Baron and Ferejohn Bargaining over an Endogenous Fund

Andrzej Baranski (NYU Abu Dhabi)

April 7, 2022

Prepared for Experimental Economics at OSU

Introduction

On the origin of the fund to distribute

In Baron and Ferejohn (1989) and most bargaining models, the **pie** to divide is assumed to have *fallen from heaven*.

On the origin of the fund to distribute

In Baron and Ferejohn (1989) and most bargaining models, the **pie** to divide is assumed to have *fallen from heaven*.

- Partnerships: legal firms hold end of year partner meetings to distribute profits

On the origin of the fund to distribute

In Baron and Ferejohn (1989) and most bargaining models, the **pie** to divide is assumed to have *fallen from heaven*.

- Partnerships: legal firms hold end of year partner meetings to distribute profits
- MLB series winner prize: players of the series winner divide a monetary prize (from ticket sales pool)

On the origin of the fund to distribute

In Baron and Ferejohn (1989) and most bargaining models, the **pie** to divide is assumed to have *fallen from heaven*.

- Partnerships: legal firms hold end of year partner meetings to distribute profits
- MLB series winner prize: players of the series winner divide a monetary prize (from ticket sales pool)
- Legislatures: distribute benefits created through taxation

On the origin of the fund to distribute

In Baron and Ferejohn (1989) and most bargaining models, the **pie** to divide is assumed to have *fallen from heaven*.

- Partnerships: legal firms hold end of year partner meetings to distribute profits
- MLB series winner prize: players of the series winner divide a monetary prize (from ticket sales pool)
- Legislatures: distribute benefits created through taxation

The **exogenous fund** is not a suitable assumption:

On the origin of the fund to distribute

In Baron and Ferejohn (1989) and most bargaining models, the **pie** to divide is assumed to have *fallen from heaven*.

- Partnerships: legal firms hold end of year partner meetings to distribute profits
- MLB series winner prize: players of the series winner divide a monetary prize (from ticket sales pool)
- Legislatures: distribute benefits created through taxation

The **exogenous fund** is not a suitable assumption:

1. What is the effect of an endogenous pie on bargaining strategies?

On the origin of the fund to distribute

In Baron and Ferejohn (1989) and most bargaining models, the **pie** to divide is assumed to have *fallen from heaven*.

- Partnerships: legal firms hold end of year partner meetings to distribute profits
- MLB series winner prize: players of the series winner divide a monetary prize (from ticket sales pool)
- Legislatures: distribute benefits created through taxation

The **exogenous fund** is not a suitable assumption:

1. What is the effect of an endogenous pie on bargaining strategies?
2. What is the effect on productions of ex-post redistribution via bargaining?

Content of these slides

I've worked on several projects on this topic[1]:

[1] Apologies for the self-referencing.

Content of these slides

I've worked on several projects on this topic[1]: Baranski, Andrzej. "Voluntary contributions and collective redistribution." *American Economic Journal: Microeconomics* 8.4 (2016): 149-73.

- Majoritarian Baron Ferejohn game with joint production

[1] Apologies for the self-referencing.

Content of these slides

I've worked on several projects on this topic[1]: Baranski, Andrzej. "Voluntary contributions and collective redistribution." *American Economic Journal: Microeconomics* 8.4 (2016): 149-73.

- Majoritarian Baron Ferejohn game with joint production

Baranski, Andrzej. "Endogenous claims and collective production: an experimental study on the timing of profit-sharing negotiations and production." *Experimental Economics* 22.4 (2019): 857-884.

- Ex-post- Ex-ante bargaining

[1] Apologies for the self-referencing.

Content of these slides

I've worked on several projects on this topic[1]**:** Baranski, Andrzej. "Voluntary contributions and collective redistribution." *American Economic Journal: Microeconomics* 8.4 (2016): 149-73.

- Majoritarian Baron Ferejohn game with joint production

Baranski, Andrzej. "Endogenous claims and collective production: an experimental study on the timing of profit-sharing negotiations and production." *Experimental Economics* 22.4 (2019): 857-884.

- Ex-post- Ex-ante bargaining

Baranski, Andrzej, and Caleb Cox. "Communication in Multilateral Bargaining with Joint Production." (Working Paper).

- Communication

[1] Apologies for the self-referencing.

Experimental Design

Endogenous Claims and Collective Production (Exp Econ 2019)

Subjects are placed in a group of 5 and will play a **game** that has two stages:

Endogenous Claims and Collective Production (Exp Econ 2019)

Subjects are placed in a group of 5 and will play a **game** that has two stages:

1. **Joint production:**

Endogenous Claims and Collective Production (Exp Econ 2019)

Subjects are placed in a group of 5 and will play a **game** that has two stages:

1. **Joint production:**

2. **Baron and Ferejohn (1989) closed rule bargaining.**

Endogenous Claims and Collective Production (Exp Econ 2019)

Subjects are placed in a group of 5 and will play a **game** that has two stages:

1. **Joint production:**
    - Each sub. endowed with 50 tokens in a private account

2. **Baron and Ferejohn (1989) closed rule bargaining.**

Endogenous Claims and Collective Production (Exp Econ 2019)

Subjects are placed in a group of 5 and will play a **game** that has two stages:

1. **Joint production:**
    - Each sub. endowed with 50 tokens in a private account
    - May contribute any amount to the **common fund**

2. **Baron and Ferejohn (1989) closed rule bargaining.**

Endogenous Claims and Collective Production (Exp Econ 2019)

Subjects are placed in a group of 5 and will play a **game** that has two stages:

1. **Joint production:**
    - Each sub. endowed with 50 tokens in a private account
    - May contribute any amount to the **common fund**
    - Total Fund $= 2 \times$ Sum of contributions

2. **Baron and Ferejohn (1989) closed rule bargaining.**

Endogenous Claims and Collective Production (Exp Econ 2019)

Subjects are placed in a group of 5 and will play a **game** that has two stages:

1. **Joint production:**
    - Each sub. endowed with 50 tokens in a private account
    - May contribute any amount to the **common fund**
    - Total Fund $= 2 \times$ Sum of contributions
    - Contributions are simultaneous and independently decided
2. **Baron and Ferejohn (1989) closed rule bargaining.**

Experimental Design (cont'd)

2. **Baron and Ferejohn (1989) bargaining:**

Experimental Design (cont'd)

2. **Baron and Ferejohn (1989) bargaining:**
    - Everyone **proposes** a division of the profits

Experimental Design (cont'd)

2. **Baron and Ferejohn (1989) bargaining:**
    - Everyone **proposes** a division of the profits
    - One proposal is randomly-chosen for a vote (with $=$ chance)

Experimental Design (cont'd)

2. **Baron and Ferejohn (1989) bargaining:**
    - Everyone **proposes** a division of the profits
    - One proposal is randomly-chosen for a vote (with $=$ chance)
    - A proposal passes if a majority votes in favor (3 of 5 votes)

Experimental Design (cont'd)

2. **Baron and Ferejohn (1989) bargaining:**
    - Everyone **proposes** a division of the profits
    - One proposal is randomly-chosen for a vote (with $=$ chance)
    - A proposal passes if a majority votes in favor (3 of 5 votes)
    - Otherwise, the process repeats itself until approval

Experimental Design (cont'd)

2. **Baron and Ferejohn (1989) bargaining:**
    - Everyone **proposes** a division of the profits
    - One proposal is randomly-chosen for a vote (with $=$ chance)
    - A proposal passes if a majority votes in favor (3 of 5 votes)
    - Otherwise, the process repeats itself until approval
    - A subject earns 50-Contribution+Share.

Experimental Design (cont'd)

Other details:

Experimental Design (cont'd)

Other details:

- The game is played 10 times, with random group composition

Experimental Design (cont'd)

Other details:

- The game is played 10 times, with random group composition
- No reputation concerns, anonymous, computerized

Experimental Design (cont'd)

Other details:

- The game is played 10 times, with random group composition
- No reputation concerns, anonymous, computerized
- No communication (we will vary this later)

Experimental Design (cont'd)

Other details:

- The game is played 10 times, with random group composition
- No reputation concerns, anonymous, computerized
- No communication (we will vary this later)
- **Incentives:** Subjects are paid in cash (10 tokens = 1 EUR) plus show up fee of 5 EUR

Experimental Design (cont'd)

Other details:

- The game is played 10 times, with random group composition
- No reputation concerns, anonymous, computerized
- No communication (we will vary this later)
- **Incentives:** Subjects are paid in cash (10 tokens = 1 EUR) plus show up fee of 5 EUR
- Subjects are undergraduate students (Maastricht University, Netherlands)

Theoretical Benchmarks

Theoretical Predictions: Stationary Equilibrium

The standard equilibrium refinements is the **Stationary Subgame Perfect Equilibrium**

Theoretical Predictions: Stationary Equilibrium

The standard equilibrium refinements is the **Stationary Subgame Perfect Equilibrium**

- MWC: The proposer offers 2 other players Fund/5

Theoretical Predictions: Stationary Equilibrium

The standard equilibrium refinements is the **Stationary Subgame Perfect Equilibrium**

- MWC: The proposer offers 2 other players Fund/5
- Proposer power: 3/5 of Fund
- Immediate agreement

Theoretical Predictions: Stationary Equilibrium

The standard equilibrium refinements is the **Stationary Subgame Perfect Equilibrium**

- MWC: The proposer offers 2 other players Fund/5
- Proposer power: 3/5 of Fund
- Immediate agreement

By backward induction:

Theoretical Predictions: Stationary Equilibrium

The standard equilibrium refinements is the **Stationary Subgame Perfect Equilibrium**

- MWC: The proposer offers 2 other players Fund/5
- Proposer power: 3/5 of Fund
- Immediate agreement

By backward induction:

- The expected payoff is prior to any one being selected as proposer is Fund/5

Theoretical Predictions: Stationary Equilibrium

The standard equilibrium refinements is the **Stationary Subgame Perfect Equilibrium**

- MWC: The proposer offers 2 other players Fund/5
- Proposer power: 3/5 of Fund
- Immediate agreement

By backward induction:

- The expected payoff is prior to any one being selected as proposer is Fund/5
- Cost of contribution (=1) is greater the expected return (=2/5)

Theoretical Predictions: Stationary Equilibrium

The standard equilibrium refinements is the **Stationary Subgame Perfect Equilibrium**

- MWC: The proposer offers 2 other players Fund/5
- Proposer power: 3/5 of Fund
- Immediate agreement

By backward induction:

- The expected payoff is prior to any one being selected as proposer is Fund/5
- Cost of contribution (=1) is greater the expected return (=2/5)
- **No one should invest in equilibrium**

Theoretical Predictions: Other Subgame Perfect Equilibrium

Recall that if δ is large enough: Any allocation can be sustained as SPE

Theoretical Predictions: Other Subgame Perfect Equilibrium

Recall that if δ is large enough: Any allocation can be sustained as SPE

1. **Proportional Rule:** Distribution of shares proportional to investments

Theoretical Predictions: Other Subgame Perfect Equilibrium

Recall that if δ is large enough: Any allocation can be sustained as SPE

1. **Proportional Rule:** Distribution of shares proportional to investments
    - Sustains full contributions in equilibrium

Theoretical Predictions: Other Subgame Perfect Equilibrium

Recall that if δ is large enough: Any allocation can be sustained as SPE

1. **Proportional Rule:** Distribution of shares proportional to investments
    - Sustains full contributions in equilibrium
2. **Egalitarian splits:** 20% for everyone.

Theoretical Predictions: Other Subgame Perfect Equilibrium

Recall that if δ is large enough: Any allocation can be sustained as SPE

1. **Proportional Rule:** Distribution of shares proportional to investments
    - Sustains full contributions in equilibrium
2. **Egalitarian splits:** 20% for everyone.
    - Predicts no investments

Theoretical Predictions: Other Subgame Perfect Equilibrium

Recall that if δ is large enough: Any allocation can be sustained as SPE

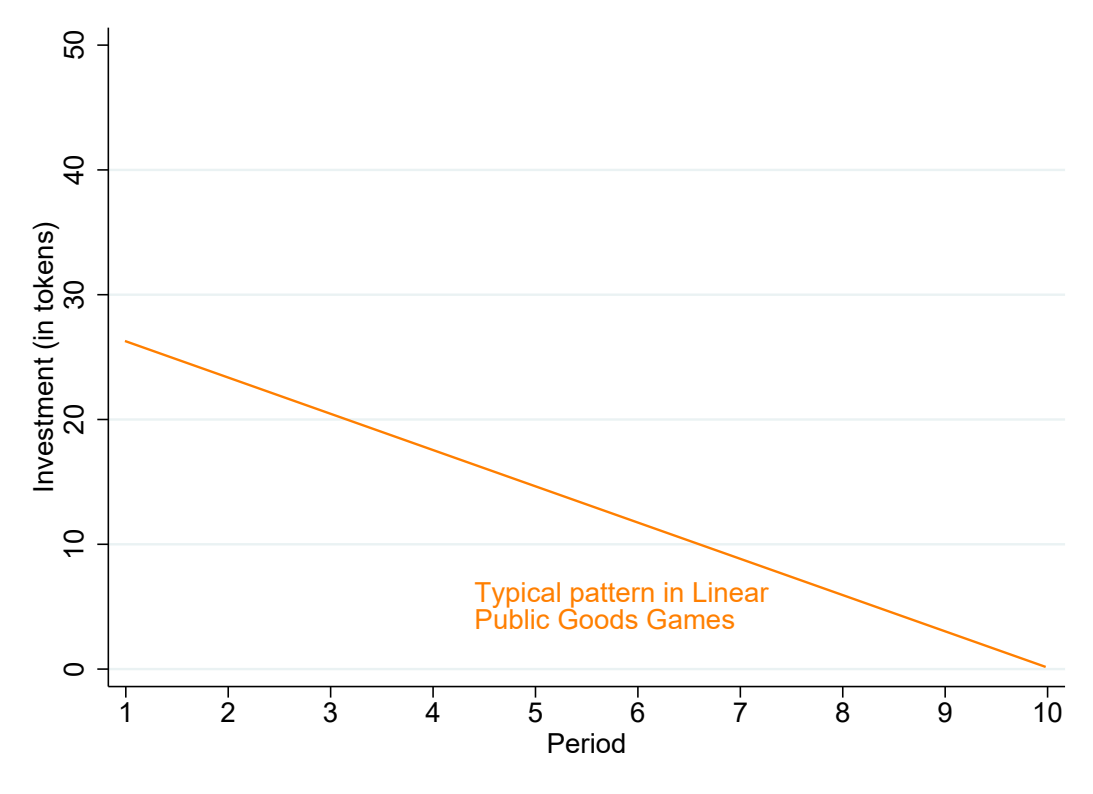
1. **Proportional Rule:** Distribution of shares proportional to investments
    - Sustains full contributions in equilibrium
2. **Egalitarian splits:** 20% for everyone.
    - Predicts no investments

Other bargaining strategies would sustain full efficiency too (MWC with higher contributors). No requirement of other-regarding preferences!

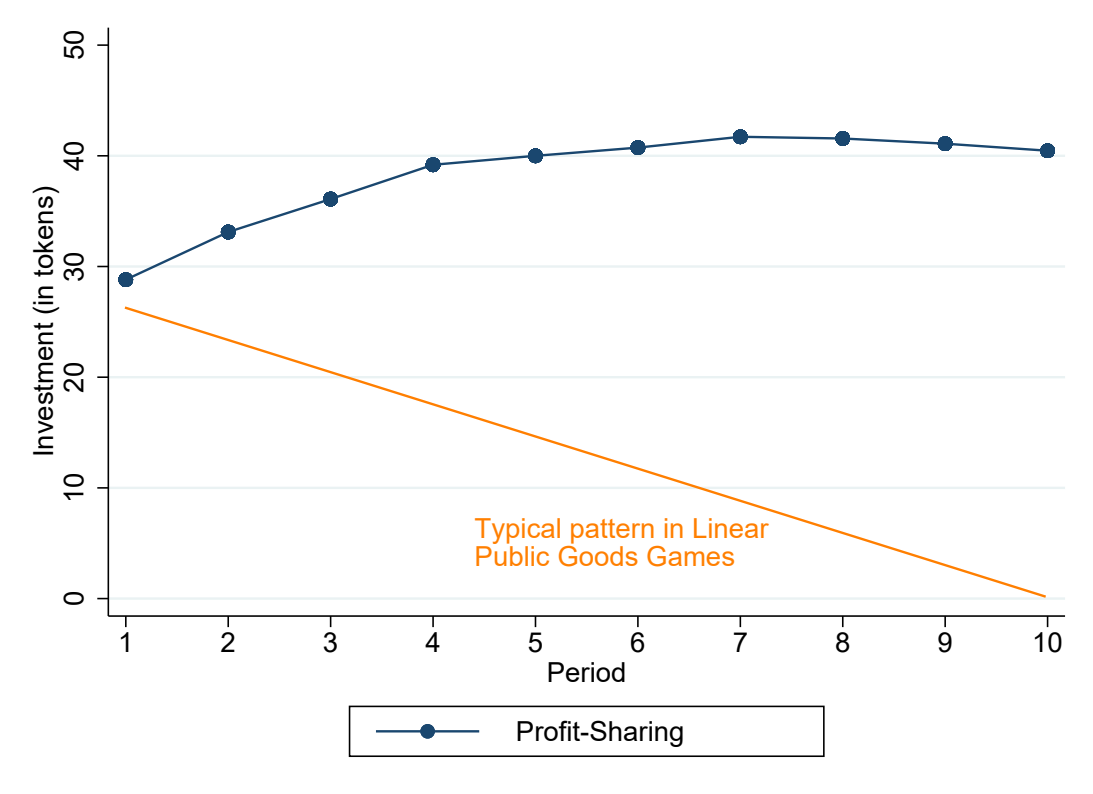
Results

Evolution of Contributions

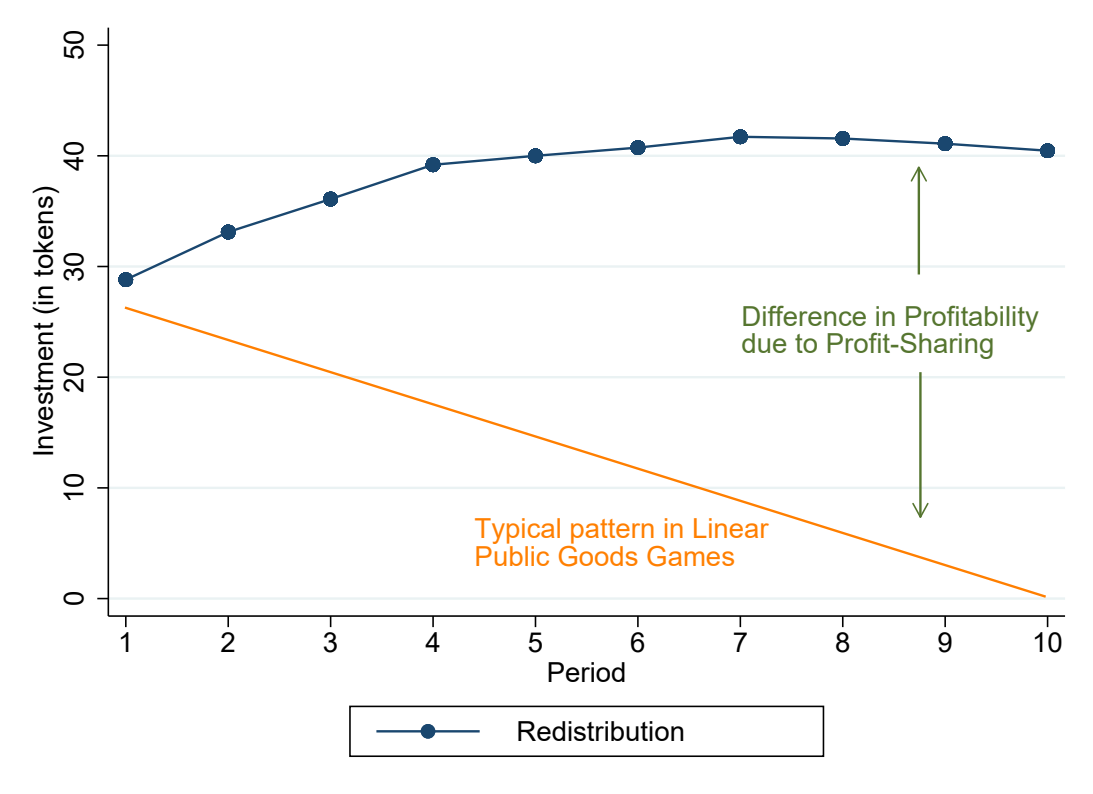
Evolution of Contributions



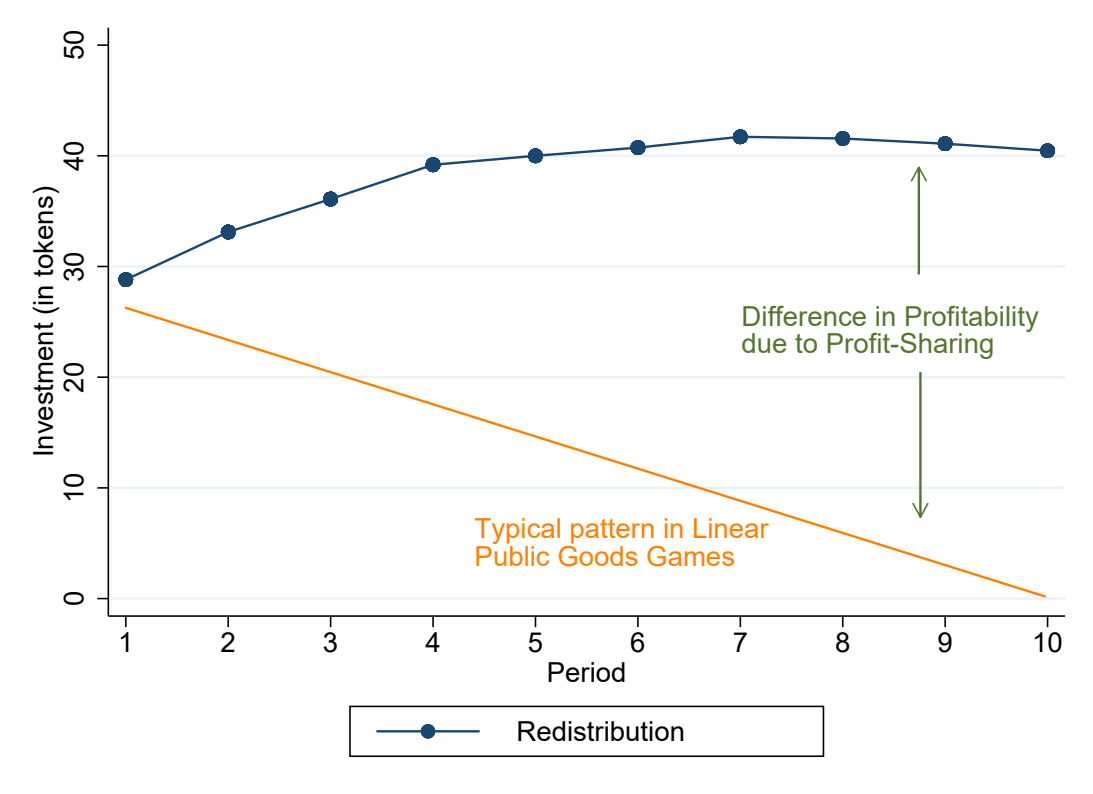
Evolution of Contributions



Evolution of Contributions



Evolution of Contributions



Conclusion 1

Bargaining to divide a jointly created surplus leads to an increase in contributions compared to an exogenously imposed equal split.

Bargaining Outcomes

Endogenous Fund

Bargaining Outcomes

	Endogenous Fund
Proposer's Share	26%

Bargaining Outcomes

	Endogenous Fund
Proposer's Share	26%
3-way splits	30%

Bargaining Outcomes

	Endogenous Fund
Proposer's Share	26%
3-way splits	30%
All-way Splits	56%

Bargaining Outcomes

	Endogenous Fund	Exogenous Fund
Proposer's Share	26%	
3-way splits	30%	
All-way Splits	56%	

Bargaining Outcomes

	Endogenous Fund	Exogenous Fund
Proposer's Share	26%	40%
3-way splits	30%	
All-way Splits	56%	

Bargaining Outcomes

	Endogenous Fund	Exogenous Fund
Proposer's Share	26%	40%
3-way splits	30%	80%
All-way Splits	56%	

Bargaining Outcomes

	Endogenous Fund	Exogenous Fund
Proposer's Share	26%	40%
3-way splits	30%	80%
All-way Splits	56%	10%

Bargaining Outcomes

	Endogenous Fund	Exogenous Fund
Proposer's Share	26%	40%
3-way splits	30%	80%
All-way Splits	56%	10%

Conclusion 2

Bargaining to divide a jointly created surplus leads to a more inclusive sharing of the common fund.

Bargaining Outcomes and Fairness

Are higher contributors receiving their fair share?

Bargaining Outcomes and Fairness

Are higher contributors receiving their fair share?

Bargaining Outcomes and Fairness

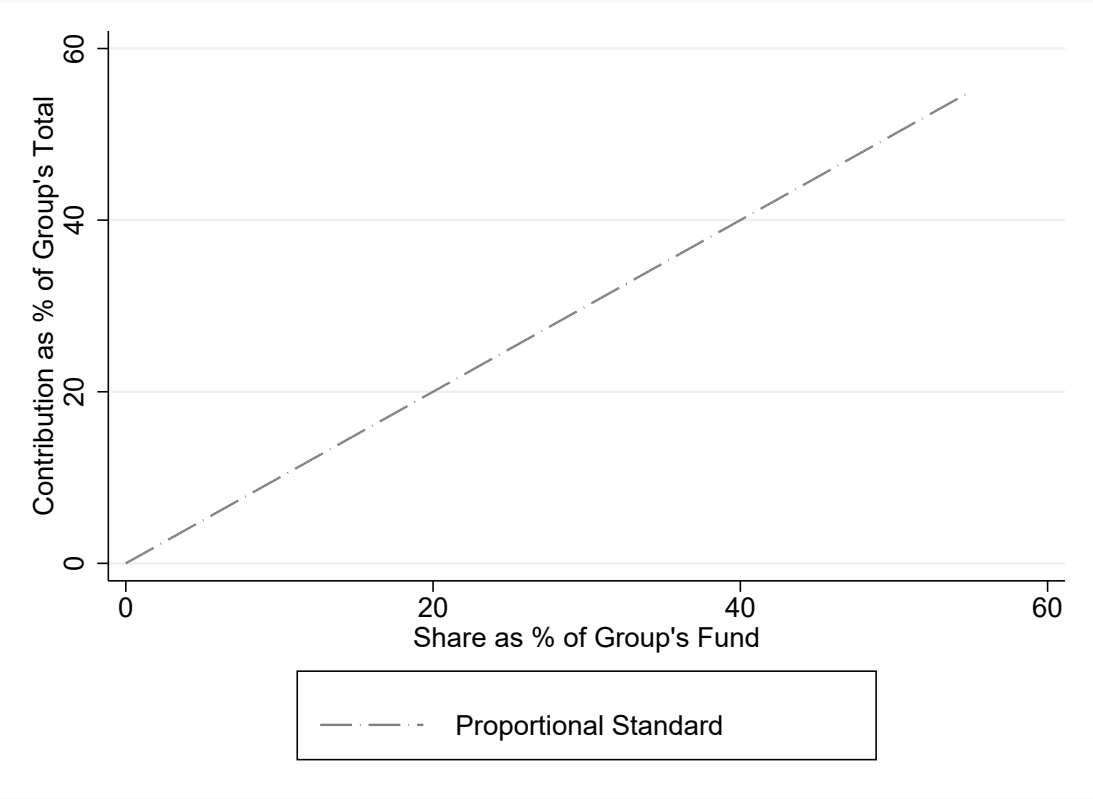
Are higher contributors receiving their fair share?

(Fair=Proportional)

Bargaining Outcomes and Fairness

Are higher contributors receiving their fair share?

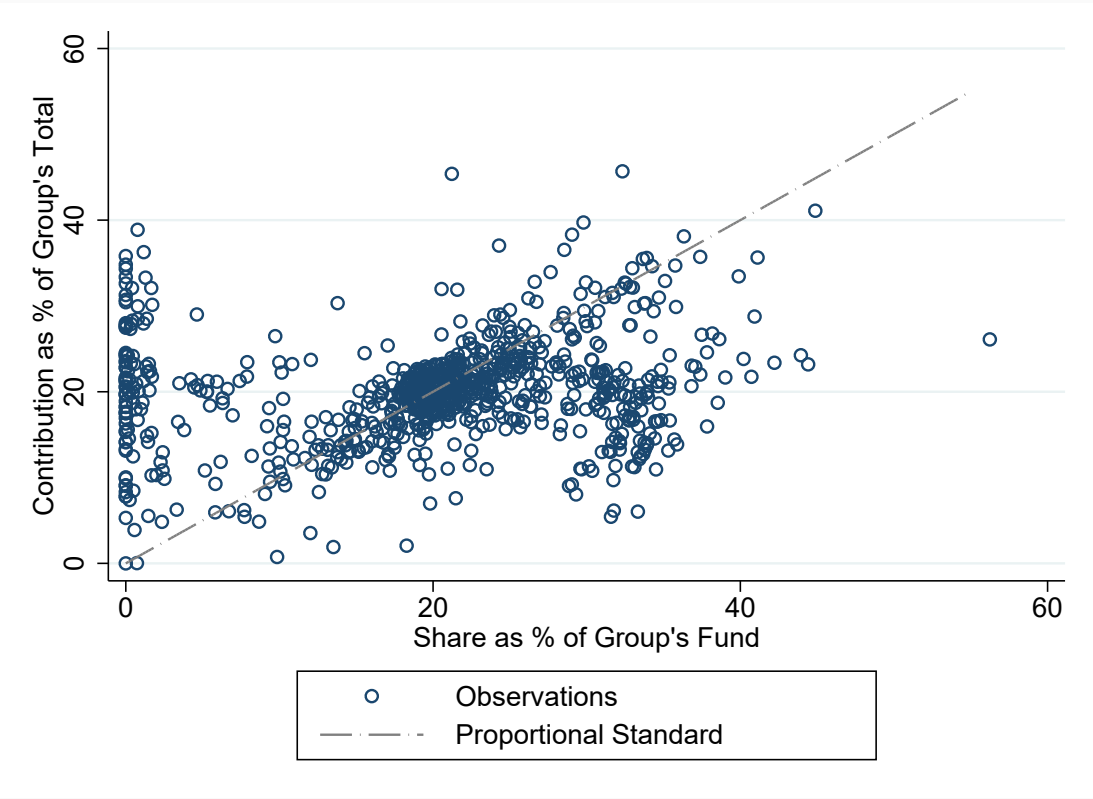
(Fair=Proportional)



Bargaining Outcomes and Fairness

Are higher contributors receiving their fair share?

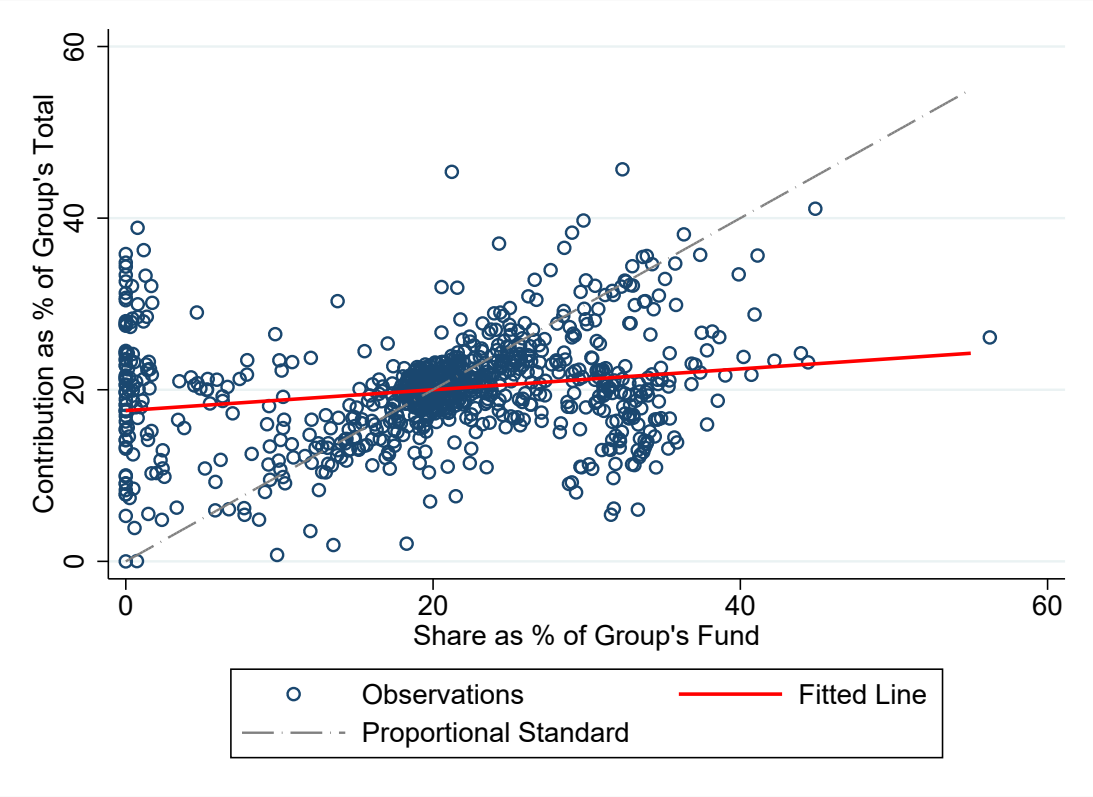
(Fair=Proportional)



Bargaining Outcomes and Fairness

Are higher contributors receiving their fair share?

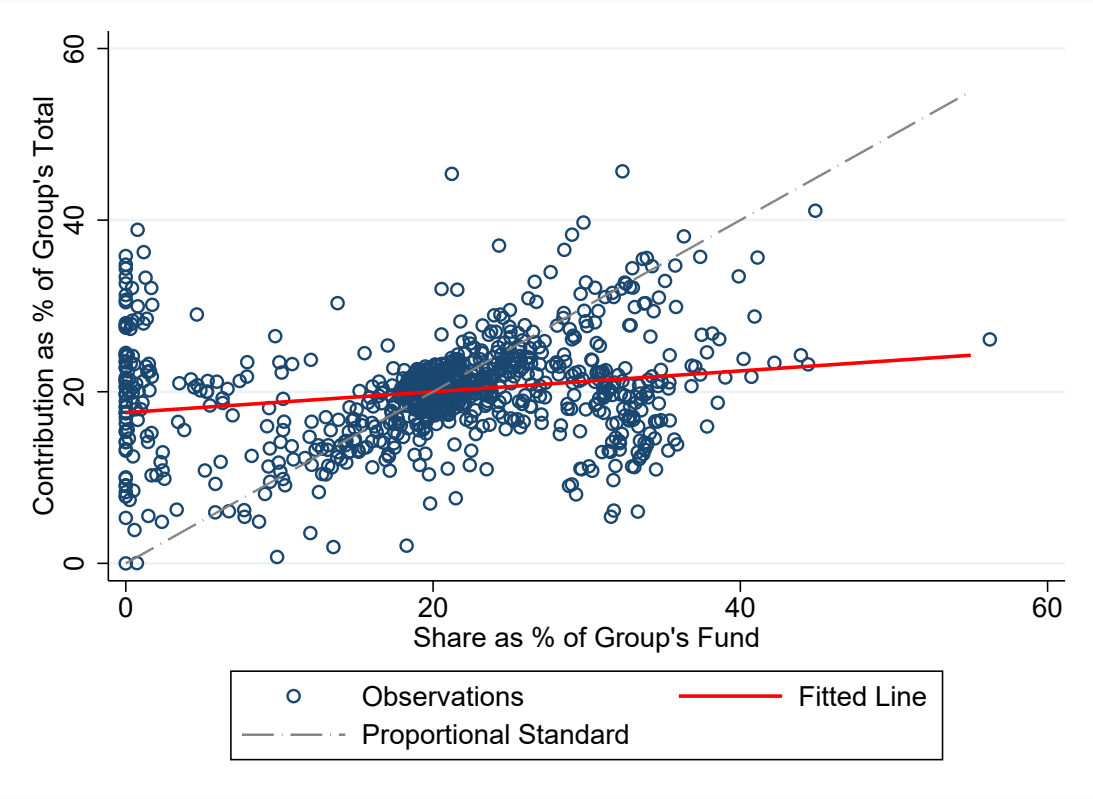
(Fair=Proportional)



Bargaining Outcomes and Fairness

Are higher contributors receiving their fair share?

(Fair=Proportional)



Conclusion 3

Equitable sharing fosters a virtuous cycle of rising contributions.

The timing of bargaining: Does it matter?

Motivation: In many partnerships/firms, profit-sharing agreements are made prior to the materialization of profits.

The timing of bargaining: Does it matter?

Motivation: In many partnerships/firms, profit-sharing agreements are made prior to the materialization of profits.

1. We study a game of **ex-ante profit sharing** bargaining

The timing of bargaining: Does it matter?

Motivation: In many partnerships/firms, profit-sharing agreements are made prior to the materialization of profits.

1. We study a game of **ex-ante profit sharing** bargaining
2. Same rules as before except that order of stages is reversed

The timing of bargaining: Does it matter?

Motivation: In many partnerships/firms, profit-sharing agreements are made prior to the materialization of profits.

1. We study a game of **ex-ante profit sharing** bargaining
2. Same rules as before except that order of stages is reversed
3. Bargaining to divide **ownership shares**

The timing of bargaining: Does it matter?

Motivation: In many partnerships/firms, profit-sharing agreements are made prior to the materialization of profits.

1. We study a game of **ex-ante profit sharing** bargaining
2. Same rules as before except that order of stages is reversed
3. Bargaining to divide **ownership shares**
4. Followed by the contribution game

The timing of bargaining: Does it matter?

Motivation: In many partnerships/firms, profit-sharing agreements are made prior to the materialization of profits.

1. We study a game of **ex-ante profit sharing** bargaining
2. Same rules as before except that order of stages is reversed
3. Bargaining to divide **ownership shares**
4. Followed by the contribution game
5. Different subjects from same subject pool

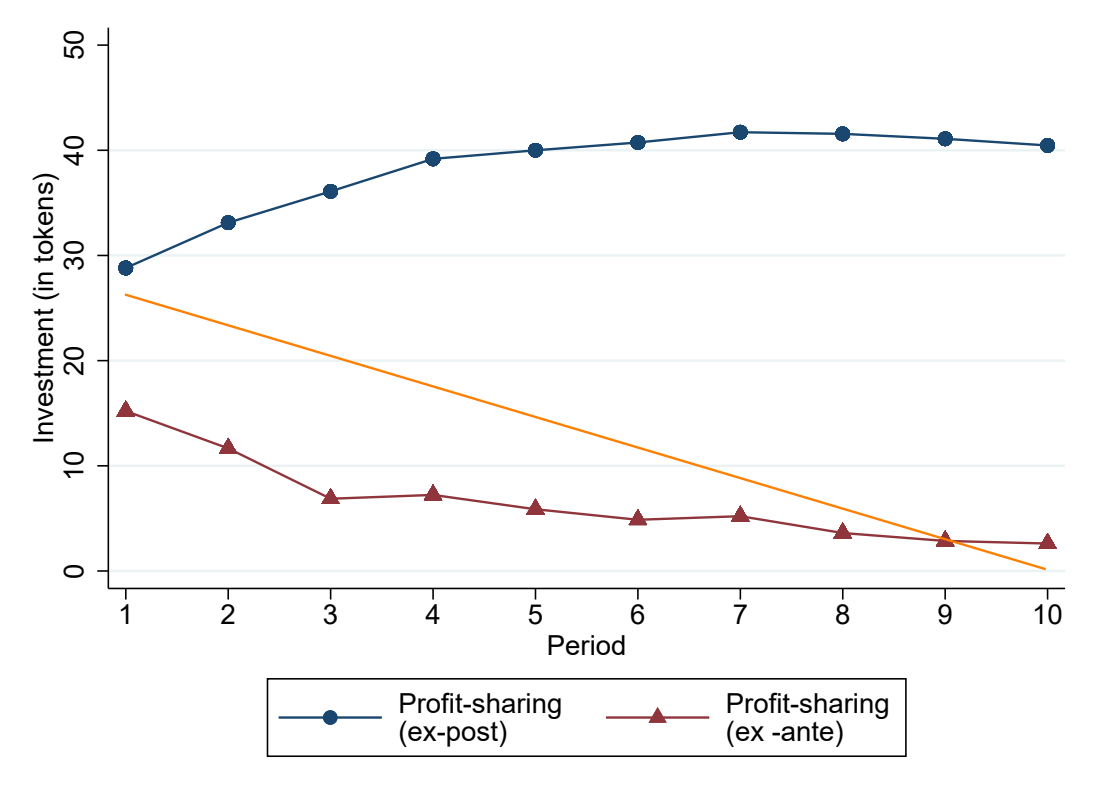
The timing of bargaining: Does it matter?

Motivation: In many partnerships/firms, profit-sharing agreements are made prior to the materialization of profits.

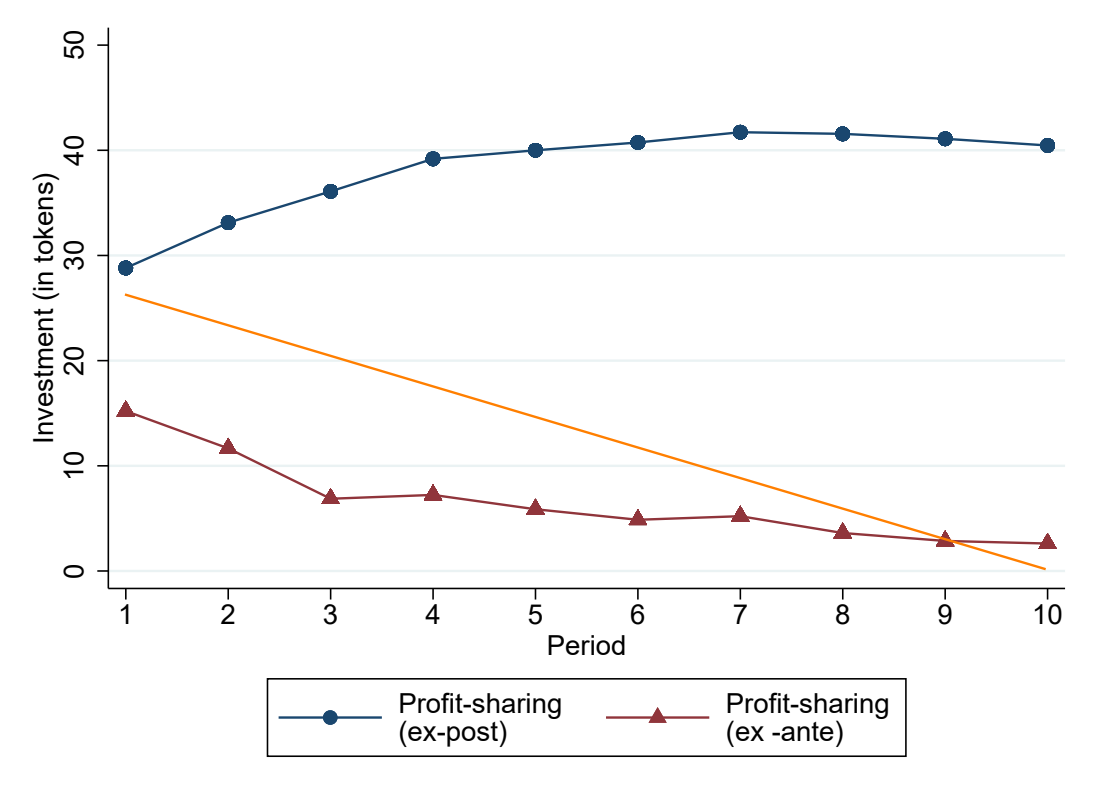
1. We study a game of **ex-ante profit sharing** bargaining
2. Same rules as before except that order of stages is reversed
3. Bargaining to divide **ownership shares**
4. Followed by the contribution game
5. Different subjects from same subject pool
6. All else remains constant

The timing of bargaining: Does it matter? (cont'd)

The timing of bargaining: Does it matter? (cont'd)



The timing of bargaining: Does it matter? (cont'd)



Conclusion 4

Ex-ante bargaining leads to an unravelling of contributions, similar to the pattern observed in linear public goods games.

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

.

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

1. **Communication:** Can communication enhance or diminish contributions?

.

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

1. **Communication:** Can communication enhance or diminish contributions?
2. **Observability:** What happens when other's contributions are not publicly observable by peers?

.

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

1. **Communication:** Can communication enhance or diminish contributions?
2. **Observability:** What happens when other's contributions are not publicly observable by peers?

"Communication in Multilateral Bargaining with Joint Production", (with Caleb Cox, VCU).

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

1. **Communication:** Can communication enhance or diminish contributions?
2. **Observability:** What happens when other's contributions are not publicly observable by peers?

"Communication in Multilateral Bargaining with Joint Production", (with Caleb Cox, VCU).

1. We have 4 treatments: No Communication-No Observability (NC-NO), No Communication with Observability (NC-O), (C-NO), and (C-O).

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

1. **Communication:** Can communication enhance or diminish contributions?
2. **Observability:** What happens when other's contributions are not publicly observable by peers?

"Communication in Multilateral Bargaining with Joint Production", (with Caleb Cox, VCU).

1. We have 4 treatments: No Communication-No Observability (NC-NO), No Communication with Observability (NC-O), (C-NO), and (C-O).

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

1. **Communication:** Can communication enhance or diminish contributions?
2. **Observability:** What happens when other's contributions are not publicly observable by peers?

"Communication in Multilateral Bargaining with Joint Production", (with Caleb Cox, VCU).

1. We have 4 treatments: No Communication-No Observability (NC-NO), No Communication with Observability (NC-O), (C-NO), and (C-O).
2. Instead of groups of 5, we have groups of 3

Other treatments and variations

Focusing on ex-post bargaining, we can think of important aspects to vary.

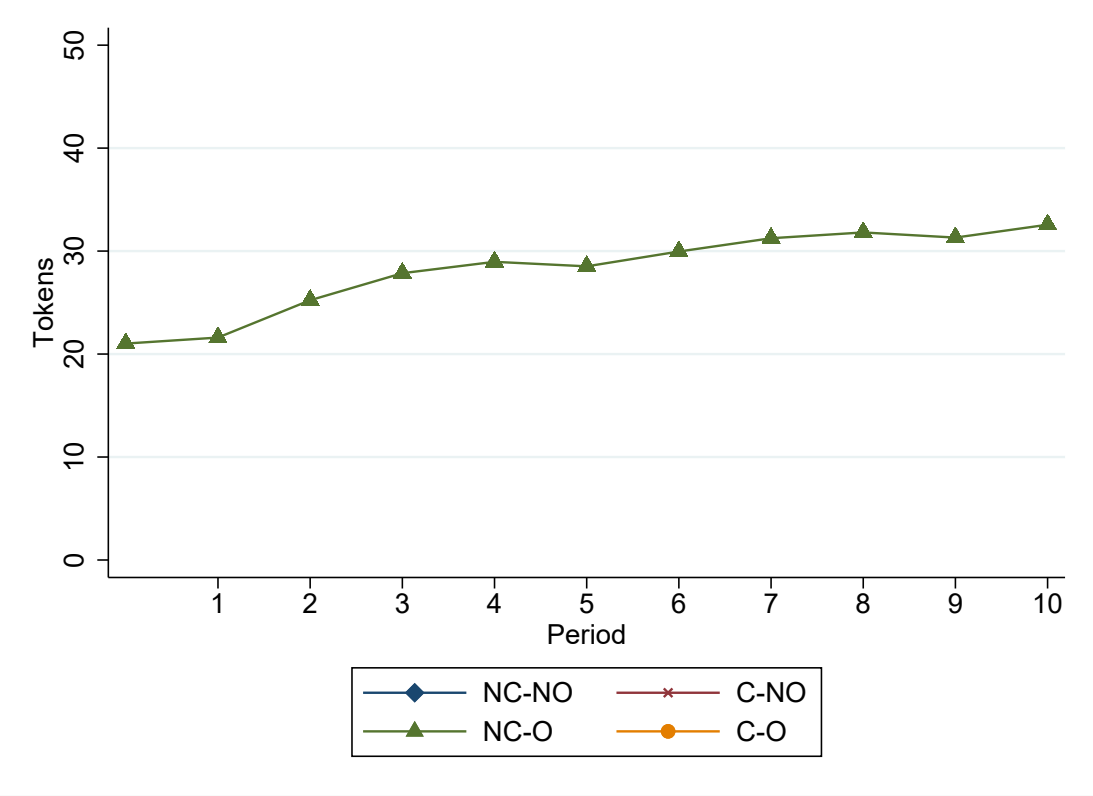
1. **Communication:** Can communication enhance or diminish contributions?
2. **Observability:** What happens when other's contributions are not publicly observable by peers?

"Communication in Multilateral Bargaining with Joint Production", (with Caleb Cox, VCU).

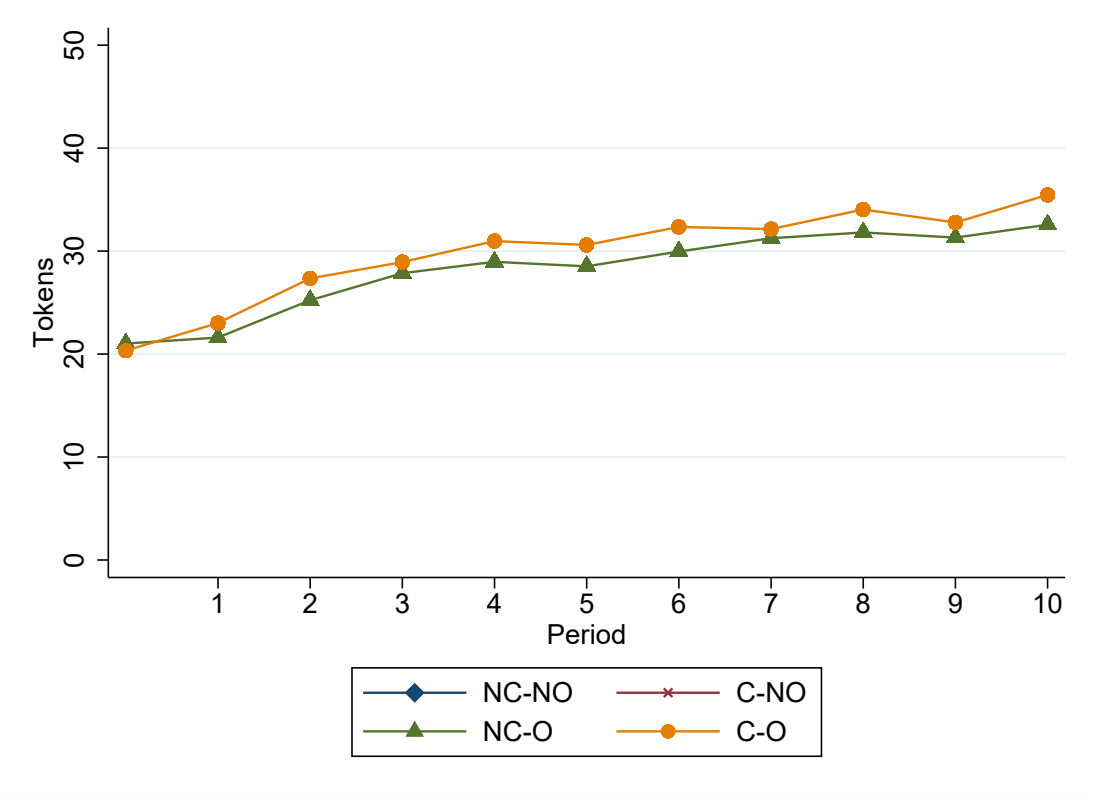
1. We have 4 treatments: No Communication-No Observability (NC-NO), No Communication with Observability (NC-O), (C-NO), and (C-O).
2. Instead of groups of 5, we have groups of 3
3. Students from Virginia Commonwealth University

Results

Results

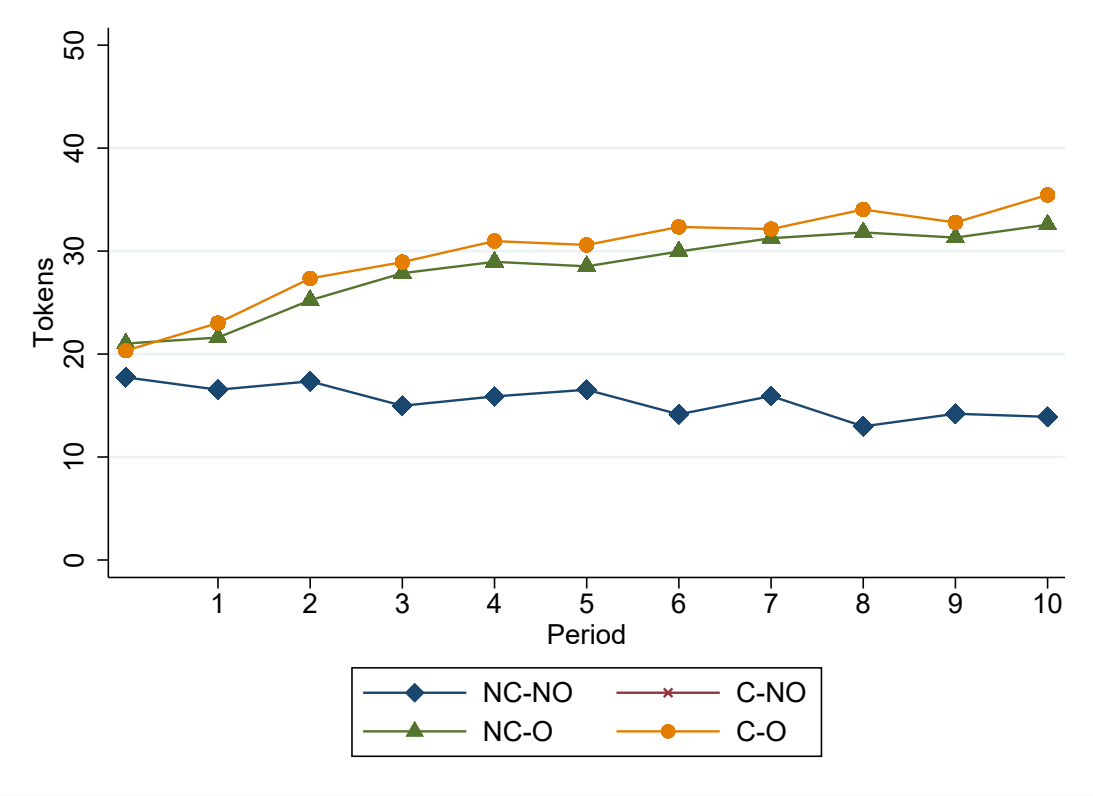


Results



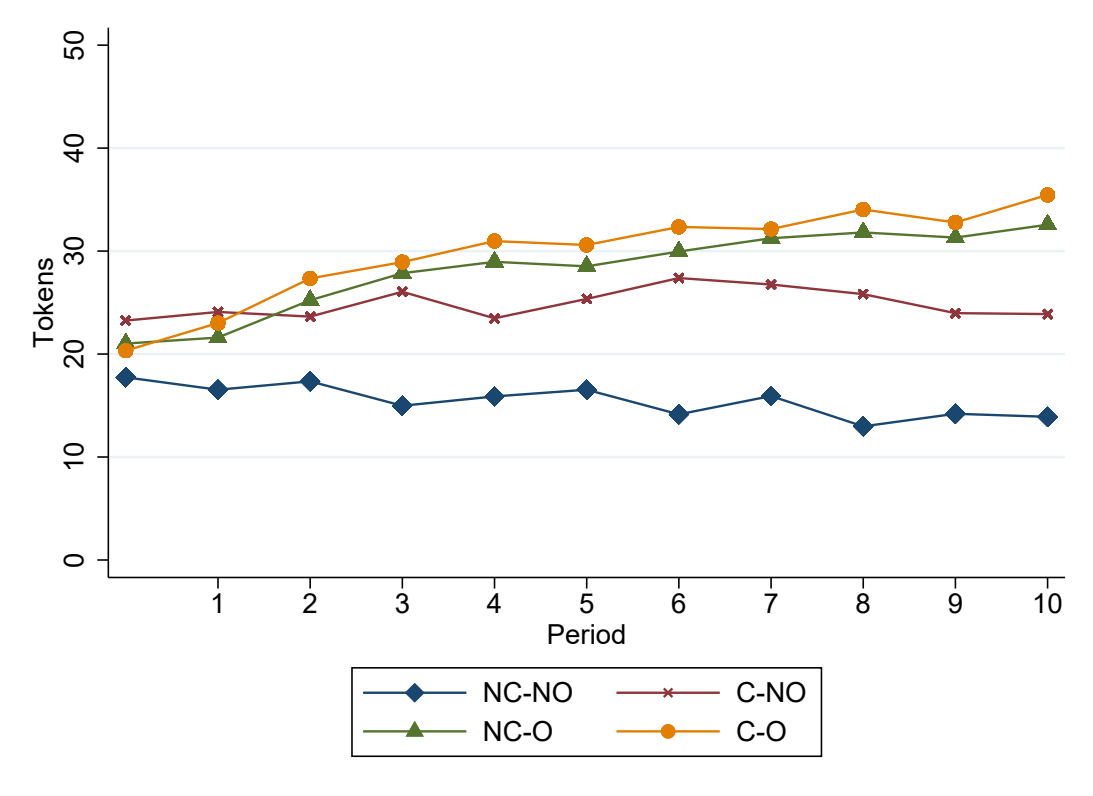
1. With observable investments: communication has no effect on efficiency. Why?

Results



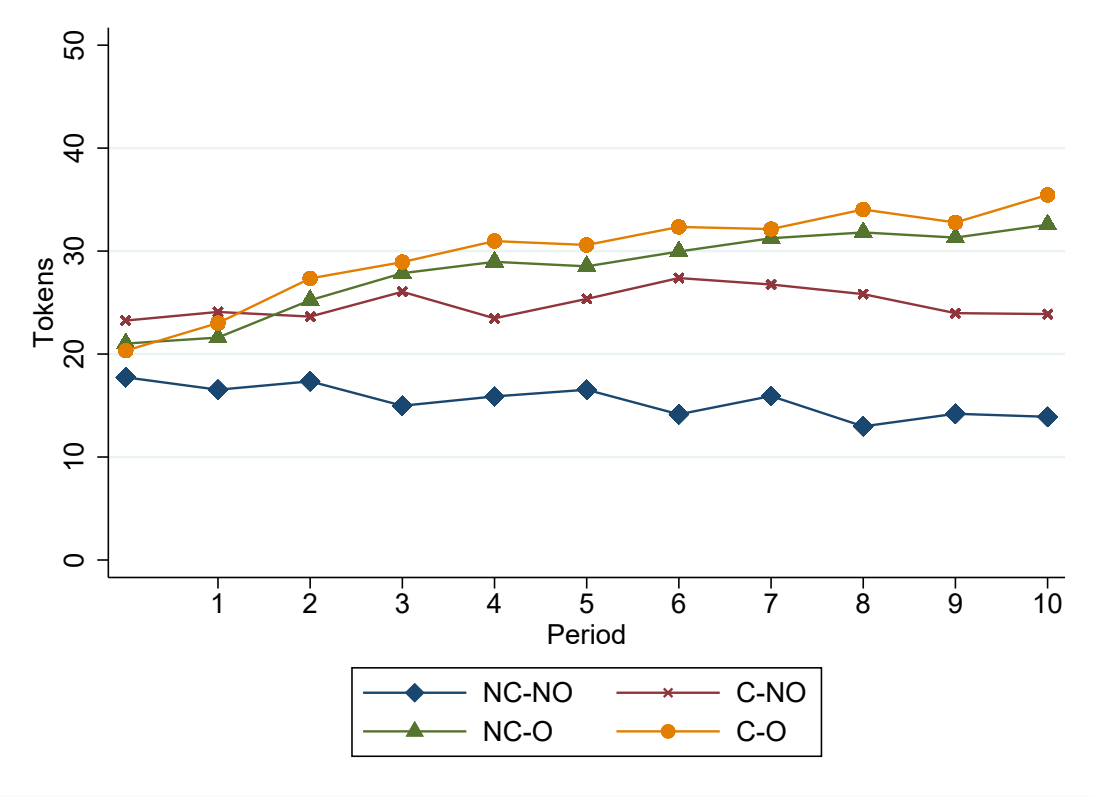
1. With observable investments: communication has no effect on efficiency. Why?
2. With unobservable investments: communication leads to an increases efficiency. Why?

Results



1. With observable investments: communication has no effect on efficiency. Why?
2. With unobservable investments: communication leads to an increases efficiency. Why?

Results



1. With observable investments: communication has no effect on efficiency. Why?
2. With unobservable investments: communication leads to an increases efficiency. Why?

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes.

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter and proposers often pitting voters against each other

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter and proposers often pitting voters against each other

Coded Categories

1. **MWC:** a member expresses that one other player should receive nothing

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter and proposers often pitting voters against each other

Coded Categories

1. **MWC:** a member expresses that one other player should receive nothing
2. **Proportionality:** member expresses that those who put in more should get more

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter and proposers often pitting voters against each other

Coded Categories

1. **MWC:** a member expresses that one other player should receive nothing
2. **Proportionality:** member expresses that those who put in more should get more
3. **Equality:** equal sharing regardless of investments

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter and proposers often pitting voters against each other

Coded Categories

1. **MWC:** a member expresses that one other player should receive nothing
2. **Proportionality:** member expresses that those who put in more should get more
3. **Equality:** equal sharing regardless of investments
4. **Desired Share**

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter and proposers often pitting voters against each other

Coded Categories

1. **MWC:** a member expresses that one other player should receive nothing
2. **Proportionality:** member expresses that those who put in more should get more
3. **Equality:** equal sharing regardless of investments
4. **Desired Share**
5. **Stated contribution**

Communication Content

Previous experiments identified a correlation between communication content and bargaining outcomes. The driving force was competition for a spot in an MWC with voters often asking the proposer to give zero to the other voter and proposers often pitting voters against each other

Coded Categories

1. **MWC:** a member expresses that one other player should receive nothing
2. **Proportionality:** member expresses that those who put in more should get more
3. **Equality:** equal sharing regardless of investments
4. **Desired Share**
5. **Stated contribution**
6. **Lying detection:** when a member suspects that someone is misrepresenting her contribution

Categories for Analysis

Excluding all empty chat screens (5%) and irrelevant messages (2%)

Categories for Analysis

Excluding all empty chat screens (5%) and irrelevant messages (2%) If at least one coders marks the category (results robust to agreement)

Unobservable	Observable

Categories for Analysis

Excluding all empty chat screens (5%) and irrelevant messages (2%) If at least one coders marks the category (results robust to agreement)

	Unobservable	Observable
Proportional		
Proposer	17.9	31.6
Voter	24.6	47.1

Categories for Analysis

Excluding all empty chat screens (5%) and irrelevant messages (2%) If at least one coders marks the category (results robust to agreement)

	Unobservable	Observable
Proportional		
Proposer	17.9	31.6
Voter	24.6	47.1
MWC		
Proposer	15.7	13.8
Voter	23.5	20.4

Categories for Analysis

Excluding all empty chat screens (5%) and irrelevant messages (2%) If at least one coders marks the category (results robust to agreement)

	Unobservable	Observable
Proportional		
Proposer	17.9	31.6
Voter	24.6	47.1
MWC		
Proposer	15.7	13.8
Voter	23.5	20.4
Equality		
Proposer	15.7	19.6
Voter	36.2	26.7

Categories for Analysis

Excluding all empty chat screens (5%) and irrelevant messages (2%) If at least one coders marks the category (results robust to agreement)

	Unobservable	Observable
Proportional		
Proposer	17.9	31.6
Voter	24.6	47.1
MWC		
Proposer	15.7	13.8
Voter	23.5	20.4
Equality		
Proposer	15.7	19.6
Voter	36.2	26.7
Competition		
Proposer	2.2	3.1
Voter	0.4	0.9

Categories for Analysis

Excluding all empty chat screens (5%) and irrelevant messages (2%) If at least one coders marks the category (results robust to agreement)

	Unobservable	Observable
Proportional		
Proposer	17.9	31.6
Voter	24.6	47.1
MWC		
Proposer	15.7	13.8
Voter	23.5	20.4
Equality		
Proposer	15.7	19.6
Voter	36.2	26.7
Competition		
Proposer	2.2	3.1
Voter	0.4	0.9

Result

Communication is mainly used to foster **equitable or equal** sharing. Calls for proportionality are more common when investments are observable.

Categories for Analysis

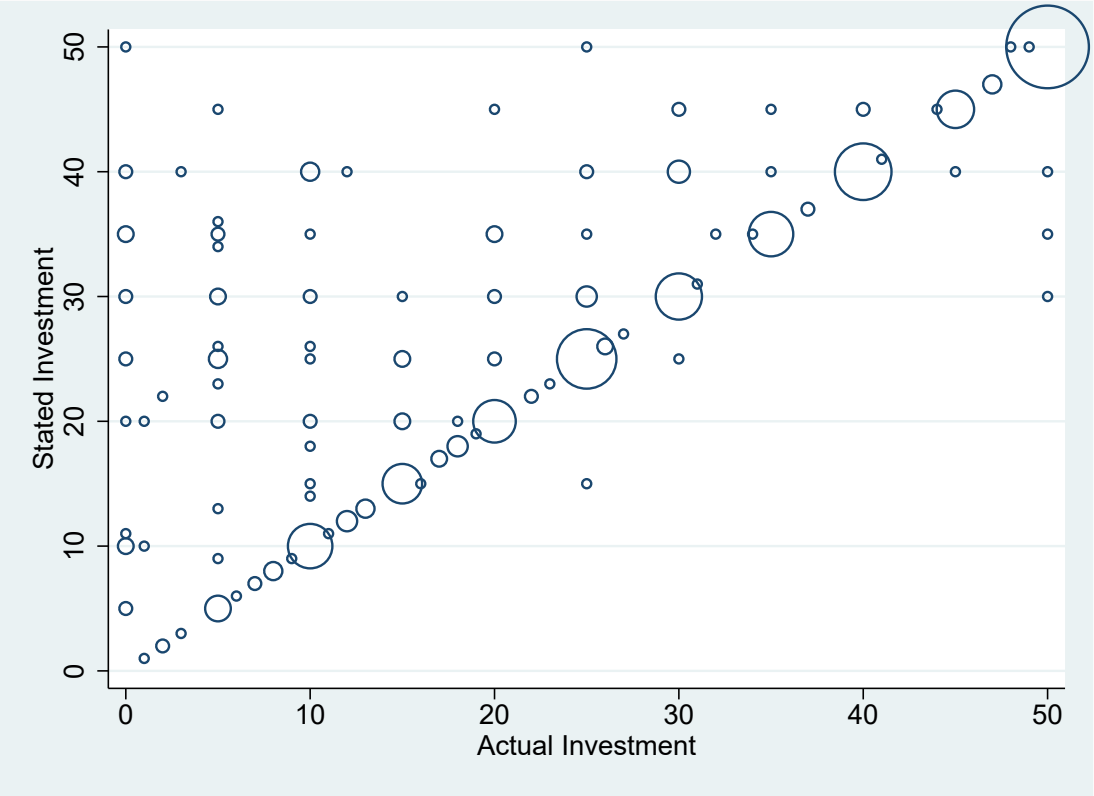
Excluding all empty chat screens (5%) and irrelevant messages (2%) If at least one coders marks the category (results robust to agreement)

	Unobservable	Observable
Proportional		
Proposer	17.9	31.6
Voter	24.6	47.1
MWC		
Proposer	15.7	13.8
Voter	23.5	20.4
Equality		
Proposer	15.7	19.6
Voter	36.2	26.7
Competition		
Proposer	2.2	3.1
Voter	0.4	0.9

Result

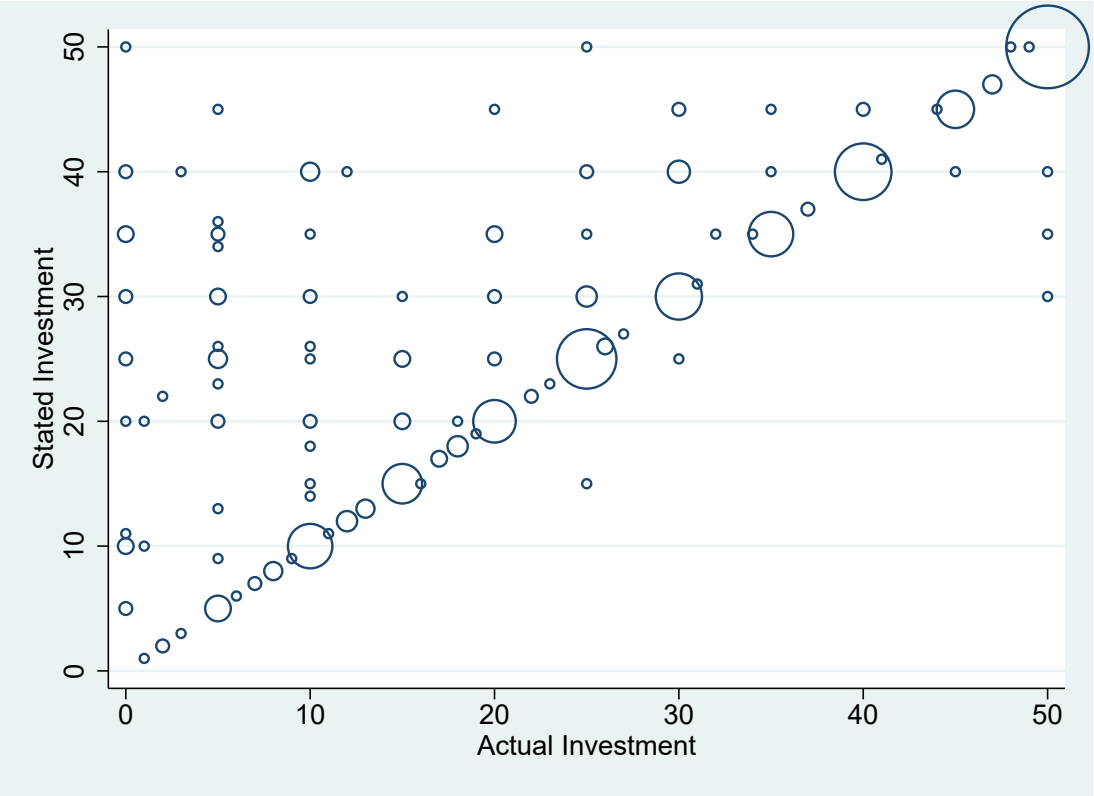
Communication is mainly used to foster **equitable or equal** sharing. Calls for proportionality are more common when investments are observable. These results contrast sharply with the role of communication when the fund is exogenous.

Stated Contributions in Unobservable Treatment



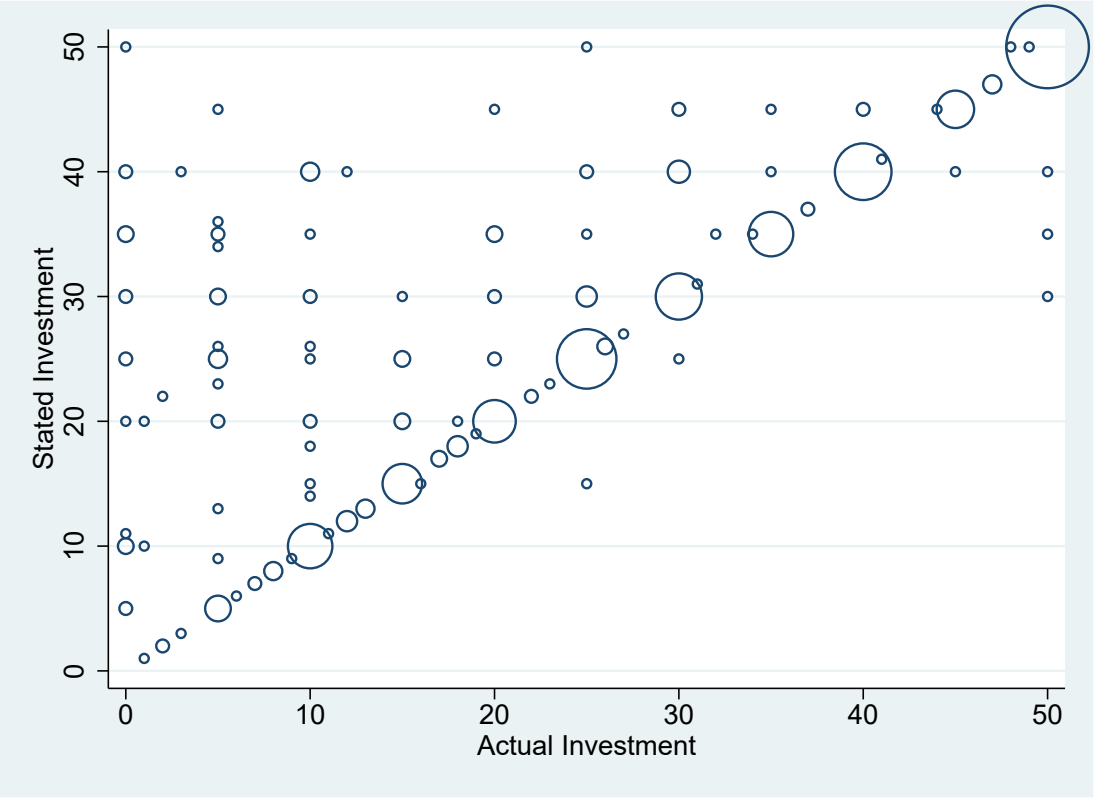
- 53% of bargainers state their contributions, 75% truthfully

Stated Contributions in Unobservable Treatment



- 53% of bargainers state their contributions, 75% truthfully
- Those who report a contribution invested on average 27 tokens which is significantly greater than 22 for those who do not report

Stated Contributions in Unobservable Treatment



- 53% of bargainers state their contributions, 75% truthfully
- Those who report a contribution invested on average 27 tokens which is significantly greater than 22 for those who do not report
- .58*** correlation coefficient between investments and report

Key Takeaways

Key Takeaways

1. Ex-post bargaining increases contributions relative to equal split or ex ante profit sharing

Key Takeaways

1. Ex-post bargaining increases contributions relative to equal split or ex ante profit sharing
2. Observability of others' contributions is key to sustain equitable fair sharing

Key Takeaways

1. Ex-post bargaining increases contributions relative to equal split or ex ante profit sharing
2. Observability of others' contributions is key to sustain equitable fair sharing
3. Communication aids when contributions are unobservable

Key Takeaways

1. Ex-post bargaining increases contributions relative to equal split or ex ante profit sharing
2. Observability of others' contributions is key to sustain equitable fair sharing
3. Communication aids when contributions are unobservable
4. Ex ante bargaining (ownership shares) leads to low contributions

Future Directions

Future Directions

1. Varying production technology to allow for synergies in production: different tasks, aggregation of contributions

Future Directions

1. Varying production technology to allow for synergies in production: different tasks, aggregation of contributions
2. Field experimentation, outside the laboratory

Future Directions

1. Varying production technology to allow for synergies in production: different tasks, aggregation of contributions
2. Field experimentation, outside the laboratory
3. Who sorts into bargaining & timing

Future Directions

1. Varying production technology to allow for synergies in production: different tasks, aggregation of contributions
2. Field experimentation, outside the laboratory
3. Who sorts into bargaining & timing

Questions or comments?

a.baranski@nyu.edu

The Determinants of Multilateral Bargaining: A Comprehensive Analysis of Baron and Ferejohn Majoritarian Bargaining Experiments

Andrzej Baranski (NYUAD) and Rebecca Morton (NYU and NYUAD)

April 7, 2022

Prepared for Experimental Economics at OSU

Introduction

Baron and Ferejohn (1989)

- Game-theoretic foundation for the analysis of **legislative bargaining**

Baron and Ferejohn (1989)

- Game-theoretic foundation for the analysis of **legislative bargaining**
- Abstraction for problems of *"distributive or expenditure policy in a unicameral, majority rule legislature not favoring any member of the legislature or any particular outcome"*

Baron and Ferejohn (1989)

- Game-theoretic foundation for the analysis of **legislative bargaining**
- Abstraction for problems of *"distributive or expenditure policy in a unicameral, majority rule legislature not favoring any member of the legislature or any particular outcome"*
- Their model has been extended to study:
  - Distributive and Ideological dimension (Jackson and Moselle, 2002)
  - Public good provision (Volden and Wiseman, 2007)
  - Dynamic public spending and taxation in which policy decisions (Battaglini and Coate, 2007)
  - A bargaining theory of the firm (Britz et al., 2013)
  - See Eraslan and Evdokimov (2019) for a review of theory

Baron and Ferejohn (1989)

- Game-theoretic foundation for the analysis of **legislative bargaining**
- Abstraction for problems of *"distributive or expenditure policy in a unicameral, majority rule legislature not favoring any member of the legislature or any particular outcome"*
- Their model has been extended to study:
  - Distributive and Ideological dimension (Jackson and Moselle, 2002)
  - Public good provision (Volden and Wiseman, 2007)
  - Dynamic public spending and taxation in which policy decisions (Battaglini and Coate, 2007)
  - A bargaining theory of the firm (Britz et al., 2013)
  - See Eraslan and Evdokimov (2019) for a review of theory
- **20+ experimental investigations** up to 2018

The Model (Symmetric Case)

1 unit of wealth to divide among n (odd) players. Utility function $u(x) = x$.

The Model (Symmetric Case)

1 unit of wealth to divide among n (odd) players. Utility function $u(x) = x$.

1. **Proposal:** Each player has $1/n$ chance of proposing $\mathbf{s} := (s_1, ..., s_n) \geq 0$ such that $\sum s_i = 1$

The Model (Symmetric Case)

1 unit of wealth to divide among n (odd) players. Utility function $u(x) = x$.

1. **Proposal:** Each player has $1/n$ chance of proposing $\mathbf{s} := (s_1, ..., s_n) \geq 0$ such that $\sum s_i = 1$
2. **Voting:** Each player has 1 vote and can vote for or against.

The Model (Symmetric Case)

1 unit of wealth to divide among n (odd) players. Utility function $u(x) = x$.

1. **Proposal:** Each player has $1/n$ chance of proposing $\mathbf{s} := (s_1, ..., s_n) \geq 0$ such that $\sum s_i = 1$
2. **Voting:** Each player has 1 vote and can vote for or against.
3. **Majority approves:** the proposal is accepted bargaining ends and payoffs are realized

The Model (Symmetric Case)

1 unit of wealth to divide among n (odd) players. Utility function $u(x) = x$.

1. **Proposal:** Each player has $1/n$ chance of proposing $\mathbf{s} := (s_1, ..., s_n) \geq 0$ such that $\sum s_i = 1$
2. **Voting:** Each player has 1 vote and can vote for or against.
3. **Majority approves:** the proposal is accepted bargaining ends and payoffs are realized
4. **Majority rejects:** the process repeats itself. (Discounting $\delta \in (0, 1]$ takes place)

The Model (Symmetric Case)

1 unit of wealth to divide among n (odd) players. Utility function $u(x) = x$.

1. **Proposal:** Each player has $1/n$ chance of proposing $\mathbf{s} := (s_1, ..., s_n) \geq 0$ such that $\sum s_i = 1$
2. **Voting:** Each player has 1 vote and can vote for or against.
3. **Majority approves:** the proposal is accepted bargaining ends and payoffs are realized
4. **Majority rejects:** the process repeats itself. (Discounting $\delta \in (0, 1]$ takes place)

Asymmetric Game

One can consider different recognition probabilities, voting weights, and discount factors (See Eraslan (2002)).

Mutiplicity of Equilibria

Nash Equilibrium

Any allocation is a Nash Equilibrium of the game.

Mutiplicity of Equilibria

Nash Equilibrium

Any allocation is a Nash Equilibrium of the game.

Subgame Perfect Nash Equilibrium

Mutiplicity of Equilibria

Nash Equilibrium

Any allocation is a Nash Equilibrium of the game.

Subgame Perfect Nash Equilibrium

1. Let $n = 3$. Then any allocation satisfying $s_i \in \left[\frac{3(1-\delta)}{9-6\delta-\delta^2}, \frac{3-\delta}{9-6\delta-\delta^2}\right]$ can be sustained as an SPE. (see Herings et al 2018)

Mutiplicity of Equilibria

Nash Equilibrium

Any allocation is a Nash Equilibrium of the game.

Subgame Perfect Nash Equilibrium

1. Let $n = 3$. Then any allocation satisfying $s_i \in \left[\frac{3(1-\delta)}{9-6\delta-\delta^2}, \frac{3-\delta}{9-6\delta-\delta^2}\right]$ can be sustained as an SPE. (see Herings et al 2018)
2. Let $n \geq 5$ and $\delta > \frac{n+2}{2(n-1)}$. Then any allocation can be sustained as an SPE. (See Baron and Ferejohn 1989)

Mutiplicity of Equilibria

Nash Equilibrium

Any allocation is a Nash Equilibrium of the game.

Subgame Perfect Nash Equilibrium

1. Let $n = 3$. Then any allocation satisfying $s_i \in \left[\frac{3(1-\delta)}{9-6\delta-\delta^2}, \frac{3-\delta}{9-6\delta-\delta^2}\right]$ can be sustained as an SPE. (see Herings et al 2018)
2. Let $n \geq 5$ and $\delta > \frac{n+2}{2(n-1)}$. Then any allocation can be sustained as an SPE. (See Baron and Ferejohn 1989)

Folk-theorem for multi-stage bargaining: requires coordinating on complicated punishment strategies.

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**
Proposer Power		
MWC		
Delay		

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**
Proposer Power	Negative	
MWC		
Delay		

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**
Proposer Power	Negative	Negative
MWC		
Delay		

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**
Proposer Power	Negative	Negative
MWC	No Effect	
Delay		

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**
Proposer Power	Negative	Negative
MWC	No Effect	No Effect
Delay		

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**
Proposer Power	Negative	Negative
MWC	No Effect	No Effect
Delay	No Effect	

Stationary Refinement

Strategies are **history-independent**: prescribe identical strategies in identical subgames.

Stationary SPE (SSPE)

1. **Minimum winning coalition:** The proposer forms a coalition with $\frac{n-1}{2}$ voters (chosen at random) by offering them the discounted continuation value of the game: δ / n
2. **Proposer Power:** The proposer keeps $1 - \frac{n-1}{2} \cdot \frac{\delta}{n}$
3. **No-delay:** Bargaining ends in round 1

Table 1: Comparative Statics

	δ	**Group Size**
Proposer Power	Negative	Negative
MWC	No Effect	No Effect
Delay	No Effect	No Effect

Results from Meta-Analysis

The Data

Collected raw data from all experiments up to 2018:

1. All treatments with symmetric predictions
2. No computer players
3. Exogenous surplus to distribute
4. Only majority voting
5. Analysis focuses on games 1-10, round-1 proposals
6. For details, see article

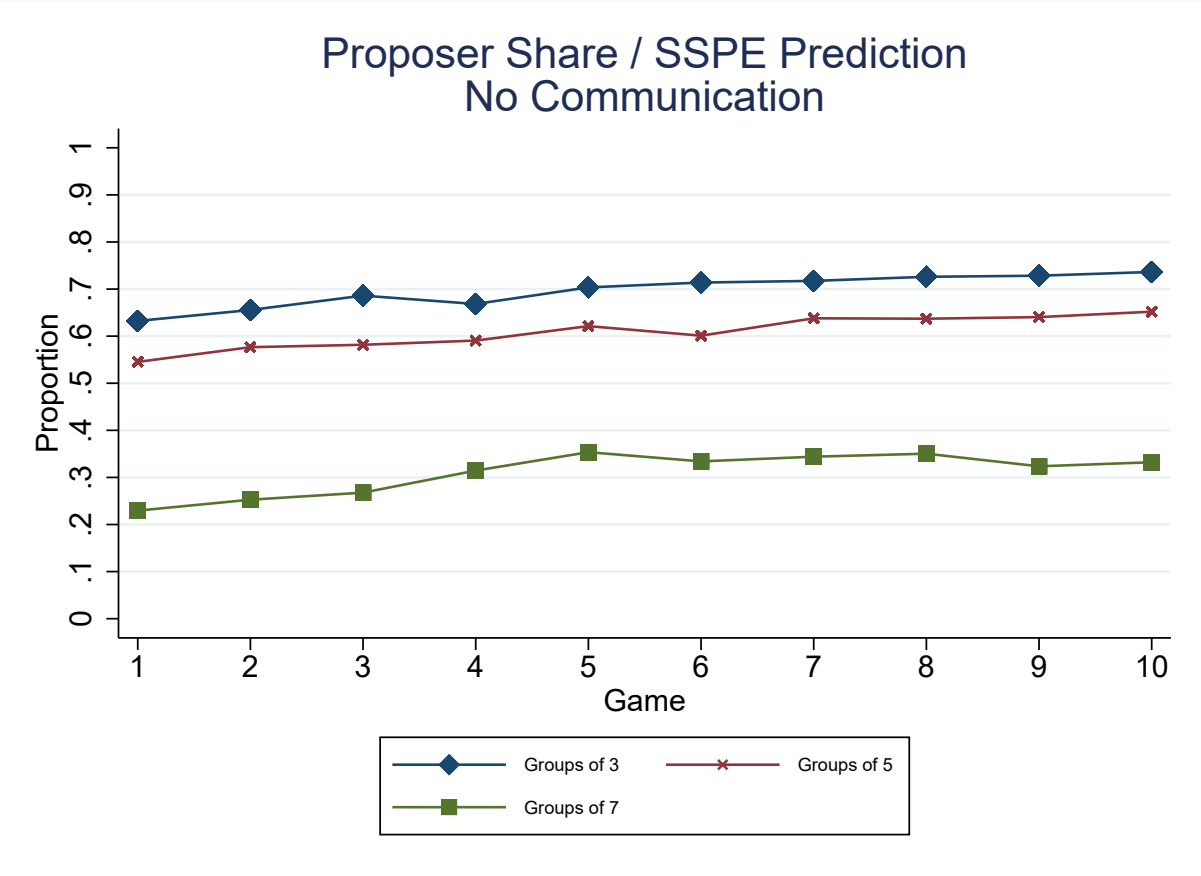
Proposer Power

Table 2: Mean Proposer Share [SSPE Prediction]

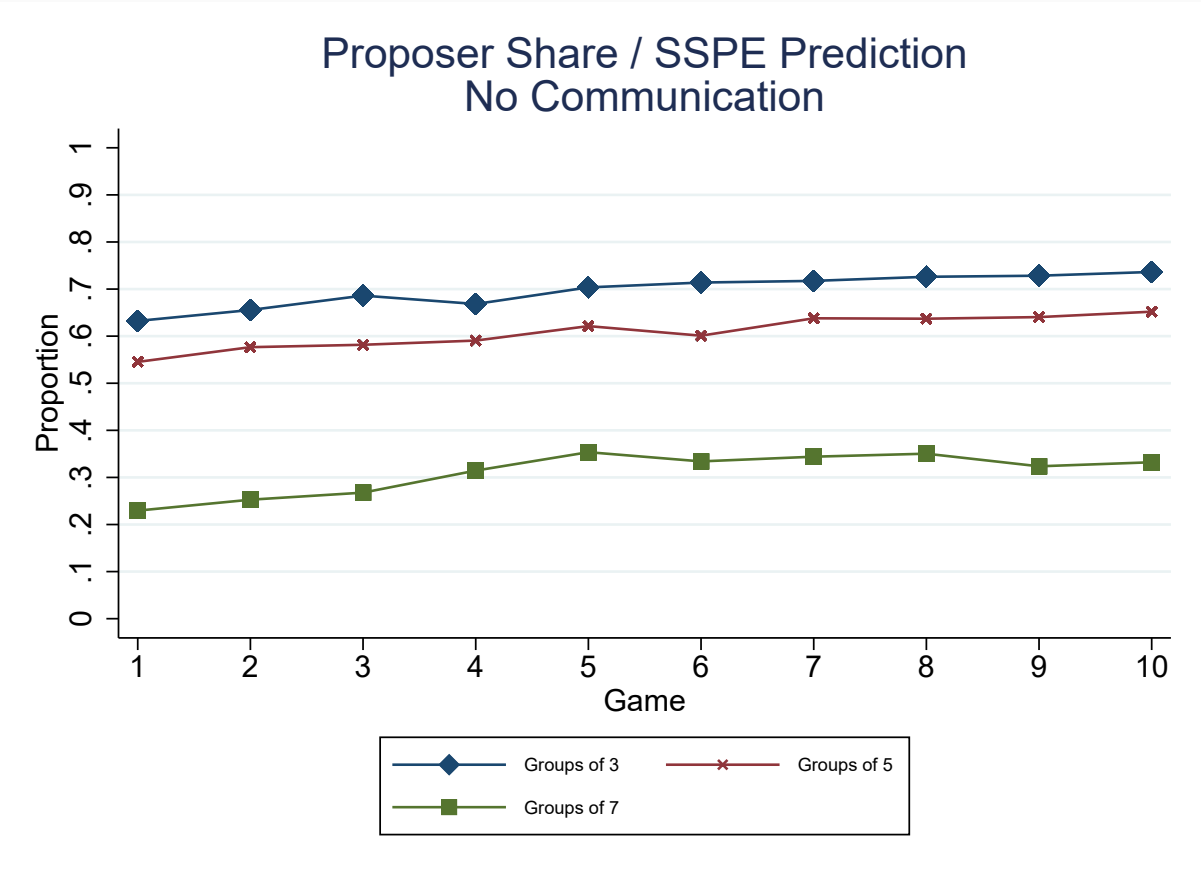
	No Communication			Communication	
Group size:	3	5	7	3	5
$\delta = 0.5$	0.50 [0.83] (0.006)		0.26 [0.78] (0.010)		
$\delta = 0.67$	0.56 [0.78] (0.014)				
$\delta = 0.8$		0.42 [0.68] (0.009)			0.56 [0.68] (0.009)
$\delta = 0.9$	0.54 [0.7] (0.010)				
$\delta = 0.95$	0.49 [0.68] (0.012)				
$\delta = 1$	0.52 [0.67] (0.004)	0.40 [0.60] (0.008)		0.61 [0.67] (0.010)	
All δ	0.52 (0.003)	0.41 (0.006)	0.26 (0.010)	0.61 (0.010)	0.56 (0.009)

Only round 1 proposals in games 6-10. Standard errors of the mean in parentheses. SSPE predicted share in brackets next to the mean observed value.

Proposer Power (with experience, no communication)

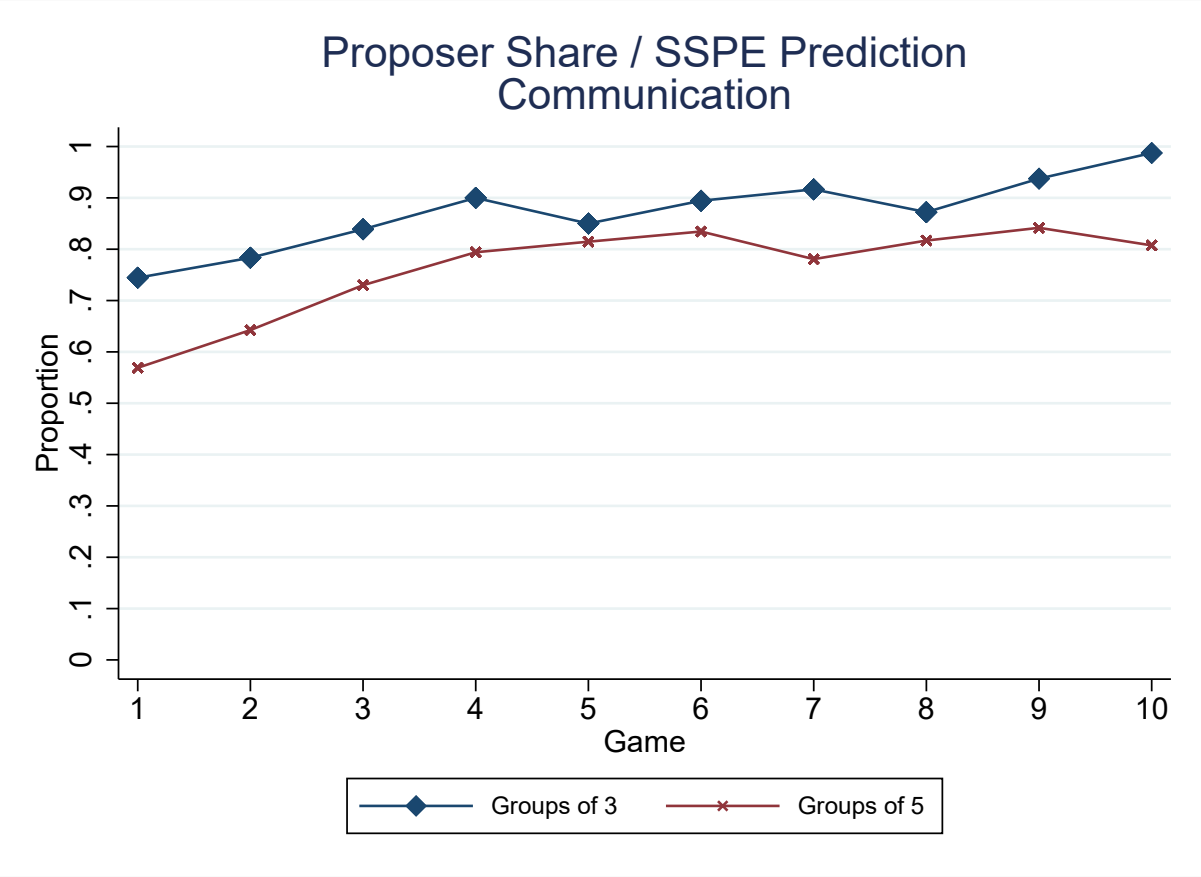


Proposer Power (with experience, no communication)

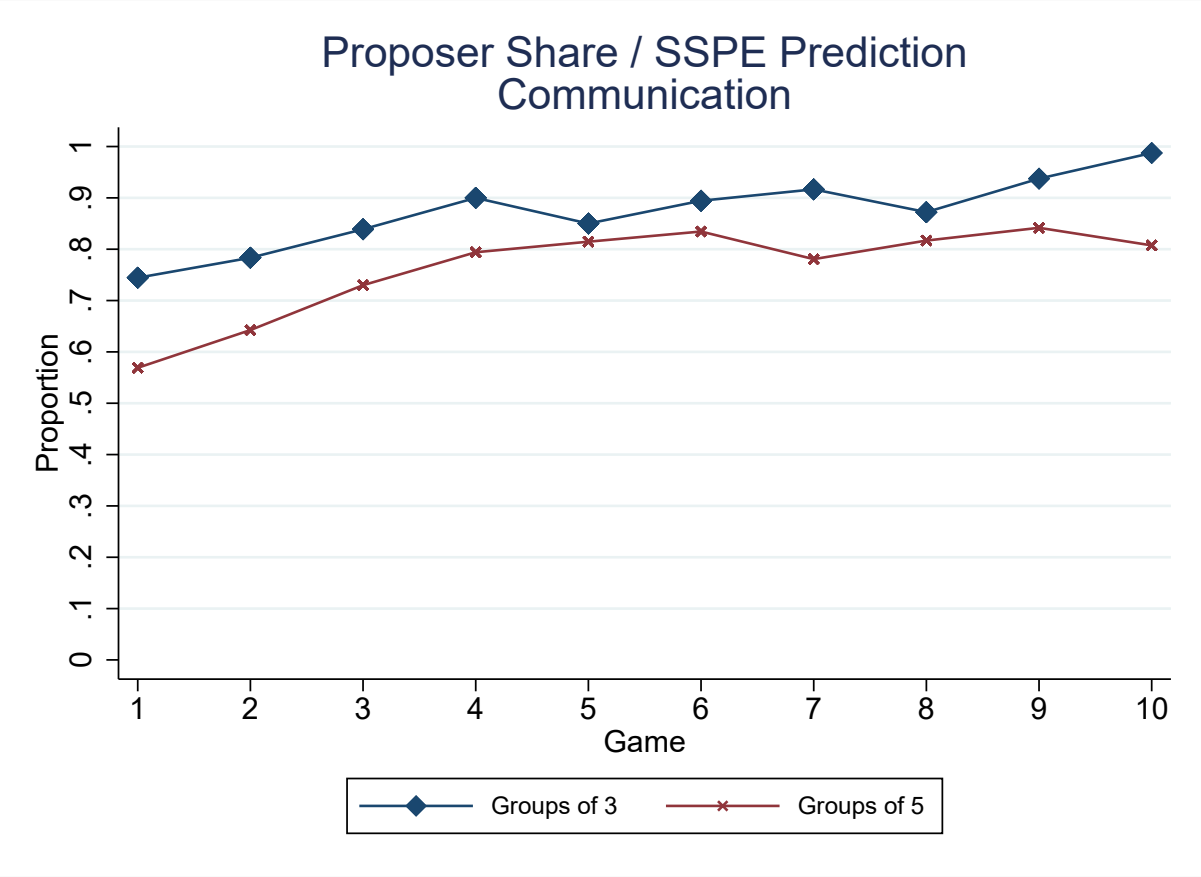


The proposer's share grows with experience. But as we will see, this is due to the increase in MWCs

Proposer Power (with experience, communication)

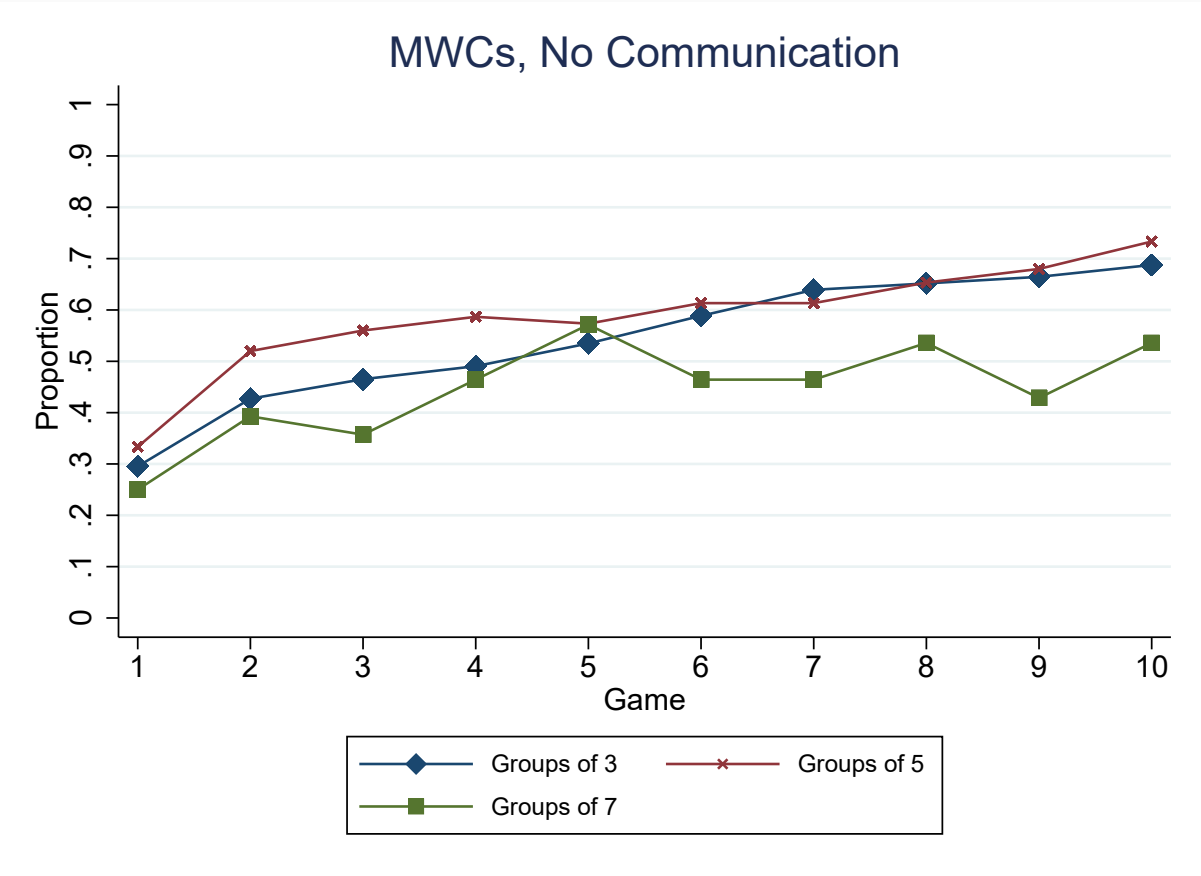


Proposer Power (with experience, communication)

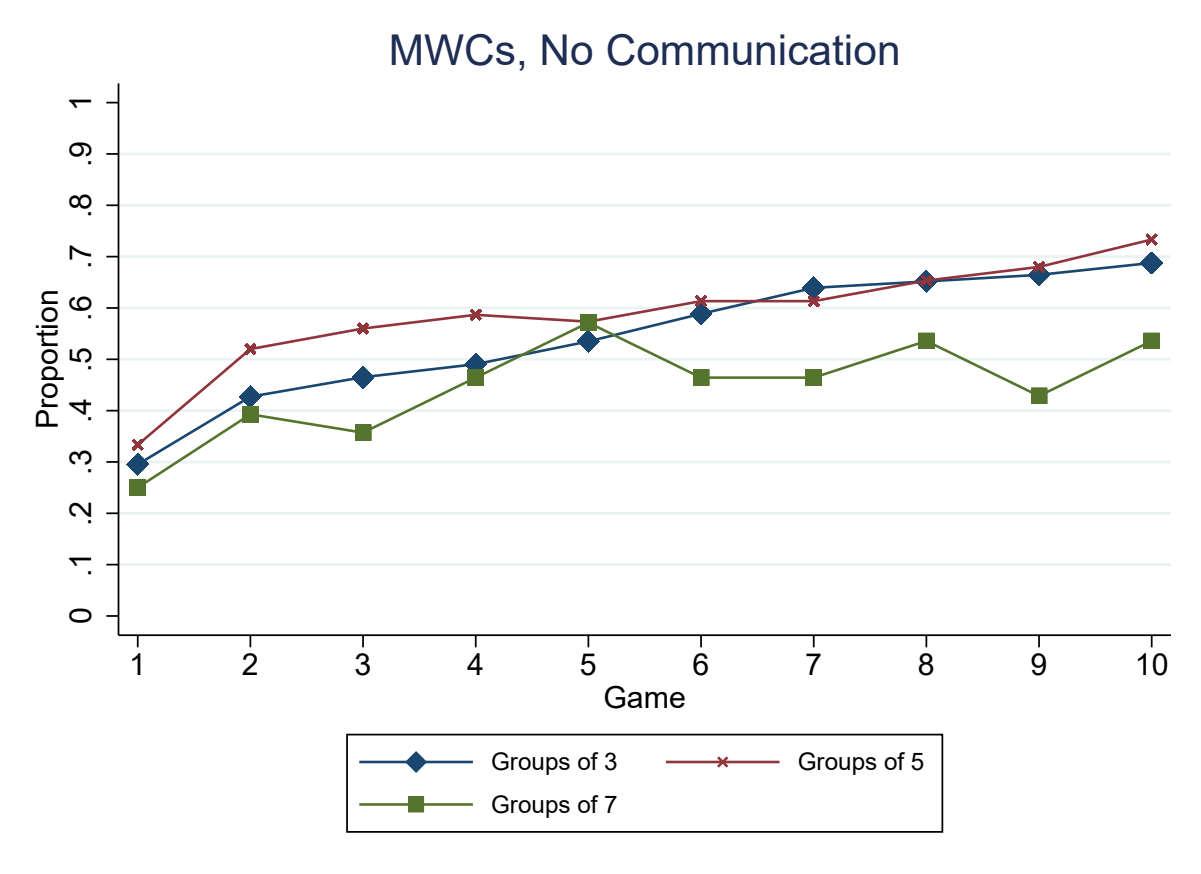


Pre-proposal communication increases the proposer's share: (1) competition between voter for a spot in the MWC (2) proposer's actively seek the *cheapest* voter

Minimum Winning Coalitions (with experience, no communication)

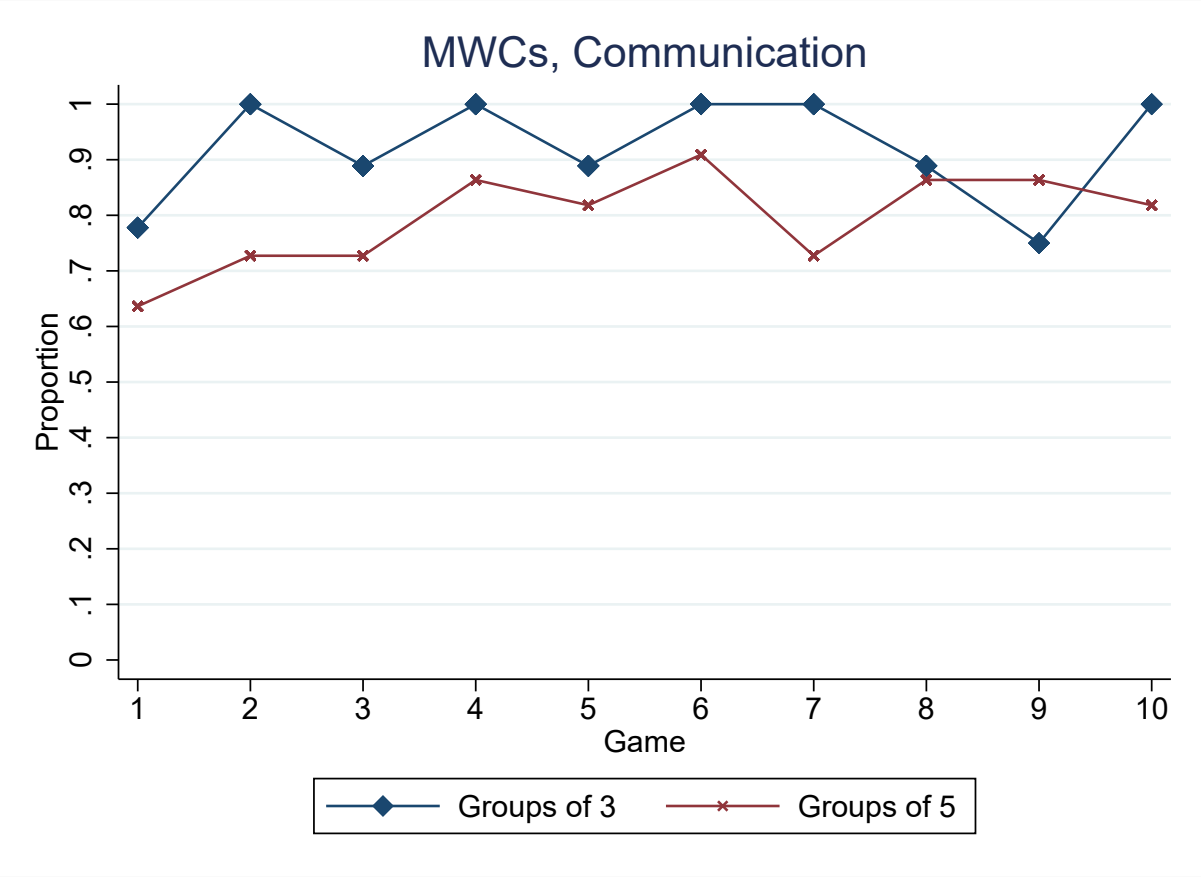


Minimum Winning Coalitions (with experience, no communication)

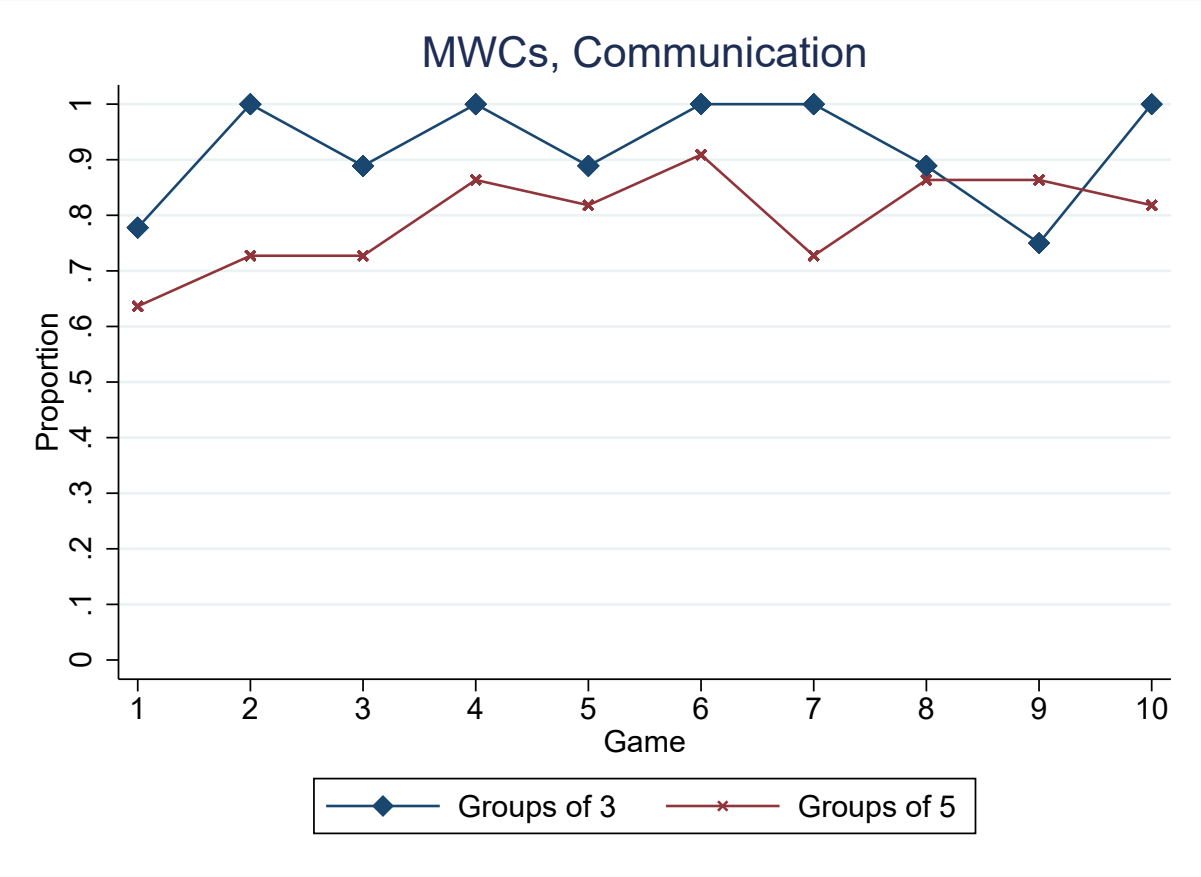


MWCs grow with experience, but are far from universal. Close to 30% are All-way splits in 3&5-player games.

Minimum Winning Coalitions (with experience, communication)

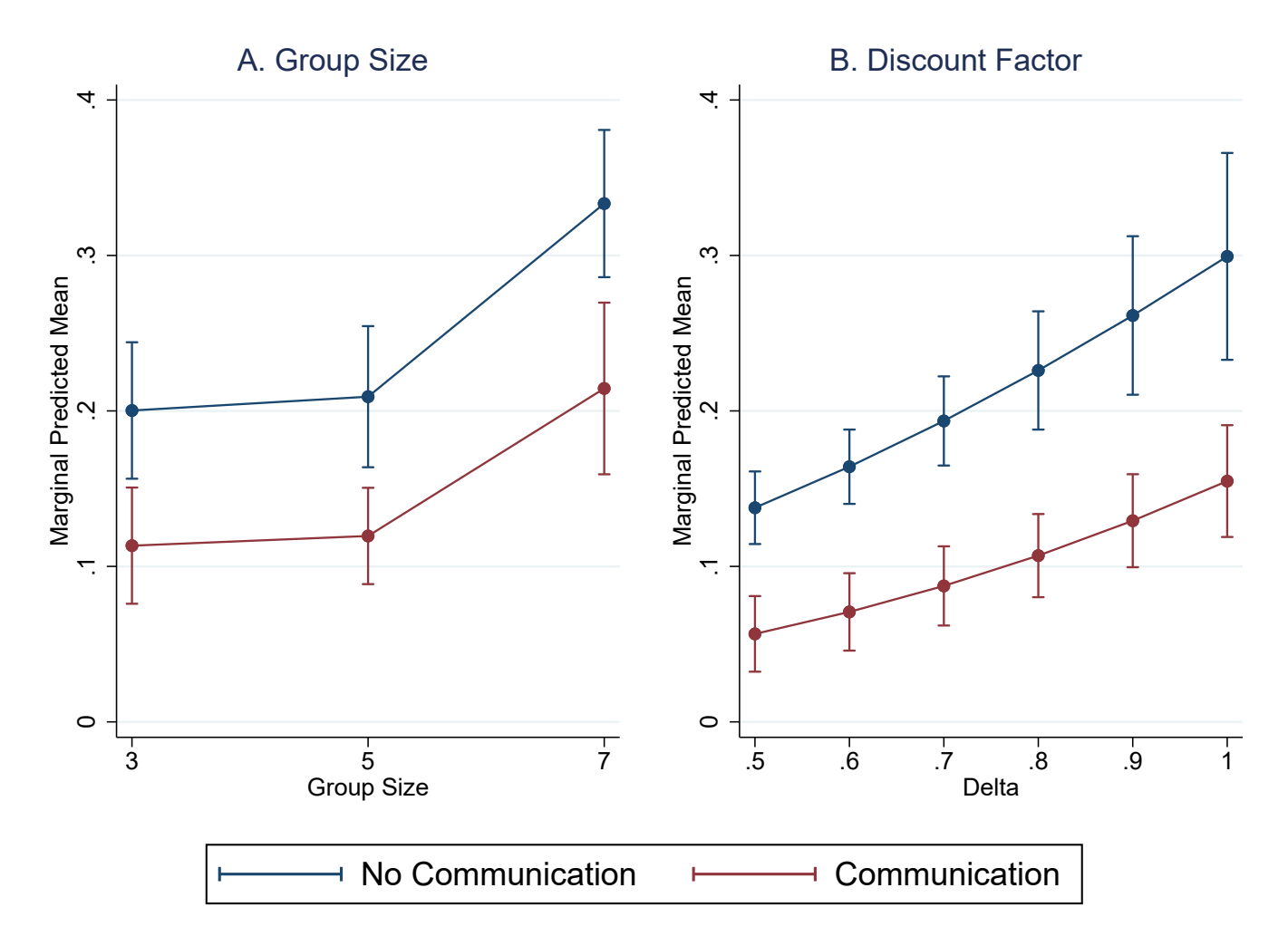


Minimum Winning Coalitions (with experience, communication)

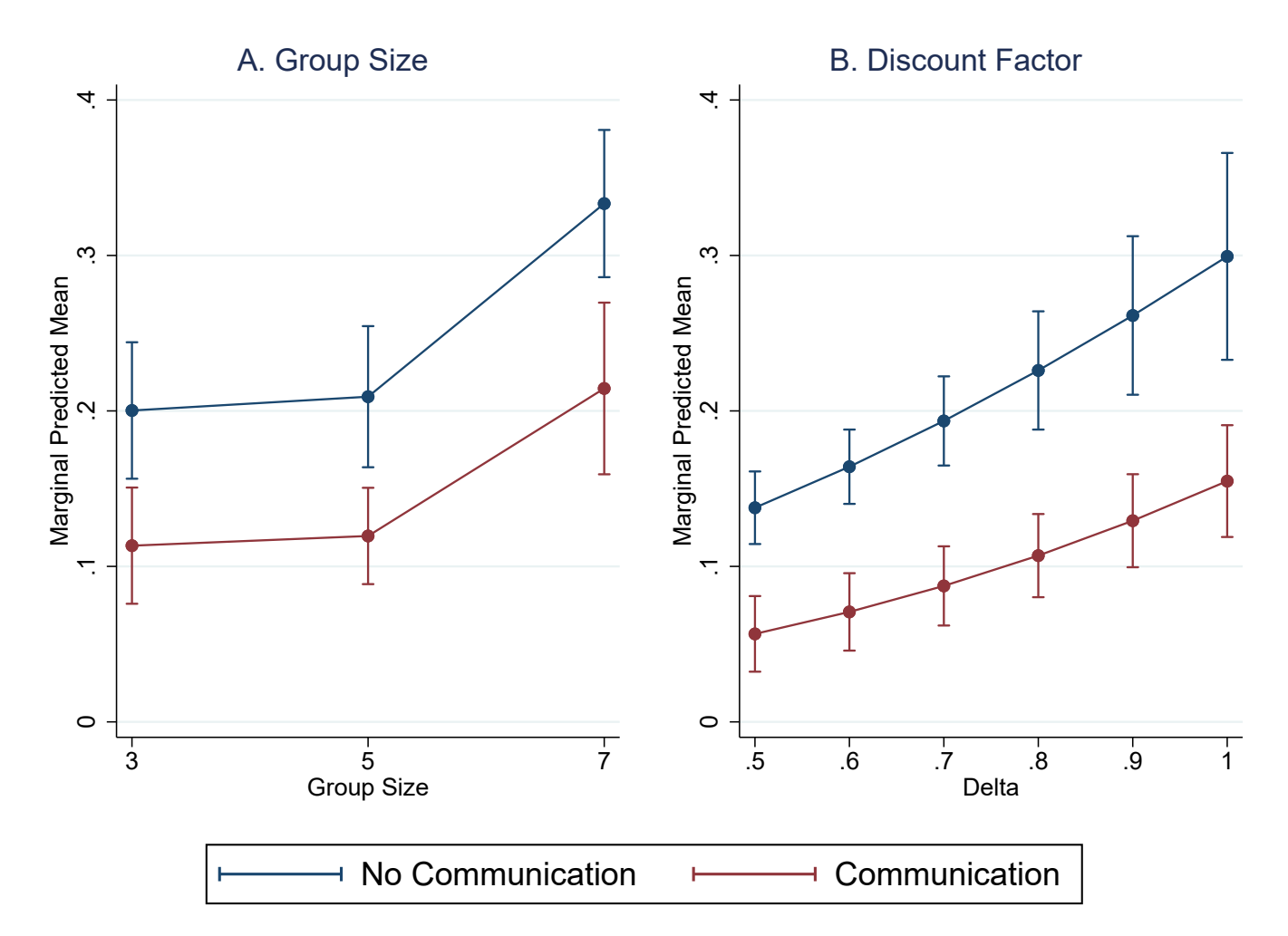


MWCs are more common when pre-proposal communication is allowed.

Delay in Agreement



Delay in Agreement



Contrary to SSPE: (1) more costly rejection $\longrightarrow$ less delay (2) higher group size $\longrightarrow$ more delay

Is play stationary?

Stationarity requires **history-independent strategies**. This implies:

Is play stationary?

Stationarity requires **history-independent strategies**. This implies:

1. Round 1 and Round 2 behavior should be identical

Is play stationary?

Stationarity requires **history-independent strategies**. This implies:

1. Round 1 and Round 2 behavior should be identical
2. **No Punishment:** Failed proposers no worse off than non-proposers in future rounds (identical continuation value)

Is play stationary?

Stationarity requires **history-independent strategies**. This implies:

1. Round 1 and Round 2 behavior should be identical
2. **No Punishment:** Failed proposers no worse off than non-proposers in future rounds (identical continuation value)

Evaluating whether subjects abide or not by stationary strategies is complicated because:

Is play stationary?

Stationarity requires **history-independent strategies**. This implies:

1. Round 1 and Round 2 behavior should be identical
2. **No Punishment:** Failed proposers no worse off than non-proposers in future rounds (identical continuation value)

Evaluating whether subjects abide or not by stationary strategies is complicated because:

1. Delay is rather uncommon (15-20%)

Is play stationary?

Stationarity requires **history-independent strategies**. This implies:

1. Round 1 and Round 2 behavior should be identical
2. **No Punishment:** Failed proposers no worse off than non-proposers in future rounds (identical continuation value)

Evaluating whether subjects abide or not by stationary strategies is complicated because:

1. Delay is rather uncommon (15-20%)
2. Individual studies yield only a handful of round 2 or beyond groups

Is play stationary?

Stationarity requires **history-independent strategies**. This implies:

1. Round 1 and Round 2 behavior should be identical
2. **No Punishment:** Failed proposers no worse off than non-proposers in future rounds (identical continuation value)

Evaluating whether subjects abide or not by stationary strategies is complicated because:

1. Delay is rather uncommon (15-20%)
2. Individual studies yield only a handful of round 2 or beyond groups
3. No statistical power to derive meaningful conclusions, but the meta-analysis overcomes these difficulties

Testing for Stationarity

We compute an **empirical continuation value:**

Testing for Stationarity

We compute an **empirical continuation value:**

- Take all round 2 proposals (round 3 and beyond is a very small sample)

Testing for Stationarity

We compute an **empirical continuation value:**

- Take all round 2 proposals (round 3 and beyond is a very small sample)
- Identify the previous proposer

Testing for Stationarity

We compute an **empirical continuation value:**

- Take all round 2 proposals (round 3 and beyond is a very small sample)
- Identify the previous proposer
- In expectation: what share of the pie is offered in R2 to R1 failed proposers vs non-proposers?

Testing for Stationarity

We compute an **empirical continuation value:**

- Take all round 2 proposals (round 3 and beyond is a very small sample)
- Identify the previous proposer
- In expectation: what share of the pie is offered in R2 to R1 failed proposers vs non-proposers?
- Likelihood of inclusion in a coalition?
- In groups of 5, rejection can occur with 2 votes in favor. Do people also punish those who supported the proposer?

Empirical Continuation Value

We compute the mean share offered to a R1 proposer / R1 non-proposer (including her own proposal if any).

Table 3: Empirical Continuation Values as Proportion of Total Fund

	Groups of 3	Groups of 5
Round 1 Proposer		
Round 1 Non-Proposer		

Std. err. in parentheses are clustered at study level.

Empirical Continuation Value

We compute the mean share offered to a R1 proposer / R1 non-proposer (including her own proposal if any).

Table 3: Empirical Continuation Values as Proportion of Total Fund

	Groups of 3	Groups of 5
Round 1 Proposer	0.28	0.16
	(0.010)	(0.008)
Round 1 Non-Proposer		

Std. err. in parentheses are clustered at study level.

Empirical Continuation Value

We compute the mean share offered to a R1 proposer / R1 non-proposer (including her own proposal if any).

Table 3: Empirical Continuation Values as Proportion of Total Fund

	Groups of 3	Groups of 5
Round 1 Proposer	0.28	0.16
	(0.010)	(0.008)
Round 1 Non-Proposer	0.36	0.21
	(0.005)	(0.002)

Std. err. in parentheses are clustered at study level.

Empirical Continuation Value

We compute the mean share offered to a R1 proposer / R1 non-proposer (including her own proposal if any).

Table 3: Empirical Continuation Values as Proportion of Total Fund

	Groups of 3	Groups of 5
Round 1 Proposer	0.28	0.16
	(0.010)	(0.008)
Round 1 Non-Proposer	0.36	0.21
	(0.005)	(0.002)

Std. err. in parentheses are clustered at study level.

Evidence that subjects punish the previous proposer. But this measure may underestimate punishment because it includes self-allocated share.

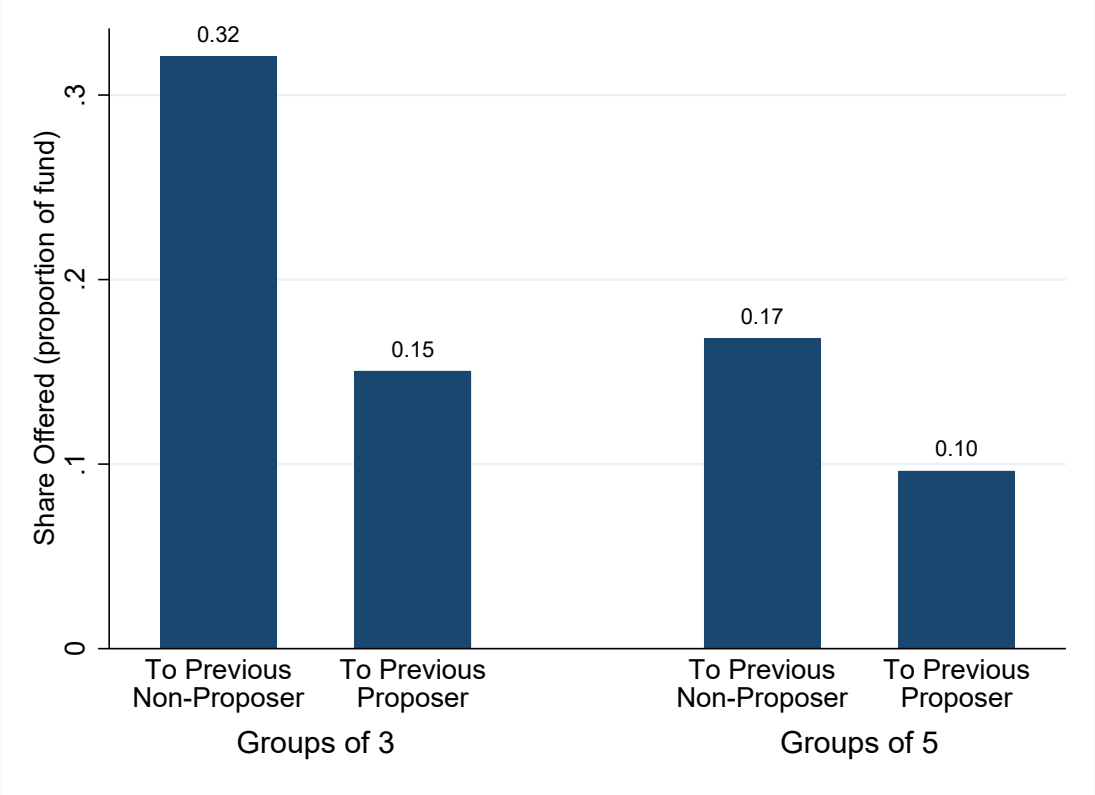
Empirical Continuation Value

We compute the mean share offered to a R1 proposer / R1 non-proposer (**excluding** her own proposal if any).

Empirical Continuation Value

We compute the mean share offered to a R1 proposer / R1 non-proposer (**excluding** her own proposal if any).

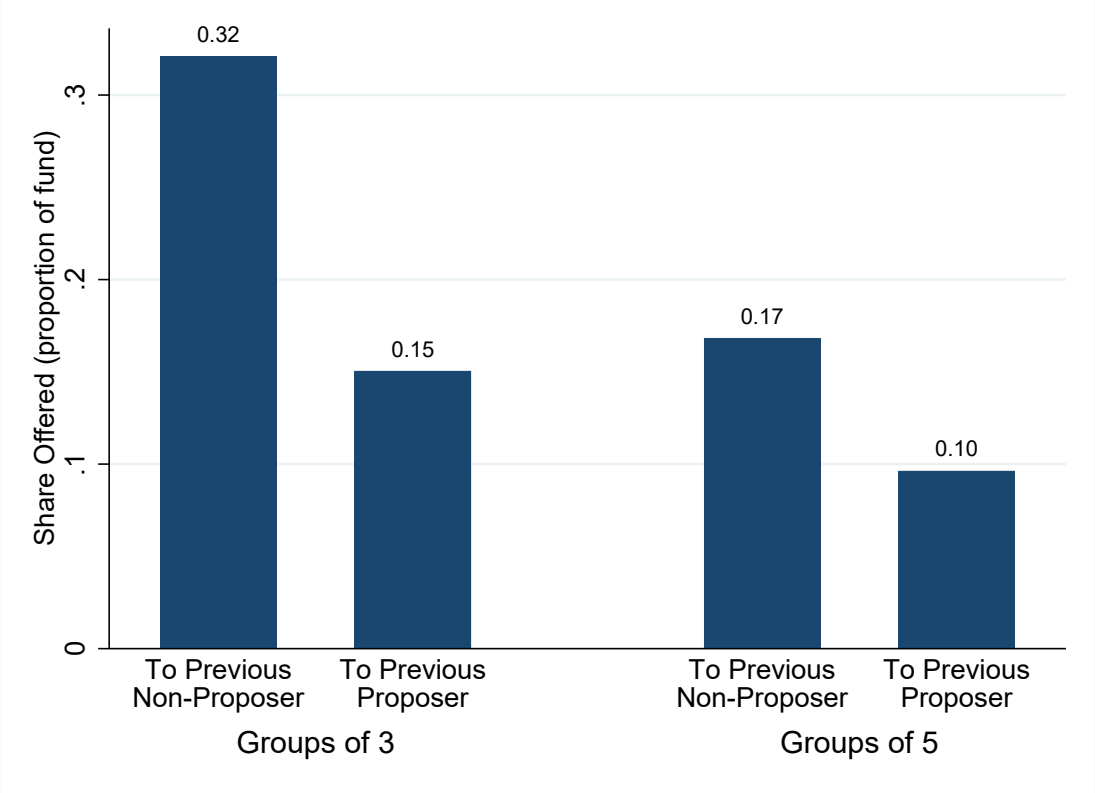
Figure 1: Shares offered in Round 2 by Subjects that did not Propose in Round 1 (by recipient and group size)



Empirical Continuation Value

We compute the mean share offered to a R1 proposer / R1 non-proposer (**excluding** her own proposal if any).

Figure 1: Shares offered in Round 2 by Subjects that did not Propose in Round 1 (by recipient and group size)



Even stronger evidence of punishment.

Do supporters of failed proposals reciprocate positively?

Key distinction between groups of 3 and 5 in how a rejection may have occurred.

Do supporters of failed proposals reciprocate positively?

Key distinction between groups of 3 and 5 in how a rejection may have occurred.

- Groups of 3: all non-proposers voted against

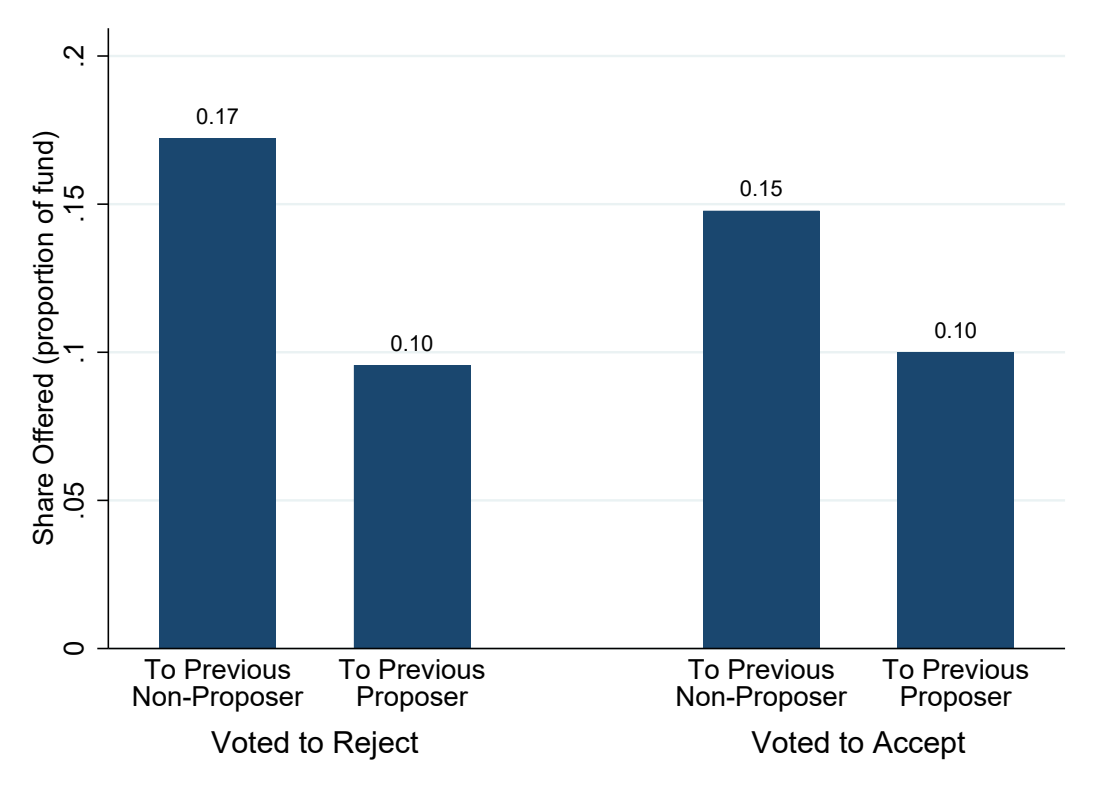
Do supporters of failed proposals reciprocate positively?

Key distinction between groups of 3 and 5 in how a rejection may have occurred.

- Groups of 3: all non-proposers voted against
- Groups of 5: a proposal may fail and one member may have supported it. Does she reciprocate?

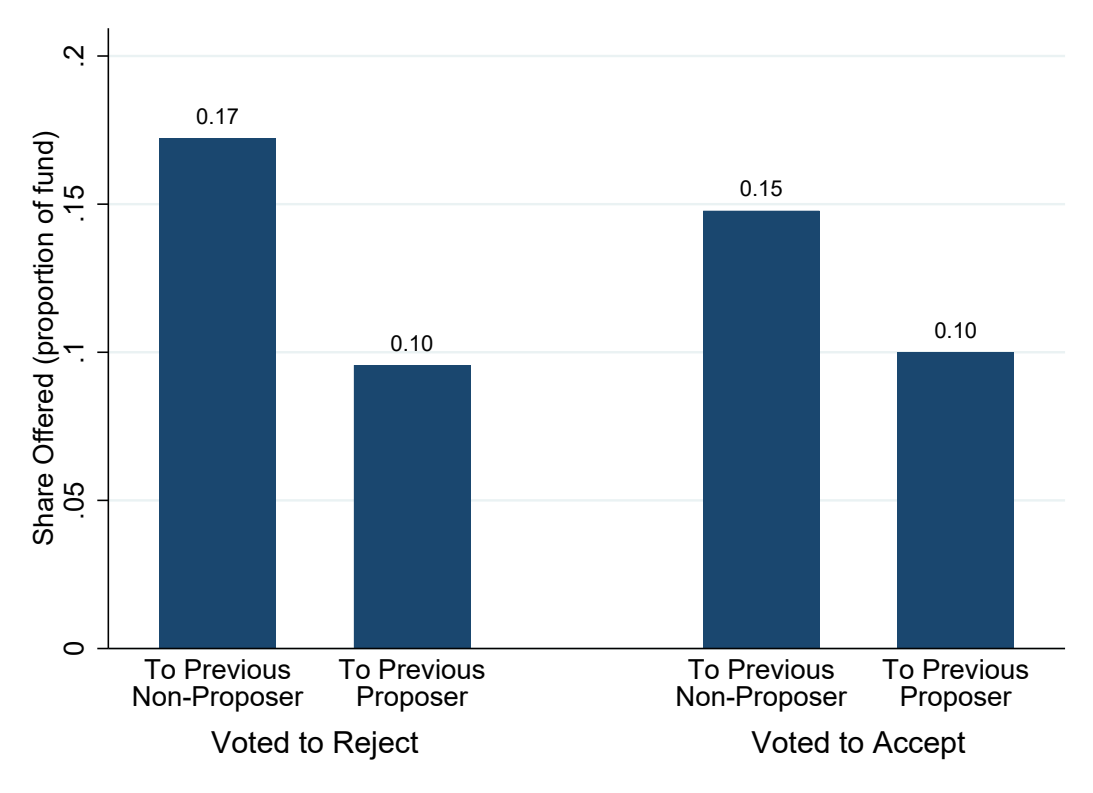
Do supporters of failed proposals reciprocate positively? (cont'd)

Figure 2: Shares offered in Round 2 by Subjects that did not Propose in Round 1 for Groups of 5, by Voting Decision



Do supporters of failed proposals reciprocate positively? (cont'd)

Figure 2: Shares offered in Round 2 by Subjects that did not Propose in Round 1 for Groups of 5, by Voting Decision



Failed proposers are doomed: punished by everyone.

Concluding Remarks

Concluding Remarks

- Very mild proposer power. Increases with experience due to increase in MWCs, **but not within MWCs**.

Concluding Remarks

- Very mild proposer power. Increases with experience due to increase in MWCs, **but not within MWCs**.
- Communication increases prop power and MWCs, reduces delay

Concluding Remarks

- Very mild proposer power. Increases with experience due to increase in MWCs, **but not within MWCs**.
- Communication increases prop power and MWCs, reduces delay
- MWCs modal but not universal: substantial heterogeneity (cross cultural work in progress...)

Concluding Remarks

- Very mild proposer power. Increases with experience due to increase in MWCs, **but not within MWCs**.
- Communication increases prop power and MWCs, reduces delay
- MWCs modal but not universal: substantial heterogeneity (cross cultural work in progress...)
- Delay is affected by groups size and discounting (against SSPE), in very intuitive ways

Concluding Remarks

- Very mild proposer power. Increases with experience due to increase in MWCs, **but not within MWCs**.
- Communication increases prop power and MWCs, reduces delay
- MWCs modal but not universal: substantial heterogeneity (cross cultural work in progress...)
- Delay is affected by groups size and discounting (against SSPE), in very intuitive ways
- Play is not stationary!

Concluding Remarks

- Very mild proposer power. Increases with experience due to increase in MWCs, **but not within MWCs**.
- Communication increases prop power and MWCs, reduces delay
- MWCs modal but not universal: substantial heterogeneity (cross cultural work in progress...)
- Delay is affected by groups size and discounting (against SSPE), in very intuitive ways
- Play is not stationary!
- Anticipation of retaliation may deter proposers from attempting to keep a large share

References

Agranov, M. and Tergiman, C. (2014). Communication in multilateral bargaining. *Journal of Public Economics*, 118:75–85.

Baranski, A. (2016). Voluntary contributions and collective redistribution. *American Economic Journal: Microeconomics*, 8(4):149–73.

Baranski, A. (2019). Endogenous claims and collective production: an experimental study on the timing of profit-sharing negotiations and production. *Experimental Economics*. https://doi.org/10.1007/s10683-018-9591-2.

Baranski, A. and Cox, C. (2019). Communication in multilateral bargaining with joint production. NYUAD Social Science Working Paper 32 `https://nyuad.nyu.edu/content/dam/nyuad/academics/divisions/social-science/working-papers/2019/0032.pdf`. Last accessed December 1, 2019.

Baranski, A. and Kagel, J. H. (2015). Communication in legislative bargaining. *Journal of the Economic science Association*, 1(1):59–71.

Baron, D. P., Bowen, T. R., and Nunnari, S. (2017). Durable coalitions and communication: Public versus private negotiations. *Journal of Public Economics*, 156:1–13.

Baron, D. P. and Ferejohn, J. A. (1989). Bargaining in legislatures. *American political science review*, 83(4):1181–1206.

Battaglini, M. and Coate, S. (2007). Inefficiency in legislative policymaking: a dynamic analysis. *American Economic Review*, 97(1):118–149.

Bradfield, A. J. and Kagel, J. H. (2015). Legislative bargaining with teams. *Games and Economic Behavior*, 93:117–127.

Britz, V., Herings, P., and Predtetchinski, A. (2013). A bargaining theory of the firm. *Economic Theory*, 54(1):45–75.

Christiansen, N., Jhunjhunwala, T., and Kagel, J. H. (2017). Gains versus costs in legislative bargaining. Mimeo. Retrieved from `https://www.asc.ohio-state.edu/kagel.4/CJK_all.pdf`. Last accessed January 5, 2020.

Diermeier, D. and Gailmard, S. (2006). Self-interest, inequality, and entitlement in majoritarian decision-making. *Quarterly Journal of Political Science*, 1(4):327–350.

Diermeier, D. and Morton, R. (2005). Experiments in majoritarian bargaining. In *Social choice and strategic decisions*, pages 201–226. Springer.

Dong, L., Falvey, R., and Luckraz, S. (2019). Fair share and social efficiency: A mechanism in which peers decide on the payoff division. *Games and Economic Behavior*, 115:209–224.

Drouvelis, M., Montero, M., and Sefton, M. (2010). Gaining power through enlargement: Strategic foundations and experimental evidence. *Games and Economic Behavior*, 69(2):274–292.

Eraslan, H. (2002). Uniqueness of stationary equilibrium payoffs in the baron–ferejohn model. *Journal of Economic Theory*, 103(1):11–30.

Eraslan, H. and Evdokimov, K. S. (2019). Legislative and multilateral bargaining. *Annual Review of Economics*, 11(1):443–472.

Fréchette, G., Kagel, J. H., and Morelli, M. (2005a). Behavioral identification in coalitional bargaining: An experimental analysis of demand bargaining and alternating offers. *Econometrica*, 73(6):1893–1937.

Fréchette, G., Kagel, J. H., and Morelli, M. (2005b). Nominal bargaining power, selection protocol, and discounting in legislative bargaining. *Journal of Public Economics*, 89(8):1497–1517.

Fréchette, G. R. (2009). Learning in a multilateral bargaining experiment. *Journal of Econometrics*, 153(2):183–195.

Fréchette, G. R., Kagel, J. H., and Lehrer, S. F. (2003). Bargaining in legislatures: An experimental investigation of open versus closed amendment rules. *American Political Science Review*, 97(2):221–232.

Fréchette, G. R., Kagel, J. H., and Morelli, M. (2005c). Gamson's law versus non-cooperative bargaining theory. *Games and Economic Behavior*, 51(2):365–390.

Fréchette, G. R. and Vespa, E. (2017). The determinants of voting in multilateral bargaining games. *Journal of the Economic Science Association*, 3(1):26–43.

Gamson, W. A. (1961). A theory of coalition formation. *American Sociological EReview*, pages 373–382.

Harrington, J. E. (1990). The role of risk preferences in bargaining when acceptance of a proposal requires less than unanimous approval. *Journal of Risk and Uncertainty*, 3(2):135–154.

Herings, P. J. J., Meshalkin, A., and Predtetchinski, A. (2018). Subgame perfect equilibria in majoritarian bargaining. *Journal of Mathematical Economics*, 76:101–112.

Jackson, M. O. and Moselle, B. (2002). Coalition and party formation in a legislative voting game. *Journal of Economic theory*, 103(1):49–87.

Kagel, J. H., Sung, H., and Winter, E. (2010). Veto power in committees: an experimental study. *Experimental Economics*, 13(2):167–188.

Kim, D. G. (2019). One bite at the apple: Legislative bargaining without replacement. Mimeo. Retrieved from `https://kimdukgyoo.github.io/PDFfiles/OneBiteAtTheApple.pdf`. Last accessed December 15, 2019.

Maaser, N., Paetzel, F., and Traub, S. (2019). Power illusion in coalitional bargaining: An experimental analysis. *Games and Economic Behavior*, 117:433–450.

McKelvey, R. D. (1991). An experimental test of a stochastic game model of committee bargaining. In Palfrey, T. R., editor, *Contemporary Laboratory Research in Political Economy*. Ann Arbor: University of Michigan Press.

Miller, L., Montero, M., and Vanberg, C. (2018). Legislative bargaining with heterogeneous disagreement values: Theory and experiments. *Games and Economic Behavior*, 107:60–92.

Miller, L. and Vanberg, C. (2013). Decision costs in legislative bargaining: an experimental analysis. *Public Choice*, 155(3-4):373–394.

Miller, L. and Vanberg, C. (2015). Group size and decision rules in legislative bargaining. *European Journal of Political Economy*, 37:288–302.

Montero, M. (2007). Inequity aversion may increase inequity. *The Economic Journal*, 117(519):C192–C204.

Morelli, M. (1999). Demand competition and policy compromise in legislative bargaining. *American Political Science Review*, 93(4):809–820.

Norman, P. (2002). Legislative bargaining and coalition formation. *Journal of Economic Theory*, 102(2):322–353.

Nunnari, S. and Zapal, J. (2016). Gambler's fallacy and imperfect best response in legislative bargaining. *Games and Economic Behavior*, 99:275–294.

Palfrey, T. R. (2016). Experiments in political economy. In Kagel, J. H. and Roth, A. E., editors, *The Handbook of Experimental Economics*, volume 2, pages 347–434. Princeton University Press.

Roth, A. (1987). Bargaining phenomena and bargaining theory. In Roth, A., editor, *Laboratory Experimentation in Economics: Six Points of View*, pages 14–41. Cambridge University Press Cambridge, UK.

Tversky, A. and Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *science*, 185(4157):1124–1131.

Volden, C. and Wiseman, A. E. (2007). Bargaining in legislatures over particularistic and collective goods. *American Political science review*, 101(1):79–92.

Winter, E. (1996). Voting and vetoing. *American Political Science Review*, 90(4):813–823.

Majoritarian Bargaining over Budgetary Divisions and Policy

Andrzej Baranski (NYUAD) (based on joint work with Nicholas Haas (Aarhus University), and Rebecca Morton)

April 7, 2022

Prepared for Experimental Economics at OSU

Introduction

Motivation

What do legislatures do?

- Budget allocations

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects
- Portfolio Allocation (Parliamentary Democracies)

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects
- Portfolio Allocation (Parliamentary Democracies)
- Gun control laws

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects
- Portfolio Allocation (Parliamentary Democracies)
- Gun control laws
- Immigration policies

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects
- Portfolio Allocation (Parliamentary Democracies)
- Gun control laws
- Immigration policies

These issues can be broadly categorized as:

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects
- Portfolio Allocation (Parliamentary Democracies)
- Gun control laws
- Immigration policies

These issues can be broadly categorized as:

1. **Distributive**: fixed sum of divisible resources to split

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects
- Portfolio Allocation (Parliamentary Democracies)
- Gun control laws
- Immigration policies

These issues can be broadly categorized as:

1. **Distributive**: fixed sum of divisible resources to split

2. **Ideological**: non-divisible choices

Motivation

What do legislatures do?

- Budget allocations
- Funding localized projects
- Portfolio Allocation (Parliamentary Democracies)
- Gun control laws
- Immigration policies

These issues can be broadly categorized as:

1. **Distributive**: fixed sum of divisible resources to split Divergent interests
2. **Ideological**: non-divisible choices may have partially aligned interests

Key question in Political Economy: what is the the interplay between **distributive** and **ideological** choices in collective decision-making?

Approaches to the study of "Pork-Barrel" Politics

(Pork = private benefits . Pork barrel politics = the targeting of spending projects to local constituencies in order to secure a legislators vote on a bill)

Approaches to the study of "Pork-Barrel" Politics

(Pork = private benefits . Pork barrel politics = the targeting of spending projects to local constituencies in order to secure a legislators vote on a bill)

1. **Theoretically:** assume a particular utility function which captures the trade-offs policy vs pork, bargaining protocol, equilibrium derivation

Approaches to the study of "Pork-Barrel" Politics

(Pork = private benefits . Pork barrel politics = the targeting of spending projects to local constituencies in order to secure a legislators vote on a bill)

1. **Theoretically:** assume a particular utility function which captures the trade-offs policy vs pork, bargaining protocol, equilibrium derivation
2. **Empirically:** identify legislators preferences based on voting patterns (PoliSci studies (Evans, 2004; Lazarus, 2018))

Approaches to the study of "Pork-Barrel" Politics

(Pork = private benefits . Pork barrel politics = the targeting of spending projects to local constituencies in order to secure a legislators vote on a bill)

1. **Theoretically:** assume a particular utility function which captures the trade-offs policy vs pork, bargaining protocol, equilibrium derivation
2. **Empirically:** identify legislators preferences based on voting patterns (PoliSci studies (Evans, 2004; Lazarus, 2018))
3. **Laboratory experiments:** Induce preferences over both dimensions (compensate with $ in both dimensions) see Christiansen, Georganas and Kagel (2014, AEJ Micro)

Motivation

Motivation

1. Broad Goal: extend our understanding of how people make choices involving trade-offs between ideological preferences and money

Motivation

1. Broad Goal: extend our understanding of how people make choices involving trade-offs between ideological preferences and money
2. **Methodological Challenge:** How to test political economy models of pork-barreling? (Is money/budget and ideology interchangeable in people's *utility functions*?)

Motivation

1. Broad Goal: extend our understanding of how people make choices involving trade-offs between ideological preferences and money
2. **Methodological Challenge:** How to test political economy models of pork-barreling? (Is money/budget and ideology interchangeable in people's *utility functions*?)
3. Ideally, we want our experiment to explain **naturally-occurring behavior** in the lab as it occurs outside the lab

Motivation

1. Broad Goal: extend our understanding of how people make choices involving trade-offs between ideological preferences and money
2. **Methodological Challenge:** How to test political economy models of pork-barreling? (Is money/budget and ideology interchangeable in people's *utility functions*?)
3. Ideally, we want our experiment to explain **naturally-occurring behavior** in the lab as it occurs outside the lab
4. **External validity:** Decisions in the lab have consequences *in the real world*

General Research Questions and Framework

Framework

General Research Questions and Framework

Framework

- Provide a simple game-theoretic model (based on Jackson and Moselle 2002 JET).

General Research Questions and Framework

Framework

- Provide a simple game-theoretic model (based on Jackson and Moselle 2002 JET).
- Introduce a methodology to measure individual policy-budget trade-offs over *real* ideological issues

General Research Questions and Framework

Framework

- Provide a simple game-theoretic model (based on Jackson and Moselle 2002 JET).
- Introduce a methodology to measure individual policy-budget trade-offs over *real* ideological issues
- Conduct an incentivized laboratory experiment

General Research Questions and Framework

Framework

- Provide a simple game-theoretic model (based on Jackson and Moselle 2002 JET).
- Introduce a methodology to measure individual policy-budget trade-offs over *real* ideological issues
- Conduct an incentivized laboratory experiment

Research Questions

General Research Questions and Framework

Framework

- Provide a simple game-theoretic model (based on Jackson and Moselle 2002 JET).
- Introduce a methodology to measure individual policy-budget trade-offs over *real* ideological issues
- Conduct an incentivized laboratory experiment

Research Questions

1. How are **bargaining outcomes** affected by the interplay between ideological policy choices and sharing of divisible goods?

General Research Questions and Framework

Framework

- Provide a simple game-theoretic model (based on Jackson and Moselle 2002 JET).
- Introduce a methodology to measure individual policy-budget trade-offs over *real* ideological issues
- Conduct an incentivized laboratory experiment

Research Questions

1. How are **bargaining outcomes** affected by the interplay between ideological policy choices and sharing of divisible goods?
2. Can bargaining behavior be **predicted** by behaviorally elicited preferences?

General Research Questions and Framework

Framework

- Provide a simple game-theoretic model (based on Jackson and Moselle 2002 JET).
- Introduce a methodology to measure individual policy-budget trade-offs over *real* ideological issues
- Conduct an incentivized laboratory experiment

Research Questions

1. How are **bargaining outcomes** affected by the interplay between ideological policy choices and sharing of divisible goods?
2. Can bargaining behavior be **predicted** by behaviorally elicited preferences?
3. How does the **ideological composition** of a group affect the agreements it can reach? (Majority versus minority)

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**
   1.1 **Donation task:** to real political interest group

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**
   - 1.1 **Donation task:** to real political interest group
   - 1.2 **Preference intensity measurement:** willingness to sacrifice own monetary holdings to *defend* previously stated ideological preference

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**
   - 1.1 **Donation task:** to real political interest group
   - 1.2 **Preference intensity measurement:** willingness to sacrifice own monetary holdings to *defend* previously stated ideological preference
2. **Bargaining Game:** Three person groups with majority voting rule.

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**
   1.1 **Donation task:** to real political interest group
   1.2 **Preference intensity measurement:** willingness to sacrifice own monetary holdings to *defend* previously stated ideological preference
2. **Bargaining Game:** Three person groups with majority voting rule.
   - Treatment 1: Policy and Budget

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**
   - 1.1 **Donation task:** to real political interest group
   - 1.2 **Preference intensity measurement:** willingness to sacrifice own monetary holdings to *defend* previously stated ideological preference
2. **Bargaining Game:** Three person groups with majority voting rule.
   - Treatment 1: Policy and Budget
   - Treatment 2: Budget Only

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**
   - 1.1 **Donation task:** to real political interest group
   - 1.2 **Preference intensity measurement:** willingness to sacrifice own monetary holdings to *defend* previously stated ideological preference
2. **Bargaining Game:** Three person groups with majority voting rule.
   - Treatment 1: Policy and Budget
   - Treatment 2: Budget Only
   - Treatment 3: Policy Only

Overview Our Experiment

Our experiment consists of the following stages:

1. **Behavioral Elicitation of ideological peak preference:**
   - 1.1 **Donation task:** to real political interest group
   - 1.2 **Preference intensity measurement:** willingness to sacrifice own monetary holdings to *defend* previously stated ideological preference
2. **Bargaining Game:** Three person groups with majority voting rule.
   - Treatment 1: Policy and Budget - Full Information
   - Treatment 2: Budget Only - Full Information
   - Treatment 3: Policy Only - Full Information
   - Treatment 4: Budget Only - No Information

Related Literature

Related Literature: Multilateral Strategic Bargaining Theory

1. Budgetary Division: Predict proposer power and minimal winning coalitions
    - Baron and Ferejohn (BF) (1989 APSR): Indefinitely repeated divide-the-dollar game with random proposer selection.

Related Literature: Multilateral Strategic Bargaining Theory

1. Budgetary Division: Predict proposer power and minimal winning coalitions
    - Baron and Ferejohn (BF) (1989 APSR): Indefinitely repeated divide-the-dollar game with random proposer selection.
    - Extensions: Merlo and Wilson (1995 Ecta), Eraslan (2002 JET), Yildirim (2007 JET)

Related Literature: Multilateral Strategic Bargaining Theory

1. Budgetary Division: Predict proposer power and minimal winning coalitions
    - Baron and Ferejohn (BF) (1989 APSR): Indefinitely repeated divide-the-dollar game with random proposer selection.
    - Extensions: Merlo and Wilson (1995 Ecta), Eraslan (2002 JET), Yildirim (2007 JET)
2. Multi-dimensional Bargaining Space: Players forgo benefits in one dimension to reap them in another
    - Banks and Duggan (2000 APSR): Extend BF and allow for policy choice in a bicameral system
    - Jackson and Moselle (JET 2002): Extend BF to One-dimensional policy & budget division
    - Volden and Wiseman (2007 APSR): Bargaining in Legislatures over Particularistic and Collective Goods

Experimental Literature

1. **Divide the dollar:** Meta-analysis (Baranski and Morton 2021 Exp Econ)
    - Proposer power is moderate, well below predictions
    - Minimum Winning Coalitions are modal but not universal (68% in groups of 3)

Experimental Literature

1. **Divide the dollar:** Meta-analysis (Baranski and Morton 2021 Exp Econ)
    - Proposer power is moderate, well below predictions
    - Minimum Winning Coalitions are modal but not universal (68% in groups of 3)
2. **Divide-the-dollar and Policy:** Christiansen, Georganas, and Kagel (2014 AEJ Micro) test Jackson and Moselle (2002)
    - **Induced preferences** over location of a facility in the policy line
    - Find evidence for private goods facilitating compromise and increase the likelihood of proposals passing

Preference Elicitation

Typical approach of measuring ideology using stated beliefs may not capture underlying population preferences (Quarfoot et al. 2017)

- **Low stakes** $\rightarrow$ higher risks of satisficing, providing a socially desirable answer, "guessing" on issues about which one is not knowledgeable (Krosnick, 1988; Haas and Morton 2018)

Preference Elicitation

Typical approach of measuring ideology using stated beliefs may not capture underlying population preferences (Quarfoot et al. 2017)

- **Low stakes** $\rightarrow$ higher risks of satisficing, providing a socially desirable answer, "guessing" on issues about which one is not knowledgeable (Krosnick, 1988; Haas and Morton 2018)

We use a validated behavioral, revealed preference measure introduced by Haas and Morton (2018)

Preference Elicitation

Typical approach of measuring ideology using stated beliefs may not capture underlying population preferences (Quarfoot et al. 2017)

- **Low stakes** $\rightarrow$ higher risks of satisficing, providing a socially desirable answer, "guessing" on issues about which one is not knowledgeable (Krosnick, 1988; Haas and Morton 2018)

We use a validated behavioral, revealed preference measure introduced by Haas and Morton (2018)

- Donation method designed to raise stakes, and evidence indicates it reduces social desirability bias

Preference Elicitation

Typical approach of measuring ideology using stated beliefs may not capture underlying population preferences (Quarfoot et al. 2017)

- **Low stakes** $\rightarrow$ higher risks of satisficing, providing a socially desirable answer, "guessing" on issues about which one is not knowledgeable (Krosnick, 1988; Haas and Morton 2018)

We use a validated behavioral, revealed preference measure
introduced by Haas and Morton (2018)

- Donation method designed to raise stakes, and evidence indicates it reduces social desirability bias
- We extend method in particular by measuring both preference strength and direction, further raising stakes

Theoretical Model

The Bargaining Game we Test: Players, choices, and Preferences

A one-round version of Jackson and Moselle (2002)

- Committee of three players: $i \in \{1, 2, 3\}$

The Bargaining Game we Test: Players, choices, and Preferences

A one-round version of Jackson and Moselle (2002)

- Committee of three players: $i \in \{1, 2, 3\}$
- Three possible policy choices $Y^j : j \in \{L, M, R\}$

The Bargaining Game we Test: Players, choices, and Preferences

A one-round version of Jackson and Moselle (2002)

- Committee of three players: $i \in \{1, 2, 3\}$
- Three possible policy choices $Y^j : j \in \{L, M, R\}$
- Each player has a most preferred policy $\hat{Y}_i$ with utility normalized at 0 at that choice

The Bargaining Game we Test: Players, choices, and Preferences

A one-round version of Jackson and Moselle (2002)

- Committee of three players: $i \in \{1, 2, 3\}$
- Three possible policy choices $Y^j : j \in \{L, M, R\}$
- Each player has a most preferred policy $\hat{Y}_i$ with utility normalized at 0 at that choice
- Players receive disutility when the policy is not at their peak

The Bargaining Game we Test: Players, choices, and Preferences

A one-round version of Jackson and Moselle (2002)

- Committee of three players: $i \in \{1, 2, 3\}$
- Three possible policy choices $Y^j : j \in \{L, M, R\}$
- Each player has a most preferred policy $\hat{Y}_i$ with utility normalized at 0 at that choice
- Players receive disutility when the policy is not at their peak
- Define $MAA_i^{j \to j'}$ as the disutility that player i receives from policy j' when her peak is at j.

The Bargaining Game we Test: Players, choices, and Preferences

A one-round version of Jackson and Moselle (2002)

- Committee of three players: $i \in \{1, 2, 3\}$
- Three possible policy choices $Y^j : j \in \{L, M, R\}$
- Each player has a most preferred policy $\hat{Y}_i$ with utility normalized at 0 at that choice
- Players receive disutility when the policy is not at their peak
- Define $MAA_i^{j \to j'}$ as the disutility that player i receives from policy j' when her peak is at j.
- (Label comes from **M**inimum **A**cceptable **A**mount (We measure this in the elicitation task)

The Bargaining Game we Test: Players, choices, and Preferences

A one-round version of Jackson and Moselle (2002)

- Committee of three players: $i \in \{1, 2, 3\}$
- Three possible policy choices $Y^j : j \in \{L, M, R\}$
- Each player has a most preferred policy $\hat{Y}_i$ with utility normalized at 0 at that choice
- Players receive disutility when the policy is not at their peak
- Define $MAA_i^{j \to j'}$ as the disutility that player i receives from policy j' when her peak is at j.
- (Label comes from **M**inimum **A**cceptable **A**mount (We measure this in the elicitation task)
- $u_i(x, Y^j | \hat{Y}_i) = \begin{cases} x & \text{if} \quad Y^j = \hat{Y}_i \\ x - MAA_i^{j \to j'} & \text{if} \quad Y^j \neq \hat{Y}_i \end{cases}$ where x is money

Bargaining Protocol (same as experiment)

For two-dimensional bargaining space with common knowledge of preferences

- Proposal stage: Each player submits a proposal consisting of a vector of transfers and a policy choice

Bargaining Protocol (same as experiment)

For two-dimensional bargaining space with common knowledge of preferences

- Proposal stage: Each player submits a proposal consisting of a vector of transfers and a policy choice
- Voting stage: Each player submits a voting decision consisting of the **V**oting **T**hreshold (VT) in order to vote in favor for each possible policy option

Bargaining Protocol (same as experiment)

For two-dimensional bargaining space with common knowledge of preferences

- Proposal stage: Each player submits a proposal consisting of a vector of transfers and a policy choice
- Voting stage: Each player submits a voting decision consisting of the **V**oting **T**hreshold (VT) in order to vote in favor for each possible policy option
- Implementation: One proposal is selected at random and votes are calculated

Bargaining Protocol (same as experiment)

For two-dimensional bargaining space with common knowledge of preferences

- Proposal stage: Each player submits a proposal consisting of a vector of transfers and a policy choice
- Voting stage: Each player submits a voting decision consisting of the **V**oting **T**hreshold (VT) in order to vote in favor for each possible policy option
- Implementation: One proposal is selected at random and votes are calculated
- Agreement leads to realization of payoffs (2 out of 3 votes)

Bargaining Protocol (same as experiment)

For two-dimensional bargaining space with common knowledge of preferences

- Proposal stage: Each player submits a proposal consisting of a vector of transfers and a policy choice
- Voting stage: Each player submits a voting decision consisting of the **V**oting **T**hreshold (VT) in order to vote in favor for each possible policy option
- Implementation: One proposal is selected at random and votes are calculated
- Agreement leads to realization of payoffs (2 out of 3 votes)
- Disagreement leads vanishing budget ($x = 0$) and status quo $Y = \mathring{Y}$.

Bargaining Protocol (same as experiment)

For two-dimensional bargaining space with common knowledge of preferences

- Proposal stage: Each player submits a proposal consisting of a vector of transfers and a policy choice
- Voting stage: Each player submits a voting decision consisting of the **V**oting **T**hreshold (VT) in order to vote in favor for each possible policy option
- Implementation: One proposal is selected at random and votes are calculated
- Agreement leads to realization of payoffs (2 out of 3 votes)
- Disagreement leads vanishing budget ($x = 0$) and status quo $Y = \mathring{Y}$.
- Common knowledge of preferences: MAA, peak prefs ($\hat{Y}$), and $Y = \mathring{Y}$

Bargaining Protocol (same as experiment)

For two-dimensional bargaining space with common knowledge of preferences

- Proposal stage: Each player submits a proposal consisting of a vector of transfers and a policy choice
- Voting stage: Each player submits a voting decision consisting of the **V**oting **T**hreshold (VT) in order to vote in favor for each possible policy option
- Implementation: One proposal is selected at random and votes are calculated
- Agreement leads to realization of payoffs (2 out of 3 votes)
- Disagreement leads vanishing budget ($x = 0$) and status quo $Y = \mathring{Y}$.
- Common knowledge of preferences: MAA, peak prefs ($\hat{Y}$), and $Y = \mathring{Y}$

Bargaining space and information varies by treatment.

Theoretical Predictions

Preliminaries

We focus on majority-minority groups: 2 players share a peak preferences.

Preliminaries

We focus on majority-minority groups: 2 players share a peak preferences. Equilibrium Concept: Subgame Perfect Nash Equilibrium

Preliminaries

We focus on majority-minority groups: 2 players share a peak preferences. Equilibrium Concept: Subgame Perfect Nash Equilibrium

- Intuition for optimal proposal: combination of policy and budget shares that maximize own utility subject to the voting constraint

Preliminaries

We focus on majority-minority groups: 2 players share a peak preferences. Equilibrium Concept: Subgame Perfect Nash Equilibrium

- Intuition for optimal proposal: combination of policy and budget shares that maximize own utility subject to the voting constraint
- Marjority rule: At least one other member must be weakly better off compared to the *outside option*

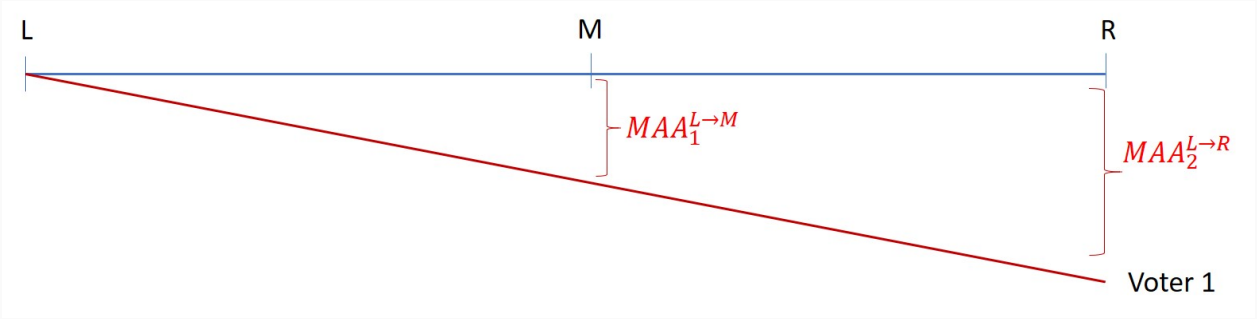
Preliminaries

We focus on majority-minority groups: 2 players share a peak preferences. Equilibrium Concept: Subgame Perfect Nash Equilibrium

- Intuition for optimal proposal: combination of policy and budget shares that maximize own utility subject to the voting constraint
- Marjority rule: At least one other member must be weakly better off compared to the *outside option*
- Voting: A player at or above her continuation value votes in favor

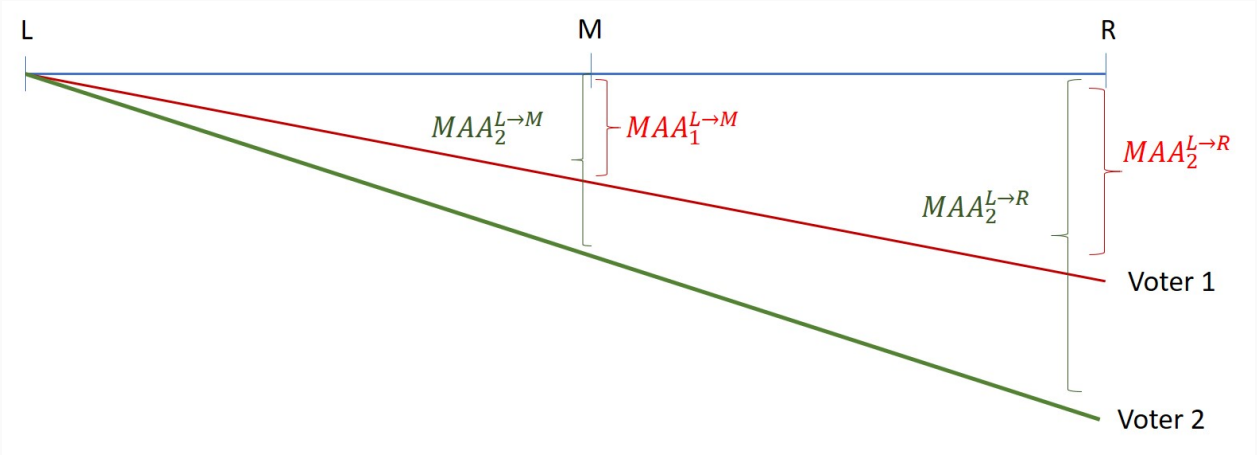
Example: Minority Proposer

Consider Voter 1 with peak at L



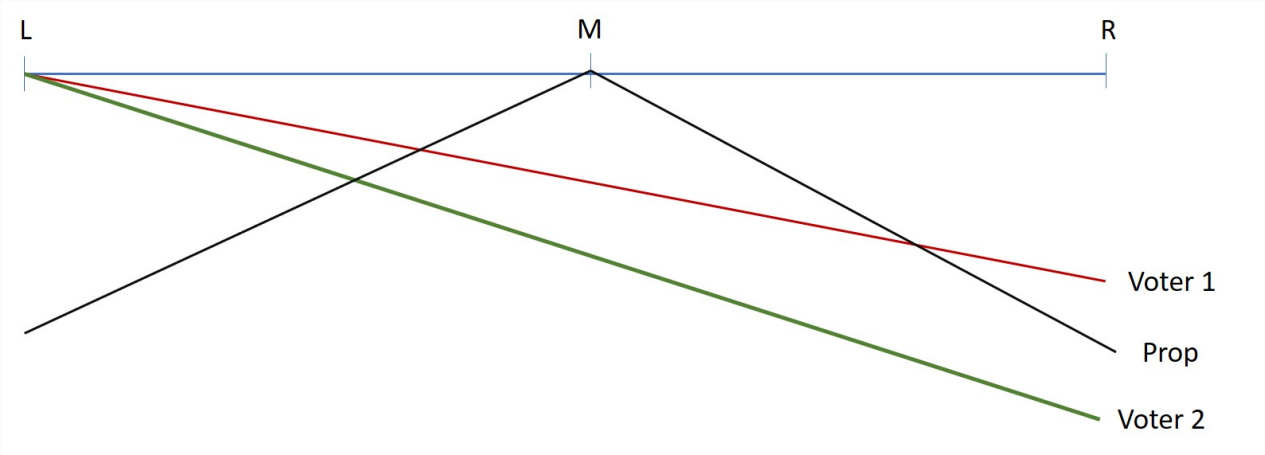
Example: Minority Proposer

Consider Voter 2 with peak at L, stronger prefs than Voter 1



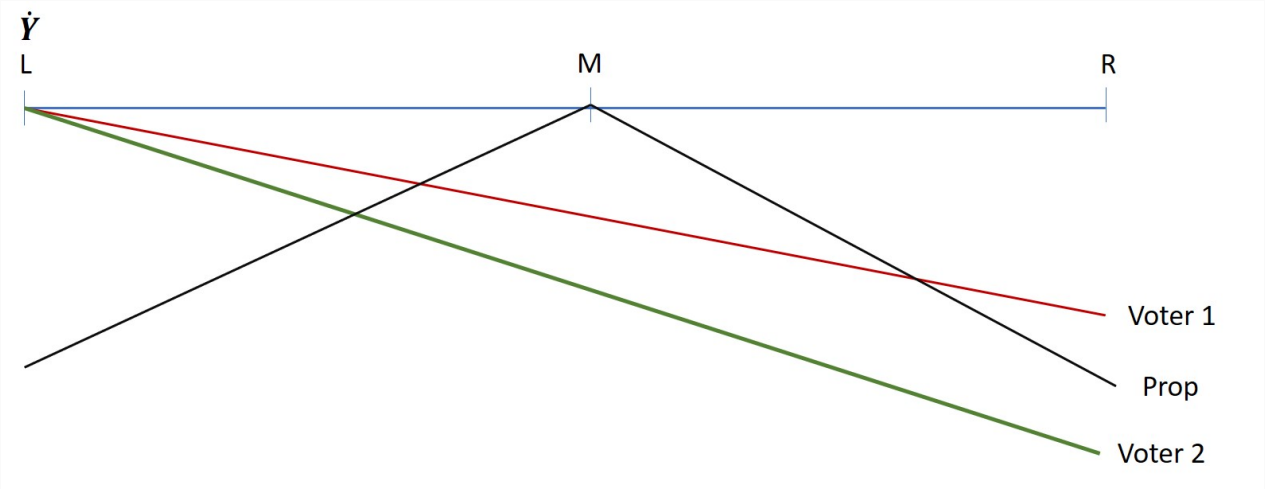
Example: Minority Proposer

Consider a proposer with peak at M



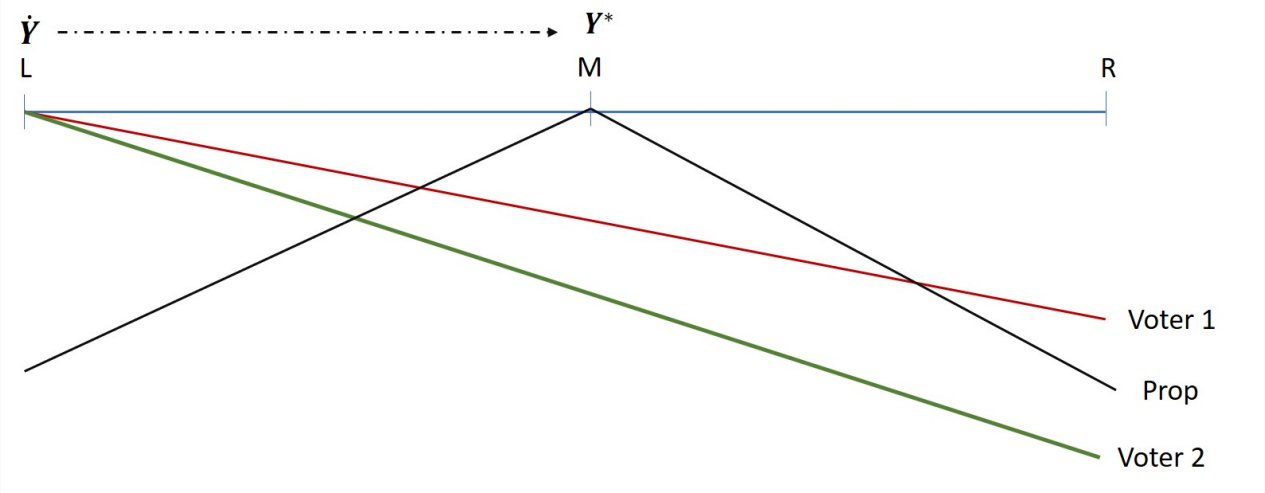
Example: Minority Proposer

Consider the status quo at L, where the majority are



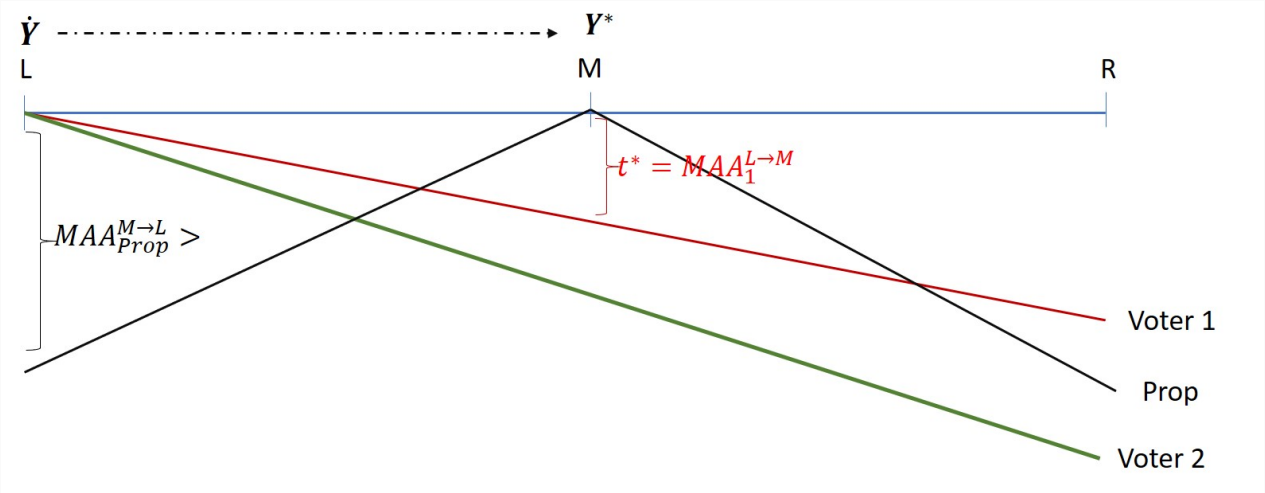
Example: Minority Proposer

The proposer will choose her preferred policy M



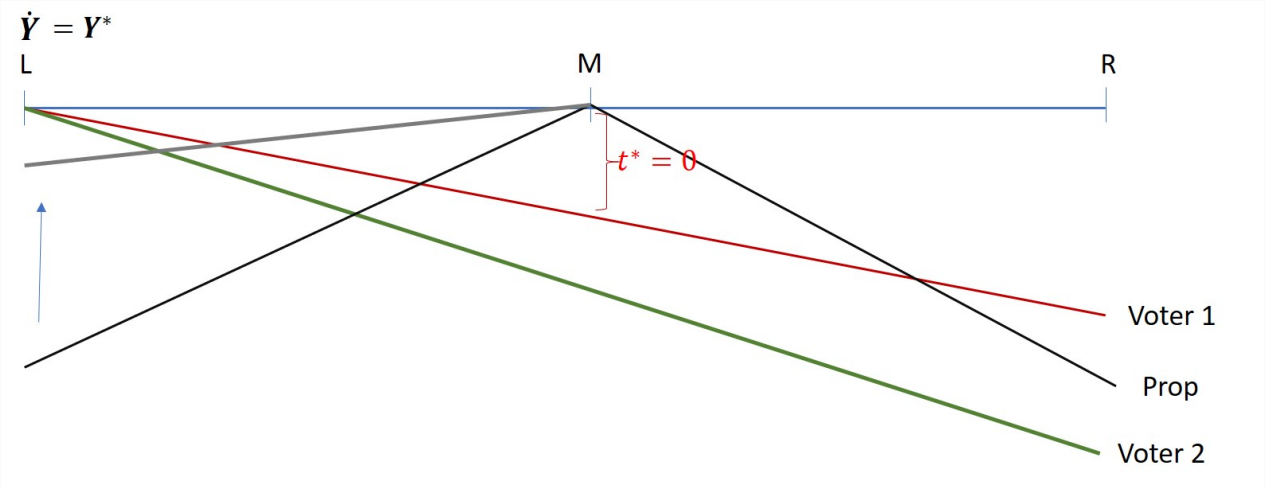
Example: Minority Proposer

Will transfer t^* to voter 1, the cheapest voter. The money paid is less than the disutility of L.

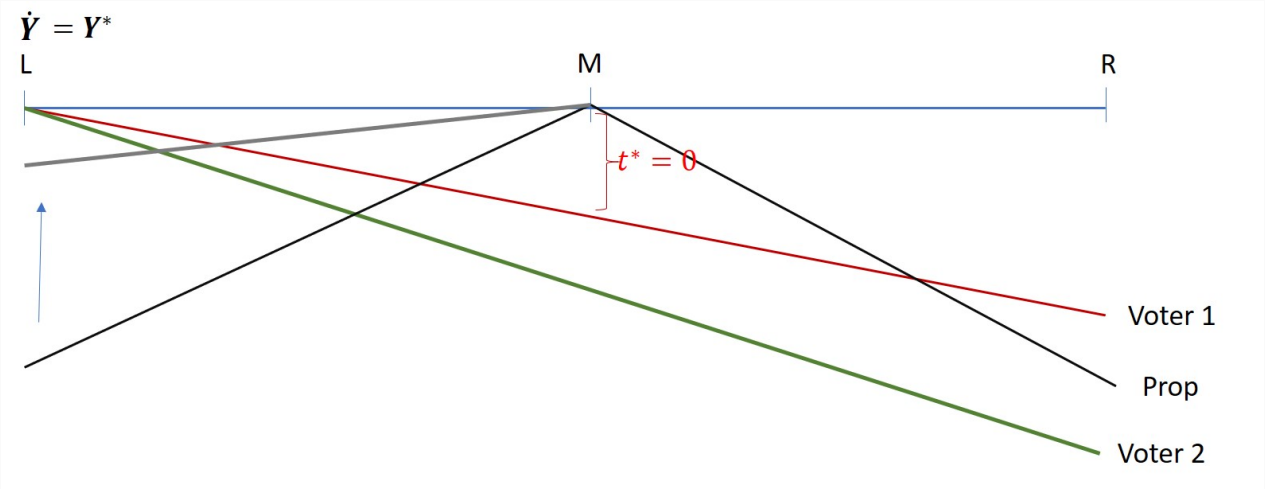


Example: Minority Proposer

What if the proposer has weaker preferences? She leaves the policy at L and transfers $t^* = 0$.



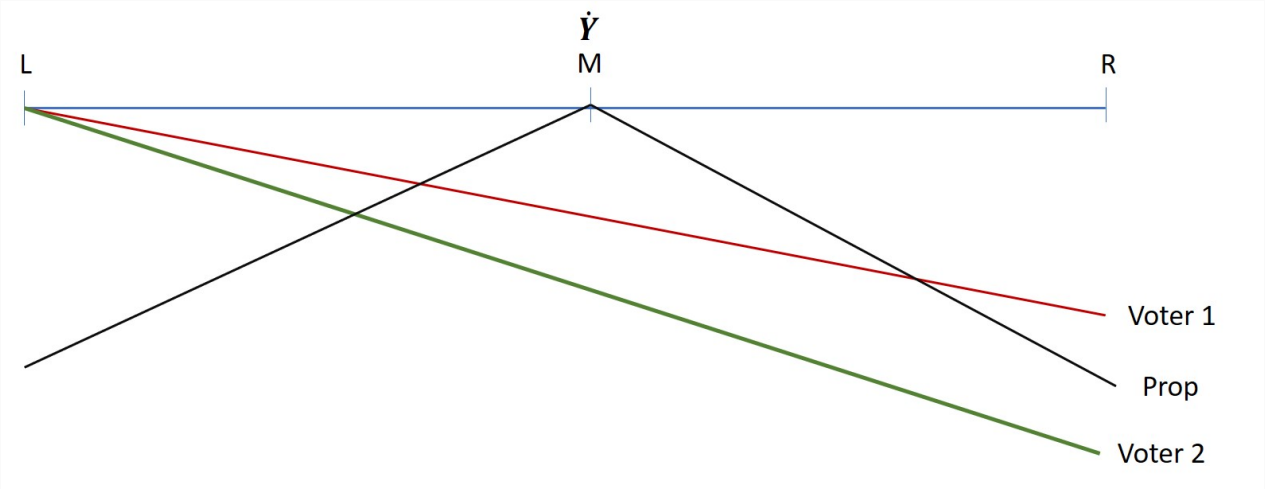
Example: Minority Proposer



Minority players compromise depending on their preferences relative to the majority players.

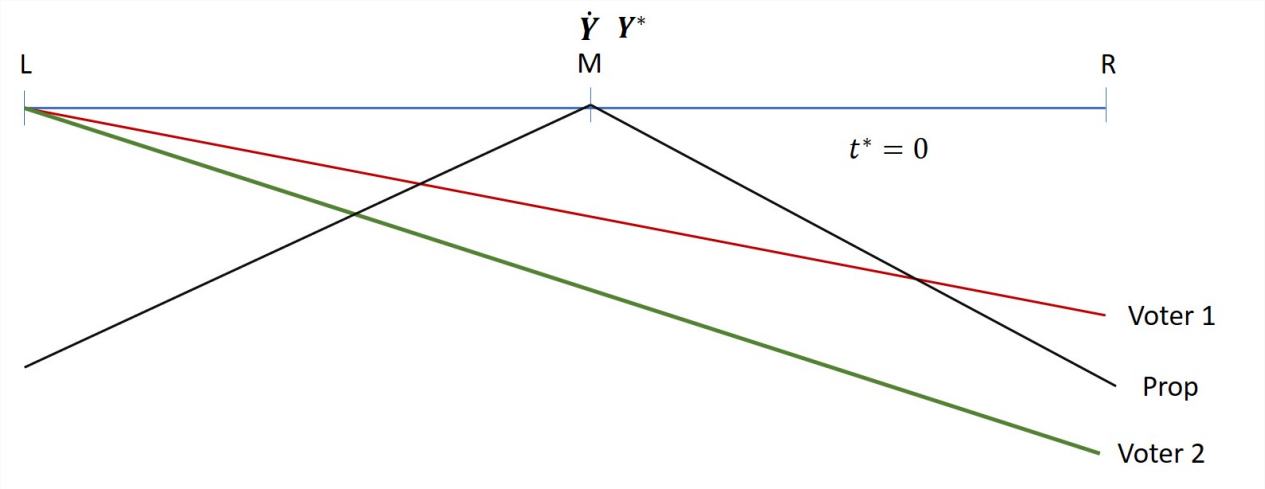
Status Quo Advantage

Now consider when then Status Quo is the Minority Player's peak.



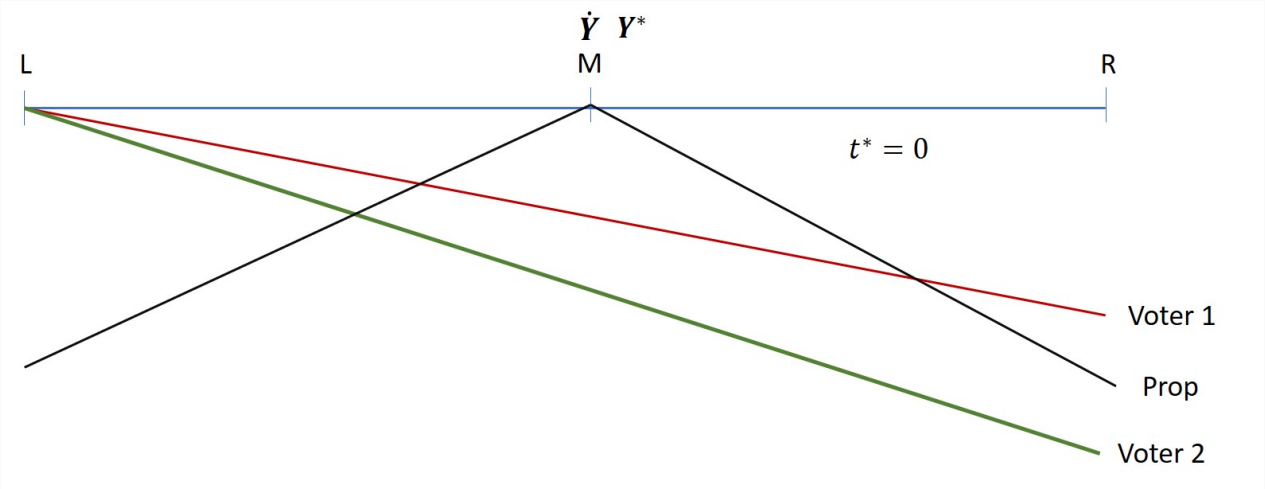
Status Quo Advantage

Now consider when then Status Quo is the Minority Player's peak.



Status Quo Advantage

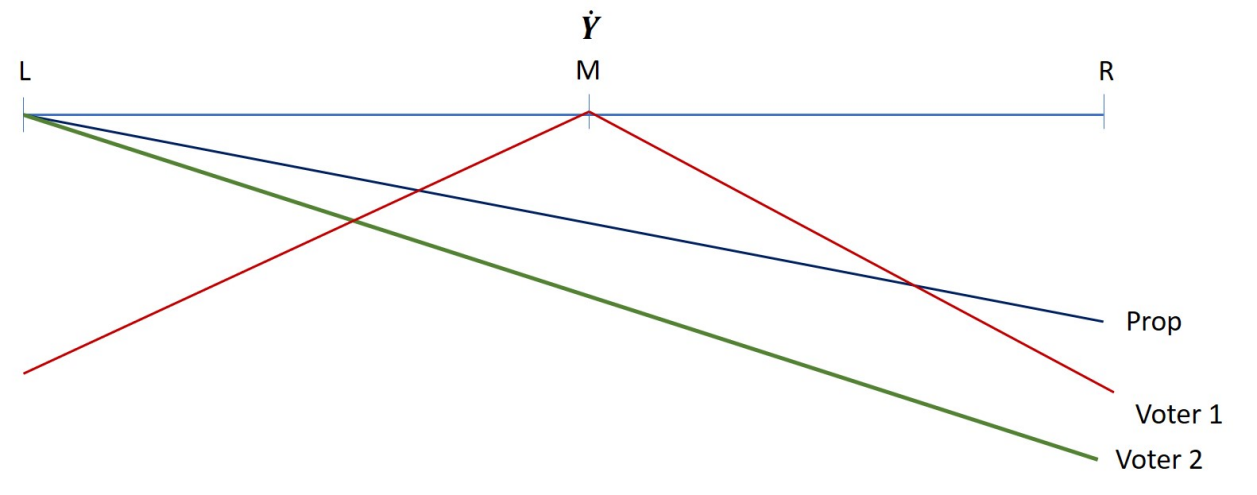
Now consider when then Status Quo is the Minority Player's peak.



A player whose peak preference is the status keeps all the budget and choose their own policy.

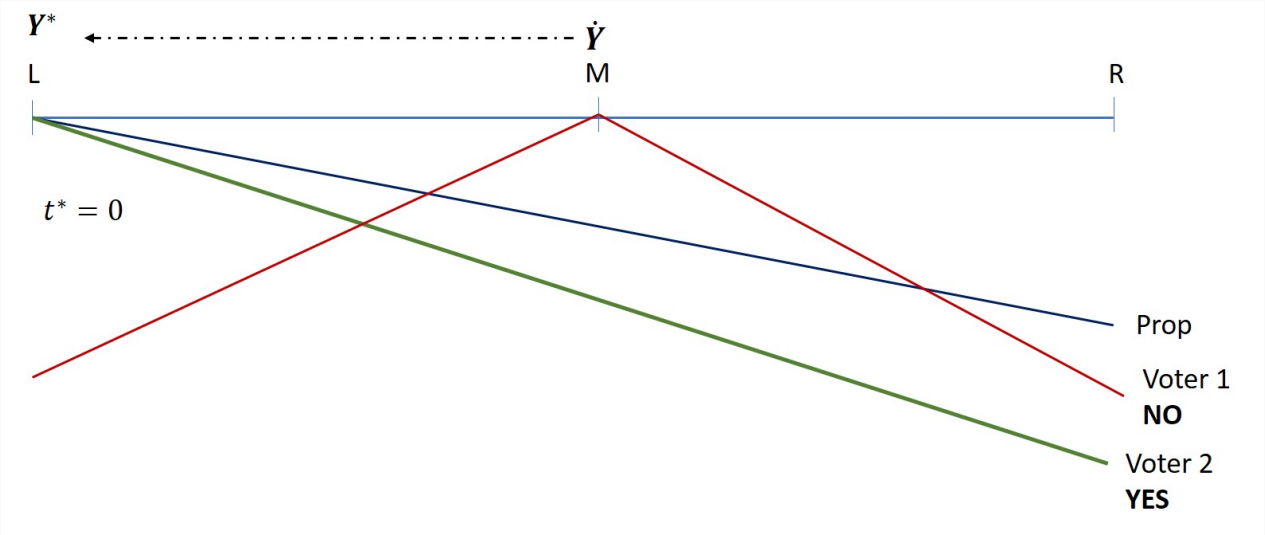
Majority Advantage

Now consider when the proposer is part of the ideological majority.



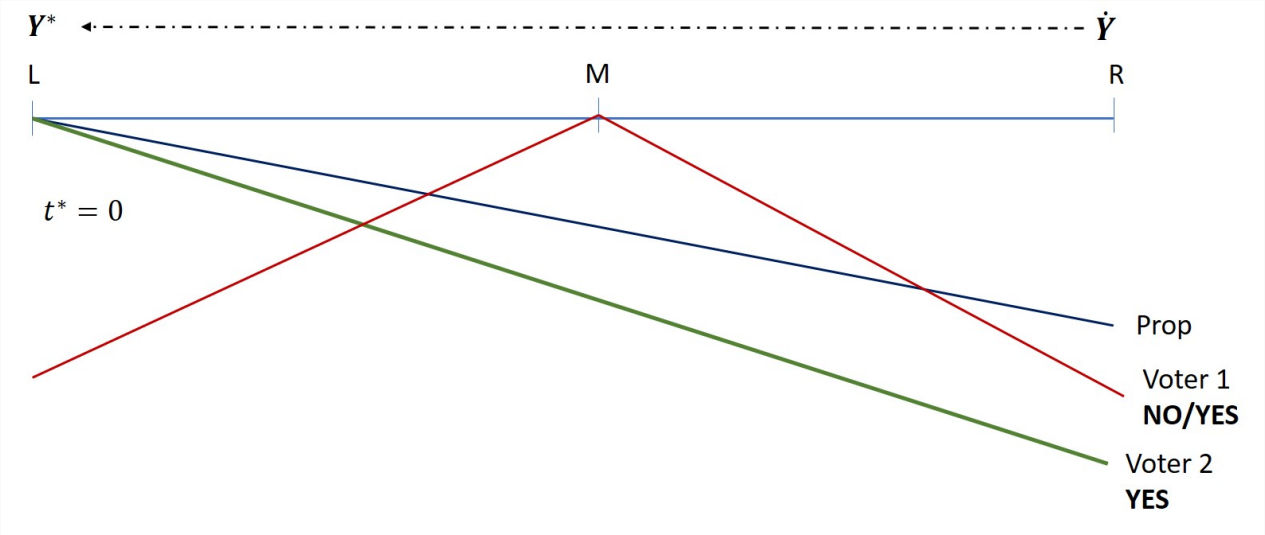
Majority Advantage

If status quo is the Middle: Bring policy to L and obtain voter 2's approval.



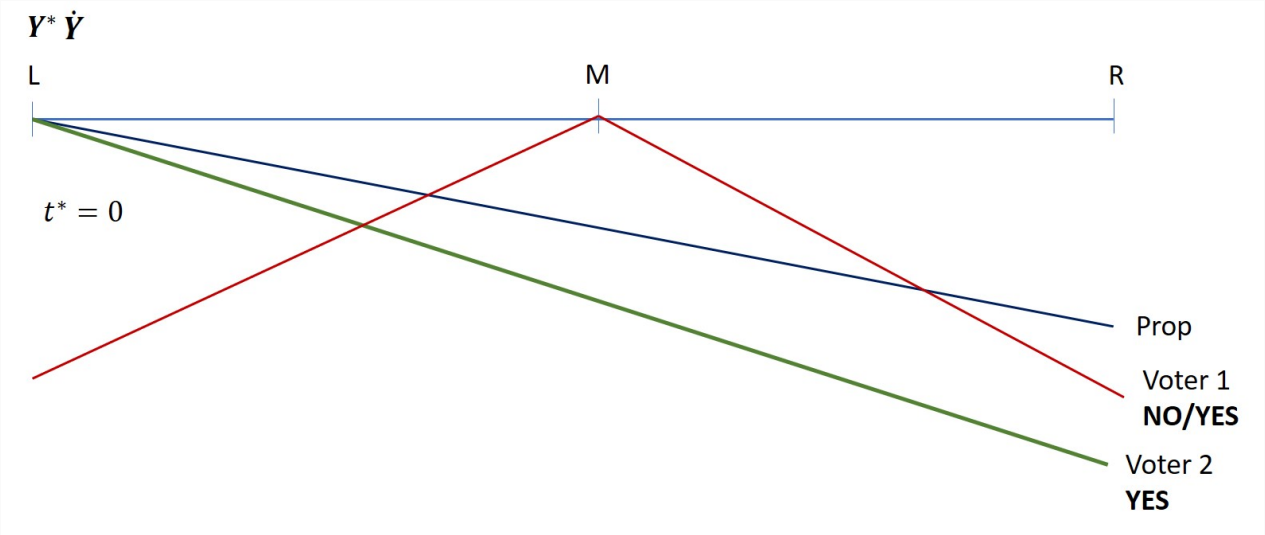
Majority Advantage

If status quo is the Right: Bring policy to L and obtain voter 2's approval. Voter 1's approval depends on her prefs

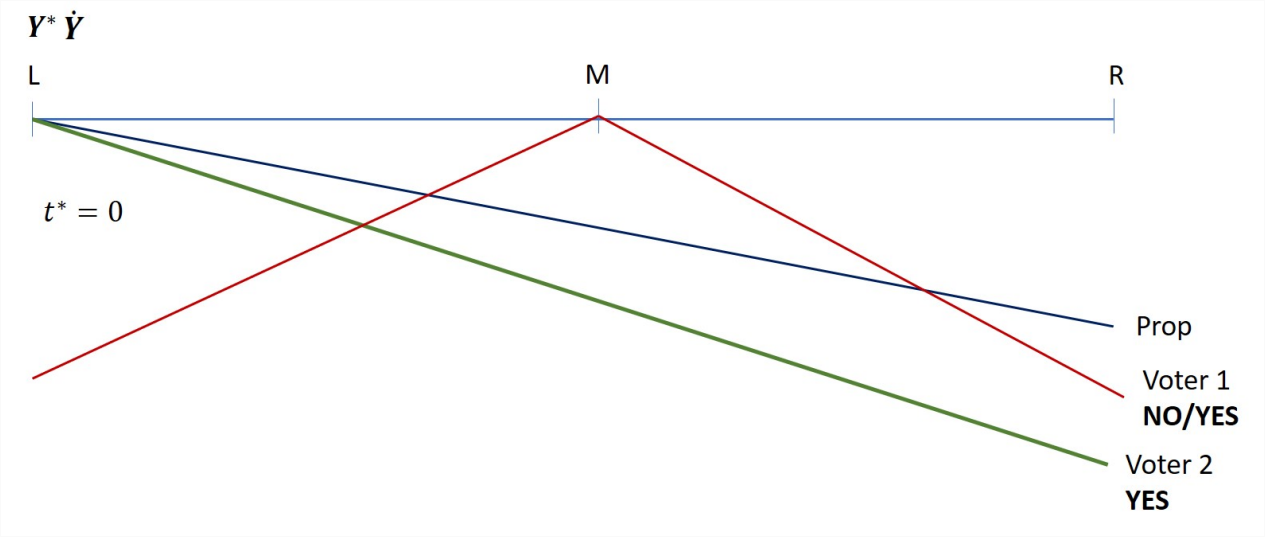


Majority Advantage

If status quo is Left: Keep it there.



Majority Advantage



Majority players keep all the budget and choose their own policy.

Summary Theoretical Benchmarks

	Status Quo	
	Own Policy	**Other**
In Majority	keep \$10, own policy	keep \$10, own policy
In Minority	keep \$10, own policy	Depends on Relative MAAs

Experimental Design

Experimental Design: Ideal Policy Elicitation

Identifying the ideal policy for each subject: we operationalize the ideological spectrum with political interest groups

- Subjects are shown the names and official descriptions of three interest groups for a given topic and asked to make a $1 donation

Experimental Design: Ideal Policy Elicitation

Identifying the ideal policy for each subject: we operationalize the ideological spectrum with political interest groups

- Subjects are shown the names and official descriptions of three interest groups for a given topic and asked to make a $1 donation
- Interest groups have different ideological stances and can be ordered on the **left, middle, right** ideological spectrum

Experimental Design: Ideal Policy Elicitation

Identifying the ideal policy for each subject: we operationalize the ideological spectrum with political interest groups

- Subjects are shown the names and official descriptions of three interest groups for a given topic and asked to make a $1 donation
- Interest groups have different ideological stances and can be ordered on the **left, middle, right** ideological spectrum
- Topics: Gun control, welfare, taxes, immigration

Experimental Design: Ideal Policy Elicitation

Identifying the ideal policy for each subject: we operationalize the ideological spectrum with political interest groups

- Subjects are shown the names and official descriptions of three interest groups for a given topic and asked to make a $1 donation
- Interest groups have different ideological stances and can be ordered on the **left, middle, right** ideological spectrum
- Topics: Gun control, welfare, taxes, immigration
- **Donation:** subjects chose one of three groups for the experimenter to donate $1 on their behalf.

Experimental Design: Ideal Policy Elicitation

Identifying the ideal policy for each subject: we operationalize the ideological spectrum with political interest groups

- Subjects are shown the names and official descriptions of three interest groups for a given topic and asked to make a $1 donation
- Interest groups have different ideological stances and can be ordered on the **left, middle, right** ideological spectrum
- Topics: Gun control, welfare, taxes, immigration
- **Donation:** subjects chose one of three groups for the experimenter to donate $1 on their behalf.
- Example with gun control: Coalition to Stop Gun Violence on left, The American Security Project in middle, National Rifle Association on right

Experimental Design: Ideal Policy Elicitation

Identifying the ideal policy for each subject: we operationalize the ideological spectrum with political interest groups

- Subjects are shown the names and official descriptions of three interest groups for a given topic and asked to make a $1 donation
- Interest groups have different ideological stances and can be ordered on the **left, middle, right** ideological spectrum
- Topics: Gun control, welfare, taxes, immigration
- **Donation:** subjects chose one of three groups for the experimenter to donate $1 on their behalf.
- Example with gun control: Coalition to Stop Gun Violence on left, The American Security Project in middle, National Rifle Association on right
- With this exercise we identify subjects' preferred policies

Experimental Design: Ideal Policy Elicitation

Identifying the ideal policy for each subject: we operationalize the ideological spectrum with political interest groups

- Subjects are shown the names and official descriptions of three interest groups for a given topic and asked to make a $1 donation
- Interest groups have different ideological stances and can be ordered on the **left, middle, right** ideological spectrum
- Topics: Gun control, welfare, taxes, immigration
- **Donation:** subjects chose one of three groups for the experimenter to donate $1 on their behalf.
- Example with gun control: Coalition to Stop Gun Violence on left, The American Security Project in middle, National Rifle Association on right
- With this exercise we identify subjects' preferred policies
- Exercise repeated for each of four topics, with one choice per subject implemented at random

Topics and Interest Groups: Table Shown to Subjects

Topic	Ideological Location of Interest Group		
	Ideologically Democrat (Left)	**Ideologically Independent (Middle)**	**Ideologically Republican (Right)**
Taxes	Citizens for Tax Justice	The Tax Foundation	Americans for Tax Reform
Welfare	Center for American Progress	Child Welfare League of America	Heritage Foundation
Immigration	American Immigration Council	The Migration Policy Institute	Negative Population Growth
Guns	Coalition to Stop Gun Violence	The American Security Project	National Rifle Association

Experimental Design: Elicitation of MAA

Identifying preference strength: How much money are subjects willing to sacrifice in order to defend their ideal policy?

- Subjects were shown their preferred group on a topic & asked for the MAA between \$0 and \$5 to be given to them so that they would be okay with the experimenter donating \$100 to each of the alternative interest groups.

Experimental Design: Elicitation of MAA

Identifying preference strength: How much money are subjects willing to sacrifice in order to defend their ideal policy?

- Subjects were shown their preferred group on a topic & asked for the MAA between \$0 and \$5 to be given to them so that they would be okay with the experimenter donating \$100 to each of the alternative interest groups.
- Computer drew a number p in same interval

Experimental Design: Elicitation of MAA

Identifying preference strength: How much money are subjects willing to sacrifice in order to defend their ideal policy?

- Subjects were shown their preferred group on a topic & asked for the MAA between \$0 and \$5 to be given to them so that they would be okay with the experimenter donating \$100 to each of the alternative interest groups.
- Computer drew a number p in same interval
- If $p \geq MAA$ then subject receives p donation made to non-preferred group

Experimental Design: Elicitation of MAA

Identifying preference strength: How much money are subjects willing to sacrifice in order to defend their ideal policy?

- Subjects were shown their preferred group on a topic & asked for the MAA between \$0 and \$5 to be given to them so that they would be okay with the experimenter donating \$100 to each of the alternative interest groups.
- Computer drew a number p in same interval
- If $p \geq MAA$ then subject receives p donation made to non-preferred group
- Otherwise subject received \$0 and donation made to preferred group.

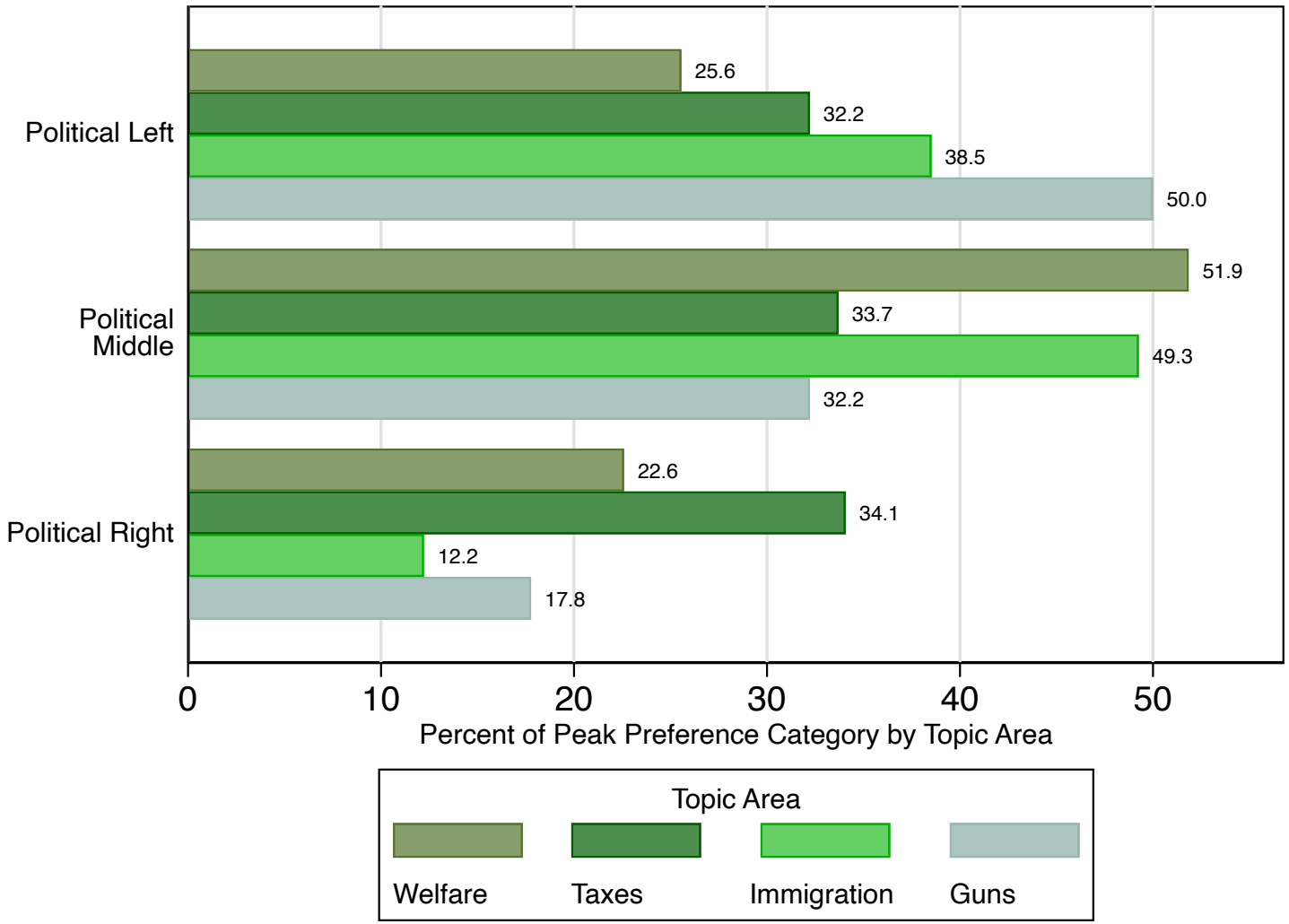
Experimental Design: Elicitation of MAA

Identifying preference strength: How much money are subjects willing to sacrifice in order to defend their ideal policy?

- Subjects were shown their preferred group on a topic & asked for the MAA between \$0 and \$5 to be given to them so that they would be okay with the experimenter donating \$100 to each of the alternative interest groups.
- Computer drew a number p in same interval
- If $p \geq MAA$ then subject receives p donation made to non-preferred group
- Otherwise subject received \$0 and donation made to preferred group.
- One person's decision per session counted for payment

Subjects knew another stage of the experiment followed, but were not aware of what it was about.

Peak Preferences in our Sample



Attitudinal Strength of Preferences in our Sample

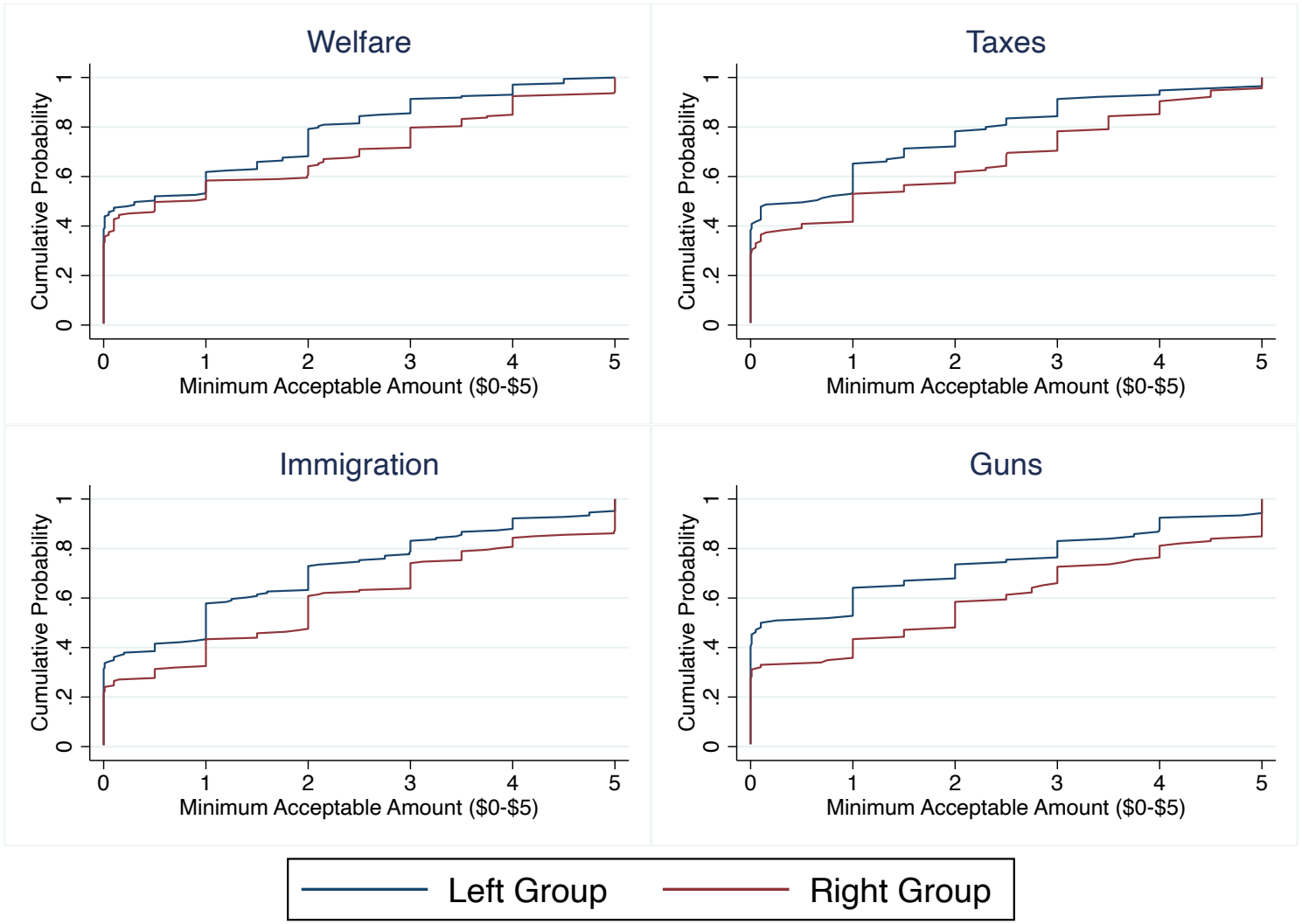


Figure 1: CDF of MAA for Subjects with Peak in the Middle

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** $10 to divide

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** $10 to divide
- **Policy choice:** $100 donation to one interest group

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** $10 to divide
- **Policy choice:** $100 donation to one interest group
- 8 games with **random rematching**, each topic played twice

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** \$10 to divide
- **Policy choice:** \$100 donation to one interest group
- 8 games with **random rematching**, each topic played twice
- Voting threshold (**VT**): each subject states the lowest amount she is willing to accept to vote in favor (1 VT for each donation choice)

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** \$10 to divide
- **Policy choice:** \$100 donation to one interest group
- 8 games with **random rematching**, each topic played twice
- Voting threshold (**VT**): each subject states the lowest amount she is willing to accept to vote in favor (1 VT for each donation choice)
- Random proposal selection, then votes are implemented

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** \$10 to divide
- **Policy choice:** \$100 donation to one interest group
- 8 games with **random rematching**, each topic played twice
- Voting threshold (**VT**): each subject states the lowest amount she is willing to accept to vote in favor (1 VT for each donation choice)
- Random proposal selection, then votes are implemented
- **Rejection:** \$10 vanish and \$100 go to status quo

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** \$10 to divide
- **Policy choice:** \$100 donation to one interest group
- 8 games with **random rematching**, each topic played twice
- Voting threshold (**VT**): each subject states the lowest amount she is willing to accept to vote in favor (1 VT for each donation choice)
- Random proposal selection, then votes are implemented
- **Rejection:** \$10 vanish and \$100 go to status quo
- Games 1-4 **status quo** was group median preference, 5-8 non-median preference

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** \$10 to divide
- **Policy choice:** \$100 donation to one interest group
- 8 games with **random rematching**, each topic played twice
- Voting threshold (**VT**): each subject states the lowest amount she is willing to accept to vote in favor (1 VT for each donation choice)
- Random proposal selection, then votes are implemented
- **Rejection:** \$10 vanish and \$100 go to status quo
- Games 1-4 **status quo** was group median preference, 5-8 non-median preference

Only one group per session was selected for payment. (Too expensive to pay all for 1 period!)

Treatment 1: Budget and Policy Bargaining Game

- **Budget:** \$10 to divide
- **Policy choice:** \$100 donation to one interest group
- 8 games with **random rematching**, each topic played twice
- Voting threshold (**VT**): each subject states the lowest amount she is willing to accept to vote in favor (1 VT for each donation choice)
- Random proposal selection, then votes are implemented
- **Rejection:** \$10 vanish and \$100 go to status quo
- Games 1-4 **status quo** was group median preference, 5-8 non-median preference

Only one group per session was selected for payment. (Too expensive to pay all for 1 period!) Other aspects: \$8 show up fee + other fixed payments + earnings

Results of Policy and Budget Treatment

Hypothesis 1: Policy and Budget Trade-off

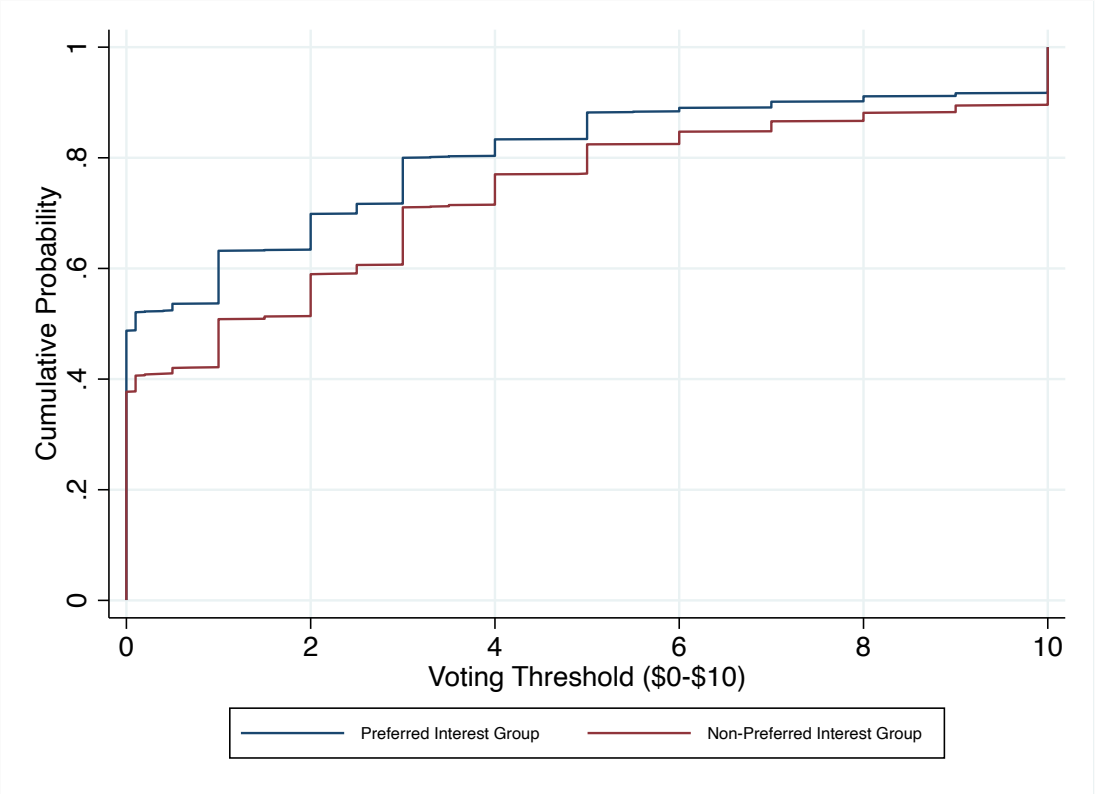
Hypothesis 1

In the Policy and Budget Treatment (Treatment 1), players are willing to accept a smaller share of the budget when the policy is their preferred one and demand a larger share for alternative policies.

Hypothesis 1: Policy and Budget Trade-off

Hypothesis 1

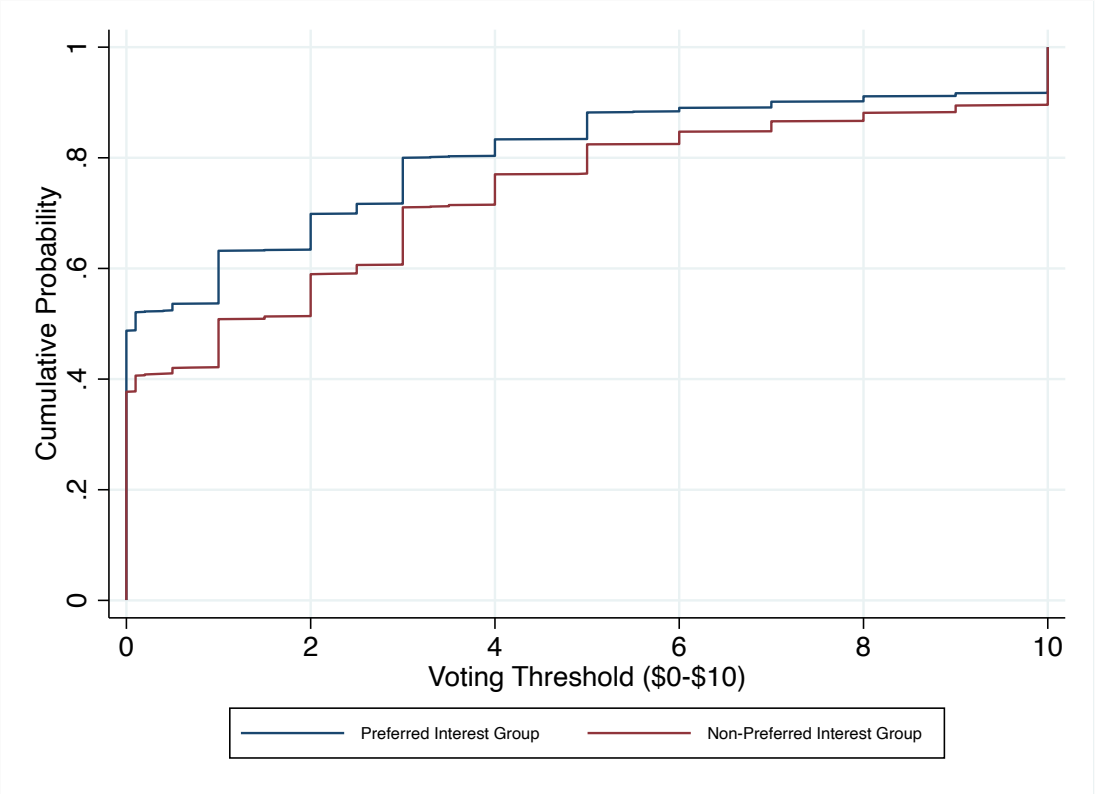
In the Policy and Budget Treatment (Treatment 1), players are willing to accept a smaller share of the budget when the policy is their preferred one and demand a larger share for alternative policies.



Hypothesis 1: Policy and Budget Trade-off

Hypothesis 1

In the Policy and Budget Treatment (Treatment 1), players are willing to accept a smaller share of the budget when the policy is their preferred one and demand a larger share for alternative policies.

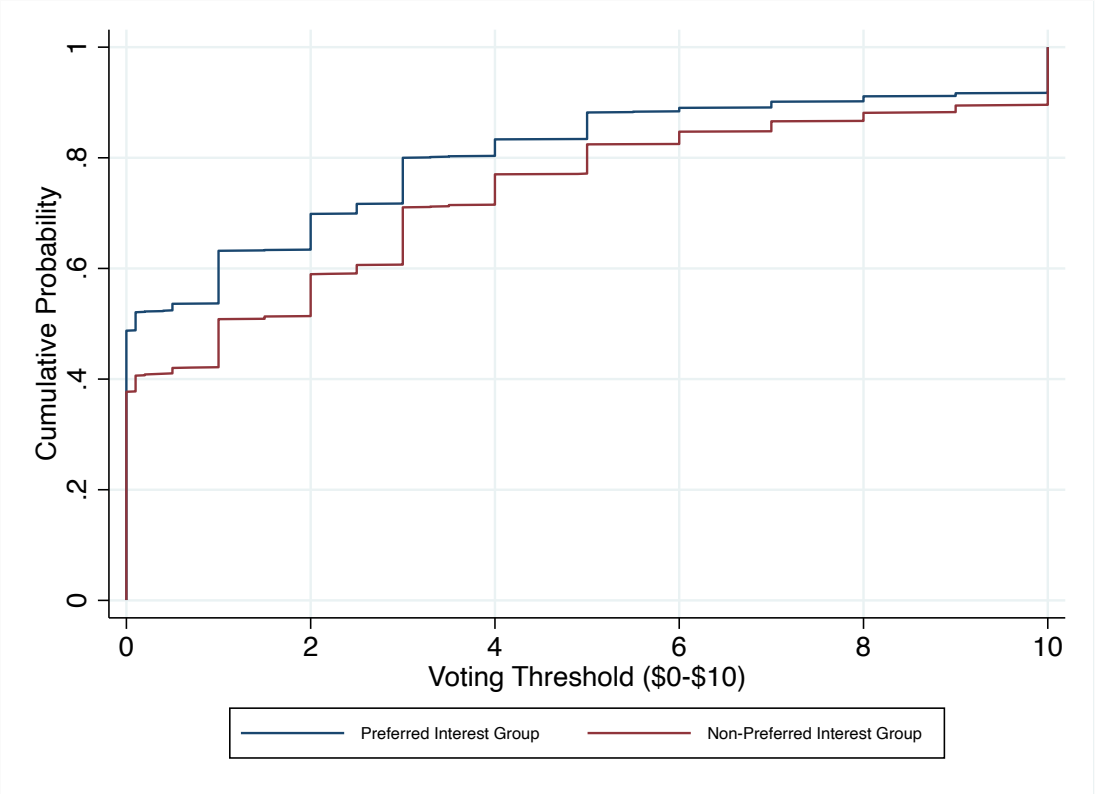


Kolmogorov-Smirnov test indicates distribution functions are not equal ($p < 0.001$).

Hypothesis 1: Policy and Budget Trade-off

Hypothesis 1

In the Policy and Budget Treatment (Treatment 1), players are willing to accept a smaller share of the budget when the policy is their preferred one and demand a larger share for alternative policies.

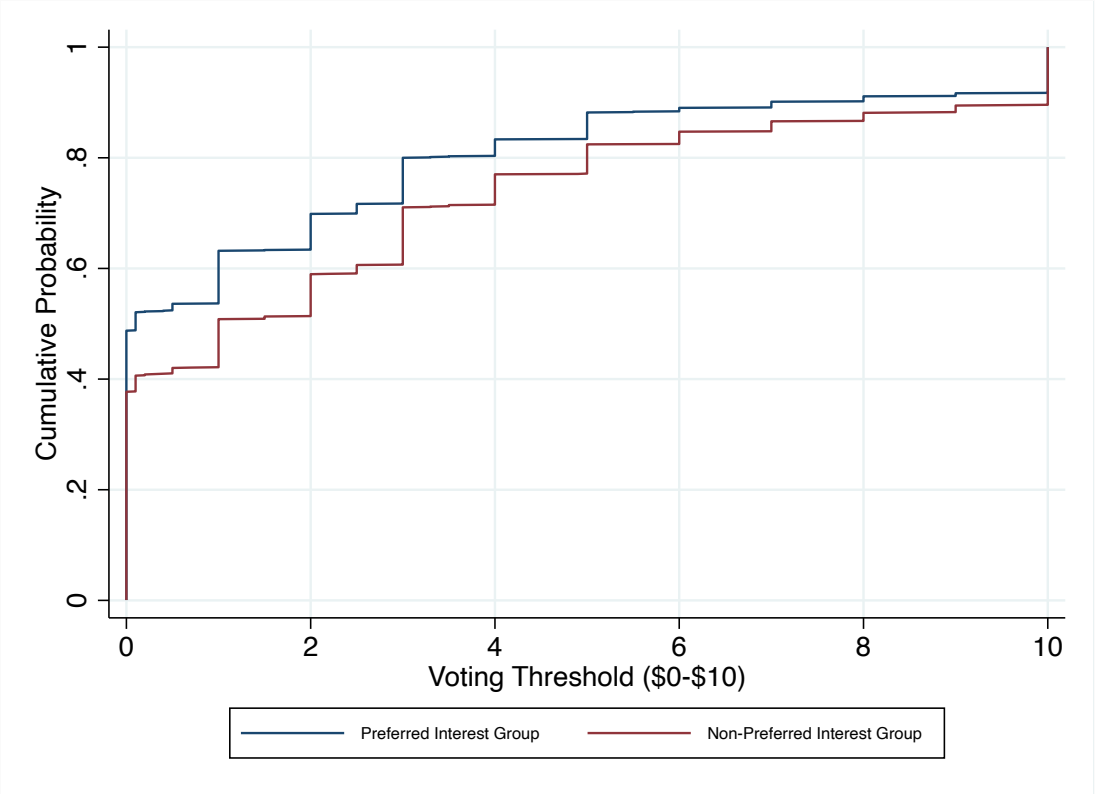


10% of people have a threshold of 10 for non-preferred

Hypothesis 1: Policy and Budget Trade-off

Hypothesis 1

In the Policy and Budget Treatment (Treatment 1), players are willing to accept a smaller share of the budget when the policy is their preferred one and demand a larger share for alternative policies.



about 30% have a threshold of 0 for both preferred and non-preferred

Hypothesis 2: Majority Advantage

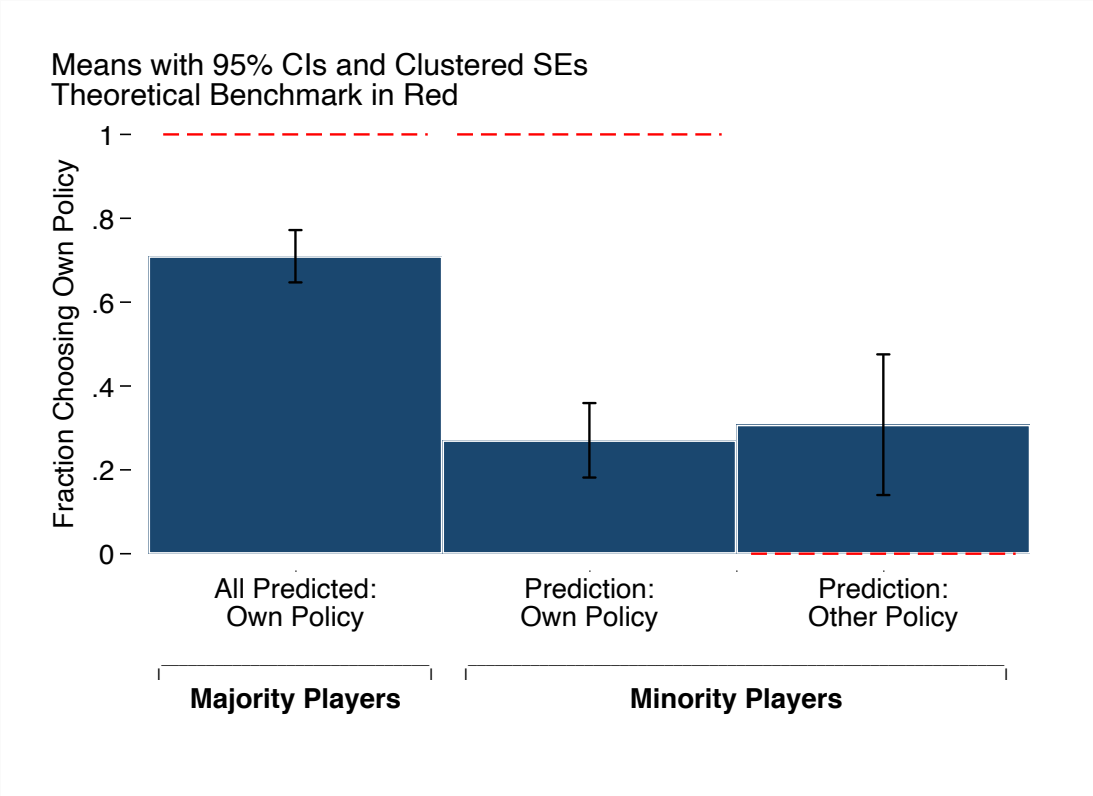
Hypothesis 2.a

Majority members never compromise on policy (always choose preferred policy).

Hypothesis 2: Majority Advantage

Hypothesis 2.a

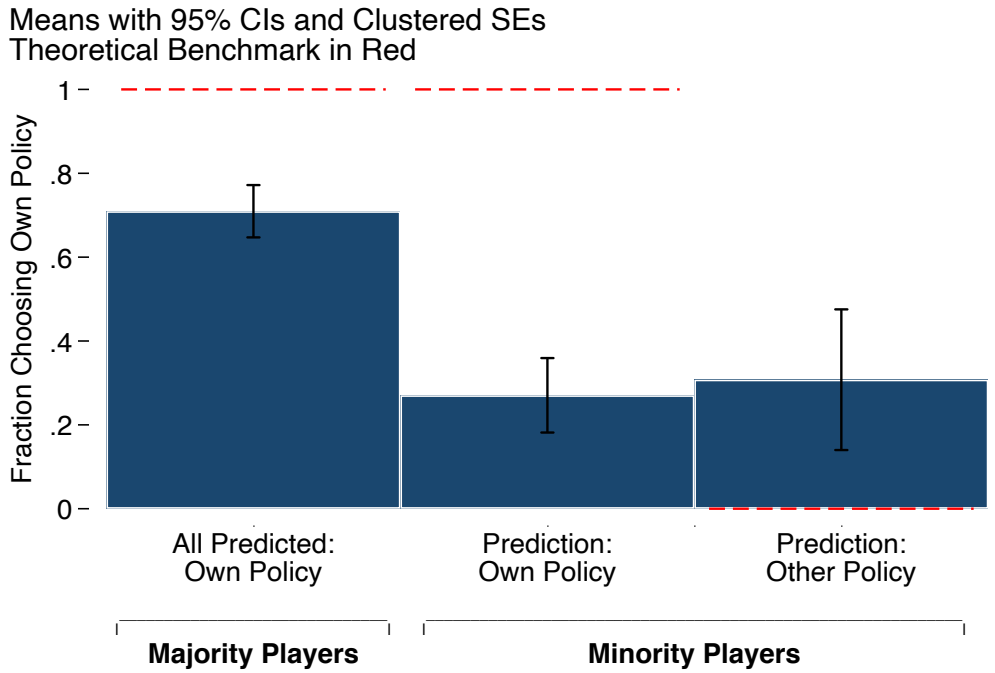
Majority members never compromise on policy (always choose preferred policy).



Hypothesis 2: Majority Advantage

Hypothesis 2.a

Majority members never compromise on policy (always choose preferred policy).



Majority members choose own policy 75% of the time.

Hypothesis 2: Majority Advantage

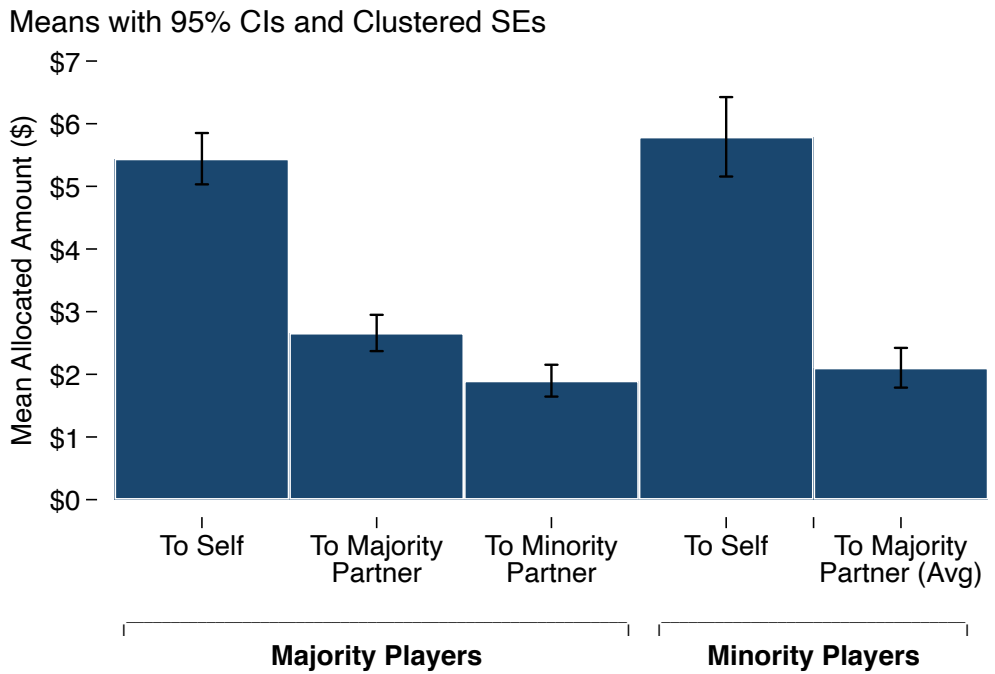
Hypothesis 2b

Majority Members share more with other majority members than with minority members.

Hypothesis 2: Majority Advantage

Hypothesis 2b

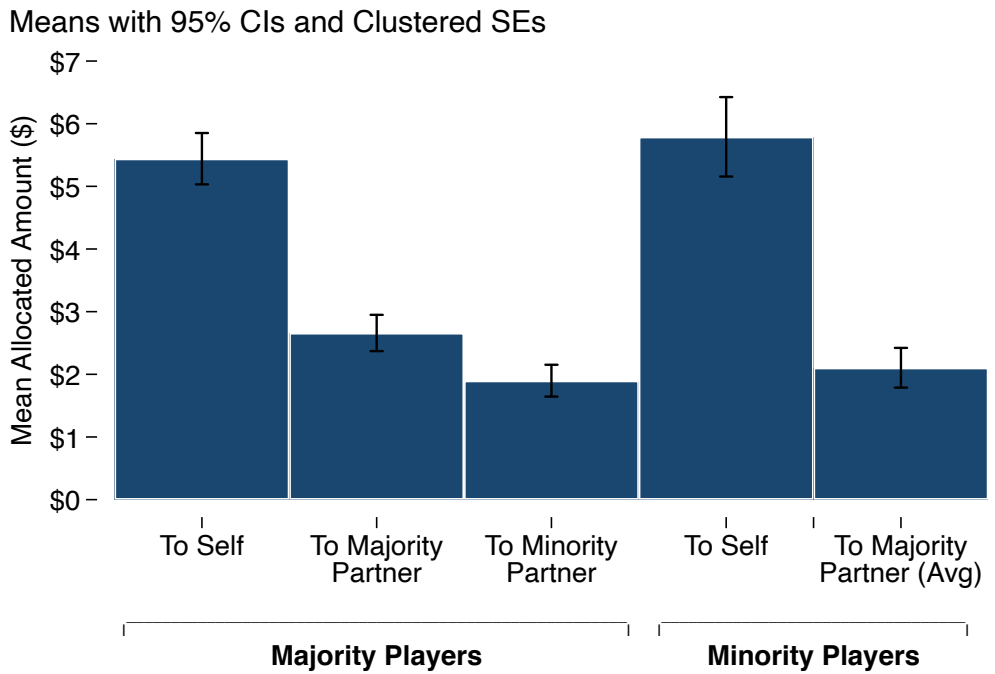
Majority Members share more with other majority members than with minority members.



Hypothesis 2: Majority Advantage

Hypothesis 2b

Majority Members share more with other majority members than with minority members.



Significantly smaller transfers to minority members (1.8 vs 2.6)

Hypothesis 3: Minorities Compromise

Hypothesis 3

Minorities compromise when it is relatively cheap to do so.

Table 1: Policy Choice and (Acceptance Rate)

	Policy Proposal	
	Own Policy	Majority Policy
Should Choose Own Policy	0.27	0.56
Should Choose Majority Policy	0.29	0.54

Hypothesis 3: Minorities Compromise

Hypothesis 3

Minorities compromise when it is relatively cheap to do so.

Table 1: Policy Choice and (Acceptance Rate)

	Policy Proposal	
	Own Policy	Majority Policy
Should Choose Own Policy	0.27 (.84)	0.56
Should Choose Majority Policy	0.29	0.54

Hypothesis 3: Minorities Compromise

Hypothesis 3

Minorities compromise when it is relatively cheap to do so.

Table 1: Policy Choice and (Acceptance Rate)

	Policy Proposal	
	Own Policy	Majority Policy
Should Choose Own Policy	0.27 (.84)	0.56 (.95)
Should Choose Majority Policy	0.29	0.54

Hypothesis 3: Minorities Compromise

Hypothesis 3

Minorities compromise when it is relatively cheap to do so.

Table 1: Policy Choice and (Acceptance Rate)

	Policy Proposal	
	Own Policy	Majority Policy
Should Choose Own Policy	0.27 (.84)	0.56 (.95)
Should Choose Majority Policy	0.29 (.64)	0.54 (.83)

Hypothesis 3: Minorities Compromise

Hypothesis 3

Minorities compromise when it is relatively cheap to do so.

Table 1: Policy Choice and (Acceptance Rate)

	Policy Proposal	
	Own Policy	Majority Policy
Should Choose Own Policy	0.27 (.84)	0.56 (.95)
Should Choose Majority Policy	0.29 (.64)	0.54 (.83)

1. Minorities compromise on policy more often than they *should*

Hypothesis 3: Minorities Compromise

Hypothesis 3

Minorities compromise when it is relatively cheap to do so.

Table 1: Policy Choice and (Acceptance Rate)

	Policy Proposal	
	Own Policy	Majority Policy
Should Choose Own Policy	0.27 (.84)	0.56 (.95)
Should Choose Majority Policy	0.29 (.64)	0.54 (.83)

1. Minorities compromise on policy more often than they *should*
2. Rational anticipation of the larger odds of acceptance can explain this behavior

Hypothesis 4: Status Quo Advantage

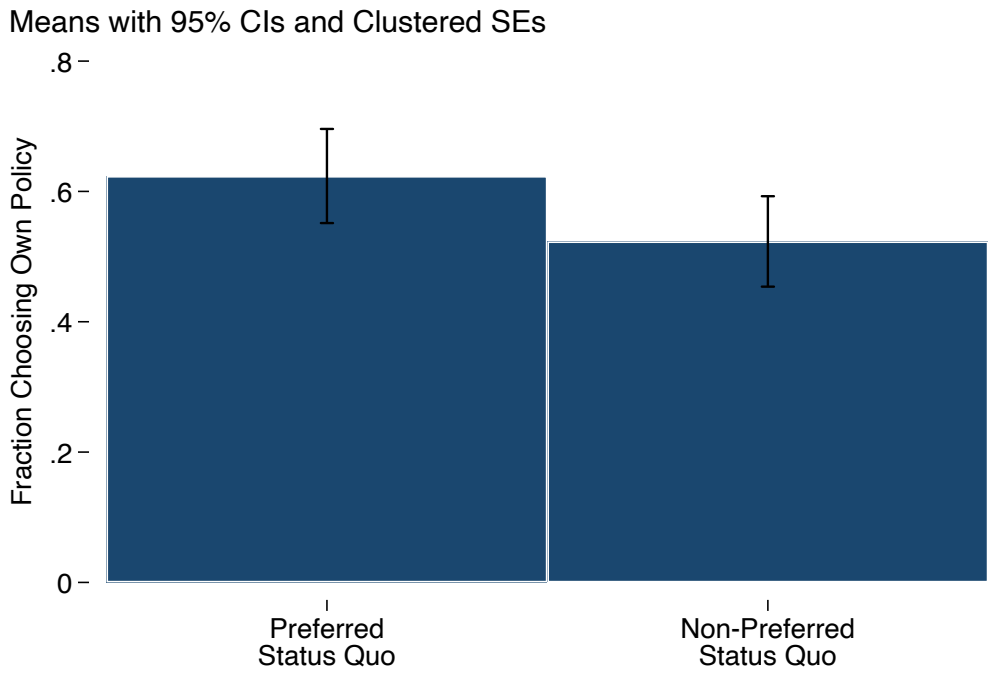
Hypothesis 4

Members whose peak preference is the status quo are (1) more likely to choose their own policy and (2) keep a large share of the budget

Hypothesis 4: Status Quo Advantage

Hypothesis 4

Members whose peak preference is the status quo are (1) more likely to choose their own policy and (2) keep a large share of the budget

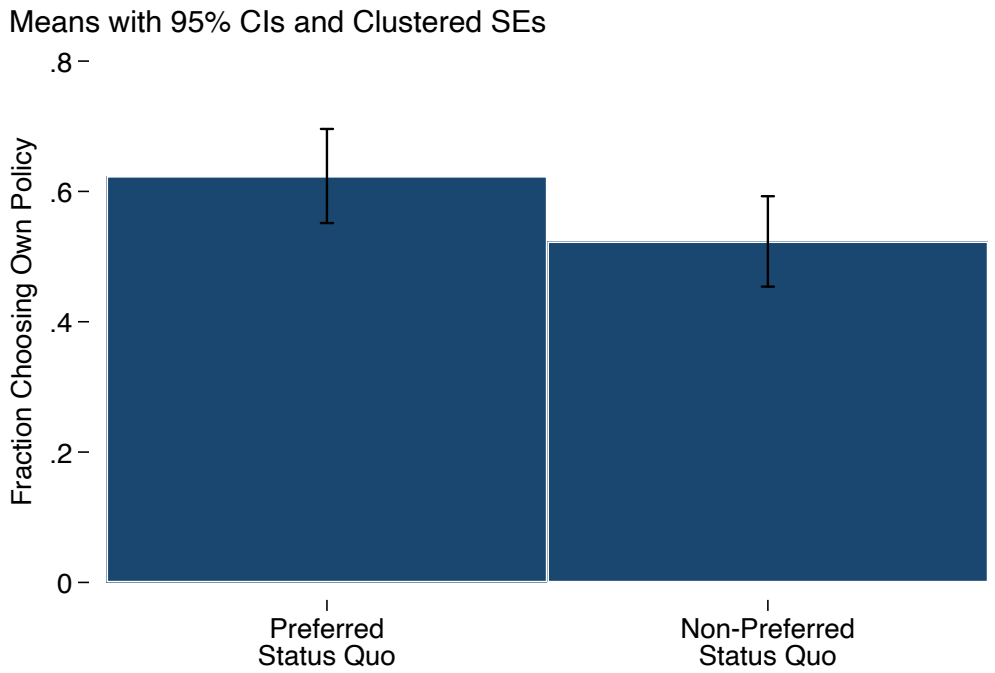


9 percentage points more likely to propose own policy

Hypothesis 4: Status Quo Advantage

Hypothesis 4

Members whose peak preference is the status quo are (1) more likely to choose their own policy and (2) keep a large share of the budget



9 percentage points more likely to propose own policy

We do not find differences in self-allocated amount

Results Treatment 1 Summary

1. Subject accept lower transfers when the proposed policy is their preferred one

Results Treatment 1 Summary

1. Subject accept lower transfers when the proposed policy is their preferred one
2. Majority members generally propose own policy and share more with the other majority partner

Results Treatment 1 Summary

1. Subject accept lower transfers when the proposed policy is their preferred one
2. Majority members generally propose own policy and share more with the other majority partner
3. Minorities are unlikely to propose own policy even when *they should*

Results Treatment 1 Summary

1. Subject accept lower transfers when the proposed policy is their preferred one
2. Majority members generally propose own policy and share more with the other majority partner
3. Minorities are unlikely to propose own policy even when *they should*
4. The status quo advantage is only present in policy proposals not in the budget division

Results of Other Treatments

Hypothesis 5: Policy and Budget Trade-off

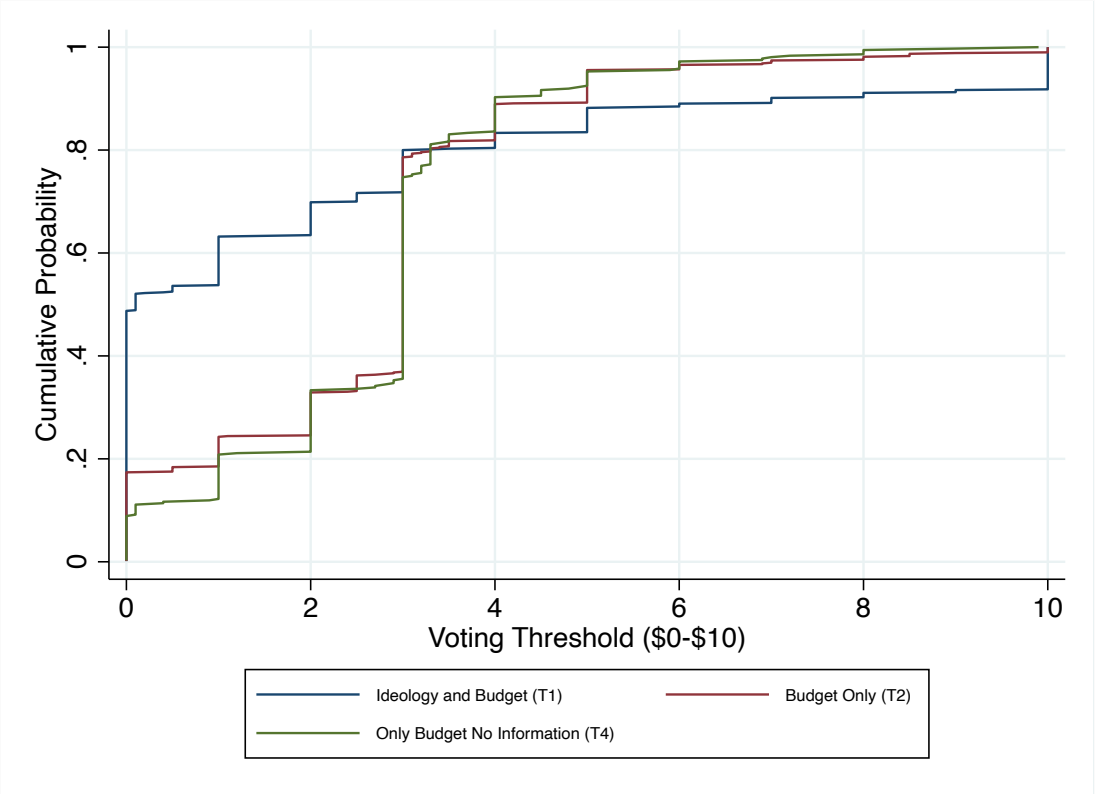
Hypothesis 5

Overall, the distribution of voting thresholds in Treatment 1 are skewed to the left and significantly lower on average compared to the voting thresholds in Budget Only Treatments (Treatments 2 and 4).

Hypothesis 5: Policy and Budget Trade-off

Hypothesis 5

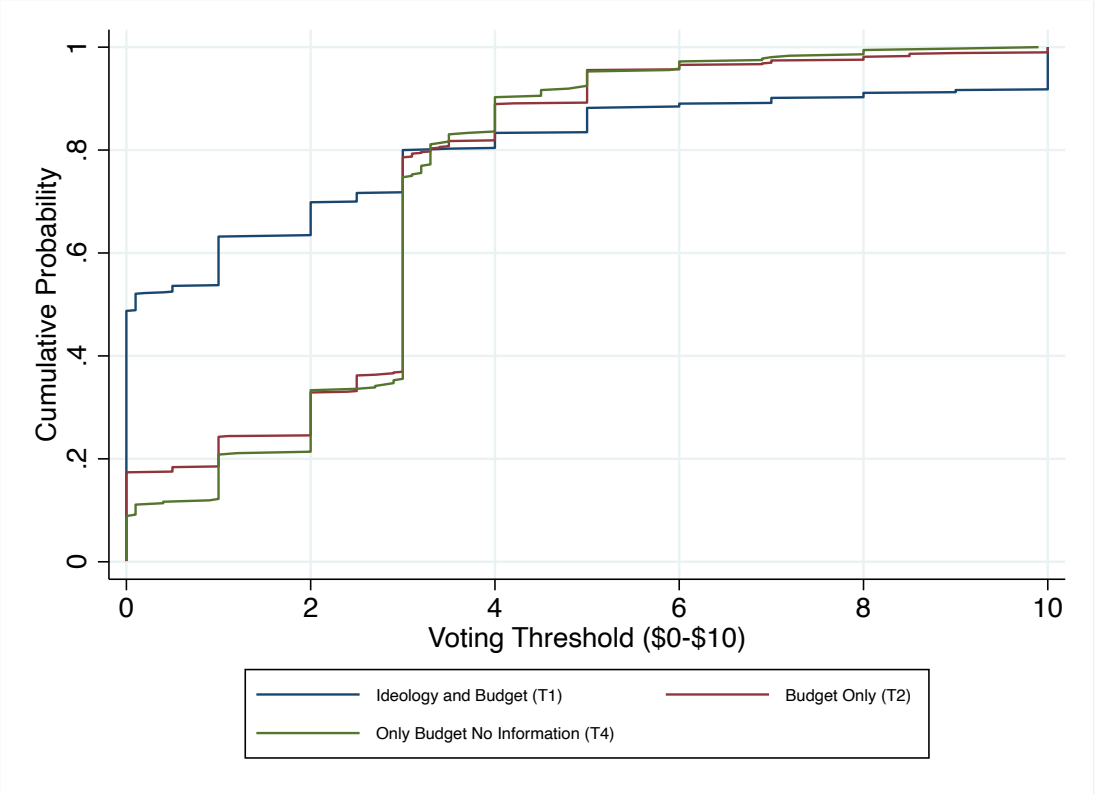
Overall, the distribution of voting thresholds in Treatment 1 are skewed to the left and significantly lower on average compared to the voting thresholds in Budget Only Treatments (Treatments 2 and 4).



Hypothesis 5: Policy and Budget Trade-off

Hypothesis 5

Overall, the distribution of voting thresholds in Treatment 1 are skewed to the left and significantly lower on average compared to the voting thresholds in Budget Only Treatments (Treatments 2 and 4).

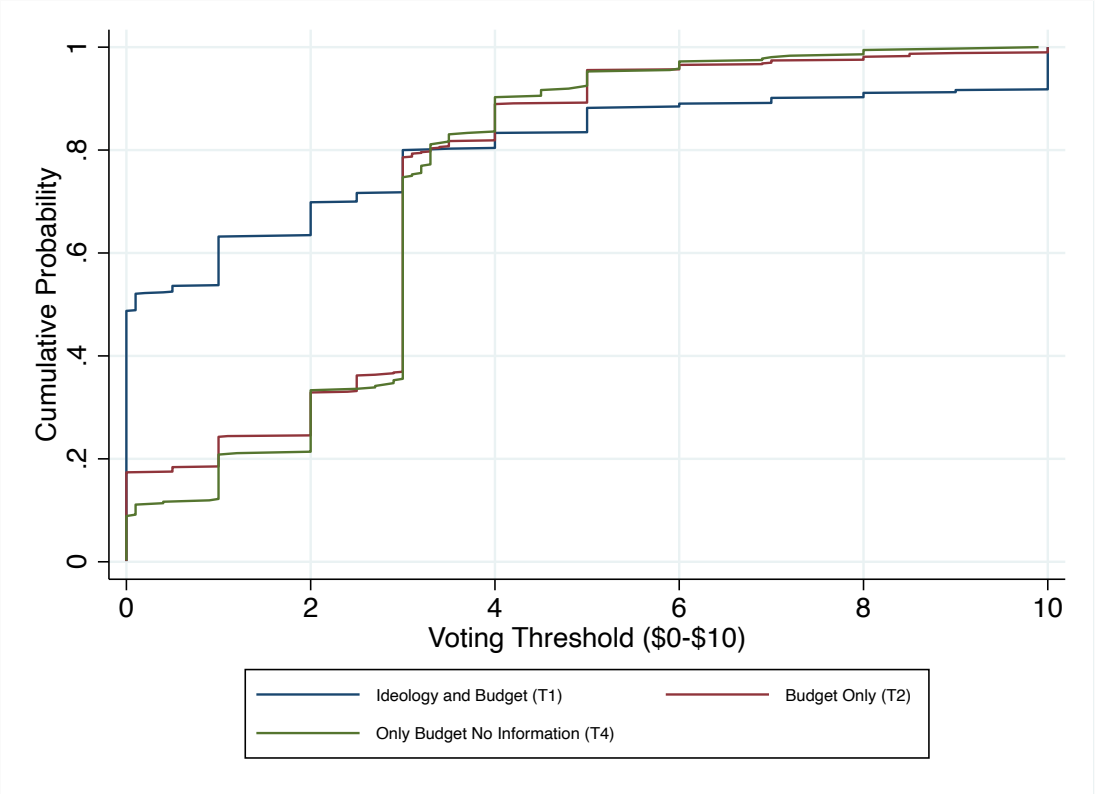


Voting thresholds significantly higher in Budget only TRTs

Hypothesis 5: Policy and Budget Trade-off

Hypothesis 5

Overall, the distribution of voting thresholds in Treatment 1 are skewed to the left and significantly lower on average compared to the voting thresholds in Budget Only Treatments (Treatments 2 and 4).



Voting thresholds significantly higher in Budget only TRTs Jump at $3 indicates subjects mostly willing to accept shares resulting from equal split.

Hypothesis 6: Minorities Cannot Compromise

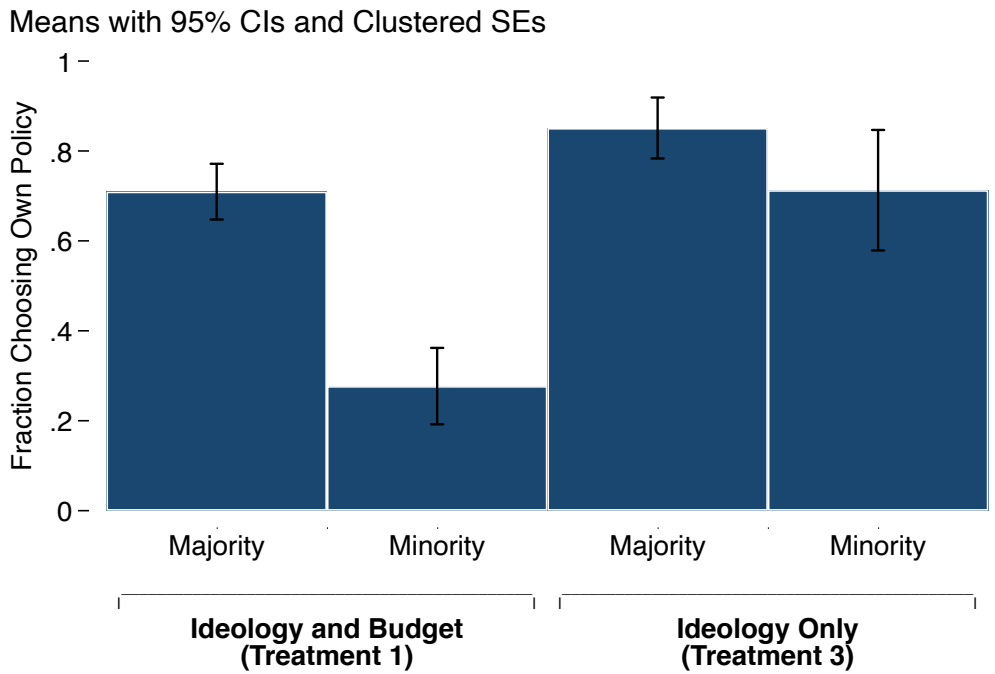
Hypothesis 6

In the Policy Only treatment minorities will mainly propose their own policy but are unlikely to be approved.

Hypothesis 6: Minorities Cannot Compromise

Hypothesis 6

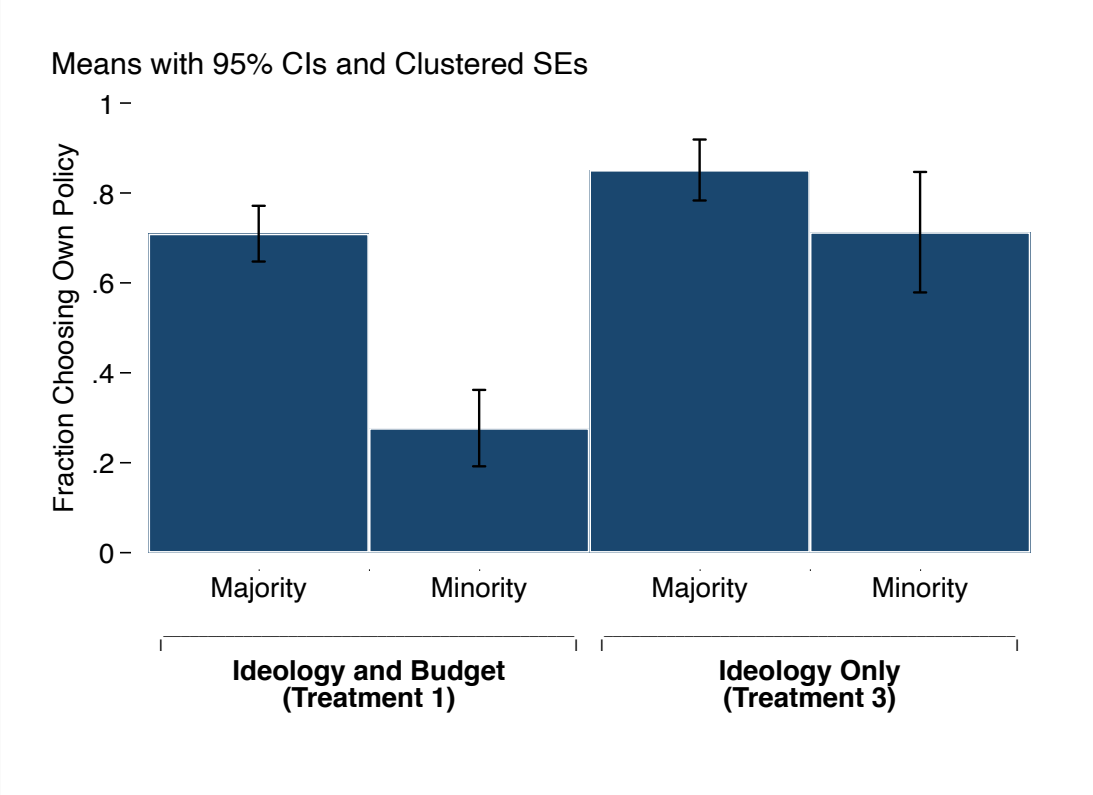
In the Policy Only treatment minorities will mainly propose their own policy but are unlikely to be approved.



Hypothesis 6: Minorities Cannot Compromise

Hypothesis 6

In the Policy Only treatment minorities will mainly propose their own policy but are unlikely to be approved.

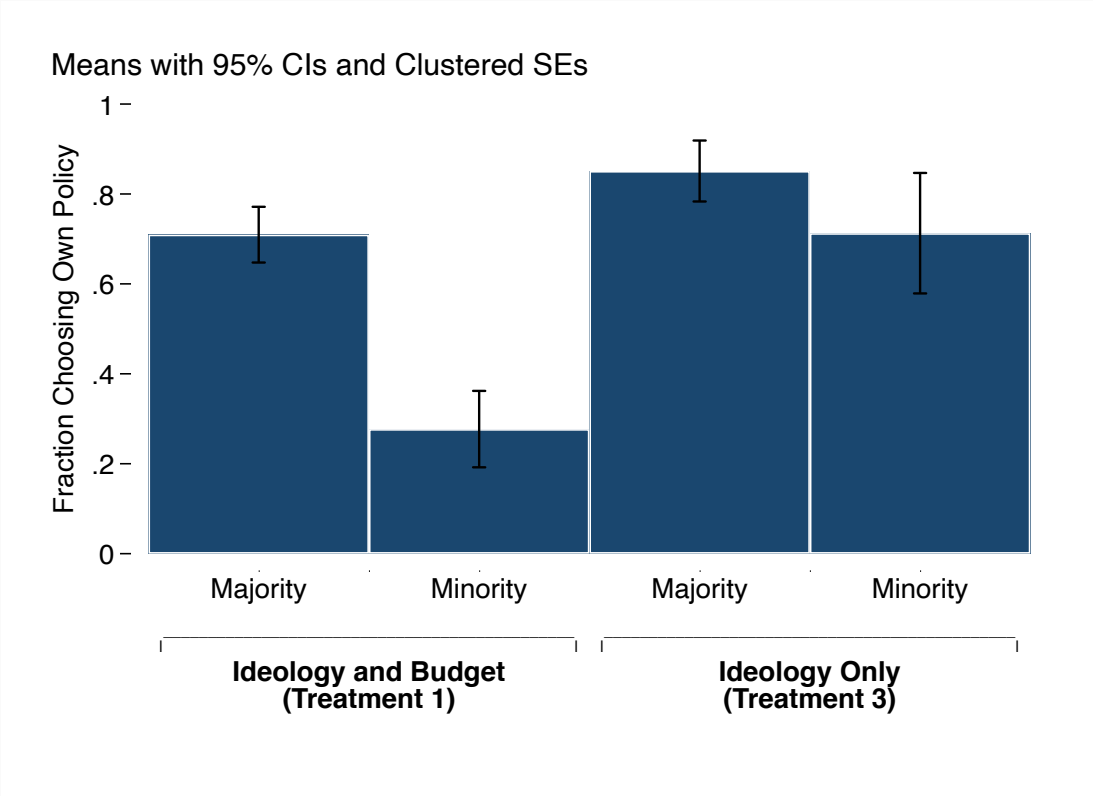


72% of the time minorities choose own policy (compared to 28% in Policy and Budget)

Hypothesis 6: Minorities Cannot Compromise

Hypothesis 6

In the Policy Only treatment minorities will mainly propose their own policy but are unlikely to be approved.



72% of the time minorities choose own policy (compared to 28% in Policy and Budget) Majorities are almost always approved (save 1 instance), minorities are approved only 50% when proposing own policy

Hypothesis 7: Budgetary Splits

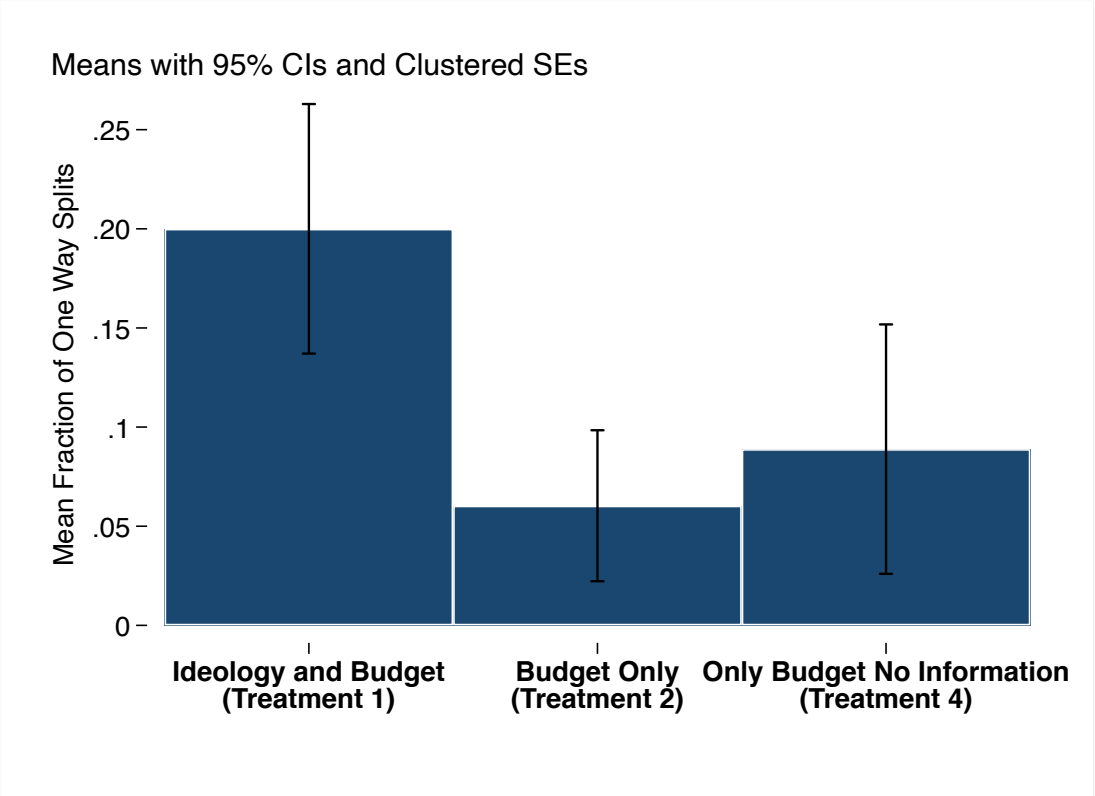
Hypothesis 7: One-way Splits

One-way budgetary splits are only proposed and approved in the Policy and Budget Trt.

Hypothesis 7: Budgetary Splits

Hypothesis 7: One-way Splits

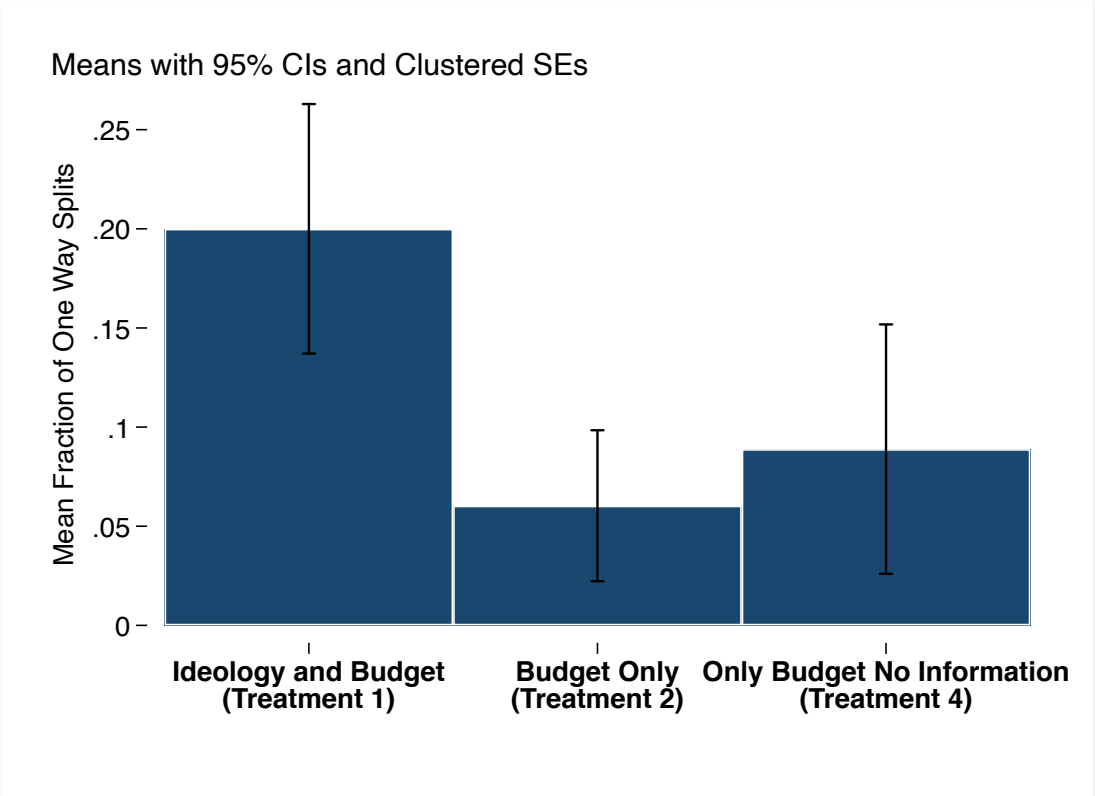
One-way budgetary splits are only proposed and approved in the Policy and Budget Trt.



Hypothesis 7: Budgetary Splits

Hypothesis 7: One-way Splits

One-way budgetary splits are only proposed and approved in the Policy and Budget Trt.

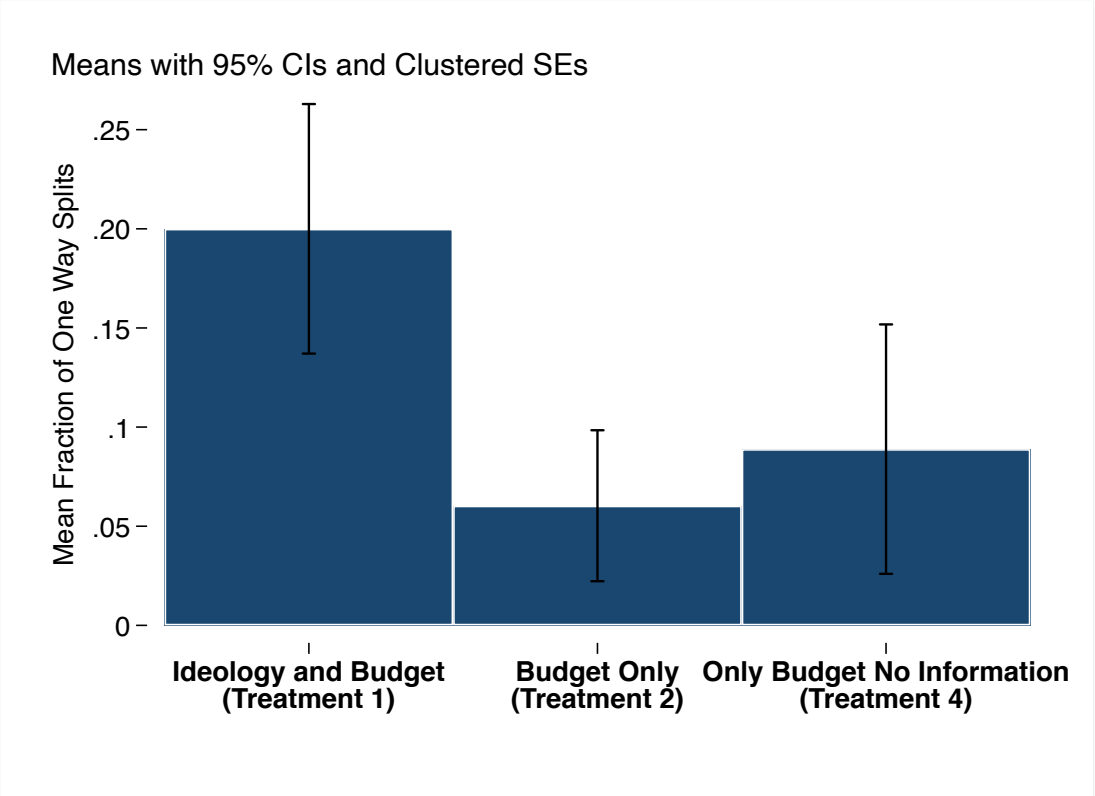


15% of approved proposals are 1 way splits in TRT1, only 3% in Budget Only TRTs

Hypothesis 7: Budgetary Splits

Hypothesis 7: One-way Splits

One-way budgetary splits are only proposed and approved in the Policy and Budget Trt.



15% of approved proposals are 1 way splits in TRT1, only 3% in Budget Only TRTs

Interestingly, 2-way splits represent only 20% in budget only TRTs and 13% in Policy and Budget

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

- We designed a modified version of the policy and budget treatment

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

- We designed a modified version of the policy and budget treatment
- Ideological component: locating a *facility* on the line

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

- We designed a modified version of the policy and budget treatment
- Ideological component: locating a *facility* on the line
- Subject's peak preferences were induced: *"Your preferred location is the Middle"*

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

- We designed a modified version of the policy and budget treatment
- Ideological component: locating a *facility* on the line
- Subject's peak preferences were induced: *"Your preferred location is the Middle"*
- Subject's strength of preferences (MAAs): *"If the location of the facility is different than your preferred one, you will forgo $x"*

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

- We designed a modified version of the policy and budget treatment
- Ideological component: locating a *facility* on the line
- Subject's peak preferences were induced: *"Your preferred location is the Middle"*
- Subject's strength of preferences (MAAs): *"If the location of the facility is different than your preferred one, you will forgo $x"*
- Subjects were given a $5 endowment from which losses for non-preferred locations would be deducted

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

- We designed a modified version of the policy and budget treatment
- Ideological component: locating a *facility* on the line
- Subject's peak preferences were induced: *"Your preferred location is the Middle"*
- Subject's strength of preferences (MAAs): *"If the location of the facility is different than your preferred one, you will forgo $x"*
- Subjects were given a $5 endowment from which losses for non-preferred locations would be deducted
- Peaks and MAAs were assigned based on actual peaks and MAAs elicited from sessions in TRT 1

Treatment with Induced Ideology

Do induced ideological preferences produce the same bargaining outcomes as elicited *real* preferences?

- We designed a modified version of the policy and budget treatment
- Ideological component: locating a *facility* on the line
- Subject's peak preferences were induced: *"Your preferred location is the Middle"*
- Subject's strength of preferences (MAAs): *"If the location of the facility is different than your preferred one, you will forgo $x"*
- Subjects were given a $5 endowment from which losses for non-preferred locations would be deducted
- Peaks and MAAs were assigned based on actual peaks and MAAs elicited from sessions in TRT 1
- Same treatment with a neutral frame (Your earnings from location 1 are...)
- Subjects played in same order and matching groups as TRT1 sessions

Hypothesis 8: Induced vs. Elicited Preferences

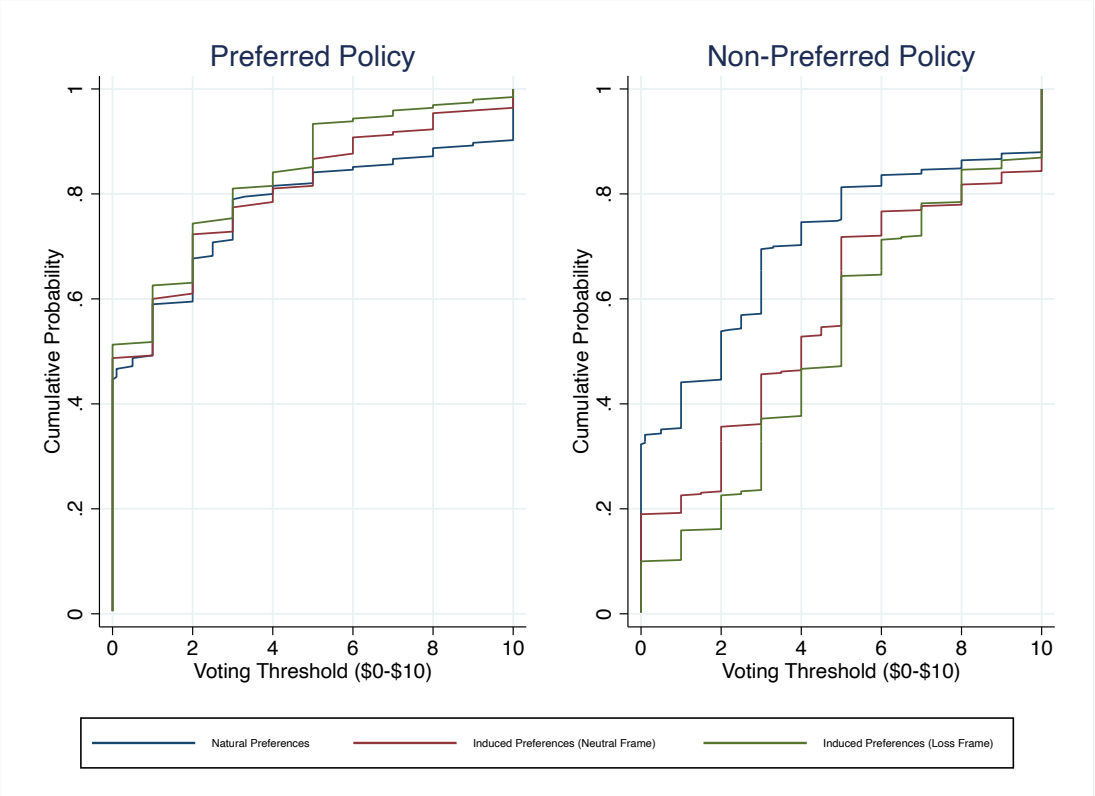
Hypothesis 8a. Voting Thresholds

There are no differences in voting thresholds between Policy and Budget Trt with Elicited and Induced preferences.

Hypothesis 8: Induced vs. Elicited Preferences

Hypothesis 8a. Voting Thresholds

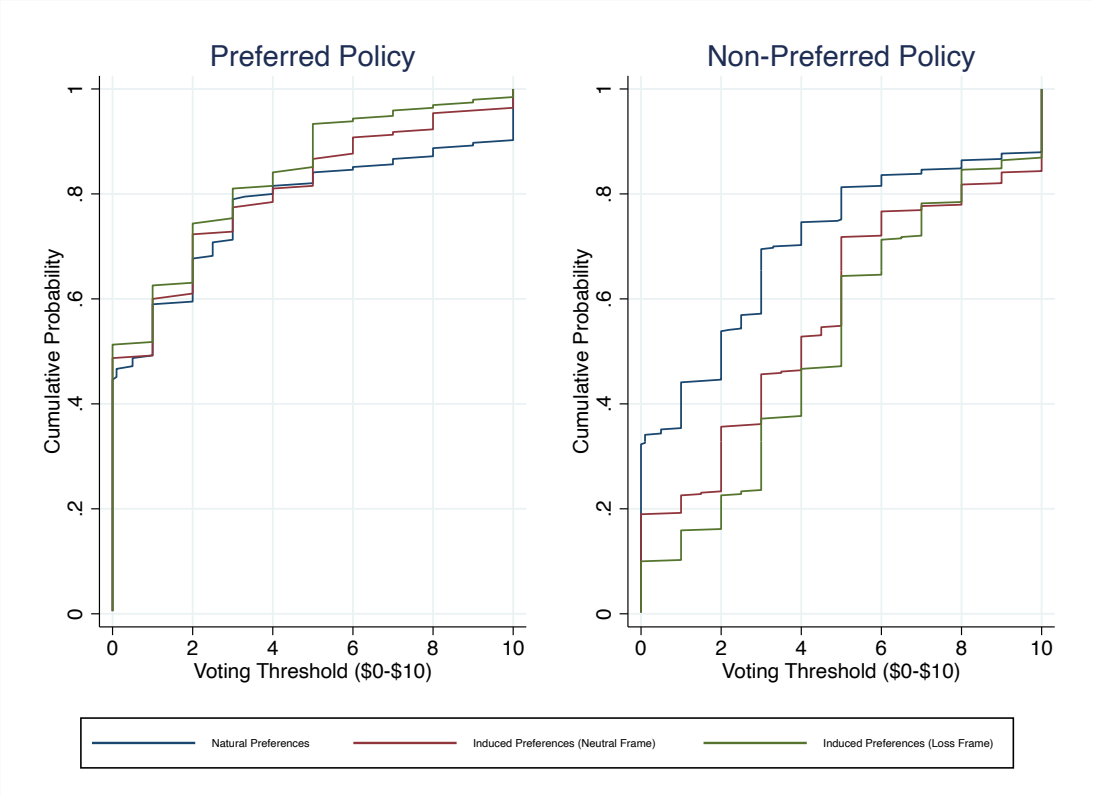
There are no differences in voting thresholds between Policy and Budget Trt with Elicited and Induced preferences.



Hypothesis 8: Induced vs. Elicited Preferences

Hypothesis 8a. Voting Thresholds

There are no differences in voting thresholds between Policy and Budget Trt with Elicited and Induced preferences.



No difference in VT for preferred policy, but significantly higher for Non-preferred policy

Hypothesis 9: Voting Threshold and Preference Correlation

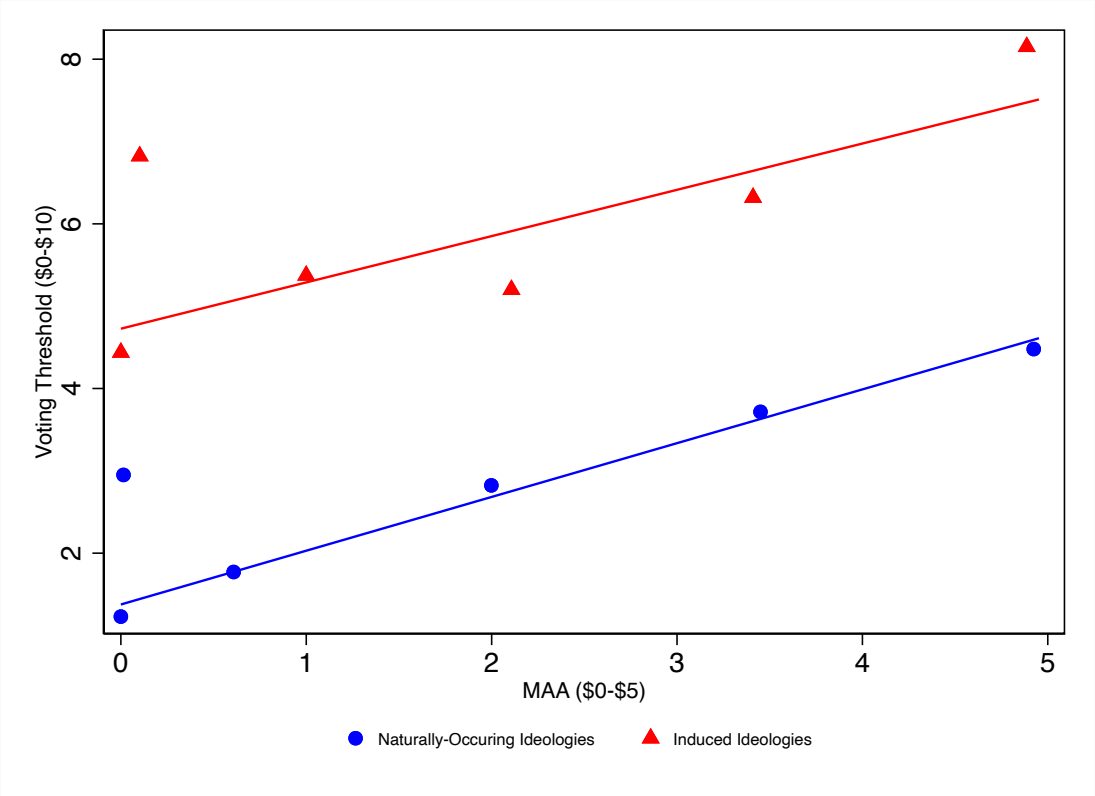
Hypothesis 9. Correlation

Voting threshold as positively correlated with elicited and induced MAAs.

Hypothesis 9: Voting Threshold and Preference Correlation

Hypothesis 9. Correlation

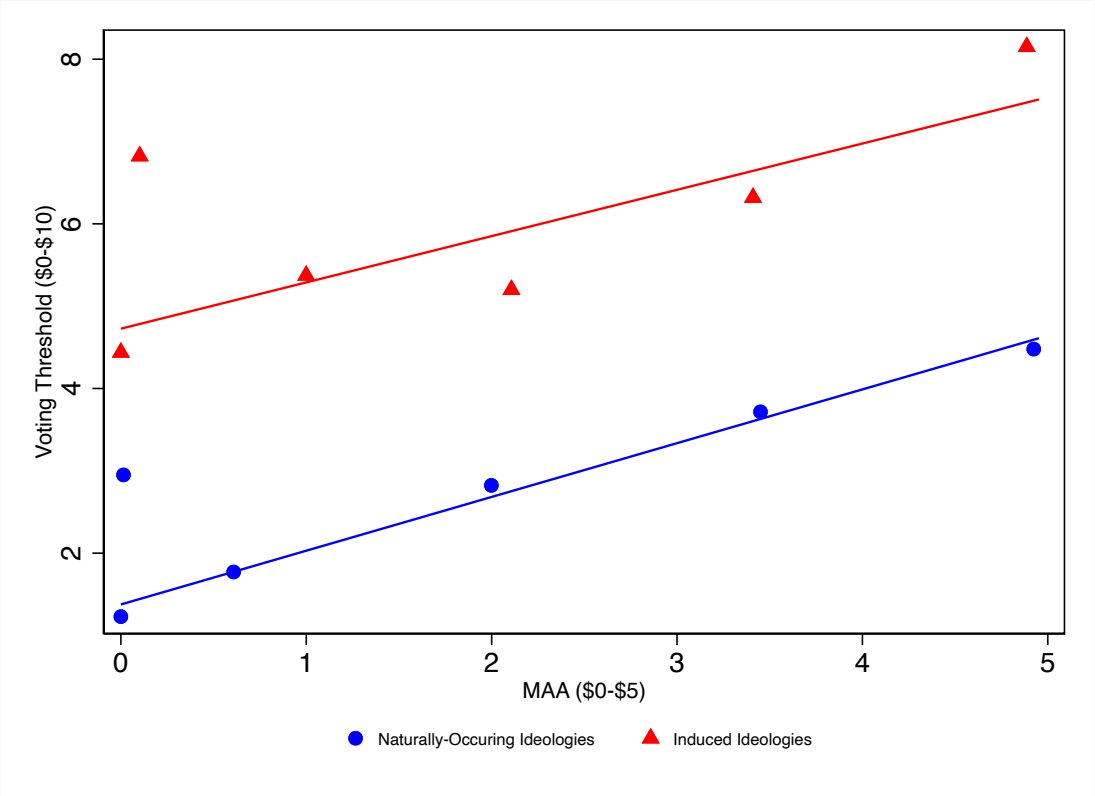
Voting threshold as positively correlated with elicited and induced MAAs.



Hypothesis 9: Voting Threshold and Preference Correlation

Hypothesis 9. Correlation

Voting threshold as positively correlated with elicited and induced MAAs.

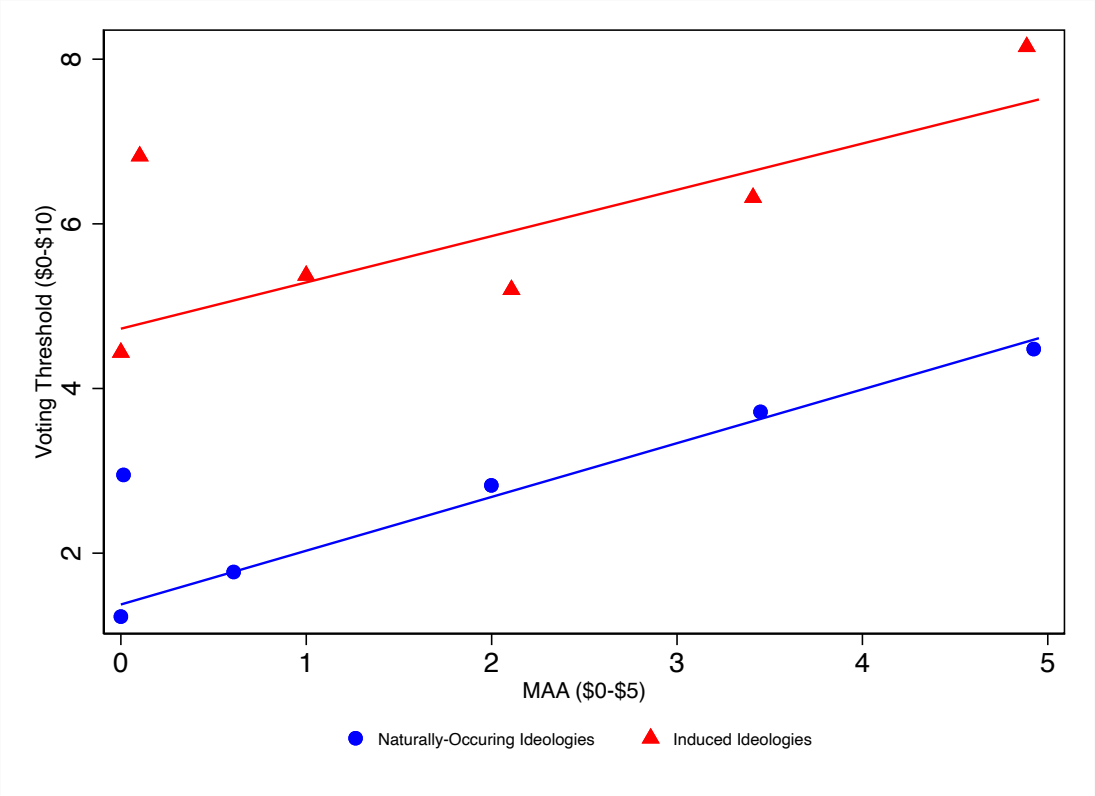


Elicited and Induced prefs correlate positively with voting thresholds (same coefficient)

Hypothesis 9: Voting Threshold and Preference Correlation

Hypothesis 9. Correlation

Voting threshold as positively correlated with elicited and induced MAAs.



Elicited and Induced prefs correlate positively with voting thresholds (same coefficient) The intercept is higher for induced preferences (as expected from previous result)

Concluding Remarks

1. We present a novel ideological preference elicitation method and bargaining game

Concluding Remarks

1. We present a novel ideological preference elicitation method and bargaining game
2. Our measure correlates with bargaining behavior

Concluding Remarks

1. We present a novel ideological preference elicitation method and bargaining game
2. Our measure correlates with bargaining behavior
3. The data qualitatively fits some of the model's key predictions: majority advantage, existence of one-way splits, status quo policy advantage

Concluding Remarks

1. We present a novel ideological preference elicitation method and bargaining game
2. Our measure correlates with bargaining behavior
3. The data qualitatively fits some of the model's key predictions: majority advantage, existence of one-way splits, status quo policy advantage
4. Minorities transfer higher amounts and compromise more often than predicted

Concluding Remarks

1. We present a novel ideological preference elicitation method and bargaining game
2. Our measure correlates with bargaining behavior
3. The data qualitatively fits some of the model's key predictions: majority advantage, existence of one-way splits, status quo policy advantage
4. Minorities transfer higher amounts and compromise more often than predicted
5. Behavior under Artificial ideology and real ideology moves in the same directions –¿ Validates standard laboratory approach but...
6. Artificial ideology leads to more aggressive demands by players when proposed policy is not their preferred one. Why? (open question)

Discussion

1. Minorities benefit the most from 2-dimensional bargaining: Will majorities anticipate this?

Discussion

1. Minorities benefit the most from 2-dimensional bargaining: Will majorities anticipate this?
2. Will players misrepresent their preferences once they expect to play a bargaining game?

Discussion

1. Minorities benefit the most from 2-dimensional bargaining: Will majorities anticipate this?
2. Will players misrepresent their preferences once they expect to play a bargaining game?
3. Voters cannot condition response on identity of the proposer. Will this matter?

Discussion

1. Minorities benefit the most from 2-dimensional bargaining: Will majorities anticipate this?
2. Will players misrepresent their preferences once they expect to play a bargaining game?
3. Voters cannot condition response on identity of the proposer. Will this matter?
4. Key aspect of the real world missing: Communication

Comments or Questions?

Comments or Questions?
Thank You.