STATE INTERVENTION AND DEVELOPMENT

- Normative: What are the arguments for state intervention?
  - Internalizing Learning Externalities: Endogenous growth models
  - Inequality: Imperfect credit market models
  - Coordination failure
  - Investment in Infrastructure

- Positive: How does state intervention work, in practice?
- How can effective institutions be designed to deliver these interventions?
Political institutions

- Political system as a mapping from individual preference orderings to a social preference ordering.

- Arrow’s impossibility theorem shows that if this mapping is to satisfy certain weak conditions
  - Transitivity
  - Weakly Paretian
  - Independence of irrelevant alternatives

- The social preference must be ‘dictatorial’ in that it will reflect the preferences of a single agent.

- Implication: if agents differ in policy preferences cannot avoid conflict ⇒ what matters is who has the political power (ability to choose policy).
Political institutions: set of institutions which regulate the limits of political power, and determines how political power is acquired by a subset of citizens.

Why did certain political institutions have emerged as dominant institutions across countries (e.g. universal franchise, representative democracy)

- Historic accident, colonialism, efficiency, rent-seeking

How does policy-making occur in these environments.

- When will the impossibility theorem not bind - assumptions on preferences and institutions

Specific institutions for choosing public policy: Representative democracy
Table 1: Total Government Expenditure as Per Cent of GDP at Current Prices: Western Europe, the United States and Japan, 1913–1999.

<table>
<thead>
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<th></th>
<th>1913</th>
<th>1938</th>
<th>1950</th>
<th>1973</th>
<th>1999</th>
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<td>23.2</td>
<td>27.6</td>
<td>38.8</td>
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<td>42.4</td>
<td>30.4</td>
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<tr>
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<td>21.7</td>
<td>26.8</td>
<td>45.5</td>
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<tr>
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<td>28.8</td>
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<td>41.5</td>
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<td>Arithmetic Average</td>
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<td>29</td>
<td>29.8</td>
<td>42</td>
<td>45.9</td>
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<tr>
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<td>8</td>
<td>19.8</td>
<td>21.4</td>
<td>31.1</td>
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</tr>
<tr>
<td>Japan</td>
<td>14.2</td>
<td>30.3</td>
<td>19.8</td>
<td>22.9</td>
<td>38.1</td>
</tr>
</tbody>
</table>

Note: the data for Netherlands 1913 refers to 1910 instead.
Figure 1: Government share of tax revenue in GDP for OECD countries and all countries 1970-2001
Figure 2: Democracies in the world, 1850-2000
Figure 3 The size of government in countries with high and low democracy (var: ratio of government consumption to GDP, threshold for democracy at 8).

(mean) govsizehidem

(mean) govsizelodem
Figure 4 The size of government in OECD countries with high and low democracy (var: ratio of government consumption to GDP, threshold for democracy at 8).
Figure 5: Tax Share in U.S. State Level Data (1950-1998)
The Growth of Government

The (Concurrent) rise of Democracy

Need or Populism
Figure 7: Election Turnout in OECD countries.
Figure 8: Trust, Responsiveness and Effectiveness in U.S. State Level Data (from NES surveys): 1952-2000.
ECONOMIC ENVIRONMENT

→ $N$ citizens, make a social decision about a set of policies $x \in \mathbb{N}$, where $\mathbb{N}$ is the set of feasible policies.

→ Citizens preferences over policy: $V^i(x, j)$ (where $i = 1, \ldots, N$) and $j$ is the identity of the policy-maker.

→ one dimensional political science environment
  $V^i(x, j) = -\| \alpha_i - x \|$ for all $j$

→ negative income tax model:
  → Agent preferences: $\omega^i = c^i + V(n^i)$ where $c$ is consumption and $n^i$ is leisure and $V(.)$ is concave utility function.
  → Budget constraint $c^i \leq (1 - t)l^i + T$
Income tax rate is $t$ and transfer level is $T$. The real wage is exogenous and normalized to one.

Individuals have identical preferences over consumption $c$, and labor supply $l$, denoted by $u(c, l)$ but differ in productivity $a_i$ s.t individual $i$’s time constraint is

$$a_i \geq n^i + l^i$$

Assume $a_i$ is distributed in population with mean $a$ and median $a_m$.

Since individual preferences are linear in consumption, optimal labor supply will be decreasing in tax rates (by concavity of $V()$). Specifically,

$$l^i = a^i - V_n^{-1}(1 - \tau)$$
Let \( a_i \) denote ability/difference in preferences and \( x \) as before policy. Let \( x(a_i) \) be individual \( i \)'s most preferred policy.

**Single peaked preferences** Voter \( i \) has single peaked preferences if his preference ordering over alternative policies is determined by their distance from his most preferred policy (bliss point) - If \( x'' > x' > x^{a_i} \) or \( x'' < x' < x^{a_i} \) then \( V(x'', a_i) < V(x', a_i) \)

**Single crossing** The preferences of voters satisfy single-crossing when the following property holds: If \( x > x' \) and \( a'_i > a_i \) or if \( x < x' \) and \( a'_i < a_i \) then \( V(x, a_i) \geq V(x', a_i) \Rightarrow V(x, a'_i) \geq V(x', a'_i) \)
→ **Condorcet winner**: A Condorcet winner exists if there is some alternative that beats all others in pairwise comparison. A particular policy is a Condorcet winner in the set $\aleph$ if there is no other policy $x \in \aleph/\{x_c\}$, which is (strictly) preferred to it by a majority in the population.

→ **Median Voter Theorem**: If all voters have single peaked preferences over a given ordering of policy preferences or if their preferences satisfy the single-crossing property then a Condorcet winner always exists and coincides with the median ranked bliss (preferred) point (policy).

→ (note doesn’t require sincere voting)
→ In the one dimensional pol-sci example, preferences are single peaked. The Condorcet winner is the median ideal point.

→ In the negative income tax case Roberts shows that there is a Condorcet winner if $y(t, T, a) \equiv al(a(1 - t), T)$ is increasing in $a$ for all $(t, T) \in [0, 1] \times \mathbb{R}$. It is the level of redistribution preferred by the median ability group.

→ A Condorcet winner does not exist in a game of pure distribution

→ Divide a cake of size one. A policy $x$ is an element of the N-dimensional simplex. For any randomly selected alternative in this simplex, another can be found that beats it in pairwise comparison under majority rule.
APPLICATION

- Two parties compete

- Preferences are as in the labor supply model

- Preferences satisfy single-crossing $\implies$ outcome will be the tax rate preferred by the median voter.

- If the mean exceeds the median as we would expect for a skewed distribution then it must be the case that median productivity is less than mean productivity.

- Increases in difference between mean and median will increase tax rate $\implies$ greater inequality more redistribution.
EVIDENCE

- Inequality and Growth: evidence goes both ways

- Inequality and Redistribution: More equal countries redistribute more (Benabou/Perotti)
REPRESENTATIVE DEMOCRACY

- Three stage game
  - Stage one: entry stage, the number of candidates is determined.
  - Stage two: citizens vote over candidates.
  - Stage 3: Policies are implemented.
  - Solve backward
Policy choice: In a Downsian model each candidate is associated with: \( \hat{x}_i = \text{argmax}_x V^i(x) | x \in \mathbb{R} \). Assume unique per candidate.

Let \( X_i \) denote the campaign announcement of candidate \( i \in C \). Then we suppose the actual policy outcome will be

\[ x_i^* = h(\hat{x}_i, X_i) \]

With full policy commitment \( x_i^* = X_i \), while in its absence it is \( x_i^* = \hat{x}_i \)

Given policy selection rule we can define utility imputation \((v_{1i}, ... v_{Ni})\) associated with each candidate’s election, where \( v_{ji} = V^j(x_i^*, i) \) is individual \( j \)’s utility if \( i \) is elected.
VOTING

→ Given candidate set $C \subset N$ and a policy announcement per candidate $X = X_{i \in C}$ for $X_i \in \mathbb{R}$, each citizen $j$ makes a choice.

→ Let $\alpha_j \in C$ denote her decision, $\alpha_j = 1$ implies she casts her vote for candidate $j$, while if $\alpha_j = 0$ she abstains.

→ A vector of voting decisions is $\alpha = (\alpha_1, \ldots, \alpha_N)$. Given $C$ and $\alpha$ let $P^i(C, \alpha)$ be probability that candidate $i$ wins.

→ Under plurality rule this is the candidate with the most votes.
Citizens correctly anticipate policies associated with every candidate and act to maximize expected utility i.e. vote strategically.

A voting equilibrium is a vector of voting decisions $\alpha^*$ such that for each citizen $j \in N$

(i) $\alpha^*_j$ is a best response to $\alpha^*_{-j}$, i.e.,

$$\alpha^*_j(C, X) \in \arg\max \{\Sigma P^i(C(\alpha_j, \alpha^*_{-j})) V^j(h(\hat{x}_i, X_i)) | \alpha_j \in C \cup 0\}$$

and (ii) $\alpha^*_j$ is not a weakly-dominated strategy.

Implication: individuals vote sincerely in a two candidate election.

note: another way of modelling voting is as probabilistic voting.
ENTRY

→ Assume only some subset of citizens can stand for election. Denote this set as $D \subset N$.

→ Model entry as a game between this group of citizens. Such citizens pure strategies are denoted $s^i < 0, 1$ where $s^i = 1$ implies entry.

→ A pure strategy profile is denoted $s = s^1, \ldots s^D$. Given $s$, the set of candidates in it is $C(s) = \{i|s^i = 1\} < D$.

→ The entry decisions must form a Nash equilibrium.

→ Let $\alpha(C, \hat{X}(C))$ be the vector of voting decisions when the candidate set is $C$. Given this, the expected payoff for a citizen from a particular pure strategy profile $s$ is given by:

$$U^i(s, \alpha(.)) = \sum P^j(C(s), \alpha(C(s), \hat{X}(C(s))))v_{ij}$$
To ensure existence it may be necessary to allow mixed strategies.

Let $\gamma_i$ be a mixed strategy for citizen $i$ with the interpretation that $\gamma_i$ is the probability of running for office.

The set of mixed strategies is the unit interval $[0,1]$.

An equilibrium of the entry game is the mixed strategy profile $\hat{\gamma}$ with the property that there is a voting equilibrium $\alpha(C')$ such that for all $i \in D$, $\hat{\gamma}_i$ is a best response for $\hat{\gamma}_i$. The entry game is finite, and so Nash existence theorem implies an equilibrium exists.
EQUILIBRIUM

→ A political equilibrium is a collection of entry decisions $\gamma$, and a function describing voting behavior $\alpha(C, \hat{X}(C))$ such that

→ (i) $\gamma$ is an equilibrium of the entry game given $\hat{X}(C)$ and $\alpha(C, \hat{X}(C))$, and

→ (ii) for all non-empty candidate sets $C$, $\alpha(c, \hat{X}(C))$ is a voting equilibrium.
**DOWNSIAN MODEL**

- Downs assumed candidates only cared about winning. i.e. candidate preferences are of the form

\[ V^i(x_i, j) = \Delta \text{if } i = j; 0 \text{otherwise} \]

- In the two candidate case it follows that: **Result 1** Suppose that a Condorcet winner exists in \( \mathbb{N} \). Then the unique Nash equilibrium has both candidates committing to \( x_c \).

- Downsian model predicts convergence to the Condorcet winner. Underlies the usual practice of assuming that the outcome preferred by the median voter is selected in political equilibrium. This result generalizes to more than two candidates if entry is costly.
Citizen Candidate Model

→ No restriction on who may enter as a candidate

→ Announcements made about policy prior to the election have no force since candidates will simply implement preferred policy if they win.

→ Besley and Coate (1997) provide conditions for equivalence between their and the Downsian model in the one candidate case:

→ **Result 2** Suppose that $V^i(x, j)$ is independent of $j$ for all $i \in N$, and that a Condorcet winner $x^*_c$ exists in $\mathbb{R}$, then (i) if citizen $i$ running unopposed is an equilibrium of the entry game for sufficiently small entry costs, $x^*_i = x^*_c$ and (ii) if $x^*_i = x^*_c \neq x_0$ then citizen $i$ running unopposed is an equilibrium of the entry game for sufficiently small entry cost.
EFFICIENCY

→ Political failure: Adopting a policy that is not Pareto efficient in political equilibrium.

→ **Result 3** Let $x_c$ be a strict Condorcet winner in $\mathbb{N}$, then it is Pareto efficient in $\mathbb{N}$.

→ Argument: Suppose there is a policy that is better for everyone. Then clearly it must be better for the majority. Hence the set of Condorcet winners must be a subset of the set of Pareto efficient outcomes.
PROBLEMS

→ Citizen candidate models tend to be characterized by too many equilibria, and Downsian models with too few.

→ Possible solutions
  
  → consider probabilistic voting models
  
  → use institutional features of the political process (e.g. political parties, electoral laws, legislative rules) to pin down equilibria.