European Journal of Political Economy 37 (2015) 288–302

Contents lists available at ScienceDirect

European Journal of Political Economy

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

Group size and decision rules in legislative bargaining

Luis Miller [a], Christoph Vanberg [b,*]

[a] University of the Basque Country, School of Economics, Av. Lehendakari Aguirre 83, 48015 Bilbao, Spain
[b] University of Heidelberg, Department of Economics, Bergheimer Str. 58, 69115 Heidelberg, Germany

A R T I C L E I N F O

Article history:
Received 20 February 2014
Received in revised form 9 September 2014
Accepted 24 September 2014
Available online 5 October 2014

JEL classification:
C78
C92
D71
D72

Keywords:
Legislative bargaining
Experiments
Group size
Majority rule
Unanimity rule

A B S T R A C T

We experimentally investigate the effects of group size on behavior and outcomes in a multilateral bargaining game. Using a Baron–Ferejohn protocol, our main interest is in the extent of costly delay (number of bargaining rounds needed to reach agreement). We investigate the effects of group size on delay under both majority and unanimity rule. Under both decision rules, we find that proposals more often fail in larger groups, leading to increased delay. Consistent with prior research, we also find that unanimity rule leads to more delay than does majority rule, in both small and large groups. Contrary to one of our initial hypotheses, we find that the latter effect is not more pronounced in larger groups. The higher rate of failure in larger groups and under unanimity rule is driven by a combination of three factors: (1) a larger number of individuals must agree, (2) an important fraction of individuals reject offers below the equal share, and (3) proposers demand more (relative to the equal share) in large groups.

1. Introduction

How many members of a group or decision making body should be required to agree to an action that changes the status quo? One? Two? A Majority? Or perhaps all members of the group? Each of these rules (and others) is used in different real-world contexts. For example, the European Council currently uses either qualified majority rule or unanimity rule, depending on the category of legislation being considered. Whether a rule is 'optimal' in a given context depends on two considerations (see Buchanan and Tullock (1962)). First, requiring the agreement of more members will tend to make it less likely that actions are taken which harm other members of the group. In the limit, a rule of unanimity guarantees that no person can be harmed by a decision taken, as each has the power to veto such an action. Second, requiring agreement of more members may increase the cost of decision making, for several reasons: more persons must be asked to state an opinion, the chance that all agree diminishes statistically as the required number grows, and the incentives for individuals to strategically withhold agreement may rise. The point at which this tradeoff balances out is likely to depend, among other factors, on the size of the decision making body.

We experimentally investigate the effects of group size on the costs of decision making under majority and unanimity rule. Using a Baron and Ferejohn (1989) legislative bargaining framework, we compare the extent of costly delay in groups of 3 and 7 players under both rules. Our design allows us to test two classic conjectures put forth by Buchanan and Tullock (1962). First, that decision making

* Corresponding author. Tel.: +49 6221 54 2947.
E-mail address: vanberg@uni-hd.de (C. Vanberg).

http://dx.doi.org/10.1016/j.ejpoleco.2014.09.005
0176-2680/© 2014 Elsevier B.V. All rights reserved.

costs increase with group size under a given decision rule. Second, that decision making costs increase more sharply with the inclusiveness of the decision rule, the larger the group is.[1] In addition to these hypotheses, we will also be interested in testing equilibrium predictions of this game under the different decision rules imposed, as well as investigating how previously established deviations from these predictions are affected by our treatment conditions.

The remainder of the paper is organized as follows. Section 2 describes our experimental design and relates it to previous experimental literature. We derive equilibrium predictions for our experimental game and describes our hypotheses. Results are presented in Section 3, and Section 4 concludes.

2. Experimental design

Building on established experimental literature on multilateral bargaining going back to McKelvey (1991), we base our experimental design on the classic legislative bargaining game introduced by Baron and Ferejohn (1989). The Baron–Ferejohn game is an extension of the Rubinstein bargaining model to the case of more than two players. In our experiment, we will be implementing a finite horizon version of the game.

2.1. The (finite horizon) Baron–Ferejohn game

At the beginning of the game, a certain surplus (initially worth $P > 0$) is available to be divided among n players. The game consists of a sequence of bargaining rounds. In each round, one player is randomly chosen to propose a division of the available surplus. All players are informed of the proposed division and vote to accept or reject it. If the required majority votes to accept, the proposal passes, the game ends and each player receives his allocated share. Otherwise, the proposal fails. In this case the available surplus shrinks by a factor $\delta < 1$, and a new round begins. If an agreement is not reached after T rounds, all players receive a payoff of zero.

Substantively, we can interpret this game as representing a situation in which a group of individuals faces an opportunity to take some action which can potentially generate benefits for all members of the group. The rules of the game assume that the ‘surplus’ resulting from this joint action is transferable. Taking the action therefore requires agreement, according to a given decision rule, on a division of the surplus. The surplus lost in case of delay represents resources (and time) invested in bargaining, as well as the possible deterioration of the opportunity that is under consideration. The realized sum of these losses constitutes the cost of reaching an agreement.

2.2. Benchmark predictions and hypotheses

The Baron–Ferejohn (henceforth BF) game admits multiple Subgame Perfect Equilibria, both in the infinite horizon and the finite horizon version.[2] The theoretical and experimental literature has typically focused on symmetric, stationary equilibria, which are unique. The unique Symmetric Markov Perfect Equilibrium (SMPE) of the finite horizon game is characterized by three empirically testable features.[3] First, proposers form minimum winning coalitions, allocating positive payoffs only to the number of players required to agree according to the decision rule. Second, the distribution of payoffs within the coalition is unequal, favoring the proposer. Third, the first proposal passes immediately. The specific proposals made under the parameter constellations used in the experiment ($\delta = 0.5$ and $n = 3, 7$) are presented in Table 1.

While these are the benchmark predictions assuming symmetric stationary equilibrium play, it is important to bear in mind that further Subgame Perfect Equilibria exist. Indeed, the multiplicity of equilibria is one of the reasons that experimental work on these games is interesting. And indeed, prior experiments have shown that human players deviate in systematic ways from the Markovian equilibrium predictions.

Experimental work on the BF game has established a number of consistent patterns in observed behavior (see Fréchette et al. (2003, 2005a,b); Kagel et al. (2010); Miller and Vanberg (2013)). The first is that proposers indeed often build minimum winning coalitions, but there are also a fair number of larger-than-minimum-winning coalitions. Second, proposers typically divide the available surplus more evenly and extract much smaller shares than theoretically predicted.[4] Finally, a non-negligible fraction of proposals fail, leading to inefficient delays.[5] In prior work involving groups of 3 players and a discount factor of $\delta = 0.9$, we found that such delays are significantly more frequent under unanimity rule (Miller and Vanberg, 2013).

One aim of our experiment is to investigate how these established deviations from the standard benchmark predictions are affected by the number of players involved (small or large groups) and the decision rule used (majority vs unanimity rule). Thus we will investigate the extent to which proposers build larger than minimum winning coalitions, as well as the ‘fairness’ of the splits within those

[1] The small group treatments also serve as a robustness check for the results obtained in Miller and Vanberg (2013), where we looked only at groups of 3 players. (See Section 2.3. for more details.)
[2] See Norman (2002) for a detailed analysis of the finite horizon BF game, including the establishment of a Folk Theorem.
[3] The same features characterize the unique symmetric stationary subgame perfect equilibrium of the infinite horizon version of the game.
[4] Agranov and Tergiman (2014) and Baranski and Kagel (2013) find that proposer power increases significantly when subjects can engage in cheap talk communication.
[5] Palfrey (2013) surveys the experimental literature on the BF game, emphasizing four main findings: (1) proposers receive larger shares, (2) they extract less than is predicted by theory, (3) there is some delay, though it becomes less with experience, and (4) proposers build minimum winning coalitions.