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The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis

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INTRODUCTION

During 1995, the House of Representatives passed a bill designed to radically revamp laws protecting public health and the environment.¹ Robert Dole, the Republican Presidential nominee in 1996,

1. See Job Creation and Wage and Enhancement Act of 1995, H.R. 9, 104th Cong. (1995). Division A of the bill, the Paperwork Reduction Act, establishes an elaborate bu-

sponsored a similar "regulatory reform" bill in the Senate, which came close to passage.² These bills posed a serious threat to environmental protection.³ They required, *inter alia*, that government agencies sub-

reaucratic process that would reduce collection of information, such as information about emissions and pollution control costs, principally by mandating that the Office of Management and Budget (OMB) control agency information collection. Division B, the Private Property Protection Act of 1995, requires the Federal Government to compensate property owners when agency action diminishes the fair market value of their property by 20% or more. Division C is entitled the Regulatory Reform and Relief Act. Title I of Division C allows "small entities" to seek judicial review of a regulatory impact analysis (or a decision not to prepare a regulatory impact analysis) within one year after promulgation of a final rule. Under current law, courts do not review this kind of analysis except to the extent it influences EPA's "overall judgment whether a rule is reasonable." See *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 538-39 (D.C. Cir. 1983); *Thompson v. Clark*, 741 F.2d 401, 405 (D.C. Cir. 1984). Moreover, most statutes do not permit any challenges more than 90 days after an agency takes a reviewable final action. See, e.g., *Eagle-Picher Indus. v. EPA*, 759 F.2d 905, 908-09 (D.C. Cir. 1985) (90 day period under CERCLA). Title II of Division C adds detailed and difficult analytical requirements to regulatory impact analysis and requires this analysis for many rules. Division D is entitled the Risk Assessment and Cost-Benefit Act of 1995. It requires an enormously detailed analysis of a wide variety of agency actions and proposals, along with a variety of potential alternatives to those actions and proposals, of a scope and complexity going well beyond that required by current law. It provides for multiple layers of bureaucratic review of the analysis. Division D also subjects the analysis to judicial review, which can be the basis for invalidating the action analyzed. In addition it provides that cost-benefit criteria will supersede the criteria in existing statutes. H.R. 9, § 422.

These were not the only attempts to revamp environmental law in the 104th Congress. See, e.g., H.R. 2586, 104th Cong. (1995); 141 CONG. REC. D1346 (budget rider including a central part of H.R. 9) (daily ed. Nov. 13, 1995); Clean Water Amendments of 1995 and the Comprehensive Wetlands Conservation and Management Act of 1995, H.R. 961, 104th Cong. (1995); Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (requiring Congressional oversight of agency rulemaking). See also Sharon Buccino & Gregory S. Wetstone, *Environmental Policy Battles in the Congressional Budget Process: The 104th Congress: Back-Door Assault*, 27 ENVTL. L. REP. 10113 (1997) (describing the environmental budget battles of the 104th Congress); Cass R. Sunstein, *Congress, Constitutional Moments and the Cost-Benefit State*, 48 STAN. L. REV. 247, 269-86 (1996) (describing the history of regulatory reform in the 104th Congress); James E. Saterfield, *Comment: A Funny Thing Happened on the Way to the Revolution: The Environmental Record of the 104th Congress*, 27 ENVTL. L. REP. 10019 (1997). In 1996, new proposals requiring cost benefit analysis (CBA) have been introduced. See 27 Env't Rep. (BNA) 376-77 (May 31, 1996) (new bill requiring consideration of costs in setting national ambient air quality standards); Thomas O. McGarity, *The Expanded Debate Over the Future of the Regulatory State*, 63 U. CHI. L. REV. 1463, 1481-82 (1996) [hereinafter *Expanded Debate*]; Note, *Congressional Attempts to Amend the Clean Water Act: American Wetlands under Attack*, 72 N.D. L. REV. 125 (1996).

2. Comprehensive Regulatory Reform Act of 1995, S. 343, 104th Cong. (1995); 141 CONG. REC. S2057 (1995); John H. Cushman, Jr., *Democrats Block Vote on Anti-Regulation Measures*, N.Y. TIMES, July 21, 1995, at A16 (describing how the Senate bill died because the sponsors were two votes short of the 2/3 majority necessary to cut off debate).

3. See NATURAL RESOURCES DEFENSE COUNCIL, BREACH OF FAITH: HOW THE CONTRACT'S FINE PRINT UNDERMINES AMERICA'S ENVIRONMENTAL SUCCESS (1995) [hereinafter BREACH OF FAITH]; David A. Wirth & Ellen K. Silbergeld, *Risky Reform*, 95 COLUM. L. REV. 1857 (1995) (book review); Victor B. Flatt, *Environmental "Contraction" for America? (Or How I Stopped Worrying and Learned to Love the EPA)*, 29 LOY. L.A. L. REV. 585, 643 (1996) (concluding that "many provisions" of H.R. 9 as proposed, "slash

stitute cost-benefit criteria for existing statutory criteria.⁴ They included a gauntlet of requirements and procedures that would have effectively prevented administrative agencies from completing the required analysis in a reasonable amount of time and would have afforded ample opportunities to stop regulations from being issued.⁵ Although these "regulatory reform" bills did not become law, the 104th Congress passed an Unfunded Mandates Reform Act that generally requires analysis of the costs and benefits of major rules, but does not explicitly displace existing statutory criteria governing

overall programs or make them more costly"); Sunstein, *supra* note 1, at 250 (characterizing the 104th Congress' activities as "an effort to clog the administrative process with paperwork"); Lynn R. Goldman, *Environmental Risk Assessment and National Policy: Keeping the Process Fair, Effective, and Affordable*, 63 U. CIN. L. REV. 1533 (1995) (arguing that proposed legislation will increase the bureaucratic inefficiencies and costs associated with adopting and implementing environmental regulations); Bernard D. Goldstein, *Risk Management Will Not Be Improved by Mandating Numerical Uncertainty Analysis for Risk Assessment*, 63 U. CIN. L. REV. 1599 (1995) (arguing that numerical estimate of uncertainty of risk estimates will waste time and fail to improve decisionmaking); John S. Applegate, *A Beginning and Not an End in Itself: The Role of Risk Assessment in Environmental Decision-Making*, 63 U. CIN. L. REV. 1643-45 (1995) (arguing that mandatory risk assessment is a poor and dishonest way to restructure environmental regulation). Cf. Robert M. Simon, *Issues in Risk Assessment and Cost-Benefit Analysis and their Relationship to Regulatory Reform*, 63 U. CIN. L. REV. 1611, 1641 (1995) (supporting CBA based "regulatory reform"); Bob Herbert, *G.O.P. Hit Men*, N. Y. TIMES, Apr. 19, 1996, at A29 (discussing bills sponsored by Representatives Delay and Bliley).

4. Both the Senate and House bills required an enormously time consuming and detailed cost-benefit analysis and authorized the courts to overrule agency actions based on flaws in the analysis. See H.R. 9, Divisions C & D; S. 343. The Senate bill flatly prohibits promulgation of rules absent a finding that benefits outweigh costs. S. 343, § 623(a)(1). The House bill prohibits regulation absent a finding that the incremental benefits will likely justify the incremental costs. H.R. 9, § 422(a). See also William W. Buzbee, *Regulatory Reform or Statutory Muddle: The "Legislative Mirage" of Single Statute Regulatory Reform*, 5 N.Y.U. ENVTL. L.J. 298, 298-99, 306-07, 330-42 (1996). Professor Buzbee analyzes, inter alia, the principle successors to this version of Senate Bill 343 introduced in February, 1995, and H.R. 9. 104th Cong. 141 CONG. REC. S9542-01 (daily ed. June 30, 1995) and H.R. 1022, 104th Cong. 141 CONG. REC. 2261 (daily ed. Feb. 27, 1995). This article's references to S. 343 refer to the original February, 1995 bill.

5. See BREACH OF FAITH, *supra* note 3, at 22-40, for a review of the requirements in H.R. 9 as proposed. EPA Administrator Carol Browner concluded that EPA compliance with H.R. 9 would require 980 new employees and more than \$220 million. *Id.* at 6-7. Sally Katzen, the Administrator of the Office of Administration and Regulatory Affairs at OMB, stated that H.R. 9 as proposed "would create endless analytic loops and excessive opportunity for delay." *Id.* at 7. H.R. 9 retained much of this complexity in the final version the house passed, and S. 343 contains similarly detailed requirements. See H.R. 9, Divisions C & D; S. 343. See also Gregory S. Wetstone, *And Now, Regulatory Reform*, N.Y. TIMES, Feb. 23, 1995, at A23; Jerry L. Mashaw, *Reinventing Government and Regulatory Reform: Studies in the Neglect and Abuse of Administrative Law*, 57 U. PITT. L. REV. 405, 416 (1996) (describing "regulatory reform" as an effort to seize on "administrative law's capacity to incapacitate administration").

rulemaking or create as many new procedural impediments to regulation.⁶

While strong Congressional support for making the outcome of a cost-benefit analysis (CBA) a dispositive consideration in almost every regulatory decision is new,⁷ CBA is not. The use of CBA in regulatory decisionmaking has grown and its use has received at least some support over the past decade and a half from all three branches of government and some scholars.⁸ Whether or not future legislative enactments mandate yet more reliance on cost-benefit criteria, the Congressional demand for CBA may make such criteria more important in rulemaking.⁹

This Article addresses a question that has received surprisingly little attention (given the long experience with CBA): whether administrative agency reliance on cost-benefit criteria theoretically makes good economic sense. Many scholars assume that administrative use of cost-benefit criteria produces more economically rational outcomes than traditional "polluter pays" principles.¹⁰ Most critics of "regulatory analysis" have focused on the practical difficulty of giving appro-

6. Pub. L. No. 104-4, § 202(a), 109 Stat. 64 (to be codified at 2 U.S.C. § 1532). See generally Rena I. Steinzor, *Unfunded Environmental Mandates and the "New (New) Federalism": Devolution, Revolution or Reform?*, 81 MINN. L. REV. 97 (1996).

7. As recently as 1990, a virtually unanimous Congress passed a sweeping revision to the Clean Air Act. See 42 U.S.C. §§ 7401-7671q (1997). The Act contained numerous detailed decisions about reductions and no requirements for cost-benefit analysis as part of the rulemaking process. See David M. Driesen, *Five Lessons From Clean Air Act Implementation*, 14 PACE ENVTL. L. REV. (forthcoming, 1996)[hereinafter *Five Lessons*]. The legislative history reflects an explicit intention to deter EPA from using cost-benefit or cost effectiveness criteria in setting emission standards for hazardous air pollutants. S. REP. NO. 101-228, at 169 (1990).

8. See, e.g., *International Union v. OSHA*, 938 F.2d 1310, 1319-21 (D.C. Cir. 1991); DAVID P. CURRIE, *AIR POLLUTION: FEDERAL LAW AND ANALYSIS* § 10.01 (1981); James E. Krier, *The Irrational National Ambient Air Quality Standards: Macro- and Micro-Mistakes*, 22 UCLA L. Rev. 323, 324-30 (1974).

9. See Pub. L. No. 104-4, § 202(a) (mandating CBA for regulations with costs exceeding 100 million dollars). There has been some support for more use of cost-benefit criteria in Congress prior to the 104th Congress. For example, in 1993 the Senate passed the "Johnston Amendment" to a bill elevating EPA to cabinet status, which would have required a finding that costs of any regulation outweigh the benefits. Jay Michaelson, Note, *Rethinking Regulatory Reform: Toxics, Politics, and Ethics*, 105 YALE L.J. 1891, 1904-05 (1996). The bill ultimately failed. *Id.* at 1904 n.92.

10. See, e.g., D.W. PEARCE, *COST-BENEFIT ANALYSIS* 3 (2d ed. 1983) ("Given the definitions of 'rationality' and 'society,' we can therefore say that a rational *social decision* is one in which the benefits to society . . . exceed the costs."); Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 715, 725 (1996) (assuming that a rule where costs equal benefits is ideal); THOMAS O. MCGARITY, *REINVENTING RATIONALITY: THE ROLE OF REGULATORY ANALYSIS IN THE FEDERAL BUREAUCRACY* 5 (1996) [hereinafter *REINVENTING RATIONALITY*] (referring to "comprehensive analytical rationality").

priate weight to environmental values in CBA rather than the economic rationale for relying upon it.¹¹

This Article questions the assumption that cost-benefit criteria has a theoretically coherent and compelling economic rationale. It argues that increased emphasis on cost-benefit criteria will probably hamper achievement of the important economic goals having to do with the economy's long-term ability to grow and employ people. CBA exacerbates tendencies to focus myopically on short-term costs to regulated companies, even when imposition of costs upon them may economically benefit their workers and/or competitors in the short-term and society in the long-term.

This Article recommends that Congress consider CBA when it revises statutes, but that it not require CBA in administrative rulemaking. It advocates a reorientation of environmental policy to create a long-term economic dynamic likely to encourage innovation that will spur economic growth and improve environmental quality. It argues that environmental policy should focus less on momentary ratios of costs and benefit and more on our long-term economic and environmental well being.

Part I of this Article provides basic background and shows that cost-benefit criteria provide less environmental protection than the "polluter pays" approach of most environmental statutes and conflicts with traditional concepts of justice.¹² This Article will discuss how CBA critics' weaker claim, that CBA is indifferent to justice claims, understates the justice problem.

Part II reviews the economic rationality theory behind CBA that claims to justify weaker environmental protection and a systematic overriding of traditional ideas of justice. This section points out that a cost-benefit criterion does not help find the cheapest way of achieving a given environmental goal. Rather, a cost-benefit criterion may determine the stringency of pollution reduction goals. But a cost-benefit

11. See, e.g., Richard H. Pildes & Cass R. Sunstein, *Reinventing the Regulatory State*, 62 U. CHI. L. REV. 1, 7-11 (1995) (recommending various incremental reforms designed primarily to improve valuation of regulatory benefits); Thomas O. McGarity, *Regulatory Analysis and Regulatory Reform*, 65 TEX. L. REV. 1243 (1987) [hereinafter *Regulatory Reform*] (assessing primarily the practical value of regulatory analysis); Howard Latin, *Ideal v. Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reform*, 37 STAN. L. REV. 1267, 1269 (1985) (citing CBA as an example of fine-tuning regulatory reform and arguing that ideally efficient reforms need to meet real world tests of practicability); Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1352 (1985) (citing "problems of limited information and excessive regulatory complexity"); William B. Rodgers, *Benefits, Costs, and Risks: Oversight of Health and Environmental Decisionmaking*, 4 HARV. ENVTL. L. REV. 191 (1980).

12. See Thomas O. McGarity, *Media-Quality, Technology and Cost Benefit Balancing Strategies for Health and Environmental Regulation*, 46 LAW & CONTEMP. PROBS. 159, 206-09 (1983).

criterion fails to address crucial economic goals such as maximizing employment, encouraging dynamic economic growth, and developing a sustainable economic pattern. A cost-benefit criterion can only purport to address a fairly limited economic goal, that of improving “allocative efficiency” among an artificially limited set of actors. The “polluter pays” principle better addresses more compelling economic goals, including some competing efficiency goals.¹³

Part III argues that the CBA principle (i.e., that the costs of each regulation should not exceed its benefits), found in regulatory reform bills, will not advance allocative efficiency even in theory. First, regulations meeting such a cost-benefit criterion theoretically allow more total pollution in the country than the neoclassical economist’s optimum. This is because the law leaves some pollution sources unregulated and some under-regulated (relative to ideal efficiency). Second, economic theory suggests that economic efficiency comes from rules that appropriately balance consumers’ valuations of environmental benefits with polluters’ control costs, without producing significant transaction costs. However, CBA entails paralyzing transaction costs. Moreover, regulators will systematically value environmental benefits less highly than consumers because of institutional imperatives, and value costs more highly than the market because the promulgation of a regulation changes the equilibrium upon which the cost estimate is based.

Present health protective criteria meet allocative efficiency goals better than cost-benefit criteria. The notion that they do not rests on an inadequate understanding of the institutional constraints on administrative agencies and an implicit, and unjustified, assumption that polluters have a right to pollute.

Part IV draws conclusions about the proper role of CBA and suggests future directions for environmental policy. It argues that Congress, rather than administrative agencies, should consider CBA. This will enable CBA to perform the role that many economists say it should perform: informing public debate while allowing agencies to perform the more narrow and appropriate function of implementing Congressional decisions. After Congress broadly balances competing costs and benefits, the agency can then reflect and implement Congress’ determinations. This approach enhances political accountability, administrative efficiency, and agency legitimacy.

Part IV then proposes a greater focus on long-term economic concerns and less attention to short-term equilibria. Environmental policy should encourage a dynamic likely to generate sustainable de-

13. See generally Richard B. Stewart, *Environmental Regulation and International Competitiveness*, 102 *YALE L.J.* 2039 (1993) [hereinafter Stewart, *Competitiveness*].

velopment, innovation, efficient materials usage, and employment in the long run.¹⁴ The section then identifies some considerations relevant to fashioning an economically dynamic approach to environmental policy. Focusing simply on short-term equilibria will tend to undermine both environmental progress and long-term prosperity.

I

COST-BENEFIT ANALYSIS AND THE "POLLUTER PAYS" PRINCIPLE

This section will discuss the economic theory justifying government intervention to protect public health and the environment,¹⁵ and explain how environmental law has used the "polluter pays" principle and CBA. It will also examine recent Congressional proposals to substitute cost-benefit criteria for health and technology-based criteria, and sketch some of the policy arguments behind CBA. Finally, this section will explain CBA's failure to protect fully public health.

A. *The Economic Theory Supporting Governmental Environmental Protection*

Neoclassical economics¹⁶ assumes that the free market will enhance the "general welfare" if all consumers have perfect information

14. Ironically, even as Congress debated laws that would weaken environmental goals to enhance short-term equilibria, the President's Commission on Sustainable Development, which includes CEOs of several major companies, recommended adhering to traditional health protective goals while focusing efforts on making them easier to meet, in the interests of long-term economic considerations. See John H. Cushman, *Adversaries Back Current Rules Curbing Pollution*, N.Y. TIMES, Feb. 12, 1996, at A1; THE PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT: SUSTAINABLE AMERICA: A NEW CONSENSUS FOR PROSPERITY, OPPORTUNITY AND A HEALTHY ENVIRONMENT FOR THE FUTURE (1996) at 12, 14, 31 [hereinafter, PRESIDENT'S COUNCIL].

15. By focusing on economic theories and considerations, I do not suggest that other values and frameworks merit less attention. I have simply chosen to focus this article on asking whether CBA advances economic goals. An enormous literature supports environmental protection on other grounds, for example, that life is precious and that protection of all life (including animal and plant life) should be the predominant goal of society. See, e.g., Robin Paul Malloy, *Letters from the Longhouse: Law Economics and Native American Values*, 5 WIS. L. REV. 1569, 1627-29 (1992) (setting out Chief Seattle's 1854 letter to President Franklin Pierce); MARK SAGOFF, *THE ECONOMY OF THE EARTH* 124-45 (1988) (arguing that environmental policies should be based on ethical, esthetic, cultural, and historical considerations, not just economic analysis); ALDO LEOPOLD, *A SAND COUNTY ALMANAC* (1949) (discussing an ethical relationship to land).

16. See INGRID HAHNE RIMA, *DEVELOPMENT OF ECONOMIC ANALYSIS* 304-485 (5th ed. 1991) for an overview of the development of neoclassical economics. In general, neoclassical economists have focused on developing highly refined mathematical models seeking to explain the operation of free markets. I use the term neoclassical economists here to refer to those that believe that these models should strongly influence how we approach environmental problems. A number of economists have dissented from this point of view, usually on the grounds that consumer preferences do not adequately account for the environmental and economic needs of future generations. See, e.g., Michael Redclift, *Eco-*

about goods and services and all producers have perfect information about the costs of production. Yet neoclassical economics also recognizes that a free market fails to provide the environmental quality people want because market prices communicate little or no information about the environmental effects of producing or using a product.¹⁷

The environmental harm, a "cost" in economic parlance, remains "external" to the market, i.e., it is not reflected in the market price.¹⁸ Absent correction of this "market failure," the market will not necessarily enhance the public welfare, because environmental quality will remain inadequate. So neoclassical economics supports systems that will put a price on environmental "externalities" (effects external to the market prices). This allows market mechanisms to maximize general welfare (including environmental quality) and not just the consumption of goods and resources.¹⁹

Most neoclassical economists agree that government should regulate or tax to force producers to internalize the "external" costs of production.²⁰ In the environmental area this involves forcing polluters to pay to reduce or eliminate pollution (internalize the externality). If polluters pay for the cost of clean-up then the market price of products may reflect the "prevention cost" (i.e., the full cost of clean-up associated with those products). Thus, producers who figure out how to clean-up more cheaply will have an advantage over polluters who do not.²¹ If polluters must pay the "effects" cost (i.e., the estimated "cost" of the damage the pollution causes) their product prices may reflect this "effects" cost.²²

omic Models and Environmental Values: A Discourse on Theory, in SUSTAINABLE ENVIRONMENTAL MANAGEMENT: PRINCIPLES AND PRACTICE 55 (R. Kerry Turner ed., 1988) (arguing that neoclassical economic assumptions produce an inappropriate "reductionist view of natural resources and their utility.") [hereinafter SUSTAINABLE MANAGEMENT]; JOHN GOWDY & SABINE O'HARA, *ECONOMIC THEORY FOR ENVIRONMENTALISTS* (1995) (providing a detailed description of neoclassical economic concepts with some critique).

17. See, e.g., WILLIAM J. BAUMOL & WALLACE E. OATES, *ECONOMICS, ENVIRONMENTAL POLICY, AND THE QUALITY OF LIFE* 72-79 (1979) [hereinafter BAUMOL & OATES, *ECONOMICS*]; Barbara Ann White, *Economizing on the Sins of Our Past: Cleaning up our Hazardous Waste*, 25 HOUS. L. REV. 899, 915-16 (1988) [hereinafter White, *Economizing*].

18. Lisa Heinzerling, *Selling Pollution, Forcing Democracy*, 14 STAN. ENVTL. L.J. 300, 305 (1995) [hereinafter *Selling Pollution*]; White, *Economizing*, *supra* note 17, at 916-17; BAUMOL & OATES, *ECONOMICS*, *supra* note 17, at 75-77.

19. White, *Economizing*, *supra* note 17, at 917.

20. BAUMOL & OATES, *ECONOMICS*, *supra* note 17, at 230, 313. As Baumol and Oates note, most economists would prefer taxes to direct regulation.

21. David A. Westbrook, *Liberal Environmental Jurisprudence*, 27 U.C. DAVIS L. REV. 619, 650 (1994).

22. The price may not reflect any of these costs where competition forces the producer to accept lower profitability rather than pass the costs on to customers.

B. *The "Polluter Pays" Principle and Statutes Not Providing for Cost-Benefit Analysis*

Most public health and environmental statutes have the goal of protecting public health and the environment, rather than balancing that protection against economic interests.²³ This reflects a "polluter pays" principle that assumes that the prices of goods should reflect the "prevention" costs.²⁴ It treats these costs as part of the cost of doing business, i.e., as production costs.

At times, Congress has specified explicit numerical emission limitations for classes of polluters and has expressly listed the pollutants that agencies must regulate.²⁵ But on other occasions Congress leaves the task of translating general goals into concrete requirements for polluters to administrative agencies with authority to write rules, such as the Environmental Protection Agency (EPA) or the Occupational Safety and Health Administration (OSHA), and their state counterparts.²⁶

Generally, the "polluter pays" statutes require EPA to use one of two criteria to determine the stringency of pollution control regulations. Some provisions use "health-based" (or "effects-based") criteria, requiring a level of reduction sufficient to protect public health and/or the environment.²⁷ Others use "technology-based" criteria, requiring the agency to demand reductions achievable through available technology.²⁸

23. See, e.g., *Public Citizen v. Young*, 831 F.2d 1108, 1112 (D.C. Cir. 1987) (primary goal of Food Drug and Cosmetic Act is "human safety"); *American Textile Mfrs. Inst. Inc. v. Donovan*, 452 U.S. 490, 540 (1981) (stating that the goal of statute is to advance worker health, unless doing so is infeasible and rejecting CBA); *Union Electric v. EPA*, 427 U.S. 246, 266 (1976) (finding that the purpose of Clean Air Act is attainment of national air quality standards).

24. *United States v. USX Corp.*, 68 F.3d 811, 814 (3rd Cir. 1995) (Comprehensive Environmental Response Compensation and Liability Act); *United States v. Coastal States Crude Gathering Co.*, 643 F.2d 1125, 1128 (5th Cir. 1981) (oil spill provisions of Clean Water Act); *Clean Air Act*, H.R. REP. NO. 95-294, at 72-75 (1977), *reprinted in* 2 U.S.C.C.A.N. 1150-53.

25. Examples include standards for automobile emissions, the phaseouts of some ozone depleting chemicals, and the limitation of certain emissions from electric utilities. See Driesen, *Five Lessons*, *supra* note 7. Congress specified numerical limitations for automobiles even prior to the 1990 Amendments.

26. See, e.g., *Natural Resources Defense Council (NRDC) v. EPA*, 824 F.2d 1146, 1146-47 (D.C. Cir. 1987) (en banc); *Lead Indus. Ass'n, Inc. v. EPA*, 647 F.2d 1130-35 (D.C. Cir. 1980), *cert. denied*, 449 U.S. 1042 (1980).

27. See, e.g., *NRDC*, 824 F.2d 1147 (interpreting Clean Air Act's requirement that regulations addressing hazardous air emissions provide an "ample margin of safety"); 42 U.S.C. § 7412(i) (1996) (requiring a similar approach to air toxics under a second phase of implementation of the Clean Air Act as amended in 1990); *Lead Indus.*, 647 F.2d at 1148-49 (interpreting requirement that National Ambient Air Quality standards for "criteria" pollutants must provide an "adequate margin of safety").

28. See, e.g., 42 U.S.C. § 7412(d)(2) (1996); *Michigan v. Thomas*, 805 F.2d 176, 181 (6th Cir. 1986). Some statutory schemes call for regulation designed to force the develop-

Congress usually requires or allows federal agencies and States to take cost into account in determining polluters' precise pollution control obligations.²⁹ Generally, the statutes make cost considerations relevant in order to meet equitable goals, such as appropriately distributing pollution control obligations among polluters. The authority to consider costs enables agencies to mandate reductions from polluters that have reasonable control options. At the same time it allows agencies to avoid extraordinarily expensive controls, lower productions, or shut downs.³⁰ The statutory provisions requiring promulgation of health and technology-based standards do not make the ratio of costs to benefits a relevant factor in agency decisionmaking, even when they authorize an agency to take costs into account.³¹ While statutes using technology or health-based standards have not met their overall goal of fully protecting public health and the environment, they have generated significant environmental improvement during a time of growing population, increased mobility and economic growth.³²

C. Cost-Benefit Analysis in Environmental Law

Presidents Reagan and Clinton issued Executive Orders requiring CBA in all major rulemaking.³³ As a result, agencies conduct CBA when they propose major regulations, even under statutes that do not authorize consideration of cost-benefit ratios. Legally, the agencies must follow the criteria set out in governing statutes, rather than a

ment of new technologies, usually for polluters that make large contributions to health and environmental problems. See, e.g., *International Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 622-24 (D.C. Cir. 1973).

29. See, e.g., 42 U.S.C. § 7412(d)(2); *Thomas*, 805 F.2d at 181; *Union Electric v. EPA*, 427 U.S. 246, 266 (1976) (finding that states may consider costs in choosing strategies for meeting national ambient air quality standards).

30. See generally, *American Textile Mfrs. Inst. Inc. v. Donovan*, 452 U.S. 490, 540 (1981) (statute requires feasibility analysis, not cost-benefit analysis); *Union Electric*, 427 U.S. at 266 (finding that states may take costs into account in choosing strategies for meeting national ambient air quality standards). For simplicity's sake, the discussion here focuses on those parts of pollution control programs that involve "facilities" and costs in the strict sense, i.e. expenditures. The pollution control programs also involve rules that address pollution sources other than production facilities and involve questions of public convenience as well as cost. See, e.g., *Environmental Defense Fund v. EPA*, 82 F.3d 451 (D.C. Cir. 1996) (discussing transportation planning requirements in Clean Air Act).

31. See, e.g., *Donovan*, 452 U.S. at 540.

32. Environmental Protection Agency, *Twenty-Five Years of Environmental Progress at a Glance*, (June 18, 1996) <<http://www.epa.gov/oppe/25year/intro.html>>.

33. Exec. Order No. 12,291, 3 C.F.R. 127 (1982), reprinted in 5 U.S.C. § 601 app. at 431-34 (1982); Exec. Order No. 12,866, 3 C.F.R. 638-49 (1994), reprinted in 5 U.S.C.A. § 601 (West Supp. 1995) (issued by President Clinton and repealing President Reagan's Exec. Order No. 12,291). For more background on these orders and context, see *Expanded Debate*, *supra* note 1, at 1476-79.

cost-benefit criterion, when they actually make a decision.³⁴ In practice, however, the Office of Management and Budget uses the analysis to weaken and delay environmental regulation in order to reduce regulated companies' compliance costs.³⁵

At least two environmental statutes, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)³⁶ and the Toxic Substances Control Act (TSCA),³⁷ have directed³⁸ EPA to use cost-benefit criteria to determine whether it should issue a regulation.³⁹ Both statutes authorize EPA to ban the production of chemicals that enter the envi-

34. See Exec. Order 12,291, § 2 (requiring that benefits outweigh costs "to the extent permitted by law"); Erik D. Olson, *The Quiet Shift of Power: Office of Management & Budget Supervision of Environmental Protection Agency Rulemaking Under Executive Order 12,291*, 4 Va. J. Nat. Resources L. 1, 25-27 (1984) (citing cases); *Project: The Impact of Cost-Benefit Analysis on Federal Administrative Law*, 42 ADMIN. L. REV. 545, 602 (1990) [hereinafter *Project*]; Alan B. Morrison, *OMB Interference with Agency Rulemaking: The Wrong Way to Write a Regulation*, 99 HARV. L. REV. 1059, 1062 (1986). See also *Environmental Defense Fund v. Thomas*, 627 F. Supp. 566 (D.D.C. 1986) (holding that orders cannot justify ignoring statutory deadlines); McGarity, *Regulatory Reform*, *supra* note 11, at 1319 ("An agency thus cannot rely upon the Executive Order . . . to take unauthorized action or to refrain from taking required action."). The Executive Orders spawned an enormous literature regarding their legitimacy and wisdom. See, e.g., Harold H. Bruff, *Presidential Management of Agency Rulemaking*, 57 GEO. WASH. L. REV. 533 (1989); Morton Rosenberg, *Presidential Control of Agency Rulemaking: An Analysis of Constitutional Issues that May be Raised by Executive Order 12,291*, 23 ARIZ. L. REV. 1199 (1981); Cass R. Sunstein, *Cost-Benefit Analysis and the Separation of Powers*, 23 ARIZ. L. REV. 1267 (1981); Jeffrey H. Howard & Linda E. Benfield, *Rulemaking in the Shadows: The Rise of OMB and Cost-Benefit Analysis in Environmental Decision-Making*, 16 COLUM. J. ENVTL. L. 143 (1991); Christopher C. DeMuth & Douglas H. Ginsburg, *White House Review of Agency Rulemaking*, 99 HARV. L. REV. 1075, 1078 (1986).

35. Olson, *supra* note 34, at 49-55; Thomas O. McGarity, *Some Thoughts on "Deossifying" the Rulemaking Process*, 41 DUKE L.J. 1385, 1431-33 (1992) [hereinafter *Deossifying*]; THOMAS O. MCGARITY & SIDNEY A. SHAPIRO, *WORKERS AT RISK: THE FAILED PROMISE OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION* 229-41 (1993) (summarizing OMB intervention detailed throughout the book). See generally, REINVENTING RATIONALITY, *supra* note 10.

36. 7 U.S.C. §§ 136-136y.

37. 15 U.S.C. §§ 2601-2692.

38. The 104th Congress amended the legal regime governing pesticides to apply standards not based upon cost-benefit analysis to pesticide residues in food and pesticides preventing disease. See The Food Quality Protection Act of 1996, Pub. L. No. 104-170, §§ 230(a), 408(b)(2), 110 Stat. 1489, 1508, 1516 (1996) (requiring health based standards for pesticide residues in food and risk/benefit standards for pesticides protecting public health). The experience prior to the 1996 amendments remains relevant to understanding CBA.

39. John S. Applegate, *The Perils of Unreasonable Risk: Information Regulatory Policy and Toxic Substances Control*, 91 COLUM. L. REV. 261, 269 (1991) [hereinafter *Perils*] (stating that FIFRA and TSCA use language that authorizes action to prevent "unreasonable" adverse effects and have legislative history calling for balancing of costs and benefits); Alan Rosenthal et al., *LEGISLATING ACCEPTABLE CANCER RISK FROM EXPOSURE TO TOXIC CHEMICALS*, 19 ECOLOGY L.Q. 269, 304-09 (1990) (referring to FIFRA and TSCA as risk-balancing statutes); *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1217 (5th Cir. 1991) (describing statutory requirements of TSCA).

ronment, but EPA has rarely used these authorities, largely because of CBA.⁴⁰

The 104th Congress considered, but did not pass, a bill that would have forbidden enactment of regulations absent an administrative finding that the benefits of the regulation outweigh the costs.⁴¹ This Article will use the formulation of cost-benefit balancing in that bill because it most sharply frames the issues regarding the theoretical justification for cost-benefit criteria. All of the arguments made here would apply to other formulations also.⁴²

The regulatory reform bills considered in the 104th Congress would have radically altered the "polluter pays" statutes because they would have substituted cost-benefit criteria for existing health and technology-based statutory criteria.⁴³ The bills would have made findings concerning cost-benefit ratios and complex regulatory analyses judicially reviewable.⁴⁴ These bills would have radically changed regulations under the "polluter pays" statutes more than the executive order mandating CBA in all major rulemaking. This is because the executive orders neither authorized judicial review of cost-benefit analyses nor superseded existing statutory criteria for decisions.⁴⁵

The bills also contained a number of provisions that would have slowed down the regulatory process to accommodate very intensive analyses.⁴⁶ Senator Dole's bill would have required the suspension of statutory deadlines to accommodate potentially infinite delay.⁴⁷ The bills would have complicated the administrative process by establishing multiple layers of review that the agency must go through before it

40. See *infra* Part IV.A.

41. S. 343, § 623.

42. See, e.g., H.R. 9, § 422(a) (prohibiting regulation absent a finding that the incremental benefits will likely justify the incremental costs).

43. See, e.g., H.R. 9, § 422(b); S. 343 § 623.

44. See H.R. 9, §§ 311, 441.

45. Exec. Order 12,291, § 9 (stating that order is "not intended to create any right or benefit, substantive or procedural, enforceable at law by a party against the United States, its agencies, its officers or any person").

46. H.R. 9 adds 90 days to the rulemaking process by requiring "a notice of intent to engage in rulemaking" 90 days prior to proposal. § 322. H.R. 9 allows industry to lengthen comment periods. § 323. H.R. 9 requires delays in proposed and final rules by requiring submission of detailed regulatory impact analysis 60 days prior to publication of a notice of proposed rulemaking and 30 days prior to publication of a final rule. § 324. It also authorizes OMB to provide further delays. § 324(5), (6).

47. S. 343, § 626. This represents a radical change in existing law. See *Environmental Defense Fund v. Thomas*, 627 F. Supp. 566 (1986) (agency cannot ignore statutory deadlines in order to accommodate analytical requirements of executive orders); *Public Citizens Health Research Group v. Food and Drug Admin.*, 724 F. Supp. 1013 (D.D.C. 1989) (imposing a duty on OMB to act without unreasonable delay). Such a change would probably virtually halt rulemaking designed to protect public health and the environment. See *Deosifying*, *supra* note 35, at 1436 ("In the absence of deadlines the [rulemaking] process barely moves at all").

could ever take action that might protect the environment or public health.⁴⁸ The bills required far more detailed and difficult analytical requirements than the executive orders or existing cost-benefit statutes.⁴⁹ The 104th Congress eventually did pass a law, the Unfunded Mandates Reform Act. The Act codifies the executive orders' requirements that CBA occur for major regulations but does not displace existing regulatory criteria.⁵⁰

D. Scholarly and Legislative Reception

CBA supporters usually argue that cost-benefit criteria will make environmental decisions more "efficient" or "cost-effective."⁵¹ Legislative proponents also claim that CBA will help simplify an overly complicated regulatory process, avoid wasteful expenditures of money, prevent job destruction, and protect American competitiveness.⁵²

Critics have attacked the appropriateness and practicality of CBA because it requires one to compare two seemingly incomparable things, environmental and health effects on the one hand, and pollution control costs on the other.⁵³ First, because environmental and public health benefits are notoriously difficult to quantify,⁵⁴ an administrative agency will tend to undervalue them in a CBA process that requires quantification. "Soft" variables tend to get lost in the equation.⁵⁵ Second, the government cannot and ought not assign a dollar

48. See *supra* note 1; Michaelson, *supra* note 9, at 1910 (pointing out that reform bill's provisions actually allow industry to become part of "peer review" panels overseeing the CBA).

49. See Michaelson, *supra* note 9, at 1909-11 (describing some of the procedures).

50. Pub. L. 104-4, § 202(a); See Exec. Order 12,866 §§ 3(f)(1), 6(a)(3)(B)(ii).

51. See, e.g., Krier, *supra* note 8, at 324-30.

52. See generally, CONTRACT WITH AMERICA: THE BOLD PLAN BY REP. NEWT GINGRICH, REP. DICK ARMEY, AND THE HOUSE REPUBLICANS TO CHANGE THE NATION, 125, 128, 131-32 (Ed Gillespie and Bob Schellhas eds., 1994).

53. See Duncan Kennedy, *Cost-Benefit Analysis of Entitlement Problems: A Critique*, 33 STAN. L. REV. 387 (1981) (arguing that the outcomes of CBA are indeterminate in theory); Lawrence A. Tribe, *Policy Science: Analysis or Ideology*, 2 PHIL. & PUB. AFF. 66, 70 (1972) (same).

54. COMMITTEE ON RISK ASSESSMENT OF HAZARDOUS AIR POLLUTANTS, NATIONAL RESEARCH COUNCIL, SCIENCE AND JUDGMENT IN RISK ASSESSMENT (1994); NATIONAL RESEARCH COUNCIL, RISK ASSESSMENT IN THE FEDERAL GOVERNMENT: MANAGING THE PROCESS (1983); Rodgers, *supra* note 11, at 196-98.

55. See Kaplow and Shavell, *supra* note 10, at 731 ("When environmental harms involve losses that are hard to measure from market data such as the death of animals . . . without clear commercial value damages calculated under standard tort principles may understate true social losses."); *Regulatory Reform*, *supra* note 11, at 1294-95; Robert R. Kuehn, *The Environmental Justice Implications of Quantitative Risk Assessment*, 1996 U. ILL. L. REV. 103, 116-39 (1996) (arguing that risk assessment tends to underestimate harms because it fails to take into account cumulative exposure to a variety of pollutants, or the needs of especially vulnerable populations, reduces complex problems to "simple" probabilities, and is susceptible to manipulation by powerful interest groups; past risk as-

value to human life, animal life, health, and aesthetic considerations.⁵⁶ Third, CBA tends to devalue the benefits to future generations that stringent environmental protection offers.⁵⁷ Fourth, benefit data simply does not exist and cannot be obtained at reasonable cost to assess benefits properly.⁵⁸ Fifth, CBA does not take equity into account.⁵⁹ For example, decisions to balance costs and benefits may leave those living nearest polluting facilities, often minority groups, susceptible to very large pollution burdens.⁶⁰

Most sophisticated CBA proponents recognize some of the force of the practical and equitable criticism of CBA, but do not regard the criticism as dispositive, because they believe that CBA focuses on the right question, presumably how to maximize allocative efficiency.⁶¹ Hence the legal literature has tended to portray the CBA debate as one between proponents of "ideal" versus "real" efficiency.⁶² Both opponents and proponents of CBA seem to assume that CBA advances a coherent, comprehensive, and important economic ideal and tend to identify the main problem as a practical difficulty of properly valuing costs and benefits to society and various groups.⁶³ This Arti-

essments have grossly underestimated risks); DAVID W. PEARCE & R. KERRY TURNER, *ECONOMICS OF NATURAL RESOURCES & THE ENVIRONMENT* at 122-23 (1990) [hereinafter PEARCE, *NATURAL RESOURCES*] (noting the temptation to "downgrade" environmental benefits because they are "soft"; Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1361-66 (1971). Cf. Herman B. Leonard & Richard J. Zeckhauser, *Cost-Benefit Analysis Applied to Risks*, in DOUGLAS MACLEAN, *VALUES AT RISK* 43-44 (1986) (agreeing that soft variables tend to be undervalued, but arguing that this is ethically neutral).

56. *Regulatory Reform*, *supra* note 11, at 1294-94; Rodgers, *supra* note 11, at 194-95 ("[D]ollars may simply be incapable of capturing the value which an individual or society places" on human life, aesthetics, wilderness and endangered species protection.).

57. *Regulatory Reform*, *supra* note 11, at 1295-96. See also Daniel A. Farber and Paul A. Hemmersbaugh, *The Shadow of the Future: Discount Rates, Later Generations, and the Environment*, 46 VAND. L. REV. 267 (1993).

58. Latin, *supra* note 11, at 1308-09.

59. Rodgers, *supra* note 11, at 193-94, 196.

60. See generally, Kuehn, *supra* note 55; Brian D. Israel, *An Environmental Justice Critique of Risk Assessment*, 3 N.Y.U. ENV'T L.J. 469 (1994).

61. See, e.g., E.J. MISHAN, *COST-BENEFIT ANALYSIS* 154-61 (1982) [hereinafter MISHAN, *COST-BENEFIT*].

62. See Latin, *supra* note 11, at 1269. Professor Latin's article portrays CBA as one example of a vain search for "ideal efficiency." Cf. Ackerman & Stewart, *supra* note 11, at 1352 (disclaiming advocacy of CBA, because of "problems of limited information and excessive regulatory complexity").

63. See, e.g., REINVENTING RATIONALITY, *supra* note 10, at 5 (referring to "comprehensive analytical rationality" without explicitly endorsing this characterization of CBA); FREDERICK R. ANDERSON ET AL., *ENVIRONMENTAL PROTECTION: LAW AND POLICY* 43-50 (2d ed. 1990) (contrasting CBA with alternative world views that place less emphasis on economic values). Some legal scholars have questioned the coherence and objectivity of CBA from the beginning. See, e.g., Tribe, *supra* note 53. Environmental law textbooks, including the one cited above, mention some fundamental critiques of CBA. But the overall tendency is to assume that CBA is coherent and important and to raise questions about its technical ability to incorporate non-economic values fully.

cle argues that CBA has fundamental theoretical problems that no amount of refinement of technique will solve.

E. Cost-Benefit Analysis and the Lack of a Complete Remedy to Environmental Harm

The traditional "polluter pays" statutes aim to protect public health and the environment from harm.⁶⁴ This means that polluters must pay the "prevention" costs: the costs of reducing emissions to prevent these harms.⁶⁵

Application of cost-benefit criterion may prevent remediation of environmental problems whenever the estimated pollution control cost and prevention cost exceed estimated pollution control "benefits." An example illustrates this point. Suppose that a polluter causes \$10,000 worth of harm and could remedy this harm by spending \$15,000 to control this pollution. A strict cost benefit criterion would forbid promulgation of an emission limitation fully remedying the \$10,000 harm, because the "prevention" cost exceeds the "effects" cost. In other words, the cost exceeds the "benefit." A cost-benefit agency might still establish a more relaxed emission limitation that produces abatement costs that are less than \$10,000. But this more relaxed emission limitation would not fully remedy the harm; the public would still suffer the harmful effects of the unabated pollution under the relaxed limitation. Even if the regulated company has ample resources to pay for a complete clean-up without significantly cutting back operations, cost-benefit criteria will prevent a full clean-up if the cost-benefit ratio is unfavorable to the citizen.

The very language of CBA obscures the fact that CBA does not protect the public from environmental harm.⁶⁶ The word "benefit" refers to harm averted in the future, not to benefits in the ordinary

64. See, e.g., *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1136-37 (D.C. Cir. 1980) (finding that national ambient air quality standards must protect public health and protect "public welfare" described as damage to the environment); *NRDC v. EPA*, 824 F.2d 1146 (D.C. Cir. 1987) (requiring EPA to set standards for hazardous air pollutants that protect public health, but allowing consideration of cost and technological feasibility in determining an ample safety margin).

65. The Clean Water Act actually has an explicit "zero-discharge" goal, but it has not been administered in a way that takes that goal very seriously. See *Atlantic States Legal Found., Inc. v. Eastman Kodak*, 12 F.3d 353 (2d Cir. 1994); Axline & McGinley, *Universal Statutes & Planetary Programs: How EPA Has Diluted the Clean Water Act*, 8 J. ENVTL. L. & LITIG. 253 (1993). The D.C. Circuit has concluded that the toxics provisions of the Clean Air Act are intended to fully protect public health, but not necessarily to completely eliminate all risk through zero emission levels. *NRDC*, 824 F.2d at 1211.

66. See generally, Robin Paul Malloy, *Is Law and Economics Moral? - Humanistic Economics and a Classical Liberal Critique of Posner's Economic Analysis*, 24 VAL. U. L. REV. 147, 160 (1990) (arguing that economics must be subservient to a concern for human dignity).

sense of the word.⁶⁷ Specifically, an agency employing cost-benefit analysis assumes that but for the analyzed regulation, facilities would expand or continue polluting at current rates.⁶⁸ However, this continuing pollution contributes to environmental degradation and damages people's health. If the regulatory agency demands reductions in pollution levels, then less harm will occur in the future than will occur if the

67. The harm/benefit distinction has played a major role in academic discussion of what constitutes a taking. See, e.g., Frank I. Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law*, 80 HARV. L. REV. 1165, 1196-201, 1235-38 (1967); Glynn S. Lunney Jr., *Responsibility, Causation, and the Harm-Benefit Line in Takings Jurisprudence*, 6 FORDHAM ENVTL. L.J. 433 (1995); Richard A. Epstein, *The Ubiquity of the Benefit Principle*, 67 S. CAL. L. REV. 1369 (1994). Like most distinctions it can be a difficult one to apply in some situations. It does not seem problematic, however, in the pollution context. For example, if a factory pollutes and nearby people breathe in harmful chemicals as a result, the factory is harming them. When an agency decides to limit emissions in the future, this prevents harm.

Professor Lunney has suggested that Professor Coase's work has cast doubt on the notion that anybody ever causes a harm. Lunney, *supra*, at 492 ("[A]s Professor Coase recognized in his seminal article, *The Problem of Social Cost*, a but-for-factual analysis alone will invariably identify more than one cause for any particular undesirable result."). The suggestion that nobody is responsible for causing harms because all harms have multiple causes would represent an overreading of Professor Coase's point and a radical and unjustified departure from common law views of rights and responsibilities as well as the common cultural understandings the common law reflects. Professor Lunney relies on the following passage from Coase:

The traditional approach has tended to obscure the nature of the choice that has to be made. The question is commonly thought of as one in which A inflicts harm on B and what has to be decided is: how should we restrain A? But this is wrong. We are dealing with a problem of a reciprocal nature. To avoid the harm to B would inflict harm on A.

Id. at 437 n.25 (quoting R. H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 2 (1960)). Clearly B does not inflict harm on A by simply breathing A's fumes. B would inflict harm on A if he demanded that A clean-up, because A would have to pay for that clean-up.

Coase writes about the choice an economist must make in identifying an "efficient" solution to a resource allocation problem, not necessarily what a court or a legislative body must decide in being just (although Coase suggests that courts should take efficiency into account). This passage does not assert that B inevitably helps cause the harm from A's smoke. It simply points out that remedying the harm to B may inflict a cost on A. Therefore, economic efficiency, abstracted from justice, may require that B move, rather than that A abate smoke. See R. H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 41-42 (1960). Hence, Coase does not dispute the notion that A causes B harm (although the piece suggests that B harms himself if he comes to a nuisance voluntarily). Coase argues that the question of causation has no necessary bearing on how to resolve a problem efficiently. *Id.* at 15. Yet, in the world we live in, we regard forced relocation as unjust because people cannot always move readily. Even if they could easily move away, they still do not free themselves from threats to their health from pollution because pollution is so ubiquitous and usually travels. Thus, we rightly reject the notion that people cause others a harm because they breathe the air and drink the water where they live.

68. See, e.g., ENVIRONMENTAL PROTECTION AGENCY, REGULATORY IMPACT ANALYSIS FOR PETROLEUM REFINERIES, NESHAP 191 (1995).

facilities continue polluting as before.⁶⁹ Regulators refer to this averted harm as a "benefit."⁷⁰

The use of the term "benefit" implies that in the absence of regulation, the polluter has the right to continue polluting in the future. The terminology implies that the agency, in its benevolence, confers a gratuitous benefit by limiting pollution.

"Averted harm" is a more precise term. It draws attention to the fact that property owners do not traditionally possess the right to use their property in a way that harms neighbors.⁷¹ Our law and customs recognize that we generally must refrain from harming other people.⁷² This ethic is fundamental, widely shared, and applies to harming others by fouling their water and air.⁷³

To be sure, the law has not always forbidden all pollution. While some common law courts have shut down polluting facilities that interfere with the enjoyment and use of neighboring properties upon proof of harm, others have declined to do so if the pollution only injured a small number of property owners and the shutdown seemed unjust.⁷⁴ Yet even those courts that would not shut down facilities upon proof of harm are almost always willing to order installation of pollution controls or payment of damages as a matter of right.⁷⁵ Thus, courts agree that polluters have no right to pollute, but differ as to when to shut down a facility to remedy harms.⁷⁶

Modern environmental law mirrors the remedial structure and conception of rights found in the common law. The "polluter pays" statutes reflect a right to a clean environment, but focus on pollution control, rather than shutdown of polluting facilities (or compensation for damages) as the predominant remedy. The "polluter pays" stat-

69. See, e.g., *id.* at 149-50.

70. See, e.g., *id.*

71. See Robert G. Bone, *Normative Theory and Legal Doctrine in American Nuisance Law*, 59 S. CAL. L. REV. 1101, 1138 (1986) (discussing principle of *sic utere tuo ut alienum non laedus*, which literally means, "so use your own as not to injure others").

72. Christopher Schroeder, *The Evolution of Federal Regulation of Toxic Substances*, in GOVERNMENT AND ENVIRONMENTAL POLITICS 263, 277-78 (Michael S. Lacey ed., 1989). See, e.g., *Woodyear v. Schaefer*, 57 Md. 1, 8-9 (1881); *Susquehanna Fertilizer Co. v. Malone*, 73 Md. 268, 20 A. 900 (1890).

73. See Kennedy, *supra* note 53, at 402 (people typically experience a "duty to abstain from acts that cause suffering").

74. See Bone, *supra* note 71, at 1178-79.

75. See *id.* at 1159-60 ("Some courts used a balancing test to determine the suitability of injunctive relief, but few endorsed utilitarian balancing to assess liability in actions for damages."); *Smith v. Staso Milling Co.*, 18 F.2d 736 (2d Cir. 1927) (awarding damages and ordering pollution control routinely, but employing equitable balancing in deciding whether to forbid emissions altogether).

76. See Jonathan Bender, *Societal Risk Reduction: Promise and Pitfalls*, 3 N.Y.U. ENVTL. L. REV. 255, 257 (1994) (allowing polluters to avoid compensation of victims violates common law principles).

utes contain provisions to minimize the necessity of shutdowns and usually require modification of production processes or installation of control devices.⁷⁷ For the most part, modern environmental statutes have reserved cost-benefit balancing for product bans under FIFRA and TSCA; a situation somewhat analogous to the decision to shut-down plants that sometimes occasioned balancing at common law.⁷⁸

The very concept of treating actions ameliorating ongoing harms, not as harm amelioration,⁷⁹ but as a benefit, something bestowed gratuitously, undermines a fundamental norm of justice: that we must refrain from harming others. Our government undermines that norm when it tells people suffering from pollution that allowing pollution to continue, but at a reduced rate, constitutes a benefit.⁸⁰

A cost-benefit criterion creates a limited right to pollute without administrative interference.⁸¹ Critics who have said that CBA does not take justice into account⁸² have understated the problem. Cost-benefit criteria do take justice into account by rejecting traditional justice norms. The following Part addresses the question of whether a compelling and comprehensive economic rationale justifies this result. This question has received surprisingly little discussion.

II

POSSIBLE ECONOMIC GOALS AND COST-BENEFIT ANALYSIS

This section asks whether cost benefit criterion offers meaningful advantages over the "polluter pays" principle in addressing public economic goals relevant to environmental protection. Traditionally, most law and economics scholarship has focused on microeconomic

77. See, e.g., H.R. REP. NO. 101-490 at 328 (1990) (Congress authorized consideration of costs in setting Clean Air Act toxics regulations in order to allow the agency to avoid shutting down large numbers of sources). On the other hand, the statutory language requires existing pollution sources to meet, at a minimum, an emission limitation reflecting what the best performing 12% of similar sources have already achieved. See 42 U.S.C. § 7412(d) (1996).

78. See *supra* I.C.

79. To the extent courts are prepared to order abatement of pollution upon demand, the right to clean air or water can be viewed as an entitlement backed by a property right. Those courts that will refuse injunctions to some citizens effectively protect the entitlement to clean air and water through a liability rule. These courts allow polluters to take away the right to clean air and water without the citizen's consent, but require compensation. See generally, Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

80. See generally, Tribe, *supra* note 53, at 97-98 (CBA and similar policy approaches may tend to anesthetize moral feeling).

81. Common law remedies remain available in theory. But Congress invented modern environmental law because those remedies proved inadequate. See *infra* III.A.1.d. Ironically, as pollution becomes more ubiquitous, the ability to meet common law causation requirements diminishes.

82. See, e.g., REINVENTING RATIONALITY, *supra* note 10, at 152-53 (discussing failure to take "distributional considerations" into account).

analysis, i.e., allocative efficiency.⁸³ This section will adopt a different approach. It will address macro as well as microeconomic issues.⁸⁴ In particular, it will analyze whether a cost-benefit criterion will help maximize employment, ensure "sustainable" economic life, foster a dynamic growing economy,⁸⁵ encourage efficient use of materials, help find the cheapest way of meeting environmentally protective goals, and improve allocative "efficiency" as defined by neoclassical economists. There is a prima facie case that CBA advances the goal of allocative efficiency, but does not advance the other goals outlined.⁸⁶ Accordingly, much of this analysis will describe the allocative efficiency concept and ask whether it constitutes a compelling and comprehensive economic goal that justifies ignoring most of the other important economic and non-economic goals that environmental policies strive to advance.

A. *Efficient Realization of Environmental Goals and Priority Setting*

CBA does not necessarily help achieve environmental goals as cheaply as possible.⁸⁷ A cost-benefit criterion (costs should not outweigh benefits) largely determines what the environmental goal of a given regulation should be. It is "goal-determinative."

83. See, e.g., Richard A. Posner, *The Ethical and Political Basis of the Efficiency Norm in Common Law Adjudication*, 8 HOFSTRA L. REV. 487 (1980); RICHARD POSNER, *THE ECONOMICS OF JUSTICE* (1983) [hereinafter *ECONOMICS OF JUSTICE*]; Guido Calabresi, *The Pointlessness of Pareto: Carrying Coase Further*, 100 YALE L.J. 1211 (1991) [hereinafter *Pointlessness*]; Ronald Dworkin, *Is Wealth a Value?*, 9 J. LEGAL STUD. 191 (1980); JULES COLEMAN, *MARKETS, MORALS AND THE LAW* (1988) [hereinafter *MARKETS & MORALS*]. Cf. ROBIN P. MALLOY, *LAW AND ECONOMICS: A COMPARATIVE APPROACH TO THEORY AND PRACTICE* 34-38 (1990).

84. Recently, scholarship addressing efficiency goals has sometimes exhibited an almost palpable sense of exhaustion. See, e.g., James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. REV. 440, 482-83 (1995) (suggesting that "[m]aybe the game [of economics based on examining and reexamining the Coase "theorem"] doesn't justify the candle"). This may come from the fact that much scholarship has been done. But it may also reflect the absence of palpable connection between economic efficiency and any particular public goal, including as shown below, public economic goals. See generally, *Pointlessness*, *supra* note 83. Ecological economists have called for macroeconomic analysis of environmental problems. See, e.g., Herman E. Daly, *Elements of Environmental Macroeconomics*, in *ECOLOGICAL ECONOMICS: THE SCIENCE AND MANAGEMENT OF SUSTAINABILITY* 32 (Robert Costanza ed., 1991).

85. See PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 10 (describing how, between 1870 and 1950, neoclassical economics sidelined classical economics' concern with long-term growth patterns almost completely).

86. See generally, Jeff L. Lewin, *Toward a New Ecological Law & Economics*, in *LAW AND ECONOMICS: NEW AND CRITICAL PERSPECTIVES* 261 (Robin Paul Malloy & Christopher K. Braun eds., 1995) ("The validity of CBA becomes increasingly questionable when we consider long-term impacts or even short-term impacts on the economy.").

87. PEARCE, *NATURAL RESOURCES*, *supra* note 85, at 19-20.

However, if one already knows what the goal is and wants to determine the most cost-effective method of achieving that goal, there is no need to compare costs with benefits. One can simply compare the costs of various measures designed to meet the same clean-up goal and pick the least costly. CBA should not be confused with a cost-effectiveness analysis. CBA, as a practical matter, will siphon resources from efforts to make regulations more cost-effective into a complex analysis of what the goals of each regulation should be.

Some writers have criticized current environmental law for generating large expenditures of money on trivial problems.⁸⁸ A CBA requirement provides an extremely overinclusive and awkward remedy to this alleged problem.⁸⁹ If avoiding large expenditures on trivial problems is the goal, it would be more straightforward to pass laws taking these trivial problems off the environmental agenda. We already have laws that authorize agencies to delist pollutants that do not pose a risk.⁹⁰ These laws may do a far better job than a crude CBA because they use criteria that make sure that determinations are made with some rigor and place the burden of demonstrating the lack of a problem on the regulated party.⁹¹

A cost-benefit criterion offers too overinclusive a solution to the alleged problems of enormous expenditures on trivial problems. It bars spending large amounts of money on very serious problems if an agency determines that the expected costs "exceed" the expected benefits.

Additionally, most of the critics who claim that society spends too much on trivial harms also assert that it spends too little on serious harms.⁹² CBA will likely exacerbate this problem by tying up enormous resources in analyzing an entirely different question: how stringent to make a given regulation limiting pollution.

88. Justice Breyer has become perhaps the most prominent proponent of this view. See STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION* (1993).

89. See Lisa Heinzerling, *Political Science*, 62 U. CHI. L. REV. 449 (1995) (arguing that Breyer's views reflect just one side, the side that downplays the risk, of the scientific debate on cancer); Wirth & Silbergeld, *supra* note 1 (discussing Breyer's work in the context of the "regulatory reform" debate); Victor B. Flatt, *Should The Circle be Unbroken?: A Review of the Hon. Stephen Breyer's Breaking the Vicious Circle: Toward Effective Risk Regulation*, 24 ENVTL. L. 1707 (1994) (arguing that Breyer's analysis neglects important issues, such as damage to non-human life).

90. See, e.g., 42 U.S.C. § 7412(b)(3)(A) (1996) (authorizing delisting of hazardous air pollutants).

91. See, e.g., 42 U.S.C. § 7412(b)(3)(C) (1996) (requiring a showing that adequate data exists on the health and environmental effects of a substance to determine that emissions "may not reasonably be anticipated to cause any adverse" health or environmental effects).

92. See, e.g., BREYER, *supra* note 88.

The criticism that "society" spends too much on some problems and not enough on others seems to suggest that a decision to regulate an industry less stringently under a cost-benefit criterion somehow frees up private resources to attack a more worthy priority. But the resources private companies spend to abate pollution are not fungible with other private and public resources.⁹³ A government agency can legitimately write a regulation telling a company to clean up its own pollution. The expectation that we must prevent the harms that we cause lies at the heart, not just of environmental law, but of many other laws and religious traditions. Adopting a regulation requiring a single chemical company to build a library, fund an anti-smoking campaign, or remedy an environmental problem that competitors have caused (because "society" could best use these private resources in one or another of these ways) would pose serious equitable and constitutional problems.⁹⁴ Hence, application of a cost-benefit criterion to stringency determinations does not redirect private resources to more worthy environmental priorities; it just weakens some regulations.

The criticism that "society" spends too much on some environmental problems and too little on others can be understood as a criticism of the selection of items subject to agency action. In other words, it is a criticism of the priorities underlying the expenditures of taxpayer funds to write and enforce regulations. This prioritizing occurs

93. Professor Sunstein's views about the need for regulatory reform may reflect such a mistaken premise. He indicates that government should engage in better priority-setting. Sunstein, *supra* note 1, at 257. He cites "asymmetries" in dollars per lives saved amongst regulations as evidence of extremely poor allocation of resources. One would expect asymmetries in any regulatory regime requiring people to remedy (wholly or in part) the harms they create, because of variations in the cost of addressing various sources of harm. Since Professor Sunstein does not explain precisely who should prioritize and what criteria one should use to evaluate the widely different types of harms associated with the actions he discusses, it is difficult to evaluate his argument that a principle lesson from regulatory experience is that priorities are badly skewed. In the environmental area, the few substances that EPA has actually banned, such as lead and ozone depleting chemicals, seem to reflect very sensible priorities in almost everyone's estimation. Since government cannot legitimately command the makers of ozone depleting chemicals (for example) to improve highway safety, it is not clear just what he has in mind. *Cf. id.* at 258 (citing the disparity between the cost of transportation safety and environmental expenditures as evidence of poor prioritization). Professor Sunstein does not explain why CBA would help attain the goal of improved prioritization or why his remedy of more executive branch control over priority setting would improve it either. *See id.* at 297. *See also* Thomas O. McGarity, *Environmental Regulation and the "Cost-Benefit State": A Response to Professor Sunstein* (1996) (unpublished article, on file with the author) (arguing that Professor Sunstein's reliance on the numbers he presents without explaining the enormous uncertainties is "more than modestly misleading").

94. *See generally* *Nollan v. California Coastal Comm.*, 483 U.S. 825, 835 n.4 (1987) (one of the principal purposes of the Takings Clause is "to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.") (citations omitted).

primarily within Congress and agencies when they decide which pollutants and polluters will be regulated and when,⁹⁵ not in decisions about the stringency of particular standards. Accordingly, a belief that CBA should play a role in prioritizing the expenditures of government resources does not necessarily support the conclusion that it should also play a role in standard setting.

Some critics of regulatory priority setting identify a goal of regulating "worst things first." However, one does not need to compare cost-benefit ratios to accomplish this goal.⁹⁶ The advocates of CBA as a priority setting mechanism have not shown that a cost-benefit criterion should govern prioritizing activities.

B. *Economic Dynamism and Long-Term Growth*

CBA proponents usually justify their calls for CBA by arguing that the societal benefits of environmental regulations should outweigh their societal costs.⁹⁷ The law and practice of CBA treat the costs that polluters pay to comply with regulatory requirements as societal costs.⁹⁸ CBA assumes that imposition of costs upon existing polluters, whatever the environmental effects, causes a societal economic detriment. It equates the economic interests of polluters with those of society. This assumption of identity between polluter and so-

95. See, e.g., 42 U.S.C. §§ 7412(b),(c),(e)(2) (1996) (reflecting Congressional decisions about which polluters and pollutants to regulate and directing EPA to prioritize regulation according to effects, quantity and location of emissions, and efficiency of categorization for regulation). It is of course, theoretically possible to reassess priorities every time one writes a regulation. However, such a procedure would tend to substitute constant questioning of priorities for effective action on even the most pressing priorities.

96. For an evaluation of a closely related issue, whether comparative risk analysis should form the basis of priority setting, see Donald T. Hornstein, *Reclaiming Environmental Law: A Normative Critique of Comparative Risk Analysis*, 92 COLUM. L. REV. 562 (1992).

97. See, e.g., David Copp, *Morality, Reason, and Management Science*, in ETHICS & ECONOMICS 128, 131 (Ellen Frankel Paul et al. eds., 1985); 141 CONG. REC. S10392 (1995) (statement of Sen. Roth), S9995 (1995) (statement of Sen. Murkowski), S9674 (1995) (statement of Sen. Kyle).

98. See, e.g., H.R. 9, § 405(1) (defining cost to include costs "to the private sector"). In practice the agencies usually quantify the costs of pollution control as the societal costs. On a few occasions agencies have tried to justify a decision balancing costs and benefits on the grounds that societal costs are low, because some other product could substitute for the regulated substance. However, the courts have generally overruled them. See, e.g., *Asbestos Info. Ass'n v. OSHA*, 727 F.2d 415, 423 (5th Cir. 1984) ("The protection afforded to workers should outweigh the economic consequences to the regulated industry.") (emphasis added). While the law and practice of CBA in the area of pollution control usually treats polluters' costs as societal costs, it need not do so. See Copp, *supra* note 97, at 131-33. Cf. Robert W. Hahn & John A. Hird, *The Costs and Benefits of Regulation: Review and Synthesis*, 8 YALE J. ON REG. 233, 240, 244-45 (1991) (describing shortcomings of partial equilibrium analysis based on expenditure studies, but arguing that general equilibrium analysis is "still in its infancy").

cial economic interests produces a static approach to economic considerations.

The best justification for treating the polluter's cost as a societal cost may come from the proposition that consumers pay the price of pollution control.⁹⁹ There are several problems with this assumption. For example, producers may not always be able to pass on their pollution control costs to the consumer. Sometimes market conditions make this impossible.¹⁰⁰ Thus an argument that costs imposed on polluters produces a societal detriment because consumers end up paying is not always correct. The control costs may simply lessen corporate profits.¹⁰¹

More importantly, one cannot determine whether pollution control costs constitute a "societal" detriment by focusing only on the effects upon the welfare of customers and constituents of regulated corporations. If pollution control expenditures produce non-environmental economic benefits that offset the cost to polluters and/or consumers (in addition to whatever environmental and public health benefits they produce), then it is hard to see why the costs are "societal."

The imposition of costs on one industry may produce economic benefits in another. Pollution intensive products often compete in the market with products and services that pollute less while providing similar services to consumers. A pollution control cost imposed on a heavy polluter may well provide an economic boon to consumers and competing producers.

99. GOWDY & O'HARA, *supra* note 16, at 108. The neoclassical model's explanation for why costs to firms matter in equilibrium models tells us nothing about who bears them and whether they are widely shared. This explanation focuses on opportunity costs and relies upon an assumption that pollution control expenditures absorb monies that would otherwise be invested elsewhere to satisfy some consumer demand. See WILLIAM F. BAXTER, *PEOPLE OR PENGUINS: THE CASE FOR OPTIMAL POLLUTION* (1974).

100. Economists use a concept of price elasticity to address this problem. See GOWDY & O'HARA, *supra* note 16, at 108-09. Producers cannot pass production price increases on to consumers for highly price-elastic goods because charging more will simply cause consumers to substitute other products. *Id.* at 109.

101. Admittedly even if a widely held public corporation cannot pass pollution control expenditures on to customers, increased cost may affect a fairly broad group of people. If corporate stockholders' bear the costs then expenditures of widely held public corporations may affect large groups of people. If pollution control costs were significant enough to affect the investment decisions of a large number of firms, this could reduce the job creation and investment that large groups of people need. If the main effect of increased environmental expenditures is to reduce the earnings of wealthy corporate managers (whose salaries may be tied to earnings), owners of closely held corporations, sole proprietors, and a small group of wealthy stockholders, then those who believe that concentrated wealth benefits society in some fashion (strong proponents of trickle-down economics) may view these costs as societal costs. Nonetheless, the argument for considering pollution control costs as "societal costs" seems weaker when price elasticity prevents their transfer to consumers.

Consider energy services. When we refrigerate our food or wash our clothes we use electricity and appliances. The generation of electricity causes enormous pollution problems because we rely heavily upon coal fired power plants to generate electricity.¹⁰² Coal competes with energy sources that cause less pollution, such as hydropower, natural gas, windmills, and solar cells.¹⁰³ An increase in the cost of coal fired utility power generation caused by pollution control requirements may make competing sources of energy more competitive, thus increasing the revenues of producers of cleaner alternatives to coal.¹⁰⁴ Consumers may have to pay higher prices for the power generated with alternative energy sources than they would pay for power from uncontrolled coal power plants. However, this price increase may not last. The costs of competing alternative energy sources have fallen in recent years and will probably fall faster if economies of scale develop.¹⁰⁵ Imposing higher costs on old "dirty" production may lead to innovations that lower the prices of products from "cleaner" competitors.

Consumers may still avoid those costs even if the price of electricity generation remains high. The consumer's goal is not electricity consumption; rather, the consumer's goal is washing clothes and refrigerating food.¹⁰⁶ Electricity consumption is just a means to an end. The consumer may elect to purchase more efficient appliances that use less electricity.¹⁰⁷ If improved energy efficiency became even

102. See FEDERAL ENERGY REGULATORY COMMISSION, PROMOTING WHOLESALE COMPETITION THROUGH OPEN ACCESS NON-DISCRIMINATORY TRANSMISSION SERVICES BY PUBLIC UTILITIES (RM95-8-000) AND RECOVERY OF STRANDED COSTS BY PUBLIC UTILITIES AND TRANSMITTING UTILITIES: FINAL ENVIRONMENTAL IMPACT STATEMENT (1996); Addition of Facilities in Certain Industry Sectors; Toxic Chemical Release Reporting; Community Right-to-Know, 61 Fed. Reg. 33588, 33601-02 (1996) (to be codified at 40 C.F.R. pt. 372); PACE UNIVERSITY CENTER FOR ENVIRONMENTAL LEGAL STUDIES et al., ENVIRONMENTAL COSTS OF ELECTRICITY "THE PACE STUDY" (1990). See also Joseph J. Romm & Charles B. Curtis, *Mideast Oil Forever? Funding for Alternative-Energy Programs in the US May be Eliminated Because of Budget Cuts*, THE ATLANTIC MONTHLY, Apr. 1996, at 57.

103. See, e.g., Andrew C. Revkin, *Under Solar Bill, Homeowners Could Cut Electricity Cost to Zero*, N.Y. TIMES, July 25, 1996, at B1.

104. The price of energy sources affects utility decisions about what kind of plants to build and what kinds of fuels to use. Until recently customers could not choose among utilities. If this changes utilities may compete for customers based on the price of their energy production. See generally, Bernard S. Black & Richard J. Pierce, Jr., *The Choice Between Markets and Central Planning in Regulating the U.S. Electricity Industry*, 93 COLUM. L. REV. 1339 (1993); Richard D. Cudahy, *Purpa: the Intersection of Competition and Regulatory Policy*, 16 ENERGY L.J. 419 (1995).

105. See Julie Edelson Halpert, *Harnessing the Sun and Selling it Abroad: U.S. Solar Industry in Export Boom*, N.Y. TIMES, June 5, 1996, at D1.

106. See Ralph C. Cavanagh, *Least-Cost Planning Imperatives for Electric Utilities and Their Regulators*, 10 HARV. ENVTL. L. REV. 299, 315 (1986).

107. Consumers may have other ways of reducing electricity costs as well. See, e.g., Kia Shant'e Breaux, *Gadgets Ease the Sting of Electric Rates*, WALL ST. J., July 5, 1996, at B6

more important to consumers than it is now, perhaps because electricity prices rise, then appliance manufacturers might compete more vigorously to produce the most energy efficient product. This would eventually result in a decreased demand for electricity and a consequential fall in emissions from electricity generation. The effect may not be a cost to a consumer, but simply a cost to a producer offset by a benefit to a producer in another sector with an efficiency gain.¹⁰⁸

This example of how an increase in pollution control costs may lead to economic improvement, as well as indirect environmental benefits, is not unique. Indeed, one could demonstrate similar potential for economic improvement by imposing costs on many polluting industries that receive significant regulatory attention. The notion that increasing an industry's costs constitutes a societal economic detriment, a notion at the heart of CBA, may be wrong more often than not. Pollution control costs may prove beneficial or at least economically neutral to society.¹⁰⁹

The traditional "polluter pays" paradigm offers an economic advantage over a system based on cost-benefit balancing. This advantage becomes apparent once the economics are considered dynamically. The "polluter pays" principle demands that the producer clean-up to at least the minimum level necessary to protect human health and the environment, and then allows consumers to "vote," through purchase decisions, for productivity improvements and greater economic efficiency if the costs are too high.¹¹⁰ It assigns the task of fine-tuning the costs of regulation to the free market, rather than to regulators.

Furthermore, the "polluter pays" principle will tend to encourage investment in pollution-reducing technologies and in products that meet our needs with less pollution over time.¹¹¹ Since the world's

(discussing programs to allow consumers to lower costs by using appliances in "off-peak" hours "when rates are lowest").

108. I do not mean to suggest that such positive effects are inevitable, only that when one focuses on the polluters' cost alone, one has no means of evaluating societal costs. See, e.g., Stewart, *Competitiveness*, *supra* note 13, at 2062-67. There are perfectly good reasons not to include indirect effects in CBA. They are very difficult to measure and estimates may vary wildly depending on the choice of assumptions in econometric models. Accordingly, the difficulty in providing reliable economy-wide cost estimates argues not for refinement of CBA, but rather for using it only where it can be publicly debated and where it does not tend to misinform low visibility administrative decisions.

109. See generally, Barbara White, *Coase and the Courts: Economics for the Common Man*, 72 IOWA L. REV. 577, 593 (1987) [hereinafter *Coase & Courts*] (arguing that since one cannot predict the implications of a transaction throughout the economy, one cannot predict whether a transaction justified by traditional economic efficiency tests is, in fact, economically efficient for the society).

110. See generally, Westbrook, *supra* note 21, at 650.

111. Because the "polluter pays" principle generally demands more pollution control than cost-benefit criteria do, "polluter pays" statutes provide a greater incentive to im-

population is growing and industrialization is spreading, world demand for products and services that meet human needs with a minimum of pollution may increase in the future.¹¹² Hence, increased investment in less polluting (or non-polluting) approaches may enhance the export potential for American products and services that pollute less or reduce pollution.

C. Sustainability

Many worry, with good reason, that current patterns of resource use are not sustainable over the long-term.¹¹³ This concern is as much an economic concern as an environmental one. For example, many of the world's most important commercial fisheries have collapsed because of overfishing and pollution.¹¹⁴ The patterns of use in that case resulted not only in environmental problems, but also resulted in the loss of an important economic good: fish.

Economists have identified three "economic" functions that the environment performs. For instance, it supplies resources, as in the fish example above. The environment also assimilates waste, and provides direct utility (e.g., beautiful views).¹¹⁵ Together these functions amount to a life support system.¹¹⁶ Even if resource uses and waste disposal practices efficiently balance the preferences of today's consumers with today's costs, they may still lead to economic problems in the future if they impair this support system.¹¹⁷

prove technology. This article focuses on the part of environmental policy that CBA most directly affects: decisions about the stringency of standards. Other legitimate questions exist about what techniques one should use to meet various standards. The resolution of these questions may also affect the creation of incentives to develop and deploy pollution reducing technologies. Nonetheless, for any given set of techniques, the "polluter pays" principle provides much stronger incentives for developing and deploying technology than cost-benefit criteria.

112. See PRESIDENT'S COUNCIL, *supra* note 14, at 166.

113. See, e.g., PEARCE, NATURAL RESOURCES, *supra* note 55, at 20 (describing how severe ecosystem losses have accumulated in a matter of decades and this "neglect of sustainability constraints" could have irreversible consequences).

114. See LESTER R. BROWN ET AL., STATE OF THE WORLD 1995 21 (1995). This fisheries example is but one of the many examples of serious resource depletion issues facing the world. The annual State of the World reports contain many additional examples.

115. PEARCE, NATURAL RESOURCES, *supra* note 55, at 41. I address this problem as economic because this paper focuses on the economic rationale for CBA. For an approach to future generations that focuses on questions of intergenerational equity, see EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY (1989).

116. See PEARCE, NATURAL RESOURCES, *supra* note 55.

117. A number of economists regard reliance on markets or consumer preferences as inadequate for this reason. See, e.g., CHARLES PERRINGS, ECONOMY AND ENVIRONMENT: A THEORETICAL ESSAY ON THE INTERDEPENDENCE OF ECONOMIC AND ENVIRONMENTAL SYSTEMS (1987).

CBA assumes that polluters should not have to pay the full costs of preventing harmful pollution if the "prevention" cost exceeds the "effects" cost to today's consumer. However, economically, it may be better to have resource users pay more than the "effects" cost to provide incentives to conserve resources, especially when pollution or resource use may cause long-term degradation of the environment.¹¹⁸ This approach may encourage a shift from using nonrenewable resources to renewable resources,¹¹⁹ slow down the rate of harvesting a renewable resource to a pace that nature can keep up with, and encourage the use of materials that degrade into harmless compounds rather than accumulate in the tissue of plants and animals.

Ecological economists have articulated economic principles designed to capture sustainability that have little to do with allocative efficiency.¹²⁰ Today, many of the economists who work on environmental problems express fundamental skepticism about the capacity of neoclassical approaches to address sustainability concerns.¹²¹

We dump into the environment large amounts of material that might be useful if incorporated into products. If we want to encourage innovation to minimize the disposal of waste in the environment, we may want pollution control costs to be high, not low. This will maximize efficiency, in the sense of producing the maximum of

118. It may be better to accomplish this through taxation. But in the absence of adequate taxation, imposition of high control costs upon industries that use renewable resources or harvest at unsustainable rates may be economically justified for reasons having nothing to do with efficiency considerations.

119. See R. Kerry Turner, *Sustainability, Resource Conservation and Pollution Control: An Overview*, in *SUSTAINABLE ENVIRONMENTAL MANAGEMENT: PRINCIPLES AND PRACTICE 1*, 12-13 (R. Kerry Turner ed., 1988) (proposing resource conservation rules for realizing "efficient use of natural environmental assets" that encourage substitution of renewable for non-renewable resources).

120. See *ECOLOGICAL ECONOMICS: THE SCIENCE AND MANAGEMENT OF SUSTAINABILITY* (Robert Costanza ed., 1991); Daly, *supra* note 84. Economists have defined sustainable development as a maximization of net economic benefits while maintaining the services and quality of natural resources over time. See, e.g., Daly, *supra* note 84, at 44-45; PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 24. Ecological economists have developed the following economic principles for sustainability:

- 1) use renewable resources at rates less than or equal to their regeneration rate;
- 2) use non-renewable resources only at rates corresponding to the rates at which technological substitutes can be developed; and
- 3) keep waste flows into the environment at or below the environment's assimilative capacity.

Daly, *supra* note 84, at 44-45; PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 24. Some argue that using sustainability as the sole criteria for environmental decisions may involve trading off the quality of life for the duration of our survival. See PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 26. But CBA generally neglects sustainability altogether in favor of summing up hypothetical consumer preferences.

121. See, e.g., Redclift, *supra* note 16; Richard Norgaard, *Coevolutionary Development Potential*, 60 *LAND ECON.* 160, 170 (1984) (neoclassical models' assumptions are inappropriate to sustainability goals); Richard Norgaard, *Environmental Economics: An Evolutionary Critique and a Plea for Pluralism*, 12 *J. ENVTL. ECON. & MGMT.* 382 (1985).

goods with a minimum of material.¹²² Hence, a “polluter pays” principle is superior to a cost-benefit principle to the extent one views sustainability as a matter of primary economic importance.

D. Maximizing Employment and Competitiveness

Regulatory requirements produce economic benefits whenever they force polluters to pay people, either their own employees or contractors, to carry out pollution control.¹²³ Furthermore, these expenditures often generate blue collar employment,¹²⁴ which has been in short supply in recent years. Ironically, Congressional CBA supporters usually cite the need to avoid job destroying excesses in environmental regulations as a justification for the use of CBA.¹²⁵ Instead, empirical literature shows that environmental regulations, mostly the product of “polluter pays” statutes, have caused a small net increase, not a decrease, in jobs.¹²⁶

Environmental regulations may create expenses that can drive a company out of business and therefore cause job losses, like any other source of costs. Nonetheless, environmental protection generally creates jobs, by causing companies to hire people to carry out environ-

122. See generally, Daly, *supra* note 84, at 44-45 (suggesting that technological progress for sustainable development should be “efficiency-increasing rather than throughput-increasing”).

123. See generally E.B. GOODSTEIN, *JOBS AND THE ENVIRONMENT: THE MYTH OF A NATIONAL TRADE-OFF* 41 (1994). The myth that environmental protection destroys jobs has roots in celebrated controversies, such as the dispute over conserving old growth forests in the Pacific Northwest. Even in this case, recent empirical studies suggest that timber industry employment levels have little to do with the ability to log old growth timber from federal land and that conservation actually increases employment overall. See Michael Axline, *Forest Health and the Politics of Expediency*, 26 ENVTL. L. 613, 615-16 (1996); Cf. Slade Gorton & Julie Kays, *Legislative History of the Timber and Salvage Amendments Enacted in the 104th Congress: A Small Victory for Timber Communities in the Pacific Northwest*, 26 ENVTL. L. 641, 646-47 (1996) (not directly disputing this claim, but stating that Congress has authorized logging in the hope of restoring lost jobs and related economic benefits). A prominent group of economists have recently opined that “[r]egulation typically affects the distribution of employment among industries rather than the general employment level.” KENNETH J. ARROW ET AL., *BENEFIT-COST ANALYSIS IN ENVIRONMENTAL, HEALTH, AND SAFETY REGULATION: A STATEMENT OF PRINCIPLES* 8 (1996). Further, “[u]sually, any specific regulation has a very minor effect on either wages or employment in the industry to which it applies.” *Id.* at 9.

124. GOODSTEIN, *supra* note 123, at 7-8.

125. See, e.g., 142 CONG. REC. S3762-63 (1996) (statement of Sen. Grams); 141 CONG. REC. S9977-78 (1995) (statement of Sen. Dole); 141 CONG. REC. S9606-07 (1995) (statement of Sen. Hatch); 141 CONG. REC. H2261, 2270 (1995) (statement of Rep. Oxley). Indeed, H.R. 9, the principal regulatory reform bill in the House bears the title of the “Job Creation and Wage Enhancement Act.” H.R. 9.

126. GOODSTEIN, *supra* note 123, at 1.

mental protection.¹²⁷ Environmental regulatory costs probably account for fewer than one tenth of 1% of massive layoffs.¹²⁸

CBA does not separate job-creating from job-destroying regulations because a regulation's capacity to destroy or create jobs has nothing to do with the ratio between costs and benefits. Rather, a regulation is likely to destroy jobs only if the expenditures are so high as compared with the overall capacity of a company to spend money that it forces the company to cut costs by firing workers or closing down.¹²⁹ Even then, a rival company may expand production and hire more workers because its competitor has shut down or decreased production.¹³⁰ Until expenditures reach a level that produces these effects, higher costs will tend to generate more jobs rather than lower costs by forcing regulated companies to pay people to clean-up.¹³¹ While the ratio of cost to the firm's ability to pay has some effect on employment, the ratio of costs to benefits has nothing to do with employment.

A hypothetical example will illustrate the lack of relationship between cost-benefit considerations and employment concerns. Suppose that a company with revenues of \$1,000,000 a year must comply with one of two regulations, each causing \$10,000 in compliance expenditures. One of these regulations limits emissions of Dangerous, a chemical causing \$100,000 worth of damage and has a cost-benefit ratio of 1:10 (a \$1 cost yields \$10 worth of benefit). The other regulation addresses the chemical Mild, a chemical causing \$1,000 worth of damage and has a cost-benefit ratio of 10:1 (a \$10 cost yields \$1 worth of benefit). Each of these regulations generates jobs at this company in equal numbers even though the cost-benefit ratio of the regulation of Dangerous is much better than the cost-benefit ratio for the regulation of Mild because both have the same \$10,000 compliance cost.

Now, let us assume that these two regulations apply to a company with much less revenue. If the company cannot spend more than \$9,000 on environmental protection costs, then application of either regulation will drive it out of business. It does not make any differ-

127. A recent Wall Street Journal article reported that environmental services constitutes a 150 billion dollar industry. Timothy Aepfel, *Environmental Cleanup Business is Down in the Dumps: Swept by Consolidations and Layoffs, Some Companies are Forced to Innovate*, WALL ST. J., June 6, 1996, at B4. See also CURTIS MOORE & ALAN MILLER, GREEN GOLD: JAPAN, GERMANY, THE UNITED STATES AND THE RACE FOR ENVIRONMENTAL TECHNOLOGY (1994).

128. Aepfel, *supra* note 127.

129. See generally Roger H. Bezdek, *Environment and the Economy: What's the Bottom Line*, 35 ENV'T NO. 7, 9 (showing that environmental expenditures sometimes cause plant closures).

130. See *id.*

131. See, e.g., *id.* at 31 tbl. 4 (showing that jobs increase as environmental expenditures increase).

ence whether we apply the regulation with a favorable or an unfavorable cost-benefit ratio. Hence, CBA is not necessarily a methodology for avoiding direct job losses or maximizing job creation.¹³²

Some CBA proponents cite international competitiveness concerns,¹³³ which raise the specter of unemployment at home because of lack of competitiveness abroad, as a reason to favor CBA.¹³⁴ They suggest that American firms bearing environmental costs exceeding those of overseas competitors will have to reduce production or go out of business because foreign companies will be able to lower prices and steal their markets. The empirical literature suggests that environmental regulations usually produce little or no loss of competitiveness.¹³⁵ Environmental costs remain minor compared to other kinds of annual operating expenses affecting price competition for most industries.¹³⁶

Professor Michael Porter of the Harvard Business School has argued that appropriate stringent environmental regulation may enhance competitiveness by spurring innovations that may provide a

132. It would be an error to equate a "misallocation" of resources from an efficiency standpoint with a failure to pursue the maximum possible job increase. A neoclassical economist might consider an expenditure on environmental protection inefficient because resources expended on pollution control could better satisfy consumer demand if expended elsewhere. It does not follow, however, that the more efficient resource allocation (expending some of the money for pollution control on meeting some other consumer "desire") would be more labor intensive than the expenditure on pollution control equipment. To the extent one is concerned about job creation, and especially job creation for those who have a difficult time finding employment, one must evaluate empirically whether certain types of investment generate jobs and what kind of jobs. See, e.g., Cavanagh, *supra* note 106, at 320-21 (explaining that energy conservation projects offer more jobs than construction of electric power plants); EBAN GOODSTEIN, *ECONOMICS AND THE ENVIRONMENT* 117-18 (1995) (discussing methodological issues with examples). As indicated above, empirical data suggests that pollution control investments generally create blue collar employment.

133. See generally Stewart, *Competitiveness*, *supra* note 13.

134. See, e.g., 141 CONG. REC. S9650 (1995) (statement of Sen. Hutchison); 140 CONG. REC. H5748-49 (1994) (statement of Rep. Delay). Cf. 141 CONG. REC. S10215 (1995) (statement of Sen. Biden) (citing studies that show little correlation between regulation and lack of competitiveness).

135. See ADAM B. JAFFEE ET AL., *ENVIRONMENTAL REGULATION AND INTERNATIONAL COMPETITIVENESS: WHAT DOES THE EVIDENCE TELL US?* (1993); STEPHEN M. MEYER, *ENVIRONMENTALISM AND ECONOMIC PROSPERITY: TESTING THE ENVIRONMENTAL IMPACT HYPOTHESIS* (Oct. 5, 1992) (unpublished manuscript, on file with the author).

136. JAFFEE, *supra* note 135, at 33. The authors estimate that gross annual environmental costs constitute .62 percent of the total value of shipments from all manufacturing industries combined. *Id.* at 14. For some pollution intensive industries, costs reach 1.3 to 1.8 percent of value of shipments. *Id.* at 14-15. Environmental costs constituted 7.5 percent of new capital expenditures in 1991. For chemicals, petroleum, pulp and paper, and primary metals industries, environmental costs run from 11 to 25 percent of overall capital expenditures. *Id.* at 14. The Jaffee study is more up-to-date than the empirical information in Stewart, *Competitiveness*, *supra* note 13.

competitive edge.¹³⁷ He cites examples where corporations eliminated costly materials and redesigned products to reduce costs in response to environmental regulation.¹³⁸ Porter argues that firms can actually "benefit from properly crafted environmental regulations that are more stringent (or imposed earlier) than those" their competitors face in other countries.¹³⁹

Professor Porter's argument forms part of a broader challenge to the traditional notion that competitive advantage derives from lowering the cost of production factors. Lowering wages and environmental standards is one example. Countries may compete by offering high wages, good education, and high environmental quality, because these things help draw talented people, spur the kinds of innovation needed for productivity growth, and increase demand for varied goods and services.¹⁴⁰ The evidence shows that competitiveness tends to be positively correlated with stringent environmental regulation.¹⁴¹ Professor Porter has argued that:

Detailed case studies of hundreds of industries, based in dozens of countries, reveal that internationally competitive companies are not those with the cheapest inputs or the largest scale, but those with the capacity to improve and innovate continually. . . . Competitive advantage, then, rests not on static efficiency nor on optimizing fixed constraints, but on the capacity for innovation and improvement that shift the constraints.¹⁴²

CBA has little to recommend it even for those convinced that environmental costs pose a threat to American competitiveness. This is because it allows the imposition of high costs that may reduce competitiveness if enough benefits accrue. CBA may also prohibit im-

137. See Michael E. Porter & Claas Van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSP. 97 (Fall, 1995); Michael E. Porter, *America's Green Strategy*, SCI. AM., Apr. 1991, at 168; MICHAEL E. PORTER, THE COMPETITIVE ADVANTAGE OF NATIONS, 647-49 (1990) [hereinafter COMPETITIVE ADVANTAGE]. See also MOORE & MILLER, *supra* note 127.

Professor Porter's critics do not dispute the fact that environmental regulation sometimes spurs innovation. See Karen Palmer et al., *Tightening Environmental Standards: The Benefit-Cost or the No-Cost Paradigm*, 9 J. ECON. PERSP. 119, 120 (1995). Rather, they argue, inter alia, that cost-saving compliance routes account for a relatively small dollar value. *Id.* at 127-28. They do not dispute the larger point of this subsection of the article, that environmental costs have relatively little negative impact on competitiveness. *Id.* at 130.

138. See Porter & Van der Linde, *supra* note 137, at 101-04.

139. See *Id.* at 98.

140. See generally, COMPETITIVE ADVANTAGE, *supra* note 137.

141. See MEYER, *supra* note 135. Nobody has proven that this correlation between economic growth and stringent regulation reflects a cause and effect relationship; it may or may not do so.

142. See Porter & Van der Linde, *supra* note 137, at 98. See generally, COMPETITIVE ADVANTAGE, *supra* note 137 (providing detailed case studies and more fully articulating Professor Porter's general theory).

posing costs on manufacturers without significant foreign competition (or with ample advantages to bear significant costs without losing out) that would have beneficial environmental effects. Cost-benefit criteria have little relationship to employment (long-term or short-term) or competitiveness.¹⁴³

E. Allocative "Efficiency"

Most academic CBA supporters assume that CBA enhances the allocative "efficiency" of environmental regulation.¹⁴⁴ This section addresses two matters. First, what does this claim mean precisely? Second, so what? Is efficiency an appropriate goal and is it so important a criterion that advancing this goal should displace the "polluter pays" principle?

1. Meaning

Economists who support CBA want to see that we have the optimal amount of pollution.¹⁴⁵ While many people would think that means zero pollution, many economists mean something different by this phrase. Economists argue that clean air and water are amenities, just like other products we purchase on the market.¹⁴⁶ In order to obtain these amenities, society must spend resources and forego other possible expenditures.¹⁴⁷ In order to know whether one is spending the right amount on these amenities society must make sure that we are paying a cost equal in value to the "effects cost," sometimes called the social cost of pollution.¹⁴⁸

A cost-benefit criterion may ensure that the "prevention cost" (the price of environmental controls) never exceeds the "effects cost" (the economic value assigned to the harm avoided by a proposed prevention expenditure).¹⁴⁹ The notion that a polluter should pay the "effects cost" rather than the "prevention costs" comes from the theory that taxation is the means of incorporating externalities into pricing. Literature in economics strongly supports charging a "Pigovian" tax (after the economist Pigou) equal in value to the social cost of the externality (e.g. the environmental and public health damage or ef-

143. See Palmer et al., *supra* note 137, at 130-31 (arguing that competitiveness effects are small, but that one should measure the economic attractiveness of environmental programs through a cost-benefit test).

144. See WILLIAM J. BAUMOL & WALLACE E. OATES, *THE THEORY OF ENVIRONMENTAL POLICY* 23 (1975) [hereinafter BAUMOL & OATES, *THEORY*].

145. See BAXTER, *supra* note 99.

146. *Id.* at 12.

147. *Id.* at 10-12.

148. See GOWDY & O'HARA, *supra* note 16, at 104-108.

149. PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 62-64.

fects cost) associated with production.¹⁵⁰ Accordingly, the notion that a regulation might impose a cost exceeding the "effects" cost bothers those accustomed to thinking in terms of the Pigovian tax as a solution to externality problems.¹⁵¹ Pigou himself did not state that the incorporated cost of a regulatory program should represent the effects cost or the prevention cost.¹⁵² He simply explained that the divergence between private cost and social cost might justify governmental intervention including regulation, taxes, or bounties.¹⁵³

CBA proponents claim that balancing costs and benefits is economically efficient using efficiency defined in the sense advanced by the economists Kaldor and Hicks.¹⁵⁴ Kaldor-Hicks efficiency posits that a change in a situation that creates enough wealth for a winner to fully compensate the loser is "efficient" whether or not the loser actually receives compensation.¹⁵⁵ The change from a situation without pollution control to a situation with pollution control only allows citizens benefitting from the change to compensate the losing polluters if the "effects" cost (the benefit) outweighs the "prevention" cost (the cost).¹⁵⁶ Hence, having polluters pay more than the "effects" cost is inefficient in the Kaldor-Hicks sense.

In order to treat pollution as something that has an economic cost, rather than just bad effects, one must imagine a free market where the right to pollute is bought and sold. One must imagine this because in the real world environmental and health effects have no price. If we assume that polluters have a right to pollute, then citizens, absent transaction costs, might pay polluters to reduce pollution.¹⁵⁷ Economists assume that citizens would be willing to pay no more than the "effects" cost, which presumably reflects the value of the reduced pollution to them.¹⁵⁸ Hence, charging a polluter a cost

150. See, e.g., BAXTER, *supra* note 99, at 59-110.

151. See Coase, *supra* note 67, at 41.

152. Pigou pointed out that the divergence between private and social costs might justify imposing taxes on products that harm people, such as alcohol. A. C. PIGOU, *THE ECONOMICS OF WELFARE* 192 (4th ed. 1932). He then goes on to note that "when the interrelations of the various private persons affected are highly complex, the Government may find it necessary to exercise some means of authoritative control . . ." *Id.* at 194. He cites land use regulation as an example, since "it is . . . necessary that an authority of wider reach should intervene and should tackle the collective problems of beauty, of air and of light . . ." *Id.* at 195.

153. *Id.* at 192.

154. See MISHAN, *COST-BENEFIT*, *supra* note 61, at 162 (referring to Kaldor-Hicks efficiency as a potential Pareto improvement). See also Tribe, *supra* note 53, at 71 (describing Kaldor-Hicks efficiency as the intellectual underpinning of CBA).

155. See MISHAN, *COST-BENEFIT*, *supra* note 61, at 162.

156. PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 88-91.

157. Coase, *supra* note 67.

158. *Project*, *supra* note 34, at 566.

equal to the effects cost seems "efficient" because it duplicates a free market outcome.

The "polluter pays" principle treats the cost of reducing pollution as a "production factor," something the polluter must pay for as part of the cost of manufacturing a product.¹⁵⁹ The market for pollution control techniques determines the price, just as the market price of an essential piece of machinery must become part of the production price. CBA converts the control cost from a production factor into the price of a separate "consumer good" consisting of an environmental improvement.

2. *Is Kaldor-Hicks Efficiency an Appropriate and Important Policy Goal?*

Scholarly critiques of "efficiency" as a policy goal suggest that it may be an inappropriate goal or a trivial enough goal to command few, if any resources. The section below will discuss the problems with accepting Kaldor-Hicks efficiency as an appropriate and important policy goal in this context.

It is not at all clear that public decisionmaking should reflect the aggregate of private preferences—the constituents of efficiency—even if it could.¹⁶⁰ There are at least two reasons that this may be inappropriate. First, economic efficiency is not a normative criteria.¹⁶¹ There is no obvious philosophical basis for saying that a particular economically efficient result, one representing a summation of individual preferences, is either desirable or undesirable.¹⁶²

Second, collective decisionmaking should focus on a collective definition of values, rather than a summation of private preferences.¹⁶³ Such a collective definition of goals allows for the give and take of debate, learning, changing of positions, and development and conservation of shared values, something that a summation of costs

159. See generally GOWDY & O'HARA, *supra* note 16, at 37-56, for a brief description of the role of production factors in the theory of the firm.

160. SAGOFF, *supra* note 15. See also Cass R. Sunstein, *Endogenous Preferences, Environmental Law*, 22 J. LEGAL STUD. 217, 254 (1993); *Pointlessness*, *supra* note 83; Dworkin, *supra* note 83. MARKETS & MORALS, *supra* note 83, at 93 ("Every economic notion of efficiency is of derivative and limited use in the public policy arena."); Daniel A. Farber, *Environmentalism, Economics and the Public Interest*, 41 STAN. L. REV. 1021 (1989) (book review) (disagreeing with some of Professor Sagoff's views, but agreeing that there is no "magic formula" for determining the appropriate level of environmental protection).

161. See SAGOFF, *supra* note 15, at 99-107 for a fuller explanation.

162. *Id.* The economics literature makes similar points. See, e.g., PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 4 ("[I]t cannot be argued that neoclassical economics and its Paretian value judgments are 'worse' or 'better' than any other economic doctrine.").

163. See SAGOFF, *supra* note 15, at 114-45; Tribe, *supra* note 53, at 99. Cf. Carol M. Rose, *Environmental Faust Succumbs to Temptations of Economic Mephistopheles, or, Value by Any Other Name is Preference*, 87 MICH. L. REV. 1631 (1987) (questioning the worth of distinguishing between values and preferences).

and benefits does not take into account.¹⁶⁴ Even before this debate occurs, people's own private preferences (what they think will benefit them) often vary from their public values, what they think the society should be like.¹⁶⁵ For example, a person may prefer a tax deduction on a second or third home because she believes it will benefit her, but oppose it in a collective debate about what kind of society we want, because her values suggest that society needs to feed the hungry, reduce the budget deficit, or build prisons more than it needs to satisfy her preferences. Our view of what society should be like reflects more than the aggregate of our individual desires as consumers. It reflects a combined vision of our values and interests.¹⁶⁶

Third, decisions producing Kaldor-Hicks efficiency do not have the virtues associated with free market exchange.¹⁶⁷ A genuine free market exchange leaves parties to a transaction better off. This is why people freely consent to exchanges. When economists state that free market exchange is efficient, they do not mean that it is Kaldor-Hicks efficient (i.e. apt to produce losers, but also producing bigger winners). Instead, they mean that it is "Pareto optimal." By this economists mean that free market exchange is capable of making both parties better off and therefore induces consent by all directly involved.¹⁶⁸ Kaldor-Hicks efficient decisions lack the attractive consensual welfare enhancing features of a free market exchange.¹⁶⁹

164. See generally, Lawrence H. Tribe, *Ways Not to Think About Plastic Trees: New Foundations for Environmental Law*, 83 YALE L.J. 1315 (1974); SAGOFF, *supra* note 15, at 118-23; Farber, *supra* note 160, at 1043 (agreeing that CBA is "fundamentally misused to provide technocratic solutions to fundamentally political questions" while faulting Sagoff's failure to develop a more comprehensive view of the public interest). Professor Rose argues that private preferences are educable. Rose, *supra* note 163, at 1636. This may be, but CBA treats them as fixed. See generally, Alexander Rosenberg, *Prospects for the Elimination of Tastes From Economics and Ethics*, in ETHICS & ECONOMICS 48 (Ellen Frankel Paul et al. eds., 1985).

165. See SAGOFF, *supra* note 15, at 65-67.

166. Professor Frank Michelman made a similar argument in a lecture in the late 1970s. See Frank I. Michelman, *Politics and Values or What's Really Wrong with Rationality Review?*, 13 CREIGHTON L. REV. 487, 508-11 (1979).

167. See Gary Lawson, *Efficiency and Individualism*, 42 DUKE L.J. 53 (1992).

168. JEFFRIE G. MURPHY & JULES L. COLEMAN, *PHILOSOPHY OF LAW: AN INTRODUCTION TO JURISPRUDENCE* 187 (1990) ("When economists talk about efficiency they almost invariably mean Pareto optimality. When lawyers who advocate economic analysis talk about efficien[cy] . . . it is considerably less clear" to which efficiency concept they refer).

169. Richard Posner has tried unsuccessfully to provide a normative basis for Kaldor-Hicks efficiency by arguing that it tends to maximize wealth. See Richard A. Posner, *The Ethical and Political Basis of the Efficiency Norm in Common Law Adjudication*, 8 HOFSTRA L. REV. 487 (1980); *ECONOMICS OF JUSTICE*, *supra* note 83, at 88-115; Jules L. Coleman, *Efficiency, Utility, and Wealth Maximization*, 8 HOFSTRA L. REV. 509 (1980) (critiquing Posner); *MARKETS & MORALS*, *supra* note 83, at 95-132; Guido Calabresi, *About Law and Economics: A Letter to Ronald Dworkin*, 8 HOFSTRA L. REV. 553 (1980); Ronald Dworkin, *Why Efficiency? A Response to Professors Calabresi and Posner*, 8 HOFSTRA L. REV. 563 (1980). Even those who are persuaded that wealth maximization should

Allowing harmful pollution levels may injure people. Nonetheless, CBA rationalizes allowing those injuries and death where "control" costs would exceed "effects" costs, even when victims receive no compensation for the harm the pollution causes.

No compelling reason exists to make allocative efficiency the sole or even dominant goal of a regulatory system. Even if a cost-benefit criterion serves the allocative efficiency goal, it seems to disserve far more important economic values.¹⁷⁰ This section has discussed several of these more important goals: the creation of jobs; sustainable economic growth over the long-term; and the stimulation of economic innovation. The "polluter pays" principle may well serve these important economic values better than a cost-benefit criterion. The principle theoretically leads to stringent demands that may stimulate innovations aimed at producing what society needs with less pollution. The "polluter pays" principle also creates more certainty about what the regulatory system will demand than a cost-benefit criterion would. Stable, health protective goals make it very likely that investments in less polluting technologies will pay off.

The "Invisible Hand" of the free market may match goods to an individual's wealth and preferences more efficiently than other systems could. However, except where the allocation of goods and services affect something more fundamental, such as people's health or their jobs, many allocation issues are economically marginal. While there may be a need for some economic tradeoffs in environmental policy, it does not follow that administrative cost-benefit criteria has any strong economic value.

III DO REGULATORY COST-BENEFIT CRITERIA THEORETICALLY PRODUCE GREATER ECONOMIC EFFICIENCY THAN A "POLLUTER PAYS" PRINCIPLE?

Does the rule that each regulation's costs may not outweigh its "benefits," the rule proposed in S.343, at least advance allocative efficiency? Let's rephrase this question using more accurate terminology

be the goal of public policy cannot justify cost-benefit criteria in the environmental area on that ground. CBA treats the avoidance of pain and death as costs exceeding the value of medical treatment associated with illness, lost productivity, and funeral costs. The actual pain of illness and the human loss from death are not economic costs. Copp, *supra* note 97, at 148. Decline in environmental quality is also treated as a cost, even aside from its effects on wealth. These features mean that CBA may not maximize wealth, but actually involves some balancing between wealth enhancement and other things people value.

170. See PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 27 (stating that economists only work with economic efficiency as a goal even though they acknowledge that many other important goals exist).

capturing what the law actually means by costs and "benefits." Does it advance allocative efficiency to adhere to a rule that harms should continue unless their economic value outweighs the polluter's prevention costs?

This section examines three questions relevant to this problem. First, does this rule provide, in theory, the "optimal" amount of pollution, as defined by economists, assuming that regulators can duplicate market valuations of the relevant costs? Second, can we reasonably expect regulators' valuations of environmental harms to resemble consumer valuations that form the theoretical predicate for the allocative efficiency prediction? Finally, are transaction costs high enough to make a regulatory regime based on this rule theoretically inefficient?

A. The Mismatch Between Regulatory Cost-Benefit Criteria and Optimal Pollution

The theory of allocative efficiency requires that the amount of pollution coincide with a balance between prevention and effects costs. If the law imposes prevention costs exceeding effects costs, then we have too little pollution. Polluters are incurring too much prevention cost for too little effect. This is allocatively inefficient. The regulation fails to provide enough benefit to the consumer to offset the cost to the firm. If on the other hand, regulators permit pollution with effects cost that exceeds the prevention cost, we have too much pollution. This is also allocatively inefficient.¹⁷¹ The decision to allow pollution fails to produce enough benefit for the polluter (foregone control costs) to offset the harm to the consumer from the pollution. Thus, in order to produce allocative efficiency the right balance is the one that matches prevention costs with effects cost.

Environmental law typically addresses an individual pollution problem, such as urban smog, through a series of regulations demanding reductions from multiple pollution sources because most negative environmental and health effects come from the combined impact of numerous pollution sources in different industries.¹⁷² The discussion below examines whether our cost-benefit criterion produces optimal pollution by analyzing its theoretical impact on individual rules and on the pollution problems addressed through these multiple rules.

171. See BAUMOL & OATES, THEORY, *supra* note 144, at 23 (misallocation of resources fixed by charging price equal to the social cost).

172. See, e.g., 42 U.S.C. §§ 7412, 7511a (1996).

1. *The Matching of Costs and Benefits in a Single Regulation*

We begin by assuming that the world has only one polluter and the EPA will write only one regulation. In this simplified world, one cannot use allocative efficiency to justify the CBA rule.¹⁷³

The rule that prevention cost may not outweigh effects cost addresses one theoretical impediment to realizing the equalization goal by disallowing regulations that result in prevention cost exceeding “effects” cost. However, the rule fails to address the alternative problem—regulations whose effects cost *exceed* prevention costs. Regulators regularly craft laws that allow future harms—an effects cost—that exceed the costs of preventing them. For example, EPA may forgoe reductions that would protect public health and the environment because of concerns about industry opposition, marginal cost effectiveness, technological availability, and economic hardship to a regulated industry. Theoretically, these overly lax regulations are as inefficient as a hypothetical regulation that meets citizens’ demands for better health and environmental quality but is too costly.

The ideal system is aimed at what economists describe as the “optimal amount” of pollution—the amount that rational consumers would allow if they could purchase reductions on the open market. Regulations that allow prevention costs to be lower than benefits (i.e., effects cost) are allowing more than the optimal amount of pollution, as economists define that optimum.¹⁷⁴ A cost-benefit criterion may justify allowing a loss of pollution reductions in a system that sometimes generates more reductions than a cost-benefit criterion would yield to protect public health and the environment. But the only justification for a rule that allows “underregulation” while forbidding “overregulation” relative to an optimum is a political preference for polluter interests over other interests.

173. BAUMOL & OATES, *THEORY*, *supra* note 144, at 48.

174. Using the word “benefit” to describe the “effects” cost is misleading. It may interfere with an intuitive grasp of the point that low prevention cost is a problem in a system devoted to neoclassical allocative economic efficiency. Substituting the more accurate term “averted harm” for the term “benefit” may help. Prevention costs are too low when the harm to the consumer exceeds the costs companies would have to pay to alleviate that harm.

One could also flip the terminology around entirely to make the correct technical analysis more intuitive. Every cost to the polluter produces a benefit for the consumer and every benefit for the consumer comes from a cost to the polluter. One could say that when regulators require *too little* pollution control, the costs exceed the benefits, meaning the cost to the consumer of allowing pollution has exceeded the benefits to polluters.

Professor Coase offers yet another way to think about this in his seminal article *The Problem of Social Cost*. He would compare the harm to the citizen (from the pollution) to the harm to the polluter (of abatement). Coase, *supra* note 67, at 2. This also makes it clear that a problem exists if “control” costs are too low.

This problem of the regulatory system demanding too little to be "efficient" may not be an idle concern. Available evidence suggests that the Clean Air Act, for example, may generate extremely low costs relative to benefits. EPA has tentatively estimated that investments of 523 billion dollars in Clean Air Act compliance over a twenty year period have produced between 5.6 and 49.4 trillion dollars in benefits.¹⁷⁵ While the marginal cost of realizing additional benefits may have been higher than the marginal costs in the actual regulations evaluated in the EPA study, an analytically correct allocative efficiency criterion likely would have required more control, not less cost, in order to bring about an appropriate balance.¹⁷⁶ After all, an additional expenditure of more than five trillion dollars would still have left control costs lower than benefits under the Clean Air Act.¹⁷⁷

This problem of the lack of correspondence between the principle that costs should not exceed benefits and the principle that costs should equal benefits has a simple fix. One could specify that costs must equal benefits. This would work in theory for many regulations that might otherwise fail to realize "optimal" reductions. However, one could not match prevention and effects costs without additional taxation authority if the effects cost of a zero emissions requirement exceeded the associated prevention cost.¹⁷⁸ For example, in some cases the government would have to tax the polluter and impose a

175. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *THE BENEFITS AND COSTS OF THE CLEAN AIR ACT, 1970 TO 1990*, at 2 (April 1997 draft). See also MCGARITY & SHAPIRO, *supra* note 35, at 267-78 (disputing claim that OSHA overregulates).

176. It is also possible that costs in the future may prove higher than costs in the past. But the extreme imbalance in the past suggests that future costs must rise enormously to outweigh future benefits. Industry, of course, regularly alleges that the costs of proposed actions will exceed benefits. See, e.g., *Versions of Tighter Ozone Standard Could Cost Chicago Area \$14 Billion per Year, Study Says*, 27 ENV'T. REP. (BNA) 435 (June 14, 1996) (industry study shows very high costs with which EPA disagrees). Industry has not accurately predicted costs during regulatory proceedings in the past, so there is no reason to credit their estimates of future costs. See Part III.B.2.

177. Of course, these numbers are fraught with uncertainties, as EPA's report notes. EPA, *supra* note 175, at ES-4, ES-10 to ES-11. These uncertainties alone suggest that CBA should not be a basis for regulation. Indeed, it is unclear why information subject to such radical uncertainties has enough information value to inform decisionmaking processes, when the information underlying a CBA could be presented without the estimates of costs and benefits that give the illusion of certainty and have enormous potential to mislead. Those who think that CBA should have a role to play, however, must be willing to live with analysis based on government agencies' estimates of costs and benefits, such as that presented in EPA's report.

178. For example, suppose that a factory uses solvents that produce air and water pollution having a value of 10 million dollars. Suppose that an investment in a new process costing 5 million dollars could eliminate solvent usage (and hence pollution) entirely. A regulation requiring zero emissions would have an effects cost of 10 million dollars, but a prevention cost of 5 million dollars. Hence, to equalize the two, one would have to impose the zero emission regulation and impose a 5 million dollar tax.

zero emission obligation to make effects and prevention costs match.¹⁷⁹

In a world of one polluter, this theoretical inability of a regulatory system to match costs and benefits without taxation would not matter. In this world, matching costs and benefits would not make pollution levels more "optimal" anyway, since the added cost would produce no additional control over pollution because there is already a zero emission standard. Since the goal behind this matching is to produce optimal pollution, the zero emissions result would still be efficient even though there is a mismatch here of costs and benefits. However, this mismatch does matter in a world of multiple emission sources and regulations.

2. *The Multiple Regulation Problem*

Absent taxation authority, even a rule requiring zero emission standards where necessary to balance prevention and effects costs would not suffice to produce optimal pollution in a world of multiple emission sources and multiple regulations. An allocatively efficient solution in a pure regulatory system (*i.e.*, one without taxation authority) requires the regulator to relax the requirement that prevention costs may not exceed effects cost, so that the system can obtain equilibrium even if some regulations demand too little cost. Otherwise, the combination of some regulations with equalized costs and others with effects cost exceeding prevention cost will produce a net imbalance. The system as a whole will therefore produce more than the optimum amount of pollution.

An example from an imaginary free market illustrates this point. Imagine a group of asthma sufferers going to the only two polluters that exist with \$100,000 in hand, the value to them of eliminating the asthma.¹⁸⁰ They need 100 tons of reductions to breathe freely. They go to the first factory and discover that this factory can eliminate its pollution, providing fifty tons of reductions, worth \$50,000 to our sufferers, at a cost of \$10,000. They buy this reduction (it's a bargain!), but they still suffer from asthma. They go to the second factory seek-

179. Readers troubled by the inequity of taxing a polluter already required not to pollute at all through regulation should consider a parallel problem. Strict application of cost-benefit criteria requires an imposition of cost upon a company even after it has eliminated pollution in order to fully internalize the effects cost (when the effects cost exceeds the prevention cost associated with zero emissions). Similarly, a cost-benefit criterion imposes costs on citizens, in the form of continued pollution damaging their health and environment, even after the citizen has theoretically paid for environmental protection. Both consequences flow from holding the internalized cost equal to the cost of the "effects" rather than the prevention cost (when prevention cost exceeds effects cost). If one is really serious about matching costs and benefits, we must accept both outcomes.

180. This Article will assume the pollution has no other effects.

ing an additional fifty tons of reductions, but the manager says: "It would cost me \$80,000.00 to provide sufficient pollution control to reduce emissions by fifty tons. I won't be able to make a fifty ton reduction, because the cost (\$80,000) would exceed the benefit (\$50,000)."

Surely, the asthma sufferer would respond, "That's o.k. I have a budget of \$100,000, I have only spent \$10,000. I'd be happy to pay you the \$80,000 to relieve my suffering."

The manager replies, "No, I'm sorry. The prevention costs exceed the effects cost (the costs exceed the benefits). This is inefficient."

The manager's nonsensical answer precisely mimics a regulatory system that does not allow prevention costs to exceed effects cost (i.e. costs to exceed benefits).¹⁸¹ A first regulation addressing a problem may demand all that it can from a polluter. However, even if the costs of this first regulation are low, a legal rule that the costs of a regulation may not exceed its benefits prevents an agency from realizing additional benefits in a second regulation, thereby preventing the realization of the optimal amount of pollution from regulated companies.

In a system where pollution problems come from the aggregate of many different sources, as is true in the real world, a requirement that costs may not exceed benefits produces inefficiency (i.e., ongoing pollution serious enough to justify additional remediation) if any regulation has costs lower than benefits. Indeed this requirement may exacerbate inefficiency in the regulatory system as a whole.¹⁸²

Further, even an allocatively "efficient" regulatory system will not produce "optimal pollution" if it fails to address all pollution sources. The combination of a cost-benefit balanced group of regulated pollution sources and a group of sources emitting pollution that have no control costs will produce less than the optimal amount of pollution. Today's statutes still leave a number of significant pollution sources, such as non-point water pollution sources, mostly unregulated.¹⁸³

181. A similar irrational result occurs when agencies use marginal cost-effectiveness or cost-benefit analysis. Even if expenditures associated with a desired pollution control program are acceptable on average, regulators may adopt less ambitious programs because the marginal costs of the last tons of reduction are usually higher than the first tons. The regulated party receives the benefit of the very cheap initial reductions, but they are not balanced out by expensive reductions at the margin to provide a reasonable overall cost.

182. See generally, *Coase & Courts*, *supra* note 109, at 594 ("Economists have demonstrated rigorously that when constraints on efficiency . . . exist throughout the economy, applying policies to induce efficiency between *some* of the parties is not necessarily or even likely to be an economic improvement for society as a whole.")

183. See, e.g., *infra* Part I.E; 42 U.S.C. § 7412(n)(4) (1996) (generally exempting oil and gas wells and pipeline facilities from regulation even if their aggregated emissions create major sources of pollution).

The “polluter pays” principle proves more likely to produce the optimal amount of pollution than a system based on CBA for each rule. A rule that costs may not exceed benefits will only lead to optimal pollution levels if costs never are less than benefits and the government regulates all pollution sources. Cost-benefit criteria probably flunks a global allocative efficiency test; and there is no reason to expect legal cost-benefit criteria applied to individual regulations to produce more efficiency than a “polluter pays” principle.

B. Theoretical Problems With Administrative Valuation of Costs and Benefits

The claim that a cost-benefit criterion promotes allocative efficiency for any given regulation must include two premises. First, decisions based on *a priori* consumers’ valuation of potential averted harms will yield efficient outcomes, in the Kaldor-Hicks sense. Second, bureaucratic evaluations of costs and benefits will approximate relevant market valuations.

In fact, accurate mimicking of *a priori* consumer valuations will prove systematically inefficient, in a Kaldor-Hicks sense, at least for pollution causing serious health effects. Administrative valuations will tend to greatly underestimate environmental benefits (relative to consumer valuations), and exaggerate environmental costs for perfectly understandable reasons. Refining valuation techniques will not fix these problems.

These problems have their roots in fundamental flaws in the theory of CBA, and the differences among the roles regulators, citizens and judges play in society, and realities of regulatory systems in a democratic society. I will examine the problems with valuation of averted harm and control costs in turn.

1. Calculating Averted Harm

Correct valuation of consumer preferences prior to a decision to allow some pollution with serious consequences cannot yield Kaldor-Hicks efficient results, because economic gains, no matter how great, cannot compensate a person for death or serious injury. Moreover, regulators’ valuations of costs will not approximate valuations truly reflecting consumer preferences because: at least some consumers will not be willing to accept a payment to put up with dirty air and water; pollution problems will often appear smaller than they really are because regulatory proceedings necessarily break these problems into smaller units amenable to meaningful regulation; and the expert opinions that form the basis of regulatory risk assessment are unlikely to

accurately reflect the public attitudes toward risk that would govern consumers' valuations in a hypothetical free market.

a. The Lack of Correspondence Between Consumer Preference and Kaldor-Hicks Efficiency

CBA rests on the assumption that those who benefit from an allocatively "efficient" arrangement can adequately compensate losers.¹⁸⁴ That is what Kaldor-Hicks efficiency means. However, one cannot adequately compensate for a loss of life or serious injury, as Kaldor himself evidently recognized.¹⁸⁵ With respect to loss of life, one cannot compensate the victim at all, for she no longer exists. While the tort system gives compensation to the victim's relatives, this arrangement does not meet the test of Kaldor-Hicks efficiency because the principle victim receives nothing. With respect to serious injury, while we use compensation in a tort system, many victims will not consider money as adequate compensation for becoming disabled or infirm.¹⁸⁶ Therefore, it is impossible to say that allowing any pollution causing death or serious injury is Kaldor-Hicks efficient.¹⁸⁷

CBA proponents seek to finesse this issue by asking whether somebody would accept a bribe to undergo a risk of death or serious injury. The answer to this question cannot establish Kaldor-Hicks efficiency. The question assumes that the consumer does not have perfect information about whether or not the pollution she accepts will kill her or make her ill. Accordingly, her acceptance gives no indication of whether the amount involved would adequately compensate her for her injuries.

Economic theory only predicts that a transaction based on perfect information will be allocatively efficient. It does not predict that pollution control decisions based on imperfect information will prove efficient. Designing a system that posits that pollution victims do not know who they are, systematically defeats efforts to achieve allocative efficiency.

CBA proponents endow citizens with precisely the right amount of information to try and justify regulatory CBA's valuations of benefits. Proponents assume that the citizen knows the risks associated with a given quantity of pollution and that CBA should evaluate how

184. See E.J. MISHAN: ECONOMIC EFFICIENCY AND SOCIAL WELFARE: SELECTED ESSAYS ON ECONOMIC ASPECTS OF THE ECONOMIC THEORY OF SOCIAL WELFARE 91 (1981) [hereinafter ECONOMIC EFFICIENCY].

185. *Id.*; Douglas MacLean, *Risk and Consent*, in RISK AND CONSENT 26 (Douglas MacLean ed. 1986); Nicholas Kaldor, *Welfare Propositions of Economic and Inter-Personal Comparisons of Utility*, 49 ECON. J. 549, 551 n.1 (1939).

186. MARKETS & MORALS, *supra* note 83, at 119 (1988).

187. See Kaldor, *supra* note 185 at 551 n.1; ECONOMIC EFFICIENCY, *supra* note 184, at 95-96.

much a citizen would pay to avoid the risk.¹⁸⁸ However, the citizen who knows the risks does not necessarily know the consequences to herself of accepting that risk. Imperfect information remains.

If citizens did have to purchase pollution reductions from polluters their valuations would reflect their own risk estimate, since they would not know who the pollution would actually kill or injure. Yet, economic theory does not predict that market transactions absent perfect information will prove efficient. So there is no reason to try to mimic an imperfect market by hypothesizing ignorance when one can hypothesize perfect information and assume that the victims know who they are.

The focus on risk systematically lowers benefits estimates to less than the value that perfect information would provide. This has great significance for environmental law, because CBA in environmental law uses risk assessment to estimate the "benefits."¹⁸⁹ The theory of economic efficiency cannot justify CBA based on probabilistic risk assessment. Instead, it may be used to justify full protection of public health from all pollution likely to kill or seriously injure anyone.

b. Consumers' Unwillingness to Accept Pollution

In order to argue that CBA promotes efficient outcomes, CBA proponents assume that CBA captures consumers' true preferences in a hypothetical free market.¹⁹⁰ The proposition that CBA enhances allocative efficiency rests on a claim that regulation is more efficient when the costs *to the consumer* of allowing additional pollution are less than the costs to a producer of preventing it. The notion that CBA has some relationship to consumers' preferences (and hence efficiency) requires an assumption that a regulator's valuation of effects cost approximates that of a rational consumer.¹⁹¹

CBA values the effects cost according to how much a citizen is willing to pay to avoid pollution.¹⁹² This necessarily involves hypothesizing a free market in which the polluter has a right to pollute. If the citizen has a right to a clean environment, on the other hand, then one would value the harm to the citizen based on what she would be willing to accept to allow the pollution. In other words, CBA treats clean

188. See, e.g., ECONOMIC EFFICIENCY, *supra* note 184, at 92.

189. *Project*, *supra* note 34, at 632-33.

190. ECONOMIC EFFICIENCY, *supra* note 184, at 95-96; Calabresi & Melamed, *supra* note 79, at 1125 (objective valuation is no guarantee of efficiency, since it does not necessarily equal the value to the purchaser).

191. Some proponents of CBA tend to assume that any consumer valuations that differ from those of bureaucrats are irrational. I show below in detail why this is not so Part III.B.1.b. See generally, K.S. SHRADER-FRECHETTE, *RISK AND RATIONALITY: PHILOSOPHICAL FOUNDATIONS FOR POPULIST REFORMS* (1991).

192. *Project*, *supra* note 34, at 566.

air and water as products that consumers must buy back from polluters.¹⁹³ An argument premised on polluter rights cannot sustain the claim that CBA is an appropriate method for producing allocatively efficient results, for the argument only holds (if it holds at all) for a novel and probably unjustifiable assignment of rights from citizens to polluters.

Regulatory cost valuations cannot approximate consumer valuations in a system where citizens have rights. Because pollution is widespread and poses risks of very serious illness, some consumers will likely refuse to sell their right to forbid pollution at any price.¹⁹⁴ Some citizens may simply regard clean water and air as essential and may not be willing to give up their rights by accepting a bribe to give up something so vital, even if some of these citizens would not or could not pay infinite amounts of money to get clean water or air.¹⁹⁵ These "holdout" citizens are not irrational. It is quite rational not to compromise something as basic to one's well being as health for a payment.¹⁹⁶ If we assume a rational citizenry with perfect information and a right to stop pollution, we would conclude that the correct price of pollution abatement is often unrestrained by anything other than the cost of control.¹⁹⁷ This looks much like the polluter pays system. It should not be too surprising if the polluter pays statutes, products of

193. See, e.g., PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 88 (the correct price of a Pigovian tax depends on whether we believe the polluter has a right to pollute); MISHAN, *COST-BENEFIT*, *supra* note 61, at 171 ("[T]he most a person will pay for a good is less than the least sum he would accept to forego it.").

194. See FRANCES CAIRNCROSS, *COSTING THE EARTH* 46-47 (1991) (reporting that some survey respondents state that nothing would compensate them for environmental loss, implying infinite value, and documenting discrepancies between willingness to pay and willingness to accept).

195. See generally, Mark Kelman, *Consumption Theory, Production Theory, and Ideology in the Coase Theorem*, 52 S. CAL. L. REV. 669, 679-80 (1979) (discussing the difference between opportunity cost income and realized income in consumption theory); MISHAN, *COST-BENEFIT*, *supra* note 61, at 171 (noting that the price a person will pay for a good is limited by her wealth, but that the price she may demand for foregoing a good "can be infinite"); Kennedy, *supra* note 53; MARKETS & MORALS, *supra* note 83, at 71 (Coase theorem predicts that allocation of property rights does not affect the allocation of resources, rather than a neutrality of pricing and wealth); PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 156-58 (discussing possible explanations of discrepancy between willingness to accept and willingness to pay); REINVENTING RATIONALITY, *supra* note 10, at 149 (discussing the significance of the widespread adoption of willingness to pay criteria in regulatory analysis).

196. Indeed, as explained above, rigorous application of economics' traditional perfect information assumption would produce an assumption that those who will suffer death or serious injury from continued pollution would know who they are and would not consent.

197. Because most pollution affects very large numbers of people, a polluter in a free market system with citizen rights can expect to pay at least the price of pollution control necessary to prevent harmful effects to human health (since there will likely be at least one holdout).

a democratically elected body, actually mirrored people's preferences, given the rights allocation that our society has traditionally used.

CBA may appear to have some theoretical ability to reflect consumer preferences in a system where polluters have a right to pollute.¹⁹⁸ Yet, a cost-benefit criterion (assuming regulators produce numbers less than infinity for pollution with potentially serious health effects) will produce inefficient outcomes in a system where citizens have rights.¹⁹⁹ Hence, CBA does not serve allocative efficiency in the abstract.²⁰⁰ It makes an implicit assumption that polluters have a right to pollute and a decision to give citizens less than they would have if

198. Robin Gregory et al., *Valuing Risks to the Environment*, 545 ANNALS OF THE AM. ACAD. POL. AND SOC. SCI. 54, 58 (1996) (“[U]sing the amount of money people are willing to pay to prevent a loss to assess its value is . . . almost certain to seriously bias environmental decisions” and lead to too little control of environmental hazards).

199. See generally BAUMOL & OATES, THEORY, *supra* note 144, at 9 (“[T]he issue of the existence of a general equilibrium solution . . . has given rise to a . . . body of materials. . . . It is possible also that the necessary or sufficient conditions for existence will themselves turn out to have basic policy implications.”).

200. Professor Coase has argued that the assignment of rights is essentially irrelevant to resource allocation issues for problems where real market prices define values. See Coase, *supra* note 67. A substantial literature exists questioning and working out the implications of Coase's article. See, e.g., Daniel Q. Posin, *The Coase Theorem: Through a Glass Darkly*, 61 TENN. L. REV. 3 (1994). The problem of widespread pollution poses issues beyond the scope of Coase's article. His claim that a unique efficient allocation of resources exists, regardless of property rights does not properly apply to the problem of widespread pollution.

Professor Coase analyzed transactions where the competing resource uses would produce goods that had a free market value. This value remained the same regardless of who received the right to use the resource, because the goods' value derived not from the allocation of rights to use the resource, but from the prices customers would pay for the goods. This feature of the problems Coase analyzed led to the conclusion that absent transaction costs, the producers bargain to reach the same efficient resource allocation regardless of the initial assignment of the right to use the resource. See MARKETS & MORALS, *supra* note 83, at 70. Since the economic values of competing resource uses remained constant regardless of rights allocations, the efficient allocation of resources did not depend upon the assignment of the rights. *Id.* at 70-71.

Coase's analysis does not apply to pollution problems, because clean air and water generally have no value in the free market. See *id.* at 73. The value that CBA assigns clean air and water (the product of using air and water resources for breathing rather than for production of commodities) depends upon the hypothetical assignment of property rights and therefore changes with the property rights assignment. Since the value of the resource use changes with property rights, so does the efficient level of pollution.

Under Coase's assumptions, an efficient allocation of resources may occur regardless of property rights assignment. However, it does not follow that an allocation of the right to use air and water will be unique and independent of property rights in a case of widespread pollution (unless all users seek to produce commodities instead of to drink and breathe). *Id.* at 76, 99.

Professor Coase analyzed resource allocation issues in a context where both competing users of a resource could forego its use. Coase, *supra* note 67, at 2-15, 41. But we do not have the option of foregoing breathing air or drinking water. See MISHAN, COST-BENEFIT, *supra* note 61, 134. At this time, dirty air and water are widespread enough problems that nobody has the ability to move completely away from them, as a practical matter. Because of these facts, even in a world of no transaction costs, the bargains Coase envi-

they had rights. The only possible justification for having a cost-benefit criterion displace laws protecting health derives not just from pursuit of allocative efficiency, but from a presumed creation of a right to pollute.²⁰¹

c. Disaggregation

A consumer and a regulator evaluate very different things when they look at pollution. A consumer wants to know how much she will suffer from the various environmental hazards she faces. If this consumer is fully informed and rational, she knows that she breathes in a combination of toxic chemicals and may eat and drink many others. These environmental insults come from an enormous variety of sources. For example, the air she breathes contains a mix of toxic chemicals from automobiles, factories, and consumer products (e.g., paint and shampoo).²⁰² Some of these compounds may cause cancer, neurological defects, and reproductive damage.²⁰³ Some of these same compounds will combine with sunlight and nitrogen oxides to form smog (tropospheric ozone), which causes asthma and other respiratory illness.²⁰⁴ She would know that air pollution, toxic waste sites, and water pollution may end up contaminating her drinking water.²⁰⁵ She would also know that she has several synthetic chemicals in her body permanently present at levels that may constitute a health risk for her offspring and herself, because of past pollution.²⁰⁶ She knows that chemicals may accumulate in the environment and pose risks far into the future.²⁰⁷ She would be concerned about the total combination of these chemicals.

sions will not take place, because health is too important to some people (as is the right not to be forced out of one's home).

201. Even if we view the valuation problem from the standpoint of risk rather than perfect information about the future, we can expect holdouts. Given the widespread nature of pollution problems and most people's averseness to risk, somebody will probably simply refuse to risk their health, even if the risk is small.

202. For this reason, the Clean Air Act now regulates all of these sources to some degree. See, e.g., 42 U.S.C. §§ 7412, 7511b(e), 7521 (1996).

203. These risks typically are associated with toxic pollutants.

204. See generally, NATIONAL RESEARCH COUNCIL, *RETHINKING THE OZONE PROBLEM IN URBAN AND REGIONAL AIR POLLUTION* (1991). Most volatile organic compounds that contribute to smog are also hazardous air pollutants.

205. Hazardous waste sites are regulated primarily to protect groundwater from possible contamination, and air pollution also can contribute to water pollution, thus creating unsafe drinking water. See JEFFREY G. MILLER & CRAIG N. JOHNSTON, *THE LAW OF HAZARDOUS WASTE DISPOSAL AND REMEDIATION* 3-4 (1996).

206. THEO COLBURN ET AL., *OUR STOLEN FUTURE: ARE WE THREATENING OUR FERTILITY, INTELLIGENCE, AND SURVIVAL? A SCIENTIFIC DETECTIVE STORY* 168 (1996); ROBERT V. PERCIVAL ET AL., *ENVIRONMENTAL REGULATION: LAW SCIENCE & POLICY* 146 (1992) ("[Two hundred] industrial chemicals and pesticides have been found in measurable amounts in human body tissue.").

207. COLBURN, *supra* note 206, at 168.

The regulator forced to justify a regulation in cost-benefit terms must focus on estimating the effects of the emissions she can potentially regulate at any given time.²⁰⁸ While real world effects result from the aggregate impacts of pollution from an enormous variety of sources in a variety of media. Regulators necessarily “disaggregate” these impacts by source in order to analyze the “benefits” of any given regulation.²⁰⁹

This disaggregation will produce underestimated benefits in theory. In order to separate the theoretical problem caused by the regulator’s need to disaggregate in order to function from the problem of uncertainty in estimating risk, we will assume perfect information and knowledge going beyond what normally exists. For example, suppose that prior to regulating petroleum refineries a regulator is evaluating a chemical that is a human carcinogen. Let us assume that we have reliable human effects data (we usually do not) showing that human beings only incur cancer if they breathe one ton of this chemical per year and that the average petroleum refinery only emits 500 pounds of this chemical. A regulator following cost-benefit principles may conclude that even very small costs will outweigh benefits and decline to regulate this chemical, since the chemical causes no effects (we’ll assume that cancer is the only problem). The regulator may make the same decision for a variety of industries. However, communities may still end up breathing in one ton or more of this cancer causing chemical a year even though only 500 pounds comes from any one industry. The total effects of this combination of chemicals may be far more devastating than any single chemical seen in isolation.

To deal with this, a rational fully informed consumer-economist would not evaluate averted harm by analyzing only one industry’s pollution. She would evaluate the harms she faces in the aggregate and then develop a budget to pay for widespread abatement. Hence, if she receives more than a ton of pollution, she would recognize that she may get cancer and value the health effect at some amount greater than zero. She would then value the “benefit” of one industry’s contributions to the harm based on some proportionality principal. For the fully informed consumer, the fact that almost all individual contributions are small would not result in a zero valuation. Hence, one

208. See generally, SHRADER-FRECHETTE, *supra* note 191, at 70-71 (describing a “contributor’s dilemma” in the evaluation of harms coming from multiple sources).

209. The failure to consider aggregate exposure probably creates particularly grave problems for communities with above average toxic exposure, which tend to be communities of color. See Kuehn, *supra* note 55; Israel, *supra* note 60. But this problem really affects everybody, since everyone faces some combination of different exposures. Recently a federal commission has recommended more consideration of aggregate effects. See THE PRESIDENTIAL/CONGRESSIONAL COMMISSION ON RISK ASSESSMENT AND RISK MANAGEMENT, FRAMEWORK FOR ENVIRONMENTAL HEALTH RISK MANAGEMENT 9-14 (1997).

may expect even a fully informed regulator using "disaggregation" to produce estimates of the value of averted harms (i.e. benefits) that are less than the estimates a fully informed consumer would make, assuming they made identical assumptions about synergies, effects of given levels of exposure, and other relevant variables.²¹⁰

d. Valuations in Conditions of Uncertainty

A regulator's valuation of risks will probably diverge from a consumer's valuations under conditions of uncertainty.²¹¹ The evaluation of health effects of discharges into the environment are often uncertain.²¹² EPA has no health effects information at all on approximately 70% of the toxic chemicals to which Americans are exposed.²¹³ EPA has enough adequate information to perform a complete health hazard assessment for fewer than 2% of commercial toxic chemicals.²¹⁴ For another 14%, sufficient information exists to perform a partial hazard assessment.²¹⁵ EPA usually has even scantier information on potentially important environmental effects.

EPA may well tacitly assign a precise value of zero to health or environmental effects about which EPA has little or no data (i.e. a normal case) while we can expect many exposed citizens to assign a high value to the same effect.²¹⁶ This divergence does not show that

210. This disaggregation problem goes beyond the simple effect of disaggregating multiple emissions of a single pollutant from multiple sources. Different pollutants may have combined effects that exceed the sum of each pollutant's effects. See *New Study Shows Combining Chemicals has More Effect on Endocrine System*, 19 INT'L ENV'T REP. 482 (BNA) (June 12, 1996) (combinations of pesticides have 160 to 1600 times the hormone disruption effect as the constituents of the mixtures alone).

211. Lisa Heinzerling, *The Commercial Constitution*, 1995 SUP. CT. REV. 217, 236 [hereinafter *Commercial Constitution*] ("Experts and laypeople tend to look at different things when they assess risk.").

212. See, e.g., Latin, *supra* note 11, at 1308.

213. WILLIAM H. RODGERS, ENVIRONMENTAL LAW 491 n.18 (2nd ed. 1994) (citing CONSERVATION FOUNDATION, STATE OF THE ENVIRONMENT: AN ASSESSMENT AT MID-DECADE 65 (1984)).

214. CONSERVATION FOUNDATION, STATE OF THE ENVIRONMENT: AN ASSESSMENT AT MID-DECADE 63 (1984).

215. *Id.*

216. *Regulatory Reform: Hearings before the Senate Committee on Governmental Affairs*, 104th Cong. 317 (1995) (statement of Linda E. Greer, Ph.D, Senior Scientist, Natural Resources Defense Council) ("EPA readily admits that" a risk assessment based program, like one based on CBA, will overlook non-cancer effects and ecological effects because adequate tools do not exist to quantify and rank these effects) [hereinafter Greer]. Dr. Greer points to the ban of the pesticide Dinoseb and the regulation of ethylene oxide as examples of regulations that would not go forward under CBA, because one could not quantify the number of deformed babies or sterilized men exposure to these chemicals will produce. Almost any EPA regulatory impact analysis (RIA) illustrates the agency practice of effectively writing off possible harms based on insufficient data. For example, EPA's RIA on petroleum refineries addressed creosols, which are listed hazardous air pollutants, by stating that "there is not sufficient evidence to support that these chemicals will cause increased cancer risks in humans" because there was "inadequate data or no data on

the consumer is irrational.²¹⁷ Absent good data, the effect may be very serious indeed, mildly serious, or minimal. An omniscient being would know the true effect, but the consumer, the EPA, and the scientist do not.²¹⁸ A rational consumer may also fear harms she poorly understands and over which she has no control.²¹⁹ Thus, a rational consumer will have a far different valuation of unknown health or environmental effects than the regulator.

The fact that the EPA lacks sufficient data to permit quantification of effects does not mean that serious effects are unlikely. Indeed, some of the most serious known pollution problems have received an implicit zero valuation in previous EPA risk assessments.²²⁰

human carcinogenicity." ENVIRONMENTAL PROTECTION AGENCY, *supra* note 175, at 152. Of course, inadequate data is as consistent with assuming that a chemical causes cancer in humans as it is with assuming that it does not. But an RIA statement like that effectively values the human health risk at zero. It may be a very serious health risk indeed, but unstudied. The document's discussion of non-cancer health effects can only be described as cursory, even though these include possibly serious neurological and reproductive effects. *Id.* The document also addresses the kind of ecosystem impacts that could occur, but fails to describe them with any specificity, probably because of lack of data. The document fails to discuss the impacts of several known pollutants from petroleum refineries at all. The point here is not that EPA did a bad job. The point is that these unknowns (assuming EPA did the best it could do with available data) would be highly valued by consumers, but written off by upper level management because they cannot be quantified and indeed cannot be concretely described qualitatively.

217. See William R. Freudenberg, *Risky Thinking: Irrational Fears About Risk and Society*, 545 THE ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCES 44 (1996) (differences between public assessments and expert risk assessments may reflect experts' blind spots or other difficulties with the high uncertainty of risk assessment). The author also points out that conservative assumptions in one part of an analysis often do not offset a "hidden flaw." *Id.* at 50.

218. See generally, Thomas O. McGarity, *Substantive and Procedural Discretion in Administrative Resolution of Science Policy Questions: Regulating Carcinogens in EPA and OSHA*, 67 GEO. L.J. 729, 734 (1979) [hereinafter *Science Policy*] (pointing out that even where correct answers exist in principle, the "truth is ultimately unascertainable in either the scientific or the legal forum").

219. *Commercial Constitution*, *supra* note 211, at 236.

220. For example, in declining to adopt a stricter standard for sulfur dioxide, which contributes to particulate formation, the agency stated that while "qualitative inferences from the available scientific evidence suggest some risk of 24-hour effects not identified in the more quantitative studies, current assessments suggest such risks would be small at concentrations at or below the present standard level." Proposed Decision Not To Revise the National Ambient Air Quality Standards for Sulfur Oxides (Sulfur Dioxide), 53 Fed. Reg. 14926, 14930 (1988). This statement about the lack of quantitative data justified a conclusion that the public exposed to air complying with the national ambient air quality standards for SO₂ and particulates provided an ample margin of safety. Less than a decade later, ample evidence existed to show that 64,000 people may die prematurely from heart and lung disease each year due to particulate pollution. NATURAL RESOURCES DEFENSE COUNCIL, BREATH TAKING: PREMATURE MORTALITY DUE TO PARTICULATE AIR POLLUTION IN 239 CITIES 1 (1996). Most of those people receive exposures below the national ambient air quality standards EPA had earlier found adequate. See *id.* at 2.

For a good example of how serious health effects may be extremely difficult to evaluate and quantify, see COLBURN, *supra* note 206. This book describes the potential threat to our reproductive systems from a wide variety of toxic chemicals now ubiquitous in small

Even if a regulator wanted to assign a non-zero value to a health or environmental effect about which little or no data existed, she could not do so without an unusually serious risk of reversal in court. The courts generally require substantial evidence to justify a regulation.²²¹ If regulators must follow a cost-benefit criterion, then using a non-zero value to justify a decision about a potentially serious threat that scientists have not studied extensively may well trigger reversal.²²²

Nor can an agency assign substantial weight to unquantifiable, but well known and demonstrably serious harm, without risking reversal in court under a CBA regime. For example, asbestos has caused health damage so massive that damage actions have driven companies manufacturing asbestos products into bankruptcy.²²³ The cost of damages from asbestosis alone, as measured by jury awards and settlements awarded to known victims and their survivors reached 1.2 billion dollars by 1986²²⁴ and is expected to exceed 31.7 billion dollars.²²⁵ Yet the Fifth Circuit Court of Appeals reversed EPA's

doses throughout the environment. Even well understood health effects may be neglected because their effects cannot be quantified. See *infra* notes 223-227 and accompanying text (discussing asbestos).

221. See, e.g., *Association of Data Processing Serv. Org., Inc. v. Board of Governors of the Fed. Reserve Sys.*, 745 F.2d 677, 683 (D.C. Cir. 1984).

222. Even with some substantial data, agencies have often experienced difficulty under the substantial evidence standard. See, e.g., *Dry Color Mfr. Ass'n v. United States Dep't of Labor*, 486 F.2d 98, 105-07 (3d Cir. 1973) (agency reversed for failing to identify which scientific studies supported its conclusion); *Asbestos Info. Ass'n v. OSHA*, 727 F.2d 415, 424-26 (5th Cir. 1984) (staying enforcement of emergency asbestos standard because agency inferred a short-term effect from long-term exposure data); *Texas Indep. Ginners Ass'n v. Marshall*, 630 F.2d 398, 411-12 (5th Cir. 1980) (OSHA finding that benefits of OSHA cotton dust regulation are "likely to be appreciable" insufficient to justify conclusion that benefits are proportional to costs); *Gulf S. Insulation v. United States Consumer Prod. Safety Comm'n*, 701 F.2d 1137, 1146 (5th Cir. 1983) (rejecting use of animal studies to predict human health effects). Cf. *Ethyl Corp. v. EPA*, 541 F.2d 1, 16-29, 31-32 (D.C. Cir. 1976) (regulating lead in gasoline), *cert. denied*, 426 U.S. 941 (1976); *Huls Am., Inc. v. Browner*, 83 F.3d 445 (D.C. Cir. 1996) (agency may rely on toxicity data from animal testing).

223. See, e.g., *In Re Joint E. and S. Dist. Asbestos Litig.*, 129 Bankr. 710 (S.D. & E.D. N.Y. 1991).

224. The RAND Institute has estimated that the average damages for an asbestosis claim equal \$54,000.00 excluding punitive damages. James S. Kakalik et al., *Variations in Asbestos Litigation Compensation and Expenses*, RAND INSTITUTE FOR CIVIL JUSTICE 30 (1984) [hereinafter RAND Study]. By 1980, litigants had settled 30,000 asbestos related claims. *Dunn v. Hovic*, 1 F.3d 1371, 1393-94 (3d Cir. 1993) (Weis, J., dissenting) (citing *In re School Asbestos Litigation*, 789 F.2d 996, 1000 (3d Cir. 1986)). The Rand Study estimates that 76% of all asbestos related claims involve asbestosis claims. RAND Study at v. Multiplying 30,000 (the number of settled asbestos related claims) by .76 (percentage involving asbestosis) by \$54,000 (the cost of an average asbestosis claim) yields a total of 1.2 billion dollars.

225. In 1990, at least 90,000 cases were pending involving asbestos claims. See *Dunn*, 1 F. 3d at 1394 (citing the Judicial Conference Ad Hoc Comm. on Asbestos Litig., Report to the Chief Justice of the United States and Members of the Judicial Conference of the

phaseout of asbestos under TSCA, a cost-benefit statute, in part because of reliance on unquantified benefits.²²⁶ The Court held that “[u]nquantified benefits can . . . permissibly tip the balance in close cases. They cannot, however, be used to effect a wholesale shift on the balance beam.”²²⁷

This decision is not aberrational under a cost-benefit balancing approach. The federal agencies carrying out mandates to protect the public health have been able to address serious harms only because standards of judicial review have traditionally reflected Congressional desire to protect public health and the environment from harmful pollution, even when the large number of sources make quantifying the effects of any particular pollution source, and therefore any particular regulation, difficult or impossible.²²⁸ A statute suggesting that Congress believed that EPA could precisely identify the environmental effects of particular regulations and assign them a particular weight to be balanced against costs, would doom most regulations for lack of sufficient data, even where harms are serious. This would cripple modern environmental law’s ability to compensate for common law’s fail-

United States (1991), *reprinted in* Asbestos Litig. Rep., Mar. 1991, at 22698, 22702-30) for an estimate of 90,000 claims and citing a 160,000 claim estimate in State Judges Asbestos Litig. Comm., *Megatorts: The Lessons of Asbestos Litigation* (July 21, 1992), *reprinted in* Mealey’s Litig. Rep.—Asbestos, Nov. 20, 1992, at B-1). In addition, asbestos experts estimate that 668,363 new claims will be filed by 2049. *Dunn*, 1 F.3d at 1294 (citing Eric Stallard & Kenneth Manton, *Estimates and Projections of Asbestos-Related Mesothelioma and Exposures Among Manville Personal Injury Settlement Trust Claimants*, 1990-2049, at 42 (Draft Nov. 9, 1992)). Multiplying the 758,363 claims (90,000 pending plus 668,363 cases projected) by .76 (percentage of asbestos related claims likely to involve asbestosis, *supra* n.224) by \$54,000.00 (the approximate value of an asbestos claim, *supra* n.224) yields 31.7 billion dollars. This estimate probably understates the financial cost, since it excludes cases filed between 1987 and 1989, fails to account for inflation since 1982, and uses lower estimates for components in the equation.

226. EPA did not quantify the economic costs of asbestosis, because the scientific data available at the time did not make it possible to estimate the precise amount of asbestosis that continuing production and use of the product would cause. 40 C.F.R. § 763 (1990). Hence, EPA faced a choice between deliberately understating the economic benefit of eliminating asbestosis and coming up with a number with no scientific foundation. For that reason, EPA elected not to quantify the benefit.

227. *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1219 (5th Cir. 1991). For a critique of *Corrosion Proof Fittings*, see Thomas O. McGarity, *The Courts and the Ossification of Rulemaking: A Response to Professor Seidenfel*, 75 TEX. L. REV. 525, 541-49 (1997).

228. See *Ethyl Corp. v. EPA*, 541 F.2d 1 (D. C. Cir. 1976) for an excellent example of this. *Ethyl* upholds an EPA decision to phase out lead from gasoline, an action that yielded enormous health benefits. The court rejected an industry argument that required data directly linking lead emissions from gasoline with specific health effects. *Id.* at 15. Instead, the court interpreted the Clean Air Act as requiring only that the emissions are potentially harmful. *Id.* at 16-20. *Ethyl* also held that lead emissions may be treated as potentially harmful even if they are only so when combined with other sources of lead emissions. *Id.* at 29-33. The court adopted this point of view because Congress had indicated that the Clean Air Act should protect people from harms resulted from cumulative impacts, even though science is normally incapable of linking any given source of emissions to a given magnitude of health effects. *Id.* at 16-33.

ure to adequately address serious harms having multiple sources. CBA may undo the relaxation of the common law's requirement that litigants link specific past effects to specific sources of pollution prior to pollution abatement.²²⁹

The Fifth Circuit's asbestos decision relied on a three judge plurality opinion in the Supreme Court's *Benzene* case, which creates substantial doubts about the ability of an agency to regulate potentially serious harms through a cost-benefit balancing statute.²³⁰ The *Benzene* Court rejected a regulation limiting occupational exposure to benzene, a potent carcinogen with an unusually robust database showing serious harm to human beings.²³¹ The plurality interpreted parts of the Occupational Safety and Health Act as requiring OSHA to prove that target levels of exposure posed "significant" health risks in the workplace, based on substantial evidence, even though the data available to the agency only directly addressed higher levels of exposure.²³²

Although the Supreme Court seems to have repudiated important aspects of the plurality opinion,²³³ the lower courts have generally placed a substantial burden of proof on implementing agencies in the decision's wake.²³⁴ Statutory cost-benefit criteria in combination with a burden of proof and a substantial evidence test would force an agency to value unquantifiable benefits as trivial, no matter how seri-

229. The causation requirements of common law make it impossible to address existing harms with environmental causes, when the science is inadequate to separate and identify the various sources of a health or environmental effect. Modern environmental law overcomes this problem by favoring prevention of pollution that has negative effects, without requiring proof linking particular illnesses of individuals to individual pollution sources. *See, e.g., Reserve Mining Co. v. EPA*, 514 F.2d 492, 528-29 & n.71 (8th Cir. 1975) (en banc) (explaining difference between causation of common law and remedial requirements of Clean Water Act); *Los Angeles v. NHTSA*, 912 F.2d 478, 490-99 (D.C. Cir. 1990), *overruled in part on other grounds* *Florida Audubon Soc'y v. Bentsen*, 94 F.3d 658 (D.C. Cir. 1996) (holding that environmental group has standing to litigate failure to evaluate environmental impact of rollback of fuel economy standards that could help alleviate global warming even though precise timing and scope of injuries cannot be determined). Indeed, the common law often fails even where science seems capable of showing that a particular pollution source causes individuals' illnesses. *See, e.g., JOANATHON HARR, A CIVIL ACTION* (1995) (suing companies dumping hazardous waste causing leukemia outbreak in town bankrupted plaintiffs' attorney).

230. *Corrosion Proof Fittings*, 947 F.2d at 1214.

231. *See Industrial Union Dept., AFL-CIO v. American Petrol. Inst.*, 448 U.S. 607 (1980).

232. *Id.* at 653.

233. *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 103 (1983) (holding that court must be "at its most deferential" when reviewing scientific determinations, citing dissenting and concurring opinions in the *Benzene* case). *See also* *Commission v. Florida Power & Light Co.*, 404 U.S. 453 (1972) (applying a more deferential approach to agency scientific decisions).

234. *See, e.g., Corrosion Proof Fittings*, 947 F.2d at 1214; *International Union v. OSHA*, 938 F.2d 1310, 1322 (D.C. Cir. 1991).

ous. In order to regulate, the agency would have to have enough detailed information to be able to rationally reach specific enough conclusions about the weight of environmental effects of particular levels of pollution from a discrete group of sources to claim that these effects outweigh a particular cost. In the normal case, where the science does not permit that kind of specificity, agencies will have extraordinary difficulty in coming up with non-arbitrary rationales for regulatory decisions, no matter how serious the effects contributed to by the regulated industry's emissions.²³⁵

One might think that environmental statutes that only require "reasonable" decisions, i.e., rationales that are not arbitrary and capricious, would permit assigning a precautionary value to an unstudied (or poorly understood) health effect pending provision of adequate data. After all, the lack of data makes the range of reasonable non-arbitrary actions broader, not narrower.²³⁶ Yet courts have imported the substantial evidence standard into judicial review even under statutes that provide for arbitrary and capricious review only. As a result, agencies may have to provide substantial evidence in order to regulate.²³⁷ Hence, agency culture, standards of judicial review, and judicial decisions compel agencies to give little weight to non-quantifiable benefits under a cost-benefit regime.

Consumers who may drink, eat, or breathe the pollutant analyzed by the regulator, treat the problem of uncertainty very differently

235. The plurality opinion in the *Benzene* case illustrates that judicial difficulties in understanding science may pose an enormous barrier, even under a statute that, on its face seems to demand health protection rather than balancing. The opinion reflects a complete inability to understand the very idea of benefits that are not quantifiable. OSHA explained that it rejected an industry claim that current benzene exposure levels would cause "at most two deaths out of 30,000 workers every six years" because, inter alia, "it is impossible to precisely quantify the anticipated benefits." *Indus. Union Dep't, AFL-CIO v. American Petroleum Inst.*, 448 U.S. at 654. The Court responded that "there are three possible interpretations of OSHA's reason for rejecting" the two deaths estimate. *Id.* It then gave three different interpretations that all involved doing precisely what OSHA said could not be done, quantifying, at least roughly, the number of deaths. *Id.* Finally, it gave the agency an example of how to proceed that assumed that the agency had data with which to predict the probability of death, when the agency had given every indication that such data did not exist. *Id.* at 655. See also MCGARITY & SHAPIRO, *supra* note 35, at 56 (citing this statement as "an ideal illustration of a confused approach to risk assessment. . .").

236. See generally *Science Policy*, *supra* note 218.

237. House Bill 9 specifically requires substantial evidence to justify any regulation. H.R. 9, § 422(b). But the D.C. Circuit, which has jurisdiction over national rules under most federal environmental statutes, apparently considers the arbitrary and capricious standard to require substantial evidence. See *Association of Data Processing Serv. Org., Inc. v. Board of Governors of the Fed. Reserve Sys.*, 745 F.2d 677, 683 (D.C. Cir. 1984); *Associated Indus. v. United States Dept. of Labor*, 487 F.2d 342 (2nd Cir. 1973); *Consumers Union of United States Inc. v. FTC*, 801 F.2d 417, 422 (D.C. Cir. 1986). Cf. *Corrosion Proof Fittings*, 947 F.2d at 1213 (concluding that the substantial evidence standard is different from the arbitrary and capricious standard).

from a regulatory agency anticipating legal challenges.²³⁸ Just as risk averse agency behavior may well cause the agency to value benefits minimally to avoid judicial reversal, many people's aversion to health and environmental risks may make them value unquantifiable risks very highly.²³⁹

The divergence between consumer valuations reflected in jury awards and settlements of asbestos tort actions and the weight the legal system gave asbestos under a cost-benefit regulatory regime illustrates the divergence between consumer and agency valuation. The jury awards and settlements for damages from asbestos may indicate, about as closely as we are ever going to know, how consumers value a set of environmental damages. Indeed, they are probably low, because they may not reflect the victim's views about the correct compensation, but reflect negotiated compromises and assessments of juries. They show that consumers valued the damage much more highly than EPA under pressure from the courts.

Consumers' rational valuations differ from those of a regulator responding to bureaucratic imperatives.²⁴⁰ Indeed, a consumer who accepted a regulator's zero valuation of many potential health and environmental hazards might be either irrational or poorly informed. Because absent an unusually complete data base, the regulator has no reason to think the value of non-quantifiable benefits is zero; the zero value typically reflects purely institutional considerations.

To sum up, administrative "benefit" valuations do not serve as a creditable proxy for consumer preference. An analysis of the relationship between rational informed consumer valuation of risks and bureaucratically rational regulatory valuation shows that CBA probably will not ferret out consumer preferences, the supposed foundation for CBA. The theory of CBA seems to provide an elaborate rationale that effectively overrides perfectly rational, albeit non-technocratic, consumer preferences and traditional conceptions of rights.

2. *The Cost Calculation Problem*

Studies comparing regulatory cost estimates with *actual* compliance costs show that regulators consistently overestimate costs.²⁴¹ The problem of cost valuation illustrates why the search for ideal

238. Hornstein, *supra* note 96, at 611-16.

239. See also Clayton P. Gillette & James E. Krier, *Risk, Courts, and Agencies*, 138 U. PA. L. REV. 1027, 1070-85 (1990) (explaining some of the reasons for the divergence between citizen and expert views about risk).

240. See generally, Gregory, *supra* note 198, at 56-57.

241. REINVENTING RATIONALITY, *supra* note 10, at 131 ("Not surprisingly, retrospective studies reveal a pattern of consistent before-the-fact overestimation of compliance costs."); Porter & Van der Linde, *supra* note 137 (estimates of regulatory compliance costs are systematically biased upward).

equilibriums should be considered too trivial a goal to justify a CBA approach. Even if an agency perfectly captured the cost of a regulation prior to promulgation, the very act of promulgating the regulation changes the cost.²⁴² The pre-promulgation cost estimates represent guesses based on a less robust market than will exist after an agency promulgates a regulation. Once an agency promulgates a rule, regulated companies will expect their managers to find the cheapest possible way of complying in a competitive market. If they use the technologies contemplated at the time of promulgation they will seek the lowest prices through competitive bidding. And if they can find a cheaper method of meeting the regulatory target, they will do so. Hence, the equilibrium that CBA tries so hard to capture disappears upon promulgation of a regulation.

C. Transaction Costs

In order to predict that CBA will be allocatively efficient, one must show that transaction costs are unimportant. In fact, CBA requires an extremely comprehensive and difficult analytical effort that takes enormous resources and saps agencies' abilities to comprehen-

For example, OSHA estimated the industry wide cost of a 0-1 part per million (ppm) vinyl chloride standard at nearly \$900 million. JOSEPH L. BADARACCO, JR., *LOADING THE DICE: A FIVE-COUNTRY STUDY OF VINYL CHLORIDE REGULATION* 52 (1985). But actual compliance costs for the 1 part per million standard turned out to be between \$200 and \$280 million. *Id.* at 55. The standard ultimately adopted required a 1 part per million level over an 8 hour average combined with a 5 parts per million standard averaged over 15 minutes. OSHA had also estimated that a far less strict standard, 10-15 parts per million would cost \$229 million. *Id.* at 52. The agency had greatly overestimated the costs, because it necessarily relied on industry estimates. *See id.* at 52.

Similarly, under the Clean Air Act's acid rain regulation, utilities have reduced sulfur dioxide emissions at a tiny fraction of the costs EPA projected at the time Congress amended the Clean Air Act in 1990. Martha M. Hamilton, *Selling Pollution Rights Cuts the Cost of Cleaner Air*, WASHINGTON POST, Aug. 24, 1994, at F1 (utilities estimated that acid rain reductions would cost \$1500 a ton during debate on 1990 Amendments to the Clean Air Act); *Comment & Analysis: An Innovation Gets Airborne*, FIN. TIMES, May 6, 1996, at 17 (allowances now selling for \$68.00 a ton). Some have claimed that the emissions trading scheme that applies to sulfur dioxide emissions accounts for the lower costs. This seems unlikely, since little trading has occurred so far. Most plants have made their reductions by using techniques that were known to be available when EPA made its initial cost estimates, installing scrubbers and substituting low for high sulfur coal. *See Driesen, Five Lessons*, *supra* note 7. If emissions trading does lower costs substantially and stimulates technological innovation, this will likely create a further disparity between agency cost estimates and the actual costs of regulatory programs, because the agency will have difficulty calculating how much trading will occur in advance.

242. Other problems compound this fundamental one. A regulatory agency must accept regulated parties' estimates of the cost of a new regulation, unless it can somehow find scarce contradictory information. *See REINVENTING RATIONALITY*, *supra* note 10, at 131-32. Professor McGarity outlines some recommendations to try to overcome systematic bias. His principle recommendation is for "cooperative" analysis, which he admits cannot work in many settings. Even if cooperative analysis reduces bias based errors, it may still be incapable of predicting future costs.

sively address environmental problems, which stem from numerous sources, including cumulatively significant, but small and difficult to regulate sources. During the analytical phase, judicial review of CBA, and remand of unsatisfactory analysis (which may be very common, because non-arbitrary CBA is so difficult) pollution continues unabated.²⁴³ Even if the outcome of the analysis is a perfectly efficient decision, the continuation of pollution from unregulated sources that agencies never reach because of the analytical effort may well defeat efforts to have the "optimum" amount of pollution. For example, one would expect CBA to cripple any effort to deal with non-industrial sources of water pollution (e.g., agricultural run-off) because they are so numerous and conducting a CBA for each would take extreme analytic effort. Yet these "non-point" sources constitute the most significant part of the problem.²⁴⁴ If a significant number of these sources remain unregulated, then we may not have optimal pollution levels in water bodies, even if we have perfectly efficient regulations for a handful of sources.²⁴⁵

We have extensive experience with cost-benefit criteria under TSCA and FIFRA. One must examine the experience with regulatory efficiency under these statutes in order to evaluate the transaction cost problems.²⁴⁶ Both FIFRA and TSCA have enormous potential to prevent pollution. Unfortunately, the cost-benefit balancing requirements in both statutes have helped paralyze their implementation, producing, not a series of finely balanced decisions, but a conspicuous failure to make decisions.

EPA's unsuccessful attempt to phase-out asbestos under TSCA, discussed above, came after more than a decade of studying the costs

243. For a detailed explanation of how risk assessment empowers regulated companies to gain substantial influence over regulatory outcomes because of the companies' ability to hire experts, see Kuehn, *supra* note 55, at 129-33.

244. See Robert W. Adler, *Addressing Barriers to Watershed Protection*, 25 ENVTL. L. 973, 978, 990 (1995).

245. See generally *id.* at 981-86.

246. Other experience is indirectly relevant as well. For example, numerous scholars have argued convincingly that regulation under "health" based standards has proved extremely slow because of the analytical, informational, and resource impediments to linking particular emissions with their health and environmental effects. See, e.g., Latin, *supra* note 11, at 1308-09; Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613, 1677-81 (1995); Kuehn, *supra* note 55, at 145-48. Congress has responded by relying more on technology-based regulation. Latin, *supra* note 11, at 1308-09; 42 U.S.C. § 7412(d) (1996). Latin points out that CBA imposes an even greater analytical burden than health based standards because the agency must link particular emission to particular effects and balance these estimates against costs. *Id.* at 1309-10 n.206. Indeed, CBA's requirement that effects be quantified dooms regulation of many potentially significant health problems. See *id.* at 1324-30 (citing experience of Consumer Product Safety Commission and OSHA).

and benefits of asbestos regulation.²⁴⁷ Asbestos is a comparatively easy substance to understand. It causes a “signature” disease, asbestosis, that distinguishes its effects on the population from that of other harmful substances. Cost-benefit requirements in TSCA have tended to paralyze implementation of the statute, as the long and unsuccessful effort to address asbestos illustrates.²⁴⁸

Ever since “Silent Spring,” Rachel Carson’s classic book describing how accumulations of toxics in the environment threatened birds and other living creatures, the public has been concerned about the accumulation of toxic substances in the environment in general, and pesticides in particular.²⁴⁹ Yet FIFRA has generated “an analytical treadmill which makes . . . forward progress strenuous if not impossible.”²⁵⁰ FIFRA has required EPA to balance costs and risks before it can ban or regulate a pesticide.²⁵¹ The statute required the EPA to analyze the health and environmental effects of older pesticides and to reregister those that are safe while banning those whose costs outweigh benefits.²⁵² Simply analyzing the health and environmental risks (the components of benefits under CBA) has paralyzed the agency.²⁵³

[T]he informational demands of risk analysis doom the regulatory process to a perpetual state of slow motion. . . . [A]fter 20 years collecting data to reevaluate the health and environmental effects of 19,000 older pesticides, EPA . . . had reregistered only 2 products²⁵⁴

247. See MICHAEL FRANCIS GAHEEN, *COST-BENEFIT ANALYSIS AND THE REGULATORY PROCESS: A CASE STUDY OF THE ENVIRONMENTAL PROTECTION AGENCY’S ASBESTOS BAN REGULATION, 1979-1991* (1995) (unpublished Ph.D. dissertation, University of Maryland) (on file with the author).

248. See Michaelson, *supra* note 9, at 1902 (“EPA is woefully inefficient at setting numerical limits for toxic substances” having set only 17 exposure limits in 20 years under TSCA); Wagner, *supra* note 246, at 1680. Other examples abound. See, e.g., SHEILA JASANOFF, *THE FIFTH BRANCH SCIENCE ADVISORS AS POLICYMAKERS* 207 (1990) (describing how scientific review of risk assessment led to protracted delays under TSCA).

249. See GAHEEN, *supra* note 247.

250. Donald Hornstein, *Lessons from Federal Pesticide Regulation on the Paradigms and Politics of Environmental Law Reform*, 10 YALE J. ON REG. 369, 422 (1993). See also *Hearings on Pesticide Safety Improvement Act of 1991 Before the Subcomm. on Dep’t Operations, Research and Foreign Agric. of the House Comm. on Agric.*, 102d Cong. 176 (1992) (statement of Erik Olson, Senior Attorney, Natural Resources Defense Council). FIFRA underwent substantial amendment in the 104th Congress. But the point here is the history of cost-benefit analysis, not whether FIFRA will continue to be dysfunctional.

251. See Hornstein, *supra* note 250, at 389.

252. See *id.*

253. *Id.* at 371. The paralysis that CBA creates reflects the combination of administrative procedure and detailed analytical requirements. See generally, *Deossifying*, *supra* note 35.

254. Hornstein, *supra* note 250, at 437-38.

EPA Special Reviews, designed to accelerate actions against especially dangerous pesticides, have taken from nine years to seventeen years to complete, since risk assessment became dominant in the mid-1970s.²⁵⁵

The FIFRA and TSCA experience also show that cost-benefit criteria create an incentive to withhold the information needed to better inform policymakers. TSCA authorizes the EPA to regulate the thousands of chemicals that are introduced into commerce every year. EPA has the authority to require testing of chemicals to try to determine their health effects prior to their introduction into commerce.²⁵⁶ Because the EPA may ban chemicals if health effects information shows that the environmental costs of a substance outweigh its economic benefit, industry has strenuously resisted most attempts to require testing.²⁵⁷ Industry has also falsified or distorted information to hide bad health effects when they are discovered.²⁵⁸ Cost-benefit criteria provides industry with additional incentives for this kind of behavior.

By contrast, EPA has been able to make some progress under some statutory provisions in the "polluter pays" statutes. Generally, decisions and actual progress tend to coincide with definite Congressional mandates respecting clean-up and the authority to make control decisions free from risk assessment and CBA.²⁵⁹

To sum up, administrative CBA will tend to defeat rather than advance allocative efficiency. Whenever pollution's effects are serious cost-benefit criteria systematically produce an increase in wealth insufficient to compensate the losers for the continuing pollution. CBA will tend to produce lower benefit valuations than those of consumers, overestimate costs, and cause agencies to make very few decisions in a world of serious environmental problems from a variety of sources.

These defects not only argue against a cost-benefit test, they show that requiring agencies to draft and consider CBA at the administrative level may well prove counterproductive. Most of the paralysis under FIFRA and TSCA occurred in the analytical phase, before any action was taken. So the analytical requirements alone may lead to

255. *Id.* at 438.

256. *See Perils, supra* note 39 (arguing that EPA should take more advantage of TSCA's information gathering capabilities).

257. *See Hornstein, supra* note 250, at 436-37. *See generally EPA's Asbestos Regulations, Report on a Case Study on OMB Interference in Agency Rulemaking by the Subcomm. on Oversight and Investigations of the House Comm. on Energy and Commerce, 99th Cong. 79 (1985).*

258. Hornstein, *supra* note 250, at 436-37 & n.395 (explaining why risk assessment creates "strategic incentives to avoid a serious scientific examination of 'true' levels of public health and environmental risk" and detailing falsification).

259. *See Driesen, supra* note 7.

paralysis. The failure of CBA to capture market valuations casts doubt upon the use of CBA to inform regulatory decisionmaking. To the extent that regulatory analysis will underestimate benefits and overstate costs, it will misinform decisionmakers.²⁶⁰

The argument that we need administrative CBA in order to realize the true desires of consumers in a world of scarce resources seems perverse. Public opinion polls consistently show that the public wants more stringent environmental regulation.²⁶¹ Yet an administrative cost-benefit criterion authorizes a politically unaccountable administrative agency to make environmental law less stringent. CBA seems designed to deny the fulfillment of known consumer desires, such as the desire for clean air and water, in return for a technocratic construct that tries to tell people that they do not want what they say they want.

IV

ECONOMIC DYNAMICS AND THE PLACE OF COST-BENEFIT ANALYSIS

The foregoing demonstrates that regulatory cost-benefit criteria neither advance important policy goals nor promote allocative efficiency, but lead to paralysis. Therefore, Congress should not require government agencies that promulgate regulations to use a cost-benefit criterion.²⁶² This in turn leads to two questions. First, does CBA have any constructive role to play in environmental decisionmaking? And second, how can we make environmental policy more dynamic, so that it advances important economic goals instead of reflexively minimizing short-term costs to regulated parties.

A. Congressional Consideration of Cost-Benefit Analysis

Many thoughtful proponents of CBA offer a limited claim for its usefulness: CBA can inform decisionmakers and enhance public debate.²⁶³ Whom should CBA inform? Can it enhance public debate? If so, how? If decisionmaking should be based on grounds other than cost-benefit ratios, why cost-benefit analysis, instead of an analysis geared to the factors that govern decisions? In addressing these ques-

260. Even those who are convinced that efficiency should be the governing principle of environmental policy and that we should have little or no further regulation because the costs of environmental protection are now exceeding benefits should not favor administrative CBA. It wastes taxpayers' money to endlessly consider regulations. If the case can really be made to stop certain classes of environmental regulation, that case should be made to Congress.

261. See Wirth & Silbergeld, *supra* note 3, at 1880; Buzbee, *supra* note 4, at 362 n.210.

262. A prominent group of economists recently stated that CBA is "neither necessary nor sufficient for designing sensible public policy." See ARROW, *supra* note 123, at 3.

263. See, e.g., *id.*; Leonard & Zeckhauser, *supra* note 55, at 34.

tions, we must bear in mind that resources used to conduct CBA will not be available for efforts to generate sorely needed information about the health and environmental effects of pollution or to develop public health protection. CBA does not create information in the same way that emissions monitoring, laboratory experiments, and epidemiological studies create information. Rather, CBA extrapolates from and orders already existing information. In order to decide whether the particular kinds of extrapolations CBA provides will prove useful enough to justify the time and effort spent generating them, one must examine the roles of various "decisionmakers" in the environmental lawmaking process.

Obviously, Congress should carefully consider all of the important advantages and disadvantages of its actions.²⁶⁴ Does it follow that CBA will help Congress? And does it follow that CBA will help agencies, which often implement statutes that already reflect Congressional appraisal of the advantages and disadvantages of particular decisions?²⁶⁵ The argument for *Congressional* consideration of CBA is much stronger than the argument for *agency* consideration of CBA, as explained below.

1. *Democratic Decisionmaking versus Technocratic Pretention*

a. *Administrative Cost-Benefit Analysis as an Evasion of Political Responsibility*

When Congress instructs an agency to decide whether or not to regulate depending on the results of CBA, Congress evades political accountability by substituting administrative for Congressional policymaking.²⁶⁶ Fortunately, most current environmental statutes reflect Congressional environmental policy decisions made at a sufficient level of detail to foster some political accountability. In the 1990 Clean Air Act Amendments, one of the most recent wholesale revisions of a major environmental statute, Congress made detailed decisions specifying which pollutants EPA would regulate, stating what level of reductions it would require (using actual numerical standards in some cases), choosing which polluters to regulate (sometimes through selection of categories, but in the acid rain program by listing

264. See Ackerman & Stewart, *supra* note 11, at 1353-55 (arguing that the question of the appropriate level of environmental protection is "the quintessentially political question" that the legislative process should answer); MISHAN, *COST-BENEFIT*, *supra* note 61, at 154 (defending CBA as an aid to decisionmaking by elected officials).

265. See, e.g., *American Textile Mfrs. Inst. Inc. v. Donovan*, 452 U.S. 490, 521-22 (1981).

266. See generally John S. Applegate, *Worst Things First: Risk Information, and Regulatory Structure in Toxics Substance Control*, 9 *YALE J. ON REG.* 277, 300-02 (1992).

specific generating units at specific plants),²⁶⁷ and effectively giving lower priority to some environmental problems by not requiring EPA to do much about them.²⁶⁸

By contrast, a mandate that EPA only regulate when CBA indicates that benefits exceed costs would represent a Congressional failure to make any tangible decisions. It would mean that Congress has not decided whether to limit pollution at all and had made no final decisions about which pollutants to limit, which polluters to regulate, or what level of reductions to demand. This would represent a reversal of an historic trend toward more detailed Congressional decisions and greater political accountability.²⁶⁹

Indeed, even the more open-ended provisions found in earlier environmental statutes involved more transparent and specific political decisions than a CBA mandate does. For example, when Congress requires EPA to list and regulate all pollutants that might damage public health so as to provide an ample margin of safety, Congress may not have decided exactly which pollutants it meant, who would have to make the reductions, or how much reduction it would demand, but it had made a decision to protect public health.²⁷⁰ Similarly, a decision not to address an environmental problem involves a specific decision; as would a decision to regulate in a manner that posed no significant cost to a company.²⁷¹ However, directing CBA

267. See 42 U.S.C. § 7651c(e)(3) (1996). Congress allowed facilities to generate more than these numerically assigned limits, but only if they secured emission "allowances" from facilities emitting less than they were allowed to emit. Hence, the provisions combine very specific legislating with flexibility for pollution sources. See generally, Note, *Emissions Trading to Reduce Acid Deposition*, 100 YALE L.J. 2707 (1991).

268. See Driesen, *Five Lessons*, *supra* note 7 (explaining that Congress has set specific limitations for mobile sources and electric utility emissions, and wrote a specific minimum phase-out schedule for certain ozone depleting chemicals). Congress listed 189 hazardous air pollutants and directed EPA to regulate them. 42 U.S.C. § 7412(b)(1),(c) (1996). Some federal and State statutes regulate many more than 189 pollutants. Congress, by leaving many pollutants off the list, effectively decided not to regulate them, at least for the time being. Congress did, however, authorize EPA to add pollutants to the list. See 42 U.S.C. § 7412(b)(2) (1996).

269. Howard Latin has pointed out, correctly, legislatures' severely limited knowledge, time, and attention. Latin, *supra* note 11, at 1300. The 1990 Amendments show, however, that Congress is capable of making more detailed decisions than has commonly been recognized, although obviously it will never be able to make an "ideal" number of detailed decisions.

270. See, e.g., *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130 (D.C. Cir. 1980); *NRDC v. EPA*, 824 F.2d 1146 (D.C. Cir. 1987).

271. Congress has in fact made some prioritizing decisions. For example, when Congress directed EPA to regulate 189 hazardous air pollutants under the Clean Air Act, it effectively decided not to regulate unlisted pollutants under that program, at least for the time being. Congress did, however, authorize EPA to add pollutants to the list, in order to allow adjustment to later scientific information. See 42 U.S.C. § 7412(b)(2) (1996). Similarly, the acid rain program only directly limits listed large electric utilities. It does not address smaller sulfur dioxide emission sources.

based decisionmaking represents an almost complete abdication of responsibility for decisions. This abdication disempowers the electorate from a meaningful role in environmental policy by transferring major decisions to unelected officials.

Requiring agencies to produce CBA without requiring them to rely upon it produces an equally serious but more subtle loss of political accountability. It allows Congress to claim that its statutory criteria protect public health while facilitating political pressure to force agencies to follow cost-benefit criteria instead.

b. Technocratic Pretension: Cost-Benefit Analysis Requirements as a Threat to Administrative Agency Legitimacy

CBA also undermines the legitimacy of administrative agencies by depriving them of a mandate sufficiently intelligible to allow them to function as implementers of a real Congressional policy.²⁷² CBA

272. A substantial body of legal experience suggests that administrative agencies lack sufficient political legitimacy to carry out broad open-ended policymaking. The electorate chooses people to make open-ended weighing of all relevant advantages and disadvantages.

Administrative agencies' technical expertise and lack of direct political accountability make them well suited to apply fairly concrete and specific criteria to a set of facts, with Congress supplying basic policy direction. *See generally*, Keith Werhan, *Delegalizing Administrative Law*, 1996 U. ILL. L. REV. 423, 424, 460; Richard B. Stewart, *The Reformation of American Administrative Law*, 88 HARV. L. REV. 1667, 1671-76 (1975); Keith Werhan, *The Neoclassical Revival in Administrative Law*, 44 ADMIN. L. REV. 567, 569-83 (1992); Thomas O. Sargentich, *The Delegation Debate and Competing Ideals of the Administrative Process*, 33 AM. U. L. REV. 419, 423-42 (1987); Theodore J. Lowi, *Two Roads to Serfdom: Liberalism, Conservatism and Administrative Power*, 36 AM. U. L. REV. 295 (1987); Richard B. Stewart, *Beyond Delegation Doctrine*, 36 AM. U. L. REV. 323 (1987). *Cf.* Jerry L. Mashaw, *Prodelegation: Why Administrators Should Make Political Decisions*, 1 J.L. & ECON. & ORG. 81 (1985).

As criteria become more open-ended, the agency's function becomes more similar to that of a legislature. The Constitution authorizes Congress to make law precisely to ensure that elected officials make fairly broad judgments about political policy. While delegating authority to make a cost-benefit based decision may not run afoul of the non-delegation doctrine, the concerns at the heart of the doctrine argue for more Congressional accountability, not less, as a matter of policy.

A mandate to balance costs and benefits does give agencies much more discretion than existing technology-based or health based standards, even under a narrow conception of CBA. Technology-based standards primarily involve a technical determination about whether a technology is available and technically feasible. Under the most open-ended of these provisions, the agency has discretion to determine that a technology that is technically feasible is too costly to be reasonably available. Even this seemingly open-ended criteria for taking cost into account tends to provide some guidance for the vast majority of cases. It would be difficult to argue that a technology that a number of firms have already used is not reasonably available because it is too costly.

Health based standards also require a technical determination, albeit a difficult and uncertain one, as to what level of protection is needed to fully protect public health. Under this kind of a standard, the agency cannot reasonably justify a standard at a level where serious health effects can be reliably predicted. The agency may be able to take costs into account in deciding how ample a margin of safety to create in the face of uncer-

tends to undermine an agency's reputation for expertise, by demanding that agencies make very precise pseudoscientific decisions from data that cannot support the required technocratic precision (but could support reasoned policy judgments by an elected body). The risk assessments that form the basis for CBA provides notoriously unreliable and unscientific "benefits" estimates, because the information rarely exists to predict precise consequences of discrete regulatory actions.²⁷³ CBA demands that the regulator do even more than determine what constitutes a safe level of pollution, she must decide precisely how safe or unsafe various levels are, pretend to know the costs of the regulation, and assign accurate weights, either implicitly or explicitly in dollar values, to various environmental effects. This amount of technocratic pretension will sap an agency's technical credibility.

A requirement that agencies consider CBA will undermine the agencies' legal credibility as well. Both the public and the courts expect administrative agencies to carry out the law, not make it up. This means agencies must base their decisions on the factors that the statute defining the implementation task makes relevant, not every possible factor.²⁷⁴ If Congress has determined that an agency should require, for example, the maximum achievable emission reductions,²⁷⁵ the agency should focus its resources on determining what is achievable, not waste time inquiring about the cost-benefit ratio of each regulation. Cost may be a factor in such an analysis.²⁷⁶ If the cost of a technology is so great relative to the resources of a group of regulated companies that it could not be implemented without forcing massive shutdowns, the technology may not be achievable within the meaning

tainty under some statutory provisions. CBA may appear to involve less agency discretion than the more open-ended technology and health based statutory provisions, because it tells the agency to make sure that costs do not exceed benefits. The most open-ended technology-based and health based criteria seem to allow consideration of costs, but are more vague as to how to consider them.

CBA is deceptive in this regard. CBA requires the agency to decide precisely how much value to give to human life, illness, and environmental degradation in all its many varieties. These determinations are more open-ended than the decision about whether a feasible technology is reasonably available or a margin of safety is ample. In addition, the same element of discretion that exists in deciding when a standard adequately protects human health exists in deciding which effects exist at what level of reductions. Furthermore, the same discretionary elements enter into evaluating the costs of technology in both CBA and technology-based standards. Hence, CBA is more than twice as open-ended as a technology or health based standard because it authorizes a cost judgment, a health effects judgment, and the agency weighing of the two.

273. See, e.g., REINVENTING RATIONALITY, *supra* note 10, at 143-52; Kuehn, *supra* note 55, at 133-39; Greer, *supra* note 216, at 315-18; SHRADER-FRECHETTE, *supra* note 191, at 95 (uncertainties of six orders of magnitude are not unusual in risk assessment).

274. Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402 (1971).

275. See 42 U.S.C. § 7412(d) (1996).

276. See *id.*

of a non-technology forcing mandate.²⁷⁷ However, determining the economic feasibility of a technology does not require a comparison of costs and benefits.²⁷⁸ It requires a comparison between regulatory costs and the economics of the regulated industry.²⁷⁹ Indeed, CBA will force agencies to use resources to perform risk assessments rather than to determine whether costs make a particular requirement unachievable.

Congress, not the implementing agency, is ultimately responsible for policy choices in legislation. It does not make much sense to require an agency to perform an analysis that the agency should really ignore to carry out its mandate.

c. Congressional Consideration of Cost-Benefit Analysis as a Builder of Political Accountability

Congress does weigh the advantages and disadvantages of possible decisions when considering legislation.²⁸⁰ Indeed, Congress often considers quantitative cost estimates and data about environmental

277. *Cf. Union Elec. Co. v. EPA*, 427 U.S. 246, 265 n.14 (1976) (literally, no plan is unfeasible, since a pollution source can always comply by shutting down). While *Union Electric* holds that Congress did not intend to allow feasibility considerations to affect EPA approval of State Implementation Plans under the Clean Air Act, it left open the possibility that statutory provisions with feasibility constraints may authorize the avoidance of massive shutdowns.

278. *See American Textile Mfrs. Inst. Inc. v. Donovan*, 452 U.S. 490, 530-31 (1981) (upholding agency finding that a cotton dust standard would not shut down the industry which was based on an analysis of cost factors in the industry without using CBA).

279. *Id.*

280. *See* H.R. REP. NO. 101-490, at 144-94 (1990), *reprinted in* 2 SENATE COMM. ON ENV'T AND PUBLIC WORKS, 103D CONG., A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 3021 (1993); S. REP. NO. 103-38, at 3168-218 (1993) (summarizing health problems the Act addressed and giving Title by Title cost estimates); 2 SENATE COMM. ON ENV'T AND PUBLIC WORKS, 103D CONG., A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 2454-556 (1993) (information about health effects and emissions trends); S. REP. NO. 101-228, at 1-9, 39-41, 90-91, 94, 111, 113-14, 122, 127-31, 186-88, 261-301 (1989), *reprinted in* 6 U.S.C.C.A.N. 3391 (1990) (detailed information about costs and benefits of various provisions in 1990 Clean Air Act amendments); *Donovan*, 452 U.S. at 521-22 (1981); *Center for Science in the Pub. Interest v. Department of Treasury*, 573 F. Supp. 1168 (D.D.C. 1983) (Congress has determined that the benefits of alcohol regulation outweighed the costs).

Professor Heinzerling has pointed out that Congress did not debate cost-benefit ratios when it enacted the acid rain control program under the 1990 Amendments. *See Selling Pollution*, *supra* note 18. However, congress can debate these considerations if it really believes in cost-benefit analysis. The lack of debate about the acid rain program reflects, in all likelihood, an unusually specific deal in which the utilities received emissions trading in exchange for fairly ambitious reduction targets. Although Congress did not discuss the economics of this in cost-benefit terms, the 1990 Amendments' treatment of acid rain does reflect consideration of economic issues. *See* 29 U.S.C. § 1662e (1996) (codifying provision in 1990 Amendments making eligible for transitional assistance those laid off because of compliance with Act).

and health effects when it develops legislation.²⁸¹ Certainly providing better information to Congress would help that process and enhance political accountability for environmental decisions.

CBA that purported to give each human life a dollar-value and quantify the precise effects of every decision would rarely meet the criteria of providing good information for a decision. When the data does not yield much precision, such an analysis simply misinforms the decisionmakers by substituting seemingly precise but terribly unreliable numbers for a frank recounting of the uncertainties that should inform public debate. While Congress does not and should not pretend to give each human life a precise dollar value or to quantify the precise effects of each of its decisions, Congress usually gathers significant information and remains politically accountable if it fails to adequately address anything the public really values, such as jobs and clean air and water.²⁸²

If CBA has the goal of informing public debate, then Congress, rather than administrative agencies, should consider CBA's results.²⁸³ Congressional deliberation is far more likely to draw public attention and to reflect responsiveness to public values, including public economic values, than arcane administrative rulemaking proceedings.

Congressional decisionmaking can accommodate a broad view of CBA. This Article has given the terms "costs" and "benefits" a discernible meaning, the meaning actually found in environmental law and practice. Without an *a priori* definition explaining, for example, that a polluter's costs should be treated as costs and not, say, contractor or competitor benefits (which we might want to maximize not minimize), we have no way of knowing what a cost is, no understanding of what CBA is, and no means of evaluating the utility of CBA. Indeed, CBA may owe some of its acceptance to its lack of clear meaning.²⁸⁴

281. Congress also considers CBA in approving specific construction projects. See *Mardis v. Big Nance Creek Water Management Dist.*, 578 F. Supp. 770 (N.D. Ala. 1983), *aff'd*, 749 F.2d 732 (11th Cir. 1984).

282. Indeed, when Congress passed the much praised emissions trading program for acid rain control, it recognized that the added flexibility it offered air pollution sources might lead to less employment. Electric utilities might well comply by using low sulfur coal, thus harming employment in regions where high sulfur coal is mined. In order to address this, Congress included appropriated monies and passed provisions designed to ameliorate negative employment impacts. See 29 U.S.C. § 1662e (1996).

Moreover, Congress debated the jobs impact of the Act. See, e.g., ENVIRONMENT AND NATURAL RESOURCES POLICY DIVISION, CONGRESSIONAL RESEARCH SERVICE OF THE LIBRARY OF CONGRESS FOR THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS U.S. SENATE, A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, Pub. L. 101-549, 104 Stat. 2399, at 748, 757, 793.

283. See MISHAN, COST-BENEFIT, *supra* note 61, at 154 (defending CBA as an aid to decisionmaking by elected officials).

284. For administrative CBA, the definition of CBA performs an essential function. It tells the administrative agency what it must analyze. Legislation that required agency use

One may, in theory, stretch the meaning of costs and benefits to take into account all advantages or disadvantages of the subject under analysis, not just costs and benefits as current law and practice define them.²⁸⁵ However, having a broad conception of CBA undermines the already weak argument for CBA's administrative use and strengthens the argument for its limited Congressional use. If CBA takes into account all important values, for example, the equitable values in claims for justice and claims that environmental policy should prefer job creation over job loss (which is different from balancing costs and benefits narrowly defined), its already meager claim to technocratic coherence disappears.²⁸⁶ Only a body that understands what society really values can properly weigh all of the competing considerations. In our society we expect bodies of elected officials to make policy choices using comprehensive balancing.

Congressional consideration of CBA, defined broadly to clarify rather than obscure the nature of evidence about various environmental, health, and economic consequences of decisions, advances values of democratic decisionmaking and avoids the vice of open-ended policymaking by unaccountable administrators.

2. *Sunshine, Accuracy, and Administrative Efficiency*

Administrative efficiency considerations also support Congressional rather than agency CBA. CBA for entire programs may be needed only once a decade or so, when Congress reauthorizes a statute. CBA for each regulation requires an enormous number of detailed analyses for a large number of individual actions.

An administrative agency is likely to overestimate the societal costs and underestimate the benefits of regulation relative to the valuations economic theory demands. For that reason, administrative CBA will probably prove a poor surrogate for the market CBA proponents seek to emulate. Will Congressional CBA prove any better?

Congress can make judgments treating potentially enormous environmental threats that are still poorly understood seriously without risking judicial reversal. By contrast, an agency cannot give threatened harms great value in a CBA system without risking judicial

of cost-benefit criteria without an *a priori* understanding of what costs and benefits are would transfer all legislative authority to an administrative agency.

285. See PEARCE, *NATURAL RESOURCES*, *supra* note 55, at 21 ("Supporters of extended CBA have adopted a 'value sensitivity' approach and have sought to incorporate non-efficiency decision criteria into their analysis.").

286. Some writers have expressed support for including distributional effects in CBA. See *Project*, *supra* note 34, at 574-75.

reversal, even if the potential environmental harm is great.²⁸⁷ In this respect, an administrative agency valuation is likely to deviate from that of citizens, who are likely to value unquantifiable risks very highly. Congressional decisions are more likely to reflect the valuation of the public.

Congress may lack the expertise that an administrative agency can bring to CBA, but Congress typically can and does rely on government agencies for critical information.²⁸⁸ Congress has access to a wide variety of governmental and private expertise. Indeed, it has already ordered EPA to prepare CBA to help it consider legislative revisions.

Supporters of CBA should favor CBA's consideration in Congress and reject its use by administrative agencies. Congress should repeal legislation demanding preparation of CBA in the regulatory process, at least for pollution control statutes, to allow agencies to focus their analytical efforts on applying governing statutory criteria to the facts before them, rather than a time-consuming rebalancing of costs and benefits. Even statutes like FIFRA and TSCA that have focused on balances between the costs to polluters and benefits to the public, could benefit from a refocus aiming at public, not private, economic considerations and relying less on scientifically dubious, probabilistic risk assessment. Such a change in focus in TSCA and FIFRA would enable the EPA to better protect the public from the risks of toxic chemicals and pesticides, especially when less polluting approaches to meeting consumer needs are available.

B. Beyond Administrative Cost-Benefit Analysis: Toward a More Economically Dynamic Approach to Environmental Policy

A cost-benefit test weakens protection of public health and the environment, undermines traditional notions of justice, and lessens political accountability without serving significant economic goals, or even an allocative efficiency goal. CBA may aid legislative decision-making, but is unhelpful in an administrative agency context. Environmental statutes authorize agencies to take cost into account in many situations even though they do not mandate CBA. Hence, rejection of administrative CBA does not necessarily imply a blanket rejection of cost considerations in regulatory proceedings.

287. See David Schoenbrod, *Goals Statutes or Rules Statutes: The Case of the Clean Air Act*, 30 UCLA L. REV. 740, 807-08, 815 (1983) (explaining that Congress, unlike agencies, may produce legitimate decisions without fine reasoning and factual findings).

288. See, e.g., S. REP. NO. 101-228, at 159, 186-87 (1989) (explaining how a Senate Committee relied on EPA's views about toxicity and cancer risks in preparing a list of toxic substances targeted for regulation in 1990 Amendments).

A comprehensive theory of how environmental law should address economic concerns lies beyond the scope of this paper, but the argument that long-term macroeconomic considerations deserve far more emphasis suggests a new approach to economic considerations for all of environmental law. We need to give more attention to important macroeconomic goals. Goals such as achieving a sustainable economic pattern, securing full employment, promoting efficient materials use, and encouraging environmentally friendly technological innovation to enhance our competitiveness deserve more attention. We need more thinking about how environmental policy can contribute to these goals. Instead, regulators, Congress, and many scholars have focused much of their attention on minimizing short-term costs, even when maximizing short-term costs might bring about more long-term economic improvement. For example, when the EPA regulates companies that use nonrenewable resources or companies that have significantly cleaner competition this may provide increased costs in the short-term. But in the long-term, such regulation may ultimately lead to cleaner companies that use renewable resources.

Rather than focusing on static and necessarily temporary ideal equilibriums, more attention should be paid to the long-term dynamics that produce economic growth and environmental improvement. A dynamic economic system that fosters innovation can meet general consumer desires, such as the desire for mobility, for energy, for healthy food, and for housing, through a variety of products and means. In general, dynamic innovations that meet human needs with a minimum of materials usage and waste creation may well increase long-term employment, lower long-term costs, and enhance sustainability, economic growth, and competitiveness.²⁸⁹ A cost-benefit regime might have prevented this ban on ozone depleting chemicals if the manufacturers of these chemicals could not defray their high costs by producing viable substitutes, even if fledgling competition could produce the substitutes.²⁹⁰

289. See generally PRESIDENT'S COUNCIL, *supra* note 14.

290. In fact, EPA and the Food and Drug Administration used the authority of TSCA and the Food Drug and Cosmetic Act to ban aerosol sprays in the late 1970s. This produced reciprocal actions on the part of other countries. See Orval E. Nangle, *Stratospheric Ozone: United States Regulation of Chlorofluorocarbons*, 16 B.C. ENVTL. AFF. L. REV. 531, 540-41 (1989). It does not appear that the TSCA decision was litigated. Later, EPA issued regulations under the Clean Air Act, in response to pressure from the environmental community. Elizabeth P. Barratt-Brown, *Building Monitoring and Compliance Regime Under the Montreal Protocol*, 16 YALE J. INT'L L. 519, 525 (1991). The successful American leadership in obtaining international bans on ozone depleting substances came about precisely because the Clean Air Act's emphasis on health protection, rather than CBA, may have required purely domestic regulation, absent an international agreement. This fact helped produce successful American leadership in obtaining international bans on ozone depleting substances. *Id.* at 525-26.

How can environmental law encourage the proper economic dynamic without unduly intruding on the free market? This Article will only suggest a few relevant considerations. Environmental law should produce a steady and predictable expectation of stringent demands for environmental improvement. A consistent demand for environmental improvement signals investors that investments in clean technology may prove profitable in the long-term.

The "polluter pays" statutes' goal of full environmental and health protection produces an expectation that innovations reducing pollution are likely to succeed in the market. In contrast, increased emphasis on CBA will probably create a situation where no economic actor will be able to predict whether the government will demand any further environmental improvement because the analytic requirements in CBA tend to produce paralysis and the eventual outcome of any analysis will be very unpredictable. This result would be an unfortunate one from an economic dynamic perspective. An emphasis on CBA will likely spur more investment in lobbying and litigation, rather than engineering and innovation, as companies seize the opportunity to avoid any internalizing of environmental cost by paralyzing the regulatory process.²⁹¹

Detailed Congressional decisions about the clean-up obligations of particular sectors can help make these statutes more predictable. Agency commitment to consistent, strict, and predictable interpretation of statutory criteria governing specific regulatory decisions may also help create greater certainty.

A goal of zero emissions offers the most hope for spurring innovation and movement. It sends a clear signal to markets that innovation is needed. This approach would produce more certain expectations than health-based, technology-based, or cost-benefit based standards. Various states have enacted zero emission standards for certain cars, and car companies are working actively toward meeting the zero emissions goal.²⁹²

An evaluation of the practical achievability of a zero emissions standard and how the government can effectively secure zero emissions lies beyond the scope of this paper. In the past, zero emission standards have often proved cheaper to the overall economy than in-

291. See Matthew D. McCubbins et al., *Structure and Process, Politics and Policy: Administrative Arrangements and the Political Control of Agencies*, 75 VA. L. REV. 431, 469 (1989) (describing how elaborate procedures favor regulated industries).

292. See *Concept of 'Zero Emissions' Being Adopted at Many Sites, Say Conference Participants*, 19 INT'L ENV'T REP. 494 (BNA) (June 12, 1996); *Ebara Announces \$235 Million Project for Zero Emission City by Turn of Century*, 19 INT'L ENV'T REP. 504 (June 12, 1996). The Clean Water Act also has a zero discharge goal, but EPA has adopted policies that undermine the goal. See *supra* note 65.

cremental reductions, because they encouraged pollution prevention and product substitution.²⁹³

Changes in regulatory design may encourage cheaper and environmentally superior compliance strategies provided that demanding goals remain intact.²⁹⁴ Increased use of CBA will tend to distract regulators from using better regulatory design to spur innovation and cheaper compliance strategies. Using the virtually impossible criteria of comparing costs to benefits, CBA funnels resources that could be used to improve regulatory design into paralyzing debates about the precise stringency of each standard.

CBA will add to the complexity of regulations. The failure of agencies to regulate with sufficient stringency to satisfy the public the first time they address a particular pollution problem often causes another level of government (or the same agency at a later time) to try again. CBA may heighten the likelihood of that occurring over the long-term.²⁹⁵

Attention to economic dynamics presents its own set of challenges. For example, there may be tradeoffs between more flexible regulations, on the one hand, and simpler regulations, on the other. Some of the program often touted as offering flexibility, such as emissions trading programs, are extremely complicated.

Of course, agencies should not completely ignore short-term impacts. However, more than adequate incentives exist to make agencies pay attention to short-term impacts almost regardless of legal rules. Long-term impacts should be emphasized more than they are presently.

293. The search for substitutes for ozone depleting chemicals has actually produced cost savings in many applications.

294. See, e.g., PRESIDENT'S COUNCIL, *supra* note 14, at 26-37. I plan to address the relationship between economic incentives and innovation in a subsequent paper.

295. Congressional proponents of CBA have often cited the need to reduce "red tape" and bureaucracy as a justification for more use of CBA. Any suggestion that CBA would reduce the bureaucratic process associated with writing regulations is clearly wrong. It would vastly increase the complexity of regulatory decisionmaking.

CBA will not reduce the complexity of the regulatory regime polluters face either. The complexity of most individual regulations comes largely from the intricacy of the compromises embodied in existing regulations, compromises arrived at, in part, to persuade polluting firms to cooperate in complying with the regulations. If we either repeal regulatory environmental protections or remove legal and policy constraints that prevent simple and very stringent regulation, we could expect a reduction in complexity. But CBA proponents argue that CBA will moderate regulatory requirements. If this is true, CBA will not decrease complexity.

CBA may reduce growth in regulatory complexity by stopping regulation altogether. But stopping regulations also means stopping the improvements in environmental quality the regulations produce. This claim, while true, may not be sufficient to justify cost-benefit analysis.

The achievement of an ideal allocation of consumer monies between environmental “goods” and other “amenities” at a given moment is a goal with little merit. The use of administrative CBA would not serve this goal even if this goal were necessary. We need to pay more attention to economic dynamics and economic goals that command public support and less attention to the short-term costs to today’s polluters. Attention to long-term economic goals will probably reduce the perceived tensions between economic considerations and the goals of fully protecting the public health and the environment.²⁹⁶ We do not need to convert a useful analytic economic concept,²⁹⁷ allocative efficiency, into a virtually useless, impossible, and inappropriate policy goal.²⁹⁸

296. See Porter & Van der Linde, *supra* note 137, at 98 (policy should focus on “relaxing the tradeoff between competitiveness and the environment rather than accepting it as a given”).

297. See Gerard V. Bradley, *Overcoming Posner*, 94 MICH. L. REV. 1898, 1900-01 (1996) (book review) (economics is a form of “instrumental reason” that cannot be put to use without some prior normative choice).

298. See generally, PEARCE, NATURAL RESOURCES *supra* note 55, at 27-28 (suggesting that economists’ fixation on efficiency enables them to apply the traditional tools of their trade, but neglects important values, including sustainability).

