AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

The Importance of Functional Form in the Estimation of Welfare: Discussion

John E. Keith

Kling's results appear to indicate that the choice of functional forms for simple demand relationships relative to the underlying "true" functional form and the error characteristics will result in widely differing estimates of welfare in the form of consumer surplus. An examination of her results indicates that, if each underlying form and error distribution is equally probable, the semilog form performs slightly better than the linear form relative to minimizing total probable mean error. This conclusion is consistent with conventional wisdom with regard to goodness of fit. If, on the other hand, the linear or semilog forms are more likely to be appropriate, then choosing the linear form is somewhat better than the semilog form as an error-minimizing strategy. This result is somewhat counter to the current literature.

The real question is the issue of the correct underlying form of the demand function, and this problem cannot be solved without some reference to demand theory and/or the sample characteristics. While the functional forms which Kling uses may be derived from underlying utility functions for the simple regressions (two variables) in her study, they generally are not consistent with more complex cases. Thus, since functional form appears to be a significant factor in welfare estimate variation, and the welfare measure is dependent upon a utility maximization paradigm, it seems imperative to choose functional forms derived from utility theory.

Further, for nonmarket recreation data, demand studies frequently (if not overwhelmingly) have truncated data sets, in that the data are limited to positive observations on the dependent variable. The use of any of the three forms discussed in the paper in an ordinary least squares analysis will result in biased estimators and, therefore, biased welfare measures. In fact, in the Kealy and Bishop article cited by Kling, the welfare measures were biased to the greater degree (300%) than the "errors" generated in this paper (a maximum of 200%).

Kling's study indicates that the generation of welfare measures for use in public policy may involve relatively large variations, depending upon the empirical form of the estimate. For studies which compare or compile various welfare measures for recreation activities, such as Sorg and Loomis, a discussion of the functional forms employed should be included, if not tested for variation, particularly if those values are to be used in public decision making. In the quest for numbers, one hopes that both the economists and the decision makers can recognize the problems and limitations which may occur in nonmarket valuation studies. Research such as Kling's is important in pointing out that critical reviews of the nonmarket values generated for public policy should be forthcoming from both researchers and policy makers.

[*Received August 1988; final revision received September 1988.*]

References

Kealy, M. J., and R. C. Bishop. "Theoretical and Empirical Specifications Issues in Travel Cost Demand Studies." *Amer. J. Agr. Econ.* 68(1986):660–67.

Sorg, C. F., and J. B. Loomis. *Empirical Estimates of Amenity Forest-Values: A Comparative Review.* USDA Forest Service General Technical Report RM-107. Rocky Mountain Forest and Range Experiment Station, Fort Collins CO.

The author is an associate professor of economics, Utah State University.

Copyright 1989 Western Agricultural Economics Association