MICROECONOMICS III

CLASS 7

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PUBLIC GOOD PROVISION

Private provision of a public good will not lead to an efficient outcome

- Non-excludability and non-rivalry

For public provision of a good, one needs to know the social preference

- Individual preferences could be then aggregated into the social preference
- But, how to do it?
- Potential issues:
  - Arrow's impossibility theorem
  - Strategic behavior

PUBLIC GOOD PROVISION

Ideally, we would want to develop a mechanism that makes it rational for individuals to reveal truthfully their preferences

- E.g., their private valuations of a public good
- We call such a scheme a demand revealing mechanism

Borda count/Rank-order voting is not a demand revealing mechanism

The Vickrey-Clarke-Groves mechanism is demand revealing.

- How does it work?

VCG MECHANISM

We assume that there are N individuals with quasi-linear preferences

- For now let assume that we consider a single public good

v_i is individual i's true (private) valuation of the public good

- E.g., Willingness to pay

c_i is the cost of supplying the public good for individual i

- Could be the same for all individuals (for example, additional tax), but does not have to be

Public good supply increases welfare (Pareto improvement) if (n_i denotes net value)

$$\sum_{i=1}^{N} v_i > \sum_{i=1}^{N} c_i \Leftrightarrow \sum_{i=1}^{N} n_i > 0.$$

VCG MECHANISM

We call an individual *j* **pivotal** if he affects the supply decision, for example

- Without individual j we have

$$\sum_{i \neq j}^{N} n_i < 0$$

- But, with individual j

$$\sum_{i \neq j}^{N} n_i + n_j > 0$$

- Without individual j the supply decision changes
  - Could also work the other way
- Individual j inflicts externality on other voters

VCG MECHANISM

Pivotal person is subjected to a tax equal to a difference in social welfare of others between

- The case when he is absent
- The case when he is present

In the case of a single public good/program:

- VCG tax is equal to

$$\pm\sum_{i\neq j}^{N} n_i$$

In the case of choosing one of many public policy programs we implement the program with the highest valuation

- VCG tax works analogously

VCG MECHANISM - EXAMPLE

	Program A	Program B
Firm 1	0	20
Firm 2	0	10
Firm 3	28	0
Firm 4	22	0
Sum	**50**	**30**

Who will pay the Vickrey-Clarke-Groves tax?

- In what amount?

VCG MECHANISM

The mechanism leads to truth-telling and to the optimal level of the public good

Some issues:

- It only works with quasi-linear preferences
- It does not generate a Pareto efficient outcome
  - Inefficient due to taxation, but public good allocation is efficient
- Susceptible to collusion