An optimal voting procedure when voting is costly ☆

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Abstract

We study optimal dynamic voting procedures when voting is costly. For a highly stylized specification of our model with private values, two alternatives, and binary, equally likely types we show the optimality of a voting procedure that combines two main elements: (i) there is an arbitrarily chosen default decision and abstention is interpreted as a vote in favor of the default; (ii) voting is sequential and is terminated when a supermajority requirement, which declines over time, is met. We show the optimality of such a voting procedure by arguing that it is first best, that is, it maximizes welfare when equilibrium constraints are ignored, and by showing that individual incentives and social welfare are sufficiently aligned to make a first best procedure incentive compatible. We also provide counterexamples where no first best procedure is incentive compatible when voters' binary types are not equally likely.
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1. Introduction

The mechanism design literature usually imposes no restrictions on the outcomes that a planner can assign to a terminal history of a game form. This assumes that agents have no intrinsic preferences over the actions that they take in a mechanism. An exception is the literature on endogenous participation and mechanism design. In this literature positive participation costs arise at every terminal history along which an agent takes an action other than the action "abstention." Papers in this line of research include Stegeman (1996) and Celik and Yilankaya (2009) who consider welfare/profit maximizing auction design with endogenous participation.

The papers listed above only allow the planner to choose mechanisms in which agents make their participation decisions simultaneously. But if the objective of the planner includes participation costs, then it may be advantageous to allow for sequential participation. This may save participation costs because some agents may recognize that it is not worthwhile for them to participate, given their knowledge of previous agents' actions. The planner thus needs to optimize over a large class of extensive game forms and their sequential equilibria.

Here we solve this problem for a particular application, voting with costly participation, but we hope that our formulation will be useful also for other applications, such as auction design. Participation costs in voting have been studied before,[1] but the problem of the optimal design of voting rules in the presence of participation costs has not been addressed. We propose a formulation of this problem that allows for sequential mechanisms, i.e. we allow some voters to condition their participation decision on previous voters' choices. In practice, it may be that a small committee votes first, and a larger population is only asked to vote if no sufficiently large majority can be established in the smaller committee.[2] This resembles referendum procedures in California or Switzerland where a referendum must first attract a quorum of signatures before being put in front of the general electorate. In the first stage the default is that the referendum fails; this default needs to be overcome by sufficient participation.

In the model, a set of voters has to choose one of two candidates A, B. Each voter has a strict preference over candidates, and knows his or her own preference, but not other voters' preferences. Participation in the voting procedure has known positive costs that may differ across voters. The game form has to satisfy some restrictions that make the interpretation of certain branches as "abstention", or "participation" meaningful.

Our main result is that if voters are equally likely to prefer A or B there is a simple optimal voting procedure: voters vote sequentially in the order of increasing participation costs. Participation is voluntary and abstention is interpreted as a vote for a default candidate. A candidate is elected if a sufficiently large supermajority of voters who have expressed their preference — either by voting or by not voting — favors the candidate. This procedure exploits the assumption that abstention is free and can be interpreted as if it was a vote. Arguably, abstention is in practice sometimes observed as an expression of a preference. If, for example, a department chair informs department members that she will take one particular course of action unless a majority of members objects, this establishes that abstention is interpreted as a vote. It may be that voting terminates at a stage when remaining voters could still overturn the majority. Continued voting until the will of majority is established without any possibility of mistake is costly and requires many voters to be polled, particularly when the alternative to the default is preferred.

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[1] See, e.g. Börgers (2004), Ghosal and Lockwood (2009), Krasa and Polborn (2009).

[2] The economics department at the University of Michigan operates such a rule for decisions about certain types of offers of faculty positions.