Public Choice (1)

Prelude

- Expenditure on private goods – determined by prices
- Competitive economy – private goods
  - Price plays the key role (remember endowment → Pareto set)
  - Supply side – upward sloping supply schedule (cost minimization/profit maximization duality)
  - Demand side – downward sloping (utility maximization/expenditure minimization duality)
- Equilibrium – intersection of demand and supply schedules
- Expenditure on public goods – determined by political process

Prelude

- Decisions about resource allocations in the public sector are quite differently made

  - Individuals vote for elected representatives
  - Elected representatives vote for a public budget
  - The money itself is spent by a variety of administrative agencies

Prelude

- Thus, there is a major difference between how an individual decides to spend his or her own money and Government decides to spend the public money
  - The vote of a member of Parliament is supposed to reflect the viewsof constituents

- In deciding how to vote, members of Parliament face two problems
  1. they must ***ascertain*** the views of their constituents, and
  2. because these views are likely to differ, they must decide how much ***weight*** to assign to various positions

Questions to start with

- In what ways does ***collective decision making***, such as determining the level of public goods, differ from standard decision making within a household?
- What is the problem of eliciting preferences?
- When individuals differ in what they want, say, about the level of expenditures on a public good, how are those differences resolved?
- What is meant by the problem of "aggregating preferences"?

The Problem of Preference Revelation

- Individuals' desirability of one private good versus another is revealed by a simple action—by buying the good or not
- Desirability of one public good versus – no comparably effective way
- Elections of public officials convey only limited information about voters' attitudes toward specific public goods; at best, they convey a general notion that voters prefer more or less government spending
- Even if individuals were asked directly about their preferences, would they ***truthfully and meaningfully reveal*** them?

The Problem of Preference Revelation

- Election results are quite confusing – some polls suggest that voters would be willing to pay higher taxes or accept expenditure cuts to reduce the deficit, but other polls suggest otherwise!

- Example from the US: Polls voters consistently say they believe that the government should spend less on assistance to foreign countries, when asked how much should be spent, they give a number considerably in excess of what the United States is currently spending

- Only some concrete trade-offs might help them think more precisely

- Problem – ***reveal truthfully their preferences*** concerning public goods

The Problem of Preference Revelation

- If what they have to pay does not depend on their answer – one would normally like more public goods as long as one does not have to pay for them

- However, if what an individual says affects how much he or she has to pay, there is an incentive for the individual to pretend that he or she enjoys the good much less than he or she really does— the individual knows that the answer will have a negligible effect on the total amount supplied, and he or she would like to be a free rider

- In public decisions, however, the decision maker must ascertain the preferences of those on whose behalf he or she is making the decision.

Individual Preferences for Public Goods

- Collective decision making is difficult because different individuals have different views
- Sometimes there are simply differences in tastes.
- Most of the times it's about incomes and taxes….
- Richer individuals have higher incomes, so normally they prefer to spend more on all goods, both public and private.
- When the government spends more on public goods, however, richer individuals often have to pay a relatively large share of the additional cost.

Individual Preferences for Public Goods

- In the case of private goods, rich and poor individuals typically pay the same price; with public goods, in effect, richer individuals typically have to pay a higher price

- The **tax price** is the additional amount an individual must pay when government expenditures increase by one dollar.

- The tax price multiplied by total government expenditures equals the individual's tax payment

- A higher tax price by itself means that richer individuals would want a lower level of expenditures on public goods

Individual Preferences for Public Goods

- Income effect leading to a higher desired demand; price effect leading to a lower desired demand – the net effect is ambiguous

- Assume there are N people and each must pay the same amount, regardless of income (***uniform taxation***) – tax price is just $1/N$ and the tax payment is G/N

- With ***proportional taxation***, everyone pays the same percentage of income –
  - Suppose Y is average income, NY is total income; if t is the tax rate, then tNY is total government revenue;
  - Government expenditures will be $G = tNY$. Tax rate $t = G/NY$
  - The tax payment of an individual with income Yi is $tY_i = GY_i/NY$

Individual Preferences for Public Goods

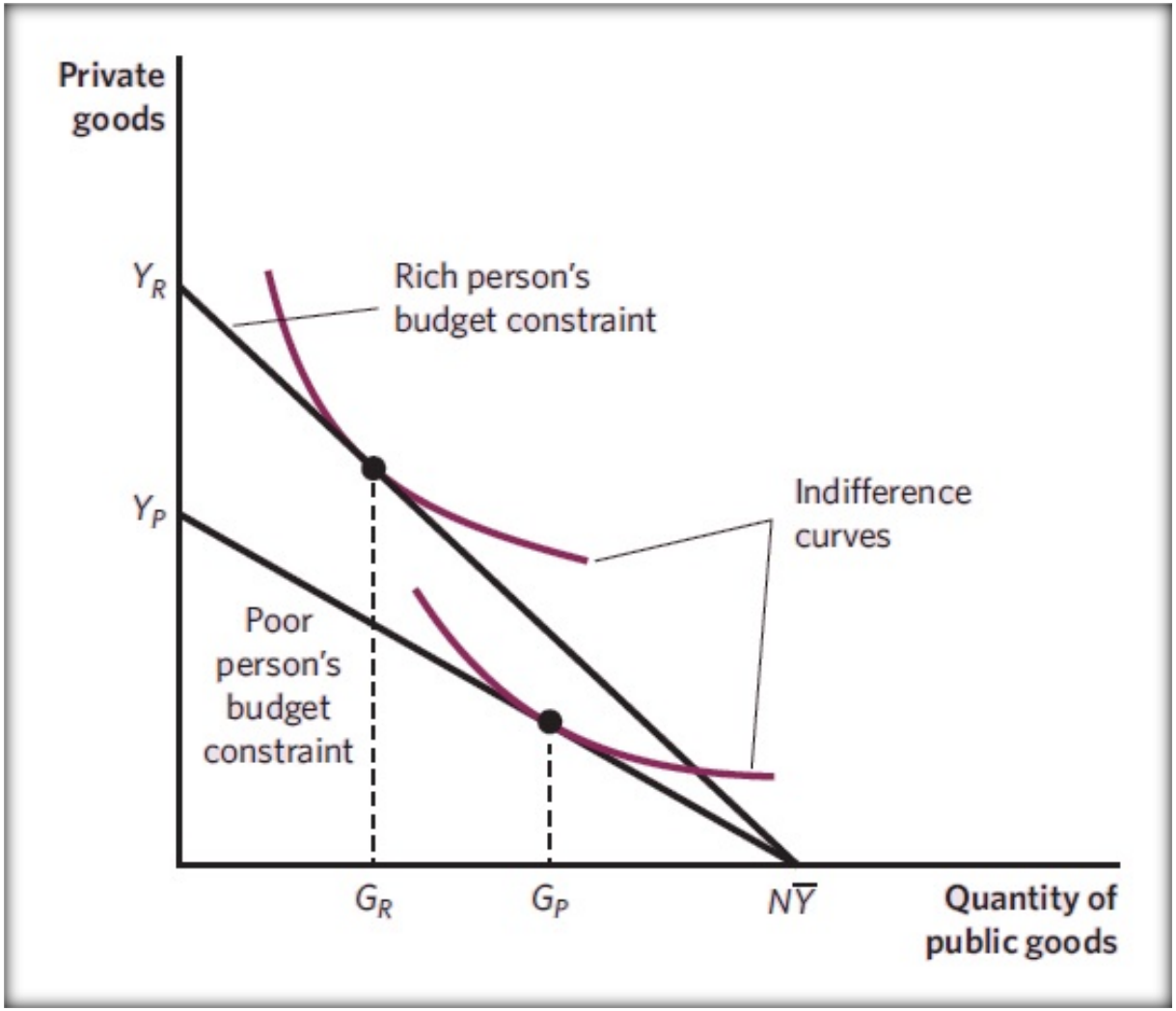
- If government expenditures increase by a dollar, the individual's incremental tax—the tax price—is just Yi / NY.
  - Thus, an individual with average income ($Yi = Y$) faces a tax price of $1/N$
  - An individual with above-average income ($Yi > Y$) faces a higher tax price
  - An individual with below-average income faces a lower tax price.

- A ***progressive*** tax system is one in which tax payments increase more than proportionately with income;
- A ***regressive*** tax system is one in which they increase less than proportionately.
- Accordingly, the tax price for a high-income individual under a progressive tax system is typically greater than Yi / NY.

Individual Preferences for Public Goods

- Given the individual's tax price, we can derive his or her preferred level of public goods expenditure
- Individuals with different incomes face different budget constraints;
- The preferred levels of public goods expenditure are at the tangencies of the indifference curves with the budget constraints
- With proportional taxation, individuals with lower incomes face a lower tax price (flatter budget constraint)
  - The income and substitution effects work in opposite directions
  - Ambiguous whether the most preferred level of government expenditure is higher or lower

Individual Preferences for Public Goods



Individual Preferences for Public Goods

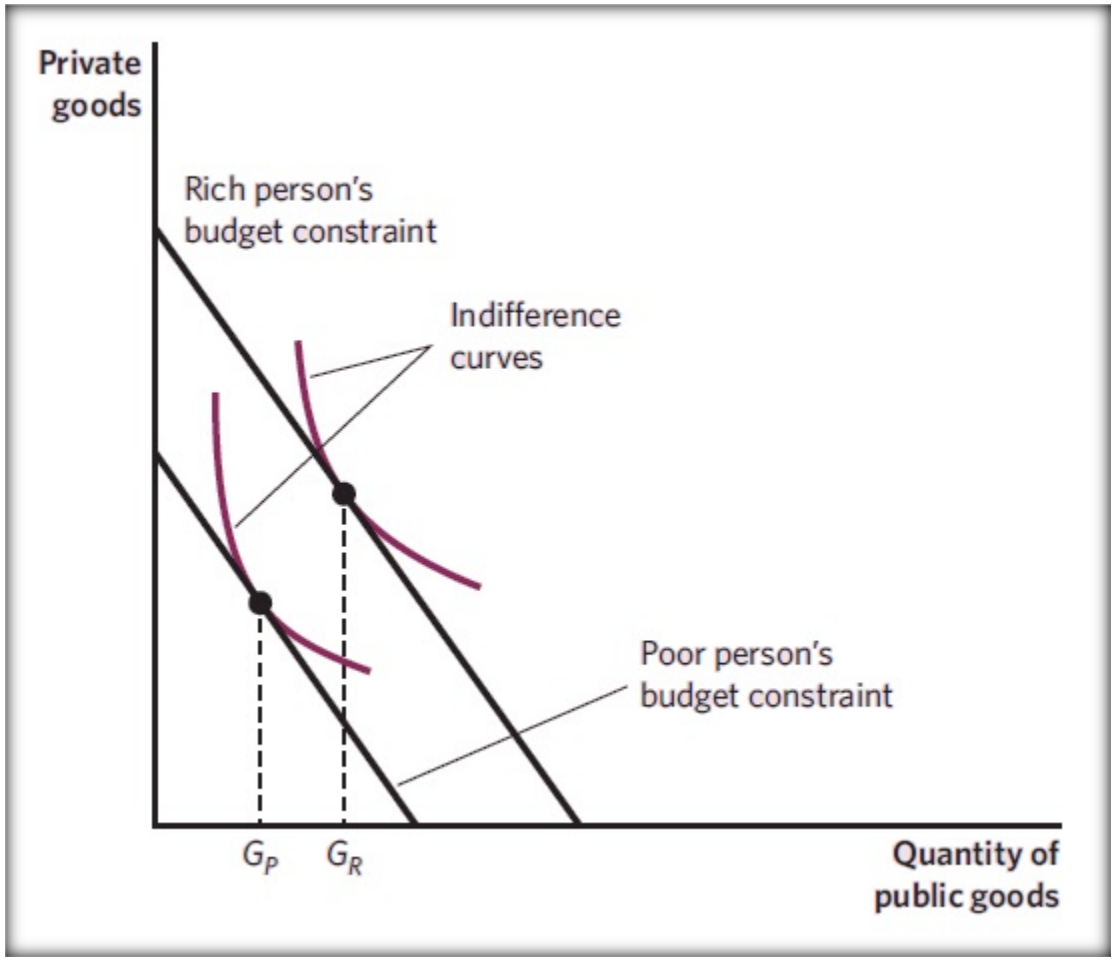
- Different individuals will differ with respect to their preferred level of expenditures.

- With proportional taxation, poorer individuals face lower tax prices, and on that account, their preferred level of expenditures, *GP*, is higher.
- Poorer individuals have lower incomes, however, and with lower incomes they demand less public as well as private goods.
- The net effect is ambiguous.

- If the substitution effect (lower tax price) dominates the income effect, so the poorer individual does prefer a higher level of public goods than the richer person

Individual Preferences for Public Goods

- With ***uniform taxation***, all individuals face the same tax price, so there is only an income effect – rich individuals prefer higher levels of expenditure.



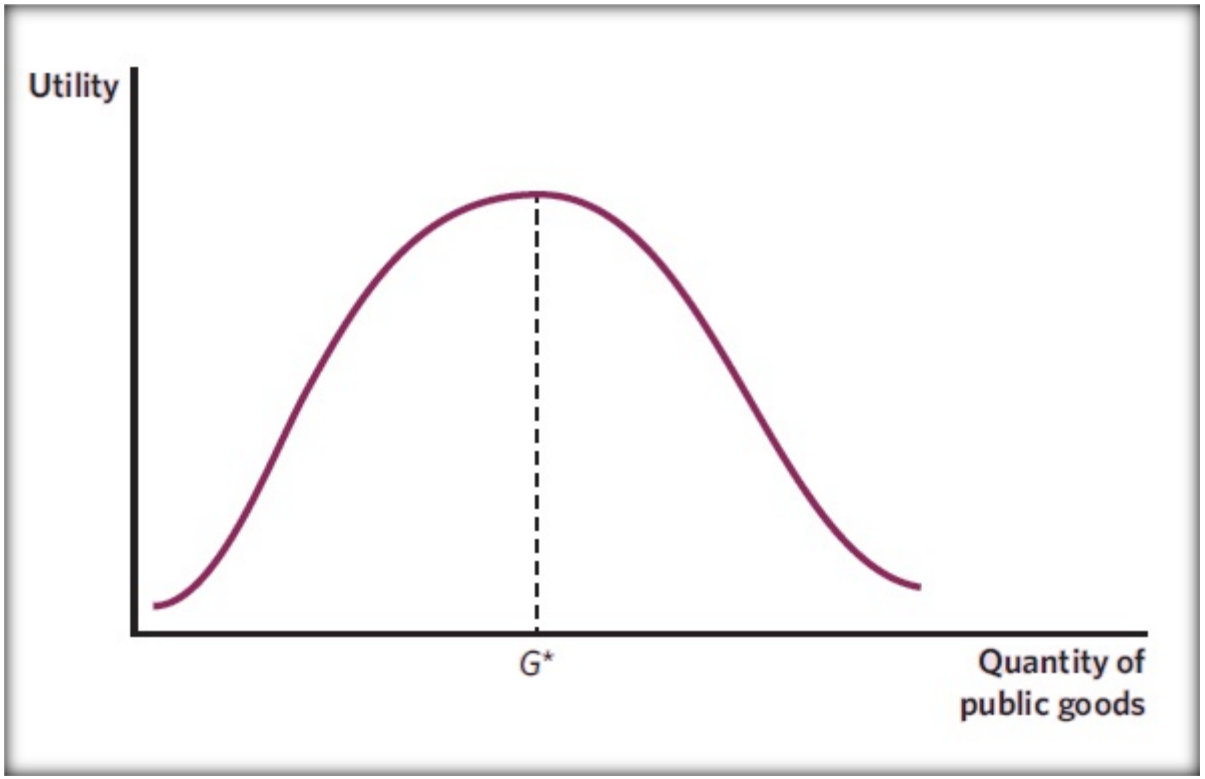
Individual Preferences for Public Goods

- With ***progressive taxation***, lower-income individuals will face a lower tax price than with proportional taxation, so their preferred level of expenditures will be even higher than with proportional taxation.

- ***How does utility depend on the level of government expenditures***?

- The individual's most preferred level of expenditures occurs at *G**, but utility is maximized under a budget constraint, at the point of tangency with the indifference curve.
- The further away the actual level of expenditures is from the preferred level of expenditures, *G**, the lower the level of utility.

Individual Preferences for Public Goods

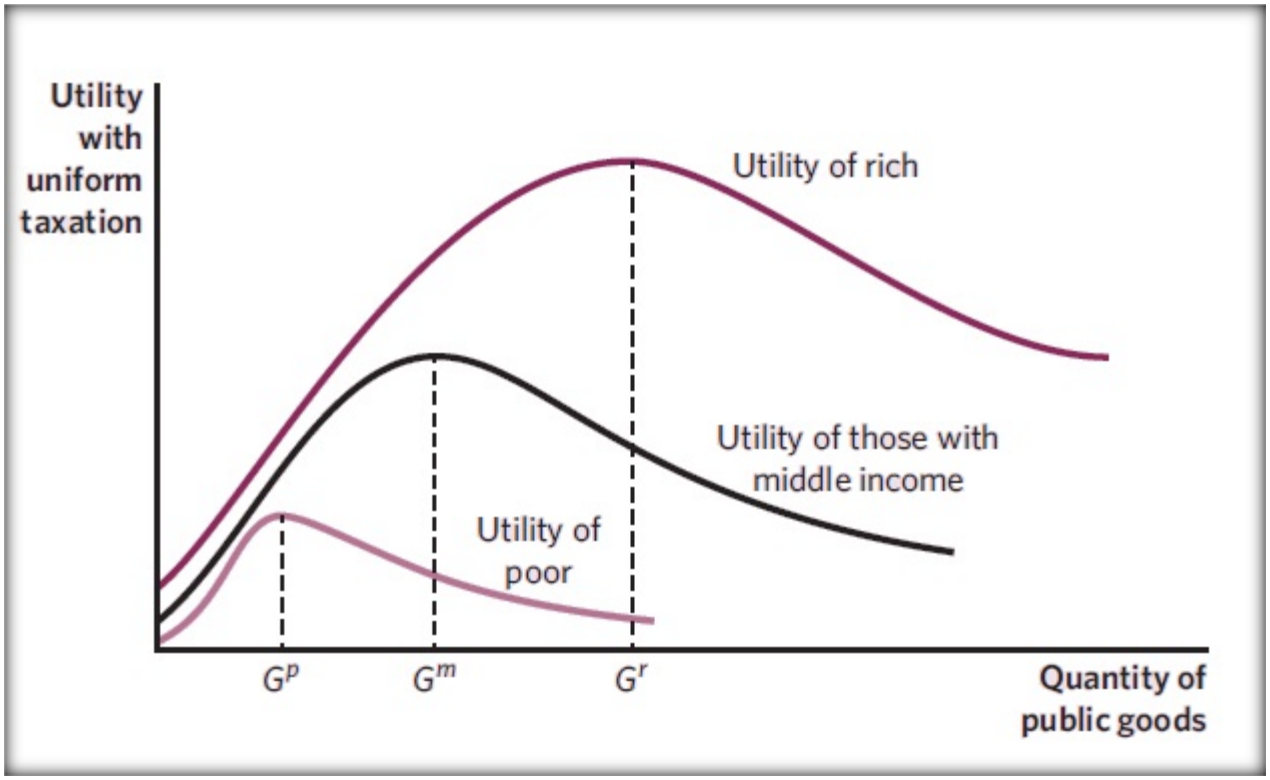


Individual Preferences for Public Goods

- Relationship between the level of utility and the level of public goods expenditure for three different groups—the rich, the poor, and the "middle"
- Let's assume uniform taxation
- Each has its own preferred outcome, and utility decreases as expenditures deviate either above or below that level
- For expenditures above the middle, the marginal benefits of increased public expenditure are less than the marginal costs the individual bears in additional tax payments, whereas the converse holds for expenditures below the preferred level.

Individual Preferences for Public Goods

- Assuming the rich prefer higher levels of expenditure to the middle class, who prefer higher levels than the poor –



The Problem of Aggregating Preferences

- In the public sector decisions are made collectively.

- For example, when a politician votes to increase expenditure on some public good, it is intended to represent the interests of his or her constituents
- But their opinions are not likely to be unanimous: some individuals would like more military spending, others less; some individuals would like more expenditures on welfare, others less

- What "the people" want - how can a social decision be made from these divergent views?
- In a dictatorship, the answer is easy: the dictator's preferences dominate.

The Problem of Aggregating Preferences

- There is **no such easy resolution in a democracy**

- A number of different voting rules have been suggested,
  - Unanimity voting,
  - Simple majority voting, and
  - Two thirds majority voting.

- Of these, perhaps the most widely employed rule for decision making in a democracy is simple ***majority voting***.

Majority Voting and the Voting Paradox

- A majority voting equilibrium requires that there is one alternative that can win a majority in a contest against *any* alternative

- ***However, there may not exist any majority voting equilibrium!!!***

- Example: three voters and three alternatives, denoted A, B, and C (A could be spending more money on health care for children, B reducing the deficit, C cutting taxes)

- Voter 1 prefers A to B to C.
- Voter 2 prefers C to A to B.
- Voter 3 prefers B to C to A.

Majority Voting and the Voting Paradox

- Assume we vote on A versus B.
- Voters 1 and 2 vote for A, so A wins.
- Now we vote on A versus C. Voters 2 and 3 prefer C to A, so C wins. It appears that C should be the social choice. C wins against A, which wins against B.
- But let us now have a direct confrontation between C and B. Both Voter 1 and Voter 3 prefer B to C.

- This is referred to as the ***voting paradox***, or the ***paradox of cyclical voting***.

- There is no clear winner

Majority Voting and the Voting Paradox

- Assume we began by saying we were going to first vote on B versus C, and put the winner against A.
- B beats C, and then A beats B.
- But just to check that we had made the right decision (A), we decide to put A against C.
- C beats A. So we think C is the winner.
- But then we check that by challenging C with B.
- B beats C—which was our original vote.
- B again appears to be the winner.
- But just to check, we again challenge it with A. A again beats B, as we knew from our earlier vote.
- The voting process thus goes on and on .....

- Voter 1 prefers

  A to B to C.

- Voter 2 prefers

  C to A to B.

- Voter 3 prefers

  B to C to A.

Majority Voting and the Voting Paradox

- Often, to avoid these voting cycles, democracies organize their decision making as a sequence of votes

- In that case, it may be very important to control the ***agenda—the order in which the votes occur***.

- The winner of each of these elections is determined solely by the order in which the pairwise comparisons were made.

Majority Voting and the Voting Paradox

- Note, too, that if individuals realize there is going to be a particular sequence of votes, they may wish to vote ***strategically***.

- That is, in the first round of the vote, Voter 1 may not vote his or her true preferences on, say, A versus B, but think through the *consequences* of that for the eventual equilibrium.

- The voter may vote for B, even though he or she would prefer A, knowing that in a contest between C and B, B will win, whereas in a contest between A and C, C might win.

- Because this voter prefers B to C, he or she votes initially for B.

Majority Voting and the Voting Paradox

- This analysis leads to two questions –

1. Are there voting rules that will ensure a ***determinate outcome*** for any vote?
2. Are there any ***circumstances*** under which simple majority voting will yield a determinate outcome?

- It turns out that the voting paradox cannot be resolved through voting rules, but there are indeed circumstances in which majority voting yields clear decisions.

Arrow's Impossibility Theorem

- An endless cycle of voting is clearly an unsatisfactory state of affairs.
- It is natural to ask, then, whether there is any other political mechanism (any other set of rules for making social decisions) that eliminates this problem.

- An ideal political mechanism should have four characteristics –
- ***Transitivity***: simple majority voting lacks this essential property, lack of this property may lead to cyclical voting.
- ***Nondictatorial choice***: give all decision-making powers to a dictator; as long as the dictator has consistent preferences, then there will never be a voting cycle. However, a meaningful political mechanism must ensure that the outcomes do not simply reflect the preferences of a single individual

Arrow's Impossibility Theorem

- ***Independence of irrelevant alternatives***: if we have to make a choice between, say, a swimming pool and a tennis court, the outcome should not depend on whether there is a third alternative, such as a new library
- ***Unrestricted domain***: The mechanism must work no matter what the set of preferences and no matter what the range of alternatives over which choices are to be made

- In looking for a system that would satisfy all four of these properties, a number of alternative rules have been examined, but each fails one or more of the requirements.

Arrow's Impossibility Theorem

- For instance, **rank-order voting** (individuals rank the alternatives, then the ranks assigned by all individuals are added together, and the alternative with the lowest score wins) does not satisfy the "independence of irrelevant alternatives" criterion.

- **Arrow's impossibility theorem:** there was no rule that would satisfy all the desired characteristics

- "The government seems to be acting in an inconsistent manner," or "Why doesn't the government determine its priorities and then act on them?"

- treating the government as if it were an individual

Arrow's Impossibility Theorem

- We come to expect that government should act consistently like a rational individual.

- Arrow's impossibility theorem suggests that, unless some individual is granted dictatorial powers, the government should not be expected to act with the same degree of consistency and rationality as an individual.