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Candidate quality, pressure group endorsements and the nature of political advertising

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Abstract

Candidates may vary in quality, where quality is some characteristic orthogonal to policy. This "simple modification" has for the most part defied integration into the Downsian framework. Here we add the following complicating factors. We consider the possibility that there are uninformed voters who are ignorant of the candidates' relative quality. However, a pressure group with inside information regarding the quality of the candidates may endorse one of the candidates as the high-quality candidate. We assume that the uninformed voters behave rationally in the presence of this endorsement. We demonstrate that truth telling by the pressure group is an equilibrium outcome. We also show that campaign endorsements by the pressure group are generally welfare improving even though the pressure group takes advantage of its private information.

JEL classification: D7
Keywords: Candidates; Pressure groups; Elections; Uninformed voters

1. Introduction

Political advertising presents the following conundrum: if voters are informed, then there is no need for advertising; and if voters are uninformed, then advertising may be dishonest and the voters would not be able to tell. So, why would voters pay any attention to political advertising?

To add substance to the puzzle, suppose that a pressure group has inside information on a candidate's integrity or some other characteristic that is valued by the voters, independent of the

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policy position taken by the candidate.[1] The pressure group might agree to publicly endorse one of the candidates as the high-quality candidate even though this was not the case if the candidate's policy position were sufficiently close to the pressure group's preferred position to make up for the lower quality. So, again we are led to ask why would the voters pay attention to such endorsements.[2]

This paper provides the following answer. Competition between the candidates results in a set of choices, such that the pressure group will always want to tell the truth about the relative quality of the candidates.

This paper also provides a different perspective on the role of pressure groups in the democratic process. In general, the role of pressure groups is viewed as negative. Here, we show that pressure group endorsements are likely to improve the welfare of the median voter, and, under plausible assumptions, pressure group endorsements improve the welfare of *all* voters.

2. Literature review

This paper differs from previous work on voting in the presence of pressure group endorsements or contributions.

Congleton (1989), Baron (1994), Mueller and Stratmann (1994) and Grossman and Helpman (1996) assume functional (reduced) form behavior by uninformed voters–uninformed voters are assumed to have a higher probability of voting for the candidate doing more advertising (even if these voters would be better off voting for the other candidate).[3] They find that pressure groups on average reduce the welfare of the median voter. Here, in contrast, the uninformed voter is fully rational and votes for the candidate who maximizes the voter's expected utility. The results are contrary, as well. In this paper, pressure groups are shown to generally aid the democratic process rather than harm it. None of the above papers consider differences in candidate quality.

Lohmann (1998) shows that candidates respond more to informed voters than to uninformed voters. If informed voters tend to be members of pressure groups, then the power of pressure groups is explained. Unlike this paper, she does not deal with the role of endorsements or how the uninformed are influenced by such endorsements. Grossman and Helpman (1999) do deal with endorsements, but their analysis is confined to the effect of the pressure group's endorsements on its members and not on those uninformed voters who are not members of the pressure group. Neither of these articles deals with inferential thinking and strategic behavior by uninformed voters whose interests are not allied with pressure groups. In contrast to the present paper, these two articles find that pressure groups have more negative implications for the welfare of the median voter. Neither article considers differences in candidate quality.

[1] These are sometimes termed valence properties. See Stokes (1992) who argues for the importance of these valence properties and Wittman (2005) for a formal presentation. The 2000 U.S. presidential election was often characterized as a choice between integrity and competence. Pressure groups are likely to know the valence characteristics of the candidates as the pressure groups have lobbyists that are actively engaged in the political process.

[2] An easy way of ducking the conundrum is to assume that the voters respond positively to advertising regardless of the true impact on their welfare. But our intent here is to deal with rational voters.

[3] Unlike the others, Congleton models the uninformed voters as responding to both position and advertising.

Ashworth (2006) and Wittman (in press-a) assume that the voters do not know the candidates' positions — the issue of quality does not arise. Unlike the present paper, Ashworth (2006) and Wittman (in press-b) assume that advertising is truthful rather than truth being an equilibrium outcome. [4]

Enelow and Hinich (1982), Londregan and Romer (1992) and Groseclose (2001) model candidates who differ in quality and voters who are rational and informed. They do not consider pressure groups or how voters obtain their information. Grofman and Norrander (1990) have a model of campaign endorsements, but both candidate positions are exogenous. In Cukierman (1991) uninformed voters rely on poll data to infer quality, but there are no pressure groups and again the candidate positions are exogenous. Here, the candidates' positions are endogenous.

Coate (2004a) assumes that candidates have preferences for policy, that their policy positions are independent of (exogenous to) pressure group donations, and that the preferences of the voters are uniformly distributed. He assumes that advertising is truthful about the candidate's quality and therefore only a high-quality candidate will advertise and accept campaign funds from a pressure group to pay for such advertising. In his model candidates offer costly favors, not more favorable policy, in return for campaign contributions. These costly favors are paid for by all the voters. Thus the higher quality candidate dissipates his quality advantage. In his model, advertising only reaches a share of the voters. Those voters who do not receive advertising are assumed to irrationally vote rather than abstain.

This paper is closest to Prat (2002a,b) and Gerber (1999). They model rational voters, pressure group endorsements, and candidates who differ in quality. But there are significant differences in approach and results. They have models of costly signaling — there is no content to the advertising. To use Prat's phrase, the pressure group "burns money" to demonstrate its beliefs. The work presented here involves cheap talk — in equilibrium, the advertising is informative. In the Prat articles, voters may collectively obtain the truth after the pressure group has come to an agreement with the candidate. The nature of the agreement between the pressure group and the candidate depends on the likelihood of the voters obtaining the truth. Here, the voters have no independent way of ascertaining the truth, yet the outcome is better for the median voter. Signaling models have a continuum of equilibria. The Prat and Gerber models are no exception. Here there are only three possible cheap talk equilibria with consistent beliefs (a babbling equilibrium where there is no endorsements, and two other equilibria that have identical outcomes but opposing beliefs). In Prat (2002b), the voters are uniformly distributed, there are multiple policy dimensions, and only the incumbent's position can be influenced by pressure group contributions (the challenger always chooses the median voter). Here, the voter distribution is not so restricted, there is one policy dimension, and either candidate can receive funds and be influenced by the contributions of a pressure group (the same holds for Prat, 2002a). In Gerber (1999) the pressure group donates money to the challenger's campaign in return for favors if the candidate is elected (the incumbent's position is treated as a given). These authors show that when pressure groups have extreme preferences, the median voter is worse off by the presence of pressure groups, contrary to the results obtained here.

Melding quality differences with a spatial model is not an easy task. As Groseclose (2001) has shown, when voters are perfectly informed about both the candidates' positions and their relative quality, there is no pure-strategy equilibrium (that is why most of the literature has

[4] Further afield is work by Austen-Smith (1987), Lupia (1992), Potters, Sloof, and Van Winden (1997), Sloof (1998), and Coate (2004b). Although all of these articles deal with rational voters, none of them deal with quality. But Ansolobehere and Snyder (2000) model valence issues their work too is only tangentially related.

assumed that one or both of the candidates' positions are exogenous or that voting is probabilistic). The intuition behind the result is that the high-quality candidate wants to choose a position identical to the low-quality candidate, thereby getting all the votes. But the low-quality candidate wants to be sufficiently far away from the high-quality candidate so that some voters prefer the low-quality candidate because the low-quality candidate's closer position to these voters more than makes up for his lack of quality. Thus even the simple model presents difficulties.[5] We are now complicating the model by making the voters uninformed and introducing a pressure group. Clearly the added complexity must come at some cost. We will have to make some simplifying assumptions about the voters' utility functions, but we believe that they are reasonable and justified. As we will show, this more complicated model yields a perfect Bayesian equilibrium in the negotiated offers.

The paper is organized as follows: Section 3 presents the basic model, where the candidates make offers to the one pressure group. Section 4 considers the effect of endorsement costs. Section 5 looks at the case when there are two or more pressure groups. Section 6 again considers the effect of endorsement costs, but this time in the context of there being two pressure groups. Section 7 deals with other variations. Section 8 is the conclusion.

3. The basic model

We start with a basic model where the structure of the argument is clearest. Later we will consider several complicating variations. The assumptions of the basic model are:

(A) Let x be a position on a political continuum, $[A, B]$. $f(x)>0$ is the continuous density function of the voters' most preferred positions, and $F(x)$ is the cumulative distribution. $F(B)=100\%$. I assume a continuum of voters for mathematical convenience; similar results can be obtained with a finite number of voters. x^C is the position chosen by candidate C.

(B1) $U(x, x^C, Q^C)=-|x^C-x|+Q^C$ is the utility of a voter with most preferred position x when candidate C wins the election. That is, voters have identical linear loss functions on the spatial dimension (only their preferred positions differ) and identical weights for the quality dimension, Q^C.[6] Letting L stand for the low-quality candidate and H stand for the high-quality candidate, for convenience, I will assume that $Q^L=0$ and $Q^H=Q$.
This is the same functional form as used by Aragones and Palfrey (2002), Prat (2002b) and Coate (2004a,b). There is agreement on quality, but no agreement on what position is best. One could have a more general utility function, but that would greatly complicate the analysis and make welfare comparisons difficult. Later, I will explicitly consider a quadratic loss function; and still later on, I will consider a more general concave loss function.

(B2) If the voter is otherwise indifferent between two candidates, then the voter prefers the candidate closest to his most preferred position.
Parts (B1) and (B2) together say that a voter is willing to trade-off quality for position, but when the benefit from a better position of one candidate is exactly compensated by higher quality of the other candidate, the voter will vote for the candidate with the preferred

[5] See Aragones and Palfrey (2002) for the mixed-strategy solution.

[6] The slightly more general formulation $g(-E|x^C-x|+FQ^C)$ where g is a positive monotonic transformation would not change the argument but would make the exposition more complicated. Interesting tradeoffs between Q and position only take place if Q is not too large, say less than $[B-A]/4$.

position. Here and elsewhere in the paper, there are alternative assumptions that yield similar results but at a cost of making the proofs longer. [7]

(C) The voters observe x^C but not Q^C. They do not know $f(x)$.[8] Because the voters do not directly observe or know Q during the election, we should state that Q is the quality the voter expects to receive if the candidate that they think is high-quality wins.

(D1) $W(p, x^C, Q^C) = -|x^C - p| + DQ^C$ is the utility function of the pressure group, P, with most preferred position p when candidate C wins the election. $D=1$.
Because the pressure group is composed of voters, it seems natural that the pressure group member(s) would have the same type of utility function (but not necessarily the same preferences) as the voters. Thus the pressure group also values quality. Note however that some of our results do not depend on the assumption that $D=1$. If the voters are symmetrically distributed and $0.5<D<1$, then the outcome is *identical* to the case where $D=1$. For two or more pressure groups, we only require that $D>0$. Prat assumes that $D=0$. Later, after the basic model is explicated, I will consider a more complicated utility function where the pressure group takes into account the financial cost involved in endorsing a candidate.

(D2) If the pressure group is otherwise indifferent between endorsing one candidate or the other because the outcome of the election is the same regardless of whom the pressure group endorses as the high-quality candidate (but better for the pressure group than when there is no endorsement), then the pressure group prefers to endorse the candidate who will win the election.[9]
For example, if candidate 1 will win with position $M+Q/2$ (and therefore the pressure group's utility is $-|M+Q/2-p|+DQ^1$) whether the pressure group endorses candidate 1 or candidate 2, then the pressure group will want to endorse candidate 1.
This seems a reasonable assumption as it means that the pressure group will have additional access to the winner.[10] For similar reasons, I assume that if P is otherwise indifferent between two candidates, then P will endorse the candidate who will have the greater probability of winning if endorsed. Later, I will consider an alternative assumption to D2 that explicitly includes the financial cost of endorsement.

(E) Each candidate wants to maximize her probability of winning. And given two positions, each with the same probability of winning, the candidate will choose that position with the highest vote share.

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[7] When the voter is indifferent, convention suggests that the probability of voting for a candidate is 0, 0.5 or 1. We have chosen the last possibility to avoid dealing with suprema. This would not be necessary if the set of positions were discrete.

[8] We assume that the voters do not know $f(x)$ to minimize the amount that the voters can infer. In general, if voters know too much, then they can make the necessary inferences about quality in the absence of pressure group endorsements. So the less that the voters can infer, the more that the pressure groups can manipulate, up to a point. If voters do not know enough, they may choose to ignore the pressure group endorsements completely in order to avoid bad outcomes.

[9] Of course, much of the time endorsements would affect the outcome of the election and thus the conditional statement would not hold.

[10] If the benefit of access was not lexicographic but instead part of the utility function, this would increase the power of the candidate vis-à-vis the pressure group. If the benefit of access were large enough, H would choose the median position, knowing that the pressure group would always endorse H. We consider the worst-case scenario to demonstrate that the results do not depend on strong assumptions.

For example, if one candidate is sure to win, it prefers to win with 60% of the votes instead of 55%; and if the other candidate is sure to lose, it prefers to lose with 40% of the votes than with 30% of the votes.[11] I also assume that candidates cannot engage in mixed strategies.

The election takes place in the following sequence:

1. The distribution of the voters' preferences is determined. Only the candidate and the pressure group know the distribution of voters, $f(x)$, and the median voter's most preferred position, M.
2. The pressure group's most preferred position, p, is determined. For convenience we will assume that it on the right and that $p > M+2Q$.[12] The candidates observe p.
   The proofs do not require that the voters know anything about the pressure group's preference. However, if the reader is uncomfortable with that, the reader can assume that the voters know that $p \geq M$.
3. With equal probability, nature chooses which candidate is the high-quality candidate (H). The candidates and pressure group observe this choice; the voters do not, but know that a choice has been made.
   The election is divided into two stages: the negotiation stage and the election stage.
4. Negotiations take place according to the following procedure:
   A. Candidates H and L make simultaneous and binding *offers* (x_H and x_L) to the pressure group that they will choose a particular position (possibly different from each other) in return for an endorsement.
   B. The pressure group either endorses one of the candidates as the high-quality candidate or endorses neither. Both candidates know whether the other candidate has been endorsed (this assumption is not needed, but it makes the proofs shorter).

   The endorsement of one candidate as the high-quality candidate is equivalent to saying that the other-candidate is of low quality. So the model includes the possibility of negative advertising.

   C. An unendorsed candidate is free to choose any election position (x^C). Note that *offers* are denoted by a subscript and *election positions* are denoted by a superscript. For the endorsed candidate, $x_C = x^C$. For the unendorsed candidate, x_C need not equal x^C.

   The voters know that negotiations have taken place, but they do not observe the rejected offer (s). Furthermore, in the absence of an endorsement, they cannot infer from the positions alone which candidate is the high-quality candidate.

   It is not unreasonable to believe that candidates try to make secret deals with the pressure groups, and if unsuccessful, choose positions more appealing to the voters. Thus, I have assumed that the unendorsed candidate can choose an election position different from its offer to the pressure group. However, one could also argue that candidates cannot so easily switch their positions and that $x_C = x^C$ whether or not the candidate is endorsed. In my working paper, I show that this alternative assumption combined with a different lexicographic ordering by the pressure group, results in the identical outcome. I believe that the characterization here provides more insight than the alternative characterization in the working paper. This is a major reason why the models are placed where they are rather than vice-versa. Since both sets

[11] Later, I consider an alternative assumption to E and show that the results are strengthened by this alternative.

[12] For the sake of argument and to shorten the proofs, we only consider extremist pressure groups. Obviously less extreme pressure groups would not pull the candidates as far away from the median voter.

of assumptions come to the same conclusion, it is not necessary for us to come to a definitive vote for one set here. In later theorems, in equilibrium, both candidates choose election positions coinciding with their offers.

5. Each voter observes the *election positions* of the candidates, x^H and x^L, and knows whether the candidate has been endorsed as the high-quality candidate. Each voter votes for the candidate who the voter believes will provide the voter with the highest utility. Ties are settled by a toss of the coin.

I assume that voters do not have direct knowledge of the quality of the candidates. I use the word "direct" because, in the presence of campaign endorsements, uninformed voters may be able to infer quality. However, the voters do know the model. For example, the voters know that the candidates maximize their probability of winning and that the pressure group maximizes it utility.

Proposition 1. *Under the above conditions:*

i. *In the absence of any endorsements, both candidates will be at the median voter's most preferred position, M, and each will win with probability* 1/2.
ii. *If voters believe the endorsement, then the non-endorsed candidate will always take a position Q away from the endorsed candidate's position.*
iii. *H's maximin strategy is to choose that* x_H *such that* $F(x_H)=100-F(x_H-Q)$. *L's minimax strategy is to choose that* x_L *such that* $F(x_L-2Q)=100-F(x_L-Q)$.[13] *The Nash equilibrium in offers, where both of these equations are satisfied, is then* $x_L=x_H+Q$.
iv. *If the voters believe that the high-quality candidate gets the pressure group endorsement, then the low-quality candidate is never endorsed as the high-quality candidate by the pressure group. Hence, whenever there is an endorsement, the voters are fully informed about the quality of the candidates.*
v. *If x has a symmetric distribution with mean=M, then a pressure group endorsement weakly improves every voter's welfare. The high-quality candidate will choose position* $M+Q/2$.

Before proceeding with the proof, it is useful to understand its internal logic. We begin by assuming that the voters believe that the pressure group is telling the truth. We show how the candidates and pressure group act under this scenario. In particular, the candidates present a set of choices (ii and iii) such that the pressure group will want to tell the truth (iv). Hence there is a truth-telling equilibrium. It can be shown that this is a perfect Bayesian equilibrium. Alternatively, one could have started with a list of strategies and beliefs and shown that the particular choices are a PBE. The problem with such an approach is that there is a continuum of choices and the underlying intuition would not be as transparent as the method we use. The approach used here allows one to construct and discover the truth-telling PBE.

In some ways, Proposition 1 is a worse case scenario. Despite the fact that there is no other pressure group to compete away rents, pressure group endorsements improve welfare (v). Later we will consider some variations. There may be two or more pressure groups with opposing interests, in which case every voter is made better off regardless of the form of the utility function. And some voters may ignore the endorsements of the pressure group, in which case the high-quality candidate moves closer to the median voter.

[13] If the candidate is endorsed, then the other candidate is the second mover. Therefore, the candidate strategies are maximin and minimax.

The proof has to take care of a lot of details. However, the intuition behind the proofs for points (ii), (iii) and (v) can be seen in Figs. 1–3.

Proof. (i) No endorsement:

If there is no endorsement, then voters only know the candidates' positions, not their relative quality. Both candidates will take the position of the median voter; that is, $x^H = x^L = M$. Each candidate will win with a probability of 1/2.

(ii) If voters believe the endorsement, then, the candidate who is not endorsed will always choose an *election* position exactly Q units away from the endorsed candidate's position; that is, $x^{NE} = x_E \pm Q = x^E \pm Q$, where E stands for endorsed and NE stands for non-endorsed.

The intuition behind the argument is easily demonstrated in Fig. 1 where the endorsed candidate has chosen $x_E = x^E$ (note that the distribution of voter preferences in Fig. 1 is not symmetric). Suppose that the unendorsed candidate is originally strictly to the right of $x^E + Q$ say at $x^E + Q + z$ (not illustrated). By moving left until $x^{NE} = x^E + Q$, the unendorsed candidate will not lose any voters to the right but will gain all those voters whose most preferred position are weakly between $x^E + Q$ and $x^E + Q + 0.5Z$ who would have voted for the endorsed candidate if the unendorsed candidate had remained at $x^E + Q + z$. The unendorsed candidate will not move strictly to the left of $x^E + Q$ (unless the unendorsed candidate is weakly to the left of $x^E - Q$) because then all of the voters would prefer the endorsed candidate. A similar argument shows that the non-endorsed candidate will not take a position strictly to the left of $x^E + Q$. Note that the shaded portion on the right (left) is the percent of votes for the unendorsed candidate when the unendorsed candidate takes position $x^E + Q$ ($x^E - Q$).

The area under the curve is 100%. If the non-endorsed candidate chooses $x^E - Q$, then the vote share of the non-endorsed candidate is the shaded area on the left. If the non-endorsed candidate chooses $x^E + Q$, then the vote share of the non-endorsed candidate is the shaded area on the right.

The non-endorsed candidate, NE, will get 0 votes if x^{NE} is less than Q away from x^E.

If $x^{NE} < x^E - Q$, then NE will get more votes by moving right to $x^E - Q$. NE will not lose any voters to its left but will gain voters on its right by such a move.

If $x^{NE} > x^E + Q$, then NE will get more votes by moving left to $x^E + Q$. NE will not lose any voters to its right but will gain voters on its left by such a move.

(iii) H maximizes its minimum vote share; equivalently, H minimizes L's maximum vote share.

Fig. 1. The non-endorsed candidate (NE) will be Q away from the endorsed candidate (E).

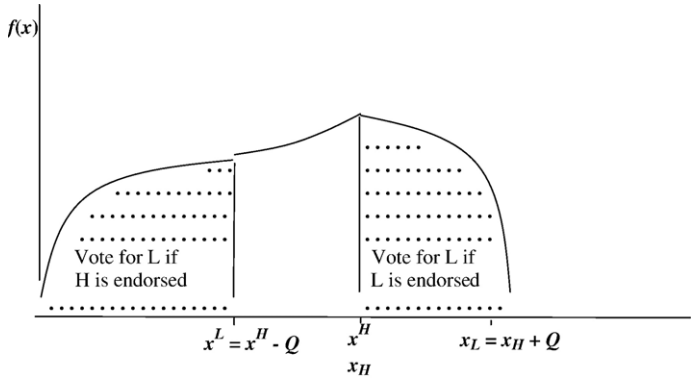

Fig. 2. H's maximin strategy: choose x_H such that the shaded areas are of equal size.

Once again the intuition behind a rather complicated analysis is easily demonstrated in a diagram. In the graphic analysis, we consider the case where H minimizes L's maximum share of votes. Looking at Fig. 2 (where the distribution of voter preferences is again not symmetric), H has offered x_H and L has offered $x_L = x_H + Q$. If L is endorsed as the high-quality candidate, then H will choose $x^H = x_L - Q = x_H + Q - Q = x_H$. L will get all the votes to the right of $x^H = x_L - Q$. This is the shaded area on the right. On the other hand, if H is endorsed as the high-quality candidate, then L will take a position $x_L = x_H - Q$. In this way, L will receive all of the votes to the left of $x_H - Q$. This is the shaded portion on the left. H's optimal strategy is to make these two portions equal.

Suppose that H had taken a position further to the right (say H') and had been endorsed, then L would have taken a position $L' = H' - Q$ and received more voters than if H had stayed at her original position. Alternatively, suppose that H had taken a position further to the left (say H'') and L had taken position $H'' + Q$ and been endorsed, then L would also receive a greater share than if H had stayed in her original position.

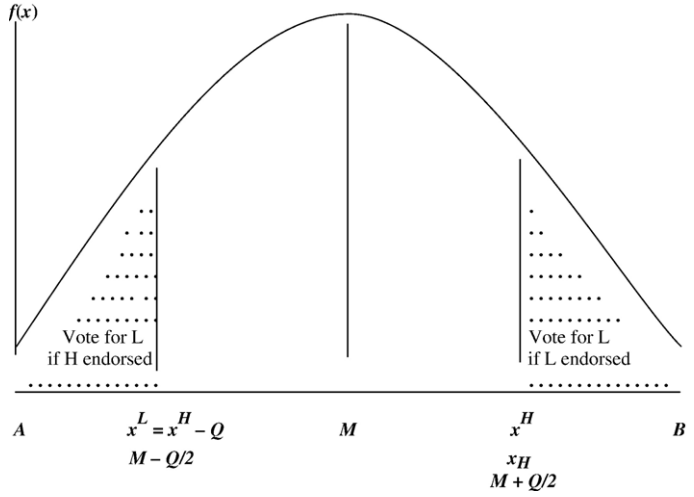

Fig. 3. When the distribution around M is symmetric, then $x^H = M + Q/2$.

The two equal portions do not add up to 100% as the area between $x^H - Q$ and x^H is non-zero. Thus H will win if endorsed.

There is another way of gaining the intuition. Suppose that $x_H = M$ and $x_L = M + Q + \delta$. Then the pressure group would endorse L as the high-quality candidate; H would then choose $x^H = M + \delta$ and win, but by just a little over 50%. If instead x_H had been to the right of M, then the only way for L to be endorsed is for L to have offered Q more (that is by being more extreme than when H offered M). In this way, H's vote share increases. However, there is a limit to this strategy as H has to worry about the possibility that H will be endorsed and L will choose an election position Q to the left. Clearly, if H had chosen $M+Q$ and been endorsed, then L would have chosen M and won 50% of the time.

(iv) In equilibrium, the voters' beliefs are justified.

If P endorses H as the high-quality candidate, then H will win with position x^H. If P endorses L as the high-quality candidate, then H will also win with position x^H. We have assumed that, other things being equal, the pressure group will want to endorse the winning candidate. Therefore, given the choice between endorsing H and endorsing L, P will endorse H. If P endorses neither, then both candidates will be at M and H will win half the time. So P would be worse off on both position and expected quality if P endorsed neither candidate. Therefore, P endorses H. Of course H prefers to win all of the time rather than half the time. So H will make the offer. As we have seen, L will be unsuccessful at gaining an endorsement. In equilibrium, P tells the truth, and the voters' belief that P tells the truth is justified. We have a truth-telling equilibrium where the voters are fully informed.

In this cheap-talk model, there are two other equilibria with consistent beliefs. If voters did not pay attention to the endorsements, there would be a babbling equilibrium with both candidates at the median voter (if the pressure group were to make an endorsement, it would be completely uninformative). The other equilibrium, which might be hard to implement in practice, is that the voters believe that P lies, and P always endorses the low-quality candidate as being of high quality. The election outcome would still be the same.

It is easy (but time consuming) to demonstrate that if the voters believe that the pressure group is telling the truth, then there are no other equilibria. Suppose first that an equilibrium choice for H is $M+Q/2$ and that $x_L > M+3Q/2$. Then H would offer $x_H < x_L - Q$ in order to insure that L was endorsed; the unendorsed H would then take a position exactly Q to the left of the endorsed L in the election and win with a larger plurality than otherwise. But if H's offer was more than the Q value to the left of L's offer but strictly greater than $M+Q/2$, then L would then want to move left so that it was exactly Q to the right, starting the whole process over again.

Next suppose that $M < x_H < M+Q/2$. If $x_L > x_H + Q$, then L would want to move within ε of $x_H + Q$. In this way, L would still be endorsed, but L would gain a larger plurality than if remained farther right. But then it would pay H to move her offer right toward $M+Q/2$ because then H would be endorsed and do better in the election than if L were endorsed at a position $x_L < M+3Q/2$. In turn, L would offer a position $Q+e$ to the right of H, starting the whole process over again.

The other possibilities can be analyzed in a similar fashion. When voters believe that the pressure group is telling the truth, and $x_H = M+Q/2$, $x_L = M+3Q/2$ is an equilibrium pair, then there is no other equilibrium outcome. Since the proof did not depend on this particular pair, any equilibrium will be unique.

(v) If x has a symmetric distribution, then *every* voter's welfare is improved when the pressure group makes endorsements. H will choose position $M+Q/2$.

From (iii) we know that the area to the right of x_H equals the area to the left of $x_H - Q$. For a symmetric distribution, this must mean that $x_H = M+Q/2$. Thus H will offer position $x_H = M+Q/2$;

L will offer position $x_H = M + 3Q/2$; H will be endorsed, and L will take position $x^L = x_H - Q = M - Q/2$. H will win with position $x^H = M + Q/2$. This can be seen in Fig. 3. The shaded area on the left is the share of votes going to L when H is endorsed as the high-quality candidate. The shaded area on the right is the share of votes going to L when L is endorsed. Once again, H's minimax strategy is to make these two areas equal. And once again, the pressure group will endorse H as the high-quality candidate.

Voters weakly to the left of the median will lose $Q/2$ in position, but gain $Q/2$ in quality in comparison to the non-endorsement expected outcome (where both candidates are at M and H wins half the time). So net, those voters weakly to the left of the median are indifferent between a regime of no endorsements and a regime with endorsements. Those voters strictly to the right of the median will have a net gain. Those to the right of $M + Q/4$ will gain on both position and quality. Those between the M and $M + Q/4$ will gain more on quality ($Q/2$) than they lose on position (a maximum of $Q/2$).

Hence, welfare is weakly improved for all voters by campaign endorsements. □

Note that a consideration of corner solutions only strengthens the results. For example, suppose that the voters were distributed within [0, 1], $M = 0.5$, $Q = 1.5$. Since the rightmost position is $x_H = 1$, even if H were to take the rightmost position, everyone would be better off with the endorsed outcome as the loss in terms of position would be 0.5 while the gain in expected quality would be 0.75.

Staying with the symmetry assumption, suppose that $D = 0.6$ instead of 1 so that $W(p, x^C, Q^C) = -|x^C - p| + 0.6Q^C$. H would again offer $M + Q/2$. Even if L were to offer $M + Q/2 + 0.6Q$, P would again endorse H. If P were to endorse L, H would run on platform $M + 0.1Q$ and win. This would be worse for P than endorsing H with position $M + Q/2$. Clearly, the same argument holds for all D such that $0.5 < D < 1$.[14]

If the distribution of voters is not symmetric, then, depending on the shape of the distribution, $x_H = x^H$ may be anywhere between M and $M + Q$. Recall from Figs. 2 and 3 that H chooses a position x^H such that the area under the curve to the right of x^H equals the area under the curve to the left of $x^H - Q$. Now let us alter the symmetric distribution drawn in Fig. 3. Suppose that the area under the curve to the left of $M - Q/2$ is increased by the same amount that the area between $M - Q/2$ and M is decreased. In this way M remains the same, but the area under the curve to the left of $M - Q/2$ is now greater than the area under the curve to the right of $M + Q/2$. As a result, H would move left toward M so that the areas in the two tails would again be equal. In this situation, the welfare of all voters would be strictly increased when the pressure group enters into the picture.[15] In contrast, if the distribution of voters to the right of M is shifted to the right of $M + Q/2$ (and all other preferences are held equal), then x^H will shift right, as well. Voters to the right of $M + Q/2$ would benefit from the pressure group endorsements. The other voters would be worse off by a maximum of $Q/2$. In a nutshell, the distribution of voters in the tails of the distribution is a key variable in determining the degree of benefit or harm that is induced by pressure group contributions.

[14] For $0 < D < 0.5$, as D converges towards 0, x^H converges toward $M + Q$. Note that if voters' weighted quality was less as well, then H's position would move toward the median.

[15] If endorsements required costly advertising underwritten by the pressure group, then welfare comparisons would require that the cost of the advertising be subtracted from the election benefit. Since pressure groups are only interested in their own welfare and they pay for the advertising, the net welfare increase would almost always still be positive. Pressure groups do not care about the cost or benefits to other voters, but as we have shown the other voters still benefit.

Proposition 1 assumes a linear utility function. Suppose instead that the utility function is:

$$U(x,x^C,Q^C) = -[x^C - x]^2 + Q^C \quad \text{(B1}')$$

Proposition 2. *Given the above utility function, but keeping symmetry and the rest of the assumptions presented earlier, a majority of voters prefer the pressure group outcome to the no endorsement outcome.*

The proof can be obtained from the author.

4. Costly endorsements

Until now I have not explicitly considered the cost, Y, that the pressure group incurs when it donates money to a candidate's election campaign to advertise the endorsement. Let us redefine the pressure group's utility function to account for this cost.

D'. $W(p, x^C, QC) = -|x^C - p| + DQ^C - Y$ is the utility function of the pressure group, P, with most preferred position p when candidate C wins the election and it has endorsed one of the candidates at cost Y. $D > 0.5$.

For mathematical closure, I will assume that if a candidate is otherwise indifferent between being at the median voter and being at another position, the candidate prefers to be at the median voter (the opposite assumption could be made without changing anything except for making a weak inequality into a strict one).

Again, I will consider the case where the voters are distributed symmetrically.

I will first show that when Y is small (that is, $Q/2 + 0.5DQ \geq Y$) the outcome will be the same as before. Recall that when there is an endorsement, H wins with position $x_H = x^H = M + Q/2$ and that when there is no endorsement both candidates are at M with H winning half the time. If P endorses H when H offers $x_H = M + Q/2$, then P's expected utility is $M + Q/2 - p + DQ - Y$ (the first three terms are the utility loss from the position not being at the pressure group's most preferred position, p; the next term is the pressure group's gain from quality; and the third term is the financial cost of the endorsement). If P endorses neither candidate, then P's expected utility is $M - p + 0.5DQ$. P will endorse H if the benefits outweigh the costs—that is, P will endorse H if $Q/2 + 0.5DQ \geq Y$.[16] Thus when Y is small, the analysis is identical to our earlier analysis, which ignored the monetary cost of endorsements.

Next I consider the case where Y is large ($Q + 0.5DQ \leq Y$). In this case there are no endorsements. Let us first look at the case where $Q + 0.5DQ < Y$. The only time that it is worthwhile for P to make an endorsement is when H has offered a position to the right of $M + Q$ (where H is sure to lose and therefore H would not make such an offer in the first place) or L has offered a position to the right of $2Q + 0.5DQ$ and H then chooses a position Q to the left and wins (but L would not make such an offer in the first place as L would have more votes if L had made no offer to the pressure group). When $Q + 0.5DQ = Y$, x_H would have to equal $M + Q$. If endorsed, H would win only half the time. But by assumption, H would prefer to be unendorsed at M and win half the time. Thus when the cost of endorsements is high, there are no endorsements.

[16] Recall that we have assumed that if the pressure group is otherwise indifferent (now after including endorsement costs), the pressure group will endorse the winning candidate.

We are thus left with the following possibility: $Q/2+0.5DQ<Y<Q+0.5DQ$. In this situation, the greater the cost to P, the farther to the right H will be. In particular, $x_H=x^H=M+Y-0.5DQ$. The logic is as follows. The pressure group's utility is $M+Y-0.5DQ-p+DQ-Y=M+0.5DQ-p$ if it endorses H and $M+0.5DQ-p$ if it does not endorse H. By assumption, the pressure group will endorse H, the winning candidate, if the pressure group is otherwise indifferent. If H were to choose a position to the left of this point, H would not be endorsed and at best H would have a 50% chance of winning the election. If H were to move right of this point, then x^L would be further to the right as well, and H would have a smaller plurality. So H will indeed choose $x_H=M+Y-0.5DQ$, be endorsed by the pressure group, and win the election. But H's plurality will not be as large as it would be in the absence of the financial constraint.

5. Two or more pressure groups

I have dealt with the extreme case where there is only one pressure group. Even though the pressure group has a monopoly on endorsements and inside information on quality, when the voters have linear loss functions and the distribution of voters is symmetric everyone is at least weakly better off (if the financial cost of endorsement is not too high). Although some might argue that the one pressure group model is an accurate assessment of the political world, where consumers, for example, are less likely to organize into pressure groups than producers, it is still useful to see what happens when there are two (or more) pressure groups with opposing interests. As I will now show, when there are two-opposing pressure groups, H will choose the median voter's most preferred position and be endorsed as the high-quality candidate. In this way every voter is strictly better off than in the no-endorsement outcome. This result holds even if the pressure groups care very little about the quality of the candidate (that is, D is close to 0).

I make the following slight alterations to the assumptions made for Proposition 1:

B1″. $U(x, x^C, Q^C)=-g(|x^C-x|)+Q^C$ is the utility of a voter with most preferred position x when candidate C wins the election. $g''\geq 0$, which means that the utility function is concave in x.

D1″. $W(p, x^C, Q^C)=-|x^C-p_j|+DQ^C$ is the utility function of pressure group, j, with most preferred position p_j when candidate C wins the election. $0<D\leq 1$.

Pressure group 1's most preferred position is less than $M-2Q$ while pressure group 2's most preferred position is greater than $M+2Q$. We keep the pressure groups this distance apart so we do not have to deal with the details of a less interesting case.

4A″. Candidates H and L make simultaneous and binding offers (x_H and x_L) to the pressure groups that the candidate will choose a particular position in return for an endorsement. That is, each candidate offers the same position to both pressure groups—it cannot make two different binding offers.

If the outcome of the election is the same, a candidate will offer the same position as it intends to run on in the election. That is, if the non-endorsed candidate will run on position x^{NE} in the election, then the candidate will offer $x_{NE}=x^{NE}$ if that does not worsen the election outcome from the non-endorsed candidate's point of view.

4B″. Each pressure group endorses one of the candidates as the high-quality candidate or endorses neither.

Finally, I assume that if the pressure groups endorse different candidates as the high-quality candidate, then the voters will ignore the endorsements entirely and base their vote solely on position.

This is a reasonable assumption. The voters have no additional information to infer which endorsement is truthful. If the voters did have the requisite information to make the proper inferences, then endorsements would not be needed in the first place.

Proposition 3. *Under the above assumptions, when the voters are distributed symmetrically, the high-quality candidate will offer M, be endorsed by both pressure groups, and win the election. The low quality candidate will offer either $M+Q$ or $M-Q$ and run on the same position in the election.*[17]

Proof. H offering $x_H = M$ and both pressure groups endorsing H is an equilibrium. If L offers a position strictly to the right of M, H will win whether the right-wing pressure group endorses L, endorses neither, or endorses H. So the right-wing pressure group will not be motivated to endorse L, and of course neither will the left-wing pressure group. If L offers M and is endorsed by the right-wing pressure group, the right-wing pressure group is worse off since the pressure group prefers that H wins at M all the time rather than half the time. Again, the same holds for the left-wing pressure group. If otherwise indifferent, we have assumed that both pressure groups prefer to endorse the winning candidate rather than endorsing neither. □

Offering M is a maximin strategy for H. Because L will not be endorsed, there is no need for H to move toward L's offer to prevent an endorsement. Further, any move from M by H would result in L getting more votes in the election. So H will not want to change its strategy. L will offer M+Q or $M-Q$ and run on the same position in the election.

Again, truth-telling by the pressure groups is an equilibrium outcome. Now everyone is strictly better off when there are two pressure groups instead of none, but only a majority, $F(M+Q/4)$, are strictly better off when there are two pressure groups instead of only one.

6. Endorsement costs when there is more than one pressure group

Once again we consider the role of endorsement costs, Y, on the outcome, but this time in the context of there being more than one pressure group. We will see that endorsement costs play a similar role when there are two pressure groups as endorsement costs play when there is only one pressure group. When Y is small, the results are similar to the case where Y is zero in that H will choose M, be endorsed as the high-quality candidate, and win the election. When Y is large, there will be no endorsements. And when Y is moderate, greater endorsement costs move H farther away from the median.

We use the same pressure group utility function as was used in Section 3 (assumption D1″) but subtract the cost of endorsement, Y. For heuristic reasons we will revert back to the assumptions that (a) the voters' (as well as the pressure groups') utility functions are triangular (that is, they are decreasing linear functions of the absolute distance of the implemented policy from the most preferred policy), (b) the distribution of voter preferences is symmetric around M, and (c) $D=1$. Again for heuristic purposes, we also assume that (d) if a pressure group is otherwise indifferent (after including the cost of endorsement), it will choose to endorse the winning candidate (otherwise, we would have to work with epsilons), and (e) other things being equal, H prefers to be at M rather than at $M+Q$ or $M-Q$ (this allows for mathematical closure). We assume that the candidates make their offers to opposing pressure groups. For simplicity, we will assume that H makes her offer to the right-wing pressure group and L makes his offer to the left-wing pressure group. Finally, we assume that if voters get contradictory messages about relative quality, they will vote on position.

[17] The convergence to M result is somewhat reminiscent of Congleton (1989), but in his paper quality was not an issue and uniformed voters voted mechanistically rather than rationally.

Proposition 4. *Under the above conditions:*

(i) Suppose that $Y \leq 0.5Q$. Then $x_H = M$, $x_L = M - Q$, the right-wing pressure group endorses H, the left-wing pressure group makes no endorsement, $x^L = x_L$, and H wins the election is an equilibrium outcome.[18]

(ii) Suppose that $0.5Q < Y < Q + 0.5Q$. Then $x_H = M + Y - 0.5Q$, $x_L = M + Y - 1.5Q$, the right-wing pressure group endorses H, the left-wing pressure group makes no endorsement, $x^L = x_L$, and H wins the election is an equilibrium outcome.

(iii) Suppose that $Y \geq Q + 0.5Q$. Then no endorsements are made, $x^L = x^H = M$, and each candidate wins with probability 0.5.

Proof.

$$Y \leq 0.5Q. \tag{i}$$

We will establish that $x_H = M$, $x_L = M - Q$, the right-wing pressure group endorsing H, the left-wing pressure group making no endorsement, $x^L = M - Q$, and H winning is an equilibrium outcome.

Suppose first that the right-wing pressure group is endorsing H at M. If $x_L < M$ and the left-wing pressure group endorses L, then H will win because voters will vote on position when they get contradictory endorsements and H is at the median voter's most preferred position. Hence the left-wing pressure group is worse off by endorsing L as it has incurred a cost, but the outcome is the same as it would be if it had not endorsed L. If $x_L = M$, then the left-wing pressure group would again be worse off if it endorsed L because quality would be reduced without an improvement in position. So, the left-wing pressure group will not endorse L. Given that it will not be endorsed regardless of its choice, L will choose $x_L = x^L = M - Q$.

Suppose next that the left-wing pressure group is not endorsing L. If the right-wing pressure group does not endorse H at M, then in the election both candidates will choose position M. The right-wing pressure group will save Y in endorsement costs but lose $0.5Q$ because H is no longer elected all of the time. But by assumption, $Y \leq 0.5Q$. So the right-wing pressure group would prefer to endorse H. Recall that we have assumed that when otherwise indifferent (including endorsement costs), the pressure group will endorse the candidate; hence, even if the equality holds, the right-wing pressure group will still endorse H.

Of course, H will not want to choose a different position because M maximizes the minimum amount of votes it gets.

Thus $x_L = x^L = M - Q$ and $x_H = x^H = M$.

$$0.5Q < Y < Q. \tag{ii}$$

We will establish that $x_H = M + Y - 0.5Q$, $x_L = M + Y - 1.5Q$, the right-wing pressure group endorses H, the left-wing pressure group makes no endorsement, $x^L = x_L$, and H wins the election is an equilibrium outcome.

Suppose first that the right-wing pressure group is endorsing H at $x_H = M + Y - 0.5Q$. Then the left-wing pressure group will not want to endorse L regardless of the position that L offers. The logic is as

[18] Note that this proof does not rule out the possibility that there are other equilibria (besides the babbling equilibrium and the equilibrium where everyone believes that the pressure group is lying and it does lie). However, it does not appear that there are other equilibria.

follows. If the left-wing pressure group does not endorse L, then an endorsed H will win regardless of L's position (since $x_H = M + Y - 0.5Q$ and $M < M + Y - 0.5Q < M + Q - 0.5Q = M + 0.5Q < M + Q$). The left-wing pressure group's utility is thus $P_L - M - Y + 0.5Q$. The left-wing pressure group would only want to endorse L, if L wins and the benefit to the left-wing pressure group is greater than the cost. This means that $P_L - x_L - Y \geq P_L - M - Y + 0.5Q$. This implies that $M \geq x_L + 0.5Q$. If this is a strict inequality, then x_L is further away from M than x_H is, and therefore L will lose even if endorsed. If this is a strict equality, then L will only win half the time. So the benefit will not be greater than the cost. Hence L will not be endorsed. Given that L will not be endorsed, $x_L = M + Y - 1.5Q = x^L$.

Next suppose that L is not being endorsed. We will now show that the right-wing pressure group will want to endorse H. If the right-wing pressure group endorses H, then the right-wing pressure group's utility is $-P_R + M + Y - 0.5Q + Q - Y = -P_R + M + 0.5Q$. If the right-wing pressure group does not endorse H, then the right-wing pressure group's utility is $-P_R + M + 0.5Q$. The right-wing pressure group is indifferent and therefore by assumption will endorse H, the winning candidate.

H prefers a 100% chance of winning over a 50% chance of winning. And given that it will win, H prefers a higher share of the vote to a lower share of the vote. Therefore, H will choose the above strategy. If x_H were to the left, the right-wing pressure group would no longer endorse H and H would win only 50% of the time. If x_H were to the right, x^L would be to the right as well, and H would receive fewer votes.

$$Y \geq Q + 0.5Q \tag{iii}$$

We have established in (ii) that in order for the right-wing pressure group to endorse H, H will have to offer at least $x_H = M + Y - 0.5Q$. If $Y \geq Q + 0.5Q$, then $x_H \geq M + Q$. Suppose first that the inequality is strict. This implies that H will lose even if endorsed if L takes position M for the election. Therefore, H will not make such an offer in the first place. If $x_H = M + Q$, H will have a 50% chance of winning. Therefore, H is indifferent between taking this position and being endorsed or not being endorsed and taking position M. We have assumed that H prefers the latter. An even stronger argument holds for L. In a nutshell, when the financial cost of endorsing is high, a platform that would compensate a pressure group for the cost of the endorsement would always lose. So an offer would not be made in the first place. Neither candidate will be endorsed and both will choose M in the election. □

7. Other variations

In this section, I briefly consider further variations on the basic model.

I have followed the literature in assuming that all voters value quality (for example, both pro-abortion and anti-abortion voters would prefer that the economy be well run). Nevertheless, it is possible that some voters on the extreme left (right) would prefer that the right-wing (left-wing) candidate would be of low quality because the candidate would be less capable of implementing right-wing (left-wing) policies. Allowing for this possibility does not change the analysis if such voters are in the tails (more than $3Q/2$ away from the M); they are already voting for the candidate that is closest to them. And if the voters are not in the tails, this just weakens the power of the pressure group(s).

Until now, I have assumed that the candidates make the offers to the pressure groups. But suppose that the opposite is the case—the pressure group(s) make the offers to the candidates. If

there is only one pressure group, then the pressure group will offer to endorse H only if it takes a position $M+Q-\varepsilon$. Under these circumstances, H will accept the offer and the median voter's welfare is reduced in comparison to the situation where there are no pressure groups. This result mirrors those of Coate (2004a) who assumes that pressure groups tell the truth and that voters are uniformly distributed. The conclusion (but not the approach) is also similar to that obtained by Prat (2002a) in that pressure group contributions makes the median voter worse off. However, this welfare deterioration result is not robust. When there are opposing pressure groups, the equilibrium result is that H is at M and is endorsed as the high-quality candidate (the proof can be obtained from the author).[19] This is the same result as when the candidates make the offers. Once again, if the voters believe that pressure groups tell the truth, in equilibrium their beliefs are justified.

Whether pressure groups make offers to candidates or candidates make offers to pressure groups is an empirical question that cannot be answered here. But let me provide the following food for thought in the mean time. Candidates and political parties specialize in knowing what the voters want and predicting the electoral support for various policies. It makes sense that candidates would decide what positions to take rather than have policy positions dictated by the pressure groups, which are less knowledgeable in this regard. Pressure groups also face a serious coordination problem. There are many pressure groups that donate to each candidate. Each pressure group would have to decide the kind of offer to make based on what the pressure group thinks the other offers will be. This would be like consumers collectively setting the price for the monopolist (or individually setting price schedules if we treated the monopoly as a common agency problem). Not surprisingly, we treat monopolists and duopolists rather than the consumers as the price or quantity setters. For all these reasons, it seems plausible that the candidates set the terms of agreement rather than the pressure groups. Consequently, it makes sense to investigate the ramifications of such a model.

8. Concluding remarks

In this paper, I have embedded quality, pressure group endorsements, and uninformed voters into the standard Downsian framework. Quality differentials cause divergence in the candidate positions. The greater the quality differential (equivalently, the more voters weight quality), the greater the divergence and the higher proportion of votes for the high-quality candidate. In principle, these results should be testable with the appropriate data.

Initially, I considered the case where a pressure group has extreme power: the pressure group has inside information on the quality of the candidates; there are no other pressure groups to compete away any rents, neither candidate is able to credibly transmit information on its quality to the uninformed voters, and the pressure group endorsement cannot be independently verified. The pressure group takes advantage of this power to improve its own welfare. Nevertheless, when the distribution of voters is symmetric, the by-product is improved welfare for a majority of voters. When voters have linear-symmetric loss functions, pressure group endorsements are weakly

[19] This result differs from Prat's multi-pressure group model (2002b). It is hard to pinpoint the reason for the differing results because the models are so different. In his model, only the incumbent can receive campaign contributions, the challenger's position is always at the median voter's most preferred position, and there are multiple dimension. The most likely reason for the different results appears to be as follows: In Prat's model the pressure group on the "left" has fewer financial resources than the pressure group on the "right." Voters measure quality by the size of the campaign chest and do not account for the fact that the right-wing pressure group has more resources. Therefore, there is a bias to the right.

welfare improving for *all* voters. The competition between the candidates for an endorsement by the pressure group results in the high-quality candidate moving away from the median voter toward the position of the pressure group. But the degree of distortion away from the median voter is compensated by the improvement in candidate quality.

Later, I considered the case where there are two or more pressure groups with opposing interests. If the financial costs of endorsement are low, there will be no distortion whatsoever—the high-quality candidate will be endorsed at the median voter's most preferred position. So all voters will be strictly better off (in comparison to a situation without pressure groups), whatever the shape of the voters' loss functions or the distribution of voters. As the cost of informing voters increases, the high-quality candidate moves away from the median towards a pressure group's most preferred position in order to compensate the pressure group for the cost of the endorsement.

In many democratic countries the role of pressure groups in the democratic process is a major political–economic issue. In the United States, the recent passage of the McCain-Feingold bill was hailed by some as a welcome reduction in the influence of pressure groups. In the contentious debate regarding pressure group influence, this paper argues that pressure groups are limited in their power to distort the democratic process and, if anything, their actions are likely to improve the welfare of the median voter.

Voters can be uninformed in different ways, and the interaction among candidates, pressure groups and rational voters can take various forms. So far, only a few papers have modeled how uninformed but rational voters can make appropriate inferences about the political process. Much work remains to be done before we get a complete picture. The present paper is a move in that direction.

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