In memory of Professor Tomas Björk

Voting with Decentralized Policy Contingent Promises

Ali Lazrak Jianfeng Zhang

UBC USC

Stockholm School of Economics
October 2022

Tomas Björk and time inconsistency

- All started with Strotz (1955): beautiful continuous time, deterministic model with non constant discount rate.
- Tomas introduced very the idea of time inconsistency in stochastic settings in a standard model in math finance:
  - Mean variance preferences
- The problem of time inconsistency is much broader because it appears endogenously (i.e not from the preferences) in
  - Dynamic games: game between central banks and private agents
  - Collective decision making: Voting

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- “Vote trading” is however common:

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- "Vote trading" is however common:

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- “Vote trading” is however common:
    - “Logrolling” in legislatures

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- "Vote trading" is however common:
  - "Logrolling" in legislatures
  - Borrow shares to use their voting rights prior to shareholders meetings

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- "Vote trading" is however common:
  - "Logrolling" in legislatures
  - Borrow shares to use their voting rights prior to shareholders meetings
  - Acquires make promises to labor unions to entice them to support a takeover

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- "Vote trading" is however common:
  - "Logrolling" in legislatures
  - Borrow shares to use their voting rights prior to shareholders meetings
  - Acquires make promises to labor unions to entice them to support a takeover
  - Democrats had to change the economic stimulus bill to get the pivotal support of Joe Manchin

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading

- "Vote trading" is however common:
  - "Logrolling" in legislatures
  - Borrow shares to use their voting rights prior to shareholders meetings
  - Acquires make promises to labor unions to entice them to support a takeover
  - Democrats had to change the economic stimulus bill to get the pivotal support of Joe Manchin

- Normative implications of vote trading are not clear:

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- "Vote trading" is however common:
  - "Logrolling" in legislatures
  - Borrow shares to use their voting rights prior to shareholders meetings
  - Acquires make promises to labor unions to entice them to support a takeover
  - Democrats had to change the economic stimulus bill to get the pivotal support of Joe Manchin
- Normative implications of vote trading are not clear:
  - Vote trading allows to express the intensity of preferences (good)

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- "Vote trading" is however common:
  - "Logrolling" in legislatures
  - Borrow shares to use their voting rights prior to shareholders meetings
  - Acquires make promises to labor unions to entice them to support a takeover
  - Democrats had to change the economic stimulus bill to get the pivotal support of Joe Manchin
- Normative implications of vote trading are not clear:
  - Vote trading allows to express the intensity of preferences (good)
  - Trading votes generates externalities on non-trading members (bad)

Motivation

- There is a stigma with vote trading: Voting is a moral duty that is not amenable to trading
- "Vote trading" is however common:
  - "Logrolling" in legislatures
  - Borrow shares to use their voting rights prior to shareholders meetings
  - Acquires make promises to labor unions to entice them to support a takeover
  - Democrats had to change the economic stimulus bill to get the pivotal support of Joe Manchin
- Normative implications of vote trading are not clear:
  - Vote trading allows to express the intensity of preferences (good)
  - Trading votes generates externalities on non-trading members (bad)
- This paper: **Vote trading through promises contingent on the collective decision of a committee ruled by a qualified majority rule in the absence of any stigma/constraint.**

This paper

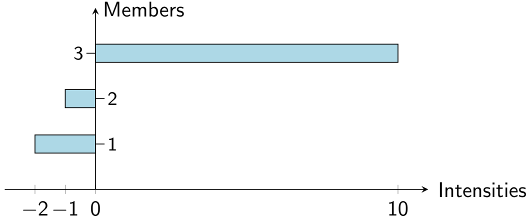
- A committee $\mathbb{I} = \{1, \cdots, I\}$ of I members vote to adopt/reject a reform with a super majority rule κ (If $I = 3$, $\kappa = 2$).
  1. Intensity of preferences for the reform are known $u_1 \leq u_2 \leq ... \leq 0 \leq ... \leq u_I$.
  2. The reform is socially optimal $\sum_i u_i > 0$.

- **Timing of the model**:
  1. The promises $\boldsymbol{r} = (r_1, .., r_I)$ (resp. $\boldsymbol{s} = (s_1, .., s_I)$) contingent on adopting (resp. rejecting) the reform are done within the committee:
  $$(\boldsymbol{r}, \boldsymbol{s}) \in \mathcal{P}^2 \Leftrightarrow \sum_i r_i = \sum_i s_i = 0$$
  .
  2. Committee member i vote for or against the reform to maximize the *ex post* intensity
  $$v_i^{\boldsymbol{r},\boldsymbol{s}} := \begin{cases} u_i + r_i & \text{if the reform is adopted;} \\ s_i, & \text{otherwise} \end{cases}$$
  3. The promises are enforced.

- In this framework, we define the "*political equilibrium*" and provide insights on the structure of promises that need to be done to implement the political equilibrium.

An example: Committee with 3 members ruled by majority ($\kappa = 2$)

Ex ante utilities: $\boldsymbol{u} = (-2, \ -1, \ 10)$



- Reform is defeated without promises: $\boldsymbol{v^0} = (0, 0, 0)$
- Promises generate gains from trades

$$\boldsymbol{r} = (+3, \ +2, \ -5) \qquad \boldsymbol{s} = \boldsymbol{0} \qquad \boldsymbol{v}^{(\boldsymbol{r},\boldsymbol{0})} = (1, \ 1, \ 5)\,;$$
$$\boldsymbol{r} = (+2, \ +2, \ -4) \qquad \boldsymbol{s} = \boldsymbol{0} \qquad \boldsymbol{v}^{(\boldsymbol{r},\boldsymbol{0})} = (1, \ 2, \ 6)\,.$$

- Reform is adopted after the promises are made!
- Too many degrees of freedom: **Stability at the cheapest cost**

Main results

Equilibrium Definition

1) No **blocking coalition** exists, **2)** The total promises are minimized

- All equilibria implement the socially optimal reform
  - **Intuition:** If the reform is defeated, blocking coalitions emerge to "grow the total size of the pie" and get a better payoff.
- Multiple equilibria
  - **Intuition:** indeterminacy in cost sharing and distribution of enticements.
- Equilibrium promises feature some general properties:
  - Voluntary participation for those who make the promises
  - Push toward equality: Top-down flow of promises.
  - When the reform is defeated under no trade: Frustrated minority coalition compensates a majority coalition to sway their vote in favour of the reform.
  - When the reform is adopted under no trade: Promises may be needed to preempt the emergence of frustrated minorities

Notations

- Decisive coalitions:

$$\mathcal{D}^R = \{\mathcal{C} \subseteq \mathbb{I} : |\mathcal{C}| \geq \kappa\}, \quad \mathcal{D}^S = \{\mathcal{C} \subseteq \mathbb{I} : |\mathcal{C}| \geq I - \kappa + 1\}$$

- Supportive coalitions: $\mathcal{C}^R = \{i : u_i \geq 0\}, \quad \mathcal{C}^S = \{i : u_i < 0\}$
- Aggregate intensity of preferences: $U_R = \sum_{i \in \mathcal{C}^R} |u_i|$, $U_S = \sum_{i \in \mathcal{C}^S} |u_i|$.
- For any given transfer promises $(\boldsymbol{r}, \boldsymbol{s})$ from the set $\mathcal{P} = \{x | \sum_{i \in \mathbb{I}} x_i = 0\}$:
  - The committee decision is $D(\boldsymbol{r}, \boldsymbol{s}) \in \{R, S\}$

$$D(\boldsymbol{r}, \boldsymbol{s}) := \begin{cases} R, & \text{if } |\{i : u_i + r_i \geq s_i\}| \geq \kappa; \\ S, & \text{otherwise} \end{cases}$$

  - The voting outcome: $v_i^{\boldsymbol{r}, \boldsymbol{s}}$ is given by

$$v_i^{\boldsymbol{r}, \boldsymbol{s}} := \begin{cases} u_i + r_i, & \text{if } D(\boldsymbol{r}, \boldsymbol{s}) = R; \\ s_i, & \text{otherwise} \end{cases}$$

The political equilibrium

A coalition $\mathcal{C}$ of at least two members blocks the promises $(\boldsymbol{r}, \boldsymbol{s}) \in \mathcal{P}^2$ iff

1. **When** $D(\boldsymbol{r}, \boldsymbol{s}) = R$**:** There exists a promise $\tilde{\boldsymbol{s}} \in \mathcal{P}$ such that:
   - $\tilde{\boldsymbol{s}}_i \neq 0$ if and only if $i \in \mathcal{C}$; $D(\boldsymbol{r}, \boldsymbol{s} + \tilde{\boldsymbol{s}}) = S$ and,
   - $v_i^{\boldsymbol{r}, \boldsymbol{s}+\tilde{\boldsymbol{s}}} > v_i^{\boldsymbol{r}, \boldsymbol{s}}$ for all $i \in \mathcal{C}$.
2. **When** $D(\boldsymbol{r}, \boldsymbol{s}) = S$**:** There exists a promise $\tilde{\boldsymbol{r}} \in \mathcal{P}$ such that:
   - $\tilde{\boldsymbol{r}}_i \neq 0$ if and only if $i \in \mathcal{C}$; $D(\boldsymbol{r} + \tilde{\boldsymbol{r}}, \boldsymbol{s}) = R$ and,
   - $v_i^{\boldsymbol{r}+\tilde{\boldsymbol{r}}, \boldsymbol{s}} > v_i^{\boldsymbol{r}, \boldsymbol{s}}$ for all $i \in \mathcal{C}$.

$(\boldsymbol{r}, \boldsymbol{s}) \in \mathcal{P}^2$ is an equilibrium $(\mathcal{E})$ iff

1. No blocking coalition exists: $(\boldsymbol{r}, \boldsymbol{s})$ is stable $(\mathcal{S}_0)$,
2. **Cheapest cost of enticement:** The total promise $\mathcal{T}_{\boldsymbol{r},\boldsymbol{s}} = \frac{1}{2} \sum_{\mathbb{I}} |r_i| + \frac{1}{2} \sum_{\mathbb{I}} |s_i|$ is minimized

Equilibrium analysis

Observation

Equilibria with minimal total promises have the form $(\boldsymbol{r}, \mathbf{0})$ or simply $\boldsymbol{r}$.
Intuition: if $(\boldsymbol{r}, \boldsymbol{s})$ is stable, then $(\boldsymbol{r} - \boldsymbol{s}, \mathbf{0})$ is also stable and $\mathcal{T}_{\boldsymbol{r}-\boldsymbol{s},\mathbf{0}} \leq \mathcal{T}_{\boldsymbol{r},\boldsymbol{s}}$.

Proposition 1: Characterization of the stable promises

A promise $\boldsymbol{r}$ is stable iff

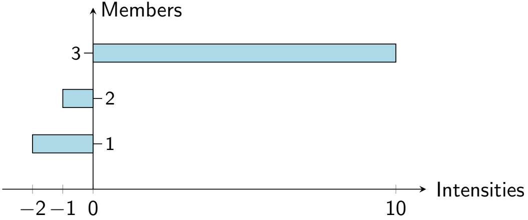
$$\sum_{\mathcal{C}} (u_i + r_i) \geq 0 \text{ for all coalitions } \mathcal{C} \in \mathcal{D}^S.$$

Proposition 2: Existence, indeterminacy and efficiency

Stable promises $\boldsymbol{r}$ are indeterminate they all implement the reform: $D(\boldsymbol{r}) = R$.

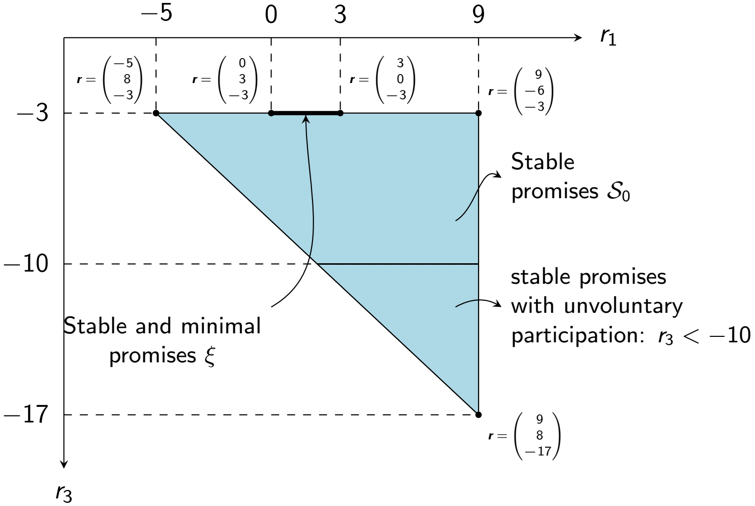
The equilibrium promises are also indeterminate: the multiplicity is not removed by minimizing the total payment $\mathcal{T}_{\boldsymbol{r}}$.

Example continued: Committee with 3 members ruled by majority



- $\boldsymbol{u} = (u_1, u_2, u_3) = (-2, \ -1, \ 10)$.
- No trading is not an equilibrium: $u_1 + u_2 = -3 < 0$
- The equilibrium payment promises satisfy $r_1 + r_2 \geq 3$, $r_1 + r_3 \geq -8$, $r_2 + r_3 \geq -9$ and, $r_1 + r_2 + r_3 = 0$.
- Member 3 need to pay 3 to the coalition $\{1, 2\}$.
- The set of equilibrium payment promises satisfies $\mathcal{T}_{\boldsymbol{r}} = 3$

Visualization of the example: $\boldsymbol{u} = (-2, \ -1, \ 10)$



- **Minimality i) reduces multiplicity but does not eliminate it and, ii) imply voluntary participation: no one promises more than ex ante utility**

General properties of the equilibrium promises

Proposition 3: Voluntary participation

Stable promises can violate voluntary participation for those who make the promises. Equilibrium promises are consistent with voluntary participation for those who make the promises.

Proposition 4: Push toward equality

For any equilibrium with minimal total promises, there exists k_* such that:

- $r_i \geq 0$ for all $i < k_*$,
- $r_j \leq 0$ for all $k_* \leq j$ and,
- $v_i^{\mathbf{r}} \leq v_j^{\mathbf{r}}$ for all $i < k_* \leq j$.

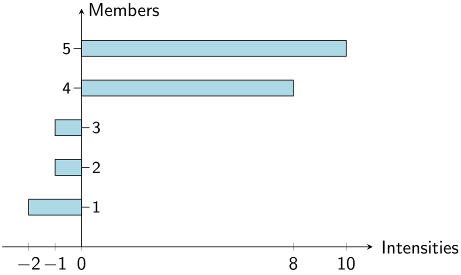
Result:

- Top-down flow of promises.
- The order of inter-coalition *ex ante* intensities is not reversed by the *ex post* intensities.

An example of frustrated minority: $\mid \mathcal{C}^R \mid < \kappa$

- A committee with 5 members rules by majority $\kappa = 3$:

$$\boldsymbol{u} = (u_1, u_2, u_3, u_4, u_5) = (-2, \ -1, \ -1, \ 8, \ 10).$$

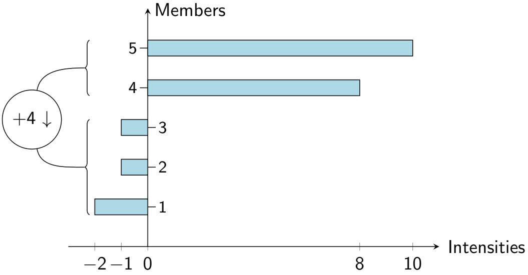


- In any equilibrium, $\mathcal{T}_{\boldsymbol{r}} = 4$ and the coalition $\mathcal{C}^R = \{4, \ 5\}$ need to promise a total of 4 to the coalition $\mathcal{C}^S = \{1, \ 2, \ 3\}$.

An example of frustrated minority: $\mid \mathcal{C}^R \mid < \kappa$

- A committee with 5 members rules by majority $\kappa = 3$:

$$\boldsymbol{u} = (u_1, u_2, u_3, u_4, u_5) = (-2,\ -1,\ -1,\ 8,\ 10).$$



- Examples of minimum payment equilibrium
  - $\boldsymbol{r} = (2,\ 1,\ 1,\ -2,\ -2)$ leading to $\boldsymbol{v}^{\boldsymbol{r}} = (0,\ 0,\ 0,\ 6,\ 8)$.
  - $\boldsymbol{r} = (0,\ 0,\ 4,\ 0,\ -4)$ leading to $\boldsymbol{v}^{\boldsymbol{r}} = (-2,\ -1,\ 3,\ 8,\ 6)$.

Equilibrium with weak support for the reform $|\mathcal{C}^R| < \kappa$

Proposition 5: "Frustrated minority"

The promise profile $\boldsymbol{r} \in \mathcal{P}$ is an equilibrium if and only if

1. $\mathcal{T}_{\boldsymbol{r}} = \min_{\boldsymbol{r'} \in \mathcal{S}_o} \mathcal{T}_{\boldsymbol{r'}} = U_S$
2. Members of $\mathcal{C}^R$ send the promises: $r_i \leq 0$ for all $i \in \mathcal{C}^R$. The promises are indeterminate but satisfy the voluntary participation constraint $-u_i \leq r_i$ and $\sum_{\mathcal{C}^R} r_i = -U_S$.
3. Members of the coalition $\mathcal{C}^S$ receive the promises: $r_i \geq 0$ with $\sum_{\mathcal{C}^S} r_i = U_S$.
   1. When $|\mathcal{C}^R| < \kappa - 1$, $r_i = -u_i > 0$ for all $i \in \mathcal{C}^S$.
   2. When $|\mathcal{C}^R| = \kappa - 1$, there are multiple ways of distributing the total payment promises of U^S among the members of $\mathcal{C}^S$.
4. In all cases, the ex post intensity of any reform opponent is smaller than the ex post intensity of any reform supporter

$$u_i + r_i \leq u_j + r_j, \text{ for all } i \in \mathcal{C}^S, \ j \in \mathcal{C}^R.$$

Equilibrium with strong support for the reform: $|\mathcal{C}^R| \geq \kappa$

- We denote by n the swing voter for the status quo $\mathcal{C}^S = \{1, .., n\}$ with $|\mathcal{C}^S| = n \leq I - \kappa$, so that $\mathcal{C}^R = \{n+1, .., I\}$.

- The minority coalition $\mathcal{C}^S$ can "entice" the coalition:

$$\underline{\mathcal{C}}^R = \{n+1, .., I - \kappa + 1\}$$

- The coalition $\mathcal{C}^S$ need to promise a total of $\underline{U}^R := \sum_{\underline{\mathcal{C}}^R} u_i$ to convince members of the coalition $\underline{\mathcal{C}}^R$ to vote against the reform.

- The gains from trade of the coalition $\mathcal{C}^S$ is:

$$G^S = U^S - \underline{U}^R.$$

Proposition 6: No trade equilibrium

Assume $|\mathcal{C}^R| \geq \kappa$ and $G^S \leq 0$. The only equilibrium is a no trade equilibrium $\boldsymbol{r} = \mathbf{0}$.

Strong support of the reform, $|\mathcal{C}^R| \geq \kappa$ and $G^S > 0$

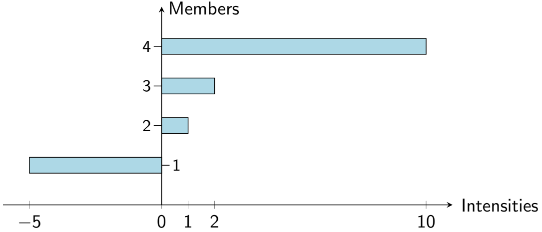
- Members of the coalition $\mathcal{C}^R/\underline{\mathcal{C}}^R$ have to promise G^S to preempt members of the coalition $\mathcal{C}^S$ from "bribing" the coalition $\underline{\mathcal{C}}^R$ into voting for S.

- The total payment promise will be at least G^S.

- The analysis shows that two subcases need to be considered:
  - The coalition $\mathcal{C}^R/\underline{\mathcal{C}}^R$ can afford to promise G^S to preempt the enticement of $\underline{\mathcal{C}}^R$ from taking place without inducing some of its members to be new subjects of enticements to vote against the reform.
  - The coalition $\mathcal{C}^R/\underline{\mathcal{C}}^R$ cannot afford to promise G^S without reversing the natural order to *ex ante* intensities.

The case $|\mathcal{C}^R| \geq \kappa$ and positive but small G^S

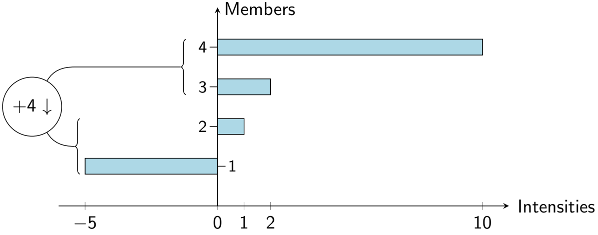
$I = 4$, *ex ante* intensities $\boldsymbol{u} = (-5, 1, 2, 10)$; majority rule $\kappa = 3$.



- We have $U^R = 13$, $U^S = 5$, $\underline{U}^R = 1$ and $G^S = 4$
- All equilibria require the coalition $\{3, 4\}$ to promise 4 to the members of the coalition $\{1, 2\}$ without reversing the *ex ante* inter coalition ranking of intensities.
- All equilibria have $\mathcal{T}_{\boldsymbol{r}} = 4$

The case $|\mathcal{C}^R| \geq \kappa$ and positive but small G^S

$I = 4$, *ex ante* intensities $\boldsymbol{u} = (-5, 1, 2, 10)$; majority rule $\kappa = 3$.



- Indeterminacy occurs again:

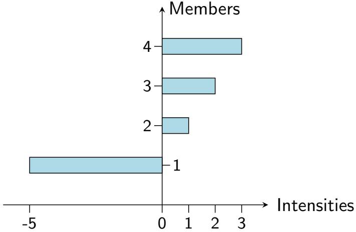
$$\boldsymbol{r} = (3, 1, 0, -4), \qquad \boldsymbol{v^r} = (-2, 2, 2, 6);$$
$$\boldsymbol{r} = (4, 0, -1, -3), \qquad \boldsymbol{v^r} = (-1, 1, 1, 7);$$

- The following $\boldsymbol{r}$ is not an equilibrium, although its total payment is \$4:

$$\boldsymbol{r} = (2, 2, -1, -3), \qquad \boldsymbol{v^r} = (-3, 3, 1, 7).$$

The case $|\mathcal{C}^R| \geq \kappa$ and large $G^S > 0$

$I = 4$, *ex ante* intensities $\boldsymbol{u} = (-5, 1, 2, 3)$; majority rule $\kappa = 3$.



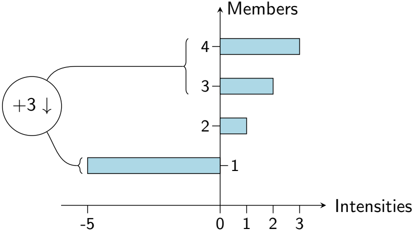
- We have $U^R = 6$, $U^S = 5$, $\underline{U}^R = 1$ and $G^S = 4$

- If the members of the coalition $\{3, 4\}$ promise 4 to the members of the coalition $\{1, 2\}$ the *ex ante* inter coalition ranking of intensities cannot be preserved by the *ex post* intensities.

- For example $\boldsymbol{r} = (4, 0, -2, -2)$ lead to the it ex post intensities $\boldsymbol{v^r} = (-1, 1, 0, 1)$: Member 2 becomes a new target of enticement by member 1.

The case $|\mathcal{C}^R| \geq \kappa$ and large $G^S > 0$

$I = 4$, *ex ante* intensities $\boldsymbol{u} = (-5, 1, 2, 3)$; majority rule $\kappa = 3$.



- To achieve an equilibrium the following algorithm need to be performed:
- **Step 1:** Member 3 and 4 need to promise just enough to align their intensities with that of member 2

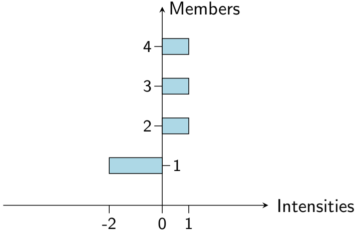
$$\boldsymbol{r}^{[1]} = (3, 0, -1, -2).$$

- New intensities become

$$\boldsymbol{u}^{[1]} = (-2, 1, 1, 1).$$

The case $|\mathcal{C}^R| \geq \kappa$ and large $G^S > 0$

$I = 4$, *ex ante* intensities $\boldsymbol{u} = (-5, 1, 2, 3)$; majority rule $\kappa = 3$.



- New intensities are

$$\boldsymbol{u}^{[1]} = (-2, 1, 1, 1).$$

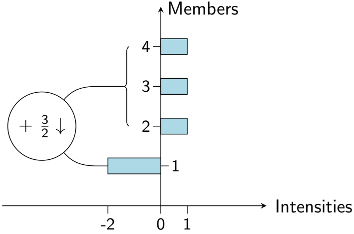
- Gains from trade is

$$G^S_{[1]} = 1$$

- Members of the coalition $\{2, 3, 4\}$ need to promise the same amount otherwise whoever pays more becomes a new target of enticement

The case $|\mathcal{C}^R| \geq \kappa$ and large $G^S > 0$

$I = 4$, *ex ante* intensities $\boldsymbol{u} = (-5, 1, 2, 3)$; majority rule $\kappa = 3$.

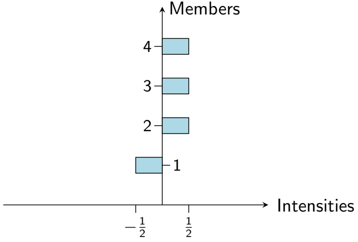


- Each member of the coalition $\{2, 3, 4\}$ promises 0.5 to member 1
- The total payment promises after the two rounds is

$$\mathcal{T}_{\boldsymbol{r}} = 3 + 3/2 = 9/2 > G^S = 4$$

The case $|\mathcal{C}^R| \geq \kappa$ and large $G^S > 0$

$I = 4$, *ex ante* intensities $\boldsymbol{u} = (-5, 1, 2, 3)$; majority rule $\kappa = 3$.



- New intensities are

$$\boldsymbol{u}^{[2]} = (-\frac{1}{2},\ \frac{1}{2},\ \frac{1}{2},\ \frac{1}{2}).$$

- No more incentives for enticements: $G^S_{[2]} = 0$.

The case $|\mathcal{C}^R| \geq \kappa$ and positive but small G^S

Proposition 7: Preemptive promises of first order

Assume $|\mathcal{C}^R| \geq \kappa$ and $0 < G^S \leq \sum_{j \in \mathcal{C}^R \backslash \underline{\mathcal{C}}^R} [u_j - u_{I-\kappa+1}]$.

The payment promises profile $\boldsymbol{r} \in \mathcal{P}$ is an equilibrium if and only if

- Members of the coalition $\mathcal{C}^S \cup \underline{\mathcal{C}}^R$ receive the promises while the members of the coalition $\mathcal{C}^R \backslash \underline{\mathcal{C}}^R$ send the promises :

$$-u_j \leq r_j \leq 0 \leq r_i \text{ for all } i \in \mathcal{C}^S \cup \underline{\mathcal{C}}^R \text{ and} j \in \mathcal{C}^R \backslash \underline{\mathcal{C}}^R.$$

- the ex post intensity of any reform opponent is smaller than the ex post intensity of any reform supporter

$$u_i + r_i \leq u_j + r_j, \text{ for all } i \in \mathcal{C}^S \cup \underline{\mathcal{C}}^R \text{ and} j \in \mathcal{C}^R \backslash \underline{\mathcal{C}}^R.$$

- The minimum total payment achieved in all equilibria is

$$\mathcal{T}_* = \sum_{i \in \mathcal{C}^S \cup \underline{\mathcal{C}}^R} r_i = G^S$$

The case $|\mathcal{C}^R| \geq \kappa$ and large $G^S > 0$

Proposition 8: Preemptive promises of higher order

Assume $|\mathcal{C}^R| \geq \kappa$ and $G^S > \sum_{j \in \mathcal{C}^R \setminus \underline{\mathcal{C}}^R} [u_j - u_{I-\kappa+1}]$. Define k_* with

$$\sum_{j \in \mathcal{C}^R \setminus \underline{\mathcal{C}}^R} [u_j - u_{k_*}] < G^S \leq \sum_{j \in \mathcal{C}^R \setminus \underline{\mathcal{C}}^R} [u_j - u_{k_*-1}]$$

The promises $\boldsymbol{r} \in \mathcal{P}$ is an equilibrium if and only if

$$r_i \geq 0 > r_j, \quad v_i^{\boldsymbol{r}} \leq u_{k_*} - x_* = v_j^{\boldsymbol{r}}, \quad \forall i < k_* \leq j.$$

The minimum total promises achieved in all equilibria is,

$$\mathcal{T}_* = \sum_{i < k_*} r_i = \sum_{i \geq k_*} \left[u_i - u_{k_*} + x_*\right] > G^S,$$

$$x_* := \frac{G^S - \sum_{j \in \mathcal{C}^R \setminus \underline{\mathcal{C}}^R} [u_j - u_{k_*}]}{\kappa - 1}.$$

Conclusion

- We consider a voting model where voters can freely make promises contingent on vote outcome and prior to voting in order to influence the vote of those who receive the promises.
- The promises are decentralized, enforceable and, are only guided by self interest
- Median voter theorem does not hold because the policy set is multidimensional: The political equilibrium is based on stability and total promises minimization.
- We find, that equilibria exist, are indeterminate but satisfy some general properties:
  - Push toward equality: Top-down flow of payment.
  - When the reform is defeated under no trade: Frustrated minority coalition compensates a majority coalition to sway their vote in favour of the reform.
  - When the reform is adopted under no trade: Trading may be needed to preempt the emergence of frustrated minorities