R. SCARPA, W.G. HUTCHINSON, S.M. CHILTON
AND J. BUONGIORNO

BENEFIT VALUE TRANSFERS CONDITIONAL ON SITE ATTRIBUTES: SOME EVIDENCE OF RELIABILITY FROM FOREST RECREATION IN IRELAND

1. INTRODUCTION

The best way to investigate the magnitude of benefits from recreation at one natural resource site,[1] such as a forest park, is to conduct an original data collection on site. However, this is often costly[2] and time consuming. If information on the economic benefits produced by similar sites (the *study* sites) is already available, then one may consider the much cheaper option of 'transferring' these to the site of interest (the *policy* sites) after accounting for the idiosyncratic nature of the policy site. Then policy decisions can be based on these "second best" values. In the literature, this practice is referred to as 'benefit transfer' (BT), and it has been regarded as so important to natural resource management agencies that in 1992 a whole special issue of *Water Resources Research* was dedicated to the practical assessment of this technique by leading academics (issue n. 28, 1992).

More results from research on reliability of benefit transfer estimates, mostly developed in the context of North American water resources, were published by Loomis *et al.*(1995), Downing and Ozuna (1996), Kirchhoff *et al.* (1997), and Feather and Hellerstein (1997). More work from the nineties is reported in a book on water resource valuation by Bergstrom *et al.* (2000). Much of these reliability studies produced mixed recommendations on the use of BT, as reported in a review published by Bergstrom and De Civita (1999).

More recently the debate has rekindled with the publications of research papers reporting on applications evaluating new approaches, such as meta-analysis (Santos, 1998) choice modelling (Morrison *et al.* 2002), preference calibration (Smith *et al.* 2002) and alternative testing strategies for reliability (Kristofersson and Navrud this volume and 2002). However, most practitioners would probably agree that the state of knowledge has not substantially changed since Kirchhoff *et al.* (1997, p.75) wrote that:

> Although benefit value transfers are currently used in decision making by public agencies, the scientific debate over benefit transfer continues and many issues remain unresolved."

Benefit value transfers estimates are obviously of great potential interest to practitioners, provided they can be proven to be adequate surrogates of on-site estimates achievable by conducting more costly full-scale studies. In other words, to gain acceptance in the policy arena, BT estimates must show *convergent validity* (Bishop *et al.* 1995). That is, they must show theoretically meaningful and statistically

S. Navrud and R. Ready (eds.), Environmental Value Transfer: Issues and Methods, 179–205.

significant relationships with alternative measures of the same theoretical construct such as other site-specific estimates of the same welfare change. But the issue of how to evaluate this convergence remains contentious.

Validity assessment must recognise that both the BT value estimate for the policy site and the on-site value estimate to be surrogated by it are random variables. Hence, a measure of reliability must account for the probabilistic nature of these values. The major obstacle to this form of validity is argued to be represented by various source of measurement errors (Bergstrom and De Civita 1999). In benefit estimates from outdoor recreation one such source is represented by site-specific attributes, which are determinants of recreational value. When benefits are determined by site attributes their omission from the econometric specification of the benefit function causes mis-specification errors. In the context of maximum likelihood estimation this omission results in biased estimates.

On the other hand, the inclusion of attributes in the specification may induce collinearity because all observations from the same site are associated with the same set of value attributes. For this reason, BT function estimation with site-specific attributes can only be achieved with data from a sufficiently large number of sites and must bear the consequences of collinearity, such as wide standard error estimates. However, with large sample sizes these consequences are less deleterious than one may expect.

In this respect multi-attribute stated preference techniques based on orthogonal experimental design of choice contexts (choice modelling or choice experiments) can be considered superior from the view-point of statistical efficiency. Contingent valuation (CV) responses from samples collected at different sites and choice modelling responses from experimentally designed choice contexts both face the problem of the choice of value to employ to represent attribute levels in the econometric specification. However, in as much as choice contexts are separated from the experience of the effects of the site attributes of relevance – as is often the case in choice modelling – these techniques have another drawback. This is due to the fact that often attributes levels are *described to* respondents, rather than being *experienced by* respondents. Behavioural psychology and common sense suggest that the *experienced* and the *described* give rise to two different sets of value constructs by individuals. See for example the work of Adamowicz *et al.* (1997) on real versus perceived attributes.

In the present study willingness to pay (*WTP*) responses were obtained from respondents who had just completed a visit to the forest, and therefore had experienced the attributes of the site. Furthermore, in merging data from CV surveys at different sites, one must ensure the invariance of the survey instrument, and possibly of the preference structure over time. In our study this was achieved by using data from an identical survey instrument across all sites, conducted more or less simultaneously, over a time interval of a few weeks (summer 1992) (see details in Ni Dhubhain *et al.* 1994).