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IMPROVING THE PRACTICE OF BENEFITS TRANSFER: A PREFERENCE CALIBRATION APPROACH

1. INTRODUCTION

Most applied welfare analyses for environmental policy evaluations, whether benefit-cost or natural resource damage assessments, rely on adaptations of existing benefit estimates in what is described as benefits transfer rather than new research. Over 10 years ago, David Brookshire organized a set of papers in *Water Resources Research* to focus attention on the practice of benefit transfer (see Brookshire and Neill [1992]. Since then, interest in research on the potential for improvement in these techniques has exploded and this volume reports on a number of innovations relying on refinements in the statistical methods used in meta analyses that often provide empirical benefit functions for transfer. Nonetheless, where evaluations of benefits transfer have taken place, current practice is generally regarded as *very unreliable*![1]

This paper considers a different perspective on the practice of benefit transfers. It is one that interprets the benefit transfer problem as an identification problem. That is, the analyst must calibrate individual preferences for the environmental resources of interest based on the available empirical benefit estimates. Our proposed methodology is general. Here we apply it to one example – the development of consistent measures of the benefits of water quality improvements. To develop this logic we begin with a historical perspective, interpreting Harberger's [1971] approximation using indifference curves and then suggesting this logic seems to have been a conceptual antecedent to the logic used with unit benefit transfers. However, in this case the same desirable properties cannot be assured. Section 2 presents a detailed description of conventional benefit transfer practices and these antecedents. Section 3 illustrates the limitations of such practices through a simple example. In Section 4, we provide a detailed description of our proposed methodology in six steps. Using a case study from the Chesapeake Bay our proposed approach is illustrated in Section 5 with travel cost and contingent valuation (CV) data. We then demonstrate how the calibrated functions can be used to construct benefit estimates for a separate situation. We discuss how the resulting benefit estimates differ from those of a more traditional benefit transfer practice, hereafter labeled "simple approximation." Finally, in Section 6 we present a few methodological conclusions.

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Table 1. Recent Evaluations of Conventional Benefit Transfers

Commodity/Service	Authors	Year	Source
Recreation water quality	Loomis, Roach, Ward, and Ready	1995	*Water Resources Research*
Fishing water quality	Downing and Ozuna	1996	*JEEM*
Recreation water quality	Kirchhoff, Colby, and LaFrance	1997	*JEEM*
Health water quality	Barton	1999a	Working Paper
Waste water treatment benefits	Barton	1999b	Working Paper
Rural farm landscape	Santos	1999	Working Paper
Peat meadow amenities	Brouwer and Spaninks	1999	*Environmental and Resource Economics*
Overview	Brouwer	2000	*Ecological Economics*
City air quality	Rozan	2000	Working paper
Forest amenities	Scarpa, Hutchinson, Chilton, and Buongiorno	2000	Working paper

[a] The numbers correspond to the RFF water quality ladder and index (boatable = 2.5, fishable = 5.1, and swimmable = 7).

2. BENEFIT TRANSFER: CONVENTIONAL PRACTICE AND CONCEPTUAL ANTECEDENTS

Benefit transfer adapts available estimates of the economic value for a change in environmental quality (or quantity) to evaluate a proposed policy-induced change in the same or a "similar" resource. In these situations, the analyst is typically taking the results from one or more existing studies (defined in terms of their time frame, the location, the environmental resource, or quality change, and the affected population), and using them to evaluate a different context that is relevant for a specific policy. The new policy context can require changes in both the features of the resource and the characteristics of the people who care about it.

Most benefit transfer methods use either the *benefit value* or the *benefit function* approaches. In the case of a benefit value approach, a single point estimate (usually a mean willingness to pay (WTP) estimate) or value range is typically used to summarize the results of one or more studies that have been developed for another purpose. For example, an average consumer surplus per fishing trip might be taken from a recreational travel cost study, or a mean WTP estimate for an incremental change in water quality may be estimated from a CV study. These values are then used to evaluate the benefits from proposed policies that change water quality at different locations. In these applications, the transfers are intended to assess the economic value of fishing trips or changes in water quality in new areas. In the case of a benefit function transfer, a model has been estimated to describe how benefit measures (from one or more existing studies) change with the characteristics of the study population or the resource being evaluated.[2] Often this function is derived