Media Bias and Electoral Competition*

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Abstract

We introduce mass media in a one-dimensional Downsian model of electoral competition in order to address the following question: to what extent can the media have policy influence when its ideological bias is widely known? Voters and the media have conflicting preferences over policy (i.e., they are ideologically distant), but both value higher ability or valence in the elected official who implements the policy. The media is privately informed about the relative abilities of the candidates and strategically conveys this information through cheap talk endorsements. When the ideological distance between the media and the average voter is small, equilibrium platform choices of candidates converge to the media's ideal policy rather than the voter's. When the ideological distance is large, a mixed strategy equilibrium arises which often takes a polarized form—candidates either choose very populist platforms or very elitist ones that cater to the tastes of the media elite. The equilibrium displays platform divergence *ex post*, with the media's partisanship increasing and its influence on voters diminishing with the degree of divergence. There could be immiserizing information—the existence of a biased media could hurt a majority of voters in spite of rational voter skepticism about the media's message. The media is better off delegating message control to an editor who is ideologically closer to the average voter. In the presence of multiple media outlets with biases in opposite directions, the median voter theorem is restored if all players are risk neutral in their policy preference.

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1 Introduction

We cannot measure [the media's] power and influence by traditional democratic standards, for these men can create national issues overnight... They can reward some politicians with national exposure, and ignore others. For millions of Americans, the network reporter who covers a continuing issue, like ABM or Civil Rights, becomes, in effect, the presiding judge in a national trial by jury.
– Spiro Agnew.

I'm not going to Washington to seek [the media's] good opinion. I'm going to Washington to serve the people of this country.
– Sarah Palin.

There is widespread belief that in most democracies, the media has a powerful influence on electoral outcomes and policymaking. Moreover, even in countries that enjoy a high degree of press freedom, the media is often seen as biased towards a particular ideology, party, class or cultural group. Critics argue that the media engages in slanted coverage, influencing voters with selective reporting, innuendo, opinionating and even outright lies. By manipulating public opinion through the use of distorted information, the media generates support for policies that serve the interest of an elite minority rather than the average voter.

In the American context, the notion that the mainstream media has a liberal bias has gained wide currency among conservatives and Republicans, and even among some Independents and Democrats. Charges of liberal bias have been levelled at the major TV networks and leading national dailies in polemical bestsellers (Coulter (2002)), insider tell-all books by journalists (Goldberg (2002)) and survey based studies (Lichter, Rothman and Lichter (1986), Groseclose and Milyo (2005)). Several liberal and progressive writers, on the other hand, have denied the existence of liberal bias and have raised the counter-charge of a conservative tilt in reporting, derived from corporate control of all or part of the mass media (Herman and Chomsky (1988), Franken (2003)). A 2009 survey by the Pew Research Center shows that 74% of the voting public believe the media's coverage is biased and one-sided, while only 18% believe it to be fair. Suspicion of the media is so deep rooted in American politics that several media watchdog groups run popular websites and spend considerable resources scanning news stories for bias virtually round the clock.[1] Critics from either end of the

[1] While some media watchdog websites report distortions and embellishments coming from both sides of the political spectrum and reported uncritically in the media (e.g., FactCheck.org), others are unabashedly partisan. For example, the Media Research Center (http://www.mrc.org/public/default.aspx) declares among its goals: "neutralizing liberal media bias" and "advancing the culture of free enterprise in America." It boasts of a staff of 60 and an annual budget of $10 million. In contrast, Fairness and Accuracy in Reporting or FAIR (http://www.fair.org/index.php), a self described "progressive group", dedicates itself to scrutinizing a "mainstream media... increasingly cozy with the economic and political powers they should be watchdogging." FAIR does not provide figures for its total budget

political spectrum unite in their view of the media as not a dispassionate disseminator of truth, but a politically motivated player who exerts influence using its voice and reach.[2]

Several recent papers have presented evidence that in spite of widespread skepticism about the veracity of news, the media has a significant influence on the choices of voters. Della Vigna and Kaplan (2007) find that in those towns where Fox News was introduced into cable programming, Republicans gained 0.4 to 0.7 percentage point vote share in the Presidential election of 2000. Chiang and Knight (2008) study newspaper endorsements of candidates in various races and their effect on voters. They find that endorsements significantly increase vote shares, but the effect is less pronounced when a left-leaning newspaper endorses a Democrat, or a right-leaning outlet endorses a Republican. These empirical findings suggest that voters rationally discount what they hear from biased sources, but are still open to some amount of persuasion.

Our aim in this paper is to understand the theoretical implications of media bias in a democracy. We construct a framework in which the media has access to some critical information (say about candidates' abilities, character or valence) that is useful to voters. This information is communicated to voters using unverifiable messages (cheap talk), such as endorsements or opinion pieces. Voters and the media care both about the relative abilities of the candidates and the policies they promise during their campaign. However, it is common knowledge that the media is ideologically biased, in the sense that its policy preferences differ from those of the median voter. We embed these additional features in an otherwise classical Downsian model, where two office-seeking candidates simultaneously choose platforms (i.e., policy promises), the media (privately informed about the candidates' abilities and publicly informed about their policy positions) endorses one of the two candidates, and finally voters vote armed with information about the publicly announced platforms and endorsements, but no direct knowledge about the candidates' abilities. We assume voters are rational Bayesians who are appropriately skeptical of the media's message.

The ideological distance between the voter and the media, combined with the media's access to private information about candidates' personal qualities, gives rise to a number of interesting effects. The media's credibility and influence are endogenously derived as a function of the platform choices

or staff on its website, but reports that 80% of its funding comes from subscriptions and contributions, and that its "action alerts" are distributed to "an international network of over 50,000 activists."

[2] In our analysis, we will assume that the media's bias is an objective fact and voters share a common perception about the direction and magnitude of this bias. Research in psychology suggests that bias perceptions are often subjective and dependent on a person's own biases. In particular, partisans are more likely to perceive bias in an information source against their own side or opinion. This phenomenon has been called the hostile media effect by Vallone, Ross and Lepper (1985), who found that pro-Palestinian viewers saw a pro-Israeli slant, and pro-Israeli viewers reached the opposite conclusion, after watching the same film clip on the 1982 Sabra and Shatila massacre in Lebanon. When the existence of bias is itself an unknown factor, accusations of bias can be put to strategic use, and some writers have suggested that the liberal bias charge is aimed at making the American media defensive and over-correct in favor of conservatives (Alterman (2003)). We do not explore the issue of unknown bias in this paper, but it is an interesting topic for further research.

of the candidates. If candidates' platforms are very close to each other, the media's preference ordering over them is determined primarily by relative ability, whereas if they are far apart, then it is decided mostly by ideological proximity. Hence, the media's credibility and influence erode with increasing platform differentiation and the voter may ignore the media's endorsement altogether when platforms are sufficiently differentiated. In our model, the media's ideological bias (i.e., its ranking of alternative policies) is exogenous, but its partisanship (i.e., its ranking of alternative candidates) is endogenous.

The candidates' platform choices, in turn, are shaped by the media's endorsement strategy as well as its influence on voters. Candidates face a tension between two opposing temptations—pander to the voter with populist policies, or woo the media with elitist policies in order to win its endorsement. We show that both these campaign strategies must have a role to play in the equilibrium of our model. Several critical outcomes are, therefore, interdependent and jointly determined—candidates' platform choices, the media's partisanship, its credibility and persuasive effect on voters, and voting behavior.

Our first significant results follow from the characterization of the candidates' platform choices, which we show must involve mixed strategies if the ideological distance between the voter and media in policy space is large. When this happens, the immediate implication is the breakdown of the median voter theorem—there is positive probability that platforms will diverge (though the extent of divergence is stochastic), and almost surely, policy outcomes will not reflect the median voter's most preferred choice. To get some intuition behind these results, consider a candidate's incentives if platforms were to converge. By moving his platform slightly closer to the media's favorite policy, he makes it slightly less attractive to the voter compared to his rival's platform but increases the probability of receiving an endorsement from the media. However, an endorsement discontinuously improves the perceived ability of a candidate and is therefore decisive in the election if platforms are not too far apart. When the media is not too ideologically distant from the voter, this *elitist creep* will lead to complete pandering of the media instead of the voter, and both platforms will converge to the media's most preferred policy. However, if the ideological gap is large, a platform which completely caters to the media's policy interest can be defeated by a *flight to populism*, i.e., a platform choice at the voter's ideal point. This is because the large distance between the platforms makes policy considerations trump ability in the voter's mind, and furthermore, reduces the information content of the endorsement, i.e., destroys the media's credibility and influence. The conflicting tugs of elitist and populist pandering can only be balanced in a mixed equilibrium where candidates are uncertain about the exact policy position of their opponent.

For an intermediate range of ideological distance between the voter and the media, the mixed equilibrium displays the additional interesting feature of a "hole in the middle", i.e., the support of candidates' equilibrium strategies is non-convex, putting probability weight on a range of policies close to the voter's ideal point and another close to the media's ideal, but nothing in between.

We interpret this as a force towards polarization—the incentives of electoral politics preclude any substantial degree of ideological compromise between the average voter and the elite whose views are voiced through the media. This result is in sharp contrast to what some other papers have found (Grossman and Helpman (1999), Andina-Diaz (2006)).

Our welfare analysis produces some surprising results. We demonstrate the possibility of *immiserizing information*—there are situations where the voter would be better off if the media was silenced altogether. In the absence of endorsements, the median voter theorem would be restored but voters must make their choices without access to any information about the candidates' relative merits. We show that this trade-off sometimes works to the voter's advantage. Put another way, by virtue of its critical role of informing citizens about the personal strengths and weaknesses of politicians seeking high office, a media elite can exert such a disproportionate influence over policy that voters may end up losing more from the resultant elitist bent of campaigns than they gain from knowledge about the candidates' governing abilities. It should be emphasized that our conclusion is based on the assumption that voters are aware of the media's bias, discount its motivated endorsements as needed, and fully understand the effect of various policies on their own well being. In other words, they are not systematically fooled due to an excess of credulity. Since our model leaves out many important details of reality, the analytical result on immiserizing information should not be taken as a reason to support censorship or suppression of press freedom. Nevertheless, it is interesting to note that there are plausible scenarios where the existence of an independent media has negative net value to a majority of voters.

A related result centers on the issue of editorial delegation. We show that in many situations, the owner of a monopoly media outlet is better off turning over control to an editor who is ideologically closer to the voter compared to the owner himself. This is reminiscent of results obtained for pure sender-receiver (cheap talk) games by Dessein (2002) and Holmstrom (1984). Unlike in those papers, we focus on delegation by the sender rather than the receiver, and optimal delegation in our framework achieves only partial moderation, i.e., the optimal editor must still be ideologically distant to the voter, albeit to a lesser degree than the owner. Furthermore, delegation is Pareto improving—it also increases the expected utility of the voter. To understand these results, observe that any change has two potential effects on the media's or voter's utility—policy outcomes could move closer to (or further from) their most preferred policy, and more (or less) information about candidates' abilities could become incorporated in voters' decisions. We show that optimal editorial delegation must have the following properties: candidates' platforms will converge to the *editor's* ideal policy but the *expected* policy outcome remains unchanged relative to the game without delegation (only variance is reduced). The convergence of platforms implies the media under the delegated editor does not display any partisanship, and consequently its endorsement is always credible and influential, avoiding some of the information destruction that arises in the absence of delegation when platforms are too differentiated *ex post* and the media's message is ignored by voters.

The results described so far are based on the assumption of a monopolistic media or equivalently, an ideologically homogeneous one. The final question we explore is the effect of increased competition (or ideological heterogeneity) in the media market. We find that if there are two media outlets instead of one, and if their biases relative to the median voter are in the same direction, the equilibrium outcomes are as if the more ideologically distant outlet did not exist. On the other hand, if the biases are opposite (not necessarily equal), equilibrium platform choices converge back to the voter's ideal point and the median voter theorem is restored. Essentially, depending on the platform choices of the candidates, the voter's ranking of the candidates (under all realized vector of abilities) would coincide with the ranking of one or the other of the two media outlets. Hence, the voter can learn all decision relevant information by listening to the endorsement coming from one source and ignoring the other. In this sense, competition among a ideological heterogenous media eliminates the possibility that information disseminated by the media may be harmful and lead to pandering by candidates to a particular elite.

The rest of the paper is organized as follows. In Section 2 we discuss the closely related literature. In Section 3 we set up our basic model while in Section 4 we analyze the effect of an ideologically biased but informed elite media on electoral competition. In Section 5 we investigate the effect of ideological as well as informational diversity within the media. Section 6 discusses some possible extensions of the model as well as our concluding remarks. The Appendix contains all proofs.

2 Related Literature

There is an emerging theoretical literature on media bias and its implications for electoral politics. Several papers explore the question of why bias may appear in commercial media that is primarily driven by the profit motive. Some authors offer explanations driven by demand side factors—preferences of readers and viewers—while others focus on the supply side—motives of owners and journalists. Mullainathan and Shleifer (2005) and Bernhardt, Krasa and Polborn (2008) assume partisan voters have a taste for biased news that conform closely to their priors. They examine to what extent a profit maximizing media will distort its reporting in response, a media outlet's slant being similar to the choice of a product characteristic in a market with heterogeneous consumers. Baron (2006) presents a model where non-ideological and profit driven media owners find it optimal to allow ideologically motivated journalists to engage in biased reporting, even though it reduces the value of the news to listeners and reduces subscription and revenues. The reason is that ideological journalists are willing to work for lower wages in return for discretion in reporting strategies. Gentzkow and Shapiro (2006) derive bias from reporters' career concerns—slanting news in a direction that confirms readers' priors makes the reporter appear more competent. None of these papers explicitly model political competition and examine its interaction with reporting bias.

Papers which jointly determine campaign strategies, media behavior and voters' choices include

Grossman and Helpman (1999), Stromberg (2004), Andina-Diaz (2004) and Chan and Suen (2008). In Grossman and Helpman (1999), voters are unsure how various policies will affect them, but this information is available to political candidates and the leader of an interest group who can issue endorsements publicly. If the realized ideal policies of the interest group and the remaining electorate are independent, candidates will pander to the interest group at the expense of the public. Our paper differs from Grossman and Helpman (1999) in several key aspects. In the latter, candidates confer favors on a voting bloc of positive measure; in ours they pander to an entity (the media) which is electorally insignificant, i.e., has no votes. Ours is also a model of open pandering, where voters perfectly understand the payoff relevant effects of various policies, and the endorser tries to persuade an audience with whom his policy preferences are known to conflict.

Stromberg (2004) presents a theory where campaign promises reach voters through the media, and due to technological fixed costs, the media provides more news to large voter groups or rich subscribers who generate advertising revenue. As a result, platforms disproportionately cater to these segments of the electorate. Chan and Suen (2008) develop a model where voters have a preference for biased news for instrumental reasons. If the media's message must be coarse due to time or attention constraints, then voters gain most decision relevant information by listening to outlets which are ideologically similar to themselves. Platforms may deviate from the position of the median voter depending on the number of media outlets. In Andina-Diaz (2004), biased media outlets hurt candidates whose platforms are far away from their policy ideal by creating bad publicity. The main difference from our model is that voters are not sophisticated enough to interpret the media's message after taking its bias into account.

In addition to these papers, Besley and Prat (2006) and Anderson and McLaren (2010) discuss theories of media bias where the media communicates with voters not through cheap talk messages but verifiable evidence about candidate traits. The well known unraveling result (Milgrom (1981)) is broken down by assuming that the evidence becomes available only with some probability. Both papers examine reasons for evidence suppression—in the former, the government bribes a commercial media to do so leading to a pro-incumbency bias, while in the latter, the media's own ideological bias is responsible for selective reporting.

Our paper straddles two older literatures—the Hotelling-Downs model of spatial competition (Hotelling (1929), Downs (1954)), and the literature on cheap talk pioneered by Crawford and Sobel (1982). In the spatial model of electoral competition, where the benchmark result is the median voter theorem, Wittman (1983) and Calvert (1985) have demonstrated that policy divergence arises when candidates are ideologically motivated and the median voter's policy position is uncertain. We derive policy divergence with office motivated candidates and deterministic positioning of the median voter. Groseclose (2001) and Aragones and Palfrey (2002) show that in the Wittman-Calvert model with stochastic median, mixed equilibria and stochastic policy divergence arise even when candidates are office seeking if one of them has a valence advantage. In our model, the valence advantage is not

common knowledge and is (imperfectly) inferred from the media's message.

There has been a surge of research on cheap talk games in recent times, and ours is one of the first applications where the sender's bias is endogenously derived and the receiver may suffer from immiserizing information (i.e., the receiver is better off if the equilibrium involved babbling). Chakraborty and Yilmaz (2010) consider a model of cheap talk with two-sided private information where the bias of one of one of the speakers is directly chosen by an interested third party. Chakraborty and Harbaugh (2010) provide an example of a cheap talk game with multidimensional information and multiple receivers where more information hurts all the receivers because of strategic externalities between them.

Our result that competing senders produce more informative outcomes is reminiscent of Battaglini's (2002) model of multi-dimensional cheap talk with multiple experts and Krishna and Morgan's (2001) model of one dimensional cheap talk. Our result is obtained in a model where there is a single dimension of communication where the biases of the two experts are endogenous and determined by political competition. In equilibrium, neither expert has any bias leading to full information equivalence.

3 Model

A unit mass of voters face a choice between two candidates in an election. Candidate $i = 1, 2$ is identified by a policy platform $x_i \in [-1, 1]$ and a type $\theta_i \in [0, 1]$. Voters have diverse policy preferences but identical preferences on candidate types. In particular, a voter is identified by her 'ideal' policy $x \in [-1, 1]$ and the value to voter x from electing candidate i with policy platform x_i and type θ_i is given by

$$u(\theta_i, x_i; x) = \theta_i - \frac{1}{3\Delta^*} d(x_i, x) \tag{1}$$

where $d(.,.)$ is a distance function and $\Delta^* > 0$ is a parameter reflecting the relative (un-)importance of policy to a voter. We let $G(x)$ denote the (atomless) distribution of voters when they are ordered by their ideal policies $x \in [-1, 1]$ and suppose $x_v = 0$ is the median of this distribution. We may interpret a policy x as a summary measure of a domestic redistributive policy about which voters have diverse preferences. On the other hand, the type θ_i is any attribute of the candidate about which all voters agree, e.g., the ability to handle national security threats or a foreign policy emergency.

The structure of our basic voting game is as follows. First, the two candidates simultaneously choose policy platforms x_1 and x_2 that are observed by all voters. Second, a single voter with ideal policy x_m *privately* learns the realization of the type profile θ_1, θ_2. We call this privately informed voter the media. The media then sends a (cheap talk) message $m \in M$ that is heard by all voters.

We suppose that M has at least two elements and often interpret a message m as an endorsement by the media of one or the other candidate. Finally, all voters vote for their preferred candidate after taking account the policy platforms x_1 and x_2 as well the media's message m. The candidate who has the larger share of votes wins the election with ties resolved uniformly. We suppose in what follows that $x_m > 0$ and let F denote the commonly held priors associated with θ_1, θ_2.

The candidates are office-seeking, i.e., choose their policy positions to maximize the probability that they will be elected after taking into account the expected effect of the media's message on the voting behavior of the electorate. The media's message may inform the electorate about the relative abilities of the two candidates. But voters are sophisticated and they take the media's strategic incentives into account when evaluating the media's message and voting for their favored candidate. The media's endorsement is strategic because the media considers the relative merits of a candidate's ability θ_i as well as his ideological distance $d(x_i, x_m)$ when deciding whether or not to endorse him. We focus on perfect Bayesian equilibria of the game described informally above.

Further Discussion of Model Features: To Be Completed

3.1 The Endorsement Subgame

We begin our analysis by considering what happens given policy choices x_1 and x_2 and a message m from the media. Our first result follows from our assumptions on preferences.

Lemma 1 *Fix x_1, x_2 and m. In any equilibrium, if the median voter $x_v = 0$ strictly prefers candidate $i = 1, 2$ then candidate i is elected with probability 1.*

Lemma 1 follows from our assumption that voter preferences are additively separable in candidate ability and policy choices and are single-peaked and single crossing in the latter. It says that the median voter is decisive in the sense that if the median voter prefers one candidate to the other so does at least a majority of the electorate. In effect, the median voter can be thought of as a single-decision maker in our model and accordingly we focus on the behavior of this voter in what follows, referring often to the median voter simply as the voter.

We turn next to a consideration of the media's endorsement strategy. In any cheap talk game, there is always a babbling equilibrium where the decision maker (median voter) refuses to ascribe any meaning to the sender's message and accordingly the sender (media) can do no better than to be uninformative. The more interesting case is one where the sender is informative and influences the behavior of the decision maker, i.e., makes the voter vote for the different candidates with probabilities that depend on the media's message. We call such equilibria influential. Our next result characterizes all influential equilibria.

Lemma 2 *Fix x_1, x_2. In any influential equilibrium, the media endorses candidate i iff the media prefers candidate i, i.e., iff*

$$\theta_i - \theta_j > \frac{1}{3\Delta^*}\left[d(x_i, x_m) - d(x_j, x_m)\right] \tag{2}$$

ignoring zero probability ties. Such an equilibrium exists iff

$$E[\theta_i - \theta_j |\ i \text{ endorsed}] \geq \frac{1}{3\Delta^*}\left[d(x_i, 0) - d(x_j, 0)\right] \geq E[\theta_i - \theta_j |\ j \text{ endorsed}] \tag{3}$$

If for different messages sent by the media, the voter behaves differently, the media will always send the message that makes the voter elect the media's preferred candidate with the highest probability. The first part of the result follows from this. Consequently, the media's endorsement strategy can at most reveal the candidate that the media prefers given its private information θ_1,θ_2 and the observed policy choices x_1, x_2 of the candidates. Given this, the inequality (3) provides the conditions under which the voter finds it in her own interest to follow the media's advice or endorsement.

The key feature which determines whether or not an influential equilibrium exists in a cheap talk game is the conflict of interest between the sender and the decision-maker. In the present context, this is given by the relative magnitudes of $d(x_i, x_m) - d(x_j, x_m)$ and $d(x_i, 0) - d(x_j, 0)$, reflecting the partisan conflict between the media and the voter in their evaluations of the candidate policy positions. This partisanship is endogenous since it is determined by the differences between the policy positions x_1 and x_2 that are chosen by the two candidates. In this sense, the bias of the media (i.e., bias in the sense of a conflict of interest in cheap talk games) is endogenous in our model. For instance, when the candidates choose identical policies $x_1 = x_2$, then $d(x_i, x_m) - d(x_j, x_m) = 0$ and $d(x_i, 0) - d(x_j, 0) = 0$. In such a case, there is no partisan conflict between the voter and the media. Since all parties have common preferences about candidate types, an influential equilibrium always exists in such cases.

Do influential equilibria exist when candidates choose different policies, $x_1 \neq x_2$? In general, the answer to this question depends on the distance between the policies x_1 and x_2, as well as the curvature properties of the distance function $d(.,.)$ and the joint distribution $F(.,.)$ of θ_1, θ_2. For the sake of tractability and to isolate the key forces at work, we make the following special assumptions about these two functions for the rest of this paper:

A1 Linear distance: $d(x, y) = |x - y|$.

A2 Uniform distribution: $\theta_2 \equiv 0$ while $\theta_1 \equiv \theta$ is uniformly distributed in $[-1, 1]$.

To illustrate the tractability benefits offered A1 and A2, consider the case where $x_1, x_2 \in [0, x_m]$.[3] Suppose $x_1 - x_2 = \Delta \geq 0$ and notice that from (2) the media will endorse candidate 1 whenever

[3] In Section 4 we show that policy choices in this interval will be a feature of the overall equilibrium of our game in all cases.

$\theta > -\frac{\Delta}{3\Delta^*}$. From (3) using the distributional assumption A2, it follows that the voter will not find it against her interest to follow the media's endorsement of the more ideologically distant candidate 1 whenever $\Delta \leq \Delta^*$.[4] In other words, the media will manage to persuade the voter to vote for the media's favorite candidate provided the candidate policy positions are not too far apart. The parameter Δ^* therefore measures the influence of the media in our setting and the importance of its information. When the candidates choose policy positions that differ by more than Δ^*, the resulting partisan conflict between the media and the median voter is too large for the media to be able to persuade the electorate. When the candidates choose policy platforms that are sufficiently similar however, there is always an equilibrium of the endorsement subgame where the media can persuade a majority of the electorate to vote for the media's favorite candidate.

The effect of (differences in) candidate policy choices on the credibility and persuasiveness of the media is a key determinant of the strategic considerations facing the candidates, as we show in the next section. Given the possible multiplicity of equilibria in the endorsement subgame however, this effect depends on the equilibrium selection rule that we employ. We suppose in what follows that whenever an influential equilibrium exists in the endorsement subgame, an influential equilibrium is played. More precisely, we suppose that even in cases where (3) holds with equality and there are multiple influential equilibria, the one where the voter follows the media's recommendation with probability one is the one that is played. In effect, these assumptions imply that whenever an influential equilibrium exists, the candidate that the media prefers is elected (in particular making ties in vote shares zero probability events). Our selection rule also guarantees that the ex-ante Pareto dominant equilibrium between the sender and receiver is played. For ease of reference, we present this selection rule as an explicit assumption.

A3 Whenever an influential equilibrium exists in the endorsement subgame, the voter follows the media's recommendation with probability 1.

In Section 6 we discuss in detail the effect of alternative equilibrium selection rules. In the next section we turn to the analysis of the overall game, i.e., the choice of policies x_1 and x_2 by the candidates seeking to maximize the probability of victory in the election.

4 Electoral Competition

The first implication of our set-up and assumptions is that the well-known median voter theorem does not obtain in our model.

Proposition 1 *For any $\Delta^* > 0$, $x_1 = x_2 = 0$ is not an equilibrium.*

[4] It is easy to see that the voter will always find it in her interest to follow the advice of the media when the latter endorses the candidate ideologically closer to the voter.

The result is an immediate implication of our equilibrium selection rule A3 and distributional symmetry assumption A2. To see why it obtains, suppose that contrary to the claim both candidates locate at the median voter's ideal point $x_v = 0$. Because there are no policy differences between the candidates, the media has common interest with the voters with respect to candidate ability. As a result full disclosure of θ is credible and, by A2, each candidate expects to win the election with probability $\frac{1}{2}$. Consider now a deviation by candidate 1 to a policy position $x_1 = \Delta \in (0, \Delta^*)$ that is closer to the media's ideal. Using Lemma 2, candidate 1 will be endorsed by the media whenever $\theta > -\frac{\Delta}{3\Delta^*}$. From the ex-ante perspective of candidate 1, this occurs with probability $\Pr[\theta > -\frac{\Delta}{3\Delta^*}] = \frac{1}{2} + \frac{1}{6}\frac{\Delta}{\Delta^*} > \frac{1}{2}$. Furthermore, since $\Delta < \Delta^*$, an influential equilibrium exists so that the median voter (and in fact a majority) will vote for candidate 1 whenever candidate 1 is endorsed by the media. It follows that this deviation is profitable for candidate 1.

More generally, choosing a policy position that is the same as one's opponent but not equal to the media's ideal policy can never be part of an equilibrium. For if a candidate chooses a policy that is slightly more desirable to the media, compared to the policy choice of his opponent, then he only slightly alters his attractiveness to the median voter on the policy dimension. However, since the media must be influential for small policy differences and since the media's endorsement contains coarse but valuable information about the candidate's ability, such slight media pandering raises the electability of the pandering candidate via a higher chance of a biased media endorsement in his favor. This incentive to obtain biased but credible media endorsements may often lead candidates to make policy choices that completely *pander to the media* as long as the media is not ideologically too distant from the median voter.

Proposition 2 *Suppose $x_m \leq \Delta^*$. In the unique equilibrium there is total media pandering: $x_1 = x_2 = x_m$.*

Proposition 2 considers the case where the media's ideological bias x_m is small relative to the importance of the media's information and influence as measured by the parameter Δ^*. In such a case, even if one candidate chooses the voter's ideal policy $x_v = 0$ and the other chooses the media's ideal policy x_m, media endorsements in favor of the more distant candidate are influential. Indeed, in this case locating at the media's ideal policy is an 'unbeatable' strategy for a candidate since it guarantees a probability of winning the election that is at least 1/2 regardless of the policy choice of the other candidate. Consequently, both candidates locating at the x_m is the unique equilibrium (given our selection rule A3). Since the equilibrium displays complete policy convergence, there is no conflict of interest between the media and any voter. Consequently, full disclosure of all private information is credible for the media.

When $x_m > \Delta^*$ the ideological conflict of the media is not small relative to the importance of its information. In such a case, there is no pure strategy equilibrium in policy choices. For instance, if one candidate locates at x_m, then the other candidate can destroy the credibility of the media by

choosing the median voter's ideal policy $x_v = 0$. The policy differences between the two candidates will then lead the median voter (and so a majority) not to follow the media's advice when the latter endorses the candidate located at x_m. Consequently, the candidate located at $x_v = 0$ will win the election for sure.

The possibility of destroying the media's credibility illustrates a second key feature of the strategic considerations facing the two candidates. When the ideological extremism of the media is large relative to its information ($x_m > \Delta^*$), and one candidate panders to the media via its policy choice, the other candidate has an incentive to engage in a *flight to populism*, i.e., to choose policies that are very different from the other candidate and close to the ideal policy of the median voter. Such a choice destroys the credibility of the media and leads a majority of voters to ignore the information content of biased media endorsements. Consequently, the populist candidate who is closer to the median voter's ideal gets elected. Our next result shows that the conflicting tugs of exploiting the credibility of the media in order to obtain favorable endorsements and of destroying the credibility of the media via a flight to populism gives rise to a mixed strategy equilibrium in policy choices. In this mixed strategy equilibrium, there is policy divergence between the candidate with strictly positive probability. However, because of atoms in the mixed strategy, policy convergence may also occur with strictly positive probability, although never at the median voter's ideal policy.

Proposition 3 *Suppose $\Delta^* < x_m < 2\Delta^*$. There is a (symmetric) mixed strategy equilibrium where each candidate chooses a policy x according to the right continuous cdf $H : [-1, 1] \to [0, 1]$ given by*

$$H(x) = \begin{cases} 0 & \text{if } x < 0 \\ 1 - \exp\left[-\frac{x}{4\Delta^*}\right] & \text{if } 0 \leq x < x_m - \Delta^* \\ 1 - \exp\left[-\frac{x_m - \Delta^*}{4\Delta^*}\right] & \text{if } x_m - \Delta^* \leq x < \Delta^* \\ (1 - \alpha_m) \exp\left[-\frac{x_m - x}{4\Delta^*}\right] & \text{if } \Delta^* \leq x < x_m \\ 1 & \text{if } x_m \leq x \end{cases} \tag{4}$$

where H has an atom of size $\alpha_{\Delta^*} = (2 - \alpha_m) \exp[-\frac{x_m - \Delta^*}{4\Delta^*}] - 1$ at $x = \Delta^*$ and another atom of size $\alpha_m = \frac{1}{2} - \frac{1}{4}\frac{x_m}{\Delta^*}$ at $x = x_m$. In equilibrium, the expected policy choice of the elected candidate is equal to Δ^*.

To understand better the properties of the mixed strategy equilibrium characterized by Proposition 3, let the support of H be the set of points $x \in [-1, 1]$ where either (i) H has an atom or (ii) H is strictly increasing either to the right. Notice that no $x < 0$ or $x > x_m$ is in the support of H. That is, the candidates choose policies that lie between the ideal policy $x_v = 0$ of the median voter and the ideal policy x_m of the media with choices outside this zone fairing worse than policies in the support of H such as $x = 0$ or $x = x_m$.

Moreover not all policies in the interval $[0, x_m]$ are in the support of H either. The cdf H is a constant for policies in the interval $[x_m - \Delta^*, \Delta^*)$ and the associated mixed strategy concentrates the

entire mass of probability on the set of policies $[0, x_m - \Delta^*) \cup [\Delta^*, x_m]$. Because of this 'hole in the middle', the equilibrium policy choices display polarization— either they display media pandering (i.e., lie in the interval $[\Delta^*, x_m]$ and 'close' to x_m) or they display a flight to populism (i.e., lie in the interval $[0, x_m - \Delta^*)$ and 'close' to $x_v = 0$). Policies in the hole $[x_m - \Delta^*, \Delta^*)$ do worse than the policy choice Δ^* against every policy in the support of H.

To gain more intuition about the underlying the structure of this mixed strategy equilibrium, it is helpful to consider the best responses of each candidate against policy choices made by his opponent. Consider, for instance the case where one candidate makes the perfectly populist choice of locating at the median voters ideal point $x_v = 0$. Given this choice by the opponent, the best response for the other candidate is to pander as much as possible to media subject to not destroying the media's credibility. This involves moving to the point $x = \Delta^*$ that is the best response to populism. But if one candidate locates at this best response to populism $x = \Delta^*$, then the best response for his opponent is to completely pander to the media and choose $x = x_m$. However, if one's opponent is located at x_m, then the best response to that is to move a distance greater than Δ^* toward's the median voter's ideal, i.e., choose policies in $[0, x_m - \Delta^*)$. This destroys the credibility of the media and leads the populist candidate to win for sure. But for any such populist policy choice $x \in [0, x_m - \Delta^*)$ by one's opponent, the best response is to once again pander to the media subject to maintaining the media's credibility, i.e., to choose the policy $x + \Delta^* \in [\Delta^*, x_m)$. The interplay between the conflicting tugs of media pandering and populism determines the mixed strategy equilibrium of Proposition 3.

Our next result characterizes a similar mixed strategy equilibrium for the case of media with extreme ideological bias, i.e., $x_m \geq 2\Delta^*$. As with the previous result, in the mixed strategy equilibrium there is policy divergence with strictly positive probability as well as policy convergence although never at the median voter's ideal policy. Unlike the previous result however, with an extreme media, policy convergence on the media's ideal policy also cannot occur.

Proposition 4 *Suppose $2\Delta^* \leq x_m$. There is a (symmetric) mixed strategy equilibrium where each candidate chooses a policy x according to the right continuous cdf $H : [-1, 1] \to [0, 1]$ given by*

$$H(x) = \begin{cases} 0 & \text{if } x < 0 \\ 1 - \exp[-\frac{x}{4\Delta^*}] & \text{if } 0 \leq x < \Delta^* \\ \exp\left[-\frac{2\Delta^* - x}{4\Delta^*}\right] & \text{if } \Delta^* \leq x < 2\Delta^* \\ 1 & \text{if } 2\Delta^* \leq x \end{cases} \tag{5}$$

where H has a single atom of size $\alpha_{\Delta^*} = 2\exp[-\frac{1}{4}] - 1$ at $x = \Delta^*$. In equilibrium, the expected policy choice of the elected candidate is equal to Δ^*.

Similar to the previous result, the mixed strategy equilibrium of Proposition 4 does not have support on $x < 0$ or $x > x_m$. However, it also does not have support on policies in the interval

$(2\Delta^*, x_m]$. The entire probability mass of H is contained in the convex interval $[0, 2\Delta^*]$ without a hole in the middle. In essence, regardless of the ideological bias of the media, the candidates face no incentives to deviate from the median voter's ideal policy and pander to the media by an amount greater than $2\Delta^*$ in the policy space.

The intuition behind is result is similar to the best response intuition provided for the previous result. If one candidate chooses the populist policy 0, then his opponent's best response is the pandering policy Δ^* that just maintains the credibility of the media. The best response to such pandering is more extreme pandering via the policy choice $2\Delta^*$ which is Δ^* closer to the media's ideal. However, the best response to $2\Delta^*$ is a flight to populism in the form of policy choices in the interval $[0, \Delta^*)$ that destroys the media's credibility and results in the populist candidate being elected. However, for each such policy choice $x \in [0, \Delta^*)$ by one's opponent, the best response is a policy $x + \Delta^* \in [\Delta^*, 2\Delta^*)$ that panders to the media by an extra amount Δ^*. When the media is more than $2\Delta^*$ away from the median voter, the conflicting tugs of populism and pandering lead to the mixed strategy equilibrium characterized by Proposition 4 in which the strategies depend only on the parameter Δ^* and not on the media's precise ideology x_m.

Propositions 2, 3 and 4 together characterize the equilibria of our game of electoral competition in the presence of an informed media with an endogenous partisan bias.[5] Notice that in all three cases the expected policy of the elected candidate equals Δ^*. While this is true with probability one when $x_m \leq \Delta^*$, the elected policy equals Δ^* only on average when $x_m > \Delta^*$ and the media is more extreme. Furthermore, when $x_m > \Delta^*$ the candidates often choose policy platforms that differ by more than Δ^*. In such cases, the media's partisan bias is too extreme and the media's information cannot be credibly communicated to the voters. The resulting information loss means that a more able candidate who is in fact preferable for all or a majority of voters may nevertheless lose the election to a less able but more populist candidate.

The possibility of such information loss raises the question whether an extreme media owner has an ex-ante incentive to be more moderate in its endorsements. We answer this question by asking whether a media owner has an incentive to delegate its endorsement strategy to an agent who is ideologically closer to the median voter. To model such delegation in the simplest possible manner, we suppose that at an ex-ante stage (i.e., before policy choices by the candidates), a media owner may commit to give access to its information to an editor and allow only the editor to send messages to the voters. The editor has the similar preferences to any other voter but with ideology x_e that may not be the same as x_m, the ideology of the media owner. The next result summarizes the effect of such delegation in our model.

[5] In the present draft we do not pursue the claim that this is the unique equilibrium even within the class that we focus on. However, given our selection rule, one can show that our equilibrium is the limit of the unique equilibrium on a finite policy grid, as the grid becomes sufficiently fine. See in particular Reny (1999).

Proposition 5 *Suppose at the ex-ante stage the media owner with ideology x_m can commit to delegate to an editor with ideology x_e. All media owners with $x_m > \Delta^*$ will prefer to delegate to an editor with $x_e = \Delta^*$, whereas media owners with ideology $x_m \leq \Delta^*$ will prefer not to delegate. When delegation is feasible, there is policy convergence and no information destruction and delegation is Pareto improving ex-ante.*

When $x_m > \Delta^*$ and there is no delegation, the media owner on average receives a policy equal to Δ^* but is sometimes unable to credibly convey its information. Delegation to an editor with ideology $x_e = \Delta^*$ leads to complete pandering by the candidates at that editor's ideal policy by Proposition 2. Therefore, the media owner does not lose in terms of the expected net effect on policy when it delegates. Because of policy convergence however there will be no [partisan conflict of interest between the editor and the voters. As a result, full disclosure will be credible and the less able candidate will never be elected. This benefits the media owner as well as all voters by avoiding the information destruction that would arise absent delegation. Of course, delegating to an editor with ideology $x_e < \Delta^*$ is not optimal for a media owner with ideology $x_m > \Delta^*$, since this only increases the distance between the media owner's ideal policy and the policy chosen by elected candidate without any offsetting gain in information aggregation. For the same reason, media owners with moderate ideology $x_m \leq \Delta^*$ will choose not to delegate.

While delegation mitigates the harmful effects of electoral competition by eliminating the possibility informational destruction, this still leaves open the question of the overall effect of the media on the welfare of voters. Our next results compares the welfare of the median voter across two cases. In the first case, there is no media so that both candidates locate at the median voter's ideal point in accordance with the median voter theorem. Because of the absence of the media, there is no information aggregation either so that the less able candidate gets elected as often as not. The lack of information aggregation is welfare reducing since the candidates are identical in terms of policy choice. We compare this case without the media with the case of an informed media that we have analyzed above. In doing so we suppose that the media can optimally delegate along the lines of Proposition 5. In such a case, candidates locate at either x_m or Δ^* whichever is smaller. Since candidates choose the same policies there is no conflict of interest between the media (editor) and the voters. As a result, there is full information aggregation and the more able candidate is always elected. Nevertheless, the next result shows that the presence of the media may make a majority of voters worse off.

Proposition 6 *The presence of the media makes a majority of voters worse off ex-ante iff $x_m > \frac{3}{4}\Delta^*$, even under optimal delegation.*

Proposition 6 shows that the presence of an informed media may have detrimental effects on the welfare of a majority of voters via its effect on the electoral promises made by office seeking

candidates as long the media is ideologically not too close to the median voter. In general there are two possible sources of this welfare loss. First, when the media's ideology is sufficiently extreme, there may be an information destruction effect. In balancing between the conflicting tugs of pandering to the media and to a majority of voters, the candidates may choose policy platforms that are too far apart. In such cases, the media loses all credibility and the media's information cannot be incorporated in the voter's decisions. This information destruction effect is however eliminated by optimal delegation by media owners as assumed Proposition 6. However, even when such delegation is feasible, a second effect remains that may be detrimental for the median voter's welfare. This effect arises from the incentive of each candidate to out do the other in pandering to the media. Such a race for the media's affection on the part of the candidates may lead to an overall migration of policy choices away from the median voter's ideal that is large enough to dominate the expected value of information the median voter obtains from the media.

5 Heterogenous Media

The results of the previous section point out that an informationally and ideologically homogenous media may have a distorting effect on elected policies away from the preferred policies of a majority of voters. In this section we ask how heterogeneity within the media, both in terms of ideology and information, may restore democracy (in the sense of the median voter theorem).

We turn first to the question of ideological heterogeneity. We maintain all our other model features and assumptions but suppose now that there are two media outlets with the same information θ_1, θ_2 but distinct ideologies x_{m1} and x_{m2}, $x_{m1} \neq x_{m2}$. For the present draft, we suppose also that all outlets provide their endorsements simultaneously. Our next result shows that ideological heterogeneity within the media may not be enough by itself to restore the median voter theorem, unless the outlets are on opposing sides of the media voter.

Proposition 7 *Suppose there are two media outlets with distinct ideologies x_{m1} and x_{m2} but the same information.*

1. *If $x_{m2} > x_{m1} > 0$, then the equilibria are identical to the case with the single media outlet that has the more moderate ideology x_{m1}.*

2. *If $x_{m2} > 0 > x_{m1}$, then it is an equilibrium for both candidates to locate at the median voter's ideal point and information is fully aggregated.*

The first part of the result says that ideological heterogeneity within the media has the effect of moderation when all outlets are ideologically conflicted relative to the median voter in the same direction. In essence, the median voter will listen to the most moderate outlet when the different outlets provide conflicting advice. As a result, the presence of the multiple media outlets all on the

same side of the median may lead to the median voter being worse off compared to the case where there is no media outlet at all.

The second part of Proposition **??** says that when different media outlets are ideologically conflicted in opposite directions relative to the median voter, then the median voter theorem is restored. When two such media outlets provide conflicting endorsements, it is in the interest of the median voter to listen to the outlet that favors the candidate that is closer to the median voter.[6]

A different kind bound on the power of a media outlet may arise when the outlet is not an informational monopolist. We provide a simple analysis of such a case now where a strategic media outlet faces competition from other heterogenous sources of information that is of independent value.

Suppose that there is a single media outlet with ideology $x_{m1} \neq 0$ as before but it only has information $\theta_1 \in [0,1]$ about candidate 1. A second media outlet with ideology $x_{m2} = x_v = 0$ has information about candidate $\theta_2 \in [0,1]$ that is stochastically independent of θ_1. We suppose as before that the two outlets speak simultaneously. Since the second outlet has the same preferences as the median voter, it discloses its information truthfully to the median voter or decision-maker. Strategic information transmission is therefore only a concern for the first ideologically biased media outlet. Our next result shows that at least in this special case the median voter theorem is restored.

Proposition 8 *Suppose that there is media outlet with ideology $x_{m1} \neq 0$ and information θ_1 and another with ideology $x_{m2} = 0$ and information θ_2. Then it is an equilibrium for both candidates to locate at the median voter's ideal point but information is not fully aggregated.*

We leave a fuller analysis of the effect of media heterogeneity on electoral competition for future drafts.

To be Completed

6 Discussion and Concluding Remarks

To be Completed

7 Appendix

Proof of Lemma 1.

Straightforward and therefore omitted.■

[6] Notice that the second part of the Proposition does not depend on relative distance of the two outlets from the median voter. This may be an artefact of the linear distance specification but we postpone such robustness exercises for future drafts.

Proof of Lemma 2.

Follows from the discussion in the text and therefore omitted.■

Proof of Proposition 1.

Follows from the discussion in the text and therefore omitted.■

Proof of Proposition 2.

TO BE ADDED.

Proof of Proposition 3.

We conjecture a right-continuous cdf H with support on $[0, x_m - \Delta^*) \cup [\Delta^*, x_m]$, possibly with atoms α_0 at $x = 0$, α_{Δ^*} at $x = \Delta^*$ and α_m at $x = x_m$, derivative h except at atoms. Let V^* be the equilibrium expected payoff for each candidate and $V^*(x)$ the payoff from a policy choice x in equilibrium. For $x \in (0, x_m - \Delta^*)$, the expected payoff is

$$\alpha_0 \frac{1 + x/3\Delta^*}{2} + \int_0^{x_m - \Delta^*} \frac{1 + (x-y)/3\Delta^*}{2} h(y)dy$$
$$+\alpha_{\Delta^*} \frac{1 + (x - \Delta^*)/3\Delta^*}{2} + \int_{\Delta^*}^{x+\Delta^*} \frac{1 + (x-y)/3\Delta^*}{2} h(y)dy + \int_{x+\Delta^*}^{x_m} h(y)dy + \alpha_m$$

Using the first-order necessary condition for a local maximum and simplifying we have

$$\frac{1}{6\Delta^*} H(x + \Delta^*) - \frac{2}{3} h(x + \Delta^*) = 0$$

or equivalently,

$$\frac{h(z)}{H(z)} = \frac{1}{4\Delta^*} \text{ for all } z \in (\Delta^*, x_m)$$

Integrating the last expression we obtain

$$H(z) = \exp[\frac{3k}{4} z + K_1];\ z \in (\Delta^*, x_m)$$

where K_1 is an arbitrary constant of integration. Since $\lim_{z \nearrow x_m} H(z) = 1 - \alpha_m$, we must have $K_1 = \ln(1 - \alpha_m) - \frac{3k}{4} x_m$ yielding in turn

$$H(x) = (1 - \alpha_m) \exp[-\frac{x_m - x}{4\Delta^*}];\ x \in (\Delta^*, x_m) \tag{6}$$

Similarly, for $x \in (\Delta^*, x_m)$, the expected payoff is

$$\int_{x-\Delta^*}^{x_m - \Delta^*} \frac{1 + (x-y)/3\Delta^*}{2} h(y)dy + \alpha_{\Delta^*} \frac{1 + (x - \Delta^*)/3\Delta^*}{2}$$
$$+ \int_{\Delta^*}^{x_m} \frac{1 + (x-y)/3\Delta^*}{2} h(y)dy + \alpha_m \frac{1 + (x - x_m)/3\Delta^*}{2}$$

Using the first-order necessary condition for a local maximum and simplifying

$$\frac{1}{6\Delta^*}(1-H(x-\Delta^*))-\frac{2}{3}h(x-\Delta^*)=0$$

or equivalently,

$$\frac{h(z)}{1-H(z)}=\frac{1}{4\Delta^*} \text{ for all } z\in(0,x_m-\Delta^*)$$

Integrating we obtain

$$H(z)=1-\exp[-(\frac{1}{4\Delta^*}z+K_2)];\ z\in(0,x_m-\Delta^*)$$

where K_1 is an arbitrary constant of integration. Since $\lim_{z\searrow 0}H(z)=\alpha_0$, we must have $K_2=-\ln(1-\alpha_0)$ yielding in turn

$$H(x)=1-(1-\alpha_0)\exp[-\frac{x}{4\Delta^*}];\ x\in(0,x_m-\Delta^*) \tag{7}$$

Next we consider the payoffs of policies $x=0$ and $x=\Delta^*$

$$V^*(0)=\alpha_0\frac{1}{2}+\int_0^{x_m-\Delta^*}\frac{1+(0-y)/3\Delta^*}{2}h(y)dy+\alpha_{\Delta^*}\frac{1+(0-\Delta^*)}{2}+\int_{\Delta^*}^{x_m}h(y)dy+\alpha_m$$

and

$$\begin{aligned}V^*(\Delta^*) &= \alpha_0\frac{1+\Delta^*/3\Delta^*}{2}+\int_0^{x_m-\Delta^*}\frac{1+(\Delta^*-y)/3\Delta^*}{2}h(y)dy\\ &\quad+\alpha_{\Delta^*}\frac{1}{2}+\int_{\Delta^*}^{x_m}\frac{1+(\Delta^*-y)/3\Delta^*}{2}h(y)dy+\frac{1+(\Delta^*-x_m)/3\Delta^*}{2}\alpha_m\end{aligned}$$

Since $V^*(\Delta^*)=V^*(0)$ this yields

$$\frac{1}{3}=\int_{\Delta^*}^{x_m}(1+\frac{y}{3\Delta^*})h(y)dy+(1+\frac{x_m}{3\Delta^*})\alpha_m$$

Integrating (by parts), using expression (6) obtained above and simplifying, this yields

$$\alpha_m=\frac{1}{2}-\frac{1}{4}\frac{x_m}{\Delta^*}$$

Notice $\alpha_m\in(0,1)$ since $x_m<2\Delta^*$.

Next consider the expected payoff from $x=x_m$

$$V^*(x_m)=\alpha_{\Delta^*}\frac{1+(x_m-\Delta^*)/3\Delta^*}{2}+\int_{\Delta^*}^{x_m}\frac{1+(x_m-y)/3\Delta^*}{2}h(y)dy+\alpha_m\frac{1}{2}$$

and compare with that from $x=\Delta^*$

$$\begin{aligned}V^*(\Delta^*) &= \alpha_0\frac{1+\Delta^*/3\Delta^*}{2}+\int_0^{x_m-\Delta^*}\frac{1+(\Delta^*-y)/3\Delta^*}{2}h(y)dy\\ &\quad+\alpha_{\Delta^*}\frac{1}{2}+\int_{\Delta^*}^{x_m}\frac{1+(\Delta^*-y)/3\Delta^*}{2}h(y)dy+\frac{1+(\Delta^*-x_m)/3\Delta^*}{2}\alpha_m\end{aligned}$$

Since $V(\Delta^*) = V^*(x_m)$ this yields

$$\frac{(x_m - \Delta^*)/3\Delta^*}{2} = \frac{1 + \frac{x_m}{3\Delta^*}}{2}\alpha_0 + \int_0^{x_m - \Delta^*} \frac{1 + (x_m - y)/3\Delta^*}{2} h(y)dy$$

Integrating (by parts), using expression (7) obtained above and simplifying, we obtain

$$\alpha_0 = 0$$

Finally, we must have

$$\begin{aligned} \alpha_{\Delta^*} &= \lim_{z \searrow \Delta^*} H(z) - \lim_{z \nearrow x_m - \Delta^*} H(z) \\ &= (2 - \alpha_m) \exp[-\frac{x_m - \Delta^*}{4\Delta^*}] - 1 \end{aligned}$$

Using the expression for α_m obtained above, it is easy to verify $\alpha_{\Delta^*} \in (0, 1)$ using $\Delta^* < x_m < 2\Delta^*$. The right continuity of H now yields that all policies in the support must yield the same expected payoff. Using Lemma 2 it is now straightforward to check that any policy $x < 0$ yields payoff strictly less than the policy $x = 0$, any policy $x > x_m$ does worse than the policy $x = x_m$ whereas any policy in $x \in [x_m - \Delta^*, \Delta^*)$ does worse than policy $x = \Delta^*$, all evaluated when playing against H. Computations also verify that the expected policy according to the strategy equals Δ^*, which equals the expected elected policy by symmetry.■

Proof of Proposition 4.

We conjecture a right-continuous cdf H with support on $[0, 2\Delta^*]$, with atom of size α_{Δ^*} at $x = \Delta^*$ and derivative h except at atoms. Let V^* be the equilibrium expected payoff for each candidate and $V^*(x)$ the payoff from a policy choice x in equilibrium.

The expected payoff from $x \in (0, \Delta^*)$ is

$$\begin{aligned} &\int_0^{\Delta^*} \frac{1 + (x - y)/3\Delta^*}{2} h(y)dy + \alpha_{\Delta^*} \frac{1 + (x - \Delta^*)/3\Delta^*}{2} \\ &+ \int_{\Delta^*}^{x + \Delta^*} \frac{1 + (x - y)/3\Delta^*}{2} h(y)dy + \int_{x + \Delta^*}^{2\Delta^*} h(y)dy \end{aligned}$$

Using the first-order necessary condition for a local maximum and simplifying we obtain

$$\frac{h(z)}{H(z)} = \frac{1}{4\Delta^*};\ z \in (\Delta^*, 2\Delta^*)$$

Integrating

$$H(z) = \exp[\frac{3k}{4}z + K_1];\ z \in (\Delta^*, 2\Delta^*)$$

where K_1 is the arbitrary constant of integration. Since $H(2\Delta^*) = 1$, we have $K_1 = -\frac{1}{2}$ so that

$$H(x) = \exp[-\frac{2\Delta^* - x}{4\Delta^*}], x \in (\Delta^*, 2\Delta^*]$$

Similarly, the expected payoff from $x \in (\Delta^*, 2\Delta^*)$

$$\int_{x-\Delta^*}^{\Delta^*} \frac{1+(x-y)/3\Delta^*}{2} h(y)dy + \alpha_{\Delta^*} \frac{1+(x-\Delta^*)/3\Delta^*}{2} + \int_{\Delta^*}^{2\Delta^*} \frac{1+(x-y)/3\Delta^*}{2} h(y)dy$$

Using the first-order necessary condition for a local maximum and simplifying we obtain

$$\frac{h(z)}{1-H(z)} = \frac{1}{4\Delta^*};\ z \in (0, \Delta^*)$$

Integrating

$$H(z) = 1 - \exp[-(\frac{3k}{4}z + K_2)];\ z \in (0, \Delta^*)$$

where K_2 is the arbitrary constant of integration. Since $G(0) = 0$, we obtain $K_2 = 0$ so that

$$H(x) = 1 - \exp[-\frac{x}{4\Delta^*}];\ x \in [0, \Delta^*)$$

Finally,

$$\begin{aligned} \alpha_{\Delta^*} &= \lim_{z \searrow \Delta^*} H(z) - \lim_{z \nearrow x_m - \Delta^*} H(z) \\ &= 2\exp[-\frac{1}{4}] - 1 \end{aligned}$$

The right continuity of H now yields that all policies in the support must yield the same expected payoff. Using Lemma 2 it is now straightforward to check that any policy $x < 0$ yields payoff strictly less than the policy $x = 0$, while any policy $x > x_m$ does worse than the policy $x = x_m$, all evaluated when playing against H. Computations also verify that the expected policy according to the strategy equals Δ^*, which equals the expected elected policy by symmetry.■

Proof of Proposition 5.

Follows from the discussion in the text and therefore omitted.■

Proof of Proposition 6.

When media is absent, both candidates choose policies $x_1 = x_2 = 0$ and the median voter learns no information about types θ. The expected payoff to the median voter in this case equals 0. In contrast, in the presence of the media and assuming optimal delegation, both candidates locate at $x_1 = x_2 = \min[\Delta^*, x_m]$. The median voter's expected payoff is then seen to be, using A2,

$$\frac{1}{2}E[\theta|\theta > 0] - \frac{1}{3\Delta^*}\min[\Delta^*, x_m] \leq \frac{1}{4} - \frac{x_m}{3\Delta^*} < 0$$

iff $x_m > \frac{3}{4}\Delta^*$.■

Proof of Proposition 7.

TO BE ADDED.

Proof of Proposition 8.

TO BE ADDED.

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