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Sincere voting in large elections ☆

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ABSTRACT

Austen-Smith and Banks (1996) showed that sincere/informative voting is not typically an equilibrium of the Condorcet voting model when the size of the electorate is large. Here, we reverse their finding by adding a third type of voter—one that receives no information in favor of either of the alternatives—as well as global uncertainty about the probability that each voter is such a "no evidence type." The expected number of no evidence type voters can be arbitrarily small; nevertheless, if the electorate is large enough, then each of the two standard Condorcet types votes sincerely in every nondegenerate type-symmetric equilibrium.

1. Introduction

In the seminal paper on voting games with private information, Austen-Smith and Banks (1996, hereafter A-SB) revisited the setting first studied by the Marquis of Condorcet (1785) in which a bench of jurors, each with private information about the guilt or innocence of a particular suspect, must vote either to convict or acquit. A-SB laid out the provocative finding that with a large electorate, there is almost always a behavioral discrepancy between "sincere," or "informative," voting and "strategic" (i.e., "equilibrium") voting. In other words, A-SB showed that in the Condorcet environment, rational voters must sometimes vote against their private information.

A-SB's finding launched a research agenda aimed at studying different *institutions*, or voting rules, to determine when information is aggregated by equilibrium behavior despite the fact that not everyone is voting informatively/sincerely (see, e.g., Feddersen and Pesendorfer, 1997). Very little attention has been paid, however, to the robustness and descriptive validity of their original *behavioral* finding, namely the discrepancy between sincere and strategic voting. This is surprising given that few empirical scholars of elections are willing to embrace the idea that real-life voters would vote against their private information in large elections.[1] While many of these scholars find it plausible that strategic calculations can lead voters to vote against their private information in small electorates like juries, committees, and clubs, the discrepancy

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[1] In fact, given the perceived implausibility of insincere voting in large real-life elections, many scholars have proposed alternative theories of voting, such as expressive voting (Tullock, 1971; Brennan and Hamlin, 1988; Hamlin and Jennings, 2011; Kamenica and Egan Brad, 2014), or they conjecture that voters have non-instrumental motivations in deciding who to vote for, and whether to vote at all (Green and Shapiro, 1996; Feddersen and Sandroni, 2013).

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between sincere/informative voting and equilibrium voting has been harder to digest for large electorates, where intuition suggests that real-life voters who show up at the ballots vote with their evidence, not against it. In contrast to this intuition, voting theory has predicted the exact opposite: that equilibrium cannot support sincere voting with large electorates, but may support it in small electorates.

In this paper we offer a method of reconciling the discrepancy between sincere and strategic voting in the Condorcet model by introducing a third type of voter to the model: one who receives no evidence that the suspect is either innocent or guilty. We call this type the "no evidence type." The standard Condorcet model studied by A-SB has only two types of voters: those who received evidence in favor of guilt, and those who received evidence in favor of innocence. Accordingly, we call these two types of voters "Condorcet types." We assume that all voters are uncertain as to what fraction of voters in the population are not Condorcet types. These beliefs are subject to very mild constraints, and the motivating case of very little uncertainty is covered. If the Condorcet types vote sincerely while the no-evidence types vote close to random, then being pivotal in a large election implies that the fraction of no-evidence type voters is large. This conclusion is independent of how unlikely it is that the fraction of no-evidence types is large *ex ante*, so long as a large fraction is possible. At this point, however, the pivotal event provides very little information about the suspect's innocence or guilt. The Condorcet types are then willing to go with their private evidence. Establishing that this is an equilibrium description therefore only requires showing that when the Condorcet types vote sincerely, the no-evidence types are willing to mix close enough to random.

After establishing the existence of a sincere voting equilibrium, the last step of our argument shows that our model rationalizes sincere voting in a strong sense: We show that with a large enough electorate the two Condorcet types vote sincerely in *every* equilibrium in which voting is non-degenerate, i.e. when it is not the case that all types of voters vote for the same alternative.[2]

Although our perturbation is special, the steps we take to reconcile the discrepancy between sincere and equilibrium voting yield a more general insight. To reconcile this discrepancy by perturbing only the *information structure* of the Condorcet model—and not the preferences of voters—it must be that a voter learns significantly less from the pivotal event than from her private signal. In particular, voters must infer, conditional on being pivotal, that the votes of others are basically random.[3] Our perturbation to the information structure involves exactly this form of conditional beliefs across *all* nondegenerate equilibria. We comment further on this observation in Section 4.1. In the next three sections, we lay out the model, main result and its proof.

2. Model

We consider a majoritarian election in which $2n+1$ voters must each vote for one of two alternatives, $a \in \{0,1\}$. There is a state of the world, denoted $s=(\omega,\alpha)$, that is drawn randomly from a distribution φ over state space $S=\{0,1\}\times[0,1]$. The state determines the distribution of voter types; in particular, conditional on s, each voter's type is drawn independently from the set $T=\{\emptyset,0,1\}$ and the probability of type $t\in T$ is given by

$$\Pr\big(t \mid s=(\omega,\alpha)\big)=\begin{cases}\alpha & \text{if } t=\emptyset\\ (1-\alpha)q_\omega & \text{if } t=\omega\\ (1-\alpha)(1-q_\omega) & \text{if } t=-\omega\end{cases} \tag{1}$$

where q_0 and q_1 are parameters and, as usual, $-\omega$ indicates 1 if $\omega=0$ and 0 if $\omega=1$. Moreover, only the first component of the state ω is payoff relevant, and determines which alternative is superior for all voters. The payoff $u(t,a,s)$ for a voter of type $t\in T$ from electing $a\in\{0,1\}$ when the state is $s\in S$ is

$$u\big(t,a,s=(\omega,\alpha)\big)=\begin{cases}1 & \text{if } a=\omega\\ 0 & \text{otherwise.}\end{cases} \tag{2}$$

Thus, all voters strictly prefer to elect alternative a when the state is $\omega=a$. This completes the description of the basic structure of our model.

With a few assumptions it is natural to interpret our model as an extension of the Condorcet model studied by A-SB in which we have included a third type of voter, type $t=\emptyset$. In the remainder of this section, we introduce these assumptions as well as some definitions that will be useful in the analysis.

[2] This result stands in contrast to the analysis in Mandler (2012) where aggregate uncertainty about signal qualities does not deliver sincere voting. The key difference is that in Mandler's model every voter is a Condorcet type (i.e., there is no no-evidence type) and the pivotal event leads voters to draw inferences only about the signal qualities.

[3] This point—that what matters is the connection between others' votes and the state, conditional on being pivotal—distinguishes the equilibria here from the asymmetric equilibria of the standard Condorcet model in which a non-trivial fraction of voters randomize in such a way as to give others the incentive to vote sincerely.

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