

Summary of “Economic and Ecological concepts
for valuing ecosystem services”, Farber et al.
(2002)

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Definitions:

- Value systems: “the normative and moral frameworks people use to assign importance and necessity to their beliefs and actions ... also imply practical objectives and actions.”
- Value: “the contribution of an action or object to user specified goals, objectives, or conditions”
- Valuation: “the process of expressing a value for a particular action or object”

Economic concept of value

- Based on the marginalist paradigm and the concept of diminishing marginal utility
- Assumes that marginal utilities of different goods are balanced
- Implies that one good can be traded off for another to increase utility
- Also implies that value can be measured in terms of money and/or time

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Some challenges to the marginalist paradigm

- Lexicography preferences (hierarchy of needs)
- Cases where basic needs can't be satisfied by current resources

Their really bad example of marginal utilities

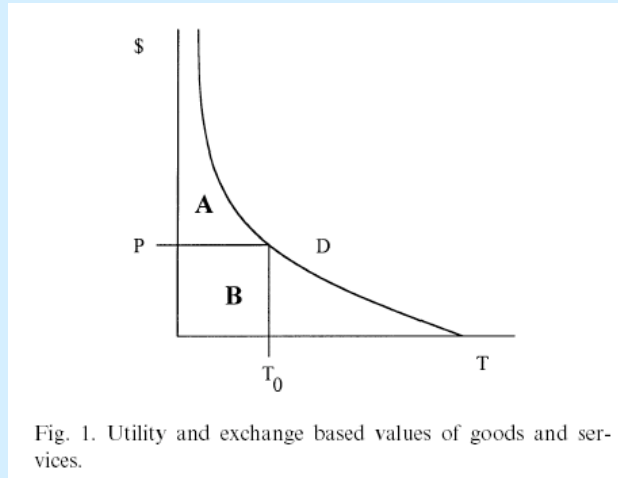
Example, utility from food depends on calories, protein, and vitamins:

$$U = aC + bP + cV$$

They note that the coefficients (a,b,c) represent marginal changes. (What is wrong with this formulation?)

(Do note that many estimated hedonic models are linear.)

Market valuation at the margin illustrated



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Some notes:

- WTP and WTA estimates can be based on marginal changes or presence/absence.
- Area B represents exchange value; area A, consumer surplus.
- Both together represent total value.
- The authors note that this concept of value is anthropocentric and instrumental

Traditional choice modeling and analysis

- Traditional choice theory assumes a deterministic solution to a constrained optimization problem
- This means that when constraints change, we can model how decisions change
- Most traditional (non-linear) models also assume that the impact of changes can be approximated linearly around the optimal solution

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Scarcity, substitution, and tastes

- The more scarce a good, the higher its value at the margin
- Goods may be substitutes in terms of their contribution to utility, but not be substitutes from an ecological perspective
- Neoclassical models assume fixed tastes and preferences; if they change over time in uncertain ways, deterministic solutions break down.
- They propose to bring social decision-making/policy into this debate.

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Ecological concepts of value

- Causal relationships: how does a tree species contribute to controlling soil erosion?
- Survival value of a characteristic to a species
- Co-evolution of species and survival value of one species to another
- Energy theory of value: they argue that studies indicate this has some empirical usefulness

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Ecological thresholds, uncertainty, and economic value

- Critical thresholds imply two sources of value for a resource: marginal value and insurance value.
- The insurance values may dominate
- Movement beyond a critical threshold may be irreversible.
- Critical thresholds in economic and ecosystem valuation may not match (p. 386)

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Uncertainty

- Uncertainty may involve knowing outcomes and their probabilities, or limited knowledge about both
- If you know both, in principle you can use expected utility theory to account for risk-aversion
- If you don't know probabilities of outcomes, you can try to minimize the worst-case outcome (safe minimum standard)

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Conflicts between economic and ecological value

- Diminishing MU may imply saturation in demand for ecosystem services
- Ecosystem services may not have direct value in market economies (biodiversity example from last week)
- Discussion of non-market valuation techniques, more or less repeat of last week

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Comments

- Some of their ecologic concepts of value could be incorporated into economics through valuation of natural capital, ecosystem services, and biodiversity
- Why try to return to a production-based theory of value? Are they mixing “should” and “do”? What does this do to the useful concepts of preferences and perceived scarcity?

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