Journal of Public Economics 112 (2014) 115–128

Contents lists available at ScienceDirect

Journal of Public Economics

journal homepage: www.elsevier.com/locate/jpube

Vote trading with and without party leaders ☆

Alessandra Casella [a,b,c,*], Thomas Palfrey [b,d], Sébastien Turban [d]

[a] Columbia University, United States
[b] NBER, United States
[c] CEPR, United Kingdom
[d] Caltech, United States

ARTICLE INFO

Article history:
Received 12 January 2013
Received in revised form 12 January 2014
Accepted 14 January 2014
Available online 5 February 2014

Keywords:
Vote trading
Majority voting
Committees
Experiments

ABSTRACT

Two groups of voters of known sizes disagree over a single binary decision to be taken by simple majority. Individuals have different, privately observed intensities of preferences and before voting can buy or sell votes among themselves for money. We study, theoretically and experimentally, the implication of such trading for outcomes and welfare when trades are coordinated by the two group leaders and when they take place anonymously in a competitive market. The theory has strong predictions. In both cases, trading falls short of full efficiency, but for opposite reasons: with group leaders, the minority wins too rarely; with market trades, the minority wins too often. As a result, with group leaders, vote trading improves over no-trade; with market trades, vote trading can be welfare reducing. The theoretical predictions are strongly supported by the experimental data.

1. Introduction

Consider a number of people collectively choosing between two alternatives through majority voting. The voters are divided into two groups, depending on which alternative they prefer. Suppose that before voting all votes can be freely traded for money: individuals feeling strongly about the decision can buy votes from those who are less concerned about the outcome. To concentrate on vote trading per se, suppose also that none of the voters is budget constrained so that they all can express the intensity of their preferences through the price they are willing to pay. In this setting, where inequality and credit constraints do not play a role, is vote trading a good idea?

In this paper, we address this question in two scenarios: when trades are coordinated by the two group leaders, and when they take place anonymously in a competitive market. The theory has strong predictions. In both cases, trading falls short of full efficiency, but for opposite reasons: with group leaders, the minority wins too rarely; with market trades, the minority wins too often. As a result, with group leaders, vote trading improves over no-trade; with market trades, vote trading can be welfare reducing. We find that these predictions are strongly supported by experimental results.

There are at least three major reasons to study vote trading. First, as is well-known, majority voting fails to account for the intensity of preferences. Second, economic theory teaches that markets typically work well in allocating goods to those who most value them. It is natural to ask whether this insight extends to votes. Third, corporate shares are traded in markets and come not only with rights to dividends and future profits, but also to votes. To what extent does the inherent trading of votes affect share prices and trades? It is difficult to answer this question without understanding the fundamental forces operating in a market for votes.[1]

It is not surprising, then, that questions about vote markets, whether mediated by money or by promises of future support (log-rolling), intrigued the early scholars in modern political economy: Buchanan and Tullock (1962), Coleman (1966, 1967), Park (1967), Wilson (1969), Tullock (1970), Haefele (1971), Kadane (1972), Riker and Brams (1973), Mueller (1973), Bernholz (1973, 1974).[2] Writing in 1974, however, Ferejohn summarized the sad state of knowledge on the subject succinctly: "[W]e really know very little theoretically about vote trading. We cannot be sure about when it will occur, or how often, or

☆ For helpful comments, we thank participants at the ESA 2011 meeting in Tucson and at seminars at Caltech, NYU, the Paris School of Economics, and Ecole Polytechnique, three referees, and the co-Editor. We thank Kyle Gerry for careful research assistance. We gratefully acknowledge financial support from the National Science Foundation (SES-0617820, SES-0617934, and SES-0962802), the Gordon and Betty Moore Foundation, the Center for Experimental Social Science at NYU, the Social Science Experimental Laboratory at Caltech, and the Straus Institute at NYU Law School. Casella thanks the Straus Institute and the Paris School of Economics for their hospitality, and the Alliance Program.

* Corresponding author at: 420 West 118 Street, Department of Economics, Columbia University, New York, NY 10027, USA
E-mail addresses: ac186@columbia.edu (A. Casella), trp@hss.caltech.edu (T. Palfrey), sebastien.turban@gmail.com (S. Turban).

http://dx.doi.org/10.1016/j.jpubeco.2014.01.001
0047-2727/

[1] See for example, Demichelis and Ritzberger (2007) and Dhillon and Rossetto (2011), and the references they cite.

[2] The papers had different methodological approaches (for example, cooperative versus non-cooperative games; or log-rolling versus markets for votes) and often focused on specific examples. McKelvey and Ordeshook (1980) report a laboratory experiment that studies the Riker and Brams (1973) logrolling example.

what sort of bargains will be made. We don't know if it has any desirable normative or efficiency properties" (p. 25).

The crux of the problem is that votes have characteristics that make them very different from typical goods. Votes are indivisible and intrinsically worthless; their value depends on the influence they provide on decision-making, and therefore on the holdings of votes by all other individuals. Thus, demands are interdependent, and payoffs discontinuous at the point at which a voter becomes pivotal. These unique features pose a major theoretical obstacle to understanding vote trading. Both in a market for votes and in log-rolling games, equilibrium and other stability concepts such as the core typically fail to exist. Ferejohn's early observation was echoed in later works (Schwartz, 1977, 1981; Shubik and van der Heyden, 1978; Weiss, 1988; Philipson and Snyder, 1996), and with very few exceptions (Piketty, 1994; Kultti and Salonen, 2005), the theoretical interest in voters trading votes among themselves effectively came to an end.

The literature shifted instead to modeling vote trading not as uncoordinated trades among vote holders, but as centralized agreements mediated either by a market-maker or by party leaders.[3] Coordinated vote trading is not only easier to study but is also a more promising route for efficiency gains, because it can address the externalities caused by individual trades on voters who are not part of the transaction. Studying models that incorporate some strong assumptions, both Koford (1982) and Philipson and Snyder (1996) conclude that vote trading through a market-maker improves welfare.[4]

In this paper, we go back to addressing these claims — both the lack of equilibrium in uncoordinated trading, and the scope for welfare gains when trading occurs through party leaders. To do so, we build on two existing contributions, one based on general equilibrium theory, and one based on mechanism design theory.

To overcome the problem of equilibrium existence in standard competitive models of vote markets, Casella et al. (2012) developed the concept of Ex Ante Competitive Equilibrium: a market price and (stochastic) demands such that each individual is maximizing his expected utility and the market clears in expectation. If realized demands do not clear the market exactly, a rationing rule determines which demands are satisfied.

That paper shows that an ex ante equilibrium exists in a symmetric environment where each voter is expected to favor either alternative with equal probability. Casella and Turban (2012) extend the analysis to asymmetric scenarios where the two groups are of known and different sizes, and thus can study explicitly the effect of the market on the outcomes of an ex-ante majority group and minority group. The environment seems particularly relevant for applications: often sides are not equal-sized and are well-established by party labels, cultural and geopolitical characteristics, or historical voting patterns. It is this latter approach we adopt in this paper.

We characterize an ex ante equilibrium with trade for the parametrization implemented in the experiment. For the great majority of possible realizations of intensities of preferences, only two actions are observed in equilibrium: voters either offer their vote for sale, or demand a majority of votes; and only two voters demand votes with positive probability: the highest-intensity member of the majority and the highest-intensity member of the minority. The competition for votes becomes a competition for dictatorship between these two voters. The frequency of minority victories then reflects the intensity of preferences of the most intense minority member, without taking into account the smaller size of the minority and the aggregate group values. As a result, relative to utilitarian efficiency, the minority wins too often. For the parameters used in the experiment, the bias is strong enough that ex ante welfare is lower with a vote market than in the absence of trade.

Results are quite different when trading occurs through party leaders. Koford (1982) and Philipson and Snyder (1996) studied the benchmark case of benevolent and all-powerful party leaders who are fully informed about their members' preferences and internalize their party's aggregate utility. We show that even under these ideal conditions vote trading will generally fall short of full efficiency. The reason is that centralized vote trading closely resembles a bilateral bargain between the leaders of the two opposing groups, which enables us to use two standard results from the mechanism design literature on bilateral bargaining. When a majority exists, it "owns" the decision: Myerson and Satterthwaite's (1983) seminal theorem thus implies that there is no incentive compatible mechanism that guarantees efficient trade and voluntary participation. Trade is then too rare, and the minority wins too infrequently. However, because the minority never wins in the absence of trade, we confirm the conclusion in the literature: trading through party leaders has higher ex ante welfare than no trade. When the two groups have the same size and ties are broken randomly, the two parties "own" half of the decision: Cramton et al.'s (1987) model of efficient dissolution of an equal partnership then implies that decision power can be transferred efficiently with voluntary participation.

We conduct a series of laboratory experiments to explore both the decentralized and the centralized approaches, and in the latter case with groups of equal and unequal size. We design the trades as a continuous auction. With party leaders, the experimental design comes to resemble well-known auction games from bilateral bargaining theory; with market trades, it is based on the widely accepted experimental design for competitive markets for goods and assets (Smith, 1965, 1982; Forsythe et al., 1982; Gray and Plott, 1990; Davis and Holt, 1992).[5]

The theory generates two main hypotheses: (1) In a decentralized market the minority wins too often and welfare is lower than in the absence of trade; (2) Centralized vote trading coordinated by party leaders leads to efficiency gains relative to majority rule in the absence of vote trading. If the two groups have different sizes, however, the minority wins too rarely and welfare falls short of full efficiency. Both hypotheses are supported in the data.

We find two departures from the theory in terms of its specific quantitative predictions. First, while centralized trade with equal size groups leads to efficiency gains, full efficiency (first best) is not usually achieved with equal sized groups. Second, our vote markets exhibit some overpricing, although it declines with experience.

The next section describes the basic model, in the two specifications applying to group leaders and to competitive trading, and derives the theoretical predictions. Section 3 describes the experimental design. Section 4 discusses the experimental results, starting with voting outcomes and welfare, and then proceeding to vote allocations and prices. Section 5 concludes.

2. The model

A committee of size n must decide between two alternatives, X and Y, and is divided into two groups with opposite preferences: it is publicly known that M individuals prefer alternative X, and m prefer alternative Y, with $m = n - M \leq M$. We will use M and m to indicate not only the size of the two groups, but also the groups' names. While the *direction* of each individual's preference is known, the *intensity* of such preference is private information. Intensity is summarized by a value v_i representing the utility that individual i attaches to obtaining his preferred alternative, relative to the competing one: individual i's utility is

[3] A different literature studies vote-buying by either candidates or lobbyists: for example, Myerson (1993), Groseclose and Snyder (1996), Dal Bò (2007), Dekel et al. (2008, 2009). We focus instead on vote-buying *within* the committee (or the electorate). The agents buying or selling votes are the voters themselves, acting either independently or through their leaders.

[4] Philipson and Snyder assume that only trades that are unanimously preferred to no-trade by all members of the two parties are allowed to take place. Koford assumes that the two party leaders cooperate in maximizing their members' surplus. We refer to Philipson and Snyder for an eloquent discussion of the practical relevance of vote trading against a numeraire.

[5] We use a one-sided bid-only auction instead of a double auction.