“Key Takeaways” Review Slides

DIS Environmental Economics A, Spring 2020

Session 2: Externalities

Externalities: consequence of activity not accounted for in market prices

- The costs and benefits associated with a market transaction that affects third parties are not internalized by producers or consumers.
- In order to force consumers & producers to internalize the costs or benefits associated with an externality, governments need to tax negative externalities and subsidize positive externalities.
- Forcing consumers and producers to internalize an externality does not eliminate the external effects, but attempts to make it the optimal social amount.

Session 2: Externalities

4 Basic Types of Externalities:

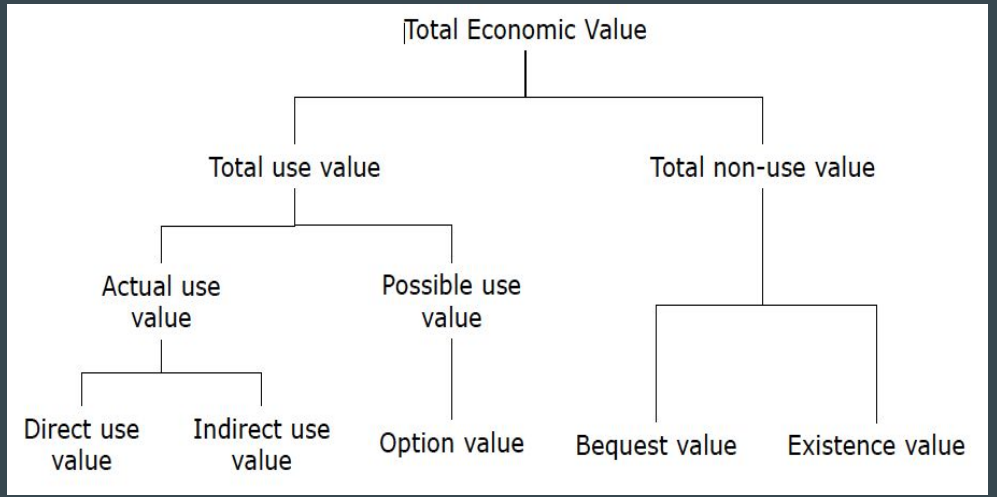
1. Negative Production Externality (shifts supply curve to the left)
    a. Pollution, dry cleaners, car manufacturers
2. Negative Consumption Externality (shifts demand curve to the left)
    a. Antibiotic resistance, pollution from car usage
3. Positive Production Externality (shifts supply curve to the right)
    a. Bakery aroma, transferable job training
4. Positive Consumption Externality (shifts demand curve to the right)
    a. Herd immunity, hipster-fueled gentrification

Session 2: Externalities - Sample Midterm Question

If a car manufacturer internalizes its negative externalities of production, what will happen to the price and quantity of the market equilibrium for the cars? How will the supply and/or the demand for the manufacturer shift?

Session 4: Valuation Methods

- Why is it necessary to know nature's value?
  - Public spending
  - Preferences
  - Encouraging public participation in projects
  - Cost/benefit
- Non-market goods



Session 4: Valuation Methods; Revealed Preference Method

Definition: demand for environmental good revealed through demand for market good that is complementary to environmental consumption

1. Travel Cost Method: sum-of-parts valuation combining total costs associated with travel and consumption of an environmental good
2. Hedonic Pricing Method: measure change in prices associated with changes to the environmental good's state

➢ Fail to include non-use values

➢ Requires existence of complementary goods and only allows for ex-post project valuations

Session 4: Valuation Methods: Stated Preference Method

Definition: identifying a willingness to pay for a well-defined hypothetical change to an environmental good

1. Contingent Valuation Method: asking for an numerical valuaiton of an environmental good, or offering dichotomous choice

➢ Often arbitrary and offers misaligned incentives, although can capture non-use value

2. Choice Modeling (Choice Experiment) Method: sum-of-parts analysis modelling valuation as a function of particular attributes by offering various alternative attribute levels

➢ Ole's preferred method

Session 4: Australian Great Barrier Reef

- 2017 Deloitte Report- an economic valuation of the Reef that sought to determine the true aggregate value (iconic, social, and asset)
  - 56 billion
- TV was sum of *Non-Use* and *Use* values
  - *Use* determined via Travel Cost (revealed preference) and Benefit Transfer (57%)
  - *Non-Use* constructed with Contingent Valuation (WTP) (43%)
- Performed a sensitivity analysis to allow for a range of plausible outcomes
  - input variable- discount factor

Session 4: Valuation Methods: Choice Experiment Method

Examines willingness-to-pay for different attributes of a good, through the use of surveys given to respondents

- Respondents are given sets of two or more configurations of a good and asked to choose their preference relative to the status quo
- By examining the choices made from various responses, we can determine what features or options present the most utility for those questioned
- This can apply to environmental economics in numerous ways, including stylistic decisions on building a potential new stream

Session 4: Valuation Methods - Sample Midterm Question

- What are two methods used to place value on environmental goods and what is the difference between them?

- Revealed Preference Method and Stated Preference Method
- For revealed preference method the value is revealed through the demand for a complementary market good while for stated preference method it is done through the willingness to pay for a hypothetical change to an environmental good.

Session 5: Impact Investment

- A way to direct more money towards sustainable development goals.
- **Impact Investment:** Investment made intention to generate positive, measurable social and environmental impact alongside a financial return.

- **Spectrum of Impact Investment:**

Pure profit → Investment → Grants → Pure social

- **Traditional investors** just want to secure the highest profits, whereas **impact investors** will typically try to avoid harmful industries.

Session 5: Impact Investment

- Impact investor seeks a double bottom line return, both a FINANCIAL and a SOCIAL return.

- Characteristics of Impact Investment:

  - Intentionality

  - Investment with return expectation

  - Impact measurement

  - Range of return expectation and asset classes

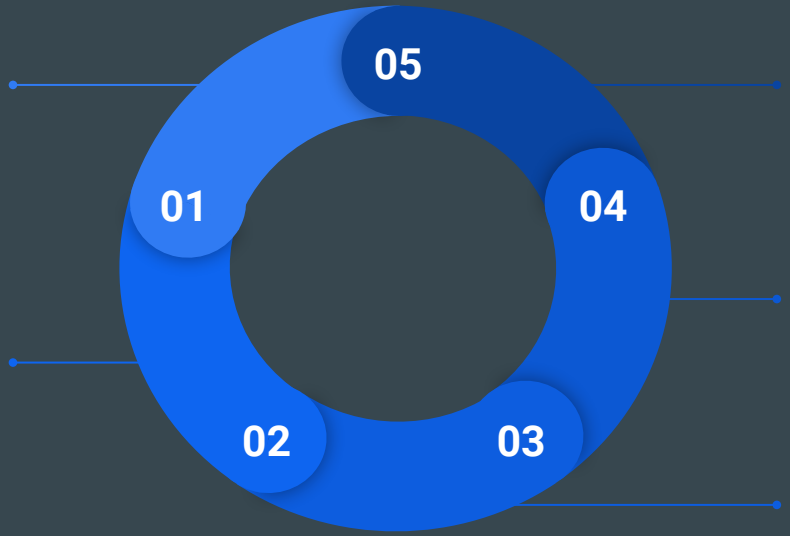
Session 5: Impact Investment - Midterm Question

Give an example of impact investment, explain why it is a kind of impact investment with description of specific characteristic.

Session 7: Cost-Benefit Analysis - Key Steps

Defining the Project or Policy Analyzed
Specify the main elements ie. location, timing, and groups involved

Identifying Impacts
Specify the Inputs and Outputs - making sure to include secondary outputs.



Issuing a Policy Recommendation
Regulations may be adopted in the United States only if it can be shown that the benefits justify the costs

Comparing Benefits and Costs
Required discounting so that cost and benefit net present values (NPV) can be "accurately" compared to one another

Valuing Impacts
Value all impact, tangible and intangible in monetary terms as marginal social costs and benefits - requiring discounting,

- Goal of BCA is to find efficient solutions that generate the greatest net benefit to society
- If this is not possible aim for most cost-effective solution by means of optimization
- If still not possible, rely on impact assessment → take a qualitative look at the other measures

Session 7: Cost-Benefit Analysis - Discounting the Future

Since the costs and benefits of a project often fall at different times, we must calculate the NPV according to the formula:

$$NPV=FV/(1+r)^n$$

The NPV will decrease as the discount rate and/or timespan increases

Taking the future values of the costs and finding their present value makes it easier to compare costs to benefits, as a dollar today is worth more than a dollar tomorrow

Concerned with how resources are allocated

Session 7: Cost-Benefit Analysis - Sample Midterm Question

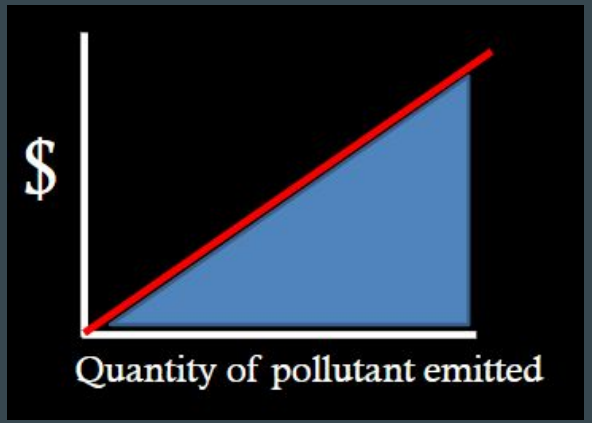
What is the problem with a discount rate estimation that is too high or too low?

Answer:
A discount rate that is too low means that too much money will be saved ahead of time. A discount rate that is too high means that not enough money will be saved.

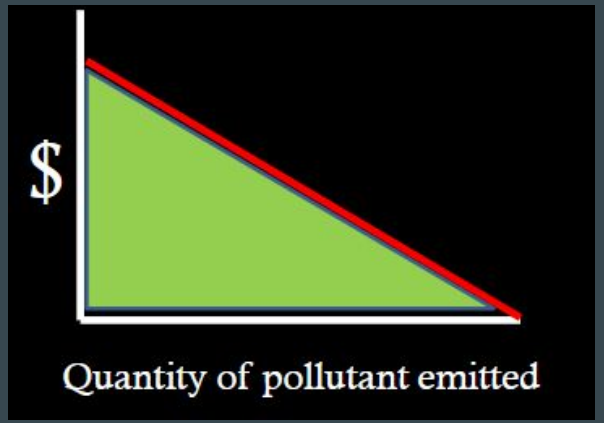
Session 8: MD Curves

- Pollution services- value of additional production made possible by the community allowing the firm to emit a given amount of pollutant
- Communities produce (supply), firms consume (demand)

Marginal damage costs
(=supply for pollution services)

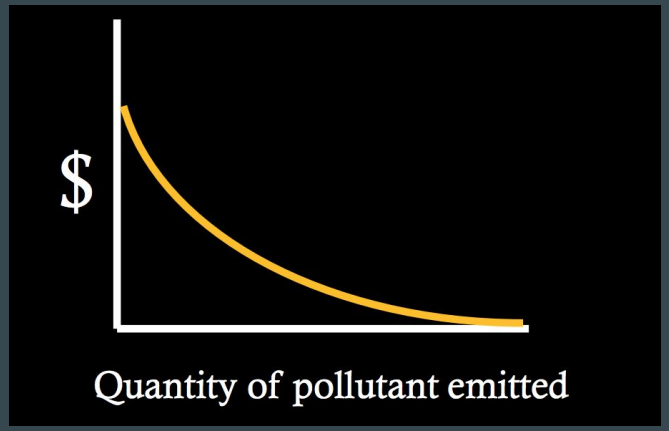


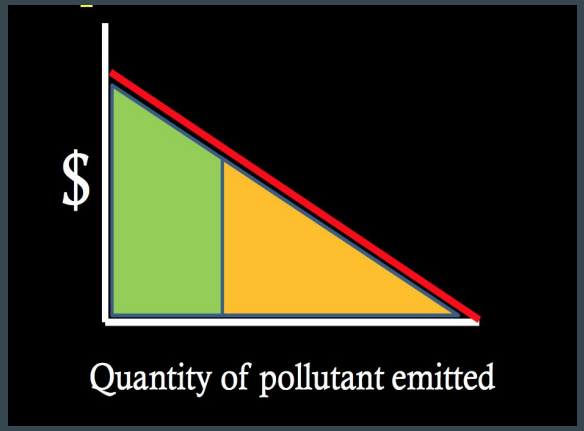
Marginal benefits from polluting
(=demand for pollution services)



Session 8: MAC and MD Curves

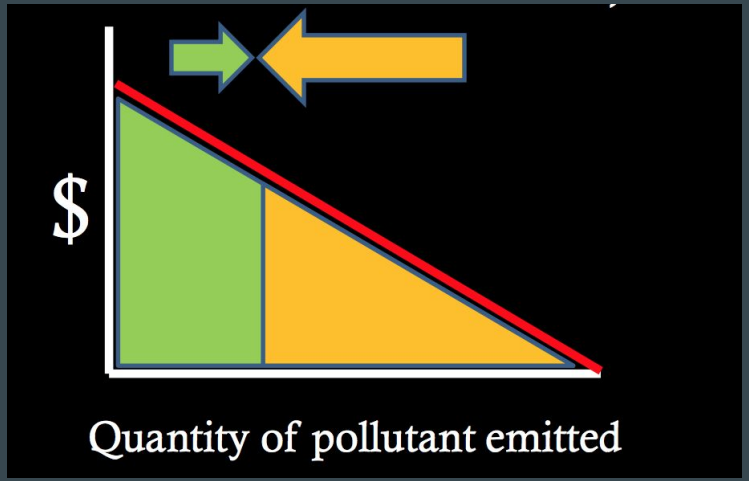
- Alternative Interpretation: MAC curve reflects costs avoided from being able to pollute more
  - = demand for pollution services curve
  - Read right to left!





Session 8: MAC and MD Curves - Sample Midterm Question

If this is a MAC curve, and the quantity polluted by the company is where the yellow meets the green, describe qualitatively what the yellow and green sections represent.



Session 9: Command-&-Control Policies - Types of Standards

- Governments can *command* specific corporate behaviors by setting standards and implementing *control* mechanisms such as fines and jail time to ensure compliance
- 3 types of standards:
  - Ambient: define maximum levels of environmental pollutants expressed as average concentration levels over a certain time period, enforced indirectly via emission controls
  - Emission: define maximum emissions levels for polluting sources expressed as total emissions over a time period, enforced directly via emission controls
  - Technology: specify technologies or practices (design, engineering or method requirements) which must be adopted, enforced via inspections and spot-checks to ensure and monitor compliance

Session 9: Command-&-Control Policies - Pros & Cons

Pros: Emissions must decrease

Abatement cost must equal the compliance cost

Cons: Incentive for technological innovation decreases, zero under certain standards

Perverse Incentives

Uniformity of Standards

Session 9: Command-&-Control Policies - Midterm Question

Use the graph to explain why there are problems with enforcing uniform standards.