

Targeted political advertising and strategic behavior by uninformed voters

Donald Wittman

Received: 4 September 2006 / Accepted: 23 January 2007 / Published online: 11 April 2007
© Springer-Verlag 2007

Abstract We consider the case where political advertising is targeted to a subset of uninformed voters and show how pressure groups, candidates, and uninformed voters interact to achieve an equilibrium outcome. The paper accomplishes the following: (1) It derives the optimal behavior of those uninformed voters who do not received targeted campaign advertising. (2) It suggests that previous results may have exaggerated the power of pressure groups and political advertising—even when there is directed advertising, any negative effect is mitigated by strategic behavior of the uninformed. (3) In the limit, pressure group donations move the outcome toward the median voter, contrary to what much of the literature on pressure groups claims.

Keywords Pressure groups · Campaign donations · Political advertising · Candidate strategies

JEL Classification 72

1 Introduction

In this paper we consider the case where truthful political advertising is targeted to a subset of uninformed voters and show how pressure groups, candidates, and uninformed voters interact to achieve an equilibrium outcome. Surprisingly, there has been very little research that considers truthful advertising in the context of electoral equilibrium. Most of the work dealing with political advertising assumes either that uninformed voters are impressionable (they merely respond positively to advertising

D. Wittman (✉)
Economics Department, 401 Engineering 2, University of California, 1156 High Street,
Santa Cruz, CA 95064, USA
e-mail: wittman@ucsc.edu

dollars) or that the amount of advertising is a signal of quality (there is no content to the advertising). Papers that do consider truthful advertising often assume that all uninformed voters have the same likelihood of receiving the political advertisement (see Coate 2004; Wittman 2006, 2007, for recent examples). But in real life this is not the case as political leaflets are directed to those voters sympathetic toward the candidate. Members of the National Rifle Association (but not members of gun control organizations) receive information from candidates opposing gun control, while members of environmental groups receive information from pro-environment candidates. Those few papers that deal with directed advertising typically do not consider the counter-strategy by the uninformed. For example, Grossman and Helpman (1999) argue that when information can be privately directed to groups on the right, then the rightwing candidate will move right because rightwing voters will be more informed and sensitive to the moves of the candidates than leftwing uninformed voters. Grossman and Helpman do not discuss any counter strategies that those on the left might be able to undertake. As another example, Bailey (2002) considers the case where candidates target their advertising towards favorable voting blocs, but he too does not consider strategic behavior by those voters in non-targeted voting blocks.¹ Besides the present paper, the only other paper dealing with how the uninformed might respond when advertising is directed towards others is Schultz (2007), but his paper has a different focus and set up. His paper does not deal with pressure groups, but instead is concerned with the distribution of income among groups. Furthermore, in his paper, candidates are policy oriented while in this paper candidates are only interested in winning. Finally, in his paper the candidates have the same campaign resources to spend on advertising. In this paper, we consider the case where the candidates have unequal resources.

When a model does not allow for non-targeted uninformed voters to have counter-strategies, the model exaggerates any possible negative consequences of pressure group contributions. To illustrate the importance of counter-strategies, consider the extreme case where there are only uninformed voters and one pressure group representing the interests of less than a majority of voters—say, the National Rifle Association. Suppose that R is closer than D is to the NRA's position on assault rifles. So R , supported by contributions from the NRA, contacts subscribers to rifle magazines and members of gun clubs and informs them that the NRA endorses R —that is, R is to the right of D on gun control, where right means less control. The remaining voters do not know where the candidates stand on this issue. Assume first (like the aforementioned authors do) that those uninformed voters who are not contacted do not have a counter-strategy, and therefore they either vote for candidate R with probability $1/2$ or abstain. As a result R wins the election. This paper suggests that non-targeted uninformed voters can have a counter-strategy. In the extreme case where all the untargeted uninformed voters know both that candidate R has a big campaign chest and that R has not contacted them, the non-targeted uninformed voters can infer that D is closer to their own position. They therefore vote for D and D wins the election.

¹ Now voters may also base their decision on valence issues—non-ideological issues valued by all voters. But in this case, the advertising would not have to be targeted. It would be public.

Knowing that this would happen, the NRA and/or candidate R would undertake a different strategy in the first place.

In a nutshell, this paper provides the following insights: (1) Uninformed voters need not be passive; instead, uninformed voters can undertake strategic behavior. (2) Previous results may have exaggerated the power of pressure groups and political advertising—even when there is directed advertising, any negative effect may be mitigated by strategic behavior of the uninformed. (3) In the limit, pressure groups contributions move the outcome toward, not away from, the median voter. The role of pressure groups is much more positive than popular opinion and previous academic literature suggests.

The paper is divided into four sections. In the first section, a simple basic model is presented. In the second section, the equilibrium results are derived. These two sections provide the underlying logic in a readily accessible way. The third section analyzes the outcome under more realistic conditions. The fourth section is the conclusion.

2 The basic model

We start off with the assumptions of the model. In general, we choose assumptions that maximize the power of the pressure group vis-à-vis the candidates and voters. These assumptions have also commonly been employed in the literature. If we can demonstrate that the pressure group moves the outcome toward the median voter under this worst-case scenario, we have a very strong result.

1. Let X be a one-dimensional issue space scaled to $[0, 1]$. x is an element of X . Candidate R 's position is denoted by r , and candidate D 's position is denoted by d .
2. Candidate R maximizes and candidate D minimizes S_R , R 's expected vote *share*.
3. A rightwing pressure group, P^R , has utility equal to $P^R(r) - C_R$ if R wins and $P^R(d) - C_R$ if D wins. $P^R(x)$ is a strictly concave function of the winning candidate's position with a maximum at 1. C_R is the amount that the rightwing pressure group donates to candidate R 's advertising campaign.²

For now, we will assume that P^R has sufficient funds to enable it to increase its donation until the marginal benefit from improved electoral outcome equals the marginal cost of C_R , and that this point is not reached until all of the uninformed voters who would prefer R if informed are contacted. Such an assumption maximizes the power of P^R . Later, we will amend this assumption to account for the possibility that not all voters who would be sympathetic to the candidate are contacted and that some voters who are not sympathetic to the candidate are. For mathematical clarity, we initially assume that there is one pressure group on the right. When there is one pressure group, the power of the pressure group is maximized because there is no competition among pressure groups. Later we will consider the possibility that there are two pressure groups.

² We label one candidate D and the other R so we can keep track of which candidate we are discussing. Alternatively, we could define R as being whichever candidate is being offered campaign funds.

4. Following Baron (1994), we assume that there are two types of voters—informed and uninformed. The median of the informed voters is M_I . Informed voters know the positions of the candidates even in the absence of advertising. The median of the uninformed voters is M_U . In the absence of advertising, uninformed voters do not know the relative positions of the candidates. That is, in the absence of advertising the uninformed voters do not know which candidate is to the left of the other candidate. They neither know the preference of the median voter nor observe poll data. We assume that, in the absence of political advertising, the uninformed do not have any of this information because, if they did, they might be able to infer the relevant information about the candidate positions and be informed. As a consequence, political advertising would be irrelevant. Political advertising informs the voter where d and r are located.
5. $f^i(x)$, voter i 's utility from implemented policy, is a symmetric strictly-concave function of the winning candidate's position with a maximum at the voter's most preferred position.

An informed voter votes for the candidate whose position is closest to the voter's own preferred position. If the informed voter is indifferent between the candidates' positions, then the voter votes for each candidate with probability equal one-half.³

Uninformed voters have the following lexicographical preferences: an uninformed voter prefers the candidate whose position is closest to the voter's own preferred position (and will vote for this candidate if the voter either is told which candidate is closest or can infer it). If the two candidates have identical positions and R has provided the relevant information to the uninformed voter, then the grateful uninformed voter will vote for R . Otherwise, the uninformed voter is indifferent when the candidates have identical positions and will vote for each with probability = 1/2.⁴

6. The uninformed voters know which candidate is doing more advertising (later we relax this assumption). In this section we assume that only R is advertising and that the uninformed know this to be the case. In the United States and some other countries, campaign contributions are public. Contributions are a cardinal number and it is relative easy to compare the amount of contributions in contrast to knowing which candidate's platform is closest to the voter's preferred position.
7. The candidates and the pressure group know the preferred position of each voter (this assumption is relaxed later in the paper). Assuming that the pressure group knows the voters' preferences means that the vote-maximizing candidates cannot take advantage of private information. Again such an assumption increases the power of the pressure group.

The sequence of moves proceeds as follows:

- (a) P^R makes a one time take-it or leave-it offer to R that the pressure group will donate C_R for campaign advertising in return for the candidate taking position r^* . Having the pressure group make the offer to a candidate rather than having the

³ We could also allow some proportion of the informed voters to abstain.

⁴ We could allow for some proportion of indifferent uninformed voters abstaining. We could also allow for otherwise indifferent uninformed voters voting for R with probability p where $0.5 < p \leq 1$.

- candidate make an offer to the pressure group, increases the power of the pressure group. This assumption provides a “worst case” scenario.
- (b) Candidate R chooses whether to accept the offer or choose another position. D observes R 's choice and then chooses d .⁵ At the end of this stage both candidates know each other's position. If R has rejected the offer, then the pressure group is out of the picture.
 - (c) If R has accepted the offer, then pressure group donations will be used to provide truthful advertising (regarding both d and r) to all those uninformed voters who weakly prefer r^* .⁶ Those (originally) uninformed voters who receive truthful advertising become (newly) informed voters. The remaining uninformed voters know that they have not been contacted.
 - (d) The voters vote or abstain (to simplify the accounting, we will assume that the voter votes if indifferent). The winning candidate's election platform is implemented.

3 Equilibrium strategies

We will now show that if the median of the uninformed voters is to the right of the median of the informed voters, then the pressure group will choose $r^* = M^*$, the median over all voters. R will accept the offer and win the election. If the median of the uninformed voters is to the left of the informed voters, then R will not accept any r^* that the pressure group would like to make.

Proposition 1 *Given the above conditions:*

- (i) *If R rejects the offer, then $r = M_I$. Both candidates will have a 50% chance of winning the election.*
- (ii) *If $M_U > M_I$, then $r^* = M^*$. R will accept the offer and win the election.*
- (iii) *If $M_U < M_I$, then R would reject any offer that the pressure group might want to make.*

Proof (i) If R rejects the offer or no offer has been made in the first place, then the candidates are in a pure Downsian world and both candidates will be at the median preference of the informed voters (M_I). Informed voters will vote for each candidate with probability 1/2. Uninformed can infer that the candidates are identical and will either vote for each candidate with probability 1/2 or abstain. Thus both candidates will have a 50% chance of winning and an expected vote share of 50%.

- (ii) We next consider the case where there is political advertising. All of the *originally* informed voters will vote for the candidate that they prefer. All of the *newly informed* voters (who were originally uninformed but are now informed by targeted political advertising) will vote for the candidate that they prefer.

How should the remaining uninformed voters act in this situation? Only one candidate (candidate R) is advertising. By assumption, the uninformed voters know which

⁵ This sequential assumption allows for a faster and more intuitive proof of the basic model.

⁶ See Lupia and McCubbins (1998) who show how truthful information is conveyed during campaigns. Later we will allow for untruthful advertising.

candidate this is. Suppose that this advertising goes to all of the voters who prefer the candidate doing the advertising (below we show this to be the case). The uninformed voters know the model. They know that all of the voters who prefer candidate R have received truthful advertising from the candidate. Therefore, if the advertising has not been directed towards them, they can infer that they should prefer candidate D , who is not doing the advertising. Hence, *all* of the uninformed voters are fully informed and will vote according to their preferences.

If R rejects an offer, then both candidates will have a 50% chance of winning. R will only accept an offer from the pressure group if R does at least as well by doing so. We have assumed that each candidate is only interested in maximizing his/her expected vote share. If R were to accept an r^* strictly to the right of M^* , the median overall, then D would win with certainty by choosing halfway between r^* and M^* .⁷ All of the originally informed and newly informed voters weakly to the left of M^* plus some of the voters between M^* and r^* would vote for D . This is greater than a majority of voters. Therefore D would win the election. R would be better off by not accepting such an offer in the first place. Therefore R would reject any $r^* > M^*$.

On the other hand if $r^* = M^*$, then the expected vote share for R would be greater than $1/2$. The reasoning is as follows: Suppose first that D chooses $d < M^*$, then R would advertise to all of the uninformed voters weakly to the right of M^* (as well as those uninformed voters between d and r^* who preferred r^*). R would win the election with certainty by capturing more than 50% of the votes (all voters weakly to the right of M^* plus those voters between d and r^* who prefer r^*). If D were to set $d = M^*$, then R would advertise to all of the uninformed voters. By assumption, all of the originally uninformed voters would vote for R . All of informed voters would vote for R with probability equal to $1/2$. So the probability of R winning the election would be greater than $1/2$ but not certain. Therefore R would accept the offer of $r^* = M^*$ (and D would choose $d = M^*$, as well, if this were better for D than being slightly to the left). Since the pressure group wants the winning position to be as far right as possible, the pressure group will set $r^* = M^*$ if $M^* > M_I$ (which we have assumed)

Given our assumption about the marginal benefit of advertising, P^R and R will want to target advertising to all uninformed voters who prefer R (thereby turning these voters into newly informed voters), because otherwise these voters would vote against R . In our basic model (but not in the general model) the contrary situation, directing advertising to voters who prefer D , is not so costly as these voters would vote for D whether they received truthful directed advertising or not. Of course, there is an additional monetary cost of doing so and therefore this is unlikely to happen unless the candidate has made a mistake (see below).⁸

Of course, if $M^* < M_I$, then the pressure group would not set $r^* = M^*$. However, R would not accept any offer r^* not equal to M^* if one were to be made. \square

⁷ Because the candidates are maximizing the share of votes, D would want to move even closer to (but not equal to) r^* . However, as will be seen, this opportunity will not arise since R would not agree to such an r^* in the first place.

⁸ R neither gains nor loses votes when informed voters are contacted. Given equilibrium beliefs, the candidate would not accept inadequate donations that led to more votes being lost because of voter counter-strategies than votes gained through targeted advertising.

Fig. 1 Voter preferences and candidate positions

				U
				U
				U
				U
	I		U	U
	I		U	U
	I		U	U
	I		I	U
	I		I	U
	I	I	I	I
	1	M_I	3	M^*
				5

All of this is illustrated in Fig. 1. If there is no targeted advertising, then both candidates will be at the median of the informed voters, M_I , and each candidate will have a 50% chance of winning. If every uninformed voter who doesn't strictly prefer D over R is targeted by R and all uninformed voters act strategically, then R will be at M^* , the median overall, and win the election. If D is at position 3, then R will get 13 votes and D will get 10. If D chooses M^* also, then R would get 12 votes for certain from all of the otherwise indifferent uninformed voters who vote for R based on their lexicographic preferences and on average half the votes from the 11 informed, but indifferent, voters. If D were to choose position 5, then R would win with 14 votes to D 's 9. If R had chosen position 5 and D had chosen M^* , then D would win with 15 votes to R 's 8.

We have shown that if there are no pressure groups and there is no targeted advertising, then both candidates are at M_I , the median of the informed voters, and if there is targeted advertising, then the winning candidate is at M^* , the median overall.⁹ If M_I is not equal to M^* , then pressure group donations improve the welfare of the median uninformed voter and the median voter, overall. Although the pressure group faces no competitors and advertising is directed only towards those who prefer the candidate, strategic voting by the uninformed results in improved welfare for the median voter. In return, the pressure group gains a preferred policy (when $M^* > M_I$). And, as already noted, if $M^* < M_I$, then there will be no campaign contributions by the pressure group because R will reject any offer that P would want to make. So, contrary to popular opinion and much of the academic literature, pressure group donations aid the political process rather than hinder it.

It is useful to see whether there are any other equilibria. We have already shown that if the pressure group tells the truth to the uninformed voters, and uninformed voters who have not been targeted but know that targeted advertising has taken place believe this to be the case, then there will be only one equilibrium. Off the equilibrium path, the pressure group could choose not to target voters and the uninformed could choose to not pay attention to any advertising (whether they were targeted, or not). But such an equilibrium would not be sequentially rational. If there were campaign donations and advertising, such beliefs would not be upheld. One could also imagine a situation where political advertising was always dishonest, and all the uninformed

⁹ Indeed, if all of the uninformed voters act strategically, there is no need to target advertising in the first place (but of course not all uninformed voters act strategically, a point we will come to in the next section).

voters believed that this was the case. The equilibrium outcome would be the same (R would lie and tell the subscribers to the gun magazines that R was further away than D from the NRA's position, and the readers of the magazine would not believe it, and vote for R).

Extending one-dimensional results to two or more dimensions requires strong assumptions regarding the distribution of voters' preferences. Plott (1967) showed that the distribution of voter preferences must be radial symmetric for a voting equilibrium to exist when voters' utilities are a function of the Euclidean distance from their most preferred position. In this case, radial symmetry must hold for both the set of informed voters and the set of all voters. When these conditions hold, the argument follows along the lines of the one-dimensional case. This is demonstrated in the Appendix, where we consider two dimensions.

It is useful to provide a concrete example to illustrate the results. Suppose that there is a uniform distribution of all voters divided as follows: a uniform distribution of uninformed voters between 0 and 10; a uniform distribution of informed voters between 10 and 40; and a uniform distribution of uninformed voter between 40 and 100 (we assume that the probability function is a horizontal line). In the absence of political advertising, the winning position would be at 25, the median of the informed voters. If the pressure group's most preferred position were to the right of 50 and uninformed voters acted strategically, then political advertising would lead to the winning position being at 50. If the pressure group's most preferred position were at 0 and uninformed voters acted strategically, the pressure group would do nothing.

Suppose however that the uninformed did not act strategically and instead abstained. If the pressure group were on the extreme left and the non-targeted uninformed abstained rather than acting strategically, then the pressure group would offer $d^* = 20$, D would target its advertising to the uninformed to the left of 10, and D would win. Or if the pressure group were on the extreme right, then R would agree to $r^* = 70$ and win the election. So we see that ignoring the strategic behavior of the uninformed may be very misleading if the uninformed do indeed act rationally and strategically. Note however in the last example, that $r^* = 70$ is closer to $M^* = 50$ than $M_I = 25$ is.

To summarize our basic results: targeted political advertising informs the uninformed even if they do not receive any of the targeted advertising. As a result, targeted advertising shifts the outcome away from the median informed voter towards the median overall, as long as the non-targeted uninformed voters act strategically.

4 Extensions

We started with the basic model in order to develop the underlying intuition. In this section, we consider some extensions.

1. *Voters may be mistaken in their inferences.* In the basic model we assumed that uninformed voters who do not receive targeted advertising from R always vote for D . Suppose instead that the probability that the *non-targeted uninformed* voter votes for D is characterized by the following function: $V = v(C_R)$, where $v(0) = 0.5$ and $v' \geq 0$. If $v = 0.5$ for all values of C_R , then non-targeted uninformed voters do not act strategically. This functional form allows for the possibility that some

proportion of uninformed voters do not engage in strategic behavior. This functional form also captures the possibility that those uninformed voters who do engage in strategic behavior may be wrong in their inference; that is, they think D has the campaign funds, not R . However, the larger the campaign funds that R has, the less likely the voter will make such a mistake. Note that the error rate is not perverse with the voter being more often wrong than right; if the error rate were perverse, then a rational voter would instead want to vote opposite of his beliefs. Note also that this function is just the opposite of the usual formulation as the more money the candidate has, the more likely the *untargeted uninformed voter* will vote for the other candidate. This is because, other things being equal, the more money a candidate has, the more uninformed voters targeted, and the more likely that the candidate has not targeted the uninformed voter because the candidate believes that the voter prefers the other candidate.

If voters make mistakes and/or the voters do not always vote strategically, then the outcome will be pulled toward the right. Recall that in the basic model, untargeted uninformed voters could infer that they preferred D ; as a result, all voters were equally informed and therefore the outcome was at the median of *all* voters. Now some untargeted uninformed voters are mistaken in their inference; while other voters do not vote strategically. This means that the winning position, r^* , will be to the right of M^* , the median voter overall. However, even in this situation the outcome may be closer to the median than if there were no pressure group and the outcome was at the median of the informed voters, instead.

2. *There may be imperfect screening.* A candidate will try to contact only those voters who prefer the candidate, but will not be completely successful in that regard. In particular, w^* percent of the voters contacted will prefer the other candidate and therefore vote for the other candidate, something that might not have happened if they had not been contacted. Campaign staffs undertake all kinds of methods to avoid contacting antagonist voters (this includes getting lists of those who have supported similar candidates in the past, undertaking phone surveys, etc.). But screening is imperfect and as we will see below, the benefits of screening have to be balanced against its costs. We assume that (in the absence of lying to the targeted voter) errors are not perverse with $w^* < 0.5$.

3. *The candidate may not contact all of the voters who prefer the candidate.* In particular z^* percent of the voters who do prefer the candidate will not be contacted. There are two reasons for this: (a) tradeoffs and (b) limited resources. Candidates face a tradeoff between two types of errors: (1) not targeting those uninformed voters who prefer the candidate and (2) targeting those uninformed voters who prefer the other candidate. At some point the marginal benefit from contacting uninformed voters who prefer the candidate equals the marginal loss from contacting uninformed voters who prefer the other candidate but would have mistakenly voted for the candidate if the candidate had not informed them.¹⁰ Limited campaign resources may also reduce the

¹⁰ If all uninformed voters acted strategically and never made a mistake, there would be no loss of votes in contacting an uninformed voter who prefers the other candidate as such voters would vote for the other candidate in any event. However, if untargeted uninformed voters make mistakes or do not always act strategically, then there is a vote loss in targeting voters sympathetic to the other party.

ability of the candidate to target advertising to all those uninformed voters who prefer the candidate. There are decreasing returns in contacting those uninformed voters who prefer the candidate. The production function is likely to be strongly concave so that it is either impossible to contact all of the desired uninformed voters with any finite amount of funds or, at the margin, the pressure group finds better use of its money elsewhere.¹¹

Points 2 and 3 consider the possibility that the candidate cannot identify partisans perfectly so that the candidate might mistakenly contact some uninformed voters who prefer the other candidate or not contact those who prefer the candidate. Taking this assumption into account, we first find the effect when uninformed voters behave strategically and then when they don't act strategically.

If all uninformed voters act strategically but R is unable to contact all of those uninformed voters who weakly prefer R , then: (1) R may lose even when $r^* = M^*$ and therefore R will not accept the pressure group offer in the first place. (2) If R accepts a pressure group offer, then r^* must equal M^* .

We start with the last point first. We have shown in Proposition 1 that if all of the uninformed who weakly prefer R are contacted and R accepts the pressure group's offer, then $r^* = M^*$. If $r^* \neq M^*$, then D would win with certainty. When R is not able to contact some voters who weakly prefer R , these voters will vote against R . So for any pair of policies (r, d) , R will do worse than if he had been able to contact all of the uninformed who weakly prefer R to D . Therefore, R will lose by an even bigger margin than before if $r^* \neq M^*$. Even when $r^* = M^*$, R might not be able to win if enough uninformed incorrectly vote against R .

It is useful to look back at Fig. 1. If R is only able to contact seven uninformed voters, then R would not accept donations from the pressure group because R would always lose. Suppose for example that R agreed to M^* , then D would win by choosing 3. R would get four votes from the informed voters who are weakly to the right of M^* and seven votes from those uninformed voters weakly to the right of M^* who are contacted. But the three uninformed voters strictly to the left and the two uninformed voters (weakly) to the right of R but who are not contacted and therefore do not know that they are to the right, will vote against R , as well as the seven informed voters strictly to the left of M^* . Note that voting against R makes sense for the uninformed voters who are not contacted. They do not know where they stand in relationship to the candidates, but the probability that an uninformed voter, who is not contacted, prefers D is $3/5$.¹² If eight uninformed voters could be contacted, then $r^* = M^*$ would be a winning position.

We next consider the effect of not targeting all of the uninformed voters (who would prefer R if informed) when untargeted uninformed voters do not behave strategically and instead abstain. If candidate R made no mistakes, then r^* would be that point where all the voters on the right, both informed and originally uninformed (but

¹¹ However, a strategic uninformed voter should still vote for the other candidate even if there is a chance that this is a mistake as long as this mistake is less likely than the contrary mistake of not voting for the other candidate.

¹² Note that probability matching (voting for R one third of the time) is neither feasible (as it requires too much information) nor desirable from the point of view of the uninformed voter.

now informed because of targeting) equaled the number of informed voters on the left. In general, this would enable R to be considerably to the right of the median voter overall. Now, because of mistakenly informing some of the voters who prefer D and not informing all voters who prefer R , r^* will move back somewhat toward the median voter. If some portion of the uninformed voters acts strategically, then the benefit to the candidate doing the targeted advertising is reduced further. Overall, imperfect targeting moves the outcome to the left, while a reduction in strategic voting by the uninformed moves the outcome to the right (when the pressure group is on the right).

4. *Advertising might not be truthful.* So far we have assumed that targeted advertising is honest. But it may not be. There are many potential ways of modeling such a situation. One way that leads to an immediate dead end is to assume that uninformed voters cannot distinguish between truthful and non-truthful advertising. Under such circumstances, rational uninformed voters would not pay any attention to such advertising. And consequently, pressure groups and candidates would not be willing to underwrite the cost of political advertising in the first place. A more promising approach is to assume that the uninformed voter can detect a lie with greater than 50% probability,¹³ and when he or she does, she votes for the other candidate (after all if the voter really preferred the candidate doing the advertising, there would be no need to lie).

Suppose, contrary to the above argument, that uninformed voters were completely stupid so that targeted advertising could persuade them to vote for the candidate even if the other candidate was closer to the voter's most preferred position. This is the essence of models by Grossman and Helpman (1996) and others, where the more money spent on advertising, the more likely the uninformed will vote for the candidate (even if it is not in the voter's own interest to do so). Suppose that more than 50% of the voters were uninformed, then in the limit (where advertising was perfectly effective), the winning outcome, r^* , would be at the pressure group's most preferred position. But, as already noted, this result depends on the uninformed voters being stupid. If uninformed voters can detect lies, albeit imperfectly, then r^* will not be so extreme.

5. *There may be two pressure groups with opposing interests.* In the basic model, there was only one pressure group. Suppose now that there are two opposing pressure groups: (1) P^L whose most preferred position is at the extreme left and who donates to D ; and (2) P^R whose most preferred position is at the extreme right and who donates to R .¹⁴

When untargeted uninformed voters do not behave strategically and only R has campaign funds, then, as we have shown, r^* can be strongly to the right of M^* . However, if D also has campaign funds, then the outcome is likely to be close to M^* even if the pressure group on the left has significantly fewer funds than the pressure group on the right. We can identify two separate reasons: (a) the returns to advertising are strongly concave, and (2) the candidate with fewer funds need not undertake costly targeted-advertising. To illustrate, suppose that there are only uninformed voters, who

¹³ If the uninformed voter had less than a 50% chance of detecting a lie, the best strategy for the uninformed voter would be to vote against his beliefs.

¹⁴ See Baron (1994) for a similar framework.

are uniformly distributed on $[0, 1]$, and that these voters do not vote strategically.¹⁵ If there is only one pressure group, P^R , then, as we have already shown, r^* will be strongly to the right. Now let P^L enter the picture. Even if P^L can only contribute half as much to L as P^R can to R , the decreasing returns implies that there will be a relatively small differential in the number of uninformed voters that are contacted. Turning to the second point, if general advertising (newspaper, radio and television)¹⁶ is less expensive than targeted advertising, then L can contact all voters through *general* advertising. This is a good strategy whenever more voters prefer L , and the desirability of this strategy increases, the fewer the voters there are who actually prefer R . Hence even if D has significantly fewer funds, these funds can be very effective. And the further to the right beyond M^* that R is, the more effective these funds will be. If targeted advertising is cheaper than general advertising, then the more funds that D has, the more uninformed voters on the left will be targeted by D , and the less need for strategic behavior by untargeted uninformed voters as fewer uninformed voters will remain untargeted. When both candidates have roughly equal funds, both the need for and the likelihood of strategic voting by the uninformed is reduced. Seen from the opposite perspective, strategic voting is most likely when one candidate has significantly greater funds. Finally, if targeted advertising can be dishonest, then when both sides target the same voter, the more likely the voter will arrive at the truth and the less payoff to dishonesty.

5 Concluding remarks

We have modeled the case where politicians target their advertising to those uninformed voters who are likely to be sympathetic to the politician's policies. However, uninformed voters who do not receive targeted advertising can still act strategically. Consequently, the effect of targeting is mitigated, and, in the limit, the outcome is the same as if all voters were completely informed. The implications go far beyond the details of this particular model. Uninformed voters who understand the political process can make rational inferences and undertake strategic responses to candidate and pressure group choices even when these choices are intentionally hidden from the uninformed voter.

If one is interested in modeling political phenomena, one typically starts with elections because the rules of the game are clearly established—e.g., each person has at one vote, the candidate with the most votes wins, etc. But the ideas in the model presented here can be applied to more general political situations. As Grossman (1991) has shown, groups may gain wealth through predation as well as through production. Pressure groups can be seen as the predatory aspect of groups that engage in productive behavior in non-political venues. But as Grossman has also shown, there are counter strategies by others. Here we have analyzed the counter strategy by the uninformed.

¹⁵ If some uninformed voters acted strategically, then both candidates would have to take into account the strategic response of non-targeted voters to their increased campaign chest.

¹⁶ Even here, some political advertising is targeted when advertising occurs during shows with specific demographic factors.

The analysis in this paper thus might be fruitfully applied to other areas of conflict that do not involve voting per se.

Appendix

In this appendix, we extend some of the results of Proposition 1 to two-dimensions. We make the following substitute assumptions:

(1') Let (x, y) be a two-dimensional issue space, where (x, y) is a element of $\{X, Y\}$. The set of *all* voters is distributed uniformly within a circle with center $(0, 0)$; that is, $M^* = (0, 0)$. The set of voters is divided into two sets: uninformed voters and informed voters. We assume that the set of informed voters is uniformly distributed in a smaller circle, with center M_I , somewhere within the larger circle.

(3') We assume that pressure group P 's most preferred position is $(1, 1)$ on the edge of the circle. $U_P(\|(x^i, y^i) - (1, 1)\|) - C_R$ is the pressure group's utility when candidate i has won the election and P has donated CR to candidate R 's campaign. $U_P(\cdot)$ is a strictly decreasing function of the Euclidean distance (denoted by $\|\cdot\|$) between the pressure group's most preferred position and the winning candidate's position. That is, the pressure group has circular indifference curves over policy. We assume that CR is sufficiently large to enable R to target all uninformed voters who prefer R to D .

(5') Let (\hat{x}_j, \hat{y}_j) be voter J 's most preferred position. Voter J 's utility, $U_j(\|(x^i, y^i) - (\hat{x}_j, \hat{y}_j)\|)$, is a strictly decreasing function of the Euclidean distance from voter J 's most preferred position to the winning candidate's position. The voter's lexicographic preferences are the same as before.

How should a voter respond when he/she gets targeted information from the candidate on one issue but not the other? The argument here is that the voter should assume that the candidate is worse on the missing issue; otherwise, the candidate would have informed the voter. Also, the voter should assume that the voter prefers the other candidate overall, otherwise the candidate providing the information would have provided all the requisite information. So from here on out, we will assume that the candidate provides the information on both dimensions if the candidate provides any information to the voter.

We first note that if there are no campaign advertisements, then both candidates will be at M_I , the median of the informed voters. There is a median because we have assumed a uniform distribution of informed voters within some circle.

Proposition 2 *Given the above assumption, if r^* is accepted, then $r^* = (0, 0)$.*

Proof Suppose that $r^* \neq (0, 0)$. If R were to accept the offer, then D would win by choosing $(0, 0)$. The logic is as follows. There is a hyperplane through $(0, 0)$ and perpendicular to the line through r^* and $(0, 0)$ that bisects the large circle in two. The voters in the half-space that does not include r^* will vote for d (this includes informed voters and untargeted uninformed voters who infer that they should vote for D). This is half of all voters. In addition, the voters in the space between that hyperplane and the one parallel to it halfway to r^* from $(0, 0)$ would vote for D . So D would win the election with certainty. There might be other positions that would be even more advantageous for D . So R would not accept the offer in the first place, thereby increasing

her probability of winning from 0 to 50%. It is easy to show that if $r^* = M^* = (0, 0)$, then R will win if she accepts the offer. If D chooses another point besides M^* , then D will lose by the same logic as used above. If D chooses M^* , then otherwise indifferent voters will vote for R and again R will win with certainty. Of course, the pressure group will only make such an offer if $(0, 0)$ is closer to $(1, 1)$ than M_I is to $(1, 1)$. \square

The logic can readily be extended to higher dimensions.

Acknowledgements I would like to thank the participants at the conference honoring Herschel Grossman and a referee for helpful comments.

References

- Bailey M (2002) Money and representation. Georgetown University working paper
- Baron DP (1994) Electoral competition with informed and uninformed voters. *Am Polit Sci Rev* 88:33–47
- Coate S (2004) Political contributions with campaign contributions and informative advertising. *Am Econ Rev* 98:624–655
- Grossman HI (1991) A general equilibrium model of insurrections. *Am Econ Rev* 81:912–921
- Grossman GM, Helpman E (1996) Electoral competition and special interest politics. *Rev Econ Stud* 63:265–286
- Grossman GM, Helpman E (1999) Competing for endorsements. *Am Econ Rev* 89:501–524
- Lupia A, McCubbins M (1998) *The democratic dilemma: can citizens learn what they need to know?* Cambridge University Press, Cambridge
- Plott C (1967) A notion of equilibrium and its possibility under majority rule. *Am Econ Rev* 57:787–806
- Schultz C (2007) Strategic campaigns and redistributive politics. *Econ J* (forthcoming)
- Wittman D (2006) Pressure group endorsements and political advertising. University of California, Santa Cruz, Department of Economics Working paper
- Wittman D (2007) Candidate quality, pressure group endorsements, and uninformed voters. *Eur J Polit Econ* (forthcoming)