University of Zurich

Faculty of Law

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Law & Economics

Economic Analysis of Law

Environmental Law and Economics

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Economics and Environment
Reminder for Law & Economics Questions

- **Positive analysis**
  - Cause-effect relationships: If X, then Y
  - Methodological Individualism
    - „Selfish“ according to preferences
    - => Does not exclude altruism
- **Normative analysis**
  - Better or worse
  - Output orientation
    - Orientation towards the effect of a measure
  - Cost and benefit v. right or wrong

The Market Mechanism and the Environment

- **„Invisible hand“**
  - (Natural) resources (typically scarce!) are distributed efficiently
  - Best solution for „environmental goods“ as well
- **The Law of ‚somebody else‘s problem‘**
  - Users of resources pay only private costs
  - Externalities are carried by others
- **Private marginal costs ≠ social marginal costs**
  - „Market failure“
  - Environmental problems are mostly problems of property rights

Differentiated Approach

- **No „fundamentalistic “ arguments**
- **Fundamental distinctions**
- **Environmental goods**
  - Renewable; e.g. wood/timber, natural oil/gas, etc.
  - Non renewable; e.g. crude oil; minerals, etc.
- **Environmental goods / pollution**
  - Local; e.g. phosphates => overfertilized lakes (lake Sempach)
  - Regional; e.g. river (Rhein)
  - Global; e.g. climate
- **Pollution, usage**
  - Reversible; e.g. rivers, lakes, air pollution
  - Non reversible; e.g. extinction of a species

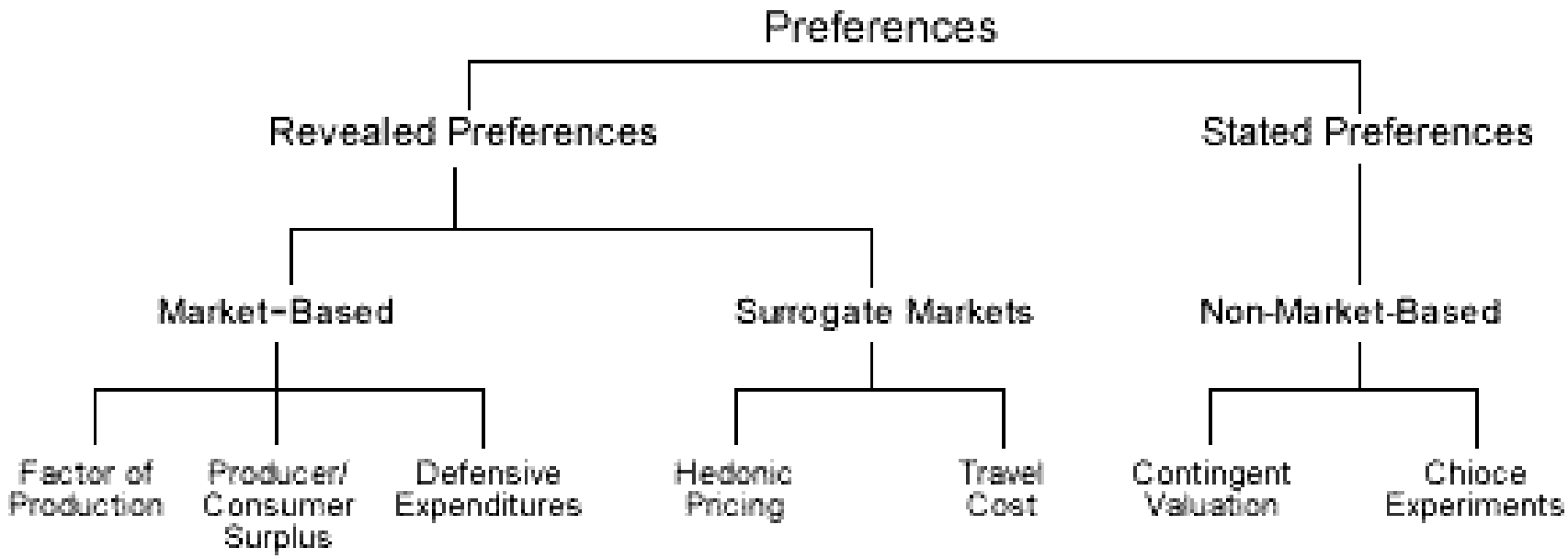
Economic Analysis
Two main Problems

- **„Optimum“ scale of pollution**
  - Cost-benefit analysis
  - No pollution is usually not reasonable (much of welfare depends on natural resources)
  - Important: categories of pollution (local, regional, global / reversible, non reversible)
- **Efficient achievement of goal**
  - Customized measures
    - Liability
    - Prohibitions and requirements
    - Taxes and subsidies
    - Tradable certificates

Optimum Scale of Pollution: Valuation of Environment

- **Environmentalist**
  - Value of an environmental good is „infinite“
  - Discussion not possible
- **Economists**
  - Valuation in money-equivalents, benefit-equivalents
    - Valuation method through monetary values
    - Benefit-happiness research
  - Permits cost-benefit analysis

Valuation of Environment : Valuation Methods



Valuation methods
Revealed Preferences (1)

- **Production functions**
  - Change in corporate profits due to environmental effects
  - Utility value: less fishing due to pollution
- **Reparation and prevention costs**
  - Expenditures on „reparation“ of environment
  - Costs to avoid environmental risks
    - E.g. costs for purification plant
- **Problems**
  - Minimum values because consequential costs are not considered
  - No measurand for values of existence; e.g. value of biodiversity?

Valuation Methods
Revealed Preferences (2)

- **Travel cost model**
  - Typical for recreation areas
  - Measurement of all travel costs
    - Explicit costs
    - Opportunity costs
  - Aim: Demand curve, „entrance fee“
  - Problems
    - Benefits for non-user
    - 2nd-best alternative: alternatives

Valuation Methods
Revealed Preferences (3)

- **Hedonic pricing**
  - Market prices of goods or services
  - Isolation of an „environmental component “
  - Typical: House prices/rent
    - Location, accessibility
    - Quality, size, age
    - Noisiness, air, etc.
  - Problems:
    - „Standard“ houses
    - large data volumes necessary
- **Example: Flight noise in Zurich**
  - Estimated costs ca. 10 Mia. CHF
  - Willingness to pay CHF 70 to halve the noise (-10dB)

Valuation Methods
Expressed/Stated Preferences

- **Contingent value method (CVM)**
  - Survey on valuation
    - Hypothetical tax
    - Entrance fee
    - Question of a referendum
  - Question technique is crucial
    - Range of answers
    - Control questions

Measures, Incentives and Efficiency

- **Property rights – Injunctive relief**
  - Owner can prevent acts a priori
  - Negotiation can permit action
- **Property rights – Liability law**
  - Owner gains redress ex post
  - Owner prevents act ex post
- **Property rights – Complete ban**
  - No action possible

Liability Law and Environment Conditions?

- **Property rights suitable**
  - Visibility of environmental damages
  - Immediate, without time lag
  - „Local“ environmental problems
    - Emigration?
    - Reversibility of pollution => Temporal horizon?
  - Few parties, low transaction costs
- **Property rights not suitable**
  - Invisible, long-term damages
  - Global environmental problems
  - High transaction costs

Example: Exxon Valdez Accident in front of the Coast of Alaska 1989

- **40 million litres oil near the coast of Alaska**
  - Exxon paid 2 billions USD for cleanup and 1 billion USD in the US for other private claims
- **Countless legal proceedings and judgements**
  - Jury: 287 millions damages, 5 billions punitive damages (1994)
  - Decrease appeal judge: 4 billions (2002)
  - Increase (same) appeal judge : 4.5 billions (2003)
  - Next instance: 2.5 billions (2006)
  - Argumentation in front of the Supreme Court 2008
- **CVM: Willingness to pay per person 31 US-$**
  - Reckoned up to the whole US : ca. 2-3 billions US-$

Measures, Incentives and Efficiency

- **Regulations, prohibitions/requirements**
  - Clear target
  - Inefficient incentives
- **Certificates**
  - Clear target
  - Efficient incentives
- **Taxes**
  - Trial and error targets
  - Efficient incentives

Example: Efficient Measures

- **Land with 2 firms A and B**
  - Total CO2 output 200 (100 company A, 100 company B)
- **Aim: 30% reduction of the CO2 output**

Reduction	Company A Costs	Company B Costs
First 20 tons	2 million per ton	4 million per ton
Next 20 tons	5 million per ton	8 million per ton

Evaluation of Measures

- **Regulations, prohibitions/requirements**
  - Efficiency of measure
  - Incentive only up to the limit
  - Control costs? Incentives?
- **Certificates**
  - Accuracy, „optimal amount of pollution “
  - Problem: Initial allocation v. auction
- **Taxes**
  - Cost control: Costs appreciable
  - Problem: Trial and error in quantitative effects

Lomborg: Where do we Stand?

- **Environmental protection is a „luxury good“**
  - Relation between income and environmental quality
- **Distinction between local and global problems**
  - Western local problems: Solved to a great extent
    - Water pollution
    - Air pollution (particles, SO4)
  - Global problems: Solutions?
    - CO2, climate
    - Biodiversity