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Benefit (value) transfer method



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What is Benefit Transfer / Value Transfer ?

Transfer economic value of a public good from *study site* (*primary valuation study*) to *policy site* (*where you are doing e.g. a Cost-benefit analysis*)

Increased use of cost-benefit analysis, and lack time and money to do new primary study at the policy site -> Value Transfer increasingly used, but often uncritically

In practise: Transfer both in *space and in time*



Basic requirements for valid value transfer

1. Complete, searchable and accessible **database of national and international primary valuation studies (with detailed info)**
2. Best practise criteria for **assessing quality of primary valuation studies**
3. Best practise **criteria for value transfer**



Databases for valuation studies

International

- EVRI –Environmental Valuation Reference Inventory
www.evri.ca
- ENVALUE (Australia and International)
<http://www.environment.nsw.gov.au/envalue/>
- EUROFOREX Database
- NOAA ´s databases on Marine and Coastal resources (CoastalrecreationandCoralReefValuationetc.)

National

- New Zealand NMDB
- ValueBase SWE
- UK Defra Environmental Valuation Source List
- USDA NRCS (Natural Resource Conservation Service)
- US Recreational Value Database, Ecosystem Val.; Coastal Res.



Quality assessment of primary valuation studies

- Identify Primary studies: Journal articles, Ph.D. Theses, and "Grey literature (M.Sc.-theses, research reports)
- Assess quality of studies using e.g. SEPA, (2006): *An instrument for assessing the quality of environmental valuation studies. Report, Swedish Environmental Protection Agency, Stockholm*

<http://www.naturvardsverket.se/bokhandeln/pdf/620-1252-5.pdf>



Value Transfer methods

Unit Value Transfer

- Simple (naïve) unit transfer
- use value: Consumer surplus/activity day
- non-use value: WTP/household/year
- Unit transfer with income adjustments
- International transfer: Purchase Power Parity (PPP)-
adjusted exchange rates

Function transfer

- Benefit function transfer(from one or a few similar studies)
- Meta-analysis(from many studies with different scope)



Unit value transfer with income adjustment

Adjusted benefit estimate B_p' at the policy site:

$$B_p' = B_s(Y_p / Y_s)^\beta$$

B_s primary benefit estimate (e.g. WTP/hh/y) from study site,
 Y_s , Y_p income levels at the study and policy site, respectively
 β income elasticity of WTP for environmental good



Benefit function (BF) and Meta analysis (MA)

$$\text{BF: } WTP_{ij} = b_0 + b_1 G_j + b_2 H_{ij} + e$$

WTP_{ij} = willingness-to-pay of household i at site j ,

G_j = set of characteristics of environmental good (including *change in quality/quantity valued*) at site j ,

H_{ij} = set of characteristics of household i at site j

$$\text{MA: } WTP_s = b_0 + b_1 G_j + b_2 H_{ij} + b_3 C_s + e$$

WTP_{ij} = mean willingness-to-pay/household of study s

C_s = set of methodological characteristics of study s

n = number of estimates studies (but also several estimates from each study)



Transfer Error (TE)

Percent difference between the transferred (WTP_T) and policy site primary estimate (WTP_P)

$$TE = (WTP_T - WTP_P) / WTP_P$$



Transferability -transfer errors (TE)

Average TE for spatial value transfers both *within and across countries tends to be in the range of 25% -40%* (Ready and Navrud 2006 –*Special issue of Ecological Economics on Benefit Transfer*).

Individual transfers could have several hundred % TE

Function transfer does not seem to perform better than unit value transfer. Meta analyses could also produce high transfer errors. Use only those with a limited scope in terms of valuing similar type environmental goods and similar change, and using state-of-the-art methodology



Criteria for Value Transfer

i) Scientific soundness (data collection procedures, empirical methodology, consistency with scientific or economic theory, statistical techniques);

ii) Relevance (change in environmental quality, baseline environmental quality, affected services and commodities, site characteristics of affected commodity, duration and timing of effects, exposure path and nature of health risks, Socio-economic characteristics of the affected population, property rights.);

iii) Richness in detail (definition of variables and means, treatment of substitutes, cost of time (in Travel cost studies), participation rates ("Extent of market" i.e. number of affected people)



Value Transfer Guidelines

1) Identify the change in the environmental good to be valued at the policy site

(i) Type of environmental good

(ii) Describe baseline, magnitude and direction of change in environmental quality

2) Identify the affected population at the policy site

(i.e. define extent of market; and identify studies with same "scope" e.g. Local/regional/national SP survey)

3) Conduct a literature review (from databases) to identify relevant primary studies



Value Transfer Guidelines (II)

4) Assessing the quality of study site values for transfer

(i) Scientific soundness; the transfer estimates are only as good as the methodology and assumptions employed in the original studies

(ii) Relevance; primary studies should be similar and applicable to the “new” context

(iii) Richness in detail; primary studies should provide a detailed dataset and accompanying information



Value Transfer Guidelines (III)

5) Select and summarize the data available from the study site(s)

6) Transfer value estimate from study site(s) to policy site

(i) Determine the transfer unit

(ii) Determine the transfer method for spatial transfer

(iii) Determine the transfer method for temporal transfer

7) Calculating total benefits or costs



Challenges for Value Transfer

- (i) Database of *valuation studies* -> *populate EVRI (the most complete international database; web-based), but need more detailed and consistent info about the studies (EUROFOREX Database)*
- (ii) Improve quality, design and reporting of results of primary valuation studies
- (iii) Improve VT Methods; e.g. improve explanatory power of function transfer by finding what motivates household WTP in SP studies, limit "scope" of meta analyses, include important cultural/institutional factors in international VT



Challenges for Value Transfer (II)

- (iv) Improve tests of validity of transfer (conventional tests versus equivalency tests; and discuss acceptable transfer errors for different types of policy use)
- (v) Test transfer guidelines (including unit of transfer) and assess transfer errors, validity and acceptability.