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A. Myrick Freeman III**

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THE BENEFITS OF ENVIRONMENTAL IMPROVEMENT: THEORY AND PRACTICE

By A. MYRICK FREEMAN III
Baltimore: Johns Hopkins University Press. 1979.
Pp. 272. \$6.95.

Environmental improvement usually costs the taxpayer money. Spending taxpayers' money has acquired, in recent years, a new unpopularity in Western economies, and supporters of public sector environmental improvement programs now face a more difficult task. In two powerful ways they can strengthen their arguments. First, they can point to the relatively small true opportunity cost of many environmental programs, and second, attempt to describe fully and measure all of the social benefits of environmental improvement. It is in this area that Myrick Freeman has made his contribution; his book describes and assesses the techniques for placing a monetary value on environmental benefits, and surveys the empirical findings.

The author's approach is firmly within the dominant neoclassical economics paradigm. In this framework, the worth of environmental improvement, as of changes in the quantity or price of any good, is determined by individuals' valuations alone. It is measured by how much people are prepared to pay, given existing incomes and prices, for the privilege of enjoying the improvement. For most goods, the total of individuals' valuations can be approximated reasonably by the area under the market demand curve. Freeman discusses the assumptions necessary for this to be valid, and argues that the likely errors where the assumptions do not hold are small enough for the approximation to be useful for public policy. A problem arises, however, with environmental benefits. They have the nature of what economic theory classifies as a "public good;" therefore, neither market prices nor market demand curves exist. Consequently, a modified technique is necessary to measure the value of environmental benefits.

The modification is to construct the demand curve for environmental goods by indirect methods. Freeman concentrates on two such techniques. For one, the direct survey method, he is pessimistic. The route between the Scylla of strategic, biased, responses and the Charybdis of disinterested, inaccurate responses, has yet to be charted. The other, more promising, technique is to identify the implicit demand for environmental goods from those cases where public good consumption is embedded in private good consumption. For instance, the demand for clean air is embedded in the demand

for houses in clean areas. The "hedonic price technique" then can be used to measure the implicit price for clean air and, under certain not over-restrictive assumptions, the demand curve can be identified.

In the second half of his book, Freeman reviews specific applications of the techniques in four distinct areas. First, and most comprehensively, he examines the use of property values to measure the benefits, mainly, of air pollution reduction. In this area the hedonic price technique has proved particularly powerful. Next, he reviews attempts to value the diminished mortality and morbidity rates implied by pollution reduction. Again, he favors a hedonic price method to infer a measure of individuals' valuations of reductions in the probability of death, noting, however, that the results so obtained differ by orders of magnitude from those derived from survey experiments. Unfortunately, he does not refer to the recent work of Broome¹ who argues most convincingly that the value of a reduced number of *ex post* deaths cannot be proxied by the value of smaller *ex ante* probabilities of death. Third, he considers the measurement of recreational benefits and espouses the familiar Clawson-Knetsch² method, but emphasizes its sensitivity to different approaches to valuing time. Fourth, he briefly describes problems in measuring the productivity benefits of environmental improvement, and concludes with a strong plea for more empirical attempts at benefit measurement; current environmental programs constitute a socio-economic experiment which deserves thorough monitoring.

Academic convention compels the reviewer to state his or her position on the subject. Mine is to question the usefulness of the neoclassical paradigm in the area. Its critical assumptions are that individuals alone can judge their welfare, and that the initial income distribution is acceptable. Since so much environmental damage goes unperceived, and since distributional effects are so pervasive, it seems that the dominant arguments must be more than narrowly economic. In his text Freeman, himself, freely acknowledges the limitations of the paradigm. Within its bounds, however, he has provided a clear and valuable guide to valuating environmental improvement; for this, even the doubters should be grateful.

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1. Broome, *Trying to Value a Life*, 9 J. of PUB. ECON. 91 (1978).

2. See M. CLAWSON & J. KNETSCH, *ECONOMICS OF OUTDOOR RECREATION* (1966).