Research in Economics 69 (2015) 320–335

Contents lists available at ScienceDirect

Research in Economics

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

Dynamic voting in clubs ☆

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ARTICLE INFO

Article history:
Received 30 January 2015
Accepted 8 February 2015
Available online 17 February 2015

Keywords:
Cooperatives
Local public goods
Majority voting
Median voter
Organization size
Partnerships

ABSTRACT

This paper examines the process and outcomes of democratic decision-making in clubs where a club is defined by its set of members whose preferences and decisions relate to the set of members in the club: the electorate is endogenous. Examples range from international organizations like the European Union and NATO to firms, workers' cooperatives and trade unions. Although the policy space is infinite, a majority voting equilibrium exists under plausible conditions and the equilibrium rule and the dynamics of clubs are characterized. Two types of club, one where a group funds some public good and the other where a given benefit is shared by the group, are analyzed in detail.

1. Introduction

The purpose of this paper is to investigate organizations where the decision makers are a group of members within the organization and decisions involve changing the group of members; more specifically, the paper examines the process and outcomes of democratic decision making in clubs where clubs are taken to be defined by a set of members whose preferences relate, directly or indirectly, to the set of members in the club. Democratic decision taking is interpreted to be majority voting by club members.

The literature on clubs initiated by Buchanan (1965) and further developed by Ng (1973) and Stiglitz (1977) views clubs as the providers of impure public goods: there is excludability so that provision may be restricted to members and there is partial rivalness through crowding and/or congestion. If the cost of provision is shared among members then individual preferences over club size will incorporate a trade-off between per capita cost reductions and increased congestion with increases in size. Whilst the literature has concentrated on concrete examples of public good provision, there are many other diverse examples. For instance, the costs and benefits of membership of international organizations like the European Union depend both directly on the set of States which form the Union and indirectly on the set of States through the decisions they take together relating to, for example, economic and legal matters. As can be evidenced by the recent Amsterdam Treaty, the size and composition of the Union is of dominant concern within the Union. At a different level, a trade union or a partnership may also be viewed as a club: it is interested in ensuring employment and high wages for its members; the larger the union membership, the more the goal of high wages may need to be compromised to ensure employment. The overall effect will be that union members or partners have preferences over the size of the union.

☆ This is a slightly amended version of a paper which appeared as a LSE Discussion Paper in 1999. Since then, interest in the issue of endogenous electorates has grown. For recent developments which build on the results of this paper, see Acemoglu et al. (2012) and the references cited in that paper. I am grateful to Tony Atkinson, Tim Besley, Avinash Dixit, Oliver Hart, Michele Piccione, and Ben Polak for the comments they provided on this paper.

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http://dx.doi.org/10.1016/j.rie.2015.02.004
1090-9443/

A club with democratic decision making is a paradigm for organizations where there is no single decision maker and decisions, particularly about the size of the organization, involve interests in the different parts of the organization. An example of this is where a firm expands by the construction of new plants and managers from these plants are involved in subsequent decision making. As multiple decision makers is a commonplace, this paper provides some insight into the growth and size of organizations.

The early club literature focussed on (welfare) optimal public good provision and club size whereas it is clear that decisions are often taken through the operation of some voting procedure.[1] However, unlike voting over a conventional policy space, voting over club size gives rise to decisions over time that are *time-inconsistent*. A majority of members of a club may wish to change the club size and then fix it at the new level. But when the membership changes, a majority of the reformed club may wish to choose a new club size. Rational members will take account of future changes induced by their decisions when initially voting and this will affect the operation of the voting procedure. Previous analyses of voting with an endogenous electorate have ignored the dynamics induced by the voting mechanism. Stiglitz (1977) looked at a median voter choice where it is assumed that decisions will not induce further changes. Klevorick and Kramer (1973) adopt a similar approach and motivate a median voter rule by assuming one-period single-peaked preferences over the decision variable. Layard (1990) looks at a specific democratic trade union model and, assuming that voting is equivalent to a median voter choice, provides a restricted analysis of equilibrium under the assumption of zero discounting. It is also possible that present decisions affect future preferences and dynamics can be induced with a fixed electorate. An example of this which is fully consistent with forward looking voters is the interesting work of Krusell and Rios-Rull (1996).

It is well-known that majority voting can fail to produce a 'preferred' outcome and Arrow's impossibility theorem shows that this problem can be inherited by a very wide class of voting procedures. To overcome this, it is common to place restrictions on voters' preferences which use a dimensionality restriction on the policy space. Restrictions then take the form either of limiting individual preferences to be single-peaked (Black, 1948), or of placing a (single-crossing) restriction across preferences which allows individuals to be ordered by their marginal preference for the policy variable (Roberts, 1977; Grandmont, 1978; Rothstein, 1990; Gans and Smart, 1996). However, with time-inconsistency, membership size may change many times and it will be impossible to restrict the dimensionality of the policy space to apply a single-peakedness or single-crossing property.[2]

Despite this, a major purpose of this paper is to show that majority winners exist in dynamic voting problems if a plausible single-crossing condition is satisfied in a one-period version the problem. In addition, such a condition allows us to determine the nature of equilibrium – a median voter result applies even though the median voter is endogenous to choices that are being made – and the character of steady states and of the transition paths taken towards a steady state can be exposed.

The model is set up in the next section and Section 3 investigates the characteristics of equilibrium in the model. The transition paths and steady states associated with equilibrium are examined in Section 4. In the following two sections, two classes of example are developed and analyzed. Section 5 looks at 'expansionist clubs' where, whatever the size of the club, a median voter would always prefer an increase in size. It is suggested that clubs providing public goods, and the European Union can be viewed as one such example, may possess this feature. In contrast, Section 6 looks at 'contractionist clubs' where median voters always prefer a reduction in club size and a standard model of a democratic trade union is an example of this. Welfare implications of the club decisions are examined in Section 7 and Section 8 contains concluding remarks.

2. The model

We consider a finite group X of infinitely lived individuals who are potential club members, $X=\{1,2\ldots\overline{x}\}$. These individuals always wish to be members of the club though some may be excluded. It is assumed that there is a natural seniority system with regard to membership of the club such that when the club is of size x, its members are the set $(1,2,\ldots,x)$. Thus, at any date t, the club is defined by its size x_t. If at some date the club size is x then the instantaneous utility of individual ξ is given by $u(x,\xi)$ and individual ξ wishes to maximize

$$U=\sum_{0}^{\infty}\delta^t u(x_t,\xi) \tag{1}$$

where δ, the discount factor satisfies $0<\delta<1$. As utilities are defined over a finite set, (1) is defined as long as $\delta<1$.

Individual utility can be a direct function of club size through the sharing of the cost of provision of a public good or through congestion effects, and an indirect function of a club size through decisions taken by a club with a particular membership, e.g. the level of public good provision. An example of this will be considered in Section 5. The function $u(x,\xi)$ is

[1] Tiebout's (1956) classic analysis may be viewed as showing that competition between clubs may lead to optimality even though decisions are taken through a voting process. The literature on public good provision and voting can be traced back to Bowen (1943).

[2] It is well-known that single-peakedness is not sufficient to ensure a majority winner when the policy space is not uni-dimensional and conditions for existence are restrictive e.g. Tullock (1967), Caplin and Nalebuff (1988). The single-crossing property is similar to that used a principal agent analysis. In that literature, the single-crossing condition loses much of its usefulness when the dimensionality of the problem increases. One example of multi-dimensionality, where the dimensionality increases by allowing stochastic contracts, is Moore (1988). Variation over state of nature is similar to variation over time as studied here.