrio, 2011). In this paper, I show that even when a media outlet does not have any biased preferences or any incentive to produce biased reports, its reports may still be biased given that the information it collects may be biased itself. That is, there is a source-driven bias in media reports due to the distortion in information created by lobbies' influence activities.

Finally, the present paper is related to the literature on cheap-talk where the Receiver is uncertain about the Sender's preferences.[16] The model considers an environment where the Receiver (voters) does not know whether the Sender (media outlet) is biased and at the same time does not know the direction of the possible bias. Moreover, the probability distribution of the signal that the Sender receives on the state of the world is also endogenously dependent on the size and probability of its bias. I show that different types of informative equilibria may arise depending on the size of the bias and on the probability of the Sender being biased.

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[15] Indeed, Dewatripont and Tirole (1999) themselves notice that "we assumed all along that moral hazard in information acquisition made it necessary to provide powerful incentive schemes for agents leading to advocacy [...]. These incentive schemes induce concealment as well as acquisition. If information collection is easy, it makes sense to reduce the power of incentive schemes so as to [...] induce truthful release of existing information" (Dewatripont and Tirole, 1999, p. 20).

[16] See Morris (2001).

The Model

In this section, I first introduced the structure of the benchmark model. Then, I discuss the intuition and robustness of the main assumptions.

The political process involves a single issue or policy P. Specifically, there are two alternative items in the legislative agenda: keeping the status quo or approving a policy proposal. That is, $P \in \{0;1\}$ represents the policy outcome in the $[0,1]$ political space, where $P = 0$ stands for ''keeping the status quo'' and $P = 1$ for ''approving the policy proposal''. Since the focus of the analysis is on the indirect channel of lobbies' influence on the political outcome, I implicitly assume that legislators are responsive to public opinion. Hence, the implemented policy outcome is assumed to be the one preferred by the median voter.[17] Nature selects the state of the world $s \in \{A, B\}$ which is Nature's private information (i.e., the state of the world is unknown to all players). To preserve symmetry, players' prior beliefs are assumed to be $\Pr(s = A) = 1/2$. These two alternative states of the world capture the possible differences in the public value of approving/rejecting the policy proposal. That is, by convention, if the state of the world is A then the net benefits (from a public value perspective) of keeping the status quo are assumed to be higher than those of approving the proposal (vice versa, if $s = B$).[18]

Voters have quadratic utility functions:

$$U_i(P, d_i) = -(P - d_i)^2 \tag{1}$$

Voter i policy preference d_i is a combination of a private value component x_i and a state-dependent public value component $\mathcal{I}$, i.e., $d_i(x_i, \mathcal{I}) = x_i + \mathcal{I}$, where

$$\mathcal{I} = \begin{cases} -\delta & \text{if } s = A \\ \delta & \text{if } s = B \end{cases} \tag{2}$$

that is, $x_i \sim f(x)$ represents the idiosyncratic policy preference of voter i. Thus, x_i represents the ideal policy for voter i if he/she were to believe that

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[17] Assuming a dichotomous policy outcome is without loss of generality. The results naturally extend to a model where the policy chosen by the legislators is the median voter's preferred policy in the $[0,1]$ space.

[18] Alternatively, $P \in \{0;1\}$ could be interpreted as the political platforms of two candidates. That is, the state of the world captures the difference between the *valence* (i.e., quality) of the two alternative candidates.

both states of the world are equally likely. Moreover, there is uncertainty over the actual distribution of voter's idiosyncratic preferences. Specifically, the median voter's idiosyncratic preference x_v is assumed to be uniformly distributed in $[0,1]$, i.e., $x_v \sim U[0,1]$.

The state-dependent public value component $\mathcal{I}$ captures the fact that, regardless of their idiosyncratic policy preferences, voters also care about the public value of approving or rejecting the policy proposal. Specifically, δ is a parameter measuring the importance of the state-dependent public value component in the voters' utility functions.[19] Moreover, without loss of generality, I assume $\delta \in (0, \frac{1}{2}]$ so that $E(d_v) \in [0,1]$.[20]

Voters receive information on the state of the world from one media outlet whose quadratic utility function is:

$$U_n(P, d_n) = -(P - d_n)^2 \tag{3}$$

where also d_n contains a private value component and a state-dependent public value component, i.e., $d_n(\varphi_n, \mathcal{I}) = \varphi_n + \mathcal{I}$, where $\mathcal{I}$ is defined as in Equation (2). The idiosyncratic preference parameter $\varphi_n \in \Phi = \{\varphi_l, \varphi_u, \varphi_r\}$ is private information of the media outlet. The possible media outlet idiosyncratic preferences are assumed to satisfy the following:

Assumption 1.

$$\varphi_l < \varphi_u = \frac{1}{2} < \varphi_r$$

$$\frac{1}{2} - \varphi_l = \varphi_r - \frac{1}{2}$$

Notice that $E(x_v) = 1/2$. Hence, if the media outlet has idiosyncratic preferences $\varphi_l(\varphi_r)$ its ideal policy lies to the left (right) of the one of the expected median voter. On the other hand, a media outlet of type φ_u and the expected median voter share the same preferences over policies. More specifically, in the following analysis a media outlet is referred to be ''unbiased''

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[19] Notice that having a more general specification of voters' utility functions would not change the results in any significant way. For example:

$$d_i(x_i, \mathcal{I}) = (x_i)^{\mathcal{I}}, \quad \text{with } \mathcal{I} = \begin{cases} \delta & \text{if } s = A \\ 1/\delta & \text{if } s = B \end{cases} \quad \text{and} \quad \delta \geq 1.$$

That is the policy preferences of more centrist voters would have a higher correlation with the true state of the world with respect to the ones of more extremists ones. Notice also that the presence of "stubborn" voters (i.e., voters whose preferences are not state-contingent), would not change the results.

[20] Clearly, for $\delta = 0$ the model becomes a pure private value one.

if $\varphi_n = \varphi_u$.[21] A media outlet is referred to be "leftist" ("rightist") if $\varphi_n = \varphi_l$ ($\varphi_n = \varphi_r$). Moreover, the possible bias of the leftist and rightist media outlet types is assumed to be symmetric. The probability distribution of the media outlet's preferences, $g(\varphi_n)$, is common knowledge and it is such that $\Pr(\varphi_n = \varphi_l) = \Pr(\varphi_n = \varphi_r) = y$.[22] That is, the media outlet is unbiased with probability $(1 - 2y)$ and has instead a bias $|\varphi_n - \frac{1}{2}|$ in a direction or another with probability y.

Two competing lobbies (indexed by a and b) exert efforts e_a and e_b, respectively, to affect the distribution of a binary signal $z \in \{z_A, z_B\}$ that the media outlet receives on the state of the world. Lobbies' preferences are $\gamma_a = 0$ and $\gamma_b = 1$. That is, lobby a wants to keep the status quo while lobby b wants the policy proposal to be approved. Then, lobby i quadratic utility function is:

$$W_i(P, \gamma_i, e_i) = -(P - \gamma_i)^2 - C(e_i) \tag{4}$$

where C is the cost function of effort, which is assumed to be linear (i.e., $C'(e) = c > 0$).[23]

The likelihood of the signal $z \in \mathcal{Z} = \{z_A, z_B\}$ received by the media outlet depends on the true state of the world and on lobbies' influence activities. This captures an environment where both lobbies spend resources to produce/collect *hard* information in favor of their preferred policy.[24] Specifically, I model this competition between lobbies as a "race for evidence" where one has an advantage over the other. That is, lobbies have different hazard rates depending on whether they are lobbying for "the right cause" or not. Thus assuming the time at which each lobby wins the race, τ, being exponentially distributed:

$$\Pr(\tau(e_a) \leq t | s = A) = 1 - \exp\{-(e_a + \eta)\tau\} \tag{5}$$

$$\Pr(\tau(e_b) \leq t | s = A) = 1 - \exp\{-(e_b)\tau\} \tag{6}$$

Analogous probabilities applies when the state is B. That is to say, for $\tau \to 0$, if the state of the world is $s = A$, then lobby a wins the race and, thus,

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[21] Notice that the results would not change assuming the presence of an unbiased media outlet with a purely public value utility function. That is, alternatively, a media outlet could be defined as "unbiased" if $d_u = 0$ for $s = A$ and $d_u = 1$ for $s = B$. Hence, the definition of unbiased media outlet does not have to rely on the expected median voter's idiosyncratic preferences.

[22] The support of $g(\varphi_n)$ is simply assumed to be $[0, 1]$.

[23] The analysis generalizes to convex cost functions.

[24] Obviously, whenever a lobby finds an unfavorable piece of hard information it has always an incentive to conceal it.

has the media outlet receiving signal z_A, with an instantaneous probability equal to $e_a + \eta$, where η is a positive parameter measuring the importance of the truth in this game. Instead, lobby b has an instantaneous probability of winning the race simply equal to e_b.[25] That is, the higher η is, the greater the likelihood that the amount of hard information in support of the true state of the world is higher than the one in support of the other state.

Defining $v^a_{z_A}$ ($v^a_{z_B}$) as the net expected benefit that lobby a gets when signal z_A (z_B) is realized, lobby a expected payoff when the state is $s = A$ is:

$$\begin{aligned} &W_a(e_a, e_b, \eta, v^a_{z_A}, v^a_{z_B}|s = A) \\ &\quad = v^a_{z_A} \int_0^\infty (e_a + \eta) \exp\{-(e_a + \eta)t\} \exp\{-(e_b)t\} dt \\ &\quad + v^a_{z_B} \int_0^\infty e_b \exp\{-(e_b)t\} \exp\{-(e_a + \eta)t\} dt \end{aligned}$$

Hence:

$$W_a(e_a, e_b, \eta, v^a_{z_A}, v^a_{z_B}|s = A) = v^a_{z_A} \frac{e_a + \eta}{e_a + e_b + \eta} + v^a_{z_B} \frac{e_b}{e_a + e_b + \eta} \tag{7}$$

Similarly, lobby b expected payoff when the state is $s = A$ is:

$$W_b(e_a, e_b, \eta, v^b_{z_A}, v^b_{z_B}|s = A) = v^b_{z_A} \frac{e_a + \eta}{e_a + e_b + \eta} + v^b_{z_B} \frac{e_b}{e_a + e_b + \eta} \tag{8}$$

Thus, the probabilities of receiving a correct signal in a given state of the world can be denoted as follows:

$$h_A(e_a, e_b, \eta) = \Pr(z_A|s = A) = \frac{e_a + \eta}{e_a + e_b + \eta} \tag{9}$$

$$h_B(e_a, e_b, \eta) = \Pr(z_B|s = B) = \frac{e_b + \eta}{e_a + e_b + \eta} \tag{10}$$

Hence, the structure of the competition between lobbies can be seen as a State Contingent Contest-Success Function (SCCSF). In this contest-success function lobbies exert efforts to win the prize represented by the signal received by the media outlet. That is, it is a straightforward generalization of the Contest-Success Function (CSF) introduced by Tullock (1980) and axiomatized by Skaperdas (1996).[26]

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[25] In other words, lobbies have state-contingent hazard rates, i.e., $\zeta(e_a|s = A) = e_a + \eta$ and $\zeta(e_b|s = A) = e_b$ (vice versa when $s = B$).

[26] A detailed and formal characterization of the properties of this SCCSF is available upon request to the author.

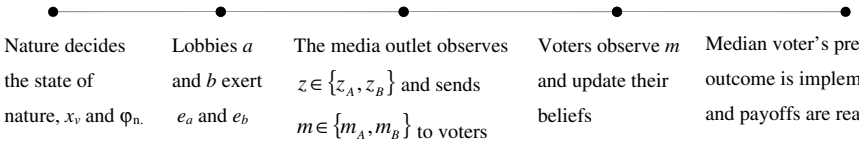

Figure 1. Timing of the game.

After having received the signal, the media outlet decides upon the (costless) message $m \in \mathcal{M} = \{m_A, m_B\}$ to send to voters. Hence, the game between the media outlet and voters takes the form of a cheap-talk game. Indeed, as it is usually assumed in the literature on media bias (e.g., Mullainathan and Shleifer, 2005; Ellman and Germano, 2009; Anderson and McLaren, 2010), the media outlet can slant its reports by *selectively omitting* relevant information, that is by simply hiding unfavorable evidence (e.g., show the benefits and hide the costs of approving the policy proposal).[27] Notice that, even though there is uncertainty on the media outlet's type, the message space $\mathcal{M}$ is binary. Indeed, given that there are just two states of the world and the media outlet may receive only two signals, voters' uncertainty is just relative to such signals. That is, a binary message space is sufficient to capture the cheap-talk communication between the media outlet and voters.[28]

Given the message received from the media outlet, voters update their beliefs on the state of the world according to Bayes' rule. That is, they discount for the possible slant present in the media outlet's report arising from lobbies' influence activities and the media outlet's bias. Then, in the last stage of the game, the policy outcome preferred by the median voter is implemented. The timing of the game is summarized in Figure 1.

Discussion: Model Assumptions

In this section I discuss the intuition and robustness of the main assumptions of the model described in the previous section.

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[27] That is, the media outlet may simply hide any unfavorable (and hard) information and present only favorable (and hard) information. Hence, even within this cheap-talk framework, the media outlet is always presenting hard and verifiable evidence (i.e., it is never providing false information).

[28] See Morris (2001) for a similar cheap-talk model (i.e., where the sender's type is private information) with two states of the world and a binary message space.

Voters' preferences. While the policy outcome is, by definition, dichotomous (i.e., either approve the policy proposal or keep the status quo), voters' preferences lie in a continuous interval. An example may help to clarify the structure of the voters' utility function. Suppose that voters have to decide on a policy proposal imposing stricter environmental regulations on the industry sector. Let the states of the world be $A =$ ''strong effects of pollution on global warming'' and $B =$ ''mild effects of pollution on global warming''. Each voter has some idiosyncratic preferences regarding the importance of protecting the environment. Nevertheless, in order to decide whether he/she prefers the policy proposal to be approved or not, the voter also takes into account the information he/she receives on the likelihood of the state of the world. For example, if voters receive (credible) reports saying that pollution does not have a strong impact on global warming ($s = B$), each of them would revise downward his/her idea of the benefits deriving from reducing pollution. Instead, if voters receive the opposite report they would revise upward their beliefs on the importance of implementing a strict environmental regulation. Thus, the median voter's ideal policy ultimately depends on his/her idiosyncratic preferences and his/her posterior beliefs on the state of the world.[29] As the section describing the interactions between lobbies, media outlet and voters shows, a higher (lower) value of the median voter's ideal policy simply corresponds to a higher probability of the policy proposal being approved (rejected).

Media outlet's bias. *Assumption 1* is meant to capture a situation in which the media outlet is on average unbiased but with some exogenous probability it may turn out to be either leftist or rightist with respect to a given issue. I assume such symmetry in the media outlet's types only to avoid introducing any exogenous asymmetry in the benchmark model. The section presenting the extensions to the benchmark model provides several robustness checks with respect to *Assumption 1* by considering more realistic assumptions about the media outlet's bias. That is, I analyze a case where the media outlet has a systematic bias (i.e., voters know whether the media outlet is leftist or rightist but there is uncertainty on the strength

[29] This specification of the voters' utility function is similar to the one of bidders in an affiliated value auction. In the same way the valuation of the object is correlated across bidders in an affiliated value auction, the value of approving the policy proposal is correlated across voters. For a similar specification of the voters' utility function see, for example, Aragones and Palfrey (2002).

of such bias). I also consider an extension where there is no uncertainty on the media outlet's bias (i.e., the media outlet's bias is common knowledge). Finally, I also analyze an extension where there are multiple media outlets. The main results of the benchmark are robust with respect to all these alternative assumptions.

Media outlet's preferences. The fact that the media outlet is just a political actor in the model (i.e., it is not explicitly maximizing profits) is without loss of generality. If the media outlet was a profit maximizer, given that in the model voters value unbiased information, it would have a strictly dominant strategy of not slanting its reports. The model would thus be equivalent to the case where the media outlet is unbiased with probability one. On the other hand, if the media outlet was maximizing profits and at the same time had a political agenda, then it would care about both the true state of the world (which is reflected in the state-contingent public value component of its utility function) and about its idiosyncratic preferences (which is reflected in the private value component of its utility function). Thus, the specification of the media outlet's utility function is a reduced form of the one arising in a model where the media outlet's utility function were given by a convex combination of its profits and (possibly) its political preferences. Since the analysis is mainly focused on how the media outlet's bias interacts with the endogenous bias arising from lobbies' influence activities, I consider the media outlet preferences, and hence the media outlet's bias, as exogenous. Following the literature on media bias, such exogenous bias may simply be the result of the idiosyncratic preferences of journalists, owners or advertisers.[30]

Lobbies' efforts and signal space. The signal received by the media outlet can be seen as a reduced form of the media outlet's investigative journalism. In other words, the signal that the media outlet receives can be interpreted as indicating whether the evidence that it collected in favor of a state of the world is *stronger* than the one in favor of the other state (i.e., amount of hard information in favor of one state higher than the one in favor of the other state). From a public value perspective, in both states approving or rejecting the policy proposal may have costs and benefits. Indeed, typically, there is mixed evidence on the efficiency of implementing a policy

[30] See Djankov *et al.* (2003), Baron (2006), Besley and Prat (2006), Ellman and Germano (2009), Anderson and McLaren (2010), Germano and Meier (2010), and Blasco *et al.* (2011).

(e.g., the costs and benefits of reducing pollution, the effectiveness of the death penalty in preventing crime, the effects of gun control on citizens' security and so on). Thus lobbies are able to find hard information on both the benefits and on the costs of each policy outcome in both states. However the amount of such costs and benefits differs in the two states of the world. That is, the true state of the world plays an important role in the evidence collected by the media outlet. Thus, *ceteris paribus*, it is more likely that the overall evidence is in favor of the lobby on the ''correct'' side.[31] Clearly, each single piece of evidence produced *and* presented by each lobby is hard and verifiable (and thus not influenced in itself by lobbies' efforts). However, the overall amount of evidence *available* to the media outlet in favor of a given policy (constituted by a collection of hard and verifiable pieces of information) is going to depend crucially on lobbies' efforts.

On the other hand, the fact that lobbies' efforts are unobservable is meant to capture the fact that the media outlet and voters cannot perfectly disentangle which piece of evidence is coming from lobbies' influence activities and which comes from independent sources. Michaels (2008) provides several examples of evidence produced by scientists paid by industries or single firms to produce favorable scientific reports/articles (e.g., questioning the cancer mortality rate of factory workers from benzene exposure).[32] Nevertheless, even though lobbies' efforts are assumed to not be directly observable by other agents, given that the media outlet and voters hold rational expectations, they always perfectly anticipate the optimal level of effort exerted by each lobby in equilibrium. That is, lobbies are never able to fool the media outlet and voters in equilibrium.

The Interactions among Lobbies, the Media Outlet and Voters

In this section, I discuss the strategic interactions among lobbies, the media outlet and voters and then derive the structure of the perfected Bayesian equilibrium of the game.[33] In the last stage voters update their beliefs according to Bayes' rule and then choose their preferred policy outcome

[31] See also Hirshleifer and Osborne (2001) for a model of trials where the party on the truth side has a natural but not perfect advantage.

[32] As pointed out by Michaels (2008, p. xi): "Industry has learned that debating the *science* is much easier and more effective than debating the *policy*".

[33] Clearly, since lobbies' efforts are unobservable, the PBE is a rational expectation equilibrium.

(i.e., keep the status quo or approve the policy proposal). The media outlet chooses its optimal strategy taking into account how the message that it is going to send to voters would affect voters' preferred policy outcome. Finally, anticipating all such interactions, each lobby decides upon the effort to exert in order to try to influence the beliefs that voters hold on the state of the world.

Voters

Given the message sent by the media outlet, $m \in \{m_A, m_B\}$, voters form their posterior beliefs using Bayes' rule. Hence, voters have the following expected utility:

$$\begin{aligned} U_i(x_i, m) = {} & \Pr(s = A|m)[-(P - (x_i - \delta))^2] \\ & + \Pr(s = B|m)[-(P - (x_i + \delta))^2] \end{aligned} \tag{11}$$

That is, the median voter's ideal policy is:

$$\varkappa_v^*(m) = x_v + \delta[1 - 2\Pr(s = A|m)] \tag{12}$$

Hence, since legislators are assumed to be responsive to the median voter's preferences, they will approve the policy proposal if and only if $\varkappa_v^*(m) \geq 1/2$. That is, the *ex-post* policy outcome is:

$$P_v^*(m) = \begin{cases} 0 & \text{if } \varkappa_v^*(m) < \dfrac{1}{2} \\ 1 & \text{if } \varkappa_v^*(m) \geq \dfrac{1}{2} \end{cases}$$

Thus, the expected policy outcome is:

$$\hat{P}(m) = E[P_v^*(m)] = \Pr\left(\varkappa_v^*(m) \geq \frac{1}{2}\right) = \frac{1}{2} + \delta[1 - 2\Pr(s = A|m)] \tag{13}$$

In other words, even though the *ex-post* policy outcome $P_v^*(m)$ is, by definition, dichotomous (i.e., either keep the status quo or approve the policy proposal), the expected policy outcome $\hat{P}(m)$ lies in the interval $[0, 1]$. Analyzing the optimal strategies of lobbies and of the media outlet with respect to this (continuous) expected policy outcome allows to easily derive all the necessary equilibrium results while maintaining a straightforward interpretation of the model. Indeed, a higher (lower) value of the expected policy outcome simply corresponds to a higher probability of the policy proposal being approved (rejected).

The Media Outlet

The media outlet acts as a *filter* in this game. The private cost that any individual should bear in order to acquire direct information is assumed to be higher than any private benefit. Hence, voters rely on the media outlet to receive information on a given issue.[34] The expected utility for a media outlet having idiosyncratic preferences φ_n is:

$$U_n(\varphi_n, z, P) = \Pr(s = A|z)[-(P-(\varphi_n-\delta))^2]+\Pr(s = B|z)[-(P-(\varphi_n+\delta))^2]$$

The media outlet observes the signal on the state of the world and updates its beliefs according to Bayes' rule. Since the media outlet has rational expectations, its posterior beliefs upon receiving signal z_A or z_B depend on the expected effort that lobbies exert, $\hat{e}_a$ and $\hat{e}_b$. Therefore, its posterior beliefs are as follows:

$$\Pr(s = A|z_A) = \frac{h_A(\hat{e}_a, \hat{e}_b, \eta)}{1 - h_B(\hat{e}_a, \hat{e}_b, \eta) + h_A(\hat{e}_a, \hat{e}_b, \eta)}$$

$$\Pr(s = A|z_B) = \frac{1 - h_A(\hat{e}_a, \hat{e}_b, \eta)}{1 - h_A(\hat{e}_a, \hat{e}_b, \eta) + h_B(\hat{e}_a, \hat{e}_b, \eta)}$$

Hence, the media outlet's ideal policy upon receiving signal z is:

$$\phi^*_n(z) = \varphi_n + \delta\,[1 - 2\Pr(s = A|z)] \tag{14}$$

Therefore, the optimal policy outcome from the media outlet's perspective is:

$$P^*_n(z) = \begin{cases} 0 & \text{if } \phi^*_n(z) < \dfrac{1}{2} \\ \\ 1 & \text{if } \phi^*_n(z) \geq \dfrac{1}{2} \end{cases}$$

The interaction between the media outlet and voters assumes here the typical structure of a cheap-talk game. By *selectively omitting* (i.e., hiding) unfavorable evidence, the media outlet is able to slant the evidence collected. Thus, the media outlet chooses $m \in \mathcal{M}$ to maximize the probability of the *ex-post* policy outcome $P^*_v(m)$ being equal to $P^*_n(z)$.

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[34] For example, any single voter would find it too costly to acquire direct information on the effects of pollution on global warming. The opportunity cost or simply the knowledge required to analyze such information would far exceed any private benefit. News media thus constitute the most efficient way to acquire information for any single citizen.

The (possibly mixed) strategy for a media outlet with preferences φ_n is a mapping from the signal space into a probability distribution over the message space:

$$\sigma(\varphi_n)\colon \mathcal{Z} \to \Sigma(\mathcal{M})$$

where $\Sigma(\mathcal{M})$ is the space of probability distributions over the message space $\mathcal{M}$. Specifically, a media outlet with preferences φ_n has two different types of pure strategies, pooling or separating respectively. A media outlet with preference φ_n plays a pooling strategy if $\sigma(\varphi_n|z_A) = \sigma(\varphi_n|z_B) = m^*$. Instead, a media outlet with preference φ_n plays a separating strategy if $\sigma(\varphi_n|z_A) = \hat{m}$ and $\sigma(\varphi_n|z_B) = \tilde{m}$, with $\tilde{m} \neq \hat{m}$. A mixed strategy simply specifies the probability that a media outlet is playing a separating strategy.[35]

Lobbies

Lobbies know that the expected equilibrium policy outcome depends on voters' posterior beliefs and thus on the message of the media outlet. Since voters have rational expectations their posterior beliefs upon receiving message m depend on the expected effort that lobbies a and b exert in a given equilibrium, $\hat{e}_a^*$ and $\hat{e}_b^*$ respectively. In other words, the expected policy outcome is a function of the expected efforts:

$$\hat{P}(m) = \hat{P}(m, \hat{e}_a^*, \hat{e}_b^*) = \frac{1}{2} + \delta[1 - 2\mu^*(s = A|m, \hat{e}_a^*, \hat{e}_b^*)] \tag{15}$$

Thus, conditional on the media outlet's message, from lobbies' *ex-ante* perspective, the implemented policy outcome is not affected by their effort decision. Therefore, lobbies choose their efforts in order to influence the signal that the media outlet receives and hence the message that voters get. In other words, lobbies' expected utilities depend on the exerted efforts (which affect $\Pr(m_A)$ and $\Pr(m_B)$) and on the expected efforts (which affect the median voter's posterior beliefs for a given message). Thus, from Equation (4) lobby a and lobby b expected utilities are:

$$\begin{aligned} W_a(e_a, e_b, \hat{e}_a^*, \hat{e}_b^*, \eta) = & -\Pr(m_A|e_a, e_b, \eta)(\hat{P}(m_A, \hat{e}_a^*, \hat{e}_b^*, \eta))^2 \\ & -\Pr(m_B|e_a, e_b, \eta)(\hat{P}(m_B, \hat{e}_a^*, \hat{e}_b^*, \eta))^2 - C(e_a) \end{aligned} \tag{16}$$

[35] Note that restricting the media outlet to always send a message is without loss of generality. Allowing the media outlet to not send any message would not change the results in any significant way. A formal analysis of this case is available upon request to the author.

$$W_b(e_a, e_b, \hat{e}_a^*, \hat{e}_b^*, \eta) = -\Pr(m_A|e_a, e_b, \eta)(1 - \hat{P}(m_A, \hat{e}_a^*, \hat{e}_b^*, \eta))^2 - \Pr(m_B|e_a, e_b, \eta)(1 - \hat{P}(m_B, \hat{e}_a^*, \hat{e}_b^*, \eta))^2 - C(e_b) \tag{17}$$

In their optimization problem lobbies take into account that the expected policy outcome, $\hat{P}$, depends on which message voters receive from the media outlet. Moreover, lobbies anticipate that such a message depends on the possible media outlet's bias (i.e., on the strategy of each media outlet's type) and their expected efforts. Thus each lobby faces a different optimization problem depending on whether it is expecting the media outlet to be playing a separating, pooling or mixed strategy, in the cheap-talk game with voters.

In what follows, I refer to **media outlet's bias** as the exogenous difference between the media outlet and the median voter's expected idiosyncratic preferences (i.e., $|\varphi_n - \frac{1}{2}|$). I denote as **information slant** the endogenous noise in the information that agents receive due to the presence of the media outlet's bias and/or lobbies' influence activities. Finally, I indicate as **policy distortion** the difference between the expected policy outcome with and without the information slant.

Informative Equilibria

This section characterizes the unique informative equilibrium of the game. Specifically, as shown by the following proposition, depending on how large the possible bias of the media outlet is, different types of informative equilibria may arise.

Proposition 1 *For any given set Φ of media outlet idiosyncratic preferences, there is a unique informative equilibrium. Specifically, $\exists\, \varphi_l^{PI}, \varphi_l^{MI}$ with $\varphi_l^{PI} < \varphi_l^{MI}$ such that*:

(i) *If $\varphi_l \in [\varphi_l^{MI}, \frac{1}{2}]$ there is a unique informative equilibrium where each biased media outlet type adopts a separating strategy* ***(maximally informative equilibrium)****.*

(ii) *If $\varphi_l \in (\varphi_l^{PI}, \varphi_l^{MI})$ there is a unique informative equilibrium where each biased media outlet type adopts a mixed strategy* ***(semi-separating equilibrium)****.*

(iii) *If $\varphi_l < \varphi_l^{PI}$ there is a unique informative equilibrium where each biased media outlet type pools on the message most preferred by the lobby on its side* ***(partially informative equilibrium)****.*

That is, φ_l^{PI} and φ_l^{MI} represent the leftist media outlet no-deviation thresholds in a *partially informative* and *maximally informative* equilibrium, respectively.[36] Two corollaries follow immediately from the above proposition.

Corollary 1 *Lobbies exert a lower effort in an equilibrium where they expect the media outlet to slant its report with a higher probability. That is*:

$$e^{PI} < e^{SS} < e^{MI}$$

Moreover:

$$\frac{\partial e^{SS}}{\partial q} < 0 \text{ and } \lim_{q \to 0} e^{SS} = e^{MI}, \lim_{q \to 1} e^{SS} = e^{PI}$$

where q represents the probability of the media outlet adopting a pooling strategy in a semi-separating equilibrium.

When the media outlet chooses to disregard the information it collects (i.e., the signal it receives on the state of the world), lobbies just waste resources in trying to influence such information (i.e., signal). Instead, when the media outlet does not bias its report and sends a message according to the signal it receives (*maximally informative* equilibrium), lobbies have strong incentives to exert effort to influence the distribution of this signal. Hence, the greater the likelihood that the media outlet adopts a pooling strategy, the lower the incentives of lobbies to engage in influence activities.

The second corollary of Proposition 1 points out that the higher the lobbies' expected efforts the higher (in a probabilistic sense) the slant that the media outlet introduces in its report.

Corollary 2 *The media outlet incentives to slant its reports are increasing in lobbies' expected efforts.*

By rational expectations, in equilibrium the expected effort is equal to the effort exerted by lobbies. Therefore, since the higher the effort exerted by lobbies the noisier the signal that the media outlet receives, this result is suggesting that the more controversial and unclear the information that the media outlet collects is, the greater the likelihood that the media outlet slants such information. Instead, when lobbies do not engage in influence

[36] Symmetric no-deviation thresholds exist for the rightist media outlet.

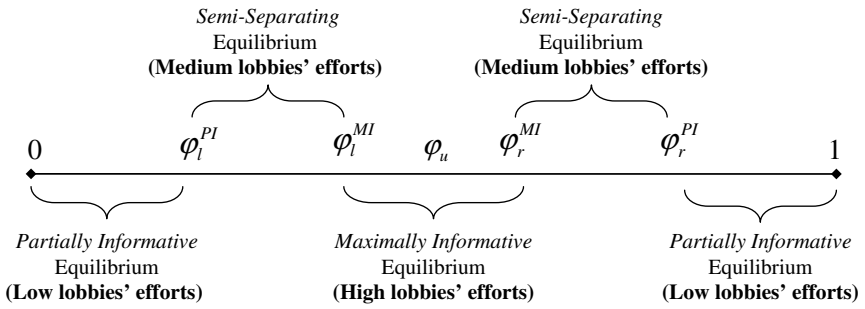

Figure 2. Media bias and informative equilibria.

activities (i.e., $e_a = e_b = 0$), the media outlet always receives the correct signal and thus it slants such information only when it has quite extreme preferences. Figure 2 illustrates the possible types of informative equilibria that can arise depending on where the media outlet's idiosyncratic preferences lie.

Therefore, Proposition 1 implies that the higher the possible bias of the media outlet, the lower the equilibrium level of effort that lobbies exert. Indeed, if the media outlet turns out to be strongly biased in the opposite direction of the lobby, no matter how much effort the lobby exerts and whether it lobbies for the efficient policy or not, the media outlet always sends a message that drives the median voter's ideal policy further from the lobby's optimal one. Moreover, even if the media outlet turn out to be strongly biased in favor of the lobby's optimal policy, the lobby's effort would be totally worthless by virtue of being unnecessary. In this case, the media outlet is the one taking care of trying to influence voters' beliefs in the direction favorable to the lobby. Therefore, in either case, the possibility of facing a very biased media outlet lowers the incentives of lobbies to spend resources on affecting the signal distribution.

Notice that for intermediate values of the media outlet's bias, an equilibrium in pure strategies cannot exist. This is due to the discontinuity in the equilibrium level of effort of lobbies: for $\varphi_l < \varphi_l^{PI}$ lobbies play according to a *partially informative* equilibrium and put an effort equal to e^{PI}. Conversely, for $\varphi_l = \varphi_l^{PI} + \varepsilon$, the leftist media outlet has an incentive to deviate from its pooling strategy. However, this gives higher incentives to lobbies to exert a higher level of effort and thus increases the incentives of the media outlet to play a pooling strategy. Therefore, for $\varphi_l^{PI} < \varphi_l < \varphi_l^{MI}$, the only possible

equilibrium is a *semi-separating* equilibrium where lobbies exert effort e^{SS}. Moreover, to any φ_l in this interval corresponds a unique optimal probability of the media outlet slanting its reports, q, which supports the unique *semi-separating* equilibrium.

It is also important to point out that, as it will be discussed in the extensions section, the *maximally informative equilibrium* characterized above is equivalent to the equilibrium arising when there is no media outlet acting as a filter between special interest groups and voters (e.g., as in the case of issue advertising). Therefore, the above results (and the following ones) relative to the *maximally informative equilibrium* apply also to the case of direct communication between lobbies and voters.

Comparative Statics

The message that voters receive contains two different kinds of slant. The first one is a source-driven slant introduced by lobbies in the signal that the media outlet receives (*lobbies-induced* slant). At the same time, in a *partially informative* and *semi-separating* type of equilibrium, the media outlet's message contains also a supply-driven slant due to the idiosyncratic bias of the media outlet (*media-induced* slant). This section analyzes how a change in the parameters of the model affects these two kinds of slant and, thus, the overall noise in the message that voters receive.

Proposition 2 *For any given* Φ *and* $\forall\, \varphi_n \in \Phi$:

1. *An increase in* δ *strictly increases the equilibrium level of lobbies' efforts* e^* *and weakly decreases* $\Pr(\sigma(\varphi_n|z_A) = \sigma(\varphi_n|z_B))$.
2. *An increase in* c *or in* y *strictly decreases the equilibrium level of lobbies' efforts* e^* *and/or weakly decreases* $\Pr(\sigma(\varphi_n|z_A) = \sigma(\varphi_n|z_B))$.

In other words, a higher δ leads to a higher level of lobbies' efforts and a weakly lower probability of *news-slanting* by the media outlet. Specifically, an increase in the importance of the public value component in the voters' utility function has two effects. A higher δ implies a larger ''space for influence'', therefore the higher δ is, the stronger the lobbies' incentives to try to influence voters' beliefs (higher *lobbies-induced* slant). Hence, the more voters care about receiving accurate information, the noisier the received information is. On the other hand, a higher δ also decreases the relative

importance of the media outlet's idiosyncratic bias. Hence, the higher δ is, the lower the media outlet's incentives to slant its reports (lower *media-induced* slant). Therefore, a higher δ has opposite effects on the incentives of lobbies and of the media outlet: it increases the *lobbies-induced* slant and it reduces the *media-induced* slant.

An increase in c has two effects. It decreases lobbies' incentives to exert effort and thus increases the quality of the signal received by the media outlet. As a consequence the media outlet has lower incentives to slant its reports. However, this last effect increases lobbies' incentives to exert effort. Thus the two effects of an increase in c on lobbies' efforts go in opposite directions. Nevertheless, the net effect on the slant in information is always negative. Notice that in an SS equilibrium the net effect of an increase in c on lobbies' efforts is null (the probability of *news-slanting* by the media outlet decreases exactly to compensate the decrease in c). Knowing that the marginal cost of effort is higher, the media outlet can choose a lower probability of slanting without inducing an increase in lobbies' efforts. Thus, in such a case, an increase in c decreases the overall slant in the message that voters receive not because it decreases the *lobbies-induced* slant but because it decreases the *media-induced* slant.

A similar effect and reasoning applies to an increase in the probability of the media outlet being biased, i.e., y. The policy outcome would be more efficient if everyone attributed a low probability to the media outlet being unbiased. Thus, knowing for sure that the media outlet is actually biased would lead to a lower policy distortion. Indeed, within a *PI* type of equilibrium (or within an *SS* type), a lower y leads to a higher policy distortion since the incentives of lobbies to engage in influence activities are higher.

Lobbies, Policy Distortion and Welfare

I now analyze the efficiency and welfare implications of this game. Notice that given Equations (9) and (10), if lobbies were to not engage in any influence activity and there was no *news-slanting* by the media outlet, the policy outcome would not have any distortion. Indeed, voters would learn the true state of the world and no distortion would be present in the policy outcome. That is, the decision to keep the status quo or approve the policy proposal would always coincide with the one maximizing the median voter's *ex-post* utility. Hence, in order to evaluate the *ex-ante* policy distortion arising from

lobbies' influence activities, the expected policy outcome arising in a *maximally informative* (*MI*), *partially informative* (*PI*), and *semi-separating* (*SS*) type of equilibrium should be compared with the one arising when there is neither any *lobbies-induced* slant nor any *media-induced* slant. I denote this policy outcome as "no-slant" (*NS*). Therefore, the *ex-ante* policy distortion in an informative equilibrium of type $\kappa = MI, PI, SS$ is given by:

$$\begin{aligned}\Lambda^{\kappa} = \Pr(s = A)|\hat{P}_m^{NS}(s = A) - E(\hat{P}_m^{\kappa}|s = A)| \\ + \Pr(s = B)|\hat{P}_m^{NS}(s = B) - E(\hat{P}_m^{\kappa}|s = B)|\end{aligned} \tag{18}$$

where $E(P_m^{\kappa}|s = A)$ represents the expected policy outcome when the state is A and $E(P_m^{\kappa}|s = B)$ is the expected policy outcome when the state is B. On the other hand, the net utility loss of voter i in the informative equilibrium of type $\kappa = MI, PI, SS$ (with respect to the *no-slant* policy outcome) is given by:

$$(\Delta U_i)^{\kappa} = |U_i^{NS}(x_i) - U_i^{\kappa}(x_i)| \tag{19}$$

The following proposition summarizes the results on the expected policy distortion and its welfare implications.

Proposition 3 $\forall\, \kappa = MI, PI, SS$ *and* $\forall\, c < \frac{\delta}{\eta}$:

1. $\Lambda^{\kappa} > 0$. *Moreover,* Λ^{κ} *is strictly increasing in* δ *and strictly decreasing in* c.
2. $(\Delta U_i)^{\kappa} > 0$, $\forall\, i$. *Moreover,* $(\Delta U_i)^{\kappa}$ *is strictly increasing in* $\Lambda^{\kappa}, \forall\, i$.

Despite the fact that, by assumption, the policy outcome is the one preferred by the median voter, there is still an *ex-ante* distortion. Even though voters are rational and discount the possible presence of slant in the information they receive, the noise that lobbies (and the media outlet) introduce in the political process prevents them from always choosing the *no-slant* optimal policy outcome.

The expected policy distortion is positively related to the size of the state-contingent public value component of the voter utility function (i.e., δ). This result suggests that, *ceteris paribus*, a higher policy distortion is expected to arise in an issue like global warming than in an issue like abortion where preferences are mostly idiosyncratic. On the other hand, the lower the lobbies' influence over the signal received by the media outlet is (i.e., the lower c

is, and the higher η is), the lower the expected policy distortion. Voters, regardless of their idiosyncratic preferences, would prefer an equilibrium without any influence activity. Moreover, their expected utility loss is larger the higher the expected policy distortion is.

Proposition 3 has immediate policy implications. Specifically, it implies that public policy measures aimed at increasing the cost of lobbies influence activities would reduce the expected policy distortion and increase voters' welfare. In the US, advocacy groups and think tanks are tax-exempt organizations that can raise unlimited contributions from private foundations. Moreover, contributions to think tanks are tax-deductible and the activities of 527 groups are not regulated by the Federal Election Commission (FEC). Therefore, the above proposition suggests that regulating the influence activities of advocacy groups more closely, requiring higher academic and deontological standards for think tanks research and imposing a stricter tax regime to these organizations, would all be welfare improving public policy measures.[37] Indeed, Proposition 2 implies that such measures would either reduce lobbies' influence activities or reduce *news-slanting* by the media outlet (in a probabilistic sense) or reduce both.

Media Bias, Policy Distortion and Welfare

The previous section analyzed the distortion in the policy outcome and its effects on the expected utilities of voters regardless of which equilibrium is actually in place (i.e., regardless of the actual size of the possible bias of the media outlet). This section instead analyzes the effect that the media outlet's idiosyncratic bias has on the policy distortion and on the welfare of voters. The following proposition shows that, from an *ex-ante* point of view, voters are indifferent when facing a media outlet with a large potential bias or one with a low or no bias since the *lobbies-induced* slant would counterbalance the lower *media-induced* slant.

Proposition 4 $\Lambda^{PI} = \Lambda^{MI}$ *and* $U_i^{PI}(x_i) = U_i^{MI}(x_i)$.

[37] Consistent with the idea of imposing a stricter tax regime to these organizations, the US Internal Revenue Service (IRS) has recently informed five large advocacy groups donors that their contributions will be subject to gift taxes, i.e., 35 percent on anything over $13,000 a year (Strom, 2011).

As pointed out by Proposition 2, the overall slant present in the media outlet's message is the result of two different types of slants: the *lobbies-induced* slant and the *media-induced* slant. Voters know that when the possible bias of the media outlet is low, the media outlet always sends truthful reports (i.e., it does not slant the information it receives). However, in this case, lobbies have strong incentives to exert effort. Therefore, the message that voters receive in a *maximally informative* equilibrium has no *media-induced* slant but incorporates a high *lobbies-induced* slant. Instead, the message that voters observe in a *partially informative* equilibrium contains a high *media-induced* slant (in a probabilistic sense) and a low *lobbies-induced* slant. Hence, voters would actually be indifferent among the different types of equilibria since the overall expected slant in the message they receive would be the same.

Extensions

In this section, I briefly describe and discuss several possible extensions and robustness checks of the benchmark model.[38]

Known Direction of the Media Outlet's Bias

Here I consider a more realistic assumption regarding the beliefs about the media outlet's bias, with respect to the benchmark model. That is, I discuss here the case where the direction of the media outlet's bias is common knowledge but the *strength* of such bias is private information. Suppose, for example, that voters and lobbies know that the media outlet is leftist but they do not know *how* leftist it is. That is, let the space of possible media outlet types be $\Phi = \{\varphi_l^H, \varphi_l^L\}$ with $\varphi_l^H < \varphi_l^L < \frac{1}{2}$ and $\Pr(\varphi_n = \varphi_l^H) = y$. Hence, with probability y the media outlet has a large leftist bias and with probability $(1 - y)$ it has a small leftist bias.

When lobbies are *ex-ante* symmetric their incentives to exert effort remain symmetric even though the media outlet's possible strategies are not symmetric. To understand why this is true, consider a *partially informative* type of equilibrium. In this type of equilibrium, the small bias type adopts a separating strategy and the large bias type adopts a pooling one. Hence, from the rightist lobby's perspective, exerting an effort to influence the information that the media outlet collects is a waste with probability y (probability

[38] Detailed formal proofs for these extensions are available upon request to the author.

of large bias type) and is productive with probability $(1-y)$. Similarly, from the leftist lobby's point of view, exerting effort is unnecessary (and thus a waste) with probability y and it is productive with probability $(1-y)$. Therefore, asymmetries in the media outlet's bias do not generate asymmetric incentives and thus the equilibrium remains symmetric.

No Uncertainty on the Media Outlet's Bias

Suppose now that voters and lobbies are informed about the exact bias of the media outlet (i.e., the media outlet's bias is common knowledge). When the media outlet has a large bias it would like to slant its reports. Therefore, voters would disregard the message coming from a very biased media outlet because it is simply uninformative. On the other hand, in such uninformative equilibrium lobbies would have no incentive to engage in influence activities, thus the signal that a very biased media outlet receives is very likely to be correct. Corollary 2 implies that in such a case the media outlet has lower incentives to adopt a pooling strategy and thus it does so only when it has a very large bias. Hence, for intermediate values of the media outlet's bias the unique equilibrium is still a *semi-separating* one. Moreover, in such equilibrium lobbies exert a lower effort with respect to the one they exert in the benchmark case because of the certainty of facing a biased media outlet. Hence, the model shows that a (not overly) biased media outlet may affect the policy outcome even in the presence of rational, Bayesian consumers who know its bias. On the other hand, when the media outlet has a very high bias, the unique equilibrium is an uninformative one where voters do not modify their prior beliefs and lobbies exert no effort.[39] Finally, for low values of the media outlet's bias the unique equilibrium is still a *maximally informative* one. Figure 3 illustrates the possible types of equilibria that may arise in this case, as a function of the media outlet's bias.

Multiple Media Outlets

Suppose that there are two media outlets with idiosyncratic preferences φ_n^1 and φ_n^2. Let m_1 be the message of the first media outlet and m_2 that

[39] Notice that this case highlights the fundamental difference between a media outlet and a lobby. If the media outlet were to have extreme preferences (as the ones of a lobby), its reports would simply be uninformative and thus it would neither have any policy influence nor get any profits from readers and/or advertisers.

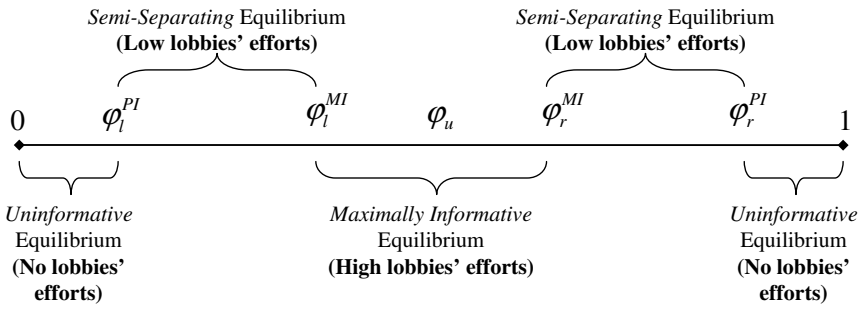

Figure 3. Equilibria with no uncertainty on the media outlet's bias.

of the second media outlet. Since voters value unbiased information, when updating their beliefs they take into account the message with the lowest slant. Therefore, whenever one of the two media outlets adopts a separating strategy, the unique equilibrium is a *maximally informative* one regardless of the type and size of the other media outlet's bias. The more interesting cases arise when the two media outlets have biases going in opposite directions and such biases are not small (i.e., the equilibrium is not a *maximally informative* one). Suppose, for example, that the first media outlet is leftist and the second is rightist. Suppose also, without loss of generality, that their idiosyncratic preferences are symmetric with respect to the ones of the median voter (i.e., $|\varphi_n^1 - \frac{1}{2}| = |\varphi_n^2 - \frac{1}{2}|$). Then, in a symmetric equilibrium, upon receiving signal $z_B, (z_A)$ the leftist (rightist) media sends message m_B (m_A) with probability $(1-q)$ and message m_A (m_B) with probability q, where $q \in (0, 1]$. Thus, when the two media outlets receive signal z_A, with probability $(1-q)$ both of them send message m_A, in which case voters would infer the signal received by the media outlets. At the same time, with probability q the two media outlets send opposite messages in which case voters would not get any information from media reports (i.e., their posterior beliefs are equal to their prior). The exact same reasoning applies when the two media outlets receive signals z_B. Therefore, with probability $(1-q)$ lobbies' efforts are very productive and with probability q they are completely unproductive. Hence, in the presence of two media outlets, lobbies still exert less effort the more they expect the media outlets to slant their reports. Moreover, media outlets still have higher incentives to slant their reports, the higher lobbies' efforts are. Therefore, the main intuitions of the benchmark model carry out in the two media outlet case.

Notice that, in the limiting case where there is a large number of media outlets, there is a probability close to one that at least two media outlets having biases going in opposite directions report the same message. In this case, voters would know the signal received by the media outlets and the equilibrium would converge to a *maximally informative* one. Similarly, if a higher degree of competition decreases the media outlets' incentives to slant their reports (see, for example, Gabszewicz *et al.*, 2002; Besley and Prat, 2006; Germano and Meier, 2010), the equilibrium would also converge to a *maximally informative* one.

Unbiased Media Outlet (Direct Communication between Lobbies and Voters)

The case where the media outlet is unbiased with probability one is equivalent to a situation where there is no such filter as media and voters receive a *direct* signal on the state of the world. Thus, the case where lobbies communicate directly with voters is nested in the benchmark model. An obvious example where such a situation arises is when lobbies compete by engaging in informative advertising (e.g., issue advertisement). In this case, the signal that voters receive can be interpreted as which informative content of the advertisements is stronger.

Proposition 1 shows that, in any informative equilibrium, when the media outlet is unbiased it never slants its reports. Therefore, the equilibrium with an unbiased media outlet is equivalent to a *maximally informative* one. Hence, even when the media outlet has no bias, the information that voters receive is still slanted and there is a distortion in the policy outcome, due to the presence of lobbies' influence activities.[40]

Single Lobby

I discuss here the case where there is just one lobby engaging in influence activities. This situation provides a useful approximation of the limit case of two asymmetric lobbies. Without loss of generality, suppose the unique lobby to be the leftist one (lobby a). In such case, a rightist media outlet is more willing to slant its reports than a leftist media outlet (in a probabilistic sense), despite having the same *ex-ante* bias. The asymmetry in the behavior of the leftist and rightist media outlet types has a clear rationale. When a leftist media outlet receives signal z_B, given that lobby a engaged in influence

[40] See Proposition 3.

activities to decrease the likelihood of such signal, it will consider this signal very informative. Therefore, in this case, a leftist media outlet would have, *ceteris paribus*, low incentives to disregard signal z_B and adopt a pooling strategy. On the other hand, when a rightist media outlet receives signal z_A, given the presence of lobby a's influence activities, it will not consider this signal very informative. Therefore, in this case, a rightist media outlet would have high incentives to disregard such a signal and choose a pooling strategy. Hence, despite having the same *ex-ante* bias, a media outlet on the opposite side of the lobby may appear relatively more biased than the one on same side of the lobby, since it is more likely to slant its reports. This result has an immediate implication for empirical studies aimed at measuring media bias. In the presence of asymmetries between lobbies, a reliable measure of the bias of a media outlet should take into account the equilibrium difference between the *ex-post* slant in a media outlet's reports and the *ex-ante* bias of the media outlet itself.

Conclusions

Lobbies spend hundreds of millions of dollars every year to advocate their positions. This is especially true on issues where the cost of choosing a policy different from that of the median voter would be too high for any politician (ideological/single issue 527 groups). In such cases the lobbies' main channel of influence is through voters. Given that voters decide on their preferred policy based on their idiosyncratic preferences and their beliefs regarding the expected benefits and costs of alternative policy outcomes, lobbies may succeed in altering the implemented policy as long as they manage to alter such beliefs. In this context, the role of a media outlet is to collect information on the costs and benefits of the alternative policy outcomes and then filter this information according to its own political agenda. In this paper, I have constructed a simple model to capture the interactions among these political players and analyze their effect on policy outcomes.

The results show that even if the policy outcome implemented (e.g., keeping the status quo or approving a policy proposal) is always the one preferred by the majority of voters, this policy may not be the one that the median voter would have chosen if lobbies had not engaged in influence activities. Moreover, there are two intrinsically related sources of slant in the information that voters receive. Lobbies' influence activities introduce a source driven slant in the information that the media outlet collects (*lobbies-induced*

slant). At the same time there is a supply driven slant resulting from the idiosyncratic bias of the media outlet (*media-induced* slant). When the media outlet has a small idiosyncratic bias, there is a unique equilibrium characterized by a large level of lobbies' influence activities (high *lobbies-induced* slant) and no *news-slanting* by the media outlet (no *media-induced* slant). When the media outlet's idiosyncratic bias is large, the unique equilibrium involves a low *lobbies-induced* slant and a high *media–induced* slant (in a probabilistic sense). As a consequence, differences in the level of lobbies' activities and in the bias of the media outlet translate into differences in voters' beliefs and thus may lead to different policy outcomes.

This analysis was intended to shed light on some of the relationships between lobbies, the media and voters. Future research should probably consider a more active role of the media. Nevertheless, the message of the paper remains. Recent lobbying reform laws in the US have focused on tackling the distortions deriving from the interactions between lobbyists and politicians, while imposing no restrictions on lobbying activities targeting voters. Specifically, the 2002 McCain-Feingold campaign finance law prohibited parties from accepting soft money but it left the activities of 527 groups unregulated. The present paper suggests that, by doing so, such reforms may have overlooked a potentially large source of *news-slant* and, ultimately, of policy inefficiency.

Appendix

Proof of Proposition 1. Lobby a and b's optimality conditions depend upon which strategy they expect the media outlet to be playing in the cheap-talk game with voters. That is, in order to prove the uniqueness of the informative equilibrium with respect to any given set of parameters values, it is necessary to characterize the possible informative equilibria of the cheap-talk game (see Lemma 1 below). Then, I analyze how lobbies' efforts vary in these different types of informative equilibria and how the media outlet's incentives to slant its news reports change as a function of lobbies' efforts.

The following lemma provides a characterization of the possible types of symmetric informative equilibria that can arise in this cheap-talk subgame.

Lemma 1 $\exists\, \varphi_l^{PI}, \varphi_l^{MI} \in [0,1]$ *such that*:

(i) *For all* $\varphi_l < \varphi_l^{PI}$, *there exists a* ***partially informative*** *equilibrium where the leftist media outlet type pools on* m_A, *the rightist media*

outlet type pools on m_B and the unbiased media outlet type adopts a separating strategy.

(ii) *For all $\varphi_l > \varphi_l^{MI}$, there exists a* ***maximally informative*** *equilibrium where the leftist and the rightist media outlet types adopt the same separating strategy of the unbiased media outlet type.*

(iii) *If $\varphi_l^{MI} > \varphi_l^{PI}$, for all $\varphi_l^{PI} < \varphi_l < \varphi_l^{MI}$ there exists a* ***semi-separating*** *equilibrium where the leftist media outlet type sends message m_A upon receiving signal z_A and sends m_A with probability q and m_B with probability $(1-q)$ upon receiving signal z_B, the rightist media outlet type sends message m_B upon receiving signal z_B and sends m_B with probability q and m_A with probability $(1-q)$ upon receiving signal z_A and the unbiased media outlet type adopts a separating strategy.*

Proof: It is immediate to verify that an unbiased media outlet would never slant its reports in any informative equilibrium. That is, $\sigma^*(\varphi_u|z_A) = m_A$ and $\sigma^*(\varphi_u|z_B) = m_B$. Clearly, $\phi_u^*(z_A) < 1/2$ and $\phi_u^*(z_B) > 1/2$, hence $P_u^*(z_A) = 0$ and $P_u^*(z_B) = 1$. Let the posterior beliefs of voters upon having received message m_A and m_B, respectively, be: $\mu(s = A|m_A) = r$ and $\mu(s = A|m_B) = t$. Assume without loss of generality that $r \geq t$ (i.e., m_A is the message that the media outlet uses to communicate that it received signal z_A). Than clearly, $E[P_v^*(m_A)] = 0$ and $E[P_v^*(m_B)] = 1$. Thus, the unbiased media outlet has no incentives to lie. I now focus on the leftist media outlet.[41] Clearly, by applying the same reasoning used for the unbiased media outlet, it must be the case that in any informative equilibrium $\sigma^*(\varphi_l|z_A) = m_A$. Hence, it is sufficient to study the case where the leftist media outlet receives signal z_B and derive under which condition it sends m_A rather than m_B (i.e., under which condition it adopts a pooling strategy). Clearly,

$$\phi_l^*(z_B) = \varphi_l + \delta[1 - 2\Pr(s = A|z_B, \hat{e}_a^*, \hat{e}_b^*)] \tag{20}$$

thus, $\sigma^*(\varphi_l|z_B) = m_A$ if and only if $P_l^*(z_B) = 0$ that is if and only if:

$$\varphi_l < \frac{1}{2} - \delta[1 - 2\Pr(s = A|z_B, \hat{e}_a^*, \hat{e}_b^*)] \tag{21}$$

hence

$$\varphi_l^{MI} = \frac{1}{2} - \delta[1 - 2\Pr(s = A|z_b, \hat{e}_a^{MI}, \hat{e}_b^{MI})] \tag{22}$$

[41] An analogous proof applies to the rightist media outlet.

$$\varphi_l^{PI} = \frac{1}{2} - \delta[1 - 2\Pr(s = A|z_b, \hat{e}_a^{PI}, \hat{e}_b^{PI})] \tag{23}$$

$$\varphi_l^{SS} = \frac{1}{2} - \delta[1 - 2\Pr(s = A|z_b, \hat{e}_a^{SS}, \hat{e}_b^{SS})]. \tag{24}$$

■

Given Equations (15) and (16), lobby a optimality conditions in a *maximally informative, partially informative* and *semi-separating* equilibrium respectively, are[42]:

$$\begin{aligned} V_a^{MI} &= \delta \left(\frac{\partial h_A}{\partial e_a} - \frac{\partial h_B}{\partial e_a} \right) [\mu^{MI}(s = A|m_A, \hat{e}_a^{MI}, \hat{e}_b^{MI}) \\ &\quad - \mu^{MI}(s = A|m_B, \hat{e}_a^{MI}, \hat{e}_b^{MI})] - c = 0 \end{aligned} \tag{25}$$

$$\begin{aligned} V_a^{PI} &= \delta(1 - 2y) \left(\frac{\partial h_A}{\partial e_a} - \frac{\partial h_B}{\partial e_a} \right) [\mu^{PI}(s = A|m_A, \hat{e}_a^{PI}, \hat{e}_b^{PI}) \\ &\quad - \mu^{PI}(s = A|m_B, \hat{e}_a^{PI}, \hat{e}_b^{PI})] - c = 0 \end{aligned} \tag{26}$$

$$\begin{aligned} V_a^{SS} &= \delta(1 - 2qy) \left(\frac{\partial h_A}{\partial e_a} - \frac{\partial h_B}{\partial e_a} \right) [\mu^{SS}(s = A|m_A, \hat{e}_a^{SS}, \hat{e}_b^{SS}) \\ &\quad - \mu^{SS}(s = A|m_B, \hat{e}_a^{SS}, \hat{e}_b^{SS})] - c = 0 \end{aligned} \tag{27}$$

where $\mu^{MI}(s = A|m_A, \hat{e}_a^{MI}, \hat{e}_b^{MI})$ represents voters' posterior beliefs in a *maximally informative* equilibrium given that they received message m_A and q is the probability that a biased media outlet slants its reports in a *semi-separating* equilibrium.[43] Notice that for $q \to 1$, the optimality condition of the *semi-separating* equilibrium degenerates into the one of the *partially informative* equilibrium. Instead, for $q \to 0$, this optimality condition converges to the one of the *maximally informative* equilibrium.[44] Since in any symmetric equilibrium $e_a = e_b = e^*$, then:

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[42] A detailed derivation of these first order conditions is available upon request to the author.

[43] A similar interpretation applies to $\mu^{PI}(s = A|m, \hat{e}_a^{PI}, \hat{e}_b^{PI})$, $\mu^{SS}(s = A|m, \hat{e}_a^{SS}, \hat{e}_b^{SS})$, for $\forall\, m \in \mathcal{M}$.

[44] Notice that $\forall\, q \in [0, 1]$ the second order condition is:

$$\gamma(1 - 2qy) \left(\frac{\partial^2 h_A}{\partial^2 e_a} - \frac{\partial^2 h_B}{\partial^2 e_a} \right) [\mu^{SS}(s = A|m_A, \hat{e}_a^{SS}, \hat{e}_b^{SS}) - \mu^{SS}(s = A|m_B, \hat{e}_a^{SS}, \hat{e}_b^{SS})]$$

which is always negative.

$$h^* = h_A(e^*, e^*, \eta) = h_B(e^*, e^*, \eta) = \frac{e^* + \eta}{2e^* + \eta} \tag{28}$$

where h^* denote the probability of receiving the correct signal given that both lobbies exert effort e^*. Moreover, by rational expectations, in any equilibrium $\hat{e}_a = \hat{e}_b = e^*$. Therefore, given that the posterior beliefs of voters in a symmetric *maximally informative* equilibrium are such that $\mu^{MI}(s = A|m_A, \hat{e}_a^{MI}, \hat{e}_b^{MI}) - \mu^{MI}(s = A|m_B, \hat{e}_a^{MI}, \hat{e}_b^{MI}) = 2h^{MI} - 1$. Similarly in a *semi-separating* equilibrium $\mu^{SS}(s = A|m_A, \hat{e}_a^{SS}, \hat{e}_b^{SS}) - \mu^{SS}(s = A|m_B, \hat{e}_a^{SS}, \hat{e}_b^{SS}) = (1 - 2qy)(2h^{SS} - 1)$. Thus, given Equations (25)–(28), lobbies' effort in the different types of equilibria can be easily computed. That is:

$$e^{MI} = \frac{1}{2}\eta\left(\sqrt[2]{\frac{\delta}{\eta c}} - 1\right) \tag{29}$$

$$e^{PI} = \frac{1}{2}\eta\left(\sqrt[2]{\frac{\delta(1-2y)^2}{\eta c}} - 1\right) \tag{30}$$

$$e^{SS} = \frac{1}{2}\eta\left(\sqrt[2]{\frac{\delta(1-2qy)^2}{\eta c}} - 1\right) \tag{31}$$

Therefore, the last part that needs to be analyzed is how the media outlet's incentives to slant its report change as a function of lobbies' efforts. Since $\Pr(s = A|z_B, e^*) = \frac{e^*}{2e^*+\eta}$ is increasing in e^*, then the r.h.s. of Equation (21) is clearly increasing in e^*. Thus, the higher is the lobbies' equilibrium effort, the more likely that a leftist media outlet chooses a pooling strategy. That is, the media outlet incentives to slant its reports are increasing in e^*. From Equations (29) and (30) it is immediate to verify that $e^{MI} > e^{PI}$, then it follows that $\varphi_l^{MI} > \varphi_l^{PI}$. Moreover, by putting together Equations (28)–(31) with Equations (22)–(24) it is possible to explicitly derive the equilibrium no-deviation thresholds:

$$\varphi_l^{PI} = \frac{1}{2} - \frac{\sqrt{c\delta\eta}}{(1-2y)} \tag{32}$$

$$\varphi_l^{MI} = \frac{1}{2} - \sqrt{c\delta\eta} \tag{33}$$

$$\varphi_l^{SS} = \frac{1}{2} - \frac{\sqrt{c\delta\eta}}{(1-2yq)} \tag{34}$$

or, equivalently,

$$q = \frac{1}{2y}\left(1 - \frac{\sqrt{c\delta\eta}}{(\frac{1}{2} - \varphi_l)}\right) \tag{35}$$

for $\varphi_l \in [\varphi_l^{PI}, \varphi_l^{MI}]$. Hence, the result directly follows from Lemma 1 and the above results. ■

Proof of Corollary 1. It follows immediately from the proof of Proposition 1. ■

Proof of Corollary 2. It follows immediately from the proof of Proposition 1. ■

Proof of Proposition 2. In order to prove the stated result, it is necessary to ensure that the comparative statics hold in any type of informative equilibrium of the game. I first analyze the *maximally informative* equilibrium. Given Equation (33), an increase in δ leads to a lower φ_l^{MI}, thus for any φ_l, the equilibrium would remain an MI one. Thus, since $\frac{\partial e^{MI}}{\partial \delta} > 0$, the result on δ follows. On the other hand, an increase in c leads to a lower φ_l^{MI}, thus for any φ_l, the equilibrium remains an MI one. Thus, since $\frac{\partial e^{MI}}{\partial c} < 0$ the result follows (clearly, $\frac{\partial e^{MI}}{\partial y} = 0$ and, by definition of the *maximally informative* equilibrium, $\Pr(\sigma(\varphi_n|z_A) = \sigma(\varphi_n|z_B)) = 0$). I now analyze the *semi-separating* equilibrium. Given Equations (31) and (35):

$$e^{SS} = \frac{1}{2}\eta\left(\frac{\delta}{\frac{1}{2} - \varphi_l} - 1\right) \tag{36}$$

Thus since $\frac{\partial q}{\partial \delta} < 0$ and $\frac{\partial e^{SS}}{\partial \delta} > 0$, the result on δ follows. On the other hand, $\frac{\partial e^{SS}}{\partial c} = 0$ while $\frac{\partial q}{\partial c} < 0$. Thus the net overall effect of an increase in c in an SS equilibrium is a lower $\Pr(\sigma(\varphi_n|z_A) = \sigma(\varphi_n|z_B))$. The same applies to an increase in y since $\frac{\partial e^{SS}}{\partial y} = 0$ while $\frac{\partial q}{\partial y} < 0$. Finally, I analyze the partially-informative equilibrium. Given Equations (32) an increase in δ leads to a lower φ_l^{PI}. There are two possible cases. Either φ_l is still lower than the new φ_l^{PI}, in which case the equilibrium is still a *PI* one and thus the net effect of an increase in δ would be just an increase in lobbies' efforts (since $\frac{\partial e^{PI}}{\partial \delta} > 0$). On the other hand, if φ_l becomes higher than φ_l^{PI}, the equilibrium switches to an *SS* one. Nevertheless, from the above reasoning, in an *SS* equilibrium $\frac{\partial e^{SS}}{\partial \delta} > 0$ and $\frac{\partial q}{\partial \delta} < 0$. Thus in this second case, the net effect of an increase in δ would be to increase lobbies' efforts and to decrease $\Pr(\sigma(\varphi_n|z_A) = \sigma(\varphi_n|z_B))$. Similarly, an increase in c leads to a lower φ_l^{PI}.

There are two possible cases. Either φ_l is still lower than the new φ_l^{PI}, in which case the equilibrium is still a PI one and thus the net effect of an increase in c would be just a decrease in lobbies' efforts (since $\frac{\partial e^{PI}}{\partial c} < 0$). On the other hand, if the φ_l becomes higher than φ_l^{PI}, the equilibrium switches to a *SS* one. Nevertheless, from the above reasoning, in a *SS* equilibrium $\frac{\partial e^{SS}}{\partial c} = 0$ and $\frac{\partial q}{\partial c} < 0$. Thus in this second case, the net effect of an increase in c is to decrease lobbies' efforts (up to the bound where $e^{PI} = e^{SS}$) and a decrease in $\Pr(\sigma(\varphi_n|z_A) = \sigma(\varphi_n|z_B))$. The same reasoning applies to the comparative statics for y. ■

Proof of Proposition 3. When the state of the world is A, the expected policy outcome in an informative equilibrium of type $\kappa = PI, SS, MI$ is:

$$E(\hat{P}_m^\kappa|s = A) = \mu^\kappa(m_A|s = A)\hat{P}_m^\kappa(m_A) + \mu^\kappa(m_B|s = A)\hat{P}_m^\kappa(m_B)$$

Moreover, $\hat{P}_m^{NS}(s = A) = \frac{1}{2} - \delta$ and $\hat{P}_m^{NS}(s = B) = \frac{1}{2} + \delta$. On the other hand, since in a symmetric equilibrium $h_A = h_B = h^{SS}$:

$$\begin{aligned}&\mu^{SS}(m_A|s = A) - \mu^{SS}(m_A|s = B)\\ &\quad = \mu^{SS}(m_B|s = B) - \mu^{SS}(m_B|s = A) = (1 - 2qy)(2h^{SS} - 1)\end{aligned}$$

moreover:

$$\begin{aligned}\hat{P}_m^{SS}(m_A) &= \frac{1}{2} + \delta[1 - 2(h^{SS}(1 - 2qy) + qy)]\\ \hat{P}_m^{SS}(m_B) &= \frac{1}{2} + \delta[1 - 2((1 - h^{SS})(1 - 2qy) + qy)]\end{aligned}$$

Thus:

$$\Lambda^{MI} = \Lambda^{PI} = \Lambda^{SS} = \delta - c\eta \tag{37}$$

In the *no-slant* policy outcome the expected utility of voter i is $U_i^{NS}(x_i) = -(\frac{1}{2} - x_i)^2$. On the other hand, in a *semi-separating* type of equilibrium the expected utility of voter i is:

$$U_i^{SS}(x_i) = -\left(\frac{1}{2} - x_i\right)^2 - 4\delta^2(qy + h^{SS}(1 - 2qy))(1 - [qy + h^{SS}(1 - 2qy)])$$

Hence, the expected loss from voter i perspective is:

$$(\Delta U_i)^{SS} = \delta^2[1 - (1 - 2qy)^2(2h^{SS} - 1)^2] = \delta \cdot \Lambda^{SS}$$

Hence, given Equation (37), $(\Delta U_i)^{SS}$ is positively related to δ and negatively related to c and η. ■

Proof of Proposition 4. From the proof of Proposition 3, $U_i^{MI}(x_i) = U_i^{PI}(x_i)$ and $\Lambda^{MI} = \Lambda^{PI}$ if and only if:

$$y = \frac{h^{PI} - h^{MI}}{2h^{PI} - 1} \tag{38}$$

Hence, given Equations (28)–(30), the above condition is always verified. ■

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