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Testing the stability of the benefit transfer function for discrete choice contingent valuation data

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Abstract

This paper examines the stability of the benefit transfer function across 42 recreational forests in the British Isles. A working definition of reliable function transfer is put forward, and a suitable statistical test is provided. A novel split sample method is used to test the sensitivity of the models' log-likelihood values to the removal of contingent valuation (CV) responses collected at individual forest sites. We find that a stable function improves our measure of transfer reliability, but not by much. We conclude that, in empirical studies on transferability, considerations of function stability are secondary to the availability and quality of site attribute data. Modellers' can study the advantages of transfer function stability vis-à-vis the value of additional information on recreation site attributes.

JEL classification: Q26; H41; C25

Keywords: Benefit function transfer; Function stability tests; Transfer reliability; Forest recreation values; Contingent valuation; Split sample

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Introduction

The objective of this paper is to report results on the reliability of the practice of benefit function transfer. We focus on the stability of the transfer function estimates to the inclusion and exclusion of data from a selection of the overall available sites. Benefit transfer techniques are used to estimate benefit values for natural resource sites for which on-site data on benefits are unavailable (the policy sites). This is done by transferring (i.e. forecasting) benefit estimates on the basis of benefit transfer functions estimated on data collected at other similar sites (the study sites). The technique is used to estimate non-market values for cost–benefit analyses in situations where either the estimation of benefits using other techniques would be prohibitively expensive, or when the available time is insufficient to allow new data collection for the policy site. The method has become widely used because of its inexpensive nature. Databases, such as the International Environmental Valuation Reference Inventory website (EVRI), have been set up to help policy-makers identify suitable studies to use for benefit estimation covering a wide range of environmental goods.

Benefit transfers in practice can take place with various degrees of sophistication. Two broad categories can be identified: the site-unadjusted value transfer, and the site-adjusted value transfer. In the first case, the transfer is quite crude, as the value of the unit of recreation (say the single day-out forest visit) is transferred from a study site for which site-specific survey data exist, to the policy site *without* adjusting for the differences in recreational attributes between the two sites. Such differences, of course, can systematically affect the magnitude of the benefits enjoyed by recreationists. In the case of site-adjusted value transfer, the transfer takes place after an adjustment, which is meant to account for differences between attributes relevant for recreation across the two sites. Adjustment techniques may also vary in their degree of sophistication. A more sophisticated approach employs the method of benefit *function* transfer, which is the focus of this study. With this method, the researcher assumes the existence of a given mathematical relationship between some site-specific attributes (e.g. parking space, forest composition, extension of forest trails, etc.) and the measure of benefit of interest. Such an approach is commonly called ''benefit function transfer'' and has been championed by a number of authors as preferable to the unadjusted value transfer approach (Loomis, 1992; Opaluch and Mazzotta, 1992).

More specifically, the benefit transfer function approach attempts to explain variation in willingness to pay (WTP) for access to the forest site on the basis of variation of forest attributes relevant to recreational activities. This is done from data obtained from a pool of sites where surveys have been conducted. It is an estimate of a behaviourally based mathematical relationship between WTP and site attributes. As such, it requires data collection across a sufficiently large number of recreational sites, to systematically explain the response of benefits to changes in site attributes. For example, in the forest recreation context, WTP may plausibly be related to measures of site quality, size of