Testing the Citizen-Candidate Model[1]

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Abstract

Citizen-candidate models of representative government postulate that any citizen may become a candidate for office, that a winner is chosen from among the candidates by voting with ties broken by the flip of a coin, that all voters have preferences among a set of policies and that the office-holder adopts his preferred policy. It has been proved on certain assumptions that there exists an equilibrium in these models and that the equilibrium is efficient. The significance of the proof is tested here with reference to the paradox of voting , the exploitation problem and the transposition of the Nash equilibrium from markets to politics. The quest for a political equilibrium leads in the end to the recognition of minimal rock-bottom requirement for cooperation and negotiation in democratic government.

Citizen-candidate models - specifically Martin Osborne and Al Slivinski, "A Model of Political Competition with Citizen Candidates"[2] and Tim Besley and Stephen Coate, "An Economic Model of Representative Democracy"[3] - can be looked upon as part of a larger enterprise by economists to explain politics on the same principles that are employed to explain markets. For politics as for markets, we seek to explain aggregate outcomes as equilibria emerging from the conjunction of uncoordinated actions by rational, self interested people, to determine when outcomes are, in some sense, in the public interest, to identify sources of inefficiency and to provide a platform for prediction and for reform.

Economists' first attempts at modelling democratic politics were focussed primarily upon the amalgamation by voting of individual preferences into social decisions. Central in this literature was the median voter theorem: When the choice among policies can be represented by the choice of points on a left-right continuum and when every voters' preferences among points is single-peaked, the first preference of the median voter prevails in a pair-wise vote with any other option.[4] Thus, the first preference of the median voter, if there is one, must prevail in voting about bills in parliament where all votes are pair-wise and all options are recognized in the larger sequence of votes. In this analysis, the voters were primary

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[1]I particularly appreciate the helpful and courteous comments of Tim Besley, Steve Coate, Martin Osborne, Al Slivinski and Stan Winer. Needless to say, the usual disclaimer applies in spades.

[2]*Quarterly Journal of Economics*, 1996, 85-114.

[3]*Quarterly Journal of Economics*, 1997, 65-95.

[4] Duncan Black, *The Theory of Committees and Elections*, 1958.

while politicians were secondary. As candidates for office or as office-holders, politicians were shunted aside in this analysis by two critical assumptions: that their only aim is to get elected and that they are truth-tellers who do in office what they promise as candidates. "Thus politicians in our model never seek office as a means of carrying out particular policies: their only goal is to reap the rewards of holding office *per se*. They treat policies purely as means to the attainment of their private ends, which they can reach only by being elected."[5]

The model worked well enough as long as preferences were single-peaked, but trouble emerged as soon as this assumption was relaxed.

- Collective preference as expressed through voting may be intransitive, cyclic or irrational even though no voter's preferences are intransitive, cyclic or irrational. A person who chooses option A over option B, option B over option C, but option C over option A would be deemed irrational, even insane. Yet an electorate may vote for option A over option B, for option B over option C and for option C over option A without any voter behaving irrationally. Among the implications of this "paradox of voting" are that it may be disadvantageous for voters to vote sincerely and that, if voters do vote sincerely, the agenda-setter, through his choice of a sequence of pair-wise votes, can arrange for any of the three options to emerge as the winner

- Voting about platforms of two or more single peaked issues - such as military expenditure and expenditure on health care - may be cyclic, even though both issues are single-peaked one at a time.

- Voting about the allocation of the entire national income is especially perverse. Imagine a society of N people where the national income is fixed at Y and where the allocation of the national income is determined by majority-rule voting. Think of every possible allocation of the national income as a platform $\{y^1, y^2,....y^N\}$ where y^i is the income of person i and where the sum of all y^i must add up to the entire national income, and think of politics as the choice by voting of one such platform from the set of all possible platforms. It turns out that when people vote selfishly and uncooperatively, as *homo economicus* would surely do, there is no platform that cannot be defeated by some other platform in a pair-wise vote. The most likely outcome would be limited cooperation. A deal would be struck among the members of some group, bound together by a common badge, such as race, language or locality, to share the entire national income among themselves, leaving nothing for outsiders. Voting about the allocation of the entire national income would be so divisive, and its outcome so unsatisfactory, that government by majority-rule voting would be impossible unless the unrestricted allocation of the national income were removed from the political realm in a system of property rights protected by a written or unwritten constitution.

- Once elected, politicians may break their promises to the electorate, enriching themselves, serving their own social class at the expense of the rest of the population, or selling public policy to the highest bidder.

If that is what is to be expected when the economists' picture of mankind extends from the market

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[5]Anthony Downs *An Economic Theory of Democracy*, 1957, 28.

to the political arena, then it is hardly surprising that many democracies are overthrown and it becomes somewhat mysterious that democracy ever works at all. Something more would seem to be required, either selfless cooperation among politicians or a better model of how self-interest plays out in the political arena.

Citizen-candidate models break the artificial bounds in the older literature between people voting about candidates for office and legislators voting about policies, incorporating both into a model of a democratic process where voters and candidates are drawn from the same population. The key assumptions are the very opposite of Downs' assumptions in the quotation above.

1) Politics is the choice of one out of a set of available options.

2) Everybody has preferences over policies.

3) Everybody is fully aware of everybody else's preferences.

4) Anybody may run as a candidate for office.

5) Office-holders adopt whatever policies they personally prefer. No promise to do otherwise would be believed. The office-holder in these models becomes an elected dictator, governing all by himself with no legislature and no political parties.

6) In the event of a tie between candidates, the winner of the election (to become the all-powerful office holder) is determined by lot. This assumption is important because ties emerge frequently in the world of the citizen-candidate model.

7) In voting and in deciding whether to run for office, people act individually, rationally and selfishly, without altruism and without deliberate cooperation.

Assumption 7 places the citizen-candidate model solidly within the realm of *homo economicus*. Introduce altruism or cooperation, and anything becomes possible. The principal objective of the economics of politics is to explain as much as possible of political life on economic assumptions, if only to identify a minimal core of politics within which conscious cooperation is really indispensable. The citizen-candidate model is especially enlightening in this context. Long ago, D. H. Robertson raised the question, "What do economists economize?"[6] His answer was, "Love". The economist's ideal is to arrange for as much of the world's work as possible to be undertaken within the domain of greed, reserving that scarce resource love (altruism and cooperation) for circumstances where love alone is sufficient for the task at hand. Whatever the authors' intentions may have been, the citizen-candidate models can be seen as the attempt to subsume as much of politics as possible under the domain of greed so that the minimal domain of love may be identified by default. In so far as there is an equilibrium, the citizen-candidate model suggests that the domain of selfishness in the political realm is not internally inconsistent. In so far as the equilibrium is efficient, the bare citizen-candidate model may serve as a platform for identifying "political

[6]Sir Dennis Robertson, *Economic Commentaries*, 1956

failure" associated with aspects of politics assumed away in the minimal formal model.[7]

The two articles - Osborne & Slivinski, and Besley & Coate - were written independently but have much in common. Both incorporate voting for issues and voting for people in the same framework of analysis. Both dispense with the artificial separation in the earlier literature between motives of voters and motives of candidates. Both describe politics as the determination through voting of one of a set of feasible policies. Both share all of the characteristics of the citizen-candidate model as set out above. There are also several differences:

The most important difference lies in their assumptions about the scope of public policy. Osborne and Slivinski restrict the set of alternative policy choices to a left-right continuum. All policies can be identified with points on a line, and all voters' preferences are single peaked. Besley and Coate are much more ambitious. They postulate an unspecified and unlimited set, A, of policy options among which some option, x, must eventually be chosen. Policies may be multi-dimensional. As nothing is ruled out of bounds, the set of feasible policies might involve any set of issues whatsoever, no matter how complex or diverse, and not excluding the allocation among voters of the entire national income.

There are differences in the rewards of office. Osborne and Slivinski impose a fixed cost of running of office and a fixed reward to the successful candidate, over and above the reward implicit in the right to choose public policy. Besley and Coate impose a cost of running for office but no benefit to the office holder over and above the right to choose public policy. Absence of a specific reward for winning is rather unimportant in the Besley and Coate model because a reward might be embedded automatically in the set of policy options.

There are differences in the behaviour of voters. Osborne and Slivinski assume people vote sincerely. Each person votes for the candidate whose policy preference is closest to his own, regardless of the candidate's chance of winning the election. Besley and Coate assume people vote strategically. Each person votes not entirely in accordance with his preferences among candidates' policies, but to maximize his expected utility associated with the winning candidate's choice of policy. Thus, in a race between three candidates, a person who prefers the policy of candidate 1 may vote for candidate 2 to break a tie between candidates 2 and 3 when he knows that candidate 1 has no chance of winning the election.

The articles also differ in their stated purposes. Osborne and Slivinski employ their model for comparing electoral systems, specifically for comparing outcomes under a plurality rule and under a run-off system. Under a plurality rule, the candidate with the most votes wins regardless of whether or not he has an absolute majority. The run-off system allows for two successive ballots. The winner of the first ballot is elected if and only if he obtains more than 50% of the votes. Otherwise, there is a second vote between the two candidates with the largest number of votes in the first ballot. Of special interest is the number of candidates entering the race and the validation of Duverger's law that a plurality system tends to promote two-candidate elections. Besley and Coate are more interested in the normative aspects of politics,

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[7]For an example of this usage, see Stephen Coate and Stephen Morris, "On the form of Transfers to Special Interests", *Journal of Political Economy*, 1995, 1210-35.

adopting the economists' criteria for the evaluation of markets to the study of the political realm. They ask whether a political equilibrium exists (It does.) and whether the equilibrium is likely to be efficient, questions of special interest in their broader framework with no constraints upon the content of the policy space. The model is well-suited for the study of political failure which can be introduced into the model by changes in assumptions about how voters or candidates behave. In what follows, I shall have more to say about Besley and Coate than about Osborne and Slivinski, in part because I am convinced by the analysis of electoral systems, but primarily because I am especially interested in the broader questions addressed within the Besley and Coate model.

The testing of the citizen-candidate model in this paper is to determine whether and to what extent it solves problems that arose within the earlier literature on the economics of politics. Among the matters to be discussed are the paradox of voting, the exploitation problem, informational requirements and the significance of the Nash equilibrium in a political context. The first two items pertain to Besley and Coate exclusively because neither the paradox of voting nor the exploitation problem can arise in a world where public policy is reducible to the choice of a point on a left-right scale.

The Paradox of Voting

The paradox of voting is exemplified in a society with three people who vote about three alternative options. The people are called α, β and γ. The options are called A, B and C. Person α's preference ordering among these options is ABC, meaning that he prefers A to B to C. Person β's preference ordering is BCA. Person γ's preference ordering is CAB. Thus, in pair-wise votes among options, A defeats B, B defeats C, but C defeats A, giving rise to an intransitive social ordering. A person whose pair-wise choices among options conformed to this pattern would be deemed irrational. Hence the paradox. The question at hand is whether the paradox of voting becomes any more determinate or less paradoxical when voting is embedded in a citizen-candidate model.

In explaining what happens in the citizen-candidate model, it is convenient, though not strictly necessary, to add a little structure to people's preferences. Suppose everybody's utility function is the same in the special sense that there is a common utility function defined over orders of preference rather than over outcomes per se. A person's utility can take on one of three values, u(I), u(II) and u(III), where u(I) is a person's utility if he attains his first preference, and so on. For person α, u(I) is his utility if the outcome of voting is option A. For person β, u(I) is his utility if the outcome of voting is option B. For person γ, u(I) is his utility if the outcome of voting is option C. By assumption,

$$u(I) \geq u(II) \geq u(III) \qquad (1)$$

By the rules of the citizen-candidate model, each person decides whether or not to run as a candidate, each person votes for the candidate of his choice and the winner among the candidates chooses his preferred option. As the model contains no restriction on the cost of becoming a candidate, there is no harm in supposing it to be 0 so that the cost of running for election can be ignored.

Now, depending on the strengths of people's preferences, there are two interesting cases. In the first, people are anxious to attain their most preferred option, but, otherwise, do not much care whether

their second preferences or their third preferences prevails. In the second case, people are very anxious to avoid their least preferred option, but do not much care whether their first preference or their second preference prevails.

The limiting form of the first case is

$$u(I) > u(II) = u(III) \qquad (2)$$

With that constellation of preferences, all three people become candidates, each person votes for himself, there is a tie among the three candidates, and the tie is broken by the flip of a three-sided coin. In this case, voting within the citizen-candidate model boils down to choosing among options by lot!

The limiting form of the second case is

$$u(I) = u(II) > u(III) \qquad (3)$$

When one's objective is to avoid one's worst option, he would always prefer a certainty of his second preference to a lottery with equal chances of the all three options. Specifically,

$$u(II) > (1/3)u(I) + (1/3)u(II) + (1/3)u(III) \qquad (4)$$

a condition implied by equation (3) but never by equation (2). On this condition, person α, whose first preference is A and whose second preference is B, would prefer a certainty of B to a lottery with equal probabilities of options A, B and C. His best strategy in these circumstances is to avoid becoming a candidate. By announcing that he will not run for office, he assures the adoption of option B which, while not his first choice, is at least preferable to C. Once person α has dropped out, person β has every incentive to remain in the race, and it no longer matters what person β does. If person β remains in the race, then voting is, in effect, between options B and C. Person β wins two-to-one with his own vote and that of person α, and he chooses his preferred option, B. If person β drops out, as he would if there were a cost to running for office, person β wins by acclamation.

The difficulty with this scenario is that all three people can play the same game. Consider person β whose worst option, B, prevails when person α is the first to drop out of the race. Person β could avoid this outcome by dropping out of the race instead. Then person α would acquire an incentive to become a candidate and person α's first preference, A, would prevail with the support of persons α and β. Person β has an analogous incentive. But three people cannot all be first to announce their non-candidacy. When there is a small cost to becoming a candidate, the model churns out three one-candidate equilibria , with no indication which of the three possible equilibria will prevail. Either politics reduces to choice by lot, or there are multiple equilibria with no indication which among the alternative equilibria will actually obtain.

Nothing changes when the three people become three groups of identical people as long as the population of each group is the same and a mechanism is devised for choosing one candidate from each group. Otherwise, if one of the three groups constitutes a clear majority of the population, its representative must necessarily win the election and its first preference prevails. A plurality (more votes than either of the

other groups, but less than 50% of the electorate) would do equally well when preferences are as shown in equation (2), but not when preferences are as shown in equation (3) because it would remain advantageous for any of the three candidates to be the first to drop out of the race. Politics would become troublesome if winning an election were advantageous to the winner himself and not just to the group to which he belongs. A situation could easily arise where, for instance, option A would prevail when there is no more than one candidate in each group but where option B or C prevails instead because two stubborn candidates split the vote of group A while only one candidate emerges from each of groups B and C.

Besley and Coate's first proposition is that "a political equilibrium exists". So far as I can tell, the proposition is correct on its assumptions, but existence is defined in a way that is not inconsistent with the paradox of voting. Nothing in the proposition requires the equilibrium to be unique. Nothing in the proposition rules out a tie broken by the flip of a coin. These omissions detract not from the validity of the proposition, but from its interest and relevance. Non-uniqueness raises the vexing question of which among a set of possible equilibria will eventually emerge.[8] Coin-tossing plays a significant role in the citizen-candidate world, but has no counterpart in actual political life.

The Exploitation Problem

By imposing no limits whatsoever on the scope of public policy, Besley and Coate have, in effect, designed a politics to deal with the exploitation problem. A political equilibrium in this model is an outcome where no voter wishes to change his vote, no candidate wishes to withdraw from the race, nobody else wishes to enter, and some candidate is destined to win by obtaining more votes than any other candidate or by tying with a group of other candidates and then winning the lottery among them. Besley and Coate prove, on certain assumptions, that a political equilibrium exists and is efficient. As the policy space is entirely unconstrained, the existence and efficiency of the political equilibrium must extend even to the case where voting is about the allocation among voters of the entire national income. Voting about who is to be rich and who is to be poor would seem to be no less feasible than voting about anything else.

To test this contention, consider a society of N people with a fixed national income, Y, to be allocated politically, and suppose for the moment that there is no cost of running for office. Politics is now about the choice of a vector $\{y^1, y^2, y^3, ..., y^N\}$ where y^i is the income assigned to person i and where there are no constraints on any y^i except that every y^i must be greater than or equal to 0 and that the sum of all y^i must be equal to Y. It is obvious what happens. Everybody becomes a candidate, everybody votes for himself, there is a massive tie with one vote for each candidate, the office-holder is determined by lot, and the office-holder grabs the entire national income for himself. If person w is the winner of the lottery, then $y^w = Y$ and $y^i = 0$ for all i not equal to w. The citizen-candidate model assigns the entire national income to one person chosen by lot with nothing left over for anybody else. Notwithstanding the extreme inequality, this outcome is strictly-speaking efficient. It is Pareto optimal because, when one person gets

[8]People are as likely to resort to violence over the choice among alternative equilibria as over any other conflict of interest when politics or the economy is indeterminate.

everything, there is no way to rearrange the economy to make at least one person better off without at the same time making anybody else worse off. It is Pareto optimal for the Dear Leader to exploit the rest of the population for his own prosperity and glory. On the other hand, this perverse efficiency is not what most people have in mind when including efficiency among the attributes of a good society.

A distinction can be drawn between efficiency *ex ante* and *ex post*. *Ex post*, the outcome in the citizen-candidate model is efficient in the trivial sense that there is at least one person, the elected dictator, who cannot be made better off by any reassignment among people of the national income. *Ex ante*, the outcome is not efficient at all. As long as people's utility of income functions are concave, each and every person would consider himself better off with an equal share of the national income than with an equal chance of emerging as the winner-take-all lottery with the entire national income as the prize. When the population is N and the national income is Y, every person would prefer a sure income of Y/N to a gamble with a 1/N chance of acquiring the entire national income and a (N - 1)/N chance of acquiring no income at all. As long as people are risk averse, a benevolent dictator or cooperation among people could make everybody better off *ex ante* than he would be in the outcome of the citizen-candidate model.[9]

Even *ex post* efficiency disappears with the introduction of a cost, c, of running for office. To keep matters simple, suppose that c is less than Y/N, that there is some mechanism in society enabling anybody and everybody to obtain the required cost of running for election, that the net national income available for consumption is automatically reduced by the sum of all candidates' cost of running for election and that the successful candidate is empowered to choose the allocation among people of the remainder of the national income. The outcome is the same as before, except that the income of the winning candidate becomes Y - cN rather than Y. Once again, everybody runs for office, everybody gets one vote (his own), and the elected candidate is determined by lot. If person w is the winner of the lottery, then $y^w = Y - cN$ and $y^i = 0$ for all i not equal to w.[10]

In an earlier draft of their article, Besley and Coate proposed an ingenious solution to the exploitation problem. Suppose society consisted of N - 1 selfish people and 1 altruist. As office-holder, each selfish person would assign the entire national income to himself, leaving nothing for anybody else, but the altruist would divide the national income equally because he thinks that would be the fair and

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[9]A similar inefficiency arises in the Osborne and Slivinski model when, for example, two candidates occupy positions x and -x on a left-right scale with a median of 0. Osborne and Slivinski postulate a utility function of the form $u = -|w - a|$ where w is the policy chosen by the winning candidate and a is the voter's preferred policy. There is no risk aversion in this specification of utility, but risk aversion is easily introduced by supposing that $u = - v(|w - a|)$ where $v' > 0$ and $v'' > 0$ as well.

[10]Besley and Coate recognize both of these difficulties, but only in a footnote that has little connection with the rest of the article. In footnote 19, they call attention to inefficiencies associated with the cost of running for election and the distinction between *ex ante* and *ex post* efficiency.

honourable thing to do. Since everybody's preferences are common knowledge, the only possible outcome is for the altruist alone to run for office and to be elected unanimously. Every selfish person reasons as follows: If I run for office and vote for myself, and if everybody else does likewise, I have a 1/N chance of acquiring the entire national income coupled with a (N - 1)/N chance of acquiring nothing. On the other hand, if I vote for the altruist, he is bound to win because he would then acquire at least 2 votes (his own and mine) in circumstances where nobody else would ever acquire more than 1 (his own). On winning and becoming the office- holder, the altruist supplies me with a sure income of Y/N which, as a risk averse person, I prefer to the gamble where I and everybody else run for office and vote for oneself. Since all selfish people reason as I do, we all vote for the altruist, and he wins unanimously.

The escape is not altogether satisfactory. First, the appearance of an altruist seems at variance with the spirit, if not with the letter, of the rest of the model. The overriding objective of the economics of politics is to explain politics in the way economists explain markets, as the outcome of universal greed. To postulate any altruism is to depart from that enterprise. Second, it is hard to see how, in practice, the altruist would be identified in a world where everybody else is rigidly selfish and where it is in the interest of each candidate to claim the mantle of selflessness for himself. Presumably the altruist wears a halo. Third, and most important, through the universal altruist wins unanimously in a contest where everybody else is strictly selfish, he must lose out to a candidate with a more limited scope of concern. For example, in a society where just over half the population is of religion J and just under half the population is of religion M, a candidate whose altruism extends no further than to the adherents of religion J - who believes fervently that adherents of religion M are unworthy of prosperity - must win in a pairwise vote with a universal altruist. This religious candidate wins against the universal altruist even in the case where everybody else is strictly selfish and not particularly religious. Suppose the population consists of N_J adherents of religion J and N_M adherents of religion M, where $N_J > N_M$. The religious candidate can offer an income of Y/N_J to each adherent of religion J as compared with an income of $Y/(N_J + N_M)$ which is all that the universal altruist could offer. All adherents of religion J vote for the religious candidate, he wins, adherents of religion J acquire incomes of Y/N_J , and adherents of religion M acquire incomes of 0.

The exploitation problem arises with no less vehemence in the citizen-candidate world than it did in the earlier literature of the economics of politics. The moral of the story remains that the scope of electorally-determined policy must somehow be restricted if democratic government is to work at all. Difficult as it is to locate the appropriate boundary between public and private spheres, it is evident from this example that there must be some minimal domain of property rights, for the allocation of the entire national income cannot be determined as the outcome of the vote.

Voters' Knowledge of Candidates' Preferences as a Substitute for Constitutional Constraints

The unfortunate outcome when people vote about the allocation of the entire national income is compounded by another consideration. Though the models themselves are atemporal, a natural extension would introduce a requirement for the office holder to step down periodically and to hold new elections from which he may not emerge victorious. Faced with this possibility, an office holder deemed to be strictly selfish and empowered to act however he pleases would employ the government's monopoly of the means of organized violence to oppress his political opponents, dispense with elections and remain in office indefinitely. Why not? There would seem to be two possible answers, one within each of the two

variants of the model. The answer in the Osborne and Slivinski model is to restrict political alternatives to a one-dimensional continuum. Though formally correct, the answer constitutes a drastic contraction of the political realm and leaves all but a relatively large segment of electoral activity unexplained. The answer may be satisfactory if all that is being explained is the difference between first-past-the-post and run-off elections, but not when the object of the model is to identify a broader political equilibrium.

By placing no limits whatsoever on the content of political alternatives and by claiming to produce "an economic model of representative democracy", Besley and Coate have committed themselves to a more comprehensive explanation of the political realm. Though their paper contains no formal discussion of political repression, one can read a constraint into the assumptions. The constraint is that voters' knowledge of all candidates' preferences would include a knowledge of their willingness to act repressively or to refuse to call new elections at the appropriate time. Armed with this knowledge, voters are unwilling to elect such candidates. Only nice candidates will be elected. In effect, I will not vote for you unless I know that you are willing to play by what I consider the rules to be. This consideration has already been discussed in connection with the exploitation problem where the altruist, if there is one, would be elected unanimously when every other candidate is strictly selfish. There three problems with this escape from predatory government: First, to postulate a nice candidate is to go well beyond the postulate of simple self-interest that seemed to characterize the model. Some candidates have to want to do what is right, even if they are free to do otherwise. There may be no such candidates in the absence of external constraints. Second, as discussed in connection with the exploitation problem, a candidate who wants to do right for the community as a whole might get beaten out by a candidate whose altruism is limited to less than the entire population. Third, and most important, the required knowledge of the true dispositions of the candidates is far greater than can be expected of voters. Indeed, candidates themselves may not know how they will behave when confronted with the powers of office. [It is often said that the most effective liars are those who can sincerely believe whatever is in their interest to proclaim.] Full and complete knowledge is a much stronger assumption than may at first appear.

There is in the end no substitute in the citizen-candidate models for genuine constitutional constraints, for checks and balances among legislature, executive and judiciary and for prospect of civil disobedience when an office holder oppresses political opponents or violates electoral rules. Just as perfect competition assumes away much of the need for conscious cooperation in the economic domain, so too does the citizen candidate (or elected dictator) model assume away much of the need for conscious cooperation in the political domain.

- To postulate an elected dictator is to postulate away the different independently-elected branches of government and the requirement for conscious cooperation between them. Gone is the need for deal-making within the legislature. Gone is the need for cooperation among legislature, executive and judiciary. Gone too are the checks and balances within different branches of government that many authors look upon as the indispensable requirement for the maintenance of democratic government.

- To postulate an elected dictator is to assume away all bargaining within political parties over the choice of platforms and leaders.

- When all candidates' preferences are common knowledge and when no candidate can commit

himself to any policy other than his own first preference, there can be no pressure groups and no deals in which candidates favour certain groups in return for their support.

There are two sides to these assumptions. On the one hand, they facilitate the analogy between politics and markets, abstracting from aspects of politics where conscious cooperation is indispensable and leaving the field for an equilibrium based exclusively upon uncoordinated self-interest. On the other hand, by stripping away domains of conscious cooperation, the models ignore the separation of powers and the checks and balances that many authors see as the first line of defence against the emergence of dictatorship. The elected dictator in the citizen-candidate model has no brake whatsoever on his authority. This may not matter too much in the Osborne and Slivinski version of the model where politics is confined to the choice of a point on a left-right continuum - precisely the circumstances where the first preference of the median voter may be expected to prevail - and where all other matters are consigned, by implication, to some non-political sphere. It matters a great deal in the Besley and Coate version where politics may be about anything whatsoever. There is a sense in which the institutions of democratic politics are fashioned not to be efficient in the economist's sense of the term, but to be inefficient as instruments for imposing the leader's will. An elected dictator is in that sense the antithesis of democratic government.[11]

The Nash Equilibrium as a Criterion for Order in the Political Realm

Both versions of the citizen-candidate model rely heavily upon the Nash equilibrium. Politics is deemed to be at rest when every person is content with his own actions as the best response to the actions of every other person in society. Among candidates and potential candidates, there is a Nash equilibrium when it is in the interest of no candidate to drop out of the race as long as all other candidates hold fast, and it is in the interest of no person not already a candidate to become one. Among voters, there is a Nash equilibrium when nobody wishes to change his vote as long as every other person's vote remains unchanged. The concept of the Nash equilibrium seems more relevant to the strategic voting as postulated in the Besley and Coate variant of the model than to sincere voting as postulated in the Osborne and Slivinski version of the model.

The Nash equilibrium is imported into the political realm from the world of perfect competition where people respond to prices rather than to other people and where it is reasonable to assume that each person looks upon prices as invariant, or, to be more precise, as not sufficiently responsive to one's own actions to make that response worth considering when deciding what to do. Politics is different as a simple example will show. Consider the two-candidate equilibrium in the Osborne and Slivinski model where political alternatives can be represented as points on a one-dimensional continuum from -T to +T and (let it be assumed) where the distribution of voters' first preferences is uniform over the entire range so that the first preference of the median voter is at 0. With the appropriate balance between the cost of running for election and the benefit of being elected, there can be a Nash equilibrium with two candidates whose first

[11] In *Controlling the State*, (1999), H. Scott Gordon attributes the preservation of representative government in Ancient Greece, Republican Rome, the Dutch Republic, Britain and the United States to checks and balances among the different branches of the government.

preferences are at x and -x as long as x is not so large that a third candidate with a first preference of 0 can acquire a third or more of the votes. This outcome is a thorough-going Nash equilibrium, but it may not yield the political determinacy that a Nash equilibrium is normally supposed to convey.

To see why, consider a third potential candidate whose first preference among all alternatives is at x - ϵ where ϵ is a small positive number. As long as the two original candidates hold fast (as they are assumed to do in the Nash equilibrium), this potential third candidate would desist from entering the race. By doing so, he would take more votes from the candidate at x than from the candidate at -x , delivering the election to the candidate at -x because he cannot obtain a plurality for himself. By entering, the would-be candidate would be twice harmed, once by having to bear the cost of running for election and again from switching the outcome from equal chances of - x and x (which is very close to his preferred alternative) to a certainty of -x. It would seem that no third candidate has an incentive to enter the race.

But if the reward for office is substantial, a third candidate might try to muscle out the one of the two original candidates. The interloper may address the original candidate at x as follows: "We both know that, unless one of us drops out, that awful person whose first preference is -x is sure to win. If you drop out, you will forgo the reward for winning but you will at least attain a policy outcome that is insignificantly different from your first preference, for, in a contest between a candidate whose first preference is - x and a candidate whose first preference is x - ϵ, the latter is bound to win. I might add that I myself am very stubborn, and, having entered the race, would consider it an unacceptable humiliation to withdraw. You being reasonable, should withdraw instead." One cannot say *a priori* what the original candidate would do, but it is not inconceivable that he would withdraw.

The point of this little story it that, notwithstanding its plausibility as an explanation of behaviour in large markets, the Nash equilibrium is a questionable concept for explaining interactions among small groups of people, such as the set of candidates in an election. The original situation with two candidates (with first preferences at x and - x) was a perfectly good Nash equilibrium in that every candidates and every voter was doing what was best for himself in the light of every other person's actions. The flaw in the Nash equilibrium in this context is its ruling out of the possibility (and people's realization of the possibility) that other's actions are not unaffected by one's own. The Nash equilibrium conveys a sort of property fight to first possession. Whoever occupies a slot in the one-dimensional continuum is assumed to hold on to it forever, regardless of any newcomer's behaviour. Newcomers defer to established occupants, not the other way round. Valid as that assumption may be in a competitive economy, it is a dubious characterization of the political realm.

A distinction can be drawn among three, rather than just two, types of behaviour: *sincere* behaviour where one supports what one favours regardless of the consequences, *strategic* behaviour where one acts to procure what one sees as the best attainable outcome given what others are doing, and *manipulative* behaviour where one acts to procure what one sees as the best attainable outcome taking account not just of what others are doing, but of how others would respond to one's actions. One may think of the Nash equilibrium of universal strategic behaviour, the appropriate notion of equilibrium for the analysis of large competitive markets where each participant thinks of himself as too small a part of the market to have any significant effect upon the market price. as would be appropriate . Reliance on the Nash equilibrium becomes dubious when and to the extent that politics is manipulative, yet the citizen-candidate models

invoke a Nash equilibrium despite the fact that they deal with interactions among a small number of candidates for office.

Consider just two people, 1 and 2, whose actions, a_1 and a_2, are chosen from sets of available options and whose utilities, u^1 and u^2 are functions of both person's actions. A Nash equilibrium is a pair of actions, a_1^* and a_2^*, such that

$$a_1^* = \text{argmax}(a_1)\, u^1(a_1, a_2^*) \qquad (5)$$

and

$$a_2^* = \text{argmax}(a_2)\, u^2(a_1^*, a_2) \qquad (6)$$

Each party chooses his strategy to maximize utility when the strategy of the other party is looked upon as invariant.

A manipulative equilibrium is a pair of actions, a_1^* and a_2^*, such that

$$a_1^* = \text{argmax}(a_1)\, u^1(a_1 , a_2^*(a_1)) \qquad (7)$$

and

$$a_2^* = \text{argmax}(a_2)\, u^2(a_1^*(a_2), a_2) \qquad (8)$$

where the functions $a_1^*(a_2)$ and $a_2^*(a_1)$ show anticipated responses to one another's actions. Person 1 might be inclined to take one action if assured that person 2 would not respond to his choice by changing his behaviour, but to take a different action in anticipation of person 2's response. With a choice restricted to actions a_1^* and a**, person 1 may reason as follows: If I choose action a_1^*, person 2 will react by choosing action a_2^*, but if I choose action a_1^{**}, person 2 will react by choosing action a_2^{**}. In choosing between actions a_1^* and a_1^{**}, person 1 anticipates not a fixed response a_2^*, but a pair of responses a_2^* and a_2^{**}. Thus, person 1 chooses a_1^* in preference to a_1^{**} if and only if $u^1(a_1^*, a_2^*) > u^1(a_1^{**}, a_2^{**})$. Person 2 makes a similar calculation based on his expectation of person 1's behaviour. The sets $a_2^*(a_1)$ and $a_1^*(a_2)$ can be thought as the expectational penumbra of the actions of persons 1 and 2. As anticipations, these sets may but need not be consistent with one another. It is difficult to say how best to incorporate a manipulative equilibrium into a citizen-candidate model or whether such an equilibrium would exist in the political realm . There may be no political equilibrium. The economist's ideal may turn out to be elusive.

The Cost of Running for Election and the Probability of Winning

Three important aspects of politics are assumed away by the assumption that each candidate bears a fixed cost of running for election. 1) The cost of running may be too high for any one candidate to bear all by himself, but not prohibitive for a group of like-minded people - in effect, a political party - to bear collectively in financing the candidacy of one member of the group. 2) A candidate's probability of winning may depend on the amount of money spent on his campaign. 3) The authority of office may be subdivided among partially competing jurisdictions: federal, provincial and local government, two Houses of Parliament, executive, legislature and judiciary.

The first of these considerations is most easily illustrated in a society with two principal options, A and B, and two groups of voters,α and β. Group α contains N_α people who prefer A to B, and group β contains N_β people who prefer B to A. Within each group, everybody is identical. There is also a default option called 0 that materializes if no candidate runs for office. Specifically, for each person in group α

$$u^\alpha(A) > u^\alpha(B) > u^\alpha(0) \qquad (9)$$

and for each person in group β

$$u^\beta(B) > u^\beta(A) > u^\beta(0) \qquad (10)$$

where u^α and u^β are the utility functions of people in groups α and β. Since group α is larger than group β, the option A would win in a head-to-head vote between options or in a head-to head vote between a person in group α and a person in group β. Who becomes a candidate depends on the cost of running for election.

The cost of running for election, c, could be prohibitive when a candidate must bear the entire cost himself, but not when that cost can be shared equally by everybody in one's group. That would be the case if

$$. \ c > u^\alpha(A) - u^\alpha(0) > u^\alpha(B) - u^\alpha(B) > c/N \qquad (11)$$

and

$$c > u^\beta(B) - u^\beta(0) > u^\beta(B) - u^\beta(A) > c/N \qquad (12)$$

With cost as indicated by these equations the only conceivable equilibrium in the citizen-candidate model would be were no candidate runs for election and the default option prevails, for the cost of running falls short of any candidate's gain from attaining his preferred option.[12]

There is, of course, an escape from this unfortunate trap. If $N_\alpha > N_\beta$, people in group α might choose a candidate among themselves and agree to share his cost of running for election. The contributors need not include every member of group α but must contain a large enough proportion, π, that $u^\alpha(A) - u^\beta(0) > c/\pi N$. The chosen candidate runs unopposed because any candidate from group β would be defeated. The candidate from group α wins and the option A is chosen. Easy in practice, this solution is deeply at variance with the assumptions of the citizen-candidate model because it requires precisely that cooperation among voters which the citizen-candidate model is designed to avoid.

Cooperation is always at the mercy of free-riders. Though everybody in group α stands to gain from running a candidate collectively, it is in the each member of the group to refuse to pay his share as long as he is confident that others in his group will not refuse to pay theirs. It is even conceivable that people in group β are cooperative while people in group α are not, in which case a candidate from group β would run unopposed and the option B would be chosen. In practice, cooperation among voters is like the establishment of a political party. People do cooperate voluntarily within political parties and for charitable

[12] In Besley and Coate and in Osborne and Slivinski, it is assumed that u and c are commensurate.

purposes. To what extent society can depend on voluntarily cooperation is an open question. In the citizen-candidate model there can be none, but democratic politics disintegrates whenever the cost of running for office exceeds any one person's benefit from the right to choose from among the options at stake in the election.

It is a curious feature of the citizen-candidate model that the outcome of an election is entirely predictable, that all candidate with any choice of winning have equal chances of winning and that a candidate's probability of winning is restricted to just three values: 1, 0 and 1/W where W is the number of candidates with any chance of winning the election. The probability is 1 when there is only one candidate with any chance of winning the election. The probability is 0 when a candidate is sure to lose but remains in the race regardless because, as shown by Besley and Coate in an ingenious example, his presence in the election affects other candidates' chances of winning. The probability is 1/W when a tie among W candidates will be broken by the flip of a W-sided coin. The outcome of an election is entirely predictable because every voter is assumed to know the preferences of every other voter and of every candidate in the election.

An immediate consequence of these features of the citizen-candidate model is that there is no place within the model for campaign expenditures to influence the electorate. Voters are assumed to be knowledgeable enough and rational enough that campaign advertising could not convince anybody of anything and would be altogether ineffective. The nature of the cost of running for election, c, is left unexplained. It is best thought of as a registration fee rather than as expenditure to inform voters of one's candidacy or to persuade voters that one is the superior candidate. A huge aspect of democratic politics is being postulated away.

Dropping this postulate opens the door for campaign advertising and other expenditures to get oneself or one's candidate elected. The cost of running for election would no longer be invariant, and the probability of winning would no longer be restricted to 1, 0 and 1/W. With only two political parties, left (L) and right (R), the left party's probability of winning, p, can be thought of as

$$p(x^L, x^R, c^L, c^R) + \epsilon \qquad (13)$$

where x^L and x^R are the policies adopted by the two parties, where c^L and c^R are their chosen campaign expenditures, and where ϵ is a random variable reflecting the inevitable uncertainty of political life, swings in the mood of the electorate, a candidate becoming suddenly ill, a scandal, and so on. Typically, a candidate's chance of winning depends upon the time and effort of his supporters and well as upon the amount of cash spent on his behalf. The willingness of the leftists, for example, to devote time and effort to their party would depend on how leftish the platform of their party turns out to be. Reinterpreting c^L as the efforts of the party faithful, the left party's choice of x^L would then become a tradeoff between the direct effect of x^L upon the left party's probability of getting elected and the indirect effect of x^L upon the enthusiasm of its supporters and their willingness, c^L, to work on the party's behalf. I suspect that such considerations, together with similar considerations on the right, have more to do with the prevalence of two candidates in most elections than the mechanism postulated in the citizen-candidate models.

The reinterpretation of c as campaign advertising and political activity in support of one's candidate

would normally cause c to exceed the amount that any one candidate could afford all by himself. Effective candidacy would require cooperation among large groups of people. It is doubtful whether politics would work in these circumstances without a large dose of conscious cooperation, negotiation and bargaining.

There is a similar problem with the specification of the reward for office, the sole right to choose public policy with or without an additional monetary reward as postulated by Osborne and Slivinski. The difficulty with this specification is that the general problem of controlling leaders is swept under the rug. The thwarting of dictatorship - not the elected dictator in these models, but the real predatory dictators of this world - is an ongoing objective of democratic government, an objective that is sometimes achieved and sometimes not. A dictatorship, elected or otherwise, would be uncontrollable. Beyond the confines of the citizen-candidate model lie other political institutions and a division of powers that somehow holds democratic government together.

Concluding Observations

The search for a political equilibrium can be looked upon not as a quest that must ultimately succeed or fail, but as the attempt to see how much of the political realm can be subsumed within the domain of self-interest, so as to identify the minimal domain within which something more than self-interest - conscious cooperation or respect for constitutional constraints - is required. It is from the latter point of view that the citizen-candidate models should be assessed. Large questions are identified and clarified, even if they remain unanswered.

First, citizen-candidate models raise questions about the appropriate boundary between government and the private sector. Comparing Osborne and Slivinski with Besley and Coate, there is a sense in which the scope of the public sector is too narrow in one model and too wide in the other. It is too narrow in Osborne and Slivinski where public policy is restricted to the choice of a point on a left-right continuum. Clearly, government can and does manage a considerably wider range of public policy. Besley and Coate present an interesting example of determinate voting about health care where preferences over policy options are not single-peaked, but, as is evident from the discussion above, the scope of the public sector cannot be extended to the allocation of the entire national income without at the same time creating such gross inefficiency, inequality and indeterminacy that the rules of democratic government would not long be respected. [Spokesmen for political parties may talk as though all issues are naturally correlated on one and the same left-right scale, but that is clearly untrue.] The scope of public policy is too wide in Besley and Coate where voters and candidates are assigned preferences, and office-holders are entitled to make policy, about anything whatsoever, not excluding the allocation among people of the entire national income. It is fairly evident from our discussion of the exploitation problem that allocation by voting of the entire national income is at best grossly inefficient and at worst destructive of the voting mechanism itself. Democratic politics must be imbedded in systems of property rights and civil rights that will not be overturned by the majority of the day. Somewhere between the left-right continuum and the political determination of the entire national income lies a boundary that cannot be crossed without at the same time undermining the foundation of democratic government. The contrast between the scope of government in the two citizen-candidate models highlights the importance of locating that boundary, but there is no

attempt within the models to do so. The problem was well-recognized in the earlier literature on the economics of politics, but citizen-candidate models supply an interesting framework within which the problem may be posed.

Second, the models facilitate the search for an irreducible role of cooperation in democratic politics. A great virtue of the citizen-candidate models is the complete absence of cooperation. As candidate and as voter, each person does what is best for himself with no thought for the common interest and no need for conscious cooperation, exactly as people relate to one another in a perfectly competitive market. The models can be looked upon as an attempt to identify an efficient political equilibrium comparable to the competitive equilibrium in a well-functioning market, a political analogue of Adam Smith's invisible hand turning self-interest to the common good. Given property rights, an efficient outcome emerges from the uncoordinated interaction of rational self-interested behaviour on the part of all the participants - people and firms - in the economy. Similarly, given political rights, an efficient outcome would, ideally, emerge from the uncoordinated interaction of rational self-interested behaviour on the part of all of the participants - candidates and voters - in the political realm. This objective of the citizen-candidate models is especially important not because it is fully attained within the models or in actual democratic politics, but because it helps to identify the place of bargaining, negotiation, compromise and cooperation in a democratic society.

The interaction of uncoordinated, rational and self-interested political behaviour can yield grossly inefficient equilibria, multiple equilibria, equilibria procured by coin-tossing with no counterpart in actual political life, or no equilibria at all. Such outcomes point to an indispensable role for cooperation, drawing attention in the strongest possible way to the problem of how far democratic politics can rely on individual self-interest within established institutions and when conscious cooperation is indispensable. The moral of the story may be that democracy is not and cannot be just about voting. Democracy is a highly complex institution where voting must, of course, have a central role to play, but where voting has to be supplemented by negotiation and compromise. It is perhaps for this reason that democratic government has proved so difficult to transplant to countries where traditions of civil rights, property rights, negotiation and compromise have not had time to take root.

The other observation is about the minimal role of cooperation in democratic politics. A great virtue of the citizen-candidates model is the complete absence of cooperation. As candidate and as voter, each person does what is best for himself with no thought for the common interest and no need for conscious cooperation, exactly as people relate to one another in a perfectly competitive market. This feature of the citizen-candidate model is a virtue not because it is realistic or descriptive of actual democratic politics, but because it helps to identify the minimal role of cooperation within a democratic society. In so far as the model yields a reasonably satisfactory outcome, it points to a political analogue of Adam Smith's invisible hand turning self-interest to the common good in the political realm. When outcomes cease to be satisfactory, the model points to an indispensable role for bargaining, negotiation and cooperation. The model peels away aspects of politics where one might suppose cooperation would be indispensable. Banishing cooperation, the model draws attention to the problem of how far democratic politics can rely on individual self-interest within established institutions and at what point conscious cooperation is indispensable.

The citizen -candidate model can be looked upon as an attempt to identify an efficient political equilibrium comparable to the competitive equilibrium in a well-functioning market. Given property rights, an efficient outcome emerges from the uncoordinated interaction of rational self-interested behaviour on the part of all the participants - people and firms - in the economy. Similarly, given political rights, one would hope to see the emergence of an efficient equilibrium from the uncoordinated interaction of rational self-interested behaviour on the part of all of the participants - voters and candidates - in the political arena. Investigation of the citizen-candidate model suggests that the ideal is in the end unattainable. Except in very special circumstances, the interaction of uncoordinated rational and self-interested behaviour yields grossly inefficient equilibria, multiple equilibria, or none at all. The moral of the story may be that democracy is not and cannot be just about voting. Democracy is instead a highly complex institution where voting must, of course, have a central role to play, but where voting must be supplemented by bargaining and negotiation. It is perhaps for this reason that democratic government has proved so difficult to transplant to countries where the tradition of negotiation and compromise has not had time to take root.

The Domain of the Public Sector

The range of policy options is artificially narrow in one model and indeterminably broad in the other. It is artificially narrow in the Osborne and Slivinski model where politics is confined to the choice of a point on a one-dimensional continuum. Either there is just one political question (such as total government expenditure) or people's preferences among all issues are perfectly correlated in a left-right scale, so that if you know a person's preference on one issue (such as prayer in school) you can predict his preference about every other policy that a winning candidate might adopt. From contemporary political rhetoric, one might easily come to suppose that politics really is one-dimensional, but a distinction should be drawn between partisanship once platforms of political parties have been established and the range of possible policies on many different issues that people may actually favour. Osborne and Slivinski buy internal consistency in their model by casting aside a major source of conflict in the political realm. By

contrast, Besley and Coate place no limits whatsoever on the set of political alternatives. Alternatives can be unlimitedly broad and multi-dimensional. Nothing in the model rules out the state's use of its monopoly of organized violence to deal with one's political rivals or to keep incumbents in office indefinitely.

Comparing Osborne and Slivinski with Besley and Coate, there is a sense in which the scope of the public sector is too narrow in one model and too wide in the other. It is too narrow in Osborne and Slivinski where public policy is restricted to the choice of a point on a left-right continuum. Clearly, government can and does manage a considerably wider range of public policy, if only because the juxtaposition of single-peaked issues is not single-peaked.[Spokesmen for political parties may talk as though all issues are naturally correlated on one and the same left-right scale, but that is clearly untrue.] The scope of public policy is too wide in Besley and Coate where voters and candidates are assigned preferences, and office-holders are entitled to make policy, about anything whatsoever, not excluding the allocation among people of the entire national income and the employment of the governments's monopoly of organized violence to suppress one's political rivals or to keep incumbents in office indefinitely. As discussed above, the government cannot allow itself to allocate the entire national income without at the same time creating such gross inefficiency, inequality and indeterminacy that the rules of democratic government would not long be respected. Similarly, with no limits whatsoever on the actions of the office holder, it is hard to see how he can be constrained from turning predatory. Presumably, politicians like office and many politicians attempt to remain in office indefinitely. In the absence of constitutional constraints or the prospect of civil disobedience when office-holders misbehave, the only defence against such behaviour (within the citizen-candidate model) is the voters' knowledge of the candidates' preferences. Every voter knows with certainty how each and every candidate would behave if elected. Presumably, voters can identify and vote for nice candidates (if there are any) who would not abuse the powers of office, even if empowered to do so. Perhaps voters' knowledge of candidate's preference would be a sufficient substitute for constitutional constraints if that knowledge were as literally and absolutely complete as is postulated in the assumptions of the model. Something more is required when such knowledge is, as it must always be, incomplete.

The real problem here is not that the authority of office-holders is literally unlimited, but that there is no specification of any limits within the formal model. Besley and Coate present an interesting example about policy toward medical care to show how their model can be applied beyond the confines of one-dimensional politics, but they supply no guidance to the reader about how the scope of admissible alternatives might be confined. Democratic politics must be imbedded in systems of property rights and civil rights that will not be overturned by the majority of the day. Somewhere between the left-right continuum and the political determination of the entire national income lies a boundary that cannot be crossed without at the same time undermining the foundation of democratic government. The contrast between the scope of government in the two citizen-candidate models highlights the importance of locating that boundary, but there is no attempt within the models to do so. The problem was well-recognized in the

earlier literature on the economics of politics. Citizen-candidate models supply an interesting framework within which the problem may be posed.

Sincere Behaviour, Strategic Behaviour, Manipulative Behaviour and the Median Voter.

Whether political outcomes conform to the first preferences of the median voter depends very much on how people are assumed to behave. Consider a society where i) voting is in accordance with the assumptions of the citizen-candidate model, ii) all policies can be represented by points on a line from -T to +T, iii) voters' first preferences are spread out evenly along the line (so that the first preference of the median voter is 0) and iv) every person's utility diminishes with the distance of the chosen policy from his first preference. The common utility function is

$$u = u(|a - w|) \qquad (5)$$

where a is a voter's first preference among all policies, w is the policy chosen by the winning candidate and utility is a diminishing function of the distance from a to w, regardless of which of the two is the larger. A person's utility is maximized when a = w and it diminishes at an ever greater rate as w moves farther and farther away from a. Osborne and Slivinski assume the utility function to be linear, implying that voters are risk neutral. Suppose instead that voters are risk averse. Risk aversion implies that the second derivative of u is negative, that utility diminishes with $|a - w|$ but at an increasing rate. Thus a person whose first preference is a would prefer a sure outcome of a + x to a risky prospect with equal chances of outcomes a and a + 2x.

If one does not run for office, his utility is $v(|a - w|)$. If one runs for office, his utility becomes the expected value of $v(|a - w|) - c$, where w = a if one wins, where w differs from a if another candidate wins, and where c is the cost of becoming a candidate. [Assume there is no monetary reward for winning. The only benefit from winning is the privilege of choosing one's preferred policy.] Let the default option - the policy that emerges when nobody chooses to become a candidate - be 0.[13] No candidate runs for office unless he has a chance of winning or his presence as a candidate affects the outcome of the election and he prefers the outcome when he runs as a candidate to the outcome when he does not.

The outcome depends on whether voting is sincere or strategic. Voting is said to be *sincere* when, as assumed by Osborne and Slivinski, every person votes for the candidate whose preference is closest to his own. With sincere voting, there may easily emerge an equilibrium with many candidates, each capturing the votes of clusters of people with similar preferences. Voting is said to be *strategic* when, as

[13]A default option is a technical requirement to ensure the emergence of an equilibrium in the Besley and Coate model. Its correspondence in actual political life may be the *status quo* when no new policy is adopted by the legislature or the executive.

assumed by Besley and Coate, every person votes to procure the most favourable outcome, even if that means abandoning the candidate whose first preference is closest to one's own. Strategic voting may cause a multi-candidate equilibrium to unravel. For there to be a multi-candidate equilibrium and as long as there is any cost to running for office, all candidates must attract equal numbers of votes. Any candidate with fewer votes than some other candidate would drop out of the race. But with a multi-candidate tie, any voter can assure the victory of any candidate other than the candidate for whom he is currently voting by switching his vote. With three candidates, there would have to be a three-way tie among candidates spread out along the continuum, one in the middle and the other two just far enough away on either side for all candidates to attract the same number of votes. That could be unstable because a voter who wanted, let us say, the left candidate to win might still have an incentive switch his vote to the central candidate. By sticking with the left candidate, the voter faces a risky prospect with equal probabilities of three outcomes, one left, one centre and one right. By switching his vote to the centre candidate, he trades in the risky prospect for a sure thing with approximately the same expected value. Being risk averse, he prefers the sure thing to the gamble. This strategy becomes increasingly attractive as the number of candidates increases. However many candidates there may be, a tie can be unstable because a voter whose policy preferences correspond, for example, to the extreme left candidate has an incentive to vote for a less extreme left-leaning candidate, preferring a victory for that slightly less extreme left-leaning candidate to the tie among all the candidates in the field, followed by the determination of the office-holder by lot. In such a process, extreme candidates would get knocked out one by one until there are only two candidates left. However, even with strategic voting, an equilibrium with more than two candidates could emerge if voters were spread out very unevenly along the left-right continuum or if their utility functions were very different from what is postulated here.[14]

The typical equilibrium would seem to contain two candidates with first preferences, x and $-x$, at equal distances to the right and to the left of the first preference of the median voter and with equal probabilities, ½, of winning the election. The distance x must be large enough to provide each candidate with an incentive to remain in the race. For each candidate, the gain from a 50% chance of his first choice (as opposed to a certainty of the first of his opponent) must outweigh the cost, c, of participating in the election. The distance x must be small enough that the median voter, should he decide to run, would capture less than one third of the votes in the election.

Even two candidates may be one too many. Consider the median voter in a context where two candidates have already occupied positions x and $-x$ that are close enough to ensure that the median voter would acquire less than a third of the votes in the event that he entered the race. He might do so anyway, reasoning that, if he enters the race, one of the other two candidates would surely drop out, for both of the two original candidates would prefer a certainty of 0 in the event that the median voter is elected to a 50-50

[14]Within the context of the formal models, strategic voting is more advantageous for the voter than sincere voting. In a more realistic context, it is less obvious which manner of voting is preferable. Sincere voting may be the better course of action in practice when candidates' policies are not known with certainty and when the behaviour of other voters is unpredictable. It is undoubtable that some voters do vote sincerely. This alone may justify the incorporation of sincere voting into political models.

chance of x and -x. But the triumph of the median voter requires a strategy not formally incorporated into the citizen-candidate models.