MEASURING VALUES OF EXTRAMARKET GOODS:

ARE INDIRECT MEASURES BIASED?

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by

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The well known travel cost method (TC) has been widely applied to outdoor recreation. A second approach has been referred to in the past as the Davis method, the questionnaire approach, and contingent valuation. It will here be termed hypothetical valuation (HV), since it involves creating a hypothetical situation designed to elicit willingness to pay for or willingness to accept compensation for a recreational or other extramarket good (or bad). TC and HV are termed "indirect methods", since they do not depend on the direct information about prices and quantities that economists would prefer to use where available to value goods and services.

A number of potential sources of bias in HV and TC have been discussed in the literature and we shall summarize these in the first section of the paper. When summed together, these potential problems are sufficient to justify considerable skepticism about the accuracy of resulting value estimates. Still, the question remains: How large an impact do these supposed sources of bias have in actual practice? In the second section of the paper we report the results of an experiment where TC and HV values were compared to values based on actual cash transactions. Though preliminary, the results of this experiment indicate that substantial biases exist in both TC and HV estimates.

considered as a very crude adjustment since it is based on urban transportation studies and offers little guidance as to the exact figure to be used. As we shall see below, whether a factor of one-fourth or one-half is used can make a substantial difference in the value estimates.

TC requires that recreationists treat travel expenditures as equivalant to admission costs, yet this is a questionable assumption which no one has examined emperically. Travel costs represent an aggregation of many smaller costs, some of which (e.g., tire wear) may not be obvious to the recreationist and which are not actually imposed on the recreationists at the time when the recreation is demanded. Admission fees are paid immediately, usually in cash. Particularly in a world of satisficing, travel costs may not be perceived as equivalent to admission fees.

Still other potential problems with TC techniques need to be noted. One stems from the fact that increases in density which recreationists label as crowding may affect quality. A travel cost demand curve implicitly assumes that recreational quality remains constant over the range from zero use to full use at the going admission fee. Thus, it may completely neglect changes in quality as quantity declines along the demand curve. Also, no satisfactory method has yet been devised to handle multiple-purpose trips (e.g., recreation plus work) or multiple-site trips (e.g., vacations involving several stops).

Because of these potential biases and because TC techniques are not applicable to recreational activities involving limited travel (e.g., backyard birdwatching) and many nonrecreational extramarket goods (e.g., air quality; public health programs), HV has evolved as a major alternative method of valuing extramarket commodities. Unfortunately, HV also has

Numerous other potential problems exist. Like TC, HV measures relate only to the status quo of the good whereas quality may change along the demand curve as the impact of density on recreational quality is felt. All the problems associated with surveys and interviews also may arise including the necessity of obtaining an adequate response rate, interviewer bias, and variations in responses depending on the construction of individual questions and the over-all survey instrument.

Furthermore, while economists have been more of less congnizant of the potential pitfalls of HV discussed so far, they have not given much attention to a whole literature in social psychology which is also rather discouraging about HV's prospects for success. In a classic study from that field completed in the early 1930's, La Piere wrote to 251 restaurants, cafes, hotels, autocamps, and tourist homes asking the hypothetical question: "Will you accept members of the Chinese race as guests in your establishment?" Of the 128 that replied, 91 percent said no, 9 percent said they were uncertain or that it depended on the circumstances, and only one said yes. However, prior to mailing the letter, all 251 of the establishments had been visited by a Chinese guest and at only one was service refused. La Piere's study was followed by a host of others examining the relationships between attitudes and behavior. In a review published in 1976 of 150 such studies, Schuman and Johnson (p.168) concluded that the correlations between attitudes and actual behavior are usually so low that they will not "... support the <u>substitution</u> of measured attitude for behavior..." In other words, it may not be safe to assume, as economists applying HV techniques do, that what people say is what they would actually do.

Results of the Experiment

Space constraints will not permit a thorough description of the experiment and how the results were arrived at. Only a summary will be presented here and the reader interested in a more thorough treatment is referred to an additional paper by Bishop and Heberlein.

The extramarket commodity that served as the subject of our study was 1978 early season goose hunting permits for the Horicon Zone of East Central Wisconsin. A total of nearly 14,000 such permits were issued and each entitled a hunter to take at most one goose from a well-defined area during the period October 1 through October 15, 1978. The hunters who were issued these permits fell into two groups. One group had applied for the early season as their first choice and automatically received a permit. The other hunters were allocated to the early season as their second choice, having lost in a lottery for middle season permits or applied for a middle season permit after the deadline.

Three entirely separate samples of goose hunters were drawn at random. The first consisted of 237 hunters who received actual cash offers for their permits. The offers were conveyed by mail along with checks ranging between $1 and $200 with instructions that each hunter should return either the check or his or her early season permit. A second sample (containing 353 hunters) received mail questionnaires specifically designed to develop HV measures of the value of their permits. A third (300 hunters) received questionnaires designed to estimate a travel cost demand curve for early season hunting.

The experiment itself was completed with response rates to all three surveys (recipients of the actual cash offers were surveyed after the

Table 1: Summary of Results

	Total Consumer Surplus	Surplus per Permit
Actual Cash Offers	880,000	$ 63
Hypothetical Offers		
Willingness to Sell	1,411,000	$101
Willingness to Pay	293,000	$ 21
Travel Cost Estimates		
Model 1 (Time value = 0)	159,000	$ 11
Model 2 (Time value = 1/4 median income rate)	387,000	$ 28
Model 3 (Time value = 1/2 median income rate)	636,000	$ 45

true value of willingness to pay.

While a full set of conclusions from our study must come after additional analysis, some tentative conclusions are evolving which will have important implications for future recreation economic studies. First, there has been a tendency to view HV willingness to pay as more or less accurate and HV willingness to sell as badly distorted. Our results suggest that both measures are biased, but in opposite directions. It appears that HV willingness to pay should be considered a lower bound and HV willingness to sell, an upper bound. Secondly, our results support those who have voiced concerns about adequately accounting for time costs in TC studies. Differences in tastes and the availability of substitutes may also be a significantsource of bias here.

Finally, and on a more general level, we would suggest that recreation economics has a long way to go before it can claim accuracy comparable to analyses of market phenomena. Much more research is needed to further develop and refine both TC and HV measures. To the extent possible, this should involve experiments like the one reported here. Furthermore, we hope that our results will encourage the discovery of new, improved approaches to valuing extramarket goods of all kinds. Such research is essential if economists are to help society recognize the contribution of extramarket goods to the overall level of economic wellbeing and facilitate sound assessments of the trade-offs between market and extramarket goods and services.

Addendum to References

Scherr, B.A., and E.M. Babb. "Pricing Public Goods: An Experiment with Two Proposed Pricing Systems." Public Choice. 23(1975): 35-53.