POLITICAL ECONOMY

Authors: Judit Kálmán, Balázs Váradi

Supervised by Balázs Váradi

June 2011

Week 3

The simple majority rule

Why is simple majority so popular?

- Because it is much „faster" than unanimity in reaching decisions.
- But consider cycling – is it really faster?
    - Q: what were the arguments against cycling?
- So why do we use simple majority so often? (Hint: what would the average Joe say?)

Normative considerations

- Condorcet's jury theorem
- May's theorem on majority rule
- Rae–Taylor theorem on majority rule

We have seen that simple majority vote is special – but is it good?

Is simple majority a good way to aggrate information?
Ex. 5 people, all with a 60% chance to be right, vote.

Threshold	formula	Prob of the true alternative to pass
5 (unanimity)	$(0.6)^5$	7.78%
4 (qualified majority)	$(0.6)^5+5(0.4)(0.6)^4$	33.7%
3 (simple majority)	$(0.6)^5+5(0.4)(0.6)^4+10(0.4)^2(0.6)^3$	68.2%

In general:
$$P_n = \sum_{h=(n+1)/2}^{n} [n!\,/\,h!\,(n-h)!]p^h(1-p)^{n-h},$$

The jury theorem (Condorcet)

Theorem (Condorcet, 1785): Let n voters (n odd) choose between two alternatives that have equal likelihood of being correct a priori. Assume that voters make their judgments independently and that each has the same probability p of being correct (1/2 < p < 1).

Then the probability that the group makes the correct judgment using the simple majority rule is

$$P_n = \sum_{h=(n+1)/2}^{n} [\,n!\,/\,h!\,(n-h)!\,]\,p^h(1-p)^{n-h},$$

which approaches 1 as n approaches infinity.

Limits of the jury theorem

Assumptions made:
- a common probability of being correct across all individuals, (and p>0.5)
- each individual's choice is independent of all others, and
- each individual votes sincerely (honestly) taking into account only his own judgment as to the correct outcome.

Limit 1: common probability

- (if p<0.5 then P_n approaches 0 as n approaches infinity)
- However, if $P_i \neq P_j$, but the distribution of P is symmetric (and P_{mean} >0.5), the theory still holds

Limit 2: choices are independent

- Is it realistic?

- Note: if correlation of votes is not too high, the theorem still holds (Ladha: a correlation of 0.25 is lowest upper bound)

Limit 3: sincere voting

- Is it optimal to vote sincerely?
- E.g. 2 urns with black and white balls
  - Here sincere voting is irrational: rational voting produces better outcomes
- (also: would a rational voter vote at all? We will discuss that later in the course)

- Condorcet considers voting a positive sum game, but is it so?

An axiomatic approach (May)

Def: a group decision function

$$D = f(D_1, D_2, \ldots, D_n),$$

where D_i and D take the values

–1, 0, or 1, and i's preference on a pair of issues x and y can be: xRy, xIy, yRx.

An axiomatic approach

Theorem (May, 1952):

Consider the following four properties

- *Decisiveness: The group decision function is defined and single valued for any given set of preference orderings.*
- *Anonymity: D is determined only by the values of D_i, and is independent of how they are assigned. Any permutation of these ballots leaves D unchanged.*
- *Neutrality: If x defeats (ties) y for one set of individual preferences, and all individuals have the same ordinal rankings for z and w as for x and y, then z defeats (ties) w.*

- *Positive responsiveness: If D equals 0 or 1, and one individual changes his vote from −1 to 0 or 1, or from 0 to 1, and all other votes remain unchanged, then D = 1.*
- *If and only if all four properties are true for f, f is the simple majority voting rule.*
- *None follows from the other three!*
- *(Also, simple majority does not satisfy e.g. transitivity. (!) So what do we have left?)*

Let us consider the axioms!

Decisiveness – clear, but eliminates all probabilistic procedures, where the probability of an issue winning depends on voters preferences.

Positive responsiveness – also clear. It's like Pareto, but stronger

Neutrality – each *issue* is alike. Intensities do not matter. It eliminates several other voting procedures (e.g Borda count).

Anonimity – each *voter* is alike. Strong normative content (e.g. confiscation of John Doe's property).

Smoking in a railroad car (Rae–Taylor)

- E.g. 5 passengers, no signs permitting or prohibiting smoking. What should the decision procedure be (without taking sides)?

Assumptions:

- Game of conflict
- No exit
- Issue is given (cannot be redefined)
- Issue is randomly selected (no agenda setter, no predefined preferences)

- Equal intensity cost-benefit

Rae (1969) and Taylor (1969): Majority rule is best.

Unanimity

- Political process is a cooperative, positive sum game, with transaction costs not being prohibitive.
- Being the member of the committee (community) is voluntary (exit option) and each has the right to preserve her own interest.
- Issues are proposed by committee members (failed issues are redefined or removed from agenda).
- E.g. firestation financed by taxes.

Unanimity, criticisms

- Politics is often a zero-sum game (e.g. what if no Pareto optimal choice is available, or Pareto-efficient choices are contrasted), distributional issues are always there.
- Exit is not always possible (e.g. railroad car example) – issues cannot always be redefined.
- Also, if transaction costs are significant (e.g. the train does not move until decision made) minority can force majority to capitulate.

- Applying rules to the "wrong" issues: firestation example – majority rule changes allocative efficiency into redistribution (and a bit of Pareto improvement)
  – But with logrolling (no stable coalitions) and quasi equal size winning and losing coalitions of differing composition *zero net* redistribution is expected
  (But then why play the game?)

So how do unanimity and simple majority compare?

Assumption	Majority rule	Unanimity rule
1. Nature of the game[a]	Conflict, zero sum	Cooperative, positive sum
2. Nature of issues	Redistributions, property rights (some benefit, some lose)	Allocative efficiency improvements (public goods, externality elimination)
	Mutually exclusive issues of a single dimension[b]	Issues with potentially several dimensions and from which all can benefit[c]
3. Intensity	Equal on all issues[d]	No assumption made
4. Method of forming committee	Involuntary; members are exogenously or randomly brought together[e]	Voluntary; individuals of common interests and like preferences join[f]
5. Conditions of exit	Blocked, expensive[g]	Free
6. Choice of issues	Exogenously or impartially proposed[h]	Proposed by committee members[i]
7. Amendment of issues	Excluded, or constrained to avoid cycles[j]	Endogenous to committee process[i]