

Competing for Power in Multilateral Negotiations under Majority and Unanimity Rules

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Abstract

Competition for power is a costly practice present in organizations and groups where collective decisions are made. In a multilateral bargaining experiment, we study how different agreement rules affect competition for power through a contest for the right to propose a distribution of benefits. Although unanimity leads to less wasteful competition investments, it also generates a greater delay in negotiations and a higher likelihood of disagreement. These opposing inefficiencies offset each other across a wide range of bargaining horizons, contest technologies, voting procedures, and subject pools. We find no statistically significant evidence of efficiency dominance by either rule over the parameters studied once competition for power is taken into account. Under equal proposal rights absent a contest, agreements are reached more quickly, demonstrating the causal effect of competition for power on bargaining gridlock and its compounding effect on efficiency losses. In addition, we find that bargaining behavior is conditioned on prior power-seeking efforts: subjects reward higher effort with higher shares, indicating that efforts enter fairness considerations despite their unproductive and competitive nature.

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1. Introduction

The willingness to engage in unproductive and costly activities to obtain favorable outcomes, commonly referred to as rent seeking (Tullock, 1967; Krueger, 1974), is a prevalent characteristic of organizations and societies. Many economic and political institutions exhibit a two-stage structure in which agents first engage in costly competition to obtain positions that confer influence over collective decisions and subsequently bargain over allocations or policies once these positions are assigned. In legislative bargaining, for example, parties and factions expend substantial resources to secure influential procedural positions¹ after which outcomes are often determined through proposal-based bargaining procedures that require voting for passage (Baron and Ferejohn, 1989). While such positions may confer broader powers in practice, an important component of their influence is the ability to shape bargaining outcomes through proposal formation. In this paper, we focus on competition for proposal rights as a specific and tractable source of bargaining power.²

The extent to which competition for proposal rights distorts outcomes and affects efficiency depends critically on the institutional rules governing collective decision-making (Milgrom and Roberts, 1992; Yildirim, 2007). In bargaining environments, which are central to economics given their relevance for a wide range of resource allocation problems, the right to make an offer is a well-known source of influence. Proposer power is not only a feature of equilibrium behavior in structured bargaining models of surplus division (Rubinstein, 1982; Baron and Ferejohn, 1989; Krishna and Serrano, 1996; Evdokimov, 2023), but also emerges robustly in empirical and experimental evidence (Ansolabehere et al., 2005; Fr chet te et al., 2005a,b,c; Palfrey, 2016; Baranski and Morton, 2022; Montero, 2025). Together, these observations suggest that individuals may be willing to invest substantial resources to obtain proposer status prior to bargaining.

In this paper, we study a form of rent-seeking behavior in multilateral bargaining environments: competition for the right to be the proposer through a contest. Our framework aims to resemble the

¹For example, chairs of legislative bodies or committees are known to wield disproportionate influence over collective decisions, making it unsurprising that politicians and their constituents devote considerable effort and resources to securing these positions (e.g., Hall and Van Houweling, 1995; Hojnacki and Kimball, 1999; Tripathi et al., 2002; Berry and Fowler, 2018).

²Our focus is on competition for proposal rights as a specific source of bargaining power. Broader forms of agenda control or organizational authority may confer additional powers that lie beyond the scope of the present framework; see Section 8 for a discussion.

two-stage structure discussed earlier in which competition for control over resources precedes their allocation. We address two questions. First, how do bargaining rules, such as unanimity versus majority requirements, shape competition for proposal rights? Second, how does this competition, in turn, influence bargaining outcomes and efficiency? To answer these questions, we conduct a laboratory experiment that builds on the canonical multilateral bargaining model of Baron and Ferejohn (1989), a framework that has been extensively generalized theoretically (Eraslan and Evdokimov, 2019) and widely tested experimentally (Baranski and Morton, 2022; Montero, 2025).³ In our setting with competition, three players bargain over a fixed surplus, but prior to bargaining, they participate in a contest to determine their likelihood of obtaining proposal rights. Specifically, a player’s probability of being selected as the proposer is proportional to her chosen effort, as in a Tullock (1980)-style contest.⁴ The selected player then makes an allocation proposal that is put to a vote; if the proposal is rejected, negotiations may break down with positive probability, and the surplus is lost. A distinctive feature of our design is the inclusion of a baseline bargaining game without a proposer contest, which allows us to isolate the causal effect of competition for proposal rights on bargaining outcomes and efficiency.

Despite the fact that equilibrium entails immediate agreement under both rules, the durability of initial efforts in affecting proposal rights throughout the bargaining game plays a central role in equilibrium. We consider two extreme cases: when efforts have a temporary effect on the likelihood of being selected as the proposer and when they have a permanent effect.⁵ When rent-seeking efforts have a permanent effect on the probability of being the proposer, they act as a double-edged sword: a player with a high chance of proposing is *relatively more expensive* as a coalition partner (i.e., when not proposing) under the majority rule because in case of bargaining disagreement such a player is more likely to be the proposer in the upcoming round. This, in turn, increases her likelihood of exclusion from a coalition when she is not proposing. Under the unanimity rule, in contrast, no one can be excluded from the coalition as their vote is pivotal, and as such, equilibrium

³The Baron and Ferejohn model is a cornerstone of political economy, providing a simple and tractable framework for capturing coalition formation dynamics and for studying the effects of proposer power, voting rules, and bargaining costs.

⁴The Tullock contest, also known as a probabilistic all-pay auction, has been widely studied and extended theoretically and is commonly used to model phenomena such as patent races, military conflict, and political lobbying.

⁵Under a *temporary* effect, a player’s likelihood of being the proposer is determined by a contest in the first round of bargaining, but if there is no agreement, all players have the same chance to propose thereafter. Under a *permanent* effect, the chance of proposing is always proportional to the initial efforts.

efforts are higher compared to the majority rule.

When efforts have a temporary effect, all players have an identical continuation value in case the first proposal is not accepted, and therefore, efforts have no effect on who is included in a coalition. Under the model parameters we selected for experimental investigation, the equilibrium posits higher proposer contest efforts for the majority rule under temporary rights and higher effort for the unanimity rule under permanent rights. Thus, our theoretical framework, varying the durability of the effect of efforts on proposal rights, offers us two contrasting effects of how the voting rule impacts competition for the proposer role, which we test in the laboratory.

The results of our experiment show that competition for proposal rights is consistently stronger under majority voting than under unanimity. In contrast, the durability of rent-seeking efforts, whether proposal rights are temporary or permanent, has no significant effect on effort provision. This comparison between temporary and permanent proposal rights is informative because these environments differ sharply in their strategic structure. Nevertheless, behavior is largely invariant to this distinction. Instead, subjects respond primarily to the voting rule itself.

Given that efforts, which are costly and unproductive, are lower under unanimity, one may conjecture that efficiency is higher compared to the majority rule case. However, bargaining duration and breakdown rates are higher in unanimity treatments. These two effects offset each other in our experimental setting, rendering efficiency levels statistically indistinguishable across the two bargaining rules. Our findings highlight that failing to account for the impact of competition for proposal rights in multilateral bargaining can lead to overestimating the efficiency advantage of majoritarian rules over unanimity, a claim that has received wide attention in the political economy literature since it was posited by Buchanan and Tullock (1965) in their seminal book “The Calculus of Consent”.⁶

To better understand the nature and robustness of the efficiency tradeoff we uncovered, we varied four aspects of our experiment. First, we conducted the same treatments on a different subject pool. Second, we varied the voting institution by comparing the threshold elicitation mechanism with a direct voting mechanism, which is more commonly used in existing experiments. Third, we consider different bargaining costs by varying the probability that bargaining can break down in the

⁶In Chapter 7, Buchanan and Tullock argue that decision-making costs increase as the number of consenting parties increases because it is harder to reach an agreement. They do not provide a game-theoretic model. Instead, the authors assume a collective decision-making cost function that includes the efforts and costs associated with bargaining, both of which increase with the required number of consenting parties.

event of disagreement (15% in the main treatments, 50% and 100%). Finally, we run a treatment with a more competitive contest for proposal rights that overweighs higher efforts relative to lower efforts. By and large, our findings robustly confirm that competition for proposal rights is higher when negotiations take place under the majority rule and that after accounting for bargaining costs, both rules yield statistically indistinguishable efficiency levels.

So far, we have compared treatments that endogenous proposal rights with each other. Hence, we cannot speak to the causal impact of a preceding contest on bargaining efficiency. To this end, we conducted a treatment of the canonical bargaining game without a contest. Results show that competing for proposal rights leads to higher gridlock. Immediate agreements are less common, and the mean agreement round is higher under both voting rules compared to when there is no contest for proposal rights. Therefore, the proposer contest has a compounding negative effect on efficiency beyond the material cost of wasteful efforts.

We next examine a secondary outcome variable. How are the benefits distributed? Theoretically, efforts affect the distribution of the common fund only through their strategic value. As such, when efforts have a temporary effect on proposal rights they are predicted to have no effect on the distribution of the surplus. This is because all players have equal rights in case of rejection and, therefore, equal equilibrium expected shares from round 2 onward. When efforts have a permanent effect, shares of the surplus should correlate positively with the share offered. The same is true for the minimum share a player is willing to vote in favor of. Nevertheless, our data show that subjects condition the distribution of the total fund and their voting decisions on their own effort relative to others, both under temporary and permanent rights.

More precisely, subjects distribute the fund in a manner that coarsely resembles the principle of equitable sharing (Adams, 1965), where higher efforts are rewarded with higher shares. Hence, the observed *fair* sharing behavior reveals that competition efforts act as a basis for deservedness in the allocation of the surplus. This finding is rather unexpected, as it shows that concerns about equitable sharing also arise in a strictly competitive setting where efforts have no productive value, and not only in settings where pre-bargaining efforts are productive and efficiency-enhancing (Baranski, 2016; Gantner et al., 2016; Takeuchi et al., 2022; Merkel and Vanberg, 2023).

Our work contributes to a growing literature on multilateral bargaining, both theoretical (Eraslan and Evdokimov, 2019; Eraslan et al., 2022) and experimental (Bolton et al., 2003; Kamm and Siegenthaler, 2022; Montero, 2025). We build on and extend the theoretical work of Yildirim (2007, 2010) in which a contest precedes bargaining. In particular, we provide an equilibrium char-

acterization for when contest efforts have a temporary effect on proposal rights. We also show the nonexistence of symmetric equilibria in efforts when proposal rights are permanent under majority rule, whereas Yildirim (2010) shows existence under unanimity.⁷ In order to provide an equilibrium benchmark in this setting, we employ a numerical method developed in Kalandrakis (2015) and adapt it for finding the optimal contest effort levels under our experimental parameters.

There are two experiments that are most closely related to our work. First, Lee and Sethi (2022) study the willingness to pay to have a high, medium, or low probability of proposing in a finite-horizon, Baron and Ferejohn, three-player game. The authors choose experimental parameters such that having higher proposal odds yields lower equilibrium payoffs. They find that subjects display a greater willingness to pay for a higher chance of proposing, contrary to theoretical predictions. In their setup, a player’s willingness to pay does not affect the odds of winning against other players. Therefore, they cannot study the efficiency implications of competing for proposer power, nor speak to the effect of different voting rules or bargaining horizons.

A second related paper is Kim and Kim (2022), who study a contest prior to a three-player ultimatum game with one round of bargaining. Their key treatment variables are the disagreement payoffs and the role of observability of efforts. One common finding we both report is that the distribution of the surplus is more inclusive than expected under majority rule compared to related experiments without a contest. Kim and Kim (2022) do not study off-equilibrium dynamics in multi-round bargaining. Instead, they simplify the setting to avoid the intricacies of coalition formation we described earlier.

Our experiment is designed to provide sharp contrasts between voting rules depending on the durability of efforts in affecting proposal rights and the bargaining horizon. By varying the voting rule, we are also able to analyze the efficiency implications of increasing the agreement requirement through two channels: agreement delay and proposer-seeking effort costs. Finally, we compare bargaining games with and without a proposer contest to identify the causal impact of competition for proposal rights on bargaining efficiency. All of these features are absent from the preceding

⁷There is a burgeoning literature that aims to expand our understanding on the strategic value of proposal rights and agenda control in bargaining. See Ali et al. (2019) for a model in which the predictability of the sequence of proposers increases proposer power. For other important theoretical contributions in endogenous proposer recognition, see Ali (2015), who studies the sale of proposal rights through all-pay or first-price auctions. Han (2011) and Levy and Razin (2013) model endogenous proposal rights via an all-pay auction in a setting with a dynamic status quo where players bargain over a uni-dimensional policy. Pérez-Castrillo and Wettstein (2001) investigates a model of bargaining with a bidding stage to become the proposer, for which Chessa et al. (2022) conduct an experiment.

work.

Important work has advanced our understanding of how voting rules affect efficiency, focusing mainly on agreement delay in settings with a fixed surplus to divide (Miller and Vanberg, 2013, 2015; Agranov and Tergiman, 2019; Piazzolo and Vanberg, 2025). Generally, these experiments find that delay is more common under the unanimity requirement, especially absent communication channels. However, when the surplus to divide is stochastic, delay may be efficient if the future surplus is high enough. In an experiment with a stochastic surplus, Agranov et al. (2024) find that the unanimity rule is more efficient because groups are likely to delay agreement when the surplus is low. Importantly, there is no experimental work investigating how the voting rule affects competition for the proposer role, which we investigate here.

Our work is also related to the study of asymmetries in bargaining, such as Fr  chette et al. (2005b), who vary voting weights and recognition probabilities, Diermeier and Morton (2005), who study a finite-horizon game in which higher proposal chances need not imply higher expected payoffs, and Maaser et al. (2019), who study nominal variations in voting weights that have no impact on equilibrium payoffs. See also Miller et al. (2018) that reports an experiment on the role that asymmetries in players’ outside options have on bargaining behavior. In all these experiments, asymmetries are exogenously imposed, and the evidence reflects a tension between strategic behavior as predicted by equilibrium and fairness norms anchored in the bargaining asymmetries.

The remainder of this article proceeds as follows. Section 2 presents the model and the equilibrium analysis is presented in Section 3. In Section 4 we lay out our experimental design. Section 5 first presents the results for the main experiment in which we vary the durability of proposal rights. Section 6 contains the analysis of our replication, robustness treatments, and comparison with a baseline game absent a proposer contest. We discuss our results in Section 7. Finally, Section 8 concludes.

2. The Model

Consider a game in which three players $i \in \{1, 2, 3\}$ must split a total fund of fixed size equal to F .⁸ Players are risk-neutral and derive utility solely from their own payoffs, that is, $u_i(\mathbf{x}) = x_i$ for any vector of payoffs $\mathbf{x} \in \mathbb{R}^n$. Before bargaining starts, players engage in a contest by choosing

⁸For the sake of conciseness, we present the game with three players, just as it will be implemented in the laboratory. The game can be easily generalized to more players, different voting rules, and contest success functions.

costly efforts, which determine the likelihood of being selected as the proposer of a division of the fund (stage 1). We first explain the bargaining game (stage 2) in order to make clear the role of stage 1.

At the bargaining stage, players engage in negotiations for an indefinite number of *rounds*. In each round of bargaining $t \in \{1, 2, \dots\}$, a player is randomly chosen according to the probability distribution $(\pi_1^t, \pi_2^t, \pi_3^t)$ to divide the total fund among the three players by submitting a proposal $\mathbf{s} = (s_1^t, s_2^t, s_3^t)$ such that $\sum s_i = F$. Next, players proceed to vote (simultaneously). If the required number of votes in favor is received (denoted by q), the allocation is binding. For $q = 2$ we have majority rule, and $q = 3$ we have unanimity.

Let $v_i \in \{0, 1\}$ be the voting actions where 1 means *yes*, and 0, *no*. If $\sum_i v_i \geq q$, proposal $\mathbf{s}$ is approved; otherwise, the bargaining process repeats itself in round $t + 1$ with probability δ (this is the discount factor). With probability $1 - \delta$, bargaining breaks down, which implies that the fund to distribute vanishes, resulting in $s_i = 0$ for all i .⁹

Before the bargaining stage begins, a contest determines players' chances of proposing. Each player chooses simultaneously and independently an effort level $e_i \in \mathbb{R}_+$ at a cost $c(e_i) = e_i$. Effort levels affect the probability of being the proposer in round t , which we denote by π_i^t , through a contest success function defined in Definition 1.

We are interested in exploring the durability of the effect of initial rent-seeking efforts on recognition probabilities. To this end, we distinguish between two cases, temporary and permanent, as defined in the following.

Definition 1 *When rent-seeking efforts are **temporary** we have that:*

$$\pi_i^t(\mathbf{e}) = \begin{cases} \frac{e_i}{\sum e_j} & \text{if } t = 1 \\ \frac{1}{3} & \text{if } t > 1 \end{cases}.$$

*When rent-seeking efforts are **permanent** we have that:*

$$\pi_i^t(\mathbf{e}) = \frac{e_i}{\sum e_j} \quad \forall t.$$

3. Equilibrium

This section presents the theoretical framework that guides the experimental design and generates behavioral *predictions*. Some equilibrium benchmarks can be characterized analytically, but others

⁹In our main treatments, we set $\delta = 0.85$, but we vary it in the robustness treatment to 0.5 and 0. Thus, we leave this as a free parameter for now.

require numerical methods. In particular, we derive analytical predictions for the temporary-rights treatments and establish several general properties of equilibrium behavior under permanent rights. For the permanent-rights treatment under majority rule, however, closed-form solutions are unavailable, and equilibrium effort levels are computed numerically by adapting the method of ?. We indicate throughout which results are analytical and which rely on numerical computations.

As is customary in the bargaining literature (Eraslan and Evdokimov, 2019), we focus on stationary subgame perfect equilibria (SSPE) in the bargaining game. There are two main properties of stationarity that we must comment on. First, stationary strategies are history-independent because they require players to neglect past play in their strategy formulation. However, when bargaining is preceded by a proposer contest as in our setting, the history of play at the bargaining stage includes the vector of efforts in stage 1. Thus, we allow for strategies to depend on $\mathbf{e}$ indirectly through the effect of efforts on π . Second, stationarity requires identical play in identical subgames. Note, however, that for the temporary proposal rights case, strategies in the first bargaining round need not coincide with strategies in further rounds because the subgames are not identical (recognition probabilities are different). This will be important for the characterization of optimal efforts, and we return to it when we address the temporary rights case. In the usual way, subgame perfection requires that there is no profitable deviation in any subgame.

After solving for the equilibrium in any bargaining subgame and obtaining the bargaining payoffs associated with each possible effort vector, we proceed by backward induction to find the optimal contest stage efforts. We solve for symmetric pure-strategy equilibria (when they exist).

3.1. *Strategies and outcomes*

A player's effort pure strategy in the contest stage is a function $g : \mathbb{R}_+^3 \rightarrow \mathbb{R}_+$. When a player i is a proposer, her proposal strategy is a vector $\mathbf{s}_i$ assigning share $s_{ij}(\pi)$ for each player j . A proposal strategy also specifies the probability that the proposer invites each player j to the coalition. We denote the inclusion probability strategies by $r_{ij}(\pi)$ (where $r_{ii} = 1$) and by $\mathbf{r}_i$ the vector of inclusion probabilities by player i .¹⁰ A player's voting strategy is a function $a_i : \mathbf{R}_+ \rightarrow \{0, 1\}$. A strategy profile σ includes the shares each player assigns, the probabilities of inclusion, and the voting strategies. Note that we have specified time-independent strategies due to the fact that we focus on stationary equilibria. When we analyze the temporary effect of efforts, we will distinguish

¹⁰As Eraslan and Evdokimov (2019) explain, this makes the problem isomorphic to one in which mixed strategies over the proposal are allowed.

between round 1 and round 2 onwards.

3.2. *Equilibrium Preliminaries of the Bargaining Subgame*

Consider the case of a bargaining subgame with a stationary vector of recognition probabilities $\{\pi_1, \pi_2, \pi_3\}$. Fixing a stationary strategy profile σ induces a vector of continuation payoffs given by (V_1, V_2, V_3) (Eraslan, 2002). A continuation payoff V_i is the payoff that player i expects to receive at the beginning of every bargaining subgame, assuming that all players are following the strategy profile σ . As such, player i is willing to vote in favor only when offered share $s_i \geq \delta V_i$, a share that yields the discounted expected payoff.

The following Proposition collects a series of results from Eraslan (2002) that are central to our analysis. Hence, we present them concisely here.

Proposition 2 *Consider a Baron and Ferejohn bargaining game with three players, a fixed surplus to divide of size F , $\delta \in (0, 1)$, and a $q \in \{2, 3\}$ voting rule. Let (π_1, π_2, π_3) be a strictly positive vector of recognition probabilities, which are fixed in all rounds of bargaining. Then, the following hold*

1. *There exists a SSPE profile σ .*
2. *There exists a unique vector of ex-ante payoffs (V_1, V_2, V_3) .*
3. *Specifically, in a SSPE, the values V_i satisfy:*

$$V_i = F\pi_i \left(1 - \sum_{j \neq i} r_{ij} \delta V_j \right) + F \sum_{j \neq i} \pi_j r_{ji} \delta V_i. \quad (1)$$

4. *Under majority ($q = 2$), V_i is weakly increasing in π_i .*
5. *Under unanimity ($q = 3$), V_i is strictly increasing in π_i , and moreover, $V_i = \pi_i F$.*

3.3. *Equilibrium under temporary rights*

We first consider the case where efforts have a one-round effect in altering proposal rights. Effort is chosen only at the start of the game, as under permanent rights, but in case of a rejection of the first proposal, all players are symmetric in rounds two onward. There are two motivations for this theoretical consideration. First, it transparently *turns off* the effect that enhanced recognition probabilities have on coalition inclusion and on bargaining behavior. As a side benefit, this

modeling choice allows us to identify unique pure strategy, symmetric equilibria under majority and unanimity. Second, as we shall see, it provides a strong contrast with the value of proposal rights under permanent rights, namely because it entails higher efforts under majority relative to unanimity.¹¹

We start by solving the majority rule case. Note that in the bargaining subgame starting in round 2, players are symmetric, meaning $\pi_i = 1/3$ for all i . In round 2, before nature selects the proposer, the *ex ante* equilibrium payoff is $V_i^2 = 1/3$ for all i . This is obtained by solving system (1) with inclusion probabilities $r_{ji} = 1/2 \forall i \neq j$.

We now proceed to characterize equilibrium behavior in round 1 of bargaining. Denote by r_{ij}^1 the probability that player i invites j to the coalition in round 1. Conditional on the proposer identity being drawn and revealed, all players have the same continuation value ($V_i^2 = 1/3$). Because once the proposer in round 1 is revealed, all players are symmetric thereafter, the proposer randomizes which other player to include in the coalition. Hence, $r_{ij}^1 = 1/2$ also.

By backward induction, a player's expected payoff from the bargaining game, prior to nature revealing the identity of the first proposer, is $F\pi_i(1 - \delta V_i^2) + F(1 - \pi_i)\delta V_i^2/2$. At the contest stage, a player faces the following maximization problem:

$$\max_{e_i} F\pi_i(\mathbf{e})(1 - \delta/3) + F(1 - \pi_i(\mathbf{e}))(\delta/3)/2 - c(e_i) \quad . \quad (2)$$

For the unanimity bargaining case, two players will be offered $\delta F/3$ when not proposing. The problem a player faces is given by:

$$\max_{e_i} F\pi_i(\mathbf{e})(1 - 2\delta/3) + F(1 - \pi_i(\mathbf{e}))(\delta/3) - c(e_i) \quad . \quad (3)$$

The following proposition provides a complete analytical characterization of equilibrium behavior under temporary rights. The proof can be found in the Online Appendix.

Proposition 3 *When efforts have a temporary effect on the probability of proposing, the following hold.*

1. *Under the majority rule:*

(a) *The optimal investment is $e^* = \frac{2F(1-\delta/2)}{9}$.*

(b) *The proposer offers another member $s = \delta F/3$ and keeps $F(1 - \delta/3)$.*

¹¹The opposite holds under permanent rights under the parameters we consider for the experiment.

2. Under the unanimity rule:

(a) The optimal investment is $e^* = \frac{2F(1-\delta)}{9}$.

(b) The proposer offers each member $s = \delta F/3$ and keeps $F(1 - 2\delta/3)$.

3.4. Equilibrium under efforts with a permanent effect

For the unanimity voting rule, $r_{ji} = 1$ because no one can be excluded. Thus, result 4 in Proposition 2 is easily derived. As such, the maximization problem that players solve under unanimity is given by

$$\max_{e_i \in \mathbb{R}_+^0} F \frac{e_i}{\sum e_j} - c(e_i). \quad (4)$$

For the majoritarian voting rule, a full characterization of equilibrium requires specifying the probabilities with which players are included in a winning coalition. These are generally not unique (Fréchette et al., 2005b), and, moreover, a closed-form solution does not exist for the V_i ' (Kalandrakis, 2015). With three players, the minimum winning coalition always consists of the proposer and the voter with the lowest equilibrium payoff (i.e., the cheapest partner). We denote by $\underline{V}_i$ the SSPE equilibrium payoff of the player with the lowest *ex-ante* payoff other than player i .

The maximization problem that players solve under the majoritarian rule is given by

$$\max_{e_i \in \mathbb{R}_+^0} FV_i(e_i, \mathbf{e}_{-i}) - c(e_i). \quad (5)$$

Proposition 4 *When efforts have a permanent effect on the probability of proposing the following hold.*

1. Under the majority rule:

(a) There is no symmetric pure strategy equilibrium vector. For any vector (e, e, e) there exists $\epsilon > 0$ such that $FV_i(e - \epsilon, e, e) - c(e - \epsilon) > FV_i(e, e, e) - c(e)$.

(b) In any subgame induced by (e_1, e_2, e_3) , the proposer (labelled i) offers one other member $s = F\delta \underline{V}_i$ and keeps $F(1 - \delta \underline{V}_i)$. Voters accept any share $s_j \geq F\delta V_j$.

2. Under the unanimity rule (Yildirim, 2010):

(a) The optimal investment is $e^* = \frac{2F}{9}$.

(b) In any subgame induced by (e_1, e_2, e_3) , the proposer (player i) offers each member $j \neq i$ a share $s_j = F\delta V_j$ and keeps $F(1 - \sum_{j \neq i} \delta V_j)$. Voters accept any share $s_j \geq \delta FV_j$.

For permanent rights, some equilibrium properties can be established analytically. However, under majority rule, equilibrium effort levels must be obtained numerically.

The proof for the non-existence of symmetric equilibria may be found in the Online Appendix Section A where we show this for any committee size n , voting rule $q < n$, and $\delta \in (0, 1]$. Here, we present the economic intuition.¹² When two players have an equal chance of proposing, and a third player has a slightly smaller chance (an undercutting deviation), the lower recognition player is invited into the coalition more often. As such, even if she is the proposer less often, the positive effect on coalition inclusion leaves her continuation payoff unchanged (weakly monotonic V_i property, see part 1 of Proposition 2). Thus, it is clear that any player would have an incentive to decrease effort by a small amount and save the associated cost without sacrificing her expected bargaining payoff.

4. Experimental Design

Subjects were randomly placed in groups of three to divide a fund of $F = 320$ tokens. They were endowed with 100 tokens for the contest stage and could choose any effort amount $e \in [10, 100] \subset \mathbb{N}$. At the bargaining stage, subjects were informed about the effort and recognition probability of each member in their group. We employed a partial strategy method at the proposal stage by eliciting a division of the fund from each subject. Only one proposal was selected for voting according to the vector of recognition probabilities, and only the selected proposal was made public.

Voting worked as follows. Once proposals were submitted, but before the selected proposal was revealed, subjects reported the smallest share that they would accept for themselves. Votes were tallied in favor whenever the share offered to the voter was equal to or greater than the voting threshold. In case of rejection and upon agreement, the voting thresholds were not revealed, only whether a subject voted in favor or against.

Our goal with this voting design feature is threefold. First, it provides a direct measure of subjects' minimum acceptable shares, which cannot be accurately obtained through a direct voting mechanism. Second, it precludes subjects from directly manifesting preferences for the overall distribution of the fund when voting and brings the theory closer to the model's assumptions, namely, that $u_i(\mathbf{x}) = x_i$. This allows us to directly test the equilibrium prediction that a player

¹²The remaining statements of Proposition 4 are derived from Eraslan (2002) (1b and 2b) and from Yildirim (2010) (2a).

Table 1. Treatments, Sessions, and Sample Size

Treatment Acronym	Voting Rule	Effect of Efforts on Probability of Proposing	# of Sessions	Matching Groups	Total Subjects	# of Games
MAJ-PERM	Majority	Permanent	4	10	78	260
UN-PERM	Unanimity	Permanent	3	6	54	180
MAJ-TEMP	Majority	Temporary	3	6	54	180
UN-TEMP	Unanimity	Temporary	3	6	54	171

Notes: One session in UN-TEMP had a software malfunction in game 8, hence the lower number of games.

votes in favor if and only if her share is greater than or equal to the discounted continuation value of the game (i.e., $s_i \geq \delta V_i$). Third, players might care about the identity of the proposer when voting, especially when a group has failed to reach an agreement in round 1 (see Kim (2023), and Baranski and Morton (2022) for ample evidence of retaliation against proposers). This plausible behavior would violate stationarity, and hence, we *turn off* this possibility by design in order to bring the decision environment closer to assumptions under which equilibrium predictions are derived. Finally, we note that Brandts and Charness (2011) find that, while alternatives to the direct response mechanism may lead to level differences in treatments, they did not seem to affect treatment comparisons in the surveyed literature.¹³

The probability of bargaining breaking down exogenously after a rejection was set at 0.15, thus $\delta = 0.85$. During the bargaining stage, we allow subjects to bargain indefinitely until they reach an agreement. Once they do, they are informed whether bargaining has exogenously ended in a previous round. This important design feature allows us to observe the exact timing of an agreement, a variable that we use to calculate bargaining efficiency. Subjects were shown the history of rejected proposals, the votes of each member, and the proposers' numeric IDs on screen.

We conducted four main treatments, varying the voting rule (majority and unanimity) and the durability of efforts in determining proposal rights (temporary and permanent), as explained in Section 3. Subjects participated only in one treatment. Table 1 summarizes the experimental design.¹⁴

Subjects played a total of ten games. A game consists of an effort choice and a bargaining stage

¹³In Section 6.1 we present the results of an experiment implementing a direct voting stage in which subjects observe the selected proposal and cast a vote. The main results of our paper hold, further confirming the findings Brandts and Charness (2011) in a multilateral bargaining setting.

¹⁴The equilibrium efforts for the parameters chosen are displayed in Table 2.

with possibly many rounds. At the end of each game, subjects were shown the payoffs for each member of their group. A summary table showed the effort choices, voting decisions, and shares of the fund of each group member. Only one game was randomly selected at the end of the experiment to count for payment. Subjects were randomly re-matched each game to avoid reputation building. Re-matching occurred only within matching groups of 9 subjects.¹⁵

All interactions were anonymous and computerized, and were programmed in zTree (Fischbacher, 2007). The experiments were conducted at the experimental laboratory of Universidad del Rosario in Bogotá, Colombia, between February 2019 and December 2021. Each token in the experiment represented 300 Colombian Pesos (COP). Subjects were paid a show-up fee of 10,000 COP, which at the time of the experiment represented about 3 US Dollars.

4.1. Equilibrium behavior under the experimental parameters

For the treatment with a temporary effect of effort on proposal probabilities we obtain an optimal symmetric effort of 66 tokens for MAJ-TEMP and 11 for UN-TEMP. For the treatment with a permanent effect, the optimal effort is 71 tokens for UN-PERM. There are no pure-strategy asymmetric equilibria. The equilibrium benchmarks for MAJ-TEMP, UN-TEMP, and UN-PERM follow directly from the analytical results in Propositions 3 and 4. The equilibrium effort vector for MAJ-PERM is obtained numerically using the algorithm described below.

To obtain the equilibrium efforts under the majority rule with permanent rights, we used an algorithm that searches the grid of efforts for a vector (e_1^*, e_2^*, e_3^*) for which there is no profitable deviation.¹⁶ The algorithm can be described in these three steps:

1. **Recognition probabilities:** For every vector (e_1, e_2, e_3) such that $e_i \in \{10, 11, \dots, 100\}$, we obtain the vector of recognition probabilities (π_1, π_2, π_3) .
2. **Continuation Values:** For each vector of recognition probabilities (π_1, π_2, π_3) , we obtain a unique vector of equilibrium continuation values (v_1, v_2, v_3) . For this step, we use the numerical method developed by Kalandrakis (2015).

¹⁵There was one exception. Due to an error by the experimenter, in one session of MAJ-PERM we had four matching groups of 6 subjects. Initially, we considered discarding this session's data because of the potential effects of a different likelihood of encountering the subjects. However, the results from these matching groups do not differ significantly from the rest. Hence, we include them in our analysis.

¹⁶The code is available upon request. We tested other parameters (i.e., size of the fund and a finer effort grid), and in every case, we obtained that the aggregate investments under the majority rule are lower.

Table 2. Proposer Contest Efforts: Equilibrium and Observed Behavior

Treatment	Equilibrium Behavior		Observed Behavior	
	Effort Vector	Mean Effort	Periods 1-5	Periods 6-10
MAJ-PERM	$e^* = (13, 27, 80)$	40	33.64	32.09
	$e^* = (14, 26, 80)$			
UN-PERM	$e^* = (71, 71, 71)$	71	28.53	17.60
MAJ-TEMP	$e^* = (66, 66, 66)$	66	32.56	30.86
UN-TEMP	$e^* = (11, 11, 11)$	11	27.55	21.31

3. **Identifying equilibria:** We search for vectors (e_1^*, e_2^*, e_3^*) , such that $320 * v_i(e_i^*, \mathbf{e}_{-i}^*) - e_i^* \geq 320 * v_i(e_i, \mathbf{e}_{-i}^*) - e_i$ for any e_i .

The numerical method returned two vectors (and their permutations) for which no player had a profitable deviation: $(13, 27, 80)$ and $(14, 26, 80)$.

5. Experimental Results

We start by presenting the results for effort provision, bargaining gridlock (round of agreement), and total efficiency. Subsequently, we focus on the distribution of the total fund in bargaining outcomes.¹⁷ Throughout the analysis, we refer to a test as yielding a significant difference if the associated p -value is at most 0.05. Throughout this section, we analyze subject-level choices using random-effects models to account for repeated observations by the same individuals across games. Standard errors clustered at the matching-group level, which is a conservative approach commonly used in experimental settings with repeated interaction.

5.1. Effort provision

The evolution of efforts over the ten periods of play is displayed in Panel A of Figure 1. The first important observation is that efforts in all treatments start around 33 tokens (which is 1/3 of the endowment) and there are no statistically significant differences between them. Table B1, column 1, shows the regression results for period 1 efforts on treatment dummies, none of which are significantly different from each other.¹⁸

¹⁷An analysis of voting thresholds is presented in the Online Appendix Section 2.2.

¹⁸For robustness, we conducted two-sided Mann-Whitney tests with each individual effort choice in period one as an independent unit of observation. We reject that efforts are drawn from different distributions in each treatment.

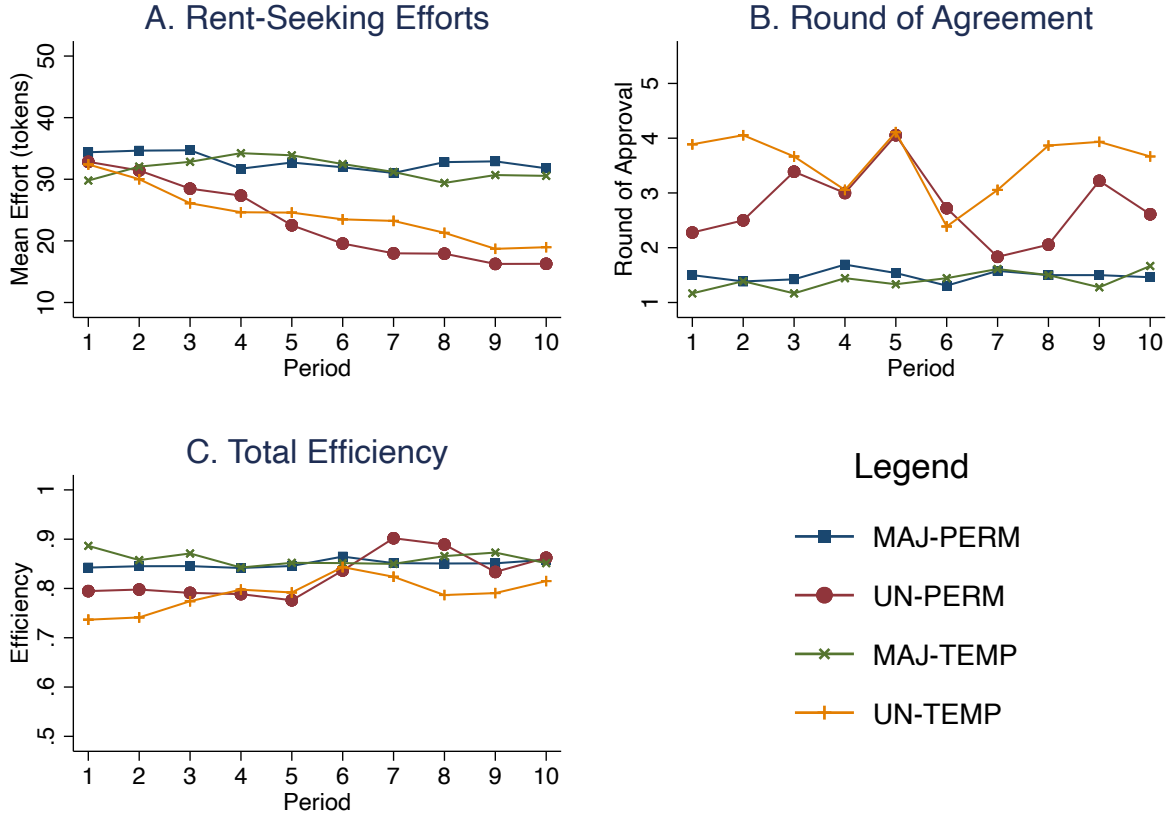


Figure 1. Evolution of Mean Efforts, Agreement Round, and Total Efficiency

Notes: Subjects can choose efforts between 10 and 100 tokens (Panel A). Higher efforts entail lower efficiency because they are purely wasteful in that they only affect recognition probabilities. The round of agreement is the round within a bargaining period in which a proposal receives the required number of votes in favor (Panel B). A higher agreement round also reduces efficiency because it entails a larger likelihood of bargaining termination, as induced by the discount factor of 0.85. Total efficiency (Panel C) is given by the proportion of expected final payoffs to the maximum attainable payoffs. Maximum efficiency is attained when subjects choose the minimum effort (10 tokens) and reach an agreement in round 1.

The second important observation is that efforts decline with experience in the game for the unanimity treatments, but remain rather steady under majority. Evidence for this is provided in the regression analysis presented in Table B2. The *Period* trend coefficient is negative and significant for the unanimity treatments, but statistically indistinguishable from 0 for the majority treatments. Pooling -TEMP and -PERM treatments by voting rule, proposer contest efforts are 36% higher under majoritarian bargaining (23.81 under unanimity vs. 32.4 tokens under majority,

For MAJ-TEMP vs MAJ-PERM, $p = 0.17$; for UN-TEMP vs UN-PERM, $p = 0.93$; for MAJ-TEMP vs UN-PERM, $p = 0.41$; for MAJ-PERM vs UN-TEMP, $p = 0.54$, for MAJ-TEMP vs UN-TEMP, $p = 0.48$, for MAJ-PERM vs UN-PERM, $p = 0.60$.

$p = 0.002$).

Third, we find that the durability of proposal rights has no effect on effort choices within each voting rule. The theory posits that the dummy variable *Permanent* should be significantly negative for the majority rule and positive for the unanimity rule, but we observe the opposite sign in both cases.

Conclusion 1 *Efforts at the contest stage to determine proposal rights are higher under majority rule bargaining than under unanimity. The difference arises with experience, as efforts unravel in the unanimity bargaining games but remain steady in the majority games. Effort choices are unresponsive to how durable their effect is on proposal rights within each voting rule, revealing that subjects neglect their strategic value as predicted in equilibrium.*

5.2. Bargaining gridlock and the round of agreement

Panel B in Figure 1 displays the mean round of agreement for each treatment over the course of the ten games, and a histogram with the percentage of agreements by round, for each treatment is provided in Figure B1. On average, it takes more than twice as long to reach an agreement under the unanimity rule as under the majority rule, with the mean round of agreement being 1.45 and 3.15, respectively. Our econometric analysis (see Table B3, column 3) robustly confirms the statistical significance of this difference ($p < 0.01$). We find no differences in the round of agreement along the durability of rights dimension within each voting rule (see Table B3, columns 1 and 2). Furthermore, if we control for the dispersion of efforts within a group, which is generally higher under majority rule, results remain unchanged.

In the preceding analysis, we have focused on the round of agreement as the outcome variable of interest. We conducted an identical analysis with bargaining delay being our dichotomous outcome variable and find comparable results: higher delay under unanimity compared to majority (58% vs 24%, $p < 0.01$) and no difference along the durability of efforts dimension.

Conclusion 2 *Immediate agreements are more prevalent under the majority rule (76%) than under the unanimity rule (42%).*

5.3. Efficiency considerations: Which voting rule dominates?

The analysis of competition for the proposer’s role demonstrates that unanimity leads to higher efficiency (as measured by total payoffs) at the contest stage because it elicits lower efforts. Con-

Table 3. Differences in Efficiency by Voting Rule

	Periods 1-5	Periods 6-10	All Periods
Majority Rule	0.072** (0.025)	0.016 (0.026)	0.045 (0.023)
Cons.	0.779*** (0.019)	0.840*** (0.022)	0.809*** (0.019)
<i>N</i>	400	391	791

Notes: OLS regressions. Standard errors in parentheses clustered at the matching group level. Accepted proposals only. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

sistent with previous research, we also find that bargaining under unanimity entails more gridlock than under the simple majority rule. Because delay is costly and can lead to exogenous bargaining termination (surplus vanishing), the higher rate of impasse expected under unanimity may override any contest efficiency advantage. This raises the question: Which collective decision-making rule yields the highest aggregate payoffs?

We decompose the total efficiency measure into two components: contest stage and bargaining stage efficiency. For the contest stage, we measure efficiency as the sum of post-contest wealth holdings relative to the holdings that would arise when subjects choose the minimum effort. Hence, maximum contest efficiency arises when $e = 10$ (the lower bound on the effort choice set) for each subject in the group. For bargaining efficiency, we calculate the probability that bargaining has not terminated by the time an agreement is reached, and hence the fund has not vanished. This is given by $\delta^{\tau-1}$, where τ is the round of approval. Full bargaining efficiency is attained if approval occurs in round 1. Finally, our measure of total efficiency is given by the total expected payoffs relative to the highest possible aggregate payoffs (i.e., when $e = 10$ for every subject and agreement is reached in round 1).¹⁹

Panel C in Figure 1 displays the evolution of the average efficiency throughout the 10 periods of play. In the first 5 periods, mean efficiency is higher in the majority rule treatments compared to the unanimity voting rule (0.85 vs. 0.78, $p = 0.007$ see regression results in Table 3). In the last 5 periods, both rules yield virtually the same level of efficiency (0.84 and 0.86, $p = 0.549$).

¹⁹Specifically, total efficiency is given by $\frac{300 - \sum_i e_i + 320\delta^{\tau-1}}{590}$ where the denominator is the total fund (320 tokens) plus 270, which is the sum of endowments minus the sum of minimum efforts. Note that this measure is always between 0 and 1.

Table 4. Bargaining Outcomes

	MAJ-PERM	MAJ-TEMP	UN-PERM	UN-TEMP
Overall division:				
Prediction	2-way splits	2-way splits	3-way splits	3-way splits
2-way splits (%)	9.62	16.67	0	0
3-way splits (%)	90.34	83.33	100	100
Proposer's Share:				
Observed (% of Fund)	38.01	39.56	35.07	33.36
Observed / Prediction	0.52	0.55	0.86	0.78
Voting Threshold:				
Observed (% of Fund)	33.13	33.23	29.47	31.41
Observed / Prediction	1.18	1.17	1.21	1.11
Round of Approval:				
Prediction	Round 1	Round 1	Round 1	Round 1
Round 1 (%)	76.15	76.11	43.89	39.77
Round 2 (%)	12.69	15.00	17.78	21.64
Round 3+ (%)	11.15	8.89	38.33	38.60

Notes: Accepted proposals only, pooled for all periods of play. In MAJ-PERM and UN-PERM, the equilibrium in the bargaining subgame depends on the vector of efforts as explained in Section 2. For MAJ-PERM we use the algorithm by Kalandrakis (2015) to obtain the expected bargaining payoffs, which we use to calculate the proposer's equilibrium share and voting thresholds.

Conclusion 3 *The unanimity rule yields higher efficiency at the contest stage and the majority rule at the bargaining stage. On average, both rules achieve statistically indistinguishable levels of efficiency once subjects have had experience in the game.*

5.4. Bargaining

We now turn to the bargaining stage to investigate how rent-seeking efforts affect the distribution of the total fund. We focus on the overall split and the proposer's share. Due to space constraints, we relegate the analysis of voting thresholds to the Online Appendix. Table 4 contains a summary of the main bargaining outcomes.

Proposer power and the division of the total fund

It is clear from Table 4 that the negotiation outcomes have little resemblance to the SSPE benchmark. Two-way splits are not modal in majority voting treatments. Instead, three-way splits

represent an overwhelming proportion of agreements. Proposers keep around 38% of the fund in the majority treatments and 34% in the unanimity treatments. In all cases, the share proposers keep of the accepted allocations is substantially below the equilibrium predictions.

To understand the determinants of the proposer’s shares, we estimated a mixed-effects regression with subject-level random effects. The dependent variable is the share that proposers keep as a proportion of the total fund in accepted allocations. We included in our regression the proposer’s effort choice relative to the total effort, which represents the probability of proposing in PERM treatments and round-one proposing in TEMP treatments.²⁰ In terms of the theoretical predictions of the SSPE, the estimated coefficient should be 0 for MAJ-TEMP, and UN-TEMP because there is no effect of efforts on the share offered to voters ($s_i = \delta F/3$). On the contrary, the proposer’s share in MAJ-PERM and UN-PERM is positively affected by her recognition probability. Thus, we should expect a positive and significant coefficient in those treatments. This happens because as π_i increases, others’ chances of recognition fall, and the share offered to others declines.²¹

In our regression, we also include the round in which the agreement took place to account for within-group dynamics, and the period of play to account for learning. We estimate the model for each treatment and then pooling but controlling for the voting rule and the durability of rights.

The estimation results are presented in Table 5. First, we find that in all treatments, there is no indication of an increase in proposer power over the course of the experiment, as can be seen by the non-significant period trend coefficient. Second, the proposer’s effort relative to total efforts is positively correlated with the proposer’s kept share. Thus, it can be argued that equity concerns play a role in the subject’s bargaining behavior.²² Third, when focusing on the pooled estimation, we find a small, significant difference of 4 percentage points between majority and unanimity bargaining. And fourth, the durability of proposal rights bears no impact on the proposer’s share.

We now turn to a more detailed investigation of how contest efforts shape the division of the total fund. Figure 2 shows a scatter plot where each observation is an effort-share pair, and the red line represents the identity line. We have pooled by majority and unanimity for ease of visualization.

²⁰Because own effort is a choice variable, and therefore endogenous, the regressions are intended to be descriptive and document how proposers condition allocations on observed efforts, rather than to identify a causal effect of effort on proposer power.

²¹Recall that player j ’s SSPE predicted share is $\delta V_j = 0.85\pi_j$ in UN-PERM, and that it is weakly increasing for MAJ-PERM games.

²²As we shall demonstrate, equity does not take the form of *perfect proportionality*, but rather a coarser approximation whereby shares offered are ranked according to effort in the proposer contest.

Table 5. Determinants of Proposers' Shares

	MAJ-PERM	MAJ-TEMP	UN-PERM	UN-TEMP	Pooled
Effort / Sum of Efforts	0.194*** (0.026)	0.151* (0.062)	0.121* (0.057)	0.099 (0.052)	0.156*** (0.023)
Round	-0.004 (0.002)	-0.005 (0.005)	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)
Period (Trend)	0.002 (0.002)	0.002 (0.002)	-0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)
Constant	0.300*** (0.012)	0.328*** (0.015)	0.306*** (0.014)	0.302*** (0.012)	0.283*** (0.008)
Majority Rule					0.040*** (0.008)
Permanent Rights					-0.003 (0.009)
N	260	180	180	171	791
χ^2	57.73	6.83	10.88	7.23	68.55

Notes: Standard errors in parentheses are clustered at the matching group level. We control for the round of approval, which has no significant impact on the proposer's share. Random effects estimations at the subject level. Accepted proposals only. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Our first observation is that 93.9% of recipients (other than the proposer) receive a share greater than or equal to their effort in majoritarian bargaining and 99.6% under unanimity. These are all the points above the break-even line. Second, most shares are between 95 and 110 tokens, reflecting the focality of splits on the neighborhood of equality (93% in majority and 99% in unanimity).

Under the majority rule, proposers offer a larger share to the voter with the higher effort 61% of the time, 25% of the time they offer equal shares, and only 11% of the time a lower share to the higher-effort voter. A similar pattern is observed under unanimity, as shown in Table 6. The observed distributions of the fund can be described as reflecting a *coarse* version of equity concerns (Cook and Hegtvedt, 1983), whereby the shares are such that the players retrieve their effort costs and are ranked by effort level. Note that perfect equity (Adams, 1965) would entail distributing the fund perfectly proportional to efforts, but this is not what we find. Instead, the pattern of proposals reflects a compromise between equality and equity.

Conclusion 4 *Regardless of the voting rule, the modal agreements are three-way splits of the total fund. The proposer's share is 4 percentage points higher in majority treatments compared to unanimity (38% vs. 34%). Proposers take into account rent-seeking efforts when distributing the*

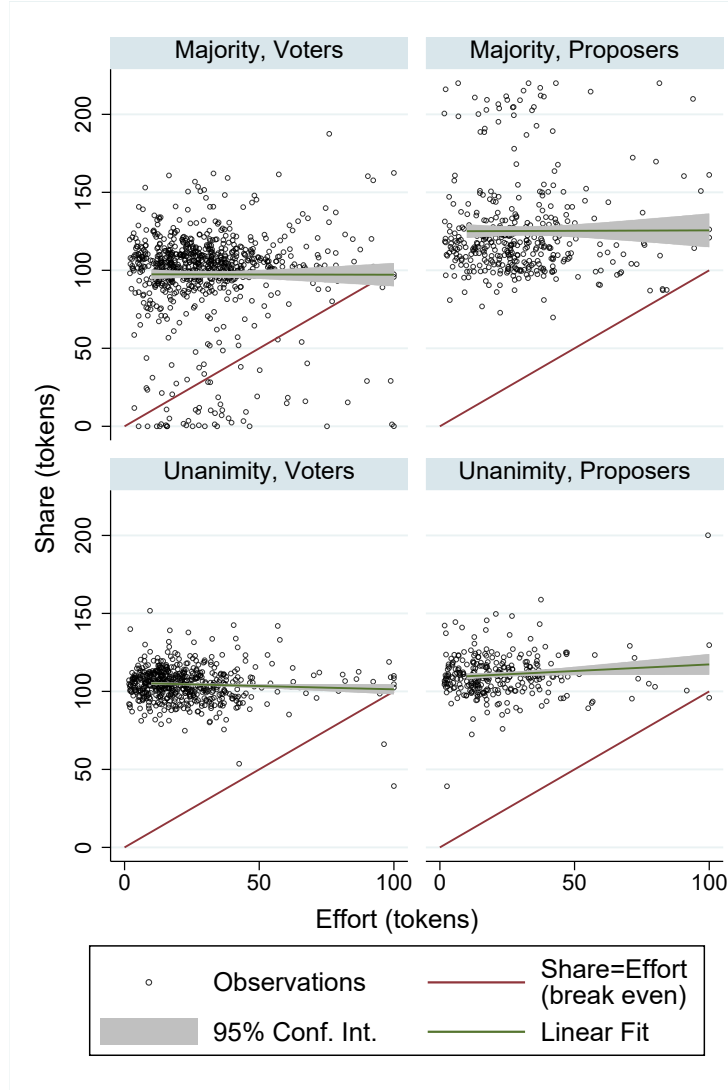


Figure 2. Agreed Shares and Efforts, by Voting Rule and Subject Role

Notes: This figure plots the observed effort (x-axis) and share of the fund (y-axis) a player received in the agreed allocation. Observations at or above the solid red line correspond to subjects who received shares greater than their efforts. The green line is the linear fit. The upper panel is for the majority rule, and the lower panel for unanimity. The first column is for the shares offered by the proposer to the other two voters. The second column is for proposers and the shares they keep to themselves.

fund by offering voters who exerted higher efforts a larger share, displaying a coarse form of equity concerns.

Table 6. Types of Proposals and their Relationship to Contest Efforts (in Percentages)

	MAJ-PERM	MAJ-TEMP	UN-PERM	UN-TEMP
All shares ordered by effort	40.89	30.54	34.13	38.93
Voters' Shares ordered by effort	67.11	53.29	58.10	62.83
Voters' shares equalized	21.33	30.54	24.55	27.43

Notes: Accepted proposals only, pooled for all periods of play. ‘All shares ordered by effort’ refers to allocations in which $s_i > s_j \iff e_i > e_j$ for each subject $i \in 1, 2, 3$. ‘Voters’ Shares ordered by effort’ refers to allocations where $s_i > s_j \iff e_i > e_j$ for the voters but the proposer’s share need not satisfy the same inequality. ‘Voters’ shares equalized’ are allocations in which both voters receive the same share.

6. Additional Treatments

In this section, we present results from additional treatments that assess the robustness of our findings on the efficiency comparison between voting rules. Furthermore, we are also interested in understanding the causal effect of the proposer contest on bargaining duration, for which we conduct a treatment without the proposer selection contest.

6.1. Robustness: Subject Pool, Voting Institution, Bargaining Costs, and Contest Technology

The efficiency dynamics between majority and unanimity that we have reported may be sensitive to alternative parameters and institutional variants of our framework. To this end, we will focus on varying four key aspects of our experiment: the subject pool (replication in Spain), the characteristics of the voting institution (direct voting mechanism), the cost of bargaining disagreements (varying the discount factor), and the contest technology (varying the marginal product of effort). In what follows, we describe each of these variants and their importance. A summary analysis of the experimental results is provided in Table 7.

Treatments

First, we investigate whether the behavioral patterns reported earlier can be replicated in a separate subject pool. To this end, we conducted the same experimental treatments as in Table 1 at LINEEX at the University of Valencia in Spain (n=216, 54 subjects in 6 matching groups per treatment).

Second, we study behavior under an institutional variant in which voting occurs only after the selected proposal is observed. This mechanism is commonly referred to as *direct voting*. Recall

that in our main treatments, we elicit individual voting thresholds, and therefore, subjects cannot condition their vote on the shares offered to others. Furthermore, thresholds are elicited before the proposal is revealed. We conducted the direct-voting variant with permanent rights, which we label MAJ-PERM-DV and UN-PERM-DV.

Conducting MAJ-PERM-DV and UN-PERM-DV is important for two reasons: internal validity (within the experimental literature) and external validity (similarity to real-world voting institutions). Most, if not all Baron and Ferejohn (1989) experiments to date abide by the direct voting mechanism. Hence, it is important to know whether our results are an artifact of the threshold-voting institution in place. From an external validity perspective, voting often takes place in situations where the division of benefits is publicly known to the parties (e.g., budgetary distributions in legislatures, profit-sharing in partnerships), and therefore this variant enhances the *realism* of the experimental game.

Third, we vary the discount factor (δ), which denotes the likelihood of continuing to bargain for one more round after disagreement. Lower values of δ indicate a higher delay cost. In our initial treatments, we set this value to $\delta = 0.85$. We conducted additional sessions with $\delta = 0.5$ under temporary effect of efforts on proposal rights. We label these treatments MAJ-TEMP-d50 and UN-TEMP-d50. We also explore the effect of reducing the bargaining horizon to a single round, akin to an ultimatum game: if no agreement is reached in the first round, the fund vanishes. In this extreme case, $\delta = 0$. We label these treatments MAJ-1R and UN-1R for the majority and unanimity rule, respectively.

Fourth, we vary the contest success function that maps efforts onto the probability of proposing. We consider a more competitive contest by increasing the marginal value of effort in affecting the probability of recognition. Specifically, $\pi_i(\mathbf{e}) = e_i^3 / (e_1^3 + e_2^3 + e_3^3)$. These treatments were conducted in a single-round bargaining protocol ($\delta = 0$), under both voting rules, and we label them MAJ-1R-COMP and UN-1R-COMP.

Results

We present the results for games 6-10, in Table 7. In every treatment, the majority rule generates higher contest efforts compared to unanimity. The effect is statistically significant in all treatments at the 1% level or better, except for MAJ-1R-COMP vs. UN-1R-COMP, where the difference is not significant.

With respect to the probability of agreement delay, we find that not reaching an agreement in

Table 7. Mean Efforts, Delay, and Efficiency in Period 6-10

Treatment	Lab	# Subjects	Effort	Delay	Efficiency
<i>a. Laboratory Sample</i>					
MAJ-PERM	Sp.	54	47.19	0.32	0.76
UN-PERM	Sp.	54	28.26	0.79	0.73
MAJ vs. UN p -value			$p < 0.001$	$p < 0.001$	$p = 0.313$
MAJ-TEMP	Sp.	54	37.84	0.43	0.80
UN-TEMP	Sp.	54	24.89	0.72	0.75
MAJ vs. UN p -value			$p = 0.020$	$p = 0.002$	$p = 0.286$
<i>b. Direct Voting</i>					
MAJ-PERM-DV	Sp.	54	49.90	0.10	0.79
UN-PERM-DV	Sp.	54	28.31	0.64	0.79
MAJ vs. UN p -value			$p = 0.001$	$p < 0.001$	$p = 0.949$
<i>c. Discounting ($\delta = 0.5$)</i>					
MAJ-TEMP-d50	Col.	54	37.67	0.29	0.75
UN-TEMP-d50	Col.	54	15.96	0.43	0.83
MAJ vs. UN p -value			$p < 0.001$	$p < 0.053$	$p = 0.085$
<i>d. Discounting ($\delta = 0$)</i>					
MAJ-1R	Col.	75	46.75	0.20	0.70
UN-1R	Col.	60	30.52	0.36	0.70
MAJ vs. UN p -value			$p = 0.011$	$p = 0.003$	$p = 0.455$
MAJ-1R	Sp.	54	44.76	0.16	0.74
UN-1R	Sp.	54	26.27	0.30	0.75
MAJ vs. UN p -value			$p < 0.001$	$p < 0.001$	$p = 0.318$
<i>e. Competition</i>					
MAJ-1R-COMP	Col.	45	30.84	0.23	0.77
UN-1R-COMP	Col.	45	26.61	0.47	0.66
MAJ vs. UN p -value			$p = 0.411$	$p = 0.112$	$p = 0.136$

Notes: In the laboratory column “Sp.” stands for Spain and “Col.” for Colombia. “Delay” refers to groups that do not reach an agreement in the first round of bargaining. The p -values for the effect of the voting rule on efforts are obtained from a random effects regression, clustering standard errors at the matching group level. The p -values for “Delay” and “Efficiency” are obtained from linear regressions, clustering standard errors at the matching group level.

round 1 is more likely under the unanimity rule. This is statistically significant in all treatments except when comparing MAJ-1R-COMP with UN-1R-COMP. Jointly, the higher efforts under majority rule and higher bargaining costs under unanimity result in no statistically significant difference in total efficiency between voting rules in any of our treatments.

Our findings should be interpreted as showing no statistically significant efficiency dominance of either voting rule over the parameters studied. More generally, the relative performance of majority and unanimity will depend on the relative costs between two sources of inefficiency: wasteful competition for proposal rights and bargaining delay. Majority rule tends to induce greater contest effort, and unanimity tends to generate more delay and disagreement. In the treatments we study, these opposing forces largely offset each other.

Quite importantly, in the MAJ-1R-COMP and UN-1R-COMP, the relative cost of contest effort is low compared with the relative cost of delay, which is where the Buchanan and Tullock (1965) argument more likely predicts an efficiency advantage for the majority rule. In line with the arguments by Buchanan and Tullock (1965), we find that mean efficiency is higher under majority rule in this treatment (0.77 versus 0.66), although the difference is not statistically significant. Given the relatively smaller sample size in this comparison, the results should be interpreted cautiously.

Conclusion 5 *Efficiency is statistically indistinguishable between majority and unanimity bargaining (i) in a different subject pool, (ii) under direct voting, (iii) with increased levels of bargaining costs, and (iv) under increased productivity of efforts in the contest stage.*

6.2. The effect of competition for power on bargaining duration and outcomes

In this subsection, we seek to understand whether the presence of a contest stage has an effect on bargaining efficiency. Specifically, does competition for the proposer role lead to greater conflict in bargaining? Theoretically, there should be no difference with or without a contest. But this question is empirically important because, if answered positively, this would imply that competition for proposal rights affects efficiency through two channels: a direct one through the wasteful efforts and an indirect one through increased bargaining duration.

To answer our question, we performed two treatments without a proposer contest (unanimity, $n=54$; majority rule, $n=54$). In these treatments, group members have exogenously fixed equal chances of proposing, as is common in the vast majority of existing experimental studies. All other aspects were identical to those of MAJ-TEMP, MAJ-PERM, UN-TEMP, and UN-PERM with $\delta = 0.85$. The experiments were conducted at LINEEX.

We regress the round of agreement on a dummy variable taking the value 1 in the absence of a contest, for each voting rule. The results, presented in columns 1 and 2 of Table 8, show that the round in which an agreement is reached is greater when there is a contest for proposer status under

both rules. The effect is statistically significant under majority at the 1% level ($p=0.003$) but not under unanimity ($p=0.092$). These findings show that the contest for the proposer role preceding bargaining has an indirect effect on efficiency through increased gridlock, beyond the direct effect of the effort costs.

Table 8. OLS for the effect of a Contest on the Round of Agreement

	All Groups		Equiprobable Groups	
	Majority	Unanimity	Majority	Unanimity
	(1)	(2)	(3)	(4)
Constant	1.842*** (0.144)	4.519*** (0.380)	2.736*** (0.210)	5.311*** (0.664)
No Contest	-0.531** (0.154)	-0.819 (0.459)	-1.425*** (0.218)	-1.611* (0.713)
<i>N</i>	540	540	267	331

Notes: *No Contest* is an indicator variable that takes the value 0 for treatments MAJ-TEMP, MAJ-PERM, UN-TEMP, and UN-PERM, and 1 for treatments where there is no contest for proposal rights. Equiprobable groups are those in which the probability of proposing for each member is between 0.3 and 0.36. Standard errors in parentheses are clustered at the matching group level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

One may argue that a reason why there is more conflict in the presence of a contest is because of the asymmetries in proposer recognition that arise, and not due to the preceding contest *per se*. Therefore, if the increase in bargaining duration is driven by asymmetries, one would expect there to be a smaller effect when players are symmetric following the contest. To test whether this is a plausible explanation for the greater duration in reaching an agreement, we estimate our regressions on the subsample of groups where players had roughly the same chance of proposing, given their efforts at the contest stage. Specifically, we considered a narrow interval where all probabilities had to be between 0.3 and 0.36 and denote these as *equiprobable groups* in columns 3 and 4 of Table 8.²³

The regression results do not support the previous conjecture. Instead, we find that contests have a significant positive impact on the duration of negotiations under both majority ($p < 0.001$) and unanimity ($p = 0.038$). If anything, the impact of the contest in equiprobable groups is stronger in magnitude and statistical significance.

Conclusion 6 *A contest for proposer power preceding multilateral bargaining leads to an increase*

²³The analysis is robust to broader and narrower intervals defining equiprobable groups.

Table 9. Mean Efforts and Proposal Type, by Gender and Voting Rule

	Majority	Unanimity
Effort (tokens)		
Female	42.7	31.8
Male	40.8	25.3
Three-Way Splits (%)		
Female	85.4	99.7
Male	67.6	99.7

in bargaining duration, which is statistically significant under the majority rule.

7. Discussion

In this section, investigate two important aspects of behavior in our experiment.²⁴ The first aspect concerns the role of individual characteristics on subject behavior, focusing on risk and gender. Second, we seek to investigate the stated reasons behind the subjects' choices. To this end, we asked two open-ended questions in our final survey. One question is about the motives behind their proposal strategies, and the other about effort choices.

7.1. *Personal characteristics and behavior*

The role of gender

Gender differences in economic behavior have been widely documented in experimental studies (Croson and Gneezy, 2009). Previous contest experiments with a fixed prize show evidence that female subjects choose higher efforts than male subjects (Price and Sheremeta, 2015; Dechenaux et al., 2015). Evidence from related auctions experiments also reveals a tendency for females to bid more than males (Casari et al., 2007; Ham and Kagel, 2006; Chen et al., 2013). However, no previous experiment reports on gender differences in a contest for the proposer role in bargaining. As we can see in Table 9, females bid more than males under both rules, but the difference is significant only under unanimity bargaining (see Table C6).

Turning to the bargaining stage, females are 18 percentage points more likely to offer three-way

²⁴The results presented in this section pertain only to the Spanish replication sample, where we collected the relevant variables.

splits than males in majority rule treatments. This complements the experimental evidence from 14 countries Baranski and Haas (2025) showing that men are more exclusionary than women in majoritarian bargaining (in a game without a proposer contest).

Taken together, our findings can be interpreted as females being equally or even more likely than males to sort into proposing in bargaining as measured by their efforts at the contest stage, yet their motives differ. Women promote more inclusive distributions of the fund while men more selfish ones.

The role of risk aversion

The extant experimental literature on contests with a fixed prize (i.e., no bargaining) shows evidence that risk aversion is negatively correlated with rent-seeking effort choices (Dechenaux et al., 2015; Shupp et al., 2013). We investigate the role of risk attitudes in our experiment by asking subjects to state their willingness to take risks on a 0 (not willing) to 10 (completely willing) scale (Dohmen et al., 2011). Our regression results show that the willingness to take risks correlates positively with effort choices (see Table C6).

7.2. Stated motives for behavior

Proposed Distributions of the Fund

Equitable sharing, as revealed by the tendency of proposers to sort voters' shares of the fund according to their efforts, arises despite the competitive nature of the preceding contest. Equity concerns, as defined in Adams (1965), that inputs are considered as the basis for sharing outputs, are widely documented in bargaining experiments with joint production of the surplus for both bilateral (e.g., Gantner et al., 2001; Cherry et al., 2002; Cappelen et al., 2007) and multilateral bargaining (Baranski, 2016; Gantner et al., 2016). In these experiments, a productive phase precedes negotiations, where a clear social benefit is created by individual costly efforts, unlike ours, in which efforts are wasteful.

It is important to stress that we do not find *perfect* proportionality, but the distribution of the benefits can be largely interpreted as a coarser conception of the principle of proportional equity (Adams, 1965) reflected in the fact that higher efforts at the contest stage are rewarded with higher shares of the surplus. Answers to an open-ended question at the end of the experimental sessions confirm that subjects care about *fairness* and take their own and others' efforts into account when

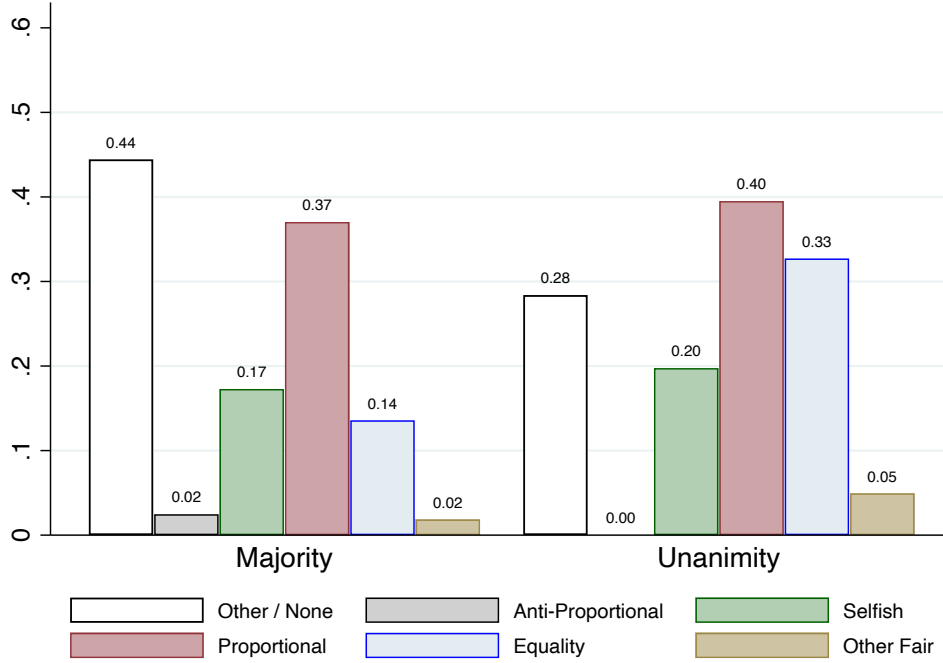


Figure 3. Subject's Stated Motives for their Bargaining Proposals

Notes: This figure pools single- and multi-round bargaining games by voting rule.

proposing.

Based on the answers to a question about the motives behind the subjects' proposed divisions of the total fund, we identified 5 main categories (which are not mutually exclusive). Responses coded as *Proportional* are those stating that the offered shares are positively related to the recipients' efforts at the contest stage, including cases where the subject aims to prioritize his/her own share. *Anti-proportional* motives are coded when subjects state that the offered shares are inversely related to efforts. References to maximizing one's payoff or prioritizing one's earnings over others are coded as *Selfish*. *Equality* motives are coded when the subject intends to offer equal shares.²⁵

Figure 3 shows subjects' stated motives behind their bargaining proposals. Proportionality, equality, and other fairness concerns are present in 53% of responses under the majority rule and 78% under unanimity. Subjects report equality concerns more often under unanimity (14% vs. 33%). Both of these patterns reflect how the strategic environment can trigger appeals to different norms of fairness.

²⁵We identified categories based on a sample of responses and hired a research assistant to categorize each response.

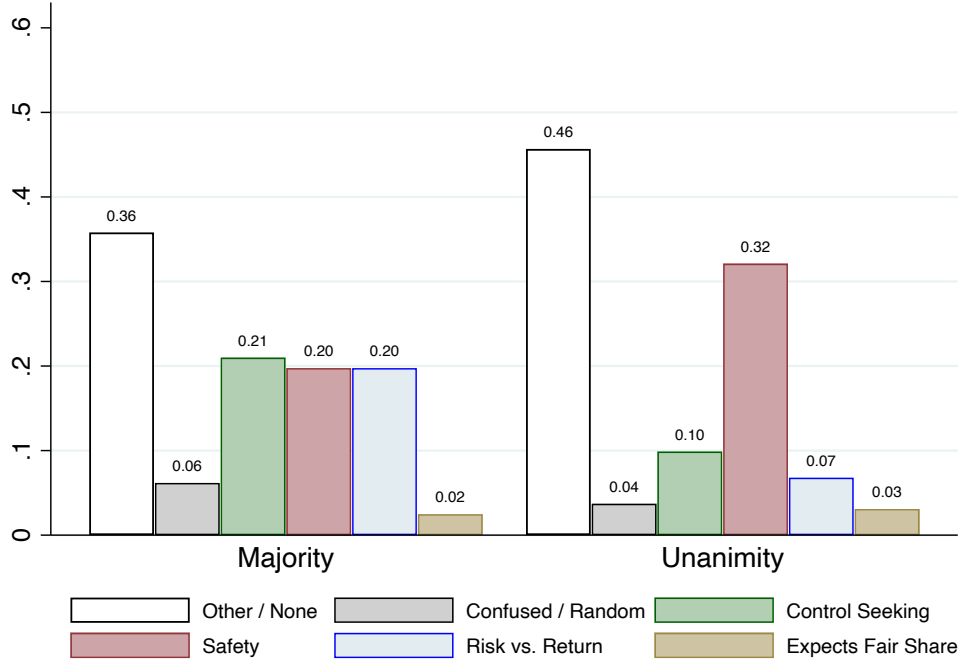


Figure 4. Subject's Stated Motives for Rent-seeking Effort Choices

Notes: This figure pools single- and multi-round bargaining games by voting rule.

Subjects' stated motives for their effort choices at the contest stage

We asked subjects to explain the reasons behind their effort choices and classified their answers into the following non-mutually exclusive categories.²⁶ *Control-seeking* refers to statements about the desire to be the proposer. *Risk versus return* motives are those in which subjects explain balancing a trade-off between keeping their endowment and investing to enhance their odds of having their proposals selected. *Safety* motives are those in which subjects state that their primary concern was to have guaranteed earnings. *Expects a fair share* is coded when subjects state that they expect to receive a share of the fund in line with their effort choice. The prevalence of these categories for each voting rule is shown in Figure 4.

Control-seeking motives are expressed by 21% of subjects under majority voting, twice as much as with unanimity. Safety concerns are more prevalent under unanimity (32%) compared to majority (20%). Concerns for striking a balance between the risk and return of efforts are expressed in 20% of responses under majority rule and 7% under unanimity.

²⁶There is a growing literature investigating when and why people value holding decision rights. See Bartling et al. (2014), Pikulina and Tergiman (2020), and Dykstra et al. (2022).

Table 10. Mean Efforts for each Motive, by Voting Rule

	Majority	Unanimity
Control Seeking		
Yes	53.1	48.3
No	38.9	33.7
Safety		
Yes	31.6	19.4
No	44.4	33.7
Risk vs. Return		
Yes	39.7	32.7
No	42.5	28.8

Only 3% of the subjects state that their motivation behind their choice of effort is the expectation of receiving *fair share*, which contrasts with the fact that subjects broadly reference taking others' efforts into consideration when bargaining. Despite the fact that such motivation is not mentioned, the analysis of their behavior regarding reservation shares as analyzed in the Online Appendix 2.2 (Table C9) suggests that subjects expect to receive a share that correlates positively with their efforts.

Table 10 shows the mean effort, by voting rule, for each of the main motives we identified. Subjects who report being concerned with the safety of their earnings choose the lowest efforts, while control seekers choose the highest efforts, under both rules. Hence, despite the variation in the prevalence of different motives under each rule, motives have the same directional effect on effort on both rules: control seekers choose higher effort than non-control seekers, and those concerned with safety choose lower efforts.

8. Conclusion

In this article, we have studied an experimental game that brings together two key features present in decision-making bodies, groups, and organizations. The first feature is that collective decisions often involve conflicting interests (i.e., division of resources), and the second is that struggles for power and control are likely to emerge. Certainly, there are many ways to incorporate these features into economic models. We do so by merging two cornerstone models in political economy: rent-seeking contests as modeled by Tullock (1980) and multilateral bargaining as modeled by Baron

and Ferejohn (1989). Thus, on the one hand, the game we study endogenizes the origin of proposal rights in bargaining, and on the other, the distribution of the prize in a contest. This concatenation of two canonical models provides a rich framework to study the interplay between power-seeking efforts and bargaining behavior and allows for comparability with existing work.

We provide the first experimental investigation of competition for proposal rights in a multi-stage model of sequential bargaining and uncover a robust series of findings, which can be summarized as follows. First, competition for proposal rights is fiercer under majoritarian voting rules than under unanimity. This holds across treatments in which equilibrium stipulates higher efforts under unanimity (permanent proposal rights) and when it indicates no differences between rules (single round bargaining games). Therefore, the stationary subgame perfect equilibrium provides little guidance in explaining the patterns of behavior that emerge.

Our second finding concerns the overall efficiency of the different voting rules. Efforts to become the proposer are wasteful from a welfare point of view, and as such, unanimity dominates the majority rule in this dimension. However, bargaining costs are higher under unanimity because subjects take more rounds to reach an agreement. Incorporating both effects, majoritarian rules yield slightly higher efficiency, but their advantage fades as subjects gain experience in the game. This finding holds robustly in different subject samples, under alternative voting mechanisms, varying levels of bargaining costs, and a more competitive proposer contest technology. Therefore, the argument that the majoritarian rule is preferable from an efficiency point of view (Buchanan and Tullock, 1965) must be qualified because the advantage, if any, can be rather small once endogenous power struggles are factored in.

Importantly, there is a specific parameter region in our experimental treatments where the costs of effort are relatively lower and the cost of delay higher (i.e., MAJ-1R-COMP and UN-1R-COMP treatments), where we find a numeric advantage for majority rule in terms of efficiency. Although the majority advantage does not reach statistical significance at conventional levels, this *boundary* parameter space highlights that the relative efficiency costs of power-seeking efforts and bargaining disagreement can affect the efficiency comparisons between rules. Our results, therefore, should be interpreted as a failure to find a robust efficiency dominance of either voting rule over the environments studied, rather than as evidence of a universal efficiency equivalence between majority and unanimity bargaining. Future work can investigate the extent and bounds of the efficiency comparisons we find.

We also note that it is possible we are underestimating the efficiency levels of the unanimity

rule because our measure is based on material payoffs only, assuming a linear utility function in which money and utility are equivalent. Nevertheless, it is reasonable to expect that subjects care about the distribution of payoffs among other members (especially in light of the distributions we observe) and not just their own payoff. Because unanimity leads to a more inclusive distribution of earnings, one can argue that the majority efficiency advantage shrinks further if utility over full distributions in the presence of social preferences is considered as a welfare measure. Moreover, we have set a lower bound on effort, which often binds under unanimity, meaning that it is possible that subjects would have chosen even lower efforts if feasible and achieved higher efficiency.

Our third finding is that, when a contest for proposer status precedes bargaining, agreements tend to be reached in later rounds compared to the canonical game absent a contest. Therefore, competition for holding proposer status can have a compounding deleterious effect on efficiency beyond the direct material costs of competing.

A fourth finding concerns the distribution of the surplus through bargaining after the contest. Quite strikingly, three-way splits of the fund are modal even in majoritarian games. This observed behavior departs from the stylized findings in majoritarian multilateral bargaining, where the fund is typically split between a minimum winning coalition and redundant members are excluded (Baranski and Morton, 2022; Montero, 2025). The fact that subjects tend to condition the distribution of the fund on competition efforts suggests that they perceive these as a basis for deservedness and not in a competitive fashion.

It is important to note that our model and experimental treatments focus on one specific and stylized form of competition for power: competition for proposal rights. In many political and organizational settings, actors compete for broader forms of influence, such as agenda-setting authority, committee leadership, board control, or managerial discretion. Such positions often confer powers beyond the ability to make proposals, including influence over which alternatives are considered and how decisions are implemented. Our framework abstracts from these additional dimensions in order to isolate the effects of competition for proposal rights on bargaining behavior and efficiency.

Open questions remain to be addressed at the intersection of competition for power and bargaining to divide resources. For example, our game allows for effort to compete for resources and not for effort to increase the value of the surplus to divide. It is possible that in settings with productive efforts, rent-seeking efforts will be penalized, while productive ones will be rewarded. Alternative ways of modeling competition for proposal rights, such as all-pay auctions as in Ali (2015) or allowing competition in every round of bargaining as in Yildirim (2007), raise interesting

theoretical insights about the value of proposal rights. Future work can also explore behavior under alternative institutional variants, such as different bargaining protocols and the possibility of communication to take place.

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Online Appendix

A. Proof of Non-existence of Pure Strategy Equilibria in Majoritarian Bargaining with Permanent Effect of Efforts of Proposal Rights

Consider a Baron and Ferejohn (1989) bargaining game with n players, a q voting rule with $1 < q < n$, and a pie of size 1 (this normalization is without loss of generality). Let π_i denote the probability that player i is the proposer. Denote by v_i the equilibrium payoff that arises in a stationary subgame perfect equilibrium, which we know exists and is unique (Eraslan, 2002).

The following lemma formalizes an example that Eraslan (2002) presented without a proof. Once we establish this result, we proceed to prove part 1 of Proposition 2.

Lemma 1 *Consider the case in which all members except player 1 have the same probability of being recognized. Denote by π_1 the probability that player 1 has of being recognized and by v_1 her equilibrium payoff. Let all the remaining $n - 1$ members of the committee have the same chance of being selected denoted by π and hence the same equilibrium payoff v . Then, we have that:*

$$1. \ v_1 > v \iff \pi_1 > \frac{1}{n-\delta(q-1)} \quad ;$$

$$2. \ v_1 < v \iff \pi_1 < \frac{1-\delta}{n-\delta q} \quad .$$

Proof. First, we note that $\pi = (1 - \pi_1)/(n - 1)$. Let $v_1 > v$. Since player 1 is the “most expensive” to include in the winning coalition, she is always excluded. The payoff function for player 1 can be written as

$$v_1 = \pi_1(1 - \delta(q - 1)v). \tag{A.1}$$

Now we examine player $j > 1$. Whenever player 1 proposes, j has probability $(q - 1)/(n - 1)$ of being assigned her continuation value. Whenever a member $i \neq j > 1$ is the proposer, player j is invited into the coalition with probability $(q - 1)/(n - 2)$. Putting these facts together, we compute the expected payoff when player j is not the proposer to be

$$\delta v \left[\pi_1 \left(\frac{q - 1}{n - 1} \right) + (n - 2)\pi \left(\frac{q - 1}{n - 2} \right) \right]. \tag{A.2}$$

In order to obtain the *ex-ante* value of the game for player $j > 1$ we must add to equation (A.2) the expected payoff when player j is the proposer. This yields

$$v = \pi(1 - \delta v(q - 1)) + \delta v \left[\pi_1 \left(\frac{q - 1}{n - 1} \right) + \pi(q - 1) \right], \quad (\text{A.3})$$

which clearly depends only on v . Next, we proceed to solve for v and obtain the equilibrium payoff to be

$$v = \frac{\pi}{1 - \delta \pi_1 \left(\frac{q - 1}{n - 1} \right)}. \quad (\text{A.4})$$

Next, we substitute the right-hand side of equation (A.1) and obtain

$$v_1 = \pi_1 \left[1 - \delta(q - 1) \left(\frac{\pi}{1 - \delta \pi_1 \left(\frac{q - 1}{n - 1} \right)} \right) \right]. \quad (\text{A.5})$$

Using the fact that $\pi = (1 - \pi_1)/(n - 1)$ one can compare equations (A.4) and (A.5) to determine conditions on π_1 and π for which $v_1 > v$. Explicitly,

$$\begin{aligned} \frac{\pi_1(n - 1 - \delta(q - 1))}{n - 1 - \delta \pi_1(q - 1)} &> \frac{1 - \pi_1}{n - 1 - \delta \pi_1(q - 1)} \iff \\ \pi_1 &> \frac{1}{n - \delta(q - 1)}. \end{aligned}$$

Next, we turn to the case when $v_1 < v$. Clearly, player 1 will always be included in any minimum winning coalition whenever $j > 1$ proposes. The payoff to player 1 is given by $v_1 = \pi_1(1 - \delta(q - 1)v) + (1 - \pi_1)\delta v_1$. After solving we obtain for v_1 in terms of v and we obtain

$$v_1 = \frac{\pi_1(1 - \delta(q - 1)v)}{1 - \delta(1 - \pi_1)}. \quad (\text{A.6})$$

Any player $j > 1$ always includes player 1 in the coalition and randomizes over his choices of the remaining players with equal probability. The disbursement amount is given by $(v_1 + (q - 2)v)\delta$. Whenever player 1 proposes, the probability of j 's inclusion is $(q - 1)/(n - 1)$. Whenever another player proposes (not 1 or j) player j is invited into the coalition with probability $(q - 2)/(n - 2)$. Putting these facts together, we obtain

$$v = \pi(1 - \delta v_1 - \delta(q - 2)v) + \delta v \left[\pi_1 \left(\frac{q - 1}{n - 1} \right) + (n - 2)\pi \left(\frac{q - 2}{n - 2} \right) \right],$$

which simplifies to

$$v = \frac{\pi(1 - \delta v_1)}{1 - \delta \pi_1 \left(\frac{q - 1}{n - 1} \right)}. \quad (\text{A.7})$$

Solving simultaneously for equations (A.7) and (A.6) we obtain that

$$v = \frac{\delta\pi_1 + 1 - \delta - \pi_1}{M} \quad (\text{A.8})$$

$$v_1 = \frac{(n - 1 + \delta - \delta q)\pi_1}{M}, \quad (\text{A.9})$$

where $M := n - 1 + \delta\pi_1 n - \delta\pi_1 q - n\delta + \delta$. Comparing (A.8) and (A.9) we verify that $v_1 < v$ holds whenever $\pi_1 < \frac{1-\delta}{n-\delta q}$ ■

We now show that for every symmetric vector of efforts in the contest stage, there exists a unilateral downward deviation that leaves the continuation values of the bargaining game unchanged.

Corollary 5 *Let $\mathbf{e}$ be any symmetric, positive vector of efforts. Then, there exists $\bar{\epsilon} > 0$ such that for all $\epsilon \in (0, \bar{\epsilon})$ we have that $v_i = 1/n$ for all i .*

Proof. Let $\epsilon > 0$ and consider $(e - \epsilon, e, \dots, e)$ the vector after player 1, without loss of generality, deviates. Then $v_1 < v \iff \frac{e-\epsilon}{3e} < \frac{1-\delta}{n-\delta q}$. Rearranging terms, we obtain

$$\bar{\epsilon} := e - \frac{3e(1-\delta)}{n-\delta q} < \epsilon$$

■

We are now ready to prove part 1a of Proposition 4.

Proof of Proposition 4. By Corollary 5, for any $\epsilon \in (0, \bar{\epsilon})$ we have that $FV_i(e - \epsilon, e, e) - c(e - \epsilon) > FV_i(e, e, e) - c(e)$. This is because $FV_i(e - \epsilon, e, e) = FV_i(e, e, e) = 1/3$ and $c(\cdot)$ is an increasing function, we have $c(e - \epsilon) < c(e)$. Hence, a small downward deviation is profitable meaning that (e, e, e) is not an equilibrium ■

Proof of Proposition 3. For the majority rule, the first order conditions are:

$$F\pi'(1 - \delta/3) - F\pi'\delta/6 = 0,$$

where

$$\pi' = \sum_{j \neq i}^3 e_j / \left(\sum_{j=1}^3 e_j \right)^2$$

. By symmetry, we let $e_i = e_j = e$ which implies that $\pi' = 2e/9e^2$. Recalling that $c(e) = e$, the first order conditions simplify to

$$\frac{F2(1 - \delta/2)}{9e} = 1$$

. Solving for e yields the desired result. The proof for unanimity follows the same logic ■

B. Supplementary Analysis for the Main Experiment

In this section of the Online Appendix we present figures and tables relating to MAJ-PERM, MAJ-TEMP, UN-PERM, UN-TEMP in the Colombian sample.

2.1. Proposer contest efforts

Table B1. Effort Choice in Period 1

	Coef.	S.E.
Constant	34.385***	(2.333)
UN-PERM	-1.551	(3.648)
MAJ-TEMP	-4.588	(3.648)
UN-TEMP	-1.977	(3.648)
<i>N</i>	240	

Notes: OLS regressions. Standard errors in parentheses. Treatment MAJ-PERM is the base level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table B2. Determinants of Effort Provision

	Majority Rule		Unanimity Rule	
	Coef.	S.E.	Coef.	S.E.
Constant	33.076***	(4.027)	33.767***	(2.836)
Permanent Rights	1.150	(4.471)	-1.661	(3.317)
Period (Trend)	-0.248	(0.315)	-1.644***	(0.252)
<i>N</i>	1320		1053	

Notes: Standard errors in parentheses clustered at the matching group level. Subject-level random effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

2.2. Bargaining duration and gridlock

Table B3. Determinants of the Round of Agreement

	Specification 1			Specification 2		
	Majority (1)	Unanimity (2)	Pooled (3)	Majority (4)	Unanimity (5)	Pooled (6)
Permanent Rights	0.088 (0.215)	−0.784 (0.721)		0.086 (0.214)	−0.677 (0.723)	
Majority Rule			−1.698*** (0.383)			−1.805*** (0.376)
Period (Trend)	0.016 (0.025)	−0.025 (0.059)	−0.004 (0.028)	0.021 (0.023)	0.020 (0.065)	0.015 (0.028)
Std. Dev. of Efforts				0.021** (0.005)	0.042 (0.022)	0.032*** (0.008)
Constant	1.313*** (0.158)	3.688*** (0.375)	3.173*** (0.324)	0.970*** (0.104)	2.897*** (0.629)	2.691*** (0.344)
<i>N</i>	440	351	791	440	351	791

Notes: OLS Regressions. Standard errors in parentheses clustered at the matching group level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

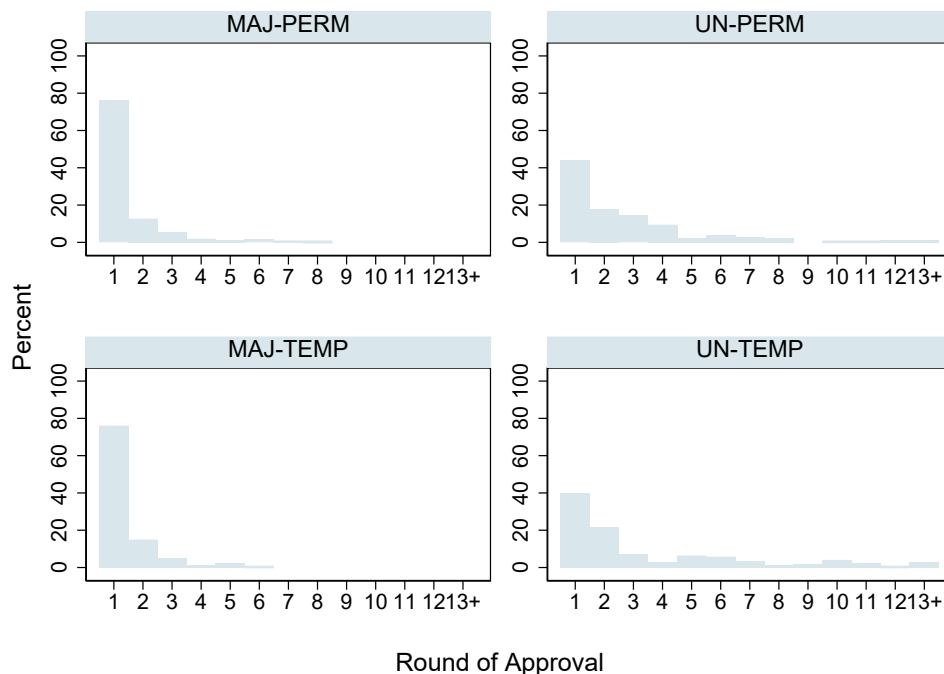


Figure B1. Round in which an Agreement is Reached, by Treatment

Table B4. Probability of Agreement Delay

	Specification 1			Specification 2		
	Majority	Unanimity	Pooled	Majority	Unanimity	Pooled
Majority Rule			−0.341*** (0.061)			−0.360*** (0.058)
Permanent Rights	−0.000 (0.097)	−0.040 (0.078)	−0.018 (0.063)	0.000 (0.096)	−0.028 (0.076)	−0.011 (0.061)
Period (Trend)	0.001 (0.007)	−0.008 (0.010)	−0.003 (0.006)	0.003 (0.006)	−0.003 (0.012)	0.001 (0.006)
Std. Dev. of Efforts				0.006*** (0.002)	0.004 (0.004)	0.006** (0.002)
<i>N</i>	440	351	791	440	351	791

Notes: Marginal effects from Probit regressions. Standard errors in parentheses clustered at the matching group level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Voting thresholds

Recall that the voting threshold is given by δV_i (as a proportion of the total fund). For treatments MAJ-TEMP and UN-TEMP, efforts should have no effect V_i because it is equal to $1/3$ due to the ensuing symmetry. For the treatment UN-PERM, $V_i = \pi_i$, which means we should expect a positive effect of one's relative effort choice on her threshold. While there is no explicit functional form for V_i under majority, we know it is weakly monotonic in effort (Eraslan, 2002). Thus, a positive effect is also expected.

We estimated the same regression specifications as we did for the proposer's share. The results, reported in Table B5, reveal that efforts play a key role in subjects' threshold decisions. In all treatments, we uncover a positive and significant relationship, which further evidences subjects' concerns for equity in the distribution of the fund.

Subjects in the majority treatments ask for nearly 3 percentage points more of the fund than subjects in the unanimity treatments ($p < 0.05$). Again, we find no significant difference in thresholds along the durability of rights dimension ($p > 0.1$). In short, we find little support for the SSPE bargaining outcomes. Equity concerns, in the form of proportionality relative to efforts, is a better descriptor of proposal and voting behavior.

Table B5. Determinants of Voting Thresholds

	MAJ-PERM	MAJ-TEMP	UN-PERM	UN-TEMP	Pooled
Effort / Sum of Efforts	0.105*** (0.026)	0.124*** (0.042)	0.095** (0.049)	0.083*** (0.038)	0.101** (0.017)
Majority Rule					0.027*** (0.009)
Permanent Rights					−0.009 (0.009)
Round	−0.003 (0.004)	−0.002 (0.002)	−0.003*** (0.001)	−0.001 (0.001)	−0.001*** (0.001)
Period (Trend)	0.001 (0.002)	0.001 (0.002)	0.002** (0.001)	0.001 (0.001)	0.001** (0.001)
Constant	0.294*** (0.015)	0.287*** (0.016)	0.257*** (0.027)	0.282*** (0.025)	0.271*** (0.014)
N	780	540	540	513	2373
χ^2	18.38	14.80	50.61	8.99	46.64

Notes: Standard errors in parentheses clustered at the matching group level. Subject-level random effects. Accepted proposals only. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

C. Tables and Figures for the Robustness Experiments

Table C6. OLS for Determinants of Effort Provision in the Spanish Sample in Treatments MAJ-PERM, MAJ-TEMP, UN-PERM, and UN-TEMP

	Majority Rule			Unanimity Rule		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	33.414*** (2.563)	20.970*** (4.662)	17.893*** (3.556)	33.205*** (3.383)	20.958*** (4.631)	17.467*** (5.288)
Permanent Rights	7.167 (3.755)	6.151 (3.453)	6.526* (3.289)	3.720 (4.580)	1.977 (4.159)	2.082 (4.194)
Period (Trend)	0.760* (0.355)	0.760* (0.355)	0.760* (0.355)	-1.051*** (0.265)	-1.051*** (0.265)	-1.051*** (0.265)
Risk		2.286*** (0.570)	2.379*** (0.524)		2.477*** (0.687)	2.584*** (0.718)
Female			3.750 (3.846)			4.848* (1.982)
N	1080	1080	1080	1080	1080	1080
χ^2	22.72	33.41	68.72	19.68	29.35	47.42

Notes: *Risk* is a self-reported measure (non-incentivized) on a scale between 0 and 10 scale, where 0 represents unwillingness to take risks and 10 willingness to take risks. Standard errors in parentheses clustered at the matching group level. Subject-level random effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table C7. Bargaining Outcomes in the Spanish Sample in Treatments MAJ-PERM, MAJ-TEMP, UN-PERM, and UN-TEMP

	MAJ-PERM	MAJ-TEMP	UN-PERM	UN-TEMP
Overall division				
Prediction	2-way splits	2-way splits	3-way splits	3-way splits
2-way splits (%)	33.52	42.04	1.85	2.96
3-way splits (%)	63.70	54.63	97.96	97.04
Proposer's Share				
Observed (% of Fund)	42.38	45.38	35.57	32.84
Voting Threshold				
Observed (% of Fund)	33.13	33.23	29.47	31.41
Round of Approval				
Prediction	Round 1	Round 1	Round 1	Round 1
Round 1	60.56	56.67	21.67	24.44
Round 2	20.00	22.78	20.00	17.78
Round 3+	19.44	20.56	58.33	57.78

Notes: Accepted proposals only, pooled for all periods of play. Predictions refer to the SSPE outcomes.

Table C8. Determinants of Proposers' Shares in the Spanish Sample in Treatments MAJ-PERM, MAJ-TEMP, UN-PERM, and UN-TEMP

	MAJ-PERM	MAJ-TEMP	UN-PERM	UN-TEMP	Pooled
Effort / Sum of Efforts	0.266*** (0.071)	0.211*** (0.092)	0.349*** (0.050)	0.123** (0.063)	0.236*** (0.037)
Round	-0.003 (0.003)	-0.002 (0.006)	-0.004 (0.003)	-0.002 (0.001)	-0.003** (0.001)
Period (Trend)	0.006*** (0.003)	0.007*** (0.003)	-0.000 (0.001)	-0.002 (0.001)	0.003*** (0.001)
Constant	0.294*** (0.030)	0.345*** (0.046)	0.239*** (0.016)	0.308*** (0.020)	0.262*** (0.014)
Majority Rule					0.087*** (0.011)
Permanent Rights					-0.014 (0.010)
N	180	180	180	180	720
χ^2	34.31	7.87	76.48	9.05	260.35

Notes: Standard errors in parentheses clustered at the matching group level. Subject-level random effects. Accepted proposals only. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table C9. Determinants of Voting Thresholds in the Spanish Sample in Treatments MAJ-PERM, MAJ-TEMP, UN-PERM, and UN-TEMP

	MAJ-PERM	MAJ-TEMP	UN-PERM	UN-TEMP	Pooled
Effort / Sum of Efforts	0.172*** (0.044)	0.113*** (0.026)	0.243*** (0.042)	0.093*** (0.026)	0.156*** (0.020)
Round	-0.002 (0.002)	-0.001 (0.004)	-0.002*** (0.001)	-0.000 (0.000)	-0.001*** (0.000)
Period (Trend)	0.002 (0.001)	0.003 (0.002)	0.001 (0.001)	0.001 (0.001)	0.002*** (0.001)
Majority Rule					0.038*** (0.006)
Permanent Rights					-0.011* (0.006)
Constant	0.275*** (0.019)	0.297*** (0.011)	0.214*** (0.016)	0.274*** (0.015)	0.252*** (0.010)
N	1320	1080	1080	1053	4533
χ^2	28.05	23.23	74.02	27.13	115.95

Notes: Standard errors in parentheses clustered at the matching group level. Subject-level random effects. Accepted proposals only. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

D. Experimental Instructions for MAJ-PERM in English

Experiment Instructions

This is an experiment in the economics of decision making. The instructions are simple, and if you follow them carefully and make good decisions, you may earn a CONSIDERABLE AMOUNT OF MONEY which will be PAID TO YOU IN CASH at the end of the experiment. We follow a no-deception ethical policy in this laboratory. Hence, these instructions fully describe the experiment.

A Brief Overview of the Experiment

In this experiment you will be part of a group of 3 people that must decide how to split 320 tokens. You will each make proposals and one of them in your group will be randomly selected for voting. Prior to negotiating how to split the money, you will have the opportunity to bid in order to have your proposal selected for voting. Higher bids lead to higher chances of selection. The full details of the experiment follow.

The Details of the Experiment

As expressed above, this experiment involves three main tasks: **(1) Bidding, (2) Proposing and (3) Voting**. We proceed to fully explain each stage.

(1) Bidding

You will have 100 tokens in a private account and will choose to bid any amount you wish in order to have your proposal selected. The minimum bid is 10. The probability that your proposal is selected depends on your bid and the bids of the other members in your group. The following formula determines the probability that your proposal is selected:

$$Probability = \frac{My\ Bid}{Sum\ of\ Bids}$$

Let us explain the formula above with a metaphor. Suppose there are 100 balls in a box. Each subject in your group will be assigned a proportion of the balls depending on their bid relative to others' bids. One ball will be randomly selected by the computer, and if it has your ID, then your proposal will be chosen.

Example: Subjects 1 and 3 invest 20, and subject 2 invests 10. Then, the probabilities are

$$\text{Probability for subject 1: } \frac{20}{50} \times 100 = 40\%$$

$$\text{Probability for subject 2: } \frac{10}{50} \times 100 = 20\%$$

$$\text{Probability for subject 3: } \frac{20}{50} \times 100 = 40\%$$

(2) Proposal

Everyone will enter a distribution of the 450 tokens. The proposals will be selected randomly according to the probabilities determined by the bids.

(3) Voting

Prior to knowing which proposal was selected, you will enter your minimum acceptable share. If the share offered to you is greater than or equal to your stated minimum, then your vote will count in favor. If a majority votes in favor, that is 2 or more members, then the proposal is approved.

If approved: the result will be binding and your group will remain in standby while others finish their allocations. Next, you will be randomly matched into new groups of 3 and your ID number will also be randomly assigned for the new group.

If rejected: every member in your group will proceed to stage (2) in order to enter a new allocation. However, there is a 15% chance that negotiations are forcefully terminated, in which case the 320 tokens disappear and no more bargaining takes place. The computer will allow you to negotiate until approval, and once you do so, the computer will inform you if bargaining came to an end earlier or not. The two following situations may arise:

- (1) If **bargaining ended** earlier, then everyone's share is 0 tokens (the 320 vanish).
- (2) If **bargaining did not end**, you receive the share assigned to you in the accepted proposal.

Example: Suppose your group accepts in round 1. Then, you receive the approved share.

Example: Suppose your group rejects 5 proposals and accepts in round 6. The computer reveals to you that bargaining terminated in round 3. Then, your share is 0. If bargaining had not been terminated, you would have received the approved share.

Your Earnings

In total, you will participate in 10 matches with groups randomly composed in each of them. One of the 10 matches will be randomly chosen for payment by the computer and will be revealed to you at the end of the experiment.

Your earnings (E) are then given by

$$E = \frac{(100 - Bid)}{\text{How much you did not bid}} + \text{Assigned Share}$$

Notice that if bargaining is terminated prior to the round in which your group approved the allocation, then the assigned share is equal to 0 and your earnings would be

$$E = \frac{(100 - Bid)}{\text{How much you did not bid}}$$

The conversion rate between tokens and euros is 10 Tokens = 1 euro. Hence, your final payment is given by:

$$Payment = Show Up Fee + E/10$$

Are there any questions so far? Please raise your hand.

Summary of the Experiment

1. Everyone is randomly assigned into groups of 3
2. Out of your 100 tokens endowment, you will decide how much to bid. The minimum bid is 10.
3. Your probability of proposing depends on how much you bid relative to others.
4. Each one of you will submit a proposal for the division of 320 tokens.
5. One of the proposals will be chosen for voting according to the probabilities determined by the bids.
6. If a majority accepts, the allocation is binding, and you will wait in standby until the other groups decide on an allocation.
7. If a majority rejects, everyone in the group will be called to submit a new proposal, and the process repeats itself until a given allocation is accepted. After each rejection, there is a 15% chance that bargaining is terminated and the fund vanishes. However, you will be allowed to negotiate until reaching an agreement and will only learn if bargaining terminated earlier upon reaching an agreement.
8. In each match you will be randomly paired with new members. Each match you will receive 100 token for bidding.
9. 1 of the 10 matches of play will be chosen randomly for payment. The selected match is the same for everyone.
10. Each token is equivalent to 0.1 Euros.

What should you do? If we knew the answer to this question, we would not need to run an experiment.

E. Experimental Instructions for MAJ-PERM in Spanish

Instrucciones

En este experimento usted deberá tomar una serie de decisiones. Las instrucciones son sencillas, y en caso de seguirlas cuidadosamente y tomar buenas decisiones, usted podrá recibir un pago sustancial. Este le será entregado en efectivo al finalizar el experimento. En este laboratorio seguimos una regla ética de completa transparencia, por lo cual nuestras instrucciones son veraces y describen el experimento tal cual es.

Resumen

Usted formará parte de un grupo de 3 personas que deben decidir cómo dividir 320 fichas. Cada uno en el grupo propondrá una división de las fichas y una de las propuestas será seleccionada aleatoriamente para someterse a votación. Antes de proponer, cada miembro tendrá la oportunidad de incrementar la probabilidad de selección de su propuesta mediante un pago el cual llamaremos apuesta. Cuanto más grande sea su apuesta en comparación con las apuestas de los demás miembros del grupo, mayor será su probabilidad de selección. A continuación, le presentamos los detalles.

Detalles del Experimento

Tal y como se explicó anteriormente, el experimento consiste de tres partes: **(1) Apuesta (2) Propuesta y (3) Votación**

(1) Apuesta

Usted tendrá 100 fichas en una cuenta privada y deberá escoger cuantas fichas apostar para que su propuesta sea seleccionada. La apuesta mínima son 10 fichas. La probabilidad de selección de su propuesta dependerá de su apuesta y las de los demás integrantes del grupo con base en la siguiente fórmula:

$$Probabilidad = \frac{Mi\ Apuesta}{Suma\ de\ las\ Apuestas}$$

A continuación, le explicamos de forma metafórica cómo funciona el proceso de selección de propuestas. Suponga que hay 100 bolas en una urna. Cada persona en su grupo recibirá cierta proporción de las bolas en la urna dependiendo de su apuesta y las de los demás. Aleatoriamente se seleccionará una bola de la urna, si tiene su nombre, entonces su propuesta sería seleccionada.

Ejemplo: Los sujetos 1 y 3 apuestan 20 y el sujeto 2 apuesta 10. Entonces, las probabilidades de selección son:

Probabilidad Sujeto 1: $\frac{20}{50} \times 100 = 40\%$

Probabilidad Sujeto 2: $\frac{10}{50} \times 100 = 20\%$

Probabilidad Sujeto 3: $\frac{20}{50} \times 100 = 40\%$

(2) Propuestas

Cada miembro del grupo deberá proponer una forma de distribuir las 320 fichas. La probabilidad de selección de su propuesta se determina con base en las apuestas como ya hemos explicado.

(3) Votación

Antes de conocer cual propuesta fue seleccionada, usted deberá someter el monto mínimo que está dispuesto a aceptar. En caso de que la propuesta seleccionada incluya un monto equivalente o superior al que usted está dispuesto a aceptar, su voto contará a favor. Para que se apruebe la propuesta se requiere una mayoría simple a favor, es decir, 2 o más votos.

En caso de aprobación: las negociaciones terminan y usted estará en espera de que los otros grupos terminen sus negociaciones. Seguidamente, se formarán grupos nuevos de forma aleatoria con tres sujetos cada uno y su número de sujeto también será asignado de forma aleatoria.

En caso de rechazo: todo en el grupo procederán nuevamente a la fase (2) para someter sus propuestas. Sin embargo, las negociaciones se darán por concluidas prematuramente con un 15% de probabilidad, en cuyo caso las 320 fichas desaparecen y no habrá más negociaciones. El software dejará que el grupo negocie hasta que haya una propuesta aprobada. Seguidamente, la pantalla le indicará si las negociaciones se habían dado por concluidas en una ronda anterior o no. Pueden darse las siguientes dos situaciones:

1. En caso de que ya se hubieran concluido las negociaciones prematuramente, cada persona recibe 0 (las 320 fichas desaparecen).
2. En caso de no haberse dado por concluidas las negociaciones prematuramente, usted recibe el monto asignado en la propuesta que fue aceptada.

Ejemplo. El grupo llega a un acuerdo en la ronda 1. Cada quien recibe el monto asignado.

Ejemplo. Suponga que el grupo rechaza 5 propuestas y acepta la propuesta en la ronda 6. La computadora le indica que las negociaciones se dieron por concluidas en la ronda 3.

En dado caso, todos reciben 0. Si las negociaciones no se hubieran dado por concluidas, cada quien recibiría el monto asignado en la ronda 6.

Determinación de su Pago

Usted participará en **10 procesos** de apuesta y negociación. En cada uno de ellos, la composición del grupo será aleatoria y al inicio de cada proceso usted cuenta con 100 fichas para apostar. Solamente uno de los 10 procesos será seleccionado al azar para realizar el pago correspondiente. Al final del experimento usted sabrá cual proceso fue seleccionado.

Sus ganancias serán calculadas de la siguiente manera:

$$Ganancia = \frac{(100 - Apuesta)}{\text{Fichas que usted retuvo}} + \text{Monto Asignado}$$

Recuerde que en caso de darse por concluidas las negociaciones antes de llegar a un acuerdo, el monto a recibir es 0 y sus ganancias serían:

$$Ganancia = \frac{(100 - Apuesta)}{\text{Fichas que usted retuvo}}$$

La tasa de cambio entre fichas y pesos colombianos es de 1 ficha igual a 0.10 Euros. Por lo tanto, el pago final que usted recibirá incluyendo el pago fijo es de:

$$\text{Pago final (Euros)} = 5 + Ganancia \times 0.10$$

¿Tiene alguna pregunta? Por favor, levante su mano.

Resumen del Experimento

1. Todos los participantes serán asignados al azar en grupos de 3
2. Usted deberá decidir cuantas fichas apostar de las 100 que le han sido asignadas. La apuesta mínima es de 10 fichas.
3. La probabilidad de que su propuesta sea seleccionada depende de su apuesta en relación con la de los demás.
4. Cada miembro debe hacer una propuesta de cómo dividir las 320 fichas.

5. Sólo una será seleccionada al azar de acuerdo a las probabilidades que fueron determinadas por las apuestas.
6. En caso de recibir mayoría de votos la propuesta seleccionada, las negociaciones terminan.
7. En caso de no contar con la mayoría de votos, todos en el grupo hacen una nueva propuesta y el proceso se repite hasta que lleguen a un acuerdo. Tras cada propuesta rechazada, existe un 15% de probabilidad de darse por concluidas prematuramente las negociaciones y que se pierdan las 320 fichas. Sin embargo, el grupo debe negociar hasta llegar a un acuerdo, momento en el cual el computador les revelará si las negociaciones ya habían terminado.
8. En cada proceso de apuesta y negociaciones, usted será asignado a un grupo de tres integrantes al azar y tendrá nuevamente 100 fichas a su disposición para apostar.
9. Uno de los 10 procesos será escogido por el computador para determinar su pago.
10. Cada ficha equivale a 0.10 Euros.

¿Qué debo hacer? ¿Qué decisiones debo tomar? Si supiéramos las respuestas a estas preguntas, no tendríamos motivo para conducir este experimento.