Lecture 7: Cost-benefit analysis

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Today's lecture

Introduction

Public goods
- What?
- Who?
- How much?

Cost benefit analysis

Valuing non-market goods

Conclusion

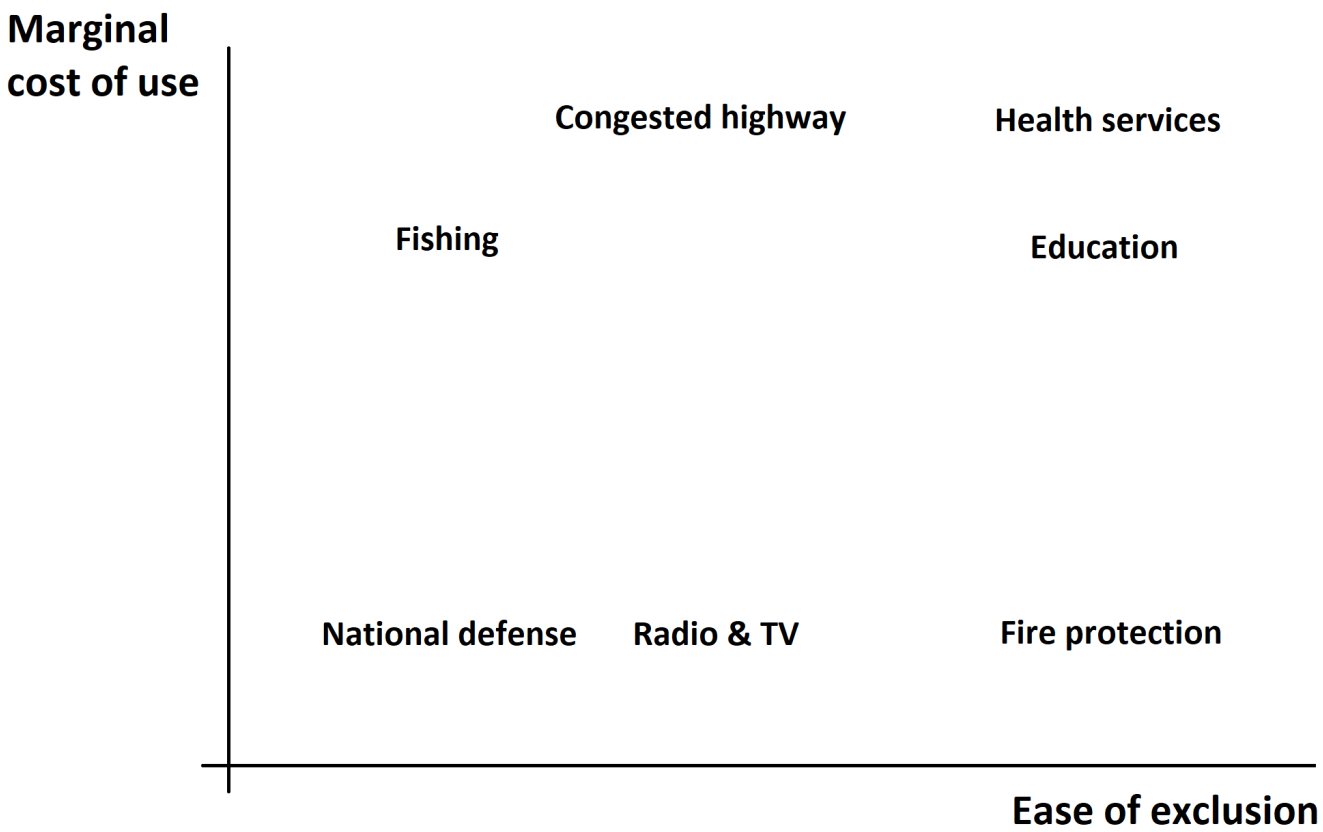
Taxonomy of goods

- Rivalry
- Excludability

	Excludable	**Non-excludable**
Rival	Private goods	Common-pool resources
Non-rival	Club goods	Public goods

- Pureness

Taxonomy of goods in more detail



The public goods problem

- Who will supply the public goods we want?
- 2 obvious options:
  1. The private sector
  2. The public sector

Private provision of public goods

- Non-excludability makes it impossible to charge for use → No incentive for private producers to supply → Undersupply
- Non-rivalry makes it undesirable to exclude anyone from the benefits → Underconsumption
- The free-rider problem

Public provision of public goods

- User fees vs. taxation
- Ability-to-pay vs. the benefits principle
- Efficiency concerns

Public provision of private goods

- Sometimes, it is desirable that the government provides private goods
- Most often for equity reasons (merit goods)
- Three ways to finance these expenditures:
  1. User prices ($\rightarrow$ transaction costs, underconsumption)
  2. Uniform provision ($\rightarrow$ under/overconsumption)
  3. Queuing ($\rightarrow$ inefficiency)

Optimal quantity of a public good

- We seek to reach the equilibrium, but prices are not there to help us
- Let's try to do what the price system does:
  - Step 1: Determine demand
  - Step 2: Derive supply
  - Step 3: Get to equilibrium

Step 1: Determine demand

- Substitution between the consumption of private and public goods
- Collective demand for public goods, i.e. marginal willingness to pay
- Classic downward-sloping demand curve

Step 2: Derive supply

- When the demand meets the budget constraint
- Evaluating projects: cost-benefit analysis (topic of the next chapter)
- Equity concerns, tax incidence

Step 3: Get to equilibrium

- Efficient equilibrium at the intersection with the supply curve
- When the marginal willingness to pay is just equal to marginal cost

  BUT! No market mechanism to lead us there
- Instead of the price system, we use the political process

Cost-benefit analysis

- A systematic process for calculating and comparing the marginal benefits and marginal costs of a project or activity.

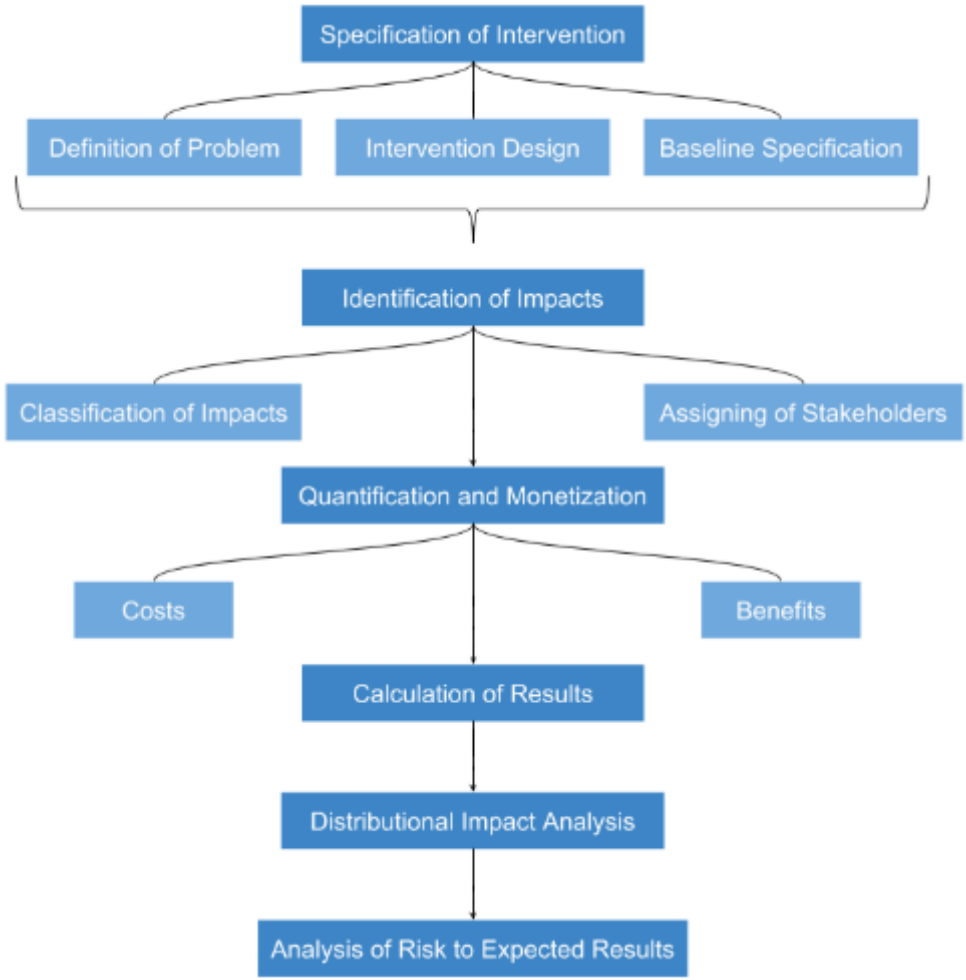
Cost benefit analysis

- Cost benefit analysis (CBA) alternatives:
- Cost-effectiveness analysis compares the costs to a unit of beneficial outcome
- A special case - the outcome expressed in quality-adjusted life years (QUALYs)
- Multi criteria analysis
- Risk-benefit analysis
- Economic impact analysis
- Fiscal impact analysis
- Social return on investment

Cost benefit analysis literature

- Textbooks: Boardman et al. (2017) and Johansson and Kriström (2018)
- Practical manuals: European Commission (2014) and Centre for European Policy Studies (2013)
- Country-specific binding guides such as the UK's Green Book (HM Treasury, 2018)
- Methodologies by the Value for Money project at the Ministry of Finance of the Slovak Republic

Steps of cost benefit analysis



Source: České priority (2019)

Cost benefit analysis

- Objectives of CBA
- Steps of CBA
- Specification of the intervention
- Identification of impacts
- Quantification and monetization of costs and benefits
- Presenting the results
- Testing the robustness of results

Cost-benefit analysis

1. Identify possibilities
2. Identify all consequences
3. Assign values to each input and output
4. Subtract costs from benefits
5. Choose the most profitable possibility

Social vs. private CBA

- Broader impacts taken into account (step 2)
  - Ecology, inequality, standard of living
- Assigning values is difficult (step 3)
  - Market prices might not exist
  - Benefits hard to measure
  - Externalities
- Discount rates, risk

Valuing time

- "Time is money." But how much?
- Using wage rate: markets do not determine the price, but they can help
- Ex.: Subway ride reduces commuting time by 20 minutes; hourly wage is \$15 $\rightarrow$ value of time saved is \$5
- Criticism:
  - Cannot find additional work $\rightarrow$ overestimation
  - Wage may be inflated/deflated due to specific features of jobs $\rightarrow$ over-/underestimation

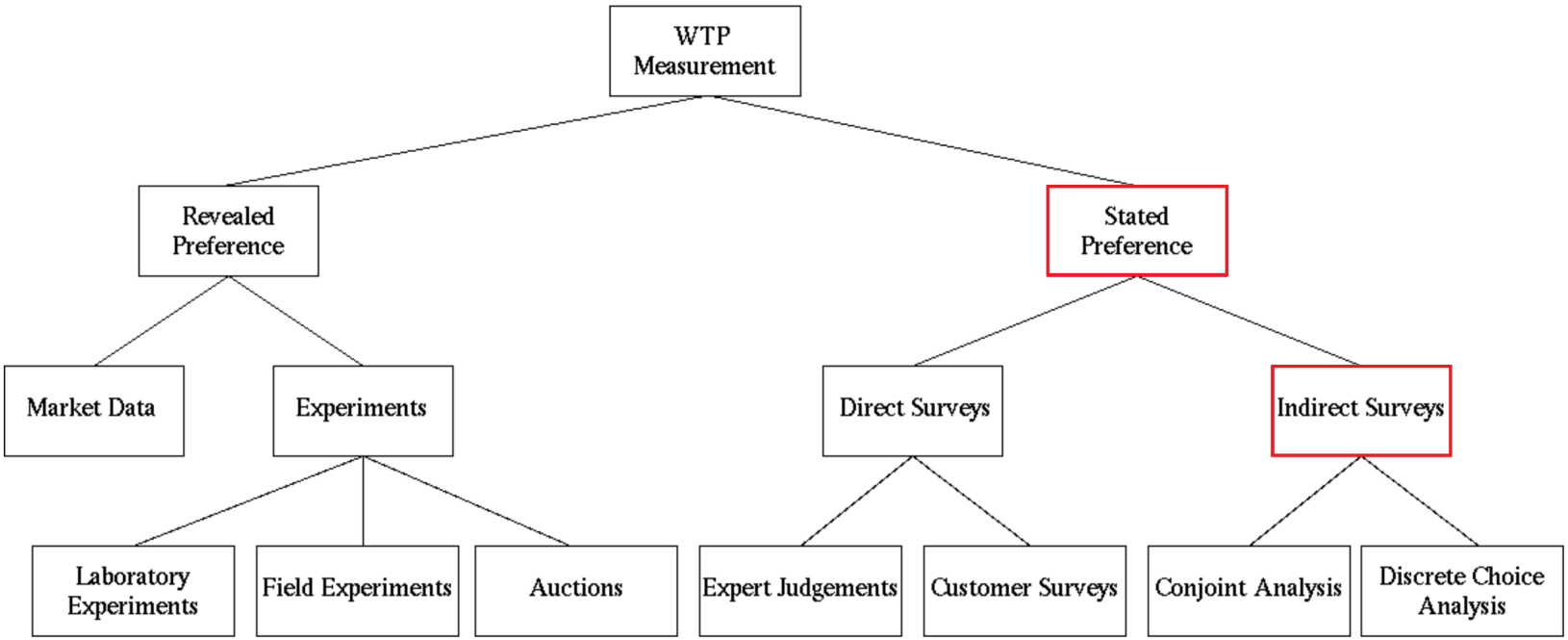
Valuing life

- "Health is something you can't put a price on." But sometimes we need to.
- Method 1: the constructive method
  - Sum of all potential future earnings
  - Clear problems: is the value of the life of a retired person zero?
- Method 2: the market wage method
  - Some jobs are riskier than others, and we know by how much
  - Clear problems: imperfect information, neglect
- Method 3: willingness to pay

Valuing natural resources

- Contingent valuation
- Existence values

Measuring willingness to pay



Source: Breidert et al. (2006)

Contingent valuation

- One of the simplest ways to measure WTP is to ask people directly, but many problems arise:
- Intensive vs. extensive margin
- Scope insensitivity (scope neglect)
- The black swan problem
- Not enough information, strongly dependent on the wording of questions, emotional and psychological numbness

Conclusions

- The government plays multiple roles: transmitter of preferences and big spender
- Cost benefit analysis is one of the economists' tools useful for public budgets

Thank you!

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References I

Breidert, C., Hahsler, M., and Reutterer, T. (2006). "A review of methods for measuring willingness-to-pay". *Innovative Marketing*, 2(4) (cited on p. 23).