Political Economy

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Outline of the class

Introduction

Lecture 2-5: Tools of political economics with applications

Lecture 6: Comparative Politics

Part II: Dynamic Political Economy

Lecture 2-5: Tools of political economics

Aim of the first lecture:

1. **Background for political economy**
2. Introduce alternative work-horse models of policy choice
3. Illustrate political forces that influence policy

Preferences and Institutions

First outline some important tenets of

- social choice theory
- spacial voting theory

More in course Social Choice and Voting

A General Policy Problem

- (Economic and Politically) Maximizing agents. Set V agents can be small (e.g. committee) or large (e.g. national election)
- Agents may differ according to an individual characteristic α^i (can be a vector): capture idiosyncratic characteristics, endowments, risks, socioeconomic attributes, etc. Follow a given distribution.
- Economic Agent:
  - Maximize Utility function w.r.t. economic variable c^i subject to a budget constraint H
  - Vector $q \in Q$: Economic policies, taken as given
  - Vector p: data determined by the market

Economic Agent Problem

$$max_{c^i} U(c^i, q, p; \alpha^i)$$

subject to

$$H(c^i, q, p; \alpha^i) \geq 0.$$

From this problem write indirect utility function:

$$W(q, p; \alpha^i) = max_{c^i} \{U(c^i, q, p; \alpha^i) | H(c^i, q, p; \alpha^i) \geq 0\}$$

Examples: Savings, Labor Supply, Purchase of Goods, Investments (given taxes, fiscal incentives and prices)

Political Problem

Policy Maker:

- Set q taking into account p and constraint $G(q,p) \geq 0$
- If the constraint is binding $\rightarrow p = P(q)$: market outcome depends on policy parameters

Political Agent:

- Maximize Indirect Utility function W (by voting, lobbying, ...)
- Individual preferences over the policies $W(q; \alpha^i) \equiv W(q, P(q); \alpha^i)$

Political Agent Problem

So that bliss point (i.e. preferred policy) of voter i

$$q(\alpha^i) = argmax_q W(q;\alpha^i)$$

$\Rightarrow$ Agents with different preferences α^i have conflicting preferences.

How do we Aggregate Preferences?

- In the general setting, a positive analysis of economic policymaking amounts to specifying an institution (e.g. majority rule) and asking how it aggregates political actions, based on individual policy preferences, into equilibrium policies

$\Rightarrow$ No general rule (with desirable properties) that enables a democracy to consistently aggregate individual preferences into policy choices.

Arrow's (1951) Impossibility theorem

There is no democratic mechanism which allows individual preferences to be aggregated in a consistent way:

- H1 Rationality (complete and transitive)
- H2 Unrestricted domain
- H3 Weak Pareto optimality
- H4 Independence (from irrelevant alternatives)

$\Rightarrow$ We are going to drop $H2$ and restrict individual preferences

Majority rule voting

A1 **Direct democracy:** The citizens themselves make the policy choices.

A2 **Sincere voting:** In every vote, each citizen votes for the alternative that gives him the highest utility according to his policy preferences (indirect utility function) $W(q; \alpha^i)$.

A3 **Open agenda:** Citizens vote over pairs of policy alternatives, such that the winning policy in one round is posed against a new alternative in the next round and the set of alternatives includes all feasible policies.

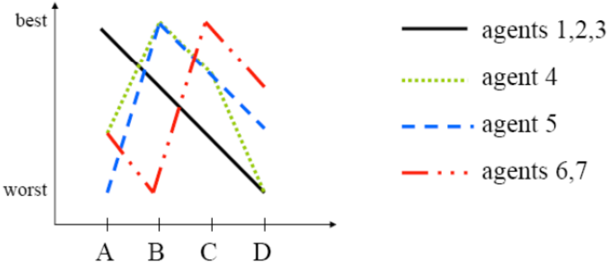
One-Dimensional Policy

Definition: Condorcet winner

A Condorcet winner is a policy q^* that beats any other feasible policy in a pairwise voting.

Definition: Single peaked preferences (Black, 1948)

Policy preferences of voter i are single peaked if the following statement is true: if $q'' \leq q' \leq q(\alpha^i)$ or $q'' \geq q' \geq q(\alpha^i)$ then $W(q''; \alpha^i) \leq W(q'; \alpha^i)$.



Preferences of agents 6 and 7 are not single-peaked.

Median Voter's Theorem

If all voters have single-peaked policy preferences over a given ordering of policy alternatives, a Condorcet winner always exists and coincide with the median-ranked bliss point (q^m).

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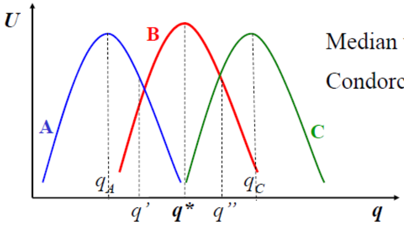
Corollary

q^m is the unique equilibrium policy (stable point) under pure majority rule, that is, under $A1 - A3$.

Sketch of Proof



Median voter: B

Condorcet winner: ***q****

$$q' < q^* \begin{cases} \text{A prefer } q' \\ \text{B and C prefer } q^* \end{cases} \qquad q'' > q^* \begin{cases} \text{A and B prefer } q^* \\ \text{C prefer } q'' \end{cases}$$

$\Rightarrow$ q^* always win in a majority voting election

Example: A Simple Model of Redistribution

- Acemoglu and Robinson (2006)
- A continuum of voters $\mathcal{I} = [0, 1]$
  - Income $y_i \sim_{iid} F(.)$.
  - Average Income $\overline{y} = \int ydF(y)$
  - Median $y^m = F^{-1}(1/2)$.
  - In a typical income distribution $y^m < \overline{y}$.
  - Linear utility $u(c_i) = c_i$.

The Government

- There is a uniform tax rate τ.
- There may be inefficiencies due to the use of a tax, either because it is costly to organize or because of distortions created by the tax system (e.g. tax evasion). This is captured by a cost $c(\tau)\bar{y}$, with $c'(.) > 0, c''(.) > 0, c'(0) = 0, c'(1) > 1$ (so that no agent prefers $\tau = 1$).
- The revenue collected is $T = (\tau - c(\tau))\,\bar{y}$.
- T is then used as a lump sum transfer to the agents to be used for private consumption.

Ideal Policies

- The utility an agent derives from a policy τ is

$$V(\tau, y_i) = (1-\tau)y_i + (\tau - c(\tau))\,\bar{y}.$$

- $V(.)$ is strictly concave and hence single-peaked.
- The ideal policy of agent i satisfies

$$\tau^*(y_i) = \begin{cases} [c']^{-1}\left(1 - \frac{y_i}{\bar{y}}\right) & \text{if } y_i < \bar{y} \\ 0 & \text{if } y_i \geq \bar{y} \end{cases}.$$

- Hence richer individuals favor lower tax rates. ($c'(.)$ is increasing hence so is its inverse $[c']^{-1}(.)$)
- In particular every agent with an income higher than the average prefers $\tau = 0$

Political Outcome

- The Median voter theorem implies that the Condorcet winner is

$$\hat{\tau} = \tau^*(y^m).$$

- With a typical income distribution such that $y^m < \bar{y}$, we have $\hat{\tau} > 0$.

- As $\frac{y^m}{\bar{y}}$ decreases (more inequality), $\hat{\tau}$ increases.

- Extending the franchise leads to a higher tax rate and bigger government.

Caveats

- Unidimensionality and single-peakedness strong assumptions.
- Unidimensionality: restricts available policy instruments
- Single-peakedness: when agents make economic choices concavity of utility function (sufficient for generating single-peakedness) not guaranteed, e.g. optimal income taxes.

  More general sufficient conditions $\Rightarrow$ Single-crossing (Gans and Smart, 1996)

Definition: Single-crossing property

The preferences of voters in V satisfy the single-crossing property when the following statement is true: if $q > q'$ and $\alpha^{i'} > \alpha^{i}$ or if $q < q'$ and $\alpha^{i'} < \alpha^{i}$ then $W(q;\alpha^{i}) \geq W(q';\alpha^{i}) \Rightarrow W(q;\alpha^{i'}) \geq W(q';\alpha^{i'})$.

Theorem

If the preferences of voters in V satisfy the single-crossing property, a Condorcet winner always exists and coincides with the bliss point of the voter with the median value of α^i.

Remarks

- Single-peakedness voters allow to rank voters according to their individually preferred policy.
- Single-crossing monotonicity of preferences allow to rank voters according to their individuals types.

  Verify single-crossing is easy: Spence-Mirrlees condition on marginal rates of substitution.

Example: political feasibility and carbon taxes

- Political feasibility of carbon taxes thorny issue: Gilets jaunes (Boyer et al., 2020), Bonnets rouges.
- Many dimensions of feasibility / possible design to improve feasibility.

$\Rightarrow$ Toy model to explicit the trade-offs: tax reform approach (Bierbrauer et al., 2021).

Basic ingredients: Some stylized facts

- Difference in consumption of the carbon good between agents (Enquête mobilité des personnes 2018 – 2019).
- Difference in ability to switch from carbon to non-carbon good: urban/rural, high/low income (Enquête mobilité des personnes 2018 – 2019).
- Fiscal illusion and trust in government (Douenne and Fabre, 2020).

Champ : déplacements des individus âgés de 6 ans ou plus résidant en France métropolitaine. - © Sources : SDES, Enquête mobilité des personnes 2018–2019 ; Insee, Enquête nationale transports et déplacements 2007–2008 (SOeS – Insee – Inrets).

The model

Continuum of mass 1.

Three goods: c_0 numéraire, c_1 carbon or c_2 non-carbon good.

Carbon consumption generates an externality $k(C_1)$ (increasing in $C_1 = \int_i c_1^i di$). One individual too small to influence the value of $k(C_1)$.

Linear carbon tax $t > 0$ and carbon tax revenue $T = \int_i t(c_1^i)di$ redistributed lump sum.

Utility function :

$$U(c_0, c_1, c_2, \alpha, \theta) = c_0 + \theta v(\alpha c_1 + c_2) - k(C_1), \tag{1}$$

where $v'(\cdot) > 0 > v''(\cdot)$, α follows cdf $F(\cdot)$ (pdf $f(\cdot)$) in $[\underline{\alpha}, \overline{\alpha}]$.

Potentially, agents derive heterogeneous benefits from carbon good consumption.

A consumer (α, θ) with income I maximizes U subject to

$$I + T \geq c_0 + (p_1 + t)c_1 + p_2 c_2, \tag{2}$$

where I initial wealth, p_1 and p_2 the prices of goods 1 and 2.

Goods c_1 and c_2 are substitutes $\rightarrow$ a consumer either chose one or the other, depending on relative prices compared to

$$MRS_{1,2} = \frac{\partial U / \partial c_1}{\partial U / \partial c_2} = \alpha,$$

where α interpreted as capacity to switch from carbon to non carbon.

Constant Relative Risk Aversion (CRRA) utility function :

$v(c) = c^{1-\sigma}/(1-\sigma)$, with $\sigma > 0$ ($\sigma \neq 1$) the degree of relative risk aversion parameter.

Proposition 1: Laissez-faire benchmark

The laissez-faire optimal consumption bundle is given by:

(i) If $p_1/p_2 \leq \alpha$, then

$$c_0^{LF} = I - \frac{p_1}{\alpha} {v'}^{-1}\left(\frac{p_1}{\alpha\theta}\right) \ , \ c_1^{LF} = \frac{1}{\alpha} {v'}^{-1}\left(\frac{p_1}{\alpha\theta}\right) \ , \ c_2^{LF} = 0;$$

(ii) If $p_1/p_2 > \alpha$, then

$$c_0^{LF} = I - p_2 {v'}^{-1}\left(\frac{p_2}{\theta}\right) \ , \ c_1^{LF} = 0 \ , \ c_2^{LF} = {v'}^{-1}\left(\frac{p_2}{\theta}\right);$$

(iii) c_1^{LF} is increasing in α when $\sigma < 1$.

Depending on the relative prices and α, individuals chose to consume either one or the other and then derive the consumption bundle that maximise their utility.

Consumption bundle with carbon tax

Consumer program:

$$\max_{(c_1,c_2)} c_0 + \theta v(\alpha c_1 + c_2) \;\; s.t. \;\; I + T = c_0 + (p_1 + t)c_1 + p_2 c_2$$

$$T := \int_{\underline{\alpha}}^{\overline{\alpha}} t c_1(\alpha, \theta) f(\alpha) d\alpha$$

$\Rightarrow$ Introduction of carbon tax t by unit of c_1 changes the relative price of carbon and non carbon good.

Proposition 2

The optimal consumption bundle with a carbon tax is given by:

(i) If $(p_1 + t)/p_2 \leq \alpha$, then

$$c_0^* = I + T^* - \frac{p_1 + t}{\alpha} v'^{-1}\left(\frac{p_1 + t}{\alpha\theta}\right) \ , \ c_1^* = \frac{1}{\alpha} v'^{-1}\left(\frac{p_1 + t}{\alpha\theta}\right) \ , \ c_2^* = 0.$$

(ii) If $(p_1 + t)/p_2 > \alpha$, then

$$c_0^* = I + T^* - p_2 v'^{-1}\left(\frac{p_2}{\theta}\right) \ , \ c_1^* = 0 \ , \ c_2^* = v'^{-1}\left(\frac{p_2}{\theta}\right).$$

The introduction of a carbon tax implies (i) a reduction of carbon good consumption $c_1^* < c_1^{LF}$ and (ii) a switch to non carbon good for some individuals ($p_1/p_2 < \alpha < (p_1 + t)/p_2$).

Winners/losers from carbon tax

Three categories of individuals:

1. Those who always use the non carbon good ($c_2^{LF} \rightarrow c_2^*$)
2. Those who change their consumption because of the carbon tax ($c_1^{LF} \rightarrow c_2^*$)
3. Those who still consume carbon good even with the carbon tax ($c_1^{LF} \rightarrow c_1^*$)

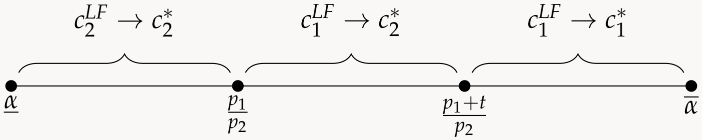


Figura: Consumer choices depending on α

Political support

Let V indirect utility of an individual. An individual is said to benefit from the carbon tax if

$$\Delta V(p_1, p_2, \alpha, \theta, t) := V(p_1 + t, p_2, \alpha, \theta) - V(p_1, p_2, \alpha, \theta) > 0.$$

Political support for the carbon tax is measured by the mass of individuals who are made better off with the reform,

$$S(t) := \int_{\underline{\alpha}}^{\overline{\alpha}} \mathbb{1}\{\Delta V(p_1, p_2, \alpha, \theta, t) > 0\} f(\alpha) d\alpha.$$

A carbon tax is supported by a majority of the population if $S(t) \geq 1/2$.

Median voter theorem

Median voter theorem: If $\Delta V(p_1, p_2, \alpha^m, \theta, t) > 0$ with α^m the median type in the population and $\sigma < 1$, then a majority of consumer supports the introduction of a carbon tax.

Intuition: How does $\Delta V(p_1, p_2, \alpha, \theta, t)$ vary with respect to α?

- $\underline{c_2^{LF} \to c_2^*}$: $\Delta V(p_1, p_2, \alpha, \theta, t)$ does not change with α
- $\underline{c_1^{LF} \to c_2^*}$: $\Delta V(p_1, p_2, \alpha, \theta, t)$ is decreasing in α
- $\underline{c_1^{LF} \to c_1^*}$: If $\sigma < 1$ in the CRRA case then $\Delta V(p_1, p_2, \alpha, \theta, t)$ is decreasing with α

$\Rightarrow$ So it exists a cutoff α that separate winners and losers (if $\sigma < 1$)

Alternative modeling (1/2)

Taking the externality into account: If individuals consider the externality in indirect utility functions $\rightarrow$ larger political support.

Fiscal illusion: If individuals do not believe they will receive all tax revenues as a lump sum (e.g. $\beta T < T$ with $\beta < 1$) $\rightarrow$ lower political support lower because effects of lump sum transfer are mitigated.

Alternative modeling (2/2)

Tax/subsidy (feebate) scheme: Linear tax on carbon good and subsidies on non carbon good (revenue neutral) $\rightarrow$ Median voter with new cutoff α.

Fix cost of switching: Consider that switching to non carbon good has a fixed cost $c_F \rightarrow$ Median voter with new cutoff α.

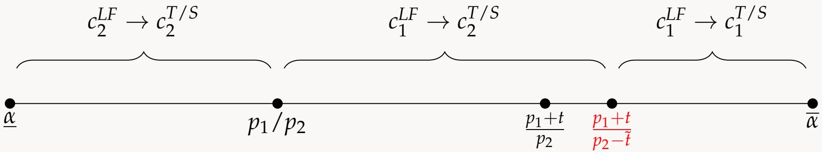


Figura: Tax/subsidy

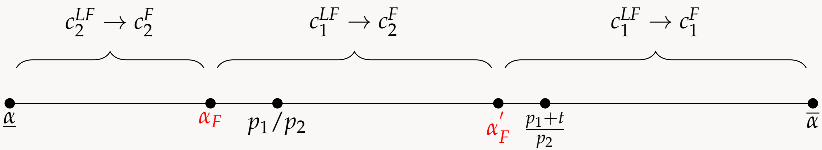


Figura: Fixed cost

Tax/subsidy (feebate) scheme

Linear tax on carbon good and subsidies on non carbon good (revenue neutral). Consumer new program:

$$\max_{(c_1,c_2)} c_0 + \theta v(\alpha c_1 + c_2) \;\; s.t. \;\; I = c_0 + (p_1 + t)c_1 + (p_2 - \tilde{t})c_2$$

$$\int_{\underline{\alpha}}^{\overline{\alpha}} \tilde{t} c_2 f(\alpha) d\alpha := \int_{\underline{\alpha}}^{\overline{\alpha}} t c_1(\alpha, \theta) f(\alpha) d\alpha$$

- $\underline{c_2^{LF} \rightarrow c_2^{T/S}}$: $\Delta V(p_1, p_2, \alpha, \theta, t, \tilde{t}) > 0$
- $\underline{c_1^{LF} \rightarrow c_2^{T/S}}$: If $p_1/(p_2 - \tilde{t}) > \alpha$ (resp. $< \alpha$) then $\Delta V(p_1, p_2, \alpha, \theta, t, \tilde{t}) > 0$ (resp. < 0)
- $\underline{c_1^{LF} \rightarrow c_1^{T/S}}$: $\Delta V(p_1, p_2, \alpha, \theta, t, \tilde{t}) < 0$

Median voter theorem applies and $\alpha = p_1/(p_2 - \tilde{t})$ is the cutoff that separate winners and losers.

Fixed cost of switching

There is a fixed cost $c_F > 0$ when starting using c_2. New budget constraint (*laissez-faire*)

$$I = c_0 + p_1 c_1 + p_2 c_2 + c_F \mathbb{1}\{c_2 > 0\}$$

With carbon tax:

$$I + T = c_0 + (p_1 + t) c_1 + p_2 c_2 + c_F \mathbb{1}\{c_2 > 0\}$$

$$T := \int_{\underline{\alpha}}^{\overline{\alpha}} t c_1(\alpha, \theta) f(\alpha) d\alpha$$

Exactly like benchmark with thresholds α_F and α_F' lower than p_1/p_2 and $(p_1 + t)/p_2$: Median voter theorem.

Multidimensional Policy - Unidimensional Conflict

Definition: Intermediate preferences (Grandmont, 1978)

Voters in the set V have intermediate preferences if their indirect utility function $W(q, \alpha^i)$ can be written as:

$$W(q; \alpha^i) = J(q) + K(\alpha^i)H(q),$$

where $K(\alpha^i)$ is monotone in α^i, for any $H(q)$ and $J(q)$ common to all voters.

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where $K(\alpha^i)$ is monotone in α^i, for any $H(q)$ and $J(q)$ common to all voters.

Intermediate preferences: voter heterogeneity is limited in that voters' preferences for a multidimensional policy can be projected on a unidimensional space in which different voters can be ordered by their type.

Theorem

If voters in V have intermediate preferences, a Condorcet winner exists and is given by $q(\alpha^m)$.

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Intermediate preferences: Poole and Rosenthal (1991) this (almost) holds for U.S. congressmen for the traditional left to right ideology.

Multidimensional Policy

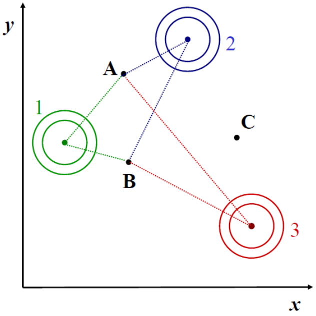
- Spacial voting models: Representation of preferences as some measure of the distance from the bliss point

  E.g. $\|q - \alpha^i\|$ or $(q - \alpha^i)^\alpha$

- When does an equilibrium exists?

  "Median in all directions": a composite-policy such that the voters are splitted in two even parts according to any policy dimension.

Spatial Representation of Preferences



Condorcet Cycles:

	1	2	3
A to B	+	-	+
B to C	-	+	+
C to A	+	+	-

Nonexistence of Condorcet winner

- Serious issue in political economy

  E.g. nonexistence in redistributive politics game.

  Sincere voting ($A2$) is restrictive if open-agenda process ($A3$) does not imply convergence to Condorcet winner.

- End of political economy?

  Restricting institutions: E.g.

  Delegation of policy choice to elected representatives $\Rightarrow$ relax $A1$.

  Restricted agenda $\Rightarrow$ relax $A3$.

  Strategic voting not an issue if two policy alternatives: all voters vote sincerely faced with only two policies $\Rightarrow$ relax $A2$.

Political Mechanisms

1. Motivation of politicians: when policy-makers play a role in political process *their* preferences matter

- Opportunistic
- Partisan

2. Timing of Policy Choice

- Pre-election politics (Commitment)
- Post-election politics (No Commitment)

Voting models

1. Legislative models:

   Post Electoral Politics: decision making rules, agenda setting, allocation of policy jurisdiction, etc.

(a) Structure induced equilibrium (Shepsle, 1979)

(b) Agenda setter (Romer-Rosenthal, 1978; Baron-Ferejhon, 1989)

2. Interest group models / lobbying:

   Contributions, informational asymmetries, etc.

(a) Becker (1983, 1985)

(b) Grossman-Helpman (1994)

3. Electoral models:

   Electoral competition between two candidates, distribution of voters preferences, etc.

(a) Downsian model (Downs, 1957)

(b) Probabilistic voting (Coughlin and Nitzan, 1981; Ledyard, 1984; Dixit-Londregan, 1996)

(c) Citizen candidate (Besley-Coate, 1997; Osborne-Slivinki, 1996)

Take away

- Classical results from social choice and voting theory tell us we cannot hope for **a** general model of universal applicability.

⇒ Case-by-case approach

- Dimension of policy key

⇒ If all issues can be ranked according to one dimension: existence of equilibria + median voter type results in Downsian electoral competition.

⇒ If multi-dimensional: assumptions about the policy process (preferences of policy-makers matter).

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