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The social sub-optimality of competitive elections

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Abstract One of the common normative assumptions about elections is that competitive elections are inherently good, and non-competitive elections are problematic. This paper challenges that assumption. At the level of individual elections, competitive elections produce either sub-optimal results or trivially optimal results, but competitive elections are never uniquely optimal. In aggregation, competitive elections for a set of offices are inherently sub-optimal. From a procedural perspective, the circumstances in which competitive elections are appropriate are rare, and from a diagnostic perspective, we cannot conclude that there are problems in the electoral system based on a lack of competition. In the context of social choice theory, competitive elections are not inherently good.

Keywords Elections · Competition · Competitive elections

Incumbent reelection rates are over 90%, and average margins of victory have increased over time. Similarly, the frequency of "close" elections has declined over time (Mayhew 1974; Jacobson 1987, 2004), which has led scholars to wonder whether institutional and structural factors in elections have given increasing advantages to incumbents. Explanations for such trends have been wide-ranging, and include redistricting, increasingly strong personal relationships between representatives and their constituents, financial advantages, and the ability to deter quality challengers. So what?

All other things being equal, is it a good thing to have competitive elections? The assumption that it is has been so pervasive that it is almost uncontested by normative theorists, reform advocates, pundits, and even most scholars, with the exception of a few works on

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redistricting.[1] Perhaps a better way to pose the question, though, is this: are we better off with competitive elections than with the alternative? Of course, that depends on the alternative, so we must define competitive elections. In a winner-take-all plurality electoral system, there will be two parties (Duverger's law), in which case there are two general conceptions we might use. First, an election can be classified as competitive if the resulting vote shares are close to 50%. This conception would be consistent with most of the empirical models commonly used, and the complaints of many political observers. However, it has an important logical problem. Mayhew's (1974) comments about the "vanishing marginals" were based on the empirical observation that there were fewer "marginal" elections over time. The number of House races with vote shares in the range defined as "close" decreased over time. Did this mean that elections were becoming less competitive? That is possible, but not the only interpretation. Despite the fact that incumbent vote shares had increased over time, the probability of individual incumbents losing might not have decreased because the variance in incumbent vote shares increased over time (Jacobson 1987, 2004; Mann 1978). As a result, the chances of any given incumbent's vote share dipping below 50% may not have declined. In a sense, this means that elections were not less competitive. Along the lines of that reasoning, this paper will define "competitive elections" as elections in which the chances of either candidate winning are close to 50%. This will also be easier to model because it requires fewer assumptions about election outcomes (such as specifying a function to translate expected vote shares into probabilities of winning or losing, which would also require an estimate of the variance of vote shares). Now that we have a definition of competitive elections, by default, we have a definition of non-competitive elections. A non-competitive election is one in which one of the candidates wins with a probability close to one.

Now, we can rephrase the question originally posed: is a probabilistic election preferable to a deterministically decided election as a social choice mechanism? There are at least three general approaches we might use to answer that question, and the objective of this paper will be to address the question with each approach. The first approach is an outcome-based approach. If we are concerned primarily with electoral outcomes, then the question is whether or not probabilistically decided elections produce superior outcomes to deterministically decided elections. A second approach is a procedural approach. We might argue that even if competitive elections do not produce uniquely preferable results, there are some circumstances in which they are procedurally preferred to deterministically decided elections. The third approach is a diagnostic one, and is related to the procedural approach. The first two approaches are theoretically motivated, but the diagnostic approach is empirically motivated. If it is true that a competitive election is procedurally appropriate under some circumstances, then the empirical presence or absence of competitive elections might indicate something about the health of electoral procedures. If there are circumstances in which an election should have been competitive, but was not, there is something wrong. If there are circumstances in which an election should not have been competitive, but was, there is something wrong. Thus, in principle, we may be able to assess the over-all health of the political system by using the presence or absence of close elections as a diagnostic tool. The value of having elections be decided probabilistically will be assessed based on each of these approaches.

[1] Drawing competitive districts achieves outcomes that are quite divergent from what democratic theory says we should want (Buchler 2005). Similarly, Brunell (2006) argues that drawing competitive districts leads to voter dissatisfaction. However, these are the exceptions rather than the rule. More indirectly, and more commonly, the literature on the tradeoffs between various redistricting goals shows that in order to draw competitive districts, we must sacrifice other worthy goals (e.g., Butler and Cain 1992; Niemi 1982; Niemi and Deegan 1978). However, even those arguments were based on the assumption that all other things being equal, competition is an appropriate goal to try to achieve.

It is important to note that this paper will focus on the value of competitive elections. This paper will not focus on competitive behavior within elections, nor some general notion of competitiveness that might include barriers to entry for challengers, openness to third parties, etc. The motivation is to examine the ubiquitous claim that predictably lopsided election results are somehow bad. Certain types of candidate behavior associated with competitive elections may be beneficial or harmful, which will be discussed, but the focus of this paper is on the value of competitive elections themselves and the claim that the frequency of lopsided elections in the U.S. is troubling and harmful to society.

It should also be noted that the definition of a competitive election in this paper is uniquely applicable to a two-candidate race. The meaning of competition in a proportional representation system must be fundamentally different since one party can 'beat' another party with a greater vote share by joining a governing coalition excluding the latter party, and the dynamics of a three-way race in a winner-take-all system are also fundamentally different. This further emphasizes the point that we must examine each form of 'competition' individually rather than to simply assume that anything characterized as 'competitive' is good.

1 The outcome-based approach: social choice and competitive elections

A great deal of democratic theory is based on the precept that competitive elections produce optimal outcomes. Madison's arguments in the *Federalist Papers* spoke of the value of competition between factions in order to prevent any faction from becoming tyrannical. Schumpeter (1942) based his arguments on analogies between economic markets and political competition. If competition in the market achieves optimal outcomes, then the same must be true of competition in the polity, or so the analogy goes. Of course, that intuitive argument falls apart given that the economic and political definitions of competition are fundamentally different (Buchler 2007), but the argument is a common one. The "responsible parties" doctrine promoted by the 1950 APSA committee stressed the necessity of perpetual competition between the two major parties to ensure democratic outcomes. Everywhere in democratic thought we can see the influence of the assumption that competition produces superior outcomes. Furthermore, when examining the health of democracy, much of our research has focused on the representativeness of public policy. Miller and Stokes (1963), for example, argue that there is a particularly strong connection between constituency interest and public policy in this country. Such findings are key to the argument that our form of government is somehow good. All of these claims are based on assessing outcomes, and few would argue that democracy itself has merit unless it achieves desirable outcomes. Thus, the most important concern when we assess the value of competitive elections is whether or not they achieve desirable outcomes.

In this section, then, we will assess the social choice implications of having elections be decided probabilistically as opposed to deterministically. From a social choice perspective, is it socially optimal for elections to be competitive? Suppose society's preferences over a field of possible candidates are well-ordered. This is, in reality, a fairly strong assumption, but without it, the concept of social optimality is perhaps out of place, as we will discuss later. Now, for the sake of algebraic convenience, let us also assume that for any given election, suppose we can construct a "social utility function" that translates a candidate's characteristics (e.g. ideology, valence characteristics, or whatever else might be of social value) into a social utility for that candidate winning. The logic of the argument will follow regardless of whether or not we can construct such a function, but the substantive processes

are easier to see algebraically. Define this function for candidate C as follows: $U_{S'}(C)$, and we can call this the candidate social utility function.[2] The specification of this function is best left open to make the arguments as generalizable as possible, but there are two parameters of this function that might seem most sensible. First, we might consider the role of a candidate's policy position relative to that of the voters, and construct a simple spatial model. Suppose there are n voters, and each voter has an ideal point i_j and each voter's utility for electing a candidate of ideology C is a quadratic loss function: $U_{S'}(C) = -(i_j - C)^2$. Suppose voters' ideal points are draws from a Standard Normal distribution. We could construct a general social utility function for a group of voters for electing a given candidate of ideology C. Using a Bentham/Mill-style conception of group utility, we can construct a social utility function, $U_{S'}(C)$ by simply adding up the utilities of all of the voters for electing candidate C:

$$U_{S'}(C) = -\sum_{j=1}^{n}(i_j - C)^2.$$

This may be a sensible specification, and it is one which incorporates strength of preferences rather than just direction, which would be consistent with pluralist theory. However, it is not the only sensible specification. Alternatively but along similar lines, we could specify $U_{S'}(C)$ as simply a decreasing function of the distance between C and the median or mean voter's ideal point. In either case, the emphasis is on the distance between the candidate's policy location and the mean voter based on Davis and Hinich's (1968) argument. Such a function would behave similarly (given the symmetric distribution of voters' ideal points), but would more closely resemble a social correspondence function since it bases social utility on the direction of individual preferences rather than the intensity of individual preferences. Essentially, it would convert a social correspondence function, which is an ordinal ranking of society's preferences over the field of possible candidates, into an interval-level variable that we can call social utility.

If, on the other hand, we want to incorporate valence characteristics such as experience, we might simply specify the social utility function as an increasing function of some valence characteristic. How we specify this function is not important, though, as long as it is fully specified. What is necessary for the calculations to follow is that this social utility function is a Von Neumann–Morgenstern utility function. Thus, for an election with two candidates, A and B, the social utility function for a given *election* can be expressed as follows: $U_S(p \mid A, B) = p(U_{S'}(A)) + (1 - p)(U_{S'}(B))$ where p is the probability that candidate A wins. What value of p maximizes this social utility function?

There are two possibilities we must consider. First, suppose without loss of generality that $U_{S'}(A) > U_{S'}(B)$. If that is the case, then $U_S(p \mid A, B)$ is maximized when $p = 1$. This is trivial to demonstrate. Suppose $p' < 1$. It then follows that $U_{S'}(A) > p'(U_{S'}(A)) + (1 - p')(U_{S'}(B))$ because we can simplify that inequality to:

$$(U_{S'}(A)) - p'(U_{S'}(A)) > (1 - p')(U_{S'}(B)),$$
$$(1 - p')(U_{S'}(A)) > (1 - p')(U_{S'}(B)),$$
$$(U_{S'}(A)) > (U_{S'}(B)).$$

[2]The notation here will use S' to denote that the function is a component of the fully-specified social utility function rather than a complete specification.

Thus, $U_S(p \mid A, B)$ is maximized when $p = 1$. Therefore, a competitive election would be sub-optimal from a social choice perspective.

Now, let us consider the possibility that $U_{S'}(A) = U_{S'}(B)$. If that is the case, $U_S(p \mid A, B)$ is not determined by p. Consider any two arbitrary probabilities, p' and p''. It follows that $p'(U_{S'}(A)) + (1 - p')(U_{S'}(B)) = p''(U_{S'}(A)) + (1 - p'')(U_{S'}(B))$ because we can simplify that equation to:

$$p'(U_{S'}(A)) + (1 - p')(U_{S'}(A)) = p''(U_{S'}(A)) + (1 - p'')(U_{S'}(A)), \tag{1}$$

$$(p' + 1 - p')(U_{S'}(A)) = (p'' + 1 - p'')(U_{S'}(A)), \tag{2}$$

$$(U_{S'}(A)) = (U_{S'}(A)). \tag{3}$$

Thus, $U_S(p \mid A, B)$ is the same for all possible values of p. Under these circumstances, $U_S(p \mid A, B)$ is maximized when $p = 0.5$, but $U_S(p \mid A, B)$ is also maximized when $p = 1$ or when $p = 0$.

Hence, from a social choice perspective, there are two possibilities. Either a competitive election would be socially sub-optimal, or a competitive election would be optimal, but not uniquely optimal. If a competitive election is socially optimal, then so is everything else. For an individual election when social utilities are exogenously determined, a competitive election cannot be uniquely socially optimal. In the abstract, this point might seem to be of little practical use, but in the context of a Downsian model, the interpretation of these results is quite clear. There are two possibilities. Suppose we have two candidates, A and B. Either A and B are equidistant from the median, or A is closer to the median. If the former is the case, then the social utility of either candidate winning is the same, so the social utility of any allocation of victory probabilities is the same. If all voters are rational spatial voters, the aggregate election result will be a statistical tie—the definition of a competitive election. However, from a social choice perspective, it wouldn't matter whether or not the election is competitive because regardless of the probability that either candidate wins, the social utility of the election is the same. Thus, a competitive election should be expected to occur, but from a social choice perspective, the fact that the election is competitive is trivial.

If A is closer to the median, the social utility of A winning is higher than the social utility of B winning, so the optimal election is one in which A wins with probability 1. If all voters are rational spatial voters, they will elect A with probability 1, and the election will not be competitive. Furthermore, if the election were competitive, that would be a "bad" thing because it would mean having a nonzero probability that the candidate further from the median wins. In that context, if an election is not competitive, that is not a reason for concern since it would be less preferable if the election had been competitive. Hence, there is nothing inherently wrong with non-competitive elections.

1.1 Incumbency advantage and non-competitive elections

The simple observation in the previous section is that if one candidate provides more social utility than his opponent, it is uniquely socially optimal for that candidate to win deterministically. Otherwise, social utility does not depend on the probability that either candidate wins, so a competitive election is trivial. A competitive election is never uniquely socially optimal. If elections were pure Downsian contests, then, we should not complain when one candidate wins decisively because that would mean such a candidate is closer to the median voter, and if his opponent had stood a reasonable chance of winning, that would have been bad. The problem, of course, is that elections are not pure Downsian contests, so this simple

model doesn't capture the complaints made by those who lament the infrequency of competitive elections. The most obvious complaint is that there are circumstances under which the social utility of electing an incumbent I is lower than the social utility of electing the challenger C (for example, if the challenger is closer to the median voter in a spatial voting model), but the incumbent wins the election for other reasons. Some might claim that this is a situation in which the election should be competitive. However, if $U_{S'}(I) < U_{S'}(C)$, and the probability that I wins is greater than 0, that is sub-optimal. In fact, a competitive election in which the probability that the incumbent wins is 0.5 is sub-optimal because social utility is maximized when the probability of I winning is 0. Given that, it is improper to say that this election should be competitive because from a social choice perspective, the optimal election is one in which the challenger wins with probability 1. If the challenger is closer to the median and the incumbent has a relatively high probability of winning, the problem is not that the election is insufficiently competitive. The problem is that the incumbent has a nonzero probability of winning. If elections functioned optimally based on Downsian principles, the incumbent would have no chance of winning and the election would not be competitive.

Suppose, though, that there is some flaw in the election procedure that prevents us from having the challenger win with probability 1. Suppose, for example, that incumbents have an inherent advantage that can never be completely overcome, either through a name recognition advantage, financial advantages, electoral reward for a history of providing pork, etc. If that is the case, then a deterministic win by the challenger would be socially optimal, but impossible, and therefore irrelevant. Does that mean that for all practical purposes, a competitive election is optimal? Possibly, but not necessarily. Suppose again that $U_{S'}(I) < U_{S'}(C)$. The presence of an incumbents' advantage would imply that if $p(C)$ is the probability of the challenger winning, $p(C) < 1$. Even $p(C) = 0.9$ would represent a situation with an incumbents' advantage because if $U_{S'}(I) < U_{S'}(C)$, the challenger *should* win deterministically, assuming a proper relationship between the social preference function and the social utility function.[3] If $p(C) > 0.5$, then making the election more competitive would mean reducing $p(C)$, which would reduce the social utility of the election. Thus, in order for an incumbents' advantage to make competitive elections preferable to the current system, it would have to be so large as to make $p(C) < 0.5$. Is the incumbents' advantage really that big? That is difficult to say, which will be discussed in the section on the diagnostic value of competitive elections, particularly if the social utility function includes valence characteristics (e.g., experience).[4] However, suppose $p(C) < 0.5$ due to an incumbents' advantage. If that is the case, then a competitive election would at least be preferable to the current state of affairs. However, social choice problems are essentially decision-theoretic problems for a benevolent dictator who is trying to maximize his own utility function, which happens to be based on benevolence. Suppose the problem is one of constrained optimization. Substantively, the benevolent dictator would like to make the challenger win with probability 1, but for whatever reason, he cannot. Is it socially optimal given constraints for the election

[3] This is, in fact, an important point, and will be discussed at the end of the paper.

[4] If so, even an incumbent who does not always represent his constituents' interests may be socially preferable to a challenger with no political experience, and if so, incumbent reelection rates are more a result of social preferences over valence characteristics than an unfair advantage. In fact, when incumbents face experienced challengers, their probabilities of winning are greatly reduced. Thus, it may seem reasonable to believe that the incumbents' advantage causes such a drastic reduction in $p(C)$ that a socially preferred challenger is more likely to lose than to win, but whether or not the challenger is really socially preferable depends on the relative value of valence characteristics.

to be more competitive? Remember that the social utility of our election increases as $p(C)$ increases, so the optimal election is to make $p(C)$ as large as constraints will allow. Suppose $p(C)$ must be bounded above by L, meaning that L is the optimal probability of the challenger winning, given constraints. Suppose $p(C) < L < 1 - p(C)$. If that is the case, then L is closer to 0.5 than $p(C)$, so the socially optimal election is more competitive than $p(C)$. However, the fact that L is more competitive than $p(C)$ is immaterial. What matters is that $L > p(C)$. So, competitive elections are not inherently good—they are coincidentally good.

Alternatively, suppose that $L > 1 - p(C)$. In that case, L is still the optimal election given constraints, but L is actually less competitive than $p(C)$, in which case a competitive election would be sub-optimal, even given constraints. Thus, if we make the problem one of constrained optimization of the social utility function and add several assumptions, a more competitive election might be the optimal election, but only coincidentally so, and when the relevant assumptions are not true, a competitive election would again be sub-optimal.

This result should not be surprising. The conception of the difference between a competitive election and a non-competitive election presented here is a perfect analog to the difference between a mixed strategy and a pure strategy in game theoretic models. In those models, it is only optimal to play a mixed strategy when the choices between which a player mixes produce equally preferable outcomes given the other players' strategies. A competitive election is the social choice equivalent of a mixed strategy, which is only optimal when the choices are equally preferable. However, applying mixed strategies in a social choice context is problematic. Mixed strategies are only necessary in game theoretic models in order to produce an equilibrium, which requires there to be another player with whom to have an equilibrium. Social choice models are essentially decision theoretic models for a benevolent dictator. Decision theoretic models have no second player with whom the actor must find an equilibrium, so mixing is irrelevant. From a social choice perspective, the mixed strategy of a competitive election is never necessary.

The arguments here do not rely on the parameters nor the functional form of the social utility function. We could just as easily build valence characteristics into the model. For example, utility functions of either individual voters or the society could incorporate how much experience or skill candidates have, or any other relevant characteristic. If, for example, we believe that competitive elections are necessary in order to prevent polarization by forcing legislators to be centrist, we can base the social utility function on centrism. As long as the social utility function is fully and properly specified, and as long as social preferences are well-ordered, there are two possibilities: Either society will be indifferent between the two candidates, or society will prefer one candidate. If the former is the case, a competitive election is socially optimal, but not uniquely so. If the latter is the case, competitive elections are socially sub-optimal. So, what can we say about the cases in which competitive elections are optimal, but not uniquely optimal? Under those circumstances, it would be equally socially desirable to arbitrarily have either candidate win. An election in which the taller candidate, or the candidate with a better haircut wins deterministically will produce an outcome that is equally socially desirable.

1.2 The assumption of exogenous social utility

The arguments here are based on the assumption that the social utility of either candidate winning an election is exogenously determined. Thus, we must now address two questions. First, how reasonable is that assumption, and second, what are the consequences of relaxing that assumption? With respect to the first question, a spatial model of candidate location is based on the assumption that candidates select locations within a policy space based on

their expectation of election outcomes. In a pure Downsian model without uncertainty and without the threat of third party entry, candidates locate themselves at the median because doing so is the only Nash equilibrium. Even if we were to believe that such a model is only a rough approximation of elections and that social utility is determined by candidates' locations in the policy space, then we could not examine the effects of arbitrarily assigning probabilities of victory to candidates without examining the effects of those assignments on candidate location strategies, and hence on social utility.

In fact, there are compelling reasons to believe that we can treat social utility as exogenously determined. At a basic empirical level, Brunell (2006) demonstrates that Members of Congress in marginal districts are no more ideologically extreme than their marginal counterparts. Griffin (2006) uncovers a relationship between *district* marginality and a measure of responsiveness, but his primary independent variable is based on district presidential vote. Of course, an incumbent may have a very high probability of winning even in a marginal district, though, so those results do not directly address the relationship between the closeness of an incumbent's election and responsiveness (recall that this paper simply examines the effects of lop-sided congressional elections). Thus, close elections do not seem to create incentives for ideological convergence. At the very least, these incentives must be outweighed by something else. We should not be particularly surprised by this result since elections are not pure Downsian contests for a variety of reasons. First, and most importantly for our purposes, candidates are not pure election seekers. They have policy preferences, and it is not at all clear that they deviate from those preferences very much for electoral purposes. Roemer (2001) distinguishes between models in the Downsian tradition of pure reelection-seekers and models in the Wittman tradition of policy-motivated office-seekers and argues that the emphasis on Downsian models is due partially to the computational convenience of such models over the more realistic Wittman-style models, but in the abstract social utility sense, we cannot ignore the fact that candidates have policy preferences that they would pursue sincerely if they lacked any electoral constraints. So, what happens when candidates are free of electoral constraints? Does their behavior change? Consider what happens when a Member of Congress retires. A retiring representative has no need to position herself at any location other than her true ideal point because she has no need to appeal to voters. Thus, the roll call voting patterns of retiring Members are likely indications of their true policy preferences. If Members of Congress locate themselves at positions other than their ideal points when they do run for reelection, then we should observe a difference between the locations of Members of Congress when they decide to retire and when they continue to run for reelection. If we do not see such a difference, then Members of Congress would seem to locate themselves at their ideal points, regardless of whether or not they need to compete for votes. In fact, Bender and Lott (1996) argue that the bulk of evidence of such shirking studies would seem to indicate that there is little change in roll call patterns when Members decide to retire, although there is evidence of participatory shirking. While there is ideological matching of representatives and their constituents, this is largely the result of a sorting effect in which poorly matched representatives are not reelected. Representatives do not shirk, largely because they do not want to shirk. If that is the case, then policy locations are exogenously determined, and changing electoral circumstances will not affect social utility derived from policy locations. Of course, the view that Members of Congress do not shift voting patterns when they retire is far from unanimous, and Rothenberg and Sanders (2000) argue that there is a small amount of ideological shirking in the last six months when Members are retiring, but even then we might not necessarily attribute this to "severing the electoral connection." There are other connections that are severed by the retirement decision, such as connections to other legislators. Perhaps such changes in roll call voting patterns are

due to the fact that Members no longer need to cooperate with other Members of Congress because they will not have indefinitely repeated interactions. Axelrod (1985) makes the basic point that Members of Congress may interact differently with each other when they do not believe such interaction will be repeated indefinitely. In any case, given how small the changes are when Members of Congress decide to retire, it is not clear that they moderate very much for electoral purposes anyway. The evidence is far from clear that Members of Congress strategically locate themselves at positions significantly different from their true ideal points for electoral purposes. A variety of models, including citizen–candidate models (Osborne and Slivinski 1996; Besley and Coate 1997; Cadigan and Janeba 2002) even explicitly prohibit strategic location based on the assumption that candidates cannot credibly commit to platforms other than their ideal points. Thus, arbitrarily assigning probabilities of victory independently of candidate locations is both theoretically and empirically justifiable.

However, the evidence of shirking is mixed, so we must consider the possibility that candidate social utilities are endogenously selected based on the process of assigning victory probabilities. In that context, perhaps 'competitive elections' are not inherently beneficial, but a process that makes certain elections competitive may be beneficial. So, we must make a distinction between a "competitive election" and a "competitive electoral system" in order to explore what happens when social utilities are endogenously determined. Elections are clearly not pure Downsian contests in which the candidate closest to the median voter deterministically wins. The process is complicated by voter uncertainty over candidate locations, candidate uncertainty over the location of the median, voter preferences over valence characteristics, financial advantages, the primary election stage, not to mention the role of party identification, which has been given little attention by formal models. However, that does not mean that election results are unresponsive to candidate locations. Canes-Wrone et al. (2002) demonstrate that ideologically extreme incumbents do face lower probabilities of victory, even though the effect is far smaller than a pure Downsian model would predict, and Ansolabehere et al. (2001) find similar results examining both incumbent and challenger locations. Furthermore, since there is mixed evidence that candidates locate themselves somewhat strategically when seeking election, as discussed earlier, let us suppose that candidates do make decisions affecting the social utility of their victories. We might define a competitive electoral system as one in which probabilities of victory are responsive to such decisions in order to incentivize social utility. Aren't such systems inherently preferable to systems in which probabilities of victory are unresponsive to such decisions?

In fact, the value of such a competitive system is dependent partially on how responsive election results are to changes in social utility, and paradoxically, over-responsiveness may be undesirable. Suppose there are two candidates, A and B. If neither candidate makes any adjustments to policy platforms for electoral purposes, their social utilities will be $U_{S'}(A)$ and $U_{S'}(B)$ respectively where $U_{S'}(A) < U_{S'}(B)$. Thus, if we exogenously determine the probability that either candidate wins, the uniquely optimal allocation of probabilities is one in which B wins deterministically. However, compare this to a competitive system in which candidates can affect their probabilities of winning by making decisions which increase their social utility, e.g., positioning themselves closer to the median voter. Would such a system produce a socially preferable election to simply assigning a probability of 1 to B's victory with a social utility of $U_{S'}(B)$?

If both candidates increase their social utility through positioning or some other method to some value of U were $U_{S'}(A) < U_{S'}(B) < U$, which produces a competitive election, then this competitive system would provide more social utility than the non-competitive system. However, if candidate B has a valence advantage over candidate A, it may not be possible for candidate A to do anything that will make the social utility of his victory reach U. Thus,

suppose the imposition of a competitive electoral system causes A and B each do something in order to increase their social utilities to $U_{S'}(A')$ and $U_{S'}(B')$ respectively where $U_{S'}(B') > U_{S'}(A')$. The consequence of this based on the allocation of probabilities is to have B win with probability $p < 1$ rather than with probability 1. Thus, imposing a competitive electoral system will cause both candidates to increase their social utilities and cause the election to become more competitive. If the following inequality holds, then the competitive electoral system will actually produce less social utility than the non-competitive system in expectation:

$$(1 - p)U_{S'}(A') + pU_{S'}(B') < U_{S'}(B).$$

If, for example, $U_{S'}(A') < U_{S'}(B)$ and p is sufficiently smaller than 1, then this inequality can be satisfied. In reality, elections are inherently probabilistic, and if the probabilities of victory are overly sensitive to shifts in social utility, the imposition of a competitive system may actually reduce the social utility of an election in expectation. The candidates might make decisions to increase their social utilities, but if these decisions have too much of an effect on election outcomes, they might paradoxically increase the probability of the 'wrong' candidate winning so much that the over-all social utility of the election is lower than what it would be if neither candidate made any adjustments to compete for votes. Of course, this could not happen in deterministically Downsian elections, and thus relies on uncertainty, but the claim that elections are deterministically Downsian is both theoretically and empirically insupportable. Thus, even if we allow social utility to be endogenously determined by the imposition of a competitive electoral system, imposition of a competitive system does not necessarily increase social utility. Thus, whether or not we assume that social utility is exogenously determined, we cannot conclude that competitive elections produce inherently preferable outcomes.

We might further argue that even if candidate locations are endogenously determined, so are other types of behavior, not all of which are beneficial. Even if competitive elections do incentivize arguably positive types of behavior like moderation, they may also incentivize less desirable behavior which negatively impacts social utility. At a basic level, candidates worried about reelection are less likely to be active legislators because they have to spend their time raising money and campaigning. Garand and Burke (2006) demonstrate that legislators are less active when they face competitive elections, although the reason they propose is that they have incentives to avoid controversy. Perhaps more troublesome is the possibility that the need to raise money for a campaign might have other negative consequences. For example, the need for campaign contributions might cause legislators to exchange policy favors for contributions if they are running in competitive races (Buchler and Jarvis 2001a, 2001b). Such favors may not be directly ideologically inconsistent with constituent wishes (or the cost of the contribution might outweigh the benefit), but such favors might come in the form of rent or particularized benefits, neither of which are beneficial to the rest of society. Competition may stifle policy innovation because it comes with electoral risks, and legislators facing reelection tend to be more risk-averse with respect to policy innovation (Mintrom 1997). Alternatively, competition may simply affect a legislator's preferences between long-term and short-term objectives (Gersbach 2004). If we are going to allow the allocation of probabilities to endogenously determine social utility, we must keep in mind that even if competition creates some incentives to do arguably beneficial things, it also creates incentives to do more harmful things.

1.3 A set of competitive elections

A single competitive election never produces uniquely socially optimal outcomes. Can a set of competitive elections be preferable to a set of non-competitive elections? Consider a set of n legislative elections with two parties. Let us define an n-dimensional column vector $\mathbf{d} = [U_{S'}(d_1)\ U_{S'}(d_2)\ \ldots\ U_{S'}(d_n)]^{\mathrm{T}}$ where $U_{S'}(d_i)$ is the social utility of the Democratic candidate winning, in district i, an n-dimensional column vector $\mathbf{r} = [U_{S'}(r_1)\ U_{S'}(r_2)\ \ldots\ U_{S'}(r_n)]^{\mathrm{T}}$ where $U_{S'}(r_i)$ is the social utility of the Republican candidate winning in district i, and an n-dimensional row vector $\mathbf{p} = [p_1\ p_2\ \ldots\ p_n]$ where p_i is the probability that the Democrat wins in district i. Also, suppose $\mathbf{1}$ is a row vector of 1's. We can now define a social utility function for a system of elections as follows: $U_S(\mathbf{p} \mid \mathbf{d}, \mathbf{r}) = \mathbf{p} \cdot \mathbf{d} + (\mathbf{1} - \mathbf{p}) \cdot \mathbf{r}$.

Now, let $\mathbf{p}^*$ be the vector that maximizes the new social utility function. Suppose there is some element of this vector, p_i^* such that $0 < p_i^* < 1$. For the same reasoning as in the previous analysis, this implies that $U_{S'}(d_i) = U_{S'}(r_i)$, in which case we can construct a new vector, $\mathbf{p}^{**}$ in which p_i^* is replaced with either a 0 or a 1, and the social utility of this set of elections is the same. Thus, any element of the vector $\mathbf{p}^*$ which is neither 0 nor 1 can be replaced with a 0 or a 1 and the social utility of this set of elections is still maximized. Thus, even in aggregation, competitive elections are either sub-optimal, or not uniquely optimal.

The problem with that reasoning, of course, is that if $\mathbf{d} = \mathbf{r}$, this implies that social utility is maximized when candidates of one specific party win every election with probability 1, giving that party all seats in the legislature. Clearly, that would not be optimal from a social choice perspective. There are two ways this problem can be addressed. The first, which is more mathematically simple, but conceptually complex, is that we can specify the elements of $\mathbf{d}$, $\mathbf{r}$, and $\mathbf{p}$ as jointly defined functions. So, for example, if there is some set of districts in which too many candidates of the same party are winning with high probabilities, the social utility of having candidates of that party win in other districts could be lower. If $\mathbf{d}$, $\mathbf{r}$, and $\mathbf{p}$ are jointly defined in that manner, that problem can be sidestepped. However, this approach is unsatisfying.

The fundamental problem that this notion addresses is the question of bias. Suppose, for example, that the social utility of a given vector $\mathbf{p}$ is dependent not just on the relative values of the elements of $\mathbf{d}$ and $\mathbf{r}$, but on the partisan ratio of the winners. Suppose there is some optimal proportion of Democratic candidates winning. We can call this ratio r. We can now define two new functions, g and h, as follows:

$$g = \mathbf{p} \cdot \mathbf{d} + (\mathbf{1} - \mathbf{p}) \cdot \mathbf{r},$$

$$h = \left(\left(\frac{1}{n} \sum_{i=1}^{n} (1 \text{ if } d_i \text{ wins, else } 0) \right) - r \right)^2.$$

Furthermore, we can define a new social utility function, $U_s = f(g, h)$ where $dU_s/dg > 0$ and $dU_s/dh < 0$. Given that specification, U_S is necessarily maximized when g is maximized and h is minimized if both can be simultaneously maximized and minimized respectively. If the proportion of Democratic candidates with higher social utilities than their Republican opponents is less than r, and the proportion of Republican candidates with higher social utilities than their Democratic opponents is less than $(1 - r)$, then U_S can be maximized when all elements of $\mathbf{p}$ are either 1 or 0. Suppose we assign a probability of 1 to each element of $\mathbf{p}$ for which the social utility of the Democratic candidate is higher, a 0 to each element of $\mathbf{p}$ for which the social utility of the Republican candidate is higher, then arbitrarily assign 1's and 0's to each other element so long as $(1/n) \sum_{i=1}^{n} p_i = r$. If that is the case,

then $h = 0$, so h is minimized, and we have already shown that g is also maximized. Thus, U_S is maximized without any competitive elections. If the proportion of Democratic or Republican candidates with higher social utilities than their opponents is higher than the ideal ratio of seats that party should win, we can apply the same logic, but the proportion of 1's and 0's will depend on the marginal utility of having each additional candidate with higher social utility win and the marginal utility of having each additional candidate of the "correct" party win to balance out the over-all ratio. Thus, even in aggregation, and even when we care about the partisan ratio as well as the relative social utilities of each candidate, we can maximize the social utility function without resorting to competitive elections.

However, suppose for the moment $\mathbf{d} = \mathbf{r}$. Can't we also maximize the social utility function by assigning 0.5 to each element of $\mathbf{p}$? Doing so would maximize g (which is always maximized when $\mathbf{d} = \mathbf{r}$), and $E((1/n)\sum_{i=1}^{n} p_i) = r$. However, this is only probabilistic. In fact, $E((((1/n)\sum_{i=1}^{n} p_i) - r)^2) > 0$, so in expectation, h is not minimized. Because there is some nonzero probability that h will be greater than 0 by any arbitrary amount, U_S is not maximized. Thus, paradoxically, competitive elections are inherently sub-optimal in aggregation because of their paradoxically weak ability to achieve proportionality.

2 The procedural value of competitive elections

If we define competitive elections as being procedurally good, then it is tautologically true that competitive elections are, at least in certain circumstances, good. However, why is one procedure inherently better than another? Why, for example, do we have legal procedures based on the presumption that the accused are innocent until proven guilty beyond a reasonable doubt? That system is based on the principle that it is better to let a guilty person go free than to convict an innocent person. Thus, the principle that such procedures are good is based on an evaluation of the aggregate outcome that would result from a presumption of guilt, and an evaluation of the aggregate outcome that would result from a presumption of innocence. Why is capitalism a better economic system? According to Adam Smith, the invisible hand produces superior outcomes. Procedures are good or bad based on the outcomes that they are likely to achieve. If that is the case, then we cannot evaluate procedures independently of outcomes, and the sub-optimality of outcomes with competitive elections actually demonstrates that competitive elections are not procedurally good unless we tautologically define them as such. However, we could argue that there are other effects of having competitive elections that are not captured by this model. Suppose, for example, that the presence of a competitive election promotes campaigns in which policy ideas are debated, and that there is social utility to having a competitive election not for its own sake, but for the sake of the side-effects. This is a more compelling argument that needs to be considered.

Suppose there is some absolute social utility provided by having a competitive election. Suppose that this is a constant c, so $U_{S'}(p = 0.5) = c$. If that is the case, then we must redefine the social utility of having an election be decided by probability p. If $p = 0.5$, then $U_S(0.5 \mid A, B) = 0.5(U_{S'}(A)) + 0.5(U_{S'}(B)) + c$, and otherwise, $U_S(p \mid A, B) = p(U_{S'}(A)) + (1 - p)(U_{S'}(B))$. Again without loss of generality, let us assume that $U_{S'}(A) > U_{S'}(B)$. So, is it still true that the social utility is maximized when $p = 1$? If $p = 1$, then $U_S(p = 1 \mid A, B) = U_{S'}(A)$. If that is true, then a competitive election will be uniquely socially optimal when the following inequality holds:

$$(U_{S'}(A)) < 0.5(U_{S'}(A)) + 0.5(U_{S'}(B)) + c,$$

$$0.5(U_{S'}(A)) < 0.5(U_{S'}(B)) + c,$$

$$0.5((U_{S'}(A)) - (U_{S'}(B))) < c.$$

So, a competitive election is uniquely socially optimal when c is greater than half the differential between the two candidate social utilities. This leaves us with two substantive questions. First, how big is c, and second, how big is $0.5((U_{S'}(A)) - (U_{S'}(B)))$? Substantively, is c so big that we should be willing to accept the risk of the worst candidate winning in order to get it?

There is nothing in the assumptions of these models to answer that question. However, we can make some reasonable inferences. Let σ_U^2 be the variance of the distribution of $U_{S'}(C)$ for the pool of potential candidates. Suppose we randomly select two candidates, A and B. We can define a parameter θ as follows: $\theta = 0.5(|U_{S'}(A) - U_{S'}(B)|)$. When σ_U^2 is large, $E(\theta)$ will also be large, and when σ_U^2 is small, $E(\theta)$ will also be small. Thus, when σ_U^2 is large, it is less reasonable to believe that $0.5((U_{S'}(A)) - (U_{S'}(B))) < c$. So, should we expect σ_U^2 to be large or small? In fact, there are compelling reasons to believe that σ_U^2 is large. The high variance in incumbent margins of victory discussed earlier are due to a high degree of variance in challenger quality. If valence characteristics are important parameters of $U_{S'}(C)$, that means σ_U^2 will be large, so $E(\theta)$ will also be large. Thus, there is no compelling reason to believe that $E(\theta) < c$, so even if competitive elections are procedurally preferable to non-competitive elections, there is no compelling reason to believe that the social utility provided by a competitive election frequently outweighs the utility differential between the two candidates. More importantly, what if A and B are not randomly selected? In fact, they are probably not randomly selected. What is more likely is that A and B are selected such that there is a negative association between $U_{S'}(A)$ and $U_{S'}(B)$. Consider, for example, the strategic politician model discussed by Jacobson and Kernell (1983). In that model, "quality" candidates will not challenge strong incumbents– they will wait until there is an election they are more likely to win. By default, then, incumbents will face challengers with inexperienced challengers, who would provide little social utility if valence characteristics are important parameters of the social utility function. As Banks and Kiewiet (1989) demonstrate, lower quality candidates may even have incentives to challenge strong incumbents. Since most congressional elections include incumbents, most elections are contests between a particularly strong candidate and a particularly weak candidate based on valence traits. If those valence traits are important parameters of $U_{S'}(C)$, then $E(\theta)$ will be large, and the circumstances in which a competitive election is procedurally desirable will be rare. Even if valence characteristics are not the most important parameters, previous models have shown that candidates with valence advantages (e.g. incumbents) have incentives to place themselves closer to their district median voters than their opponents (Groseclose 2001), so if social utility is based on more on policy, the expected candidate differential should be even higher. Thus, the circumstances in which competitive elections are uniquely optimal should be rare.

A similar argument can be made on the basis of procedural fairness. In the previous section, I argued that when two candidates provide equal social utility, it is socially optimal for the taller candidate to win deterministically. While this is true if we only care about the social utility of the outcome, such a process may violate basic principles of fairness. If that is the case, then we might simply argue that competitive elections are uniquely socially optimal when two candidates provide equal (or at least roughly equal) social utility. However, the same logic as above is at least as compelling here. It is probably rare for two candidates to provide equal social utility, so such a requirement should rarely apply.

Of course, this is not a formal proof that competitive elections are rarely desirable. However, those who argue for the procedural value of such elections should be aware that accepting competitive elections means accepting a high probability that the lesser candidate will win. How much do we care about who wins, and how much do we care about tossing a

metaphorical coin? If one candidate is socially preferred to the other and the election is not competitive, there is no reason for concern.

3 Competitive elections as diagnostic indicators

The logic of the previous section indicates that competitive elections may simply occur infrequently because they are not procedurally desirable with any great frequency. So, does that mean we should rejoice in the absence of competitive elections? There are other perspectives to consider. As indicated earlier, we might ask whether a competitive election is better than the alternative, but we might also ask whether it might serve as an indicator that things are working well. Suppose the electoral system allocates probabilities of victory optimally. In this model, the optimal election may happen to be competitive. Suppose that there is an upper limit on $U_{S'}(C)$. If that is the case, then the optimal election would be a race between two candidates of equal social utility at the upper bound of $U_{S'}(C)$. For example, in a spatial context, the optimal election would be a choice between two candidates located at the median voter. Since both candidates would have equal social utility, the uniquely optimal election would be a competitive one because of the procedural value of a competitive election when two candidates provide equal social utility. Since the socially optimal election across the pool of all possible candidates is a competitive one, does that mean a competitive election is desirable for what it represents rather than what it achieves? Not necessarily. Suppose also that there is a lower bound on $U_{S'}(C)$. If two candidates with social utilities at the lower bound of $U_{S'}(C)$ faced each other, the uniquely optimal election would be competitive, but it would be the least preferable election possible since no matter who wins, it is the worst possible candidate. In a pure Downsian model, a competitive election occurs when the two candidates are equidistant from the median, so the competitiveness of an election indicates nothing about the absolute distance between either candidate and the median. A competitive election does not indicate that voters are happy with the candidates—it indicates that voters are equally happy or unhappy with both candidates. Thus, we cannot make inferences about whether or not voters have "good" candidates from the frequency of competitive elections. For example, we cannot assess the effectiveness of pressure on candidates to converge ideologically simply by looking at the frequency of competitive elections.

Even so, might the closeness of a single election tell us if elections are working properly? Consider a social choice model based on spatial voting, as suggested earlier. If two candidates are equidistant from the median, it is equally socially optimal for either candidate to win. However, if the vote shares of each candidate are not close to 50% making the election competitive, then votes are not being cast rationally. More generally, if two candidates are equally socially optimal but one candidate gets significantly more than 50% of the vote, we might conclude that there is something wrong with the process which might produce sub-optimal outcomes under other circumstances. However, this observation is of questionable value from a practical perspective. A fully and properly specified social utility function, if it can be constructed, would have to take into account a wide variety of factors including ideology, partisanship, and valence characteristics. These factors would have to be specified with proper weight assigned to each factor. The functional form would clearly be disputable, so we would not be able to simply observe an election, reach an objective conclusion about how competitive the election should be, and conclude that there is a problem if that is not how competitive the election is. Who are we to say that a challenger would be socially preferable to an incumbent, even if the incumbent has deviated from the policy interests of his constituents? There is, after all, social utility to having a more senior

Representative who is likely to be more effective in providing particularized benefits to his constituents. Why do policy decisions in another area necessarily outweigh the social value of pork barrel projects? A more appropriate interpretation in a rational choice framework would be to apply the axiom of revealed preferences and conclude from the absence of a competitive election that the winning candidate is socially preferred to the losing candidate. Thus, we cannot use the presence or absence of a close election to make a diagnosis about the health of the political system.

4 Potential criticisms

The most obvious criticism of the arguments presented here is that they rely on a benevolent dictator unilaterally assigning probabilities of 1 and 0 to each candidate winning in each election. Thus, the paper ignores actual election processes in favor of an impossible process since no reform could possibly be instituted in order to achieve what this paper calls, "socially optimal." This criticism is a potent one, but misses the fundamental point of this paper. Two responses are required. First, the objective of this paper is not to provide guidance for political reformers on how to design an optimal electoral system. The argument is a conceptual one attacking the ubiquitous assumption that there is something inherently good about competitive elections that makes them superior to lopsided elections, and the argument is intended to spark a debate about what an electoral system should achieve, and whether or not a competitive election is truly a means of achieving it. It is still an open question whether or not they are the best we can achieve. After all, if the decisions of the benevolent dictator in this model are constrained by systemic advantages that some socially inferior candidates have, competitive elections may be the solution to a constrained optimization problem. This paper provides the criteria for when that will be true, so at the very least, this paper should refocus the debate about the value of reforms aimed at increasing the competitiveness of congressional elections. Secondly, I argue that we cannot determine from the presence or absence of close elections whether or not there is a problem to address. That was the point of the section on the diagnostic value of close elections.

Additionally, the models presented here are based on the strong, and perhaps questionable assumption that a social utility function exists—not that we can specify it, but simply that it exists. However, the conceptual argument may be applied under weaker assumptions. At the level of an individual election, society does not even need well-ordered preferences over the field of all possible candidates for the arguments to apply, so long as elections are limited to two candidates. Either society prefers A to B, or it doesn't. If society prefers A to B, then it is, in some sense, better for A to win deterministically than probabilistically. If society is indifferent between A and B, then a competitive election is neither good nor bad. If we require society to have well-ordered preferences over the field of all possible candidates, we can extend the argument to cover a set of elections—it would be "better" for the socially preferred candidate to win when there is a social preference, and other races to be decided deterministically in order to achieve the optimal partisan ratio. The models presented in this paper assume the existence of a social utility function because the substantive processes are easier to see algebraically. Of course, if a group's preferences are not well-ordered, such a utility function cannot be constructed, but if that is true, then there is no such thing as a socially optimal outcome. If that is true, election outcomes are determined by election rules, and are thus somewhat arbitrary.

Another possible defense of competitive elections is that they allow for change, whereas a system without competitive elections may be prone to stagnation. Since I do not specify

the parameters of the social utility functions, this argument is easy to address in the context of this model. Consider first a single election with two candidates, D and R, for whom we can estimate social utilities: $U_{S'}(D)$ and $U_{S'}(R)$. If elections are repeated, we can specify $U_{S'}(D_t)$ and $U_{S'}(R_t)$ such that they include parameters for the type of candidate who won at time $t-1$. In other words, if society values change over stagnation, such assumptions simply need to be included as parameters in the social utility function. As long as this is the case, the arguments of this paper hold, and if not, then the social utility function is misspecified. Similarly, in a system of elections, we can base social utility functions for any given race on aggregate characteristics of the winners in the last round. By not making any assumptions about the functional form of the social utility function, any such argument can be incorporated into this model, and the findings still hold.

We might also consider an odd possibility. Suppose there is uncertainty over candidate social utilities. If that is the case, and if society is risk averse, it may be possible that competitive elections solve a constrained optimization problem. This may be the most likely model in which competitive elections are uniquely socially optimal.

5 Extensions

The most important question raised by this paper is not obvious, but has wide-ranging implications. What is the relationship between the social correspondence function and the social utility function? Fundamentally, elections will produce socially optimal results when the mapping between the two functions follows this rule: social utility increases monotonically as we move from least preferred to most preferred. The explanation is fairly obvious: elections are simply realizations of the social preference function. When there are two candidates, the socially preferred candidate wins, assuming the preference rankings of the voters match the preference rankings of the population, or, that voter turnout is not biased in favor of one side or the other (Wolfinger and Rosenstone (1980) demonstrate that there is no such bias of significant size). The concept of social optimality, though, is based on the social utility function. If there are situations in which a socially preferred candidate provides less social utility than his opponent, then an election will produce socially sub-optimal results. If competitive elections occur when they should not, or do not occur when they should, this can only be a result of a misalignment of the social preference function and the social utility function. Thus, in order to assess the state of elections from an empirical or a theoretical perspective, we must understand the relationship between the social preference function and the social utility function. In the absence of information to the contrary, should we assume that these functions are out of alignment with each other? Such an assumption is necessary for the assertion that a lack of competitive elections is a problem, yet if true, this assumption calls into question the concept of democracy, or at least the principle of one-person-one-vote.

6 Conclusions

This paper began by pointing out the infrequency of close elections in modern American politics. The high reelection rate and high margins of victory for congressional incumbents strikes many observers as worrisome, whether it is based on the belief that uncertain elections produce superior outcomes, the belief that they are procedurally preferable, or the belief that a close election is a sign that election mechanisms are functioning properly. However, as this paper has argued, there is nothing inherently beneficial about competitive elections as a social choice mechanism. They do not produce socially optimal outcomes, they

are generally not procedurally appropriate, and they indicate nothing about the success or health of electoral mechanisms. The basic reason is actually quite intuitive. Suppose an incumbent tends to run against inexperienced opponents who are frequently less centrist than the incumbent. It would be socially preferable for the election to be a lopsided victory by the incumbent with no probability that the challenger wins. One might argue that it would be socially preferable for the incumbent to face a relatively experienced challenger who is less extreme than the inexperienced challengers, which might produce a competitive race. However, that does not mean that a competitive election is inherently desirable because it may instead be socially optimal for the incumbent to face a centrist and experienced challenger and for the challenger to win with relative certainty. Thus, it may be disingenuous for competition advocates to claim that we need more competitive elections. What they generally mean is that they want incumbents to lose deterministically to superior challengers, and that would mean non-competitive elections. An electoral system that promotes competitive behavior by candidates may have socially desirable results, but competitive elections themselves do not.

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References

Ansolabehere, S., Snyder, J., & Stewart, C. (2001). Candidate positioning in U.S. House elections. *American Journal of Political Science*, *45*(1), 136–159.

Axelrod, R. (1985). *The evolution of cooperation*. New York: Basic Books.

Banks, J., & Kiewiet, R. (1989). Explaining patterns of candidate competition in congressional elections. *American Journal of Political Science*, *33*, 997–1015.

Bender, B., & Lott, J. R. Jr. (1996). Legislator voting and shirking: a critical review of the literature. *Public Choice*, *87*, 67–100.

Besley, T., & Coate, S. (1997). An economic model of representative democracy. *Quarterly Journal of Economics*, *112*, 85–114.

Brunell, T. (2006). Rethinking redistricting: how drawing districts packed with partisans improves representation and attitudes towards Congress. *Political Science & Politics*, *39*(1), 77–85.

Buchler, J. (2005). Competition, representation and redistricting: the case against competitive congressional districts. *Journal of Theoretical Politics*, *17*(4), 431–463.

Buchler, J. (2007). The statistical properties of competitive elections: what the central limit theorem can teach us about election reform. *Political Science & Politics*, *40*(2), 333–337.

Buchler, J., & Jarvis, M. (2001a). *Reassessing the impact of campaign contributions on roll call votes*. Paper presented at the 2001 annual meeting of the American Political Science Association.

Buchler, J., & Jarvis, M. (2001b). *Buying campaign contributions with legislative favors*. Paper presented at the 2001 annual meeting of the American Political Science Association.

Butler, D., & Cain, B. E. (1992). *Congressional redistricting: comparative and theoretical perspectives*. New York: McMillan.

Cadigan, J., & Janeba, E. (2002). A citizen–candidate model with sequential elections. *Journal of Theoretical Politics*, *14*(4), 387–408.

Canes-Wrone, B., Brady, D., & Cogan, J. (2002). Out of step, out of office: electoral accountability and House members' voting. *American Political Science Review*, *96*, 127–140.

Davis, O., & Hinich, M. (1968). On the power and importance of the mean preference in a mathematical model of democratic choice. *Public Choice*, *5*, 59–72.

Garand, J., & Burke, K. (2006). Legislative activity and the 1994 Republican takeover. *American Politics Research*, *34*, 159–188.

Gersbach, H. (2004). Competition of politicians for incentive contracts and elections. *Public Choice*, *121*, 157–177.

Griffin, J. (2006). Electoral competition and democratic responsiveness: a defense of the marginality hypothesis. *Journal of Politics*, *68*, 911–921.

Groseclose, T. (2001). A model of candidate location when one candidate has a valence advantage. *American Journal of Political Science*, *45*, 862–886.

Jacobson, G. C. (1987). The marginals never vanished: incumbency and competition in elections to the U.S. House of representatives 1952–1982. *American Journal of Political Science*, *31*, 126–141.
Jacobson, G. C. (2004). *The politics of congressional elections*. New York: Pearson Longman.
Jacobson, G. C., & Kernell, S. (1983). *Strategy and choice in congressional elections*. New Haven: Yale University Press.
Mann, T. E. (1978). Unsafe at any margin: interpreting congressional elections. American Enterprise Institute for Public Policy Research, Washington, DC.
Mayhew, D. R. (1974). Congressional elections: the case of the vanishing marginals. *Polity*, *6*, 295–317.
Miller, W. E., & Stokes, D. (1963). Constituency influence in Congress. *American Political Science Review*, *57*, 45–56.
Mintrom, M. (1997). Policy entrepreneurs and the diffusion of innovation. *American Journal of Political Science*, *41*(3), 738–770.
Niemi, R. G. (1982). The effects of districting on tradeoffs among party competition, electoral responsiveness, and seats–votes relationships. In B. Grofman, A. Lijphart, R. B. McKay & H. A. Scarrow (Eds.), *Representation and redistricting issues*. Lexington: Lexington Books.
Niemi, R. G., & Deegan, J. Jr. (1978). A theory of political districting. *American Political Science Review*, *72*, 1304–1323.
Osborne, M. J., & Slivinski, A. (1996). A model of political competition with citizen candidates. *Quarterly Journal of Economics*, *111*, 65–96.
Roemer, J. (2001). *Political competition: theory and applications*. Cambridge: Harvard University Press.
Rothenberg, L., & Sanders, M. (2000). Severing the electoral connection: shirking in the contemporary congress. *American Journal of Political Science*, *44*, 310–319.
Schumpeter, J. (1942). *Capitalism, socialism and democracy*. New York: Harper and Row.
Wolfinger, R. E., & Rosenstone, S. J. (1980). *Who votes?* New Haven: Yale University Press.