BOOK REVIEW

COST-BENEFIT ANALYSIS AND ENVIRONMENTAL REGULATIONS: POLITICS, ETHICS, AND METHODS. Edited by Daniel Swartzman, Richard A. Liroff and Kevin G. Croke. Washington, D.C.: The Conservation Foundation, 1982. Pp. xv, 196. $11.50.

COST-BENEFIT ANALYSIS AND ENVIRONMENTAL REGULATIONS: POLITICS, ETHICS, AND METHODS consists of papers prepared for a conference entitled "Cost-Benefit Analysis in Environmental Regulation: Will it Clear the Air or Muddy the Water?" The conference, cosponsored by The Conservation Foundation and the Illinois Institute of Natural Resources, was convened in the hope of finding "a middle ground between those having great faith in cost-benefit analysis and those who regard it as a threat to environmental programs" (p. xiii). These papers identify the strengths and weaknesses of the technique of cost-benefit analysis and suggest possible improvements. The contributors discuss the areas of controversy surrounding this approach to decision making and suggest several design safeguards. The selected bibliography at the end of the book is a valuable starting point for further examination of the topic.

The book's primary shortcoming stems from its failure to emphasize the benefits and disadvantages of cost-benefit analysis in light of the economic concerns prompting its use. Funding for environmental protection is diminishing at the federal level,[1] placing a greater burden on the states.[2] Moreover, the lingering effects of the recent economic recession,[3] along with large federal budget deficits,[4] encourage the call for a laissez-faire attitude toward pollu-

1. President Reagan's budget proposal for fiscal 1984 called for spending by the Environmental Protection Agency to decrease by $17 million. 13 ENV'T REP. (BNA) 1747 (Feb. 4, 1983). The proposal included cuts in the air, water quality, drinking water, hazardous waste, toxic substances, pesticide and energy programs. *Id.*

2. The Environmental Protection Agency is increasingly delegating its enforcement authority to the states, according to Robert M. Perry, the agency's Administrator and General Counsel. 13 ENV'T REP. (BNA) 1492 (Dec. 31, 1982). This will impose a "resource burden" on the states, he said. *Id.*

3. As of September 1983, unemployment in the United States remained above 9%, although the inflation rate was a modest 2.9%, industrial production had increased 11.9%, gross national product had increased 4.5% and retail sales had increased 7.3% since September 1982. *Economic and Financial Indicators*, ECONOMIST, Oct. 29, 1983, at 105.

4. The federal budget deficit was a record $195.35 billion for fiscal 1983. Wall St. J., Oct. 27, 1983, at 4, col. 1. The previous record, set in fiscal 1982, was $110.66 billion. *Id.*

tion.[5] This concern with the effects of environmental regulation of the economy in turn forces those proposing environmental regulations to provide maximum protection for the lowest cost.[6] Frank Beal, director of the Illinois Institute of Natural Resources, states in his introductory essay that "[t]here is an inherent difficulty in pursuing pollution control goals. Stated succinctly, while it is essential to protect human health and environmental quality, it is equally essential that the means chosen be efficient, affordable, and realistic" (p. xiii). The Illinois program is presented as a model of cost effectiveness, but there are not enough data on the program to conclude that the program is indeed efficient. Moreover, there are so many potential variables in each cost-benefit program that policy makers are not justified in relying on the Illinois experience as the answer without extensive analysis of their own situations.

Each of the contributors to the book recognizes that the scope and use of cost-benefit analysis varies. Richard Liroff, a political scientist and senior associate at The Conservation Foundation, discusses these different concepts in his introductory essay. Liroff indicates that cost-benefit analysis may be viewed as "a highly quantified technique of defining all costs and benefits in dollars, a systematic cataloguing of all the positive and negative consequences of an action or simply a systematic recognition of unquantifiable values and significant qualitative impacts" (p. 2). Similarly, the results of a cost-benefit analysis may conclusively determine whether a regulation will be enacted or may, along with equitable and administrative concerns, be only a factor in the decision-making process. Finally, decision makers may analyze individual regulatory proposals using this technique or use it only as an agency-wide priority indicator.

Part II focuses on state and federal experience with cost-benefit analysis. The contributors explain that the design of programs that measure the costs and benefits of regulatory proposals is the result of a series of compromises. The time and money allocated to preparation of cost-benefit analyses will in many cases determine the data's accuracy and reliability as well as the weight which decision makers will accord such analyses. The designer must take account of the analyst's biases in the selection of data and the impact of that

5. For example, David Stockman, director of the Office of Management and Budget, recently argued that the $21 billion proposed acid rain control program would save fish at a cost of $6,000 per pound. Wall St. J., Oct. 12, 1983, at 28, col. 1.

6. *See generally* N.Y. Times, Mar. 6, 1983, § 1, at 1, col. 1.

bias on the credibility of the analysis. He or she must also determine the degree to which the analysis will rely on industry-supplied data and whether the analysis will quantify costs and benefits in strict monetary terms or as part of an approach which recognizes that some costs and benefits cannot be translated into these terms.

The designers of a cost-benefit analysis program set its institutional and procedural structures with these compromises in mind. The essays stress that these structures in turn determine the scope and role of cost-benefit analysis in decision making. For instance, decision makers might wish to accord greater weight to an analysis that stresses the nonquantifiable effects of proposed agency action—whether it be clean air or unascertainable compliance costs—than to a strictly quantified analysis which may be limited by assumptions concerning how much a cost or benefit is worth. Beyond strict quantification, decision makers may wish to consider social policy in balancing assumptions about unquantifiable values. The designers of these programs, therefore, must keep these goals in mind.

Kevin Croke, an associate professor at the University of Illinois School of Public Health, and Neils B. Herlevson, manager of the Economic Analysis Program at the Illinois Institute of Natural Resources, describe the Illinois cost-benefit analysis program, which is administered by two state agencies. The Illinois Institute of Natural Resources, a separate state agency, conducts analyses of environmental proposals for use by the Illinois Pollution Control Board, a regulatory body which promulgates environmental standards and regulations. The authors provide insight into "the structuring, objectives, and use of cost-benefit analysis on a state level" (p. 32). Implicit in the authors' discussion of who reviews the proposals, what alternatives are considered and at what point the analysis is made, is the fact that cost-benefit analysis is only as effective as the amount of money and human resources a state can spend on the process of analysis itself. The compromises made at the design stage are apparently the product of weighing the costs and benefits of such a program.

Both the Croke and Herlevsen article and the article by Daniel Swartzman suggest that in spite of the institutional flaws inherent in a bifurcated system, the consolidation of the preparation and review functions in one agency may increase the potential for bias because of industry-supplied data. Swartzman observes that a bifurcated system creates a time lag between the time a proposal originates with the decision-making body, the time research is fin-

ished and the time between administrative changes and the final research report. However, Croke and Herlevsen do not consider this timing problem in their discussion of the Illinois program, nor do they take account of the additional costs that may arise from a bifurcated program. The repeated exchange between agencies may not be as cost-efficient as a program concentrated in one agency, which would allow more flexibility in designating proposals and revisions for examination.

Croke and Herlevsen's cost-benefit analysis of the state-funded Illinois Economic Assessment Program suffers from the lack of reliable and quantifiable data that plagues cost-benefit analysis in general. There seems to be no way of determining the effectiveness of this technique when applied to previously unregulated areas. Most of the proposals evaluated by the Illinois program have concerned existing standards (table 2, p. 21) or efforts to bring the state up to prescribed federal standards in a specific field. Their most favorable assessment is that "hearings on economic assessment ensured that such information [on economic impact] did enter the decision process" and that "[s]ome evidence does exist . . . that a greater sensitivity to economic factors resulted from the cost-benefit program" (p. 31).

Richard Liroff's "Cost-Benefit Analysis in Federal Environmental Programs" reviews presidential and congressional efforts to use various types of economic analysis in regulatory decisions. Implicit in his review is the idea that monetary cost-benefit analysis does not produce the most effective regulation at the most reasonable price. He concludes that this type of cost-benefit analysis should not be given dominant weight in decision making. Liroff implies that the new Office of Management and Budget guidelines[7] will give monetary cost-benefit analysis just this primary position and will result in regulations that are not the most cost-efficient.

Liroff suggests that both cost and benefit estimates will be uncertain under a strict quantitative approach, but that this uncertainty stems from two different sources. Benefit estimates vary because measurement standards are not uniform and there are no conclusive data on the effects of pollution on health. Cost estimates, on the

7. These guidelines were issued pursuant to Exec. Order No. 12,291, 46 Fed. Reg. 13,193 (1981) (stating that "[i]n promulgating new regulations, reviewing existing regulations, and developing legislative proposals concerning regulations . . . to the extent permitted by law . . . regulatory action shall not be undertaken unless the potential benefits to society for the regulation outweigh the potential costs to society. . . .") [hereinafter cited as Exec. Order No. 12,291].

other hand, are not reliable because compliance costs vary with ever-changing technology, and industry-supplied data may be suspect. One of the fundamental flaws in the existing system is that agencies rely on industry-supplied data; consequently, a strict cost-benefit analysis decision process may "land government in the pocket of the regulated" (p. 48). Liroff recognizes that some systematic analysis is needed to ensure continued public support of regulation and the most effective use of limited governmental resources. Nevertheless, he concludes that the Environmental Protection Agency should not use formal cost-benefit analysis in its economic assessments and urges that "a careful examination of costs and benefits, with adequate resources devoted to measuring benefits, may advance environmental quality goals" (p. 47). Liroff, however, does not discuss the fact that agencies use data supplied by business and industry because they lack the resources for independent research. This institutional limitation occurs even in the Environmental Protection Agency's informal economic studies and cannot be alleviated by abandoning strict cost-benefit analysis.

Part III of the book examines the sources of controversy over the use of cost-benefit analysis. Daniel Swartzman, an assistant professor of Health Services Management at the University of Illinois School of Public Health, discusses the role cost-benefit analysis should play in the decision whether or not to regulate a particular risk. In contrast to Croke and Herlevsen's discussion of the problems facing the agency which prepares the analysis, Swartzman considers the decision-making body that uses this data.

The three points of controversy between opponents and proponents of this technique involve methodology, politics and ethics. Swartzman points out methodological problems in the analyst's role and in the use of industry-supplied data. Political problems arise from the tension between economic analysis and democratic decision making, between equity and efficiency and between statistically-based decisions and social value considerations. The ethical problem is not whether values such as human life and clean air should be monetized, but whether the reduction deprives the decision maker of the "power of analysis" (p. 71).

"Benefit-Cost Analysis and the Common Sense of Environmental Policy" deals with the methodological problems in defining the parameters of an analysis. The authors, Arthur Hunter, chairman of the Department of Industrial Engineering and Management Sciences at Northwestern University, George Tolley, professor of Eco-

nomics at the University of Chicago and Robert Fabian, a research assistant in Economics at the University of Chicago, believe that environmental policy must be based on a sound analytical framework which allows the decision maker to quantify the values involved. They conclude that uncertainty and bias are unavoidable components of present cost-benefit analysis systems. The authors accept this problem as a fact of life and urge that the usefulness of the technique is enhanced as decision makers and analysts are made aware of its shortcomings. The techniques proposed in this essay point to the usefulness of cost-benefit analysis in organizing valuations "into a coherent and comprehensible way of thinking about environmental actions" (p. 105). The authors base their suggested improvements on a "notice" approach, which presents decision makers with potential sources of bias and uncertainty so that they can evaluate the cost-benefit report more objectively. They would include assumptions about the nature of the regulation, introducing administrative issues which bear directly on the regulation's effectiveness. These assumptions "include factors such as the stringency of the regulation, its comprehensiveness, and its compliance schedule" (p. 99). They recommend that a quantified analysis should not be used without considering these other factors.

In the next chapter, Richard Andrews, director of the Institute for Environmental Studies at the University of North Carolina, examines the political dispute over the use of cost-benefit analysis as an instrument of regulatory reform. He asserts that cost-benefit analysis may make regulations more cost-sensitive and may stop unworthy proposals. It may also be helpful in valuing the impact of agency action on industry and society as a whole. But if used as a political tool, cost-benefit analysis could be used to thwart regulations protecting human life and the environment. Cost-benefit analysis is susceptible to use as a political tool because values cannot be easily quantified.

Andrews' comparison of the National Environmental Policy Act[8] and the Reagan cost-benefit analysis directive[9] suggests that a strictly quantified cost-benefit analysis is not an effective regulatory tool. According to Andrews, a particular analysis is the product of political forces shaping the decision-making process rather than a

8. National Environmental Policy Act of 1969, § 102(2)(c), 42 U.S.C. §§ 4321, 4331-4335, 4344-4347 (1976 & Supp. V 1981).

9. Exec. Order No. 12,291, *supra* note 7.

body of neutral information which contributes to policy debates. He urges that cost-benefit analysis is more useful as a systematic way of "setting priorities among hazards, and between regulatory and non-regulatory means of reducing those hazards," than its proposed use "as mere documentation for justifying proposals already developed" (p. 132). Thus, cost-benefit analysis would be most effective if used as part of a more limited economic analysis, such as a cost-effectiveness study or an economic impact statement. Andrews believes that such an approach would eliminate the use of cost-benefit analysis as a sole decisional tool and dispense with the need to translate every factor into monetary terms. Decision makers could then decide to use cost-benefit analysis on a case-by-case basis.

Steven Kelman, assistant professor of Public Policy at the Kennedy School of Government at Harvard University, recognizes in his essay on ethics that a particular regulation should not be adopted unless the benefits outweigh the costs. He concludes, however, that cost-benefit analysis often has no place in safety, health and environmental regulations because society might value protection more than cost effectiveness in these areas. The intrinsic values of human life and clean air are lost when they are considered in terms of dollars. Faced with these problems, Kelman advises that "it is not justifiable to devote major resources to generate data to be used in cost-benefit calculations or to undertake to 'spread the gospel' of cost-benefit analysis further" (p. 138).

Kelman's essay is addressed to the problems inherent in a highly quantified analysis of regulations, but he passes over the possible ethical problems associated with a less quantified analysis. Although Kelman concedes that "modest efforts to assess levels of benefits and costs are justified" (p. 150), he does not acknowledge that modest balancing efforts include a determination of what environmental protection is worth. Even though an informal economic assessment is made, analysts and decision makers will continue to assign a price to the value that the regulation seeks to protect. The analyst will assign values to the cost of industry compliance, and the decision maker will implicitly value a social good in dollars in deciding whether to issue a regulation. Only a policy of protection at any price would completely avoid this issue. Cost-benefit analyses of any type may contribute to the debasement of intrinsic values because the decision maker assumes that health or the environment can be put in balance with the potential economic

consequences of a particular regulatory proposal. Kelman's essay raises some of the ethical implications of cost-benefit analysis, but it offers no practical suggestions for those designing cost-benefit analysis programs.

The concluding essay by Daniel Swartzman, "Toward Productive Dialogue," details the potential benefits of cost-benefit analysis and provides a list of questions to help pinpoint and deal with its limitations. This checklist is designed for the reviewer of a cost-benefit report and provides a fairly comprehensive approach to problems of biased data, variable measurement standards and analytic assumptions.

Swartzman proposes that "[c]ost-benefit analyses [be] used as a priority-setting tool or as a screening process for judging which regulations deserve closer scrutiny" (p. 181). He believes this method "probably would be more acceptable than those used to determine the exact level at which a regulation should establish a health- or welfare-related standard" (*id.*). In light of budget restrictions, use of cost-benefit analysis at this system-wide level may be more cost-effective than a case-by-case application. Swartzman's design would avoid the ethical problems of valuation and discounting at the initial stage of analysis, since decision makers would be dealing with cases presenting obvious disproportions between costs and benefits. To the extent that existing regulations can be examined on the bases of easily monetized factors, such as compliance costs, this approach would refine cost determinations. Such an approach, however, would not produce the most cost-effective regulations on a consistent basis, since close cases might be passed over in favor of other proposals which are more amenable to extensive analysis. Nevertheless, the use of cost-benefit analysis as a priority-setting tool has an advantage over the case-by-case approach, since such cost-benefit analysis results in cost-effective use of administrative resources as well as cost-sensitive regulatory policies.

Swartzman also contends that "opponents of cost-benefit analysis must be willing to define the limits of ethical danger. Certainly some things are safely quantified and monetized while others are not" (p. 185). But Swartzman fails to recognize that establishing a hierarchy of values may permit selective application of monetary cost-benefit analysis in cases in which it is relatively simple to determine costs and benefits (such as proposals to relax or tighten existing pollution control standards). Conversely, a more informal economic assessment, such as that mandated by the National Envi-

ronmental Policy Act,[10] would allow flexibility of valuation in cases in which significant health and environmental factors are involved.

In conclusion, the authors and editors of COST-BENEFIT ANALYSIS: POLITICS, ETHICS, AND METHODS agree that decision makers should consider the costs and benefits of environmental regulations. They also agree that a strictly quantified analysis of costs and benefits should not be the decisive factor in adopting or rejecting a proposed environmental regulation. The contributors describe a range of approaches to cost-benefit analysis which they consider acceptable, and they stress that there is no single correct approach.

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10. Section 102(2)(c), 42 U.S.C. §§ 4321, 4331-4335, 4344-4347 (1976 & Supp. V 1981).