

BENEFIT-COST ANALYSIS

Applying Ecosystem Value Estimates

Benefit-Cost Analysis (BCA) or (CBA)

- Benefit-cost analysis introduction
- Applying BCA
 - Identify project
 - Valuing impacts
 - Sensitivity analysis
- BCA Uses
- Issues with BCA



BCA Analysis Basics

- Most basic level: decision-making rule used to value different policy options or projects
 - Let B be the benefits from a proposed action and C be the costs. Our decision rule would then be:
 - If $B > C$, support the action
 - Otherwise, oppose the action
- Benefits and costs expressed as monetary values

Valuing Ecological Services from Preserved Tropical Forests

- Land conversion is main threat to tropical forests
- Conversion/preservation depends on economic incentives



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Identify Project

- What is being analyzed?
- Whose welfare is being considered?
- Time frame?

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Valuing Impacts

- Must have a common unit of measurement for benefits and costs
- Comparing benefits and costs across time
 - Present value = time value of money
 - Present Value of a *one-time* net benefit (NB) received t years from now is

$$PV(NB) = \frac{B}{(1 + r)^t} = B(1 + r)^{-t}$$

Demonstrating Present Value Calculations

Year	1	2	3	4	5	Sum
Annual Amounts	\$3,000	\$5,000	\$6,000	\$10,000	\$12,000	\$36,000
Present Value ($r = 0.06$)	\$2,830.19	\$4,449.98	\$5,037.72	\$7,920.94	\$8,967.10	\$29,205.92

Applying Net Present Value (*NPV*) test

- Net present value

$$NPV = \frac{\sum B_i}{(1+r)^t} - \frac{\sum C_i}{(1+r)^t}$$

- If $NPV > 0$, then accept the project
- If $NPV < 0$, then reject the project

- Any project that passes the *NPV* test is deemed to be an improvement in social welfare.

Net Present Value Calculation

- In-class example
 - Could be created in excel

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Choosing between Preservation and Development in Australia



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Issues with BCA

- Pricing the priceless
- Troubling trade-offs
- Uncertainty and precaution
- Distorting the future
- Partisans and technicalities