

Are Recreation Values Systematically Underestimated? Reducing Publication Selection Bias for Benefit Transfer

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Abstract

This study reveals how the transformation of price coefficients to environmental values often distorts the observed distributions and can lead to large underestimates of value. The selection of statistically significant negative price coefficients tends to impart an upward bias (in magnitude) to reported price coefficients. However, consumer surplus depends on the inverse of the estimated price coefficient. Thus, any systematic overestimate of price coefficients translates into a downward bias for estimates of environmental values. Monte Carlo simulations, grounded upon the observed characteristics of freshwater fishing values, confirm this downward publication bias and finds that it can be quite large.

Meta-regression analysis (MRA) can help to fill the gap between theory and practice famously identified by Leamer (1983) and others. However, special care needs to be exercised when attempting to model and correct for publication selection in environmental valuation. Unfortunately, conventional meta-analytic methods only make the downward bias of the average environmental value much worse. The most important implication of our simulations is that conventional meta-analytic methods (fixed- and random-effects weighted averages, funnel graphs, trim-and-fill, and meta-regression models of publication bias that use the standard error) should not be employed for environmental values if values are calculated from estimated demand relations or other 'price' variables. In many cases, the downward bias of these conventional meta-analytic methods is very large.

To reduce the likely publication selection bias in consumer surplus estimates, we offer and validate alternative meta-analytic methods—'n-estimators.' In particular, Root-n meta-regression analysis (Root-n MRA) uses the square root of the sample size (n) as a proxy for the precision of the reported value. Unlike the standard error, the sample size cannot be affected by the transformation from price coefficient to consumer surplus and will not, as a result, be endogenously related to the estimated consumer surplus value. In the same spirit, we recommend an alternative weighted average ('weighted by n ' or W_n) that uses the sample size as the weight. Simulations show clearly that in most cases these 'n-estimators' reduce publication bias and dominate the alternative estimators by the mean square error criterion. Nonetheless, these simulations also reveal that all estimators, including our n-estimators, can have large downward bias and grossly underestimate environmental values. The major limitation of the n-estimators is that the square root of the sample size is often a poor proxy for the incidence of publication selection. Nonetheless, simulations show that even this poor proxy greatly reduces publication selection bias.

In the absence of some reliable method to validate the overall estimate of environmental value, what might environmental economists do? First, they should be aware of the possibility that all estimators might contain large *downward* biases due to publication selection. Secondly, the field should demand that all estimates, whether significant or not, be publically reported. [-Full Paper](#)