Public Economics

Professor: Alan Yang

Timekeeper: Rui Zhou

Spring 2023

Contents

5 Public Choice **2**
5.1 Majority Voting 2
5.2 A Model of Regulation & Distrust 4

5 Public Choice

5.1 Majority Voting

Majority voting is a mechanism used to aggregate individuals votes into a social decision, in which individual policy options are put to a vote, and the option that receives the majority of votes is chosen. However, the definition of *majority* may differ. Majority voting can produce a *consistent* aggregation of individual preferences only if preferences are restricted to take a certain form. One such faied example is the tyranny of the majority. Note that instead of majority voting is not equivalent to head-to-head competition matters, the order of which have an influence on the overall winner.

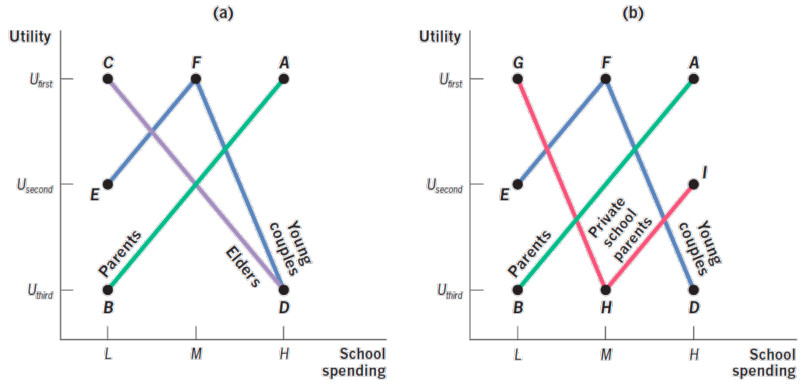
	Parents (33.3%)	Elders (33.3%)	Young Couples (33.3%)
First choice	*H*	*L*	*M*
Second choice	*M*	*M*	*L*
Third choice	*L*	*H*	*H*

M here is a consistent socially-preferred outcome.

However, under a certain set of preferences, the consistent or stable outcome may not exist. The voting result will cycle with no clear winner, which means majority voting is unable to aggregate preferences in a meaningful way.

	Public school parents (33.3%)	Private school parents (33.3%)	Young Couples (33.3%)
First choice	*H*	*L*	*M*
Second choice	*M*	*H*	*L*
Third choice	*L*	*M*	*H*

If we take the perspective of each voter's peak for her preference, we'll gain a new insight to understand the outcome from the graphic. (Single-Peaked v.s. Non-Single-Peaked)



5.1.1 Median Voter Theorem

Consider choosing along a single dimension.

- Assume that each individual has a single-peaked preference, and peak is the most preferred result for the individual.
- Median voter is the voter whose peak is at the median.
- Voting equilibrium is an outcome that wins in majority voting against any other alternatives.

Median Voter Theorem

Peak of median voter is a voting equilibrium.

Median Voter & Efficiency Efficiency requires

$$\sum \text{Social Marginal Benefits} = \text{Social Marginal Costs}$$

If the sum of social marginal benefits is greater than social marginal costs, the public good is worth providing. What matters for efficiency is the **average** marginal benefit across individuals, instead of the **median** marginal benefit. Median outcome is not efficient, unless Median = Mean, which is not true in general.

Issues with Assumptions

1. Single-dimensional voting:
   - Median voter theorem breaks down with multiple dimensions.
2. Only TWO candidates
   - No stable equilibrium in the model with three or more candidates, because there's always an incentive to move in response to your opponent's positions.
3. No selective voting
   - In the theory all people are assumed to be affected by public goods vote. However, actually only a fraction of citizens vote.
   - In reality, appeal to the base is a way to increase turnout, which in essence is moving away from median voter.
4. No possible deviation
   - Especially the role of money is ignored.
5. Full information
   - Requires perfect information along three dimensions
     - Voter knowledge of the issues and its consequence;
     - Politician knowledge of the issues and its influence on voters;
     - Politician knowledge of voter preferences.

Lobbying Lobbying needs the expending of resources by certain individuals or groups to influence a politician.

- Lobbying could correct the inefficiencies due to median voter theorem, since their value can be achieved by a form of transfer.
- Lobbying can also lead to inefficiencies if public does not have perfect information and hence does not care to pay attention to those who are potentially hurt.

5.1.2 Efficiency of Public or Private sector

- With competition, private production is more innovative and efficient but govt provision or regulation make sense for natural monopolies (e.g. utilities: water, energy, broadband)
- For goods that consumers do not understand well (pensions, health insurance, education), private competition can lead to wasteful advertising or scamming
  - Private firms compete using enticing and costly advertising rather than underlying product quality higher costs than public provision
- In emergency situations (covid), govt command and control beats market to allocate resources (e.g. vaccine distribution)
- Not-for-profit is an intermediate solution (e.g. environment protection) more innovative than govt and not as "predatory" as for-profit

But government may fail even it's selected via voting. Government failure describes the inability or unwillingness of the government to act primarily in the interest of its citizens. Two typical examples are

- Dictatorship: Dictator runs country for his (and family) benefits, not citizens
  - different from Authoritarianism ( )
- Bureaucracies and corruption: Organizations of civil servants that are in charge of carrying out the services of government but follow their self-interest.

5.2 A Model of Regulation & Distrust

5.2.1 Settings

- A continuum of risk-neutral individuals of mass one.
- There are labor and a numeraire good produced with labor.
- Timeline
  1. Individuals are educated to be civic or uncivic during childhood by parents' decision.
     - Denote α as the fraction of the population becomes civic, which is indogenous.
  2. Individuals can become either a routine producer, or an entrepreneur.
     - Productivity of a producer is normalized to 0; an entrepreneur will produce y if uncivic, $y+\varepsilon$ if civic. And $y \sim \mathcal{U}[0,1]$, ε is positive and small.
       - ε is set to break ties but may also capture the fact that production needs cooperation.
       - An entrepreneur, if uncivic, generates a negative externality of $e > 1$ for others.
       - Each individual will know y of yours but not others here.

3. People vote to regulate entry into entrepreneurship or leave it unrestricted.
   - The voting outcome will be (possibly partly) implemented by officials.
4. Entrepreneurs produce if entry is authorized. And people work as officials at night.
   - Alternatively, think of it as officials are drawn randomly; it's actually equivalent.
   - If voting to ban, a civic official always bans entry; but an uncivic official demand a bribe to authorize entry regardless of entrepreneur's type, where the bribe is denoted as b.
   - If a civic entrepreneur is denied entry, he returns to routine production; but if he is uncivic, he can still collect bribes when serving as an official at night.

5.2.2 Solution

The model can be solved through backward induction.

Step 4

- If entry is unregulated in voting in step 3, All individuals become entrepreneurs.
- Otherwise, only uncivic entrepreneurs who can bribe will enter.

Step 3 If society decides to regulate entry, every uncivic official sets the bribe to maximize

$$b \cdot (1-\alpha) \cdot (1-b)$$

where $(1-\alpha)$ is the share of uncivic entrepreneurs, and $(1-b)$ is the share (probability) of entrepreneurs with $y > b$. Clearly, optimal $b = \frac{1}{2}$.

The social decision on whether or not to regulate can be written as a function of α.

- Without regulation, all entrepreneurs will enter, and the expected output of an entrepreneur is

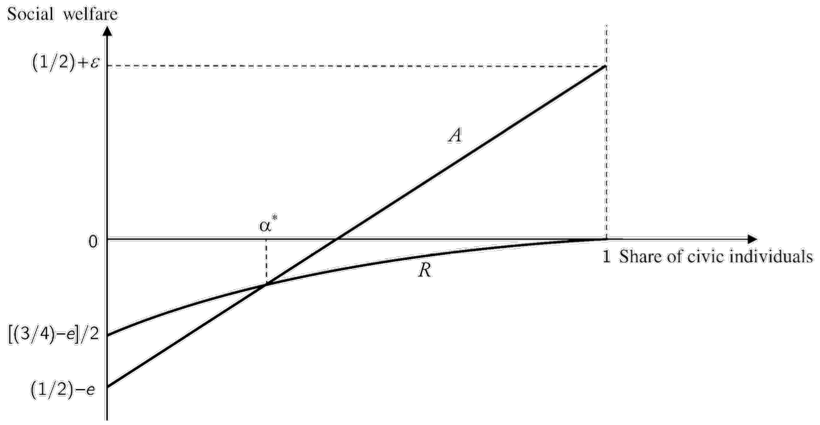
$$A = \frac{1}{2} + \alpha\varepsilon - (1-\alpha)e$$

where $\frac{1}{2}$ is the expected output of entrepreneurs, $y \sim \mathcal{U}[0,1]$.

- With regulation, the expected output of an entrepreneur is

$$R = (1-\alpha) \cdot (1-\alpha) \int_{b^*=\frac{1}{2}}^{1} (y-e)\mathrm{d}y = \frac{(1-\alpha)^2}{2} \cdot (\frac{3}{4} - e)$$

where $(1-\alpha)^2$ is the probability of an uncivic entrepreneur meeting an uncivic official, and the entrepreneurs should have a y greater than $b^* = \frac{1}{2}$. Note that bribes are not included here, since bribes are simply *transfers* between people, no effect on overall social wealth.



$A > R$ if and only if $\alpha > \alpha^*$. The level of public trust is probably positively correlated with α.

Step 1 For your parents, the expected payoff of your child being civic is

$$\begin{cases} \frac{1}{2} + \varepsilon - (1-\alpha)e, & \text{if there is no regulation.} \\ -\frac{1}{2} \cdot (1-\alpha)^2 \cdot e, & \text{if there is regulation.} \end{cases}$$

If there is no regulation, your child will have an expected output of $\frac{1}{2}$, and earn an extra ε of being civic. However, your child will suffer $-(1-\alpha)e$ from the externality imposed by uncivic entrepreneurs. If there is regulation, your child will earn 0 for herself, but suffer from negative externality of uncivic entrepreneurs. Among all entrepreneurs, negative externality can incur only if the entrepreneur's productivity is greater than $\frac{1}{2}$, and an uncivic entrepreneur coincidentially meets an uncivic official.

For your parents, the expected payoff of you being civic is

$$\begin{cases} \frac{1}{2} - (1-\alpha)e, & \text{if there is no regulation.} \\ \frac{1}{8}(1-\alpha) + \frac{1}{4}(1-\alpha) - \frac{1}{2}(1-\alpha)^2 \cdot e, & \text{if there is regulation.} \end{cases}$$

where

- $\frac{1}{8}(1-\alpha) = (1-\alpha) \cdot \frac{1}{2} \cdot (\frac{3}{4} - \frac{1}{2})$
  - $(1-\alpha)$ is the probability of your meeting an uncivic official.
  - $\frac{1}{2}$ is your probability of becoming productive with $y > \frac{1}{2}$.
  - $(\frac{3}{4} - \frac{1}{2})$ is your expected revenue, if you are productive enough and pay the bribe $b^* = \frac{1}{2}$.
- Corruption: $\frac{1}{4}(1-\alpha) = (1-\alpha) \cdot \frac{1}{2} \cdot \frac{1}{2}$
  - $(1-\alpha)$ is the your probability of meeting an uncivic entrepreneur.
  - $\frac{1}{2}$ of the first is the probability of meeting an uncivic entrepreneur with $y > b^* = \frac{1}{2}$.
  - $\frac{1}{2}$ of the second is bribe $b^* = \frac{1}{2}$ you'll receive.
- Negative externality: $-\frac{1}{2}(1-\alpha)^2 \cdot e = (1-\alpha) \cdot (1-\alpha) \cdot \frac{1}{2} \cdot (-e)$.

5.2.3 Equilibrium

Suppose the curves of A and R intersect at α^*. Then, regulation is chosen by the society iff $\alpha < \alpha^*$.

- If $\alpha > \alpha^*$, people vote for unrestricted entry.
  - Then, all individuals prefer becoming civic, and indeed $\alpha = 1 > \alpha^*$.
- If $\alpha < \alpha^*$, people vote for regulation.
  - Then, all individuals prefer becoming uncivic, and indeed $\alpha = 0 < \alpha^*$.
    $\implies \alpha = 0, \alpha = 1$ are equilibria. From the intuition,
- If everyone is civic with $\alpha = 1$,
  - Individuals do not expect others to impose negative externalities on them, and hence trust each other and see no reason to regulate entry.
  - Output is maximized in the economy as well.
- If everyone is uncivic with $\alpha = 0$,
  - Entrepreneurs in the equilibrium are the most productive, though corrupt.
  - Even though regulators who allow entry are corrupt, they are still needed to prevent less productive entrepreneurs from generating negative externalities.
    - So even with corrupt officials, the society wants more regulation and restrictions on entry.
    - When individuals distrust others, they prefer government officials to regulate, even when they know these officials themselves cannot be trusted.