

Elections with Contribution-Maximizing Candidates

Amihai Glazer

Department of Economics, University of California, Irvine
e-mail: aglazer@uci.edu

Mark Gradstein

Department of Economics, Ben-Gurion University
email: grade@bgumail.bgu.ac.il

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Abstract

Most analyses of campaign contributions follow the Downsian model to suppose that candidates seek contributions to win elections. This paper takes the opposite approach, by assuming that each candidate aims to maximize the contributions he collects. We let a citizen contribute to a candidate with the aim of increasing that candidate's chances of winning. These assumptions generate several results: in equilibrium citizens make campaign contributions; the positions the candidates adopt differ; the willingness of the rich to make larger contributions than the poor moves the candidates to adopt positions the rich prefer. A cap on political contributions reduces spending by voters and reduces the distance between the platforms adopted by the candidates; public funding of campaign contributions causes an increase in aggregate spending.

1 Introduction

The insightful Downsian model has led to a wealth of work built on the assumption that candidates aim to maximize their chances of winning election. Most analyses of campaign contributions therefore also suppose that a candidate seeks contributions because he wants to increase his chances of winning. Our paper takes the opposite approach. We suppose that each candidate maximizes the contributions he collects, adopting a policy position accordingly.¹ If the two candidates adopt the same position, then no citizen gains by contributing to either one. In equilibrium, therefore, the candidates will adopt different positions.²

A candidate can use contributions for several purposes: to win votes, to support candidates in other elections (thereby increasing his own power), to build a war chest that will scare off future challengers, or for personal benefit. The non-electoral purposes can be important. The Campaign Study Group, a campaign finance research organization, reports that about half the campaign money spent in elections for the House of Representatives goes toward “traditional” campaign expenses such as advertising, mailings, signs, phone banks, and staff salaries. On average, each House member spends another 25 percent on raising campaign funds. The final 25 percent may be used for personal benefits.³ The *Washington Post* reports⁴ that during the five elections from 1986 to 1994, congressman Bud Shuster raised \$2.4 million in campaign money, even though Shuster had no opponent in either the primary or the general elections. Over six election cycles the Shuster campaign spent an average of \$100,000 a year on hotels, airplane charters, restaurants, food, and alcoholic beverages. In 1989-90, the campaign spent \$107,000 on meals alone. In 1991-92, he spent five times more for food and travel than he did to get out the vote. During the 1990 election cycle, congressmen Bill Dickenson, Bill Young, Charles Hatcher, Marvin Leath,

¹Though, as argued below, this motivation is important, the assumption that candidates single-mindedly focus on contributions is made to highlight the effects. We intend to complement, not deny, other considerations.

²Campaign contributions are important in U.S. politics. In the 1998 election cycle, for example, the aggregate receipts of candidates to the Senate and the House of Representatives were near \$800 million.

³Cited in Alan Levin, “Campaign finance laws give candidates room to maneuver,” *Hartford Courant*, October 20, 1996, p. A1.

⁴Eric Pianin and Charles R. Babcock, “Easy street: The Bud Shuster interchange,” April 5, 1998, *Post Magazine*.

and Edward Madigan were among those who bought themselves expensive new cars with their campaign funds.⁵ Representative Stephen Solarz of New York, who retained \$1.4 million in leftover campaign money after the 1990 elections, cited this rationale: “It’s kind of an insurance policy. There’s no way I could have raised that kind of money in one cycle. But it’s also a nest egg for any future race for higher office.”⁶

Further evidence on the importance of non-campaign spending is provided from a natural experiment. Prior to 1980, House incumbents could legally convert excess campaign funds to personal use. A 1979 amendment to the Federal Election Campaign Act ended this practice, but also permitted incumbents elected before 1980 to convert excess funds upon their retirement from the House. This “Grandfather” clause was eliminated by a subsequent amendment in 1989, but this provision did not become effective until after 1992. Groseclose and Krehbiel (1994) and Milyo (1997) demonstrate that many incumbents retired rather than forfeit these funds.

2 Literature

Our explanation for policy divergence can complement existing explanations. An important explanation for divergence in the candidates’ positions arises from features of divided government, as in the United States. Alesina and Rosenthal (1995, 1996, 2000) and Fauli-Oller, Ok, and Ortuno-Ortin (2001) show that when policy reflects a compromise between the President and Congress, each party has an incentive to choose a radical policy, aiming to move the adopted policy in its direction. Alesina and Rosenthal (1995) also find some support for this hypothesis. They compare estimates of the liberal-conservative positions of U.S. presidential candidates to the positions of senators. With the exception of the 1900 presidential election, all elections saw presidential candidates with ideological positions which lied more than one standard deviation away from the mean ideology in the Senate.

Additional explanations are well surveyed by Fiorina (1999). Candidates may diverge when they care about both election and policy. This motivation was first analyzed by Wittman (1977). Calvert (1985), however, shows

⁵UC Berkeley, Institute of Governmental Studies, Travers Series on Ethics and Government, “Cashing in on the campaign: The personal use of campaign funds in California.”

⁶Richard L. Berke “Study says 165 in House can put excess war chest to personal use.” New York *Times* March 29, 1991, p. A11.

that policy-oriented candidates with perfect information about voters' preferences will converge to the position preferred by the median voter. Only if candidates are uncertain about voters' preferences will candidates diverge. Moreover, as Fiorina (1999) indicates, policy divergence increased in recent decades, while the rise of polling, surveys, and focus groups probably improved candidates' information about voters.

For a recent survey of how campaign contributions affect policy, see Milyo, Primo, and Groseclose (2000). One explanation for the connection between contributions and policy is that contributors essentially bribe politicians, buying policy. Many studies, however, find that once controls for ideological and constituent preferences are included, a congressman's roll-call votes are little affected by campaign contributions.⁷

Contributions may allow a candidate to spread his message and thus win more votes. Some influential models (for example, Baron (1994), and Grossman and Helpman (1996)) take the connection as given. The problem with this approach, as Wittman (2000) notes, is that if candidates adopt the positions favored by special-interest contributors, then rational voters with different interests should take high contributions or high spending as a signal that the candidate favors special-interest policies, and so will vote against him. Our paper explicitly views campaign contribution as financing informational efforts which inform targeted voters of the positions of the candidates. Everyone in our model behaves rationally.

Most of the literature sees one set of actors as voters and another set as campaign contributors. Our assumptions about a candidate's motives are in the spirit of Kramer (1983), who supposes that a politician's gain from winning consists of a monetary surplus, defined as the difference between the public budget and the amount paid to voters. We build on Baron (1994) in supposing that some voters are informed and others are initially uninformed, that campaigning can inform voters, and that people make contributions to influence the election outcome. Because we assume that candidates care about the amount of contributions they receive, rather than only about winning election, we find, in contrast to him, that in an election fought over ideological positions the candidates will adopt diverging policies.

⁷See for example, Chappell (1982), Grenzke (1989), Levitt (1998), and Bonnars and Lott (1998).

3 Assumptions

Two candidates, A and B , compete in an election. Each chooses a position on a one-dimensional issue. Candidate A chooses position α ; candidate B chooses position β , with $\alpha < 1/2 < \beta$. Candidates use campaign contributions for two purposes. First, each steals an exogenous fraction, s , to use for his personal benefit. A candidate's utility increases monotonically with the contributions he keeps, but with nothing else. Second, the fraction $1 - s$ of contributions not stolen is used for campaigning. The campaign contributions made to candidate i are c_i .

We make the simplest assumptions about the informativeness of campaign contributions. Initially, a fraction ϕ of voters is perfectly informed about the positions of the two candidates. The other fraction, $1 - \phi$, is initially uninformed. Campaigning is directed at such initially uninformed voters. A candidate can target any voter at a cost of one dollar. Such a targeted voter becomes fully informed about the positions of the two candidates, or less extremely, knows for sure which of the two candidates has a position which the voter prefers. Our qualitative results would not change under more general assumptions. For example, less perfect targeting of advertisements could be interpreted as raising a candidate's cost of persuading a voter to support him, or else as making a targeted voter support the candidate with a probability less than 1 but greater than $1/2$.

Each of n voters has single-peaked preferences over policy. An informed voter (one who is initially informed or who becomes informed from campaigning) votes for the candidate whose position is closer to the voter's ideal point. An uninformed person votes for candidate A over B with probability $1/2$. This randomness makes the election outcome random, and for plausible parameter values makes the probability that a given candidate wins election be a continuous function of the candidates' positions and of the campaign contributions he receives.

The fraction of voters with ideal points to the left of x is $F(x)$. The corresponding probability density function is $f(x)$. For simplicity, let the distribution of x be identical for initially informed and initially uninformed voters, and assume that the distribution is symmetric around the point $1/2$. Many of our results hold without the assumption of symmetry. Most importantly, our finding that candidates' positions diverge appears without that assumption. But symmetry simplifies the analysis (for example, the positions of candidates A and B will be equally distant from the ideal point of

the median voter), and allows us to make strong welfare comparisons (for example, that campaign contributions reduce the expected aggregate utility of voters). Each citizen can contribute to candidates, but, of course, no uninformed voter would contribute. For simplicity, we suppose that only voters who are initially informed make contributions. A person contributes only to affect the election outcome; the contributions are made after the each candidate commits to a policy position.

A voter's utility is a separable function of income and of policy: the utility of a voter with income Y_v , who contributes c_v^i to candidate i , has ideal point v , and faces policy p is $U(Y_v, v, p) = -(v - p)^2 + m(Y_v - c_v^i)$, where m is increasing, concave, and satisfies the Inada conditions.

The equilibrium consists of the candidates' policies (α and β), of the voters' contributions (c_v^i), and of the votes each candidate wins.

4 Candidates' positions and voters' contributions

The number of votes A wins is $n\phi F\left(\frac{\alpha+\beta}{2}\right) + (1-s)c_A + \frac{n(1-\phi)-(1-s)(c_A+c_B)}{2}$ where the first term represents the number of informed persons voting for candidate A , the second term represents the number of initially uninformed but targeted voters who vote for A , and the third term represents the number of uninformed and non-targeted voters who vote for A .

Normalizing the population of voters to measure one, the share of votes candidate A wins is

$$\pi(\alpha, \beta, c_A, c_B) = \phi F\left(\frac{\alpha + \beta}{2}\right) + \frac{(1-s)(c_A - c_B)}{2} + (1-\phi)/2. \quad (1)$$

Candidate B 's share is $1 - \pi(\alpha, \beta, c_A, c_B)$.

A candidate wins, and so his platform is enacted, with probability equal to his share of the votes. The contribution to candidate A made by a voter with ideal point at v is called c_v^A . The expected utility of such a voter is

$$U_v^A \equiv \pi(\alpha, \beta, c_A, c_B)(-(v - \alpha)^2) + (1 - \pi(\alpha, \beta, c_A, c_B))(-(v - \beta))^2 + m(Y - c_v^A). \quad (2)$$

The first-order condition with respect to c_v^A is

$$((v - \beta)^2 - (v - \alpha)^2) \frac{\partial \pi(\alpha, \beta, c_A, c_B)}{\partial c_A} \frac{\partial c_A}{\partial c_v^A} - m'(Y - c_v^A) = \quad (3)$$

$$((v - \beta)^2 - (v - \alpha)^2) \frac{1-s}{2} - m'(Y - c_v^A) \leq 0. \quad (4)$$

A voter contributes to candidate A if and only if $v < v^A(\alpha, \beta) < (\alpha + \beta)/2$, in which case (3) holds with equality. The cutoff value, $v^A(\alpha, \beta)$, is determined by the condition $\frac{((v-\beta)^2 - (v-\alpha)^2)(1-s)}{2} - m'(Y) = 0$ and equals

$$v^A(\alpha, \beta) = (\alpha + \beta)/2 - \frac{m'(Y)n}{(1-s)(\beta - \alpha)}. \quad (5)$$

Symmetrically, the cutoff contribution point for candidate B is $v^B(\alpha, \beta) = v^A(\beta, \alpha)$.

Note that the more the candidates differ, that is, the larger the distance $\beta - \alpha$ between the candidates' platforms, and the richer the voters, the larger the fraction of them who make contributions. Also note that when the candidates' platforms are sufficiently close, $\beta^2 - \alpha^2 < 2m'(Y)/(1-s)$, and voters contribute nothing. Differentiating (3) shows that a voter's willingness to contribute to candidate A is a decreasing function of the voter's position: he is more willing to contribute to A the further to the left is the voter's ideal policy.

Define $h \equiv m'^{-1}$, invert (3), and rearrange to obtain $h(((v - \beta)^2 - (v - \alpha)^2)(1 - s)/2) = Y - c_v^A$ for $v < v^A$. Thus, aggregate contributions to candidate A when $\beta^2 - \alpha^2 > 2nm'(Y)/(1-s)$ are

$$c_A(\alpha, \beta) = \int_0^{v^A} [Y - h(((v - \beta)^2 - (v - \alpha)^2) \frac{1-s}{2})] dF(v), \quad (6)$$

where v^A is determined by (5). If $\beta^2 - \alpha^2 < 2m'(Y)/(1-s)$, then $c_A(\alpha, \beta) = 0$. By symmetry, $c_B = c_A(\beta, \alpha)$.

Differentiating (6) with respect to α yields the first-order condition, which determines the optimal position of candidate A ; this first-order condition is equivalent to

$$\frac{\partial c_A(\alpha, \beta)}{\partial \alpha} = \int_0^{v^A} -h' \left(\frac{((v - \beta)^2 - (v - \alpha)^2)(1-s)}{2} \right) (v - \alpha) dF(v) = 0. \quad (7)$$

Moreover, symmetry implies that, at equilibrium, $\beta = 1 - \alpha$.⁸ Note that, from (5), as the platforms approach each other, v_A becomes arbitrarily small; in particular, when $\beta - \alpha < (2m'(Y)/(1-s))^{1/2}$, the value of v_A is smaller than α . This implies, however, that the integral expression above is negative, and so $\alpha < 1/2 - [m'(Y)/2(1-s)]^{1/2} < 1/2$. Since v_A increases with income, this divergence effect is stronger the poorer the voters. The effect arises because as candidate A moves to the left, he gains contributions from extreme voters and loses contributions from moderate voters. But if voters are poor, very few moderate voters are contributors, and so candidate A loses very little by moving to the left.

To summarize,

Proposition 1 *Suppose each candidate adopts a policy position to maximize his contributions. Then in equilibrium the positions of the candidates diverge. The distance between them is greater the poorer are the voters.*

Note that before the election voters are uncertain about who will win. Each voter would therefore prefer that both candidates position themselves at the point $1/2$ rather than at the equilibrium positions described above. The expected policy adopted by the candidates is the same as in the equilibrium we described, but there is no uncertainty, and no campaigning.⁹

5 Limits on political contributions

The last observation leads us to examine the effects of a cap, or limit, on the amount a voter may contribute. The first restrictions in the United States were imposed by the Tillman Act of 1907, which forbade corporate contributions. The caps have since been tightened, both at the federal level and at the state and local levels. The Federal Election Campaign Act (which came into effect in 1972) and its subsequent amendments imposed yet stricter limits on contributions. Most recently, the Bipartisan Campaign Reform Act of 2002 raised the cap on an individual's campaign contribution from \$1,000 to \$2,000. This increased cap, combined with restrictions on soft money contributions to national parties by corporations and by unions, and restrictions

⁸The symmetric equilibrium is unique up to a permutation of the candidates.

⁹Prat (1997) presents a model of campaign advertising based on microfoundations, in which excessive campaign spending can reduce the welfare of the median voter. We claim that such spending is excessive and that the resulting outcomes harm all voters.

on corporations, trade associations, and labor organizations financing “electioneering communications,” makes our analysis all the more relevant: the new bill makes it relatively easier to give money to candidates than to political parties, and makes it harder for interest groups to spend money directly instead of giving it to candidates.

Individual states in the U.S. also limit contributions, but the details differ widely across the states. Some states (Oregon, Montana, and Missouri) limit contributions for state legislature races to \$100; other states allow much higher contributions, and still other states place no limits.¹⁰

Let the cap, or limit, on a voter’s contribution be \bar{c} . The first four equations in the above analysis, describing vote shares and voters’ utilities, remain unchanged. The first-order condition characterizing a voter’s optimal contribution, equation (4), is now supplemented by $((v - \beta)^2 - (v - \alpha)^2)(1 - s)/2 - m'(Y - c_v^A) \geq 0$, with equality when the preferred contribution is below \bar{c} . Clearly, only voters with ideal points far to the left would contribute \bar{c} to candidate A ; the cutoff level of the ideal point, \bar{v}^A is

$$((\bar{v}^A - \beta)^2 - (\bar{v}^A - \alpha)^2)(1 - s)/2 - m'(Y - \bar{c}) = 0, \quad (8)$$

and it decreases in \bar{c} .

Aggregate contributions to candidate A are now modified from (6) to

$$c_A(\alpha, \beta) = \int_{\bar{v}^A}^{v^A} \left[Y - h \left(\frac{((v - \beta)^2 - (v - \alpha)^2)(1 - s)}{2} \right) \right] dF(v) + \bar{c}F(\bar{v}^A). \quad (9)$$

As before, $c_B = c_A(\beta, \alpha)$.

The first-order condition which determines the optimal position for candidate A is

$$\begin{aligned} & \int_{\bar{v}^A}^{v^A} -h' \left(\frac{((v - \beta)^2 - (v - \alpha)^2)(1 - s)}{2} \right) (v - \alpha)(1 - s) dF(v) - \\ & \left(Y - h \left(\frac{((\bar{v}^A - \beta)^2 - (\bar{v}^A - \alpha)^2)(1 - s)}{2} \right) \right) f(\bar{v}^A) \frac{\partial \bar{v}^A}{\partial \alpha} + \\ & \bar{c} f(\bar{v}^A) \frac{\partial \bar{v}^A}{\partial \alpha}. \end{aligned} \quad (10)$$

¹⁰Other countries also limit political contributions, as in Brazil, France, Israel, Italy, and Mexico.

Inverting (8), $Y - h \left(\frac{((\bar{v}^A - \beta)^2 - (\bar{v}^A - \alpha)^2)(1-s)}{2} \right) = \bar{c}$, we see that the last two terms in the expression above cancel each other. This makes the first-order condition for α

$$\int_{\bar{v}^A}^{v^A} -h' \left(\frac{((v - \beta)^2 - (v - \alpha)^2)(1-s)}{2} \right) (v - \alpha) dF(v) = 0 \quad (11)$$

The left-hand side in (11) must decrease in α to satisfy the second-order condition. Its derivative with respect to \bar{c} is $h' \left(\frac{((\bar{v}^A - \beta)^2 - (\bar{v}^A - \alpha)^2)(1-s)}{2} \right) (\bar{v}^A - \alpha)(1-s)(\partial \bar{v}^A / \partial \bar{c}) f(\bar{v}^A)$. Recall that $h' < 0$, that $\bar{v}^A < \alpha$, and that $\partial \bar{v}^A / \partial \bar{c} < 0$, so that the derivative is negative. This implies, by totally differentiating (11) with respect to \bar{c} and α , that tightening the cap increases α : the candidates' policies move closer.

The intuition here is that the people who want to contribute the most are extremists. So a cap will bind some extremists, but not moderates. This increases the importance of appealing to moderates, and so reduces the divergence of the candidates.

Differentiating (9) with respect to \bar{c} and using the envelope theorem lead to

$$-\bar{c} f(\bar{v}^A) \frac{\partial \bar{v}^A}{\partial \bar{c}} + \bar{c} f(\bar{v}^A) \frac{\partial \bar{v}^A}{\partial \bar{c}} + F(\bar{v}^A) = F(\bar{v}^A) > 0. \quad (12)$$

Thus, as expected, the cap reduces total contributions.

Collecting the results gives

Proposition 2 *A cap on the contributions a voter may make reduces aggregate contributions, and makes the platforms adopted by the candidates converge. Both effects increase the expected welfare of voters.*

A cap reduces a candidate's motivation to adopt a divergent platform so as to attract contributions. Its effect is therefore similar to the convergence effect of better informed voters with policy-motivated candidates (see e.g., Calvert, 1985).

6 Wealth differences

We now introduce differences in the voters' wealth or incomes, assuming that wealth is correlated with preferences. Thus, conservative voters are also wealthy voters: Y is an increasing function of v , and is now denoted $Y(v)$.

A voter's optimal contribution is determined from a first-order condition as in (4):

$$((v - \beta)^2 - (v - \alpha)^2) \frac{1-s}{2} - m'(Y(v) - c_v^A) \leq 0. \quad (13)$$

A similar equation holds for B 's contributors:

$$((v - \alpha)^2 - (v - \beta)^2) \frac{1-s}{2} - m'(Y(v) - c_v^B) \leq 0. \quad (14)$$

Differentiation shows that c_v^B increases with v :

$$\frac{dc_v^B}{dv} = - \frac{(\beta - \alpha)(1-s) - Y'm''(Y - c_v^B)}{m''(Y - c_v^B)} \geq 0. \quad (15)$$

The more conservative the voter (hence, by assumption, the richer the voter) the more he benefits from contributing to the candidate on the right. The preference effect and the income effect thus reinforce each other. As in the previous analysis, a cutoff v^B generally exists so that only informed voters with ideal points to the right of the cutoff contribute to B .

In contrast, c_v^A is not, in general, a monotonic function of v :

$$\frac{dc_v^A}{dv} = - \frac{(\alpha - \beta)(1-s) - Y'm''(Y - c_v^A)}{m''(Y - c_v^A)}. \quad (16)$$

The income effect induces a voter with a higher v to contribute more, but the preference effect induces smaller contributions. We shall assume that, for low v the income effect dominates but that for higher v the preference effect dominates, so that (16) increases initially and then declines. This, in particular, implies that only voters with moderate preferences (hence, wealth) contribute: very liberal voters are too poor to contribute, and moderate voters gain too little from contributing to A .

Thus, let v_L^A and v_R^A denote the cutoff values, so that only those informed voters with ideal points to the right of v_L^A and to the left of v_R^A contribute to A : $v_L^A < v_R^A < v^B$.

Total contributions to each of the candidates are

$$c_A(\alpha, \beta) = \int_{v_L^A}^{v_R^A} \left[Y(v) - h \left(\frac{((v - \beta)^2 - (v - \alpha)^2)(1 - s)}{2} \right) \right] dF(v), \quad (17)$$

and

$$c_B(\alpha, \beta) = \int_{v^B}^1 \left[Y(v) - h \left(\frac{((v - \alpha)^2 - (v - \beta)^2)(1 - s)}{2} \right) \right] dF(v). \quad (18)$$

The first-order conditions for the candidates' optimal positions are obtained by differentiating with respect to α and β , yielding

$$\int_{v_L^A}^{v_R^A} -h' \left(\frac{((v - \beta)^2 - (v - \alpha)^2)(1 - s)}{2} \right) (v - \alpha) dF(v) = 0 \quad (19)$$

and

$$\int_{v^B}^1 -h' \left(\frac{((v - \beta)^2 - (v - \alpha)^2)(1 - s)}{2} \right) (v - \beta) dF(v) = 0. \quad (20)$$

Note that from (4)

$$\frac{\partial v_k^A}{\partial \alpha} = \frac{v_k^A - \alpha}{\beta - \alpha + m''(Y(v))Y'(v)/(1 - s)}, \text{ for } k = L, R \quad (21)$$

and from (6)

$$\frac{\partial v^B}{\partial \beta} = \frac{\beta - v^B}{\beta - \alpha - m''(Y(v))Y'(v)/(1 - s)}. \quad (22)$$

Our assumption that for higher v the preference effect dominates in determining contributions to candidate A ensures that $\partial v_R^A / \partial \alpha > 0$. Furthermore, comparing (21) and (22) shows that $\partial v^B / \partial \beta > -\partial v_L^A / \partial \alpha$ when evaluated at $\alpha = 1 - \beta$.

These observations imply that the left-hand side in (19) is smaller than the left-hand side in ((20) when both are evaluated at $\alpha = 1 - \beta$. Note also that

the second-order conditions imply that the left-hand side in (19) decreases in α , and that the left-hand side in (20) decreases in β . In equilibrium the candidates therefore adopt asymmetric positions, with $\alpha > 1 - \beta$: the position of the candidate on the left lies closer to the median than does the position of the candidate on the right.

The above also implies that whenever the respective distances from contributors to the candidates are equal, a contributor to candidate A contributes less than does a contributor to candidate B . Because in equilibrium the candidates must have equal chances of winning, it follows that aggregate contributions to candidate A are smaller than to candidate B .¹¹

Thus, we obtain

Proposition 3 *When rich voters are the more conservative ones, the equilibrium positions of the candidates will be skewed to the right. Aggregate contributions to the liberal candidate are smaller than to the conservative candidate.*

This result is consistent, of course, with the view that the wealthy have more influence on policy (see, e.g., Domhoff (1983) and Mills (1956)). It also has implications for the effects of a cap on contributions. A cap would bind wealthy conservative voters more than it would poor liberal voters, thereby reducing the influence of the conservative voters. Indeed, Allen and Broyles (1991) find that the limits on contributions imposed by the Federal Election Campaign Act of 1972 caused wealthy families to reduce their contributions to presidential candidates, while the percentage of the total population making contributions increased. Candidates would then change their positions in the direction preferred by the poor. Thus, unlike the previously considered model without wealth differences across the voters where a cap resulted in a Pareto improvement, here it is a politically divisive issue, opposed by the rich and favored by the poor.

7 Public campaign financing

Some countries (including Canada, France, Germany, Italy, Japan, and Sweden) subsidize political campaigns by providing candidates or parties with

¹¹Note that the equilibrium is unique only up to the identity of the candidates.

campaign funds.¹² The subsidies can be large. In Germany, for example, direct public funding of parties represented in the Bundestag exceeds DM 300 million annually and approaches DM one billion if indirect public support (such as free media broadcasting, free newspaper advertisement, use of buildings etc.) is included. In the United States, the federal government gives money to presidential candidates; in the 2000 election cycle it constituted about half of campaign spending by the candidates. The states of Maine and Rhode Island, as well as the cities of New York, Los Angeles and San Francisco also provide public funds for campaigning.

This section examines the implications of public campaign financing. We assume first, as in the benchmark case above, that all voters have identical income, and that voters differ only in their policy preferences. Suppose, therefore, that an exogenously given lump-sum tax t is levied on each individual.¹³ The tax proceeds are then split equally between the candidates, supplementing private contributions.¹⁴ The amount of public financing received by each candidate is then $nt/2$.

The first-order condition which determines private contributions is then

$$((v - \beta)^2 - (v - \alpha)^2) \frac{1-s}{2} - m'(Y - t - c_v^A) \leq 0. \quad (23)$$

The cutoff point for making a contribution is

$$v^A(\alpha, \beta; t) = (\alpha + \beta)/2 - \frac{m'(Y - t)}{(1-s)(\beta - \alpha)}. \quad (24)$$

Private contributions to candidate A are

$$c_A(\alpha, \beta; t) = \int_0^{v^A} [Y - t - h(((v - \beta)^2 - (v - \alpha)^2) \frac{1-s}{2})] dF(v). \quad (25)$$

¹²In general, public funding of political parties is almost universal among developed countries (the UK being an exception, although there too the issue is currently discussed), but much less so in less developed ones.

¹³With identical incomes, assuming identical taxes is natural.

¹⁴Rules for allocating tax money to political parties vary across countries. Funding formulas are often based on such criteria as the relative representation in parliament, and a minimum percentage of the national vote. Such systems of public funding are analyzed by Ortuno-Ortin and Schultz (2000). In the United States, the two major presidential candidates receive equal amounts of federal monies.

Clearly, extreme voters continue to be unconstrained by the tax; for these voters public financing just crowds out private contributions one-for-one, so that their total contribution (public plus private) is unchanged. Some moderate voters, who contributed without public finance, will find themselves constrained; for them the crowding out is partial. Yet more moderate voters, those who did not contribute initially, will now be forced to contribute, thus increasing their campaign contribution by the amount of the tax.

Differentiation of (25) and of the analogous expression for the contributions made to candidate B show that $\partial c_A(\alpha, \beta; t)/\partial t = -F(v^A)$, and $\partial c_B(\alpha, \beta; t)/\partial t = F(v^B) - 1$, which implies partial crowding out. The marginal increase in total contributions is $\partial[t + c_A(\alpha, \beta; t) + c_B(\alpha, \beta; t)]/\partial t = 1 - F(v^A) + F(v^B) - 1 = F(v^B) - F(v^A)$, which is positive but smaller than one.

To summarize,

Proposition 4 *In contrast to caps on contributions, public funding of political campaigns causes an increase in aggregate contributions.*

8 Conclusion

This paper departs from standard models of political competition by assuming that a candidate aims to maximize contributions collected from the voters. As in other analyses, citizens contribute to a candidate to increase that candidate's chances of winning. In contrast to the Downsian model, here the positions the candidates adopt differ. Moreover, when the incomes of voters differ, the willingness of the rich to make larger contributions than the poor moves the candidates to adopt positions the rich prefer. Our framework also allows studying the effect of setting caps on political contributions. We find that a cap on the contributions a voter may make reduces aggregate contributions and causes the candidates' platforms to converge. Such a cap is likely to benefit poor voters at the expense of rich voters. Public funding of campaigns, though equalizing contributions across individuals and reducing the private contributions, also causes an increase in aggregate contributions.

9 Notation

\bar{c} Cap on contributions

c_i Contributions received by candidate i , for $i = A, B$; contribution made by voter with ideal point at v , for $i = v$

c_v^A Contribution by voter with ideal point at v to candidate A .

$F(x)$ Fraction of the population that has ideal points to the left of x .

$f(x)$ Probability density function of voters' ideal points.

n Number of voters

p Policy

s Fraction of contributions stolen by candidate

U_v^A Expected utility of voter with ideal point at v who contributes to candidate A

v^A Critical value such that informed voters with ideal points to the left of v^A contribute to A .

\bar{v}^A Critical value such that with a cap on an individual's contribution, informed voters with ideal points to the left of \bar{v}^A contribute to candidate A .

Y_v Income of voter with ideal point v

α Position of candidate A

β Position of candidate B

ϕ Fraction of voters initially informed about the positions of the two candidates

π Share of votes won by candidate A .

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