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Methodological Ethics in the Evaluation of Non-Market Goods Allocations

by

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TITLE: Methodological Ethics in the Evaluation of Non-Market Goods Allocations

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ABSTRACT

The ethical basis for economic evaluations of alternative non-market goods allocations is examined in terms of the treatment of property rights and intergenerational effects. The author argues that the theoretical and empirical conventions commonly adopted by resource economists are ethically biased and these ethical issues are worthy of more extensive debate.

METHODOLOGICAL ETHICS IN THE EVALUATION OF NON-MARKET GOODS ALLOCATIONS

J. Walter Milon*

The ethical foundations for economic evaluations of non-market good allocations have received only minor recognition in the theoretical and empirical work of economists in the 'upsetting discipline.' This essay examines the ethical basis for economic measures of welfare in which property rights and intergenerational effects are included. The author argues that the ethical precepts adopted by the analyst can determine the methodological conventions used to measure welfare changes and bias the prescriptive content of policy for allocating of non-market goods.

Background

Economic science is founded on the principle of logical objectivity in the study of human behavior and the allocation of scarce goods between competing ends. During the 1930s modern welfare economics sought the objectivity of scientific methodology by casting aside the practice of interpersonal comparability that characterized classical welfare economics. In its place Hicks, Kaldor, and Scitovsky carefully constructed a set of postulates based on the Pareto-Wicksell principle that an ethically neutral[1] welfare improvement could occur if at least one person was made better off without anyone being worse off . It is

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[1]The concept of ethical neutrality is based on a logical development of practical evaluation from maxioms or postulates. The purpose is to explore the implications of alternative axioms so that an objective evaluation that is free from value judgments can result. For further elaboration on this concept, see Weber.

generally accepted within the economics profession that these postulates can be employed to make objective evaluations of alternative resource allocations so long as the analyst refrains from prescribing a specific allocation.(Hennipman). In this spirit economists have developed analytical techniques and conventions for evaluating public policy on the allocation of non-market goods such as water projects, recreation facilities, and natural environments.[2]

Modern welfare economist is founded on three postulates: (1) Each individual has a preference ordering of alternative resource allocations based on his own subjective valuations; (2) The society's welfare depends only on the preference orderings of individuals; and (3) Social welfare can be improved if the aggregate value of the individual gains from an allocative change exceed the aggregate value of the individual losses. The first two postulates emanate from the Bentham-Mill development of Classical Utilitarianism while the third is the Hicks-Kaldor-Scitovsky "potential Pareto improvement", that is, the gainers from an allocative change <u>could</u> compensate the losers leaving everyone at least as well off as before the change.[3] The potential improvement is clearly a weaker version of the Pareto-Wicksell principle of an ethically neutral welfare improvement since a unanimous agreement that no one would be worse off is not required.

The actual implementation of these postulates in applied welfare analysis requires what Mishan has described as an ethical consensus (1976, pp. 384-389). This amounts to a general agreement that society accepts economists' welfare postulates and the scope of the economic activities that can be included in the analysis. For evaluations of

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[2]See Krutilla (1981) for a concise review of the use of welfare economics in evaluating non-market good allocations.

[3]Quirk and Saposnik (pp. 120-123) provide a discussion of the Hicks-Kaldor-Scitovsky condition.

allocative changes involving market goods, Harberger has argued that an ethically acceptable welfare analysis can be constructed on the principles that competitive market prices measure the value of goods to consumers and producers and the distribution of gains and losses from the change is irrelevant in evaluating the final outcome.

In the case of non-market goods, there has been relatively little discussion of the appropriate ethical basis. The most common practice is to adopt the first two postulates of welfare economics described above using appropriate techniques to determine the subjective valuations of individuals for the non-market goods. The assumption of ethical neutrality is made on the basis of the proposition advanced by Coase, Demsetz, and Mohring and Boyd that the nature and distribution of property rights is irrelevant in evaluating allocative changes. The third postulate is amended so that the aggregate gains and losses in future periods can be discounted to their present value. This approach is consistent with the definition of intergenerational equity developed by Arrow, Koopmans, and others.

In light of the scarcity of debate on the ethical basis of welfare evaluations of alternative non-market good allocations, this paper presents a critical appraisal of current theory and research in this area. As Samuelson pointed out many years ago, the postulates of welfare economics ". . . .represent the deductive implications of assumptions which are not themselves meaningful refutable hypotheses about reality" (pp. 220-221). The application of these welfare postulates does not permit the economist to adopt a set of working conventions that can be validated by appeal to the rigor of positive analysis. Rather the analysis must rest on an agreement that

economists' welfare measures are consistent with the ethical principles of the society they serve.

Measuring Welfare Changes Involving Property Rights

The concept of ethical neutrality developed from Coase's seminal analysis is based on the well-known symmetry property of general equilibrium. In the Coase model the resource allocation between two parties is invariant with respect to property rights. Regardless of the initial rights distribution, the amount that an individual would be willing to pay (WTP) for a non-market good is equal to the amount that individual would be willing to accept (WTA) to give up the good. In a costless bargaining agreement the highest valued use will prevail irrespective of the property rights. If we invoke a more formal terminology, the WTP and WTA correspond to the Hicksian measures of consumer welfare: the compensating variation (CV) and the equivalent variation (EV).[4] In a multi-party bargaining setting, the CV and EV are equal also if we assume that income effects are symmetric in the aggregate or income effects do not exist (gross substitutes) (Quirk and Saposnik, pp. 159-160).

The ethical neutrality concept thus provides a rationale for neglecting property rights and using either CV or EV for measuring welfare changes. Randall and Stoll (R-S), however, present an analysis which can be used to demonstrate that if income effects do exist (i.e. a non-zero price flexibility of income), property rights may be important. Their article suggests that when an individual has a perceived right to a non-market good either a CV or an EV using the

[4]See Randall (1981: p. 293-299) for more discussion of these measures.

WTA is correct depending on whether the individual perceives the change as a loss from some initial welfare level (WTA^C) or a gain to some subsequent level of welfare (WTA^E). When the individual has no perceived rights to the good, a CV using the WTP is correct if the change is a gain from an initial level of welfare (WTP^C) or a loss from some subsequent welfare level (WTP^E). In brief, property rights imply that WTP is not always a CV nor is WTA always an EV.

The R-S model provides two important general rules for the effects of property rights on non-market good welfare measures:

(1) $WTP^E = WTP^C \leq WTA^C = WTA^E$

(2) $WTA - WTP \simeq \zeta M^2/Y$

where ζ is the price flexibility of income, Y is income and M is the area under the good's demand curve (consumer surplus). In cases where $\zeta M^2/Y$ is relatively small ($\leq .05$), the issue of property rights assignments is moot and either WTA, WTP, or M would be a correct measure of welfare changes. When this bound is exceeded, the perceived property rights must be considered in determining the theoretically correct measure of welfare. Thus, for a range of situations in which the restriction holds, the symmetry assumption underlying the concept of ethical neutrality is plausible.

This result gives theoretical support to the assertion that an analyst can ignore the issue of property right assignments and remain ethically neutral. This assertion, however, rests on a specific and unduly restrictive assumption about the nature of individual value functions. Conventional utility theory assumes that value functions

are concave and symmetric for gains and losses.[5] An alternative theoretical construct that is supported by empirical evidence can be used to show that the value function is concave for gains but convex for losses and generally steeper for losses than for gains (Kahneman and Tversky).

The distinction can be clearly seen in Figure 1. Following the framework developed by Brookshire, Randall, and Stoll (B-R-S), the value function VV is concave for gains and losses from an initial position (Q_0). If the individual has no rights to the good the value of a gain to Q_+ is given by the vertical distance between the value function and the new level of consumption and is the individuals WTP, in this case a CV. On the other hand, if the individual has a right to good Q_0 the value of a loss to Q_- is given by WTA, also a CV. Assuming the symmetry condition holds, WTP $\simeq$ WTA and $WTP^C = WTP^E$, $WTA^C = WTA^E$ from (1) and (2). If the value function is concave for gains but convex for losses (VV′ in Fig. 1), the value of the loss is given by WTA′ and WTA′ >WTA. Clearly the symmetry condition would not hold.

The theoretical argument for rejecting the concept of ethical neutrality based on the symmetry condition is supported by empirical evidence. In a survey of non-market good valuation studies, Currie and Kidd report that the ratio of WTA bids to WTP bids ranged from a low of 3:1 to a high of 12:1. Similarly, Gordon and Knetsch's summary of several studies shows ratio of from 2.8:1 to as much as 20:1.

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[5] These properties stem from the assumptions of consistency and transitivity over alternative consumption bundles.

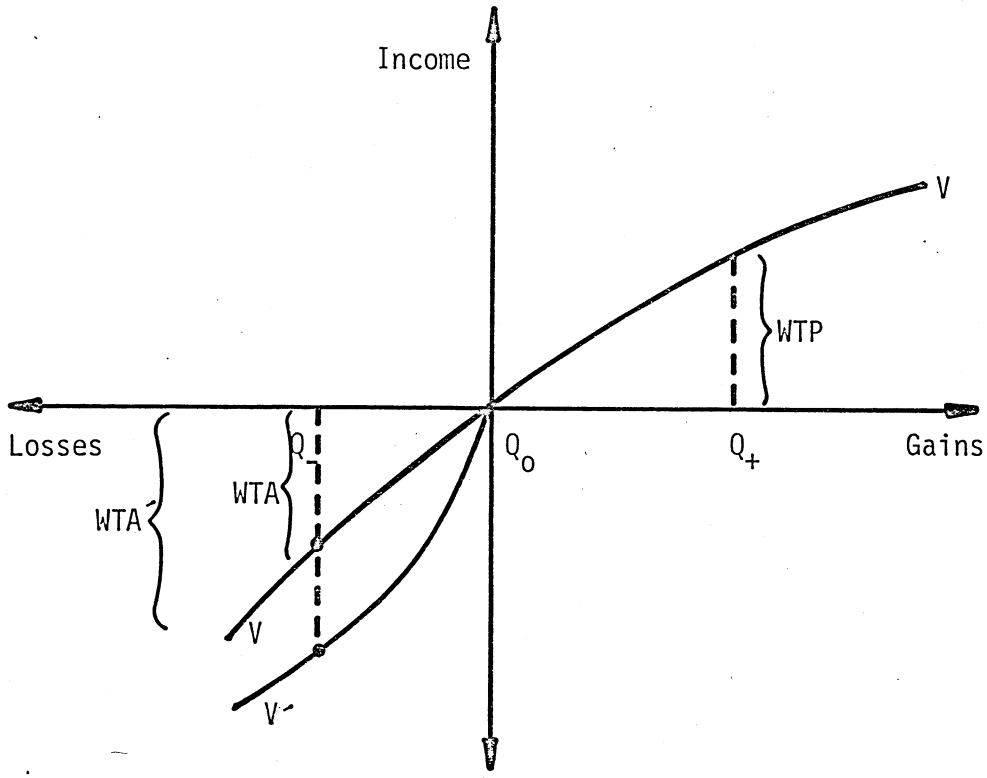

Figure 1: Hypothetical Value Functions and Welfare Measures for Gains and Losses in the Quantity of a Non-Market Good.

The customary explanation for these differences is either survey bias, respondent gamesmanship or income effects.[6] It would seem that attributing differences of these magnitudes to inept researchers or crafty respondents is merely blind criticism. In addition, considering the relatively small amount of the WTA or WTP values in relation to the income of the respondents, the magnitude of these differences ". . . would seem to place great strain on the income effect as the chief explanation" (Gordon and Knetsch, p. 6).

Thus, the notion that an analyst can remain ethically neutral in a welfare evaluation of changes in the quantity of non-market goods by neglecting property rights is unjustified. The conventional resort to CV measures[7] using WTP on the basis of symmetry between CV and EV is not

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[6]Bockstael and McConnell raise some additional issues concerning the functional form of the estimating equation.

[7]Currie and Kidd's survey of 18 bidding game studies shows that 10 used only WTP.

supported theoretically or empirically and, the notion that WTA is distorted and unreliable carelessly overlooks the choice process underlying individual's perceptions of gains and losses.[8] On the basis of the preceding discussion, it should be clear that an analyst's selection of a rights structure for evaluating welfare changes ". . .is an ethically significant act." (Tversky and Kahneman, p. 458). As an alternative the interests of society would be better served by redefining ethical neutrality to mean that both CV and EV measures are used in applied welfare analyses.[9] The price of this redefinition may be ambiguous results about the welfare effects of allocation changes.

Intergenerational Ethics

The third welfare postulate, frequently called the "potential Pareto improvement" condition, permits the aggregation of individual's valuations of changes in the allocation of non-market goods. The avowed purpose of this theoretical development by Hicks, Kaldor, and Scitovsky was to remove the stigma of cardinality and interpersonal comparability that was an ethically unacceptable convention of classical economics. The aggregation and hypothetical compensation principle were extended to consider intergenerational allocation changes through the application of a discount rate. This reflected the view that near term value was more dear

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[8] A surprising example of this is found B-R-S's statement that bidding game ". . .formats which directly observe WTP are most effective" and ". . . it remains possible to estimate WTA^C by collecting data in the form of WTP (preferably, WTP^C) and using the theoretical relationships developed by R-S to derive WTA^C." (p. 488). This conclusion is remarkable in light of the authors' results showing observed WTA to be from 4 to 10 times greater than derived WTA even with 54% of the respondents eliminated because they refused to accept any finite amount of compensation.

[9] A suggestion that only direct measures such as the travel cost method be used overlooks the numerous theoretical shortcomings of these approaches and the fact that they are wholly inapplicable in many instances.

than future value as evidenced by the positive market rate of interest.

The logic of this approach can be seen by considering the stream of net valuations resulting from an allocative change in a non-market good:

(3) $v(t_0), v(t_1), v(t_2), \ldots, v(t_\infty)$

Employing the conditions of independence, separable additivity, and stationarity as developed by Koopmans, we can express the intergenerational aggregation criteria as:

(4) $V = \sum_{t=0}^{\infty} v(t)/(1 + r)^t$

In essence this is a straightforward application of the consumer's sovereignty principle with the proviso that the current generation chooses the discount rate r and the initial time t_0. It is relatively simple to demonstrate that all generations cannot be treated equally and, in the terminology of Arrow's axioms of social choice, the current generation must be a dictator. Future generations will inherit the allocation plan determined by the current generation.

The justification for this asymmetry in non-market good allocations across generations is the compensation principle in the third welfare postulate. So long as the gainers (assume for the moment the current generation) could compensate the losers leaving everyone at least as well off, an allocation decision is justified under the third postulate. Of course, the compensation need not actually be paid. Thus, the compensation principle would require a hypothetical transfer from the gainers to the losers in the current generation <u>and</u> a hypothetical transfer between generations. This dual criterion Mishan (1979) has tagged as a "<u>potential</u> potential Pareto improvement" since it represents an ambitious extension

of the Hicks-Kaldor criterion. The customary justification is that the hypothetical transfers could be realized in fact by government reinvestment of the gains to current generations for the benefit of future generations. The illogic of this rationale is readily demonstrated by considering a project in which future generations are the gainers while current generations are the losers (an unlikely event for long-lived investments given the "iron law" of the discount rate). The deceased members of the current generation would find little comfort in the future generation's reinvestment program with it's promise of hypothetical compensation.

The ethical basis for the dictatorship and dual compensation criteria becomes even more questionable when the nature of non-market goods is considered explicitly. Quite often these may involve unique environments or wildlife speciesin which the irreversible aspect makes monetary compensation seem ludicrous.[10] For other non-market goods which are malleable over time, the valuations which enter the analysis will always reflect the preferences and rights of the current generation so that the 'just compensation' may bear little resemblance to future damage.

If one forsakes the ethical constraints of the discounting and compensation criterion, the question then becomes what ethical basis is appropriate for intergenerational non-market allocations. The answer can only be that the economist has a duty to present alternative frameworks that may be ethically appealing to society. For example, Solow's analysis of Rawl's maximin criterion discards the discounting convention to demonstrate an ethical basis could exist for uniform consumption levels

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[10] Bockstael and McConnell point out the theoretical and empirical shortcomings of attempting to calculate the welfare loss when a good is removed from the consumer's consumption bundle.

across generations in which replacement would be required for each generation. Similarly, we could invoke an equal treatment principle for successive generations that would do away with the compensation requirement. The important point to be emphasized here is that there is no justification for imposing a particular ethical constraint in evaluting alternative non-market allocations when an alternative ethical basis could produce a different outcome.[11] It is not the economist's role to dictate society's ethics.

Conclusions

The purpose of this essay is to focus attention on the ethical basis for evaluating alternative non-market good allocations. The ethical constraints adopted by an analyst can determine the methodological conventions used to measure welfare changes and bias the prescriptive content of non-market good allocation policy. It is professionally naive to fall back on the reasoning that economic measures of welfare are only one input to the public decision-making process. All too often the economist selects an objective function that is consistent with the precepts of economic theory and then sends the results of the analysis into the public debate where the limitations and constraints are poorly understood and the results take on a life of their own.

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[11] A case-in-point is a recent exchange between Smith and Krutilla and Bishop over the appropriate framework for evaluating endangered species and uncertainty. Smith and Krutilla's model is "...derived from a specific statement of society's objective function, namely to maximize the discounted net benefits associated with the expenditures involved in a given project..." (p. 372-3). Bishop adopts Ciriacy-Wantrup's safe minimum standard of conservation principle in a minimax game setting. Clearly each has adopted a different ethical basis for their model and it is fruitless rhetoric to argue that one approach is superior to another without appeal to society's ethical principles.

There is a growing need for debate among resource economists about the ethical basis of welfare evaluations for non-market good allocations. Alternative ethical frameworks can provide different information about the role of property rights and intergenerational equity in framing allocation policy. Most important of all, the profession should address itself to the issue of whether the axioms of welfare analysis bear any resemblance to the ethical standards of society or if they reflect the ethical convictions of a particular special interest group.

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