WELCOME TO ECON 437!

(POLITICAL ECONOMY)

first question we have to answer:

"what is political economy?"

- there's an easy A:
  it's the subfield of economics that studies

politics: - choice of policies by society.
- voting behavior
- decisions by politicians
- political institutions
- how media/judiciary interacts
- ⋮

so, for instance,

P.E ≠ public finance

P.E → when/how a policy can be implemented, and if not, why.

public finance → characterization of an optimal policy.

okay, but this essay A brings up another Q:

"why is P.E ≠ Political Science?"

admittedly, the line is blurrier
(we'll read a bunch of Polisci papers!)

but my preferred answer emphasizes our methodology:
we work with economic models

(i.e. a set of agents,
each with their preferences,
taking some actions in line w/ their preferences
while facing some rules,
and their interaction results in equilibrium)

& use econometric techniques to test our models

(i.e. focusing on identifying causal relations,
that is, how X affects Y.)

[NOTE: I'm still not sure how far this takes us away from PolSci. They also use econometric techniques, & there's a field called "Formal Theory" which is basically game theory applied to political situations... so it uses all the modeling techniques above.
but this is the best I can do.]

anyway, we're off to a good start.

an economic model has: agents + their preferences.

and... politics = choosing a policy = aggregating the preferences.

So, let's start with the obvious question:

IS THERE A GOOD WAY TO AGGREGATE PREFERENCES, i.e. CHOOSE POLICIES?

(spoiler alert: the answer is no, because otherwise we wouldn't have to study politics.)

but let's formalize it

CH. 1) COLLECTIVE DECISION MAKING

in this chapter, we'll see:

A-S-B I, 2.1, 2.2
O, 1
A, 4.1
- Arrow's Impossibility Thm
  "there's no good way to aggregate preferences"

A-S-B II, 2.1, 2.2
O, 2
- Gibbard-Satterthwaite Thm
  "there's no good way to choose a policy"

A-S-B I, 4.1
P-T, 2.2.1
O, 1.5
A, 4.3
- median voter thm
  "when preferences are structured in a certain way, it is possible to make choices".

Let X be a set of policies with $|X| \geq 3$.

ex: $X = \{$ low tax, medium tax, high tax $\}$.

ex: $X = \{$ (low tax, no immig), (low tax, high immig), (high tax, no immig), (high tax, high immig) $\}$.

ex: $X = \{$ RTE, Ei, KK, MY ... $\}$

[it's important to note that X contains all possible contingencies].

Suppose there are n individuals in a society

& each individual has a strict ranking over X (i.e. each ind. has preferences)

ex: $X = \{x, y, z\}$.

3 individuals:

$x \succ_1 y \succ_1 z$

$z \succ_2 x \succ_2 y$

$y \succ_3 z \succ_3 x$.

defn: A preference aggregation rule is a machine that takes $(\succ_1, \succ_2, \ldots, \succ_n)$ and produces a social ranking $\succ$ over $\bar{X}$ ($\succ$: strict)

ex: dictatorial rule. $\succ = \succ_1$.

ex: simple majority rule.
for each $x, y \in \bar{X}$, $x \succ y$ iff majority has $x \succ_i y$

wait... this is actually not an aggregation rule b/c it's not guaranteed to yield a ranking.

as an ex, see above.

$x \succ y \succ z \succ x$.

CONDORCET CYCLE!

or ex: Socialists: $K.K \succ M.Y \succ E.i$

Conservatives: $E.i \succ K.K \succ MY$

Nationalists: $M.Y \succ E.i \succ KK$

$KK \succ MY \succ Ei \succ KK$ #.

as a side note, whenever there is

not a Condorcet cycle, (when $|X|=2$,

$\exists$ a Condorcet winner, $\exists$ exists a condorcet winner)

& there are good reasons to pick it

as the social policy.

keep this in mind, we'll return later.

ex: Borda Rule.

each individual ranks alternatives,

we add the rankings, list $\succ$ based on the number obtained.

ex: $X = \{w, x, y, z\}$.

$n=3$. $\quad w \succ_1 x \succ_1 y \succ_1 z$

$y \succ_2 z \succ_2 x \succ_2 w$

$z \succ_3 y \succ_3 w \succ_3 x$

w gets: $1+4+3=8$

x : $2+3+4=9$

y : $3+1+2=6$

z : $4+2+1=7$

then, $y \succ z \succ w \succ x$.

OK ... what is a "good" aggregation rule?

some desirable properties we expect:

1) nondictatorial: (it should be democratic)

2) Paretian: if $x \succ_i y$ $\forall i$, $x \succ y$.
(it should respect preferences)

3) satisfies IIA:

if individuals keep their ranking between w & x
the same
but change their ranking between y & z,
the social ranking between w & x should
stay the same.

NOTE dictatorial rule. 1 x 2 ✓ 3 ✓
Borda rule. 1 ✓ 2 ✓ 3 x
2
[HW exercise.]

{IIA = ruling out "cardinality",
i.e. ruling out how strongly
individuals prefer x over y.
intuitively that's why Borda rule fails)

now, to the big reveal:

Arrow's Impossibility Theorem (Arrow, 1951)

There is no aggregation rule that satisfies

1 & 2 & 3.

↳ very depressing! but also, makes sense?

(if there was a good aggregation rule, we'd have used it since Ancient Greeks.)

I'll ask as exercise due to A-S-B I as a homework.

full proof is beyond our scope.

Hmm... you may say, "why do we need an aggregation rule? don't we just need to choose a policy?

why do we need to find a full ranking over X?"

a very reasonable Q, but unfortunately this path does not take us too far, either.

defn A collective choice function is a machine φ that takes $(\succ_1, \ldots, \succ_n)$ and chooses a policy $\varphi(\succ_1, \ldots, \succ_n) \in X$.

ex dictatorial rule: $\varphi(\succ_1, \ldots, \succ_n) \succ_1 y \quad \forall\, y \in X \setminus \varphi(\succ)$.

we want our collective choice function to be non-manipulable.

formally, **defn** φ is manipulable if i can make φ choose a better alternative by submitting/declaring a "false" preference $\succ_i'$.

Gibbard-Satterthwaite Theorem (Gibbard '73, Satt '75)

If $|X| \geq 3$, there is no collective choice function that is nondictatorial & non-manipulable

COMMENTS ; • is it maybe IIA or non-manipulability too strong?

• Arrow & G-S are close cousins.
for a proof of both,
see Reny (2001).

so, how do we go from here?

. relax IIA? see Maskin (2022).

. or put some restrictions on preferences
so that there are no condorcet cycles?
↳ this is the approach we'll take.

We will work with a domain where preferences are restricted in a certain way so that Condorcet cycles do not arise.

Defn Sps. policy space is ordered so that

$$X = \{x_1, \dots, x_r\}$$

ranks like: $x_1 \prec x_2 \prec \dots \prec x_{r-1} \prec x_r$

Preference $\succ_i$ is single-peaked if and only if there exists $t \in \{1, \dots, r\}$ such that:

$$x_t \succ_i x_{t-1} \succ_i \dots \succ_i x_1, \text{ and}$$

$$x_t \succ_i x_{t+1} \succ_i \dots \succ_i x_r.$$

In words: there exists a "most preferred policy" $x_t \in X$ such that i prefers that are "further away" from x_t less.

(NOTE: it is crucial to have an order of policies to be able to define single-peakedness.)

Now, sps. the policy space is ordered

and each individual has single-peaked preferences (with respect to the order on policy space)

let: x^1 : individual 1's most-preferred policy

x^2 : individual 2's most-preferred policy

⋮

x^n : —//— n's —//—

& let x^* : median of set $\{x^1, x^2, \dots, x^n\}$.

MEDIAN VOTER THEOREM

If the policy space is ordered & each individual has single-peaked preferences (with respect to the order on policy space),

then,

- a Condorcet winner exists, and,
- it coincides with x^*.

(i.e., for any other policy $x \in X \setminus \{x^*\}$, the majority prefers $x^* \succ_i x$.)

Prof) A homework question.

A couple notes:

1. is single-peakedness a reasonable restriction?

it requires an order

& it requires everyone's preferences to be single-peaked.

it's up to you to decide, but...

- there are some applications where it seems to be a natural restriction (e.g. taxation, public goods provision)

I'll ask a homework question about a taxation example

2. there is another restriction called

"single-crossing preferences"

that also yields a version of

Median Voter Theorem.

in the interest of time I'll not cover it,

but you could check:

- Osborne, chapter 1.5.2.

- Gans and Smart (1996)

(and Roberts (1977), even though he doesn't use the term "single-crossing".)

as a mental note, remember that

single-crossing is neither stronger

nor weaker

than single-peakedness.

OKAY, so we've shown that:

when preferences are single-peaked,

there is a Condorcet winner.

As I referred before, when there is a

Condorcet winner,

there are good reasons to choose it.

① normative: it looks like a "good" policy?

② positive: if the society chooses another policy,

the majority would object...

so, the median voter's most preferred policy

seems to be a decent alternative.

(NOTE: the median voter's most prefered policy

does not have to be chosen by

the Borda rule.

ex as a homework question).

so far, we have established:

"when preferences are single-peaked,
then society can choose a policy."

NEXT: how can the society choose it?
do elections work?

that'd be the focus of our next chapter,
ELECTORAL POLITICS.