



ECONOMY AND ENVIRONMENT PROGRAM FOR SOUTHEAST ASIA

POLICY BRIEF

THE BENEFIT TRANSFER APPROACH TO ENVIRONMENTAL VALUATION: AN APPLICATION IN CHINA

It is now widely accepted that the environment provides goods and services that are valuable to people and that many of these values can be expressed in monetary terms. Moreover, it is accepted that such valuation can be useful. In project appraisals, for example, it is now common for traditional cost-benefit analyses (CBA) to be supplemented by environmental impact assessments (EIA). But because the CBA is in monetary terms and the EIA is in physical terms, the results are often difficult to reconcile. To compare the two, the EIA must be converted to a monetary value.

While economists have developed a variety of methods to estimate monetary values, these methods tend to require substantial resources and specialized expertise. For project appraisals in particular, the time and money for a full-scale valuation are rarely available. In such cases, the use of 'benefit transfer' (BT) is often advocated (ADB, 1996). This involves taking the results from previous valuation studies in different locations, and modifying and transferring those values to the project being evaluated. In cases where a high degree of precision is not critical, BT may provide useful information for decision making. Often it will be the only source of such information - in most cases, the alternative to BT is not an original study but no study at all.

In 1996, Du Yaping of the Hubei Academy of Social Sciences carried out an original study to estimate visitors' willingness to pay (WTP) for improvements to the water quality of East Lake in Wuhan, China (see her EEPSEA Research Report, 1998). Recently, Ms. Du compared her findings with the results of similar studies in other parts of the world to see how close the results were and whether they provide support for the use of benefit transfer.

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The Benefit Transfer Method

An EEPSEA Special Paper by Stale Navrud (1996) describes in detail the procedure involved in BT. Briefly: The analyst first searches the literature for studies of sites that have similar characteristics to those of the local site. (This search process has recently been made easier by the development of searchable Web-based BT databases. See ENVALUE: www.epa.nsw.gov.au/envalue; and EVRI: www.evri.gc.ca.) The site of the previous research is usually called the "study site" while the site to which the benefit estimate is transferred is called the "policy site" (Navrud, 1996). Because differences between the study site and the policy site are inevitable, values must be adjusted to reflect the site-specific features. Commonly (and in Ms. Du's study) two adjustments are made: for per capita GDP and price level. The latter is a proxy for changes over time since the study site survey was conducted.

The Comparison Sites

The Policy Site

East Lake is a recreational site in Wuhan municipality. Every year, millions of visitors go boating, swimming and angling there. Recently water pollution has seriously impaired recreational quality especially for swimming. Du Yaping's 1996/97 study used the contingent valuation method (CVM) and the travel cost method (TCM) to assess WTP for cleanup to various levels of improved quality.

Three Study Sites

The first case was done in the Philippines by Choe, Whittington & Lauria (1996; hereafter referred as C,W&L). A CVM survey elicited WTP for water quality improvement but without differentiation for quality levels. (In the policy site, there are different water quality levels suitable for different types of recreational uses.) The second case was by Carson & Mitchell (1993), which used CVM to evaluate the WTP for increased water quality for all the rivers in the US. The third was Desvousges, Smith & Fisher (1987; or "D,S&F"), which used CVM to estimate the option value for increased water quality for the Monogahela River in the US.

Comparisons Results

Figures from the three study sites and the policy study are given in the table below. The first case is the closest, being one-fourth higher than the "actual" one (Ms. Du's). The Carson & Mitchell case shows some similarities to the first one. From unusable to boatable and swimmable, the estimates depart from the "actual", ranging from less than 10% to 1/3. For the increment from boatable to swimmable, the transferred figure is surprisingly close to the "actual" value, being only 7% different. However, the estimate from the third case is significantly lower than the "actual" value.



Comparison of Study Site & Policy Site Estimates
(in CNY Y/capita/annum)

	WTP _{BT} (1)	WTP _{CVM} (2)	▲WTP(3=1-2)	rate of var. (4=3/1)
C,W&L				
B S	9.97	7.88	2.09	+21.0%
C&M	16.08	10.26	5.82	+36.2%
U-B	23.81	18.14	5.67	+23.8%
U-S	7.73	7.88	-0.55	-7.1%
B S				
D,S&F	1.06	10.26	9.2	-867.9%
U-B	2.04	18.14	16.1	-789.2%
U-S				

What explains these variations? Several factors could be at play:

First, there are differences in the degree of water quality improvement described in the questionnaires in the various studies. Second, East Lake is only a one-site evaluation while Carson & Mitchell looked at all US rivers. Third, differences in time may be greater than a price index can accommodate. People's preferences for environmental quality have undergone drastic increases since 1981 when the data were collected by D, S & F. In fact, the authors did a similar valuation exercise in 1987 in the region and the estimates are four to nine times higher than those six years earlier. Since income could not have increased that much, factors such as increased environmental awareness must have played a role.

Finally, another possible bias relates to WTP per household vs. per individual. The intent of the Wuhan study was to elicit individual WTP, while the estimates from those studies selected for transfer exercise were household WTPs. To allow comparison, the household WTPs were converted to individual values. But biases could remain, since no one can be certain that the converted individual figures would be the same as the figures the respondents would have given if asked to do so.

Conclusions

Benefit transfer has been advocated as a quick, low-cost approach to the valuation of environmental goods. This comparison showed considerable variation among three transferred values and the value derived from an original study. The discrepancies varied from slight to over 8 times as large. Long time spans; "embedding" effects; the specification of the environmental good to be valued; and the willingness to pay of individuals vs. households seem to be particularly important. Detecting and controlling for such factors is not easy. While BT is certainly quicker and less costly than an original study, it does not eliminate the need for considerable skill and experience on the part of the analyst.



Economy and Environment Program for Southeast Asia

Note: 8.28 CNY = 1 USD

The full text of this study is available as an EEPSEA Research Report:
*The Use of Benefit Transfer for the Evaluation of Water Quality Improvement:
An Application in China - Du Yaping*

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