Theories of Electoral Competition: The Median Voter Model

Dilip Mookherjee

Boston University

Ec 721 Lecture 13
Governance Failures

- Many development problems owe to weak/imperfect political institutions or governance

- What is the benchmark/ideal political institution?

- For most people, it is a *representative democracy*, with accountability of appointed leaders

- Key components of (indirect) democracy:
  - executive selected via contested and fair elections (Schumpeter, Dahl)
  - separation of powers between executive, legislative and legal branches (Montesquieu, Madison)
  - free speech, civil liberties (Locke, Mill)
Contestability and Accountability

- When does contestability (electoral competition) give rise to accountable/representative government?
- First formal model: Median Voter Theorem (Hotelling (1929), Black (1948), Downs (1957))
- Analogue of Arrow-Debreu theory of perfect competition in the economic sphere: helpful in identifying ideal conditions when electoral competition generates representative policies
- Conversely, this helps generate a typology of ‘governance frictions’ that prevent actual democracies from achieving ideal outcomes
Preview: Varieties of Governance Frictions

- Aggregation: ordinal rather than cardinal preferences (Median Voter model)
- Lack of Commitment/Ideology/Politician preferences (Citizen Candidate model)
- Low political (voter) participation/awareness; non-issue-based preferences (e.g., identity politics) (Probabilistic Voting models; pork-barrel politics)
- Special interest groups and elite capture (Lobbying models); (de facto) autocracy instead of democracy
- Vote buying and political clientelism
Aggregation of Preferences

- Problem with Majority Voting rule: non-existence of a (Condorcet) winner (generalization: Arrow impossibility theorem)
- One resolution: restrict domain of preferences and policy spaces
- Median Voter model: single dimensional Euclidean policy space, single-peaked preferences
- Additional assumptions:
  - two contestants
  - commitment to policy platforms
  - purely opportunistic: maximize probability of winning/vote share
  - perfect turnout, voter awareness, no vote counting errors
MV Theorem

- Two stage game: first contestants A, B commit to policy platforms $p_A, p_B \in \mathcal{R}$, then citizens vote; contestant with more votes wins (50-50 coin toss if tie)

- Under stated assumptions, there is a unique SPNE of this game, where $p_A = p_B = p_m^*$, $p_i^*$ ideal policy for voter $i$, $m$ is the median ideal policy

- Zero-sum game, proposing $p_m^*$ is a minmax strategy

- Median ideal policy: suitable notion of ‘representativeness’
Alternative Notion of Representativeness

- Is the median ideal policy the utilitarian optimal policy? Always/sometimes?
- Utilitarianism: embodies cardinality/intensity of (interpersonally comparable) preferences
- Cannot be incorporated by any 0-1 voting mechanism
Application: ‘Size’ of Government (Persson-Tabellini, Ch 3)

- Two goods: one private, one public
- $2N + 1$ citizens, with exogenous income/endowments
  \[ y_1 < y_2 < \ldots < y_{2N+1} \]
- Quasi-linear preferences: \( U_i = c_i + H(g) \), where \( H' > 0 > H'' \)
- Public good funded by linear income tax \( \tau \); B.C: \( g = \tau \bar{y} \)
- Sole policy variable: \( \tau \in [0, 1] \)
- Single-peaked (concave) preferences: \( U_i(\tau) = y_i(1 - \tau) + H(\tau \bar{y}) \),
  ideal policy \( \tau_i^* \) satisfies:
  \[ y_i = \bar{y}H'(\tau_i^* \bar{y}) \]
Electoral competition results in both candidates proposing $\tau^p = \tau^*_N$

Utilitarian optimal policy: $\tau^W$ maximizes
$$\sum_{i=1}^{2N+1} U_i = \bar{y}(1 - \tau) + H(\tau \bar{y})$$

$\tau^W$ is the ideal policy of the citizen with mean income $\bar{y}$

Electoral competition results in utilitarian optimal outcome if and only if median and mean income coincide

Size of government is too large if income distribution is positively skewed (‘populism’)

Alesina-Rodrik (QJE 1994) extension to $AK$ endogenous growth model: cross-country negative growth-inequality correlations
Citizen-Candidate Model (Besley-Coate QJE 1997)

- Primary alternative to the Downsian model, departs in various ways:
  - Political candidates have policy preferences of their own (ideology/corruption)
  - Candidates cannot commit to policy platforms prior to elections
  - Endogenous entry into politics
  - Multidimensional policy spaces

- Downsian MVT is robust to certain ranges of policy preferences of candidates, so the CC model needs to depart on other dimensions as well
Citizen Candidate Model, Assumptions

- Citizens $i = 1, \ldots, N \geq 3$, all are potential candidates
- Policy space $\mathcal{A}$ unrestricted; default policy $0 \in \mathcal{A}$ (‘shutdown’, if no one runs for office)
- Citizen $i$ preferences: $V^i(x, j)$ for policy $x$, candidate $j$
- $\delta \geq 0$: cost of running for office
Since candidates are citizens, they have preferences over policy.

*Key assumption:* candidates cannot commit to policy platforms before the election.

*Key implicit assumption:* static game, or myopic behavior: elected officials have no concerns about re-election.

Hence elected, they will select their own favorite policy (no checks and balances): \( x_j^* = \arg \max_{x \in A} V^j(x, j) \) (assumed unique).

Citizen preferences are common knowledge, so candidate \( j \) identified by voters with expectation of policy \( x_j^* \).
Stages of Game

- **Stage 1:** citizens decide whether to run for office $s_i \in \{0, 1\}$: determines candidate set $C$

- **Stage 2:** citizen $i$ casts vote or abstains (selects $\alpha_i \in C \cup \{0\}$, pure strategy)

- **Stage 3:** Candidate with highest number of votes wins, with coin toss determining winner in case of ties

- If $j$ wins, selects policy $x_j^*$; if no one ran for office, government shuts down (policy 0)
Equilibrium concept, properties

- Subgame perfect equilibrium in weakly undominated strategies (to prevent some voter coordination problems)

- *Lemma:* Pure (voting) strategy equilibrium always exists in the second stage, for any given candidate set

- Candidate entry strategies: generally exist in mixed strategies

- This game tends to have ‘too many’ equilibria, as we shall soon see
Some Definitions

- $v_{ij} \equiv V_i(x_j^*, j)$, citizen $i$ utility if $j$ is elected; candidate utility is $v_{jj} - \delta$

- Given candidate set $C$, a **sincere partition** $(N_i)_{i \in C \cup \{0\}}$ is a partition of $N$, the set of voters such that:
  - $l \in N_i$ implies $j$ is an optimal candidate for $i$
  - $l \in N_0$ implies $l$ is indifferent between all candidates

- When there are two candidates, voting sincerely is optimal (not necessarily if there are more than two candidates)
One Candidate Equilibria

**Proposition 2:** An equilibrium where a single candidate $i$ runs unopposed, exists if and only if:

(i) $v_{ii} - v_{i0} \geq \delta$

(ii) For any $k \neq i$ such that $\#N_k \geq \#N_i$ in a sincere partition of $\mathcal{C} = \{i, k\}$,

either

$v_{kk} - v_{ki} \leq \delta$ and $\#N_k > \#N_i$

or:

$\frac{1}{2}(v_{kk} - v_{ki}) \leq \delta$ and $\#N_k = \#N_i$
Corollary to Proposition 2: Suppose citizens care only about policies. If for all sufficiently small $\delta$ an equilibrium where $i$ runs unopposed exists, then $x_i^*$ is a Condorcet winner amongst \{${x_j^*: j \in N}$\}. Conversely, if $x_i^*$ is a strict Condorcet winner in this set, there is an equilibrium where $i$ runs unopposed for all $\delta$ small enough.

Hence, policy prediction coincides with the MVT under the assumptions of single peaked preferences over a unidimensional policy space.
**Two Candidate Equilibrium**

**Proposition 3:** If there is an equilibrium where exactly two candidates \((i, j)\) enter, there exists a sincere partition \((N_i, N_j, N_0)\) of \(C = \{i, j\} \cup \{0\}\) such that \(#N_i = #N_j\) and \(\frac{1}{2} \min\{v_{ii} - v_{ij}, v_{jj} - v_{ji}\} \geq \delta\).

If this condition holds, and in addition \(#N_0 + 1 < #N_i = #N_j\), such a two candidate equilibrium exists.

**Proof:** Necessity is obvious. For sufficiency, a third candidate does not want to enter if ‘swing’ voters \((N_0)\) are few (e.g., less than one third of the population) relative to others (who could keep voting for the same candidate, expecting others to do so).
This applies even if all voters prefer the third candidate to $i$ and $j$!

Any pair of candidates who split the vote can form a two candidate equilibrium if their policies are ‘not too close’ (contrary to MV model predictions of policy convergence)

Note also that $i$ and $j$ must split the vote, so every voter is pivotal!
Three Candidate Equilibrium

- Tend to be rare in elections based on plurality voting (Duverger’s Law); voters tend to coordinate on two candidates.
- Nevertheless, three candidate equilibria can exist.
- Besley-Coate provide an example of three candidate equilibria where one wins for sure.
- Why do the losing candidates enter? To affect the election outcome by diverting votes away from candidates they don’t want to win.