Spatial Theory in 2-space

17.251
Fall 2016
Throat-clearing

• Fundamental finding of unidimensional spatial model
  – Pure majority rule: the median prevails
  – More generally: the pivot prevails
• Fundamental finding of multidimensional spatial model
  – The center doesn’t hold
  – Preferences can’t induce equilibria
  – \( \therefore \) institutions (or something else) must enter to provide stability
Basic set-up: *Ideal points*

- Rand Paul
- Jeb Bush
- Ted Cruz
- Barack Obama

Gov't intervention in economy vs. Libertarianism
Basic set-up: Utility curves

\[ U_{Obama} = \alpha - \beta(x_{Obama} - x)^2 - \gamma(y_{Obama} - y)^2 \pm \delta(x_{Obama} - x)(y_{Obama} - y) \]
Basic set-up: Indifference curves

\[ U_{Obama} = \alpha - (x_{Obama} - x)^2 - (y_{Obama} - y)^2 \]
Basic set-up: Indifference curves

\[ U_{Obama} = \alpha - \beta(x_{Obama} - x)^2 - \gamma(y_{Obama} - y)^2, \beta > \gamma \]
Basic set-up: Indifference curves

\[ U_{Obama} = \alpha - \beta(x_{Obama} - x)^2 - \gamma(y_{Obama} - y)^2, \beta < \gamma \]

Libertinism

Barack Obama

Gov’t intervention in economy
Why this makes a difference: Voter ID (the Wall?)
The Simple Euclidean System: The Equation

\[ U_i = \alpha - (x_i - x)^2 - (y_i - y)^2 \]

\[ U_i = -(x_i - x)^2 - (y_i - y)^2 \]
The Simple Euclidean System:
The Picture

Ideal points
Status quo
Indifference curves
The Simple Euclidean System: Preference relations

\[ U_B(\varphi) = U_B(P_1) = U_B(P_2) \]

\[ U_B(P_3) < U_B(\varphi) \]
The Simple Euclidean System
The Win Set, $W(\varphi)$
The Contract Curve

A

B

C

Guns

Butter

φ
The Pareto Set

\[
\begin{align*}
\text{Guns} & \quad \phi' \\
\text{Butter} & \quad \phi \\
A & \quad B \\
C &
\end{align*}
\]
You are always off a contract curve
McKelvey Chaos Theorem

• With multiple attributes and multiple decisionmakers
  – There is no equilibrium of tastes
  – Anything can happen
  – I.e., the median voter result doesn’t hold

• This is really important
What Might Induce Stability?

- Tastes
- Uncertainty
- Impatience
- Rules
Tastes may induce stability

- Ideology
- “Median in all directions”
Tastes may induce stability

(Make s.q. the “median’s” ideal point, then draw the indifference curves)
Abortion Availability

Nuclear deal with Iran

(Rotate this graph)
Nuclear deal with Iran

Abortion Availability
The result is knife-edged
Uncertainty may induce stability

Policy w/ certainty
Policy w/ uncertainty

Abortion Availability

Withdrawning from Iraq
Rules may induce stability

• Floor rules, e.g.
  – vote on status quo last
    • Not stability so much as guarding against “anything can happen”
  – Germaneness rules

• Committees
Status quo last

“C” is Speaker

Guns

Butter
Stability-inducing powers of leaders and committees

- Committees reduce dimensionality
- Committees and leaders have agenda-setting powers
Examples of Multidimensionality in Action

• Informal decisionmaking
• Riker’s “heresthetics”
  – Heresthetics: the strategic introduction of “extraneous” issues
    • Classic example: Popular election of Senators
  – Human trafficking
Simple human trafficking bill
Abortion gets introduced

Abortion

Human trafficking

\( \phi \)

B

33
Unresolved Issues

• Salience
• Sophistication
Abortion not salient
Abortion made salient

Abortion

Human trafficking
Salience can distort the win set
Salience can distort the win set
Sophisticated Voting

• The strategy of preferring one alternative at time $t$ even through the immediate alternative is better, in order to prevent an even worse outcome in the future
Sophisticated Voting Example

<table>
<thead>
<tr>
<th>Democrats</th>
<th>Hawkish R</th>
<th>Dovish R</th>
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<tbody>
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Agenda

- Add “proviso” to negotiation strategy
- If the proviso passes, pair the negotiation strategy proviso against the status quo (continue no negotiation)
- If the proviso fails, pair the negotiation strategy against the status quo
## Agenda

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The proviso passes

The amended negotiation fails, *even though a majority would have favored the original strategy over the status quo*
Outcome

• The proviso passes
• The amended treaty fails, *even though a majority would have favored the original treaty over the status quo*
• How to save ourselves? Sophistication
  – Backward induction
Agenda

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Neg., not with terr. (DR)

Neg., not with terr. (D+DR)

Q (HR)

Q (HR+DR)

Neg. with anyone (D)

Neg. with anyone (D+HR)