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The Missing Element of Environmental Cost-Benefit Analysis: Compensation for the Loss of Regulatory Benefits

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The Missing Element of Environmental Cost-Benefit Analysis: Compensation for the Loss of Regulatory Benefits

KARL S. COPLAN*

ABSTRACT

Despite its critics, cost-benefit analysis remains a fixture of the environmental regulation calculus. Most criticisms of cost-benefit analysis focus on the impossibility of monetizing environmental and health amenities protected by regulations. Less attention has been paid to the regressive wealth-transfer effects of regulations foregone based on cost-benefit analysis. This regressive effect occurs as long as downwind communities that suffer health and harms from environmental contamination are generally less wealthy than the owners of pollution sources that avoid regulatory-compliance costs. The availability of compensation to pollution-victims has the potential to ameliorate this regressive effect. This Article recommends that the availability of compensation to those suffering environmental harms should be an essential part of cost-benefit analysis, and the lack of compensation mechanisms should justify imposing regulatory burdens that might otherwise be rejected under cost-benefit analysis.

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INTRODUCTION

Cost-benefit analysis remains a fixture of environmental regulation. Its use as a tool for evaluating proposed regulations is incorporated into several statutory schemes, executive orders, and recent Supreme Court decisions, indicating that a cost-benefit inquiry is a necessary element of regulatory decision making.¹ Under cost-benefit analysis, an environmental regulation must be justified by monetizing the compliance costs of the regulation, as well as the environmental and health-benefit gains expected from the regulation, and then showing that the monetized benefits exceed the monetized costs. Proponents of cost-benefit analysis as a regulatory standard-setting tool argue that its use maximizes net social welfare by avoiding allocating resources to pollution control where the value of the pollution-control benefits falls short of the cost of implementation. Though proponents occasionally acknowledge that cost-benefit analysis may have distributional impacts, they do not condition the use of cost-benefit analysis on the availability of redistribution mechanisms to compensate for the distributional impacts of the failure to regulate.²

Most criticisms of cost benefit analysis as a regulatory tool have focused on the impossibility of monetizing the environmental and health benefits of regulation.³ However, the wealth transfer implicit in cost-benefit analysis is perhaps a more

1. See, e.g., 42 U.S.C. § 300g-1(b)(6); Exec. Order No. 13,563, 76 Fed. Reg. 3,821 (Jan. 18, 2011). Cf. *Michigan v. EPA*, 135 S. Ct. 2699 (2015).

2. See Cass R. Sunstein, *Cognition and Cost-Benefit Analysis*, 29 J. LEGAL STUD. 1059, 1090 n.76 (2000).

3. Russell S. Jutlah, *Economic Theory and the Environment*, 12 VILL. ENVTL. L.J. 1, 2021 (2001).

fundamental criticism of its application. Simply put, that it will cost a business enterprise \$2 to prevent \$1 of harm to an uncompensated member of the public cannot ever justify failing to prevent the injury. This unfairness is most palpable when the uncompensated injury consists of an avoidable death or illness, but is equally salient when the uncompensated injury consists of economic costs or loss of environmental amenities. The paradigm example of regulatory cost-benefit standard setting, the drinking water standard for arsenic, illustrates this potential problem of uncompensated lost benefits, as the Environmental Protection Agency (“EPA”) accepted that a certain number of water-consumer deaths and illnesses due to lung and bladder cancers was necessary to avoid imposing an excessive compliance cost on public drinking water enterprises.⁴

This Article will suggest that a compensation principle should be a necessary element of any cost-benefit analysis-derived regulation, and will suggest mechanisms to incorporate this compensation principle through statutory amendments, modifications of the regulatory impact executive orders, and recognition of liability in tort law for the acknowledged, uncompensated health effects of foregoing regulatory measures.

Part I provides a summary of the rationale for regulatory cost-benefit analysis, including justifications based on economic efficiency, and notes that these justifications are not concerned with distributive justice. Part II reviews prior critiques of cost-benefit analysis based on the lack of objective means of monetizing non-market regulatory benefits and the misallocation of economic resources. Part III proposes that the disregard for distributive impacts of regulatory choices is a third fundamental flaw of reliance on regulatory cost-benefit analysis as its use to forego environmental regulation can be expected to have regressive distributional impacts and the reasons given to ignore these impacts are flawed. Part IV proposes that regulatory cost-benefit analysis should take into account the availability of compensation to those injured by unregulated externalities as a factor mitigating against regulatory forbearance based on cost considerations. Finally, Part V considers existing environmental cost-benefit analysis provisions in light of the proposed compensation principle.

I. COST-BENEFIT ANALYSIS IN ENVIRONMENTAL REGULATION: BACKGROUND AND ECONOMIC RATIONALE

A. BACKGROUND

Despite decades of criticism, cost-benefit analysis retains political, academic, and jurisprudential appeal in United States environmental regulation. The basic premise of cost-benefit analysis is that government regulation should not be undertaken if the costs of complying with the regulation will exceed the value of

4. See generally Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 GEO. L.J. 2255 (2001) for a discussion of the cost-benefit analysis applied in the arsenic case.

the environmental benefits achieved by the regulation. Proponents of cost-benefit analysis in regulatory decision-making appeal to common sense as well as economic theory. The common-sense appeal of cost-benefit analysis is that, just as no individual would pay \$1000 for a lock to keep their \$100 bicycle from being stolen, regulatory agencies should be constrained from imposing million dollar solutions to protect against minimal environmental harms. This formulation of cost-benefit analysis appeals to regulated industries seeking to avoid expensive regulatory requirements they believe to be unjustified.

On a more sophisticated level, cost-benefit analysis is justified on utilitarian and wealth maximization grounds. By avoiding regulations with negative net societal benefits, cost-benefit analysis seeks to maximize net societal wealth. Proponents of cost-benefit analysis also argue that its mathematical precision leads to determinate regulatory results, allowing informed judicial review of agency standard setting, and reigning in regulatory excess.

B. RATIONALES

As noted, the political justification for cost-benefit analysis argues for limiting regulatory excesses and rationalizing agency decision-making. Political proponents of cost-benefit analysis rely heavily on academic economic justifications based on welfare economics.⁵ These neoclassical economic arguments are based on the premise that free market trading achieves the best overall result for maximizing societal wealth, modified to the extent that regulation is necessary to correct market failures.

In a way, cost-benefit analysis can be seen as the market-based reply to the regulatory answer to market failure: market economics fail when unregulated markets fail to capture externalities. Externalities in turn are damages to public goods such as environmental resources. Regulation answers this failure by forcing these uncaptured externalities onto the market in the form of restrictions on market players' freedom of action or requirements to pay compensation for environmental harms. This is the basis of the "polluter pays" principle that underlies the bulk of environmental jurisprudence; externalities are internalized when the polluter is forced to pay for their harm to public goods.⁶ But unrestrained agencies, critics argue, risk imposing inefficient solutions that the market would never accept. As

5. David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 24 *ECOLOGY L.Q.* 545, 563–64 n.83 (1997).

6. Jonathan R. Nash, *Too Much Market: Conflict Between Tradable Pollution Allowances and the Polluter Pays Principle*, 24 *HARV. ENVTL. L. REV.* 465, 471–72 (2000) (discussing the role of the "polluter pays" principle in federal environmental statutes, including the Clean Air Act, the Clean Water Act, and Comprehensive Environmental Response, Compensation, and Liability Act). The "polluter pays" principle has been incorporated as a fundamental principle of sustainable development and environmental jurisprudence in Principle 16 of the 1992 Rio Declaration. U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), annex I (Aug. 12, 1992).

one commentator colorfully puts it, “Government, in the view of many critics, is in constant danger of drifting toward producing polka dot [business] suits—and making people pay for them.”⁷ Cost-benefit analysis, in theory, seeks to replicate the market restraints against agencies ignoring market values just as agency regulation seeks to impose the restraints of environmental values ignored by the marketplace.

For example, suppose an investor considers constructing a new coal-fired power plant. Without any pollution control devices, the investment will return \$1 million in profit annually. But the externalities of the plant in the form of medical expenses for respiratory illnesses and lost workdays caused to the downwind community would exceed \$1.5 million. In an unregulated market, the investor will build the plant, ignoring the environmental health externalities. This is an example of market failure, as the unregulated market leads to a net social loss of \$500,000 (the investor’s \$1 million profit, minus the \$1.5 million loss to the community). The regulatory answer to this market failure is to empower an agency like the EPA to impose regulatory controls. But an overzealous EPA might tell the power plant that it must install pollution controls that would achieve zero-discharge of air pollution, at a cost of \$2 million, even though a \$500,000 pollution control system would largely eliminate the health risks and leave the downwind community with environmental health harms valued at \$300,000 annually. This onerous regulation prevents the investment in the power plant. With the zero-discharge regulation, the power plant would not get built, as the cost of environmental compliance would wipe out the investor’s profits. Cost-benefit analysis would force the agency to limit its regulation to requiring the \$500,000 pollution control system, as the cost of the zero-emissions pollution control system (\$2 million) would exceed its benefit in the form of \$1.5 million of avoided health costs. The plant gets built, and society is \$200,000 richer than it would have been had the agency been left unconstrained by cost-benefit analysis.⁸

The remaining problem, in this hypothetical, is that the downwind community suffers an uncompensated \$300,000 loss, while the investor’s \$500,000 profit exceeds the increase in social welfare. The \$300,000 of the investor’s profit is not a social welfare increase at all, but a simple uncompensated wealth transfer from the downwind community to the investor. Thus, cost-benefit-driven limits on regulation have distributional impacts,⁹ and as the downwind community may often

7. Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. PA. L. REV. 1553, 155–57 (2002).

8. The \$500,000 profit to the investors minus the \$300,000 losses suffered by the community.

9. See Cass R. Sunstein, *Cost-Benefit Default Principles*, 99 MICH. L. REV. 1651, 1720 (2001) (“The term ‘distributional effects’ refers to the description of the net effects of a regulatory alternative across the population and economy, divided up in various ways (e.g., income groups, race, sex, industrial sector). Benefits and costs of a regulation may be distributed unevenly over time, perhaps spanning several generations. Distributional effects may also arise through ‘transfer payments’ arising from a regulatory action.”).

be less well off than the investors in the profitable project, even before considering the externalities of the project, this distributional impact can often be expected to be regressive.¹⁰

Surprisingly (at least to the non-economist) these distributional impacts are recognized by the formal economic arguments for cost-benefit analysis, but considered irrelevant as distributive justice is not the end goal of welfare

10. A policy or effect is said to be regressive when the relative burden on a party increases as the amount subject to the burden decreases, or, more generally, when it disproportionately affects poorer people. See Gilbert E. Metcalf, *Paying for Greenhouse Gas Reductions: What Role for Fairness*, 15 LEWIS & CLARK L. REV. 393, 399–400 (2011) (“With a measure of the economic incidence (or burden) of an environmental policy, we can state whether the policy is progressive or regressive. A policy is said to be progressive if the ratio of the economic impact (measured in dollars) to some measure of household well-being rises with that measure of well-being. Conversely, if the ratio falls as the measure of well-being rises, the policy is said to be regressive.”). Some economists argue that excessive environmental regulation has regressive impacts, as the costs of complying with regulatory standards are passed on to lower income families through increased prices and decreased wages, while the environmental amenities protected by regulation address luxury interests valued by the wealthy. See Diana Thomas, *Regressive Effects of Regulation* (Mercatus Ctr., Working Paper No. 12-35 2012). This paper disregards studies establishing that environmental contamination disproportionately impacts lower income communities and communities of color. Benjamin F. Chavis & Charles Lee, *Toxic Wastes and Race in the United States*, COMM’N FOR RACIAL JUSTICE, UNITED CHURCH OF CHRIST (1987). The Thomas paper also makes a fundamental error by comparing the current low incidence of environmental and workplace death to other causes of death in the United States, without taking into account that the low incidence of environmental and workplace death is largely due to extensive (and successful) regulation that has reduced these threats. Professor Thomas acknowledges this potential defect in her analysis. *Id.* at n.4. Professor Thomas’s conclusion that the low incidence of death due to environmental contamination demonstrates the inefficacy of regulation is akin to arguing that the low incidence of polio in the United States demonstrates that administering the polio vaccine is a waste of money. Contemporary administrative examinations of the distributional impacts of environmentally protective regulations show that low-income and minority communities disproportionately benefit from regulation of environmental contaminants. Conversely, such communities are disproportionately disadvantaged by regulatory forbearance. For example, the EPA made the following finding in connection with the final effluent guidelines for coal waste disposal from steam electric power plants:

11. Impacts on Residential Electricity Prices and Low-Income and Minority Populations

EPA examined the effects of the final rule on consumers as an additional factor that might be appropriate when considering what level of control represents BAT. If all annualized compliance costs were passed on to residential consumers of electricity, instead of being borne by the operators and owners of power plants (a very conservative assumption), the average monthly increase in electricity bill for a typical household would be no more than \$0.12 under the final rule.

EPA also considered the effect of the rule on minority and low-income populations. As explained in Section XVII.J, using demographic data regarding who resides closest to steam electric power plant discharges and who consumes the most fish from waters receiving power plant discharges, EPA concluded that low-income and minority populations benefit to an even greater degree than the general population from the reductions in discharges associated with the final rule.

Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 80 Fed. Reg. 67837, 67856 (Nov. 3, 2015). See Thomas, *supra* note 10, at n.4. A recent study supports the conclusion that the health impacts of lax air quality standards falls disproportionately on low income and minority populations. Qian Di et al., *Air Pollution and Mortality in the Medicare Population*, 376 N. ENGL. J. MED. 2513 (2017).

economics.¹¹ The academic economic justifications for cost-benefit analysis are based on Pareto maximization, the Kaldor-Hicks principle, and pure utilitarianism; each concept in turn is briefly (and reductively) summarized *infra*.¹²

1. Pareto Efficiency

Pareto optimality is an ideal state of an economy, reached when all market transactions that occur will make at least one party to the transaction better off without making any other party worse off (net of any compensation).¹³ In a free market economy with full sharing of information and zero transaction costs, the economy should naturally tend to reach a state of Pareto-optimal equilibrium, as any transaction that promotes Pareto efficiency will naturally occur. As long as one party wins more by a change in distribution than the other loses, the parties will make a bargain to accommodate the change, with compensation paid to the losers so that the winner is better off, and the loser is no worse off.

In its initial formulation, Pareto efficiency took into account free market trading in market goods, omitting the economic problem of negative externalities and harms to public goods. Economist Ronald Coase is credited with extending Pareto principles to such external “social costs.” Under the Coase theorem,¹⁴ distribution of private rights to environmental values in a free market economy

11. Welfare economics is a branch of economics that studies welfare on an aggregate level. While welfare economics may not necessarily have “goals,” the field features two fundamental theorems: that competitive markets produce (weakly) Pareto efficient outcomes (see also “The Invisible Hand”); and that one can effectively achieve a particular Pareto optimal outcome by redistributing wealth and letting the market react, which could then be supported as a competitive market equilibrium. While the second theorem refers to redistribution, it is not necessarily speaking to redistributive justice. See PETER J. HAMMOND, *THE EFFICIENCY THEOREMS & MARKET FAILURE* 1, 3 (1997). Welfare economics-based justifications for cost-benefit analysis thus do not consider distributive justice. See Ackerman & Heinzerling, *supra* note 7, at 1575 (cost-benefit analysis reinforces economic inequality); see also Susan E. Dudley & Art Fraas, *The Future of Regulatory Oversight and Analysis*, *ISSUES OF THE DAY: 100 COMMENTARIES ON CLIMATE, ENERGY, & THE ENVIRONMENT* 96 (2010); Michael Livermore, *Can Cost-Benefit Analysis of Environmental Policy Go Global?*, 16 *N.Y.U. ENVTL. L.J.* 146, 190–91 (2011); Don Fullerton & Dan Karney, *Does Environmental Protection Hurt Low-Income Families?*, 21 *INST. GOV'T & PUB. AFF. POL'Y F. NO. 2* (2009) (discussing “pathways” that environmental policy can have regressive effects); John D. Graham, *Saving Lives Through Administrative Law and Economics*, 157 *UNIV. PA. L. REV.* 395, 540 (2008); see, e.g., E.J. MISHAN, *COST-BENEFIT ANALYSIS* 394 (1976) (“[I]t is not enough that the outcome of an ideal cost-benefit analysis be positive. It must be shown, among other things, that the resulting distributional changes are not perceptibly regressive and that no gross inequities are perpetrated.”); Frank B. Cross, *When Environmental Regulations Kill: The Role of Health/Health Analysis*, 22 *ECO. L.Q.* 729, 763 (1995) (“In fact, studies indicate that the distribution of environmental costs is even more regressive than the typical sales tax.”).

12. This summary is based on an excellent critical treatment of the subject in Matthew D. Adler & Eric A. Posner, *Rethinking Cost-Benefit Analysis* (John M. Olin L. & Econ., Working Paper No. 72 2D SERIES 1999).

13. *Id.* at 25.

14. See R.H. Coase, *The Problem of Social Cost*, 3 *J.L. & ECON.* 1 (1960). Simply put, “[t]he Coase theorem states that parties will reach the identical, efficient outcome as long as they are free to bargain without cost around the operative legal rule and there are no wealth effects associated with the assignment of the legal entitlement.” John J. Donohue III,

(assuming full information and zero transaction costs) will naturally result in an optimal allocation, as those who value the environmental resources will bargain with those who might exploit it for profit to achieve a transaction, with compensation, that maximizes the net value and minimizes the losses for both sides. In the power plant hypothetical, assuming the downwind community was given the absolute right to prevent any upwind air pollution (but could bargain that right away for compensation), the downwind community presumably would refuse to allow the plant to be built without any pollution controls, because it would demand \$1.5 million in compensation (in excess of the prospective profit to the plant developer). But, with adequate access to information about the harms to their community and zero transaction costs, the downwind community should arrive at an economically efficient bargain with the power company. The community would bargain to allow the plant to be built with \$500,000 of pollution control plus \$300,000 in compensation for their less serious health impacts. This transaction would be said to be Pareto efficient, because the plant developer is better off, with a \$200,000 profit, while the downwind community is no worse off being fully compensated for their losses.

This sort of Coasian bargaining does not occur in the real-world economy. Coasian conditions of full information and zero transaction costs simply do not exist and cannot be created. Real-world Coasian bargains are impeded by transaction costs and collective action problems,¹⁵ the lack of complete information, and the lack of tradable private rights in environmental resources such as the atmosphere.¹⁶ In particular, collective action challenges deter Coasian bargaining where the victims of environmental degradation are numerous and dispersed and the environmental right is assigned *ab initio* to the polluter.

Collective action problems arise where a large number of people share an interest.¹⁷ Individual members of the harmed class lack any incentive to take action because the benefits of any action will be widely shared and diluted. Rather, each individual will avoid taking action in the hopes that some other affected individual will take action to protect the group's interests, and the non-acting individual will get the benefit of others' efforts without any individual effort—the so-called free rider problem. As a result of these distorted incentives, no individual takes

Commentary, *Opting for the British Rule, or If Posner and Shavell Can't Remember the Coase Theorem, Who Will?*, 104 HARV. L. REV. 1093, 1094 n.4 (1991).

15. See generally Yvonne Rydin & Mark Pennington, *Public Participation and Local Environmental Planning: The Collective Action Problem and the Potential of Social Capital*, 5 LOC. ENV'T. 153 (2000).

16. Coase posited that the initial distribution of private rights in environmental public goods would not matter, as hypothetical free market trading would achieve an efficient distribution and accommodation between development and environmental protection. This power plant example demonstrates the distributional fallacy in the Coase theorem, since if the initial distribution were the other way around (i.e., the community was required to pay the power plant developer to clean its emissions), an unequal initial distribution of resources would make it highly unlikely that the downwind community could afford to buy the right to clean air, which should be considered a basic human right.

17. See generally Rydin & Pennington, *supra* note 15.

action, and the group's shared interests are not protected. In the case of a group of downwind residents, no individual resident has sufficient interest to bargain, and pay for, clean air rights. Every downwind resident shares the hope that someone else will undertake the effort of organizing and paying the expenses of buying the rights for them.

While initial assignment of environmental rights to the numerous and dispersed downwind residents might solve the collective action problem that prevents Coasian bargaining, requiring the polluter to purchase the right to pollute from numerous dispersed downwind residents poses its own transaction costs and market failures. As Richard Posner points out in his treatise, *Economic Analysis of the Law*, because multiplicity of parties leads to high transaction costs, assignment of the right to the multitude of downwind victims poses insurmountable transaction costs. Using the Coasian example of railroads and farmers whose crops are destroyed by steam locomotive sparks, he posits excess transaction costs where "there are too many farmers owning land adjacent to the railroad, and if only one refused to sell, he could obtain an injunction against the railroad's running its trains on tracks adjacent to his property."¹⁸ In addition, the lone holdout is an example of a market failure Richard Posner describes as a bilateral monopoly, where a landowner demands compensation beyond market value knowing that the buyer of rights has no alternative seller.¹⁹

In this scenario, high transaction costs prevent real-world bargaining to achieve the theoretically efficient adjustment of rights. But cost-benefit analysis seeks to achieve this Coasian-bargained result through the regulatory process and is thus justified on the basis of Pareto efficiency. The gaping defect of this defense of cost-benefit analysis is that, unlike in the case of Coasian bargaining, no compensation is actually paid to the transactional losers. In the case of regulatory cost-benefit analysis, the construction of the power plant does make someone (the downwind community) worse off. In the case of Coase's (and Posner's) inflammatory locomotives, the farmer loses the value of his farmland and receives no compensation. The Pareto defense of cost-benefit analysis responds, first, that because government could tax the profits of the developer and redistribute those profits to compensate the losers, cost-benefit analysis can be made to be Pareto optimal.²⁰ Second, defenders argue that cost benefit analysis can be considered Pareto-optimal *ex ante*, as the net benefits of cost benefit analysis can be expected to be distributed widely throughout society and any individual is more likely to be a "winner" under cost benefit analysis based norms as to be a "loser," and is

18. RICHARD POSNER, *ECONOMIC ANALYSIS OF THE LAW* 51–52 (Wolters Kluwer Law & Bus. 9th ed. 2014).

19. *Id.* at 62.

20. Adler & Posner, *supra* note 12, at 26. Of course, as Adler and Posner point out, a single transaction in which government allows the project to proceed but taxes the profits to compensate the transactional losers would itself be Pareto optimal, so that cost-benefit analysis would not be necessary.

thus better off.²¹

2. Kaldor-Hicks Principle

The Kaldor-Hicks principle is a refinement of Pareto efficiency that recognizes that, due to transaction costs and market failures, pure Pareto efficiency will prevent the achievement of improvements in overall welfare.²² For example, a \$1 tax on everyone in society to pay for vaccinations that will save the lives of ten percent of the population would not be considered Pareto efficient as the ninety percent of taxpayers who did not need the vaccinations are each \$1 worse off; but such a tax-funded vaccination would advance maximum social welfare.²³ The Kaldor-Hicks principle posits the utility of those transactions that maximize economic efficiency so long as one party is sufficiently better off that that party *could* compensate the party that is made worse off, even though no compensation may actually be paid. Compensation is not paid in many such preferred transactions because a system of compensation would be so complex as to add transaction costs that would prevent such compensation as being beneficial and therefore making these transactions unlikely to occur. However, according to Kaldor-Hicks, net social welfare is maximized by such transactions even though they have distributional impacts. Distributional impacts are thus not the concern of welfare maximization, and, to the extent that distributional impacts are a social concern, the increase in overall societal wealth resulting from Kaldor-Hicks is sufficient to allow governments to impose a tax on the winners and redistribute the income to the losers and still achieve Pareto efficiency if desired.²⁴ The decision to make such a redistribution, or not, should be left to the policymaking branches of government.

Cost-benefit analysis as conceived by its proponents closely tracks the Kaldor-Hicks principle: the distributional impacts of cost-benefit analysis are simply considered irrelevant to maximizing social welfare. By definition, the existence (or lack thereof) of compensation for the transactional losers is irrelevant. As Professors Posner and Adler characterize this defense, distributional justice is simply not the proper concern of regulatory agencies:

When the Environmental Protection Agency or the Food and Drug Administration decides whether to approve a project, it might seem that it should do so on the basis of overall well-being (however defined), and not as a way to redistribute wealth from one segment of the population to another. If

21. As Adler and Posner point out, this defense similarly ignores the fact that “in a many-good economy, CBA [cost-benefit analysis] will tend to favor people who have a low opportunity cost for money and intense preferences. There is no reason to believe that the people who [are] usually injured by projects are usually the same as the people who are usually benefited by projects.” *Id.*

22. See Driesen, *supra* note 5, at 578–81 for a summary of the Kaldor Hicks justification for cost-benefit analysis.

23. See Adler & Posner, *supra* note 12, at 26–27.

24. *Id.* at 28.

wealth should be redistributed, independent efforts to do so by uncoordinated agencies seem less likely to succeed than adjustment of taxes and welfare benefits by Congress. The purpose of CBA [cost-benefit analysis] is to separate out the distributional issue and isolate the efficiency issue, so that the agency will evaluate projects solely on the basis of their efficiency.²⁵

But these same commentators criticize Kaldor-Hicks as “taken as a moral principle, indefensible.”²⁶ Professors Posner and Adler recognize that the Kaldor-Hicks principle tends to favor a regressive allocation to those who already have more goods or money, and that there is no reason to believe that the overall wealth benefits to society will cancel out the welfare losses to the economic losers in transactions forced on them by the Kaldor-Hicks principle.

3. Pure Utilitarianism

The third, more implicit, economic justification for cost-benefit analysis is based on a purer form of utilitarianism: the idea that society should make choices in a way that maximizes the well-being (or satisfies the preferences) of the maximum number of people. In this theory, cost-benefit analysis is at best a highly imperfect fit for utilitarianism, as there is no non-monetized way to compare the improvement in well-being of the winners of cost-benefit analysis-based decisions with the loss of well-being for the losers. Adler and Posner posit that such a monetized comparison would only be valid for a utilitarian comparison of well-being if all members of society were equally endowed financially, so that the marginal utility of \$1 was equal for all members of society—a situation that does not ever exist.²⁷ Alternatively, an agency might weigh different monetized values differently for different members of society, but such an endeavor becomes so complex that it lacks all utility as a guide to actual agency decision-making.²⁸

In either event, the utilitarian justification ignores the distributional impacts of the application of cost-benefit analysis to regulatory decision-making. The Pareto justification likewise ignores these impacts, and the Kaldor-Hicks justification simply rejects distributional impacts of cost-benefit analysis as not being the business of economists. Yet, as seen from the Adler-Posner quote above, the precise point of cost-benefit analysis seems to be to remove distributional considerations from agency consideration. Underlying cost-benefit analysis is then a fundamental assumption that distributive justice is not a relevant consideration for regulatory agencies.

25. *Id.* at 22–23, 23 n.40 (citing Nicholas Kaldor, *Welfare Propositions and Interpersonal Comparisons of Utility*, 49 *ECON. J.* 549 (1939)).

26. *Id.* at 29.

27. *Id.* at 29–31.

28. *Id.*

II. CRITIQUES OF COST-BENEFIT ANALYSIS

The environmental community and environmentally sympathetic commentators have greeted cost-benefit analysis with a skepticism that matches the enthusiasm of industry and academic economists for cost-benefit analysis. The primary criticism of cost-benefit analysis has been the flaw in its underlying premise: environmental benefits of regulation for which there is no market can nonetheless be “monetized”—that is, converted into dollar values—and thereby provide a meaningful comparison with the more market-based dollar costs of compliance.²⁹ Critics have also argued that cost-benefit analysis fails even to promote economic efficiency and may cause misdirection of resources, because the assumptions underlying the calculation of both costs and benefits of a regulation require subjective policy judgments about how to assess and weigh risk.³⁰ The subjectivity and indeterminacy of these policy judgments vitiates the reliability of cost-benefit analysis’ theoretical claims of allocative efficiency.

A. IMPOSSIBILITY OF MONETIZING ENVIRONMENTAL AND HEALTH BENEFITS

Professors Frank Ackerman and Lisa Heinzerling have performed a detailed critique of the flaws of seeking to monetize environmental values for comparison-to-compliance costs in their book *Priceless: On Knowing the Price of Everything and the Value of Nothing*. They emphasize the problem that the public goods protected by environmental regulation are by definition not subject to markets that determine their dollar value. Any attempt to derive monetary values for such environmental amenities must, by its very nature, be artificial, subjective, and value laden, and must also ignore how real people make real choices. For example, in order to perform cost-benefit analysis, the EPA and other agencies must assume a value for a human life, yet there is no market for human lives and any sane person, when asked how much they would accept as compensation for their premature death, would necessarily say that there is no amount of money he or she would accept in order to die. So, an agency applying cost-benefit analysis must find a value for human life based on something other than a presumed market, either by substituting an inquiry into compensation for accepting a risk to one’s life, or by reference to tort compensation principles.³¹

Economists have sought to apply a number to risk of death by inquiring into the pay differential between professions involving risk of death and those demanding equivalent qualifications without the risk, but such inquiries are fraught with confounding variables.³² Equally difficult is the assessment of nonfatal illnesses and the market value of the loss of health and well-being in addition

29. See, e.g., Ackerman & Heinzerling, *supra* note 7, at 1556–57.

30. See, e.g., Duncan Kennedy, *Cost-Benefit Analysis of Entitlement Problems: A Critique*, 33 STAN. L. REV. 387 (1981).

31. See, e.g., Ackerman & Heinzerling, *supra* note 7, at 1558 n.20.

32. See *id.* at 1558.

to market-based treatment expenses. In one prominent case, the EPA, lacking any direct evidence, used a public opinion survey about what people would pay to avoid chronic bronchitis to develop a dollar value for the loss suffered by a person with nonfatal bladder cancer.³³

Even more difficult is the assessment of dollar values for environmental amenities for which there is no market analogue. For example, there is no market for protection of endangered species in the wild, nor any market analogue. Environmental economists seek to develop an estimate of the social value of such amenities using a technique called “contingent valuation.”

Contingent valuation is developed by performing a public opinion survey and aggregating the results to approximate the social value of an amenity.³⁴ For example, one survey determined that the average American household would be willing to pay an average of \$254 annually to prevent the extinction of the bald eagle or about \$173 annually to protect humpback whales from extinction, yielding a social value of \$25 billion for the bald eagle and \$17 billion for the humpback whale.³⁵ Of course, such valuations are close to meaningless as a measure of market value, both because no one is asked to pay real dollars, and because a public opinion poll is worthless as a measure of the social value of an environmental amenity that is part of a complex ecology providing essential environmental services that are not measured by human economic measures.

B. MISALLOCATION OF ECONOMIC RESOURCES

Cost-benefit analysis has also been criticized by Professor David Driesen as failing to promote its purported economic justification of achieving a more efficient allocation of economic resources.³⁶ Professor Driesen points to the mismatch between cost-benefit analysis and economically “optimal pollution” due to the problems of multiple regulations and attempting to match costs and benefits in a single regulation, as well as the problem of the high transaction costs of performing cost-benefit analysis with sufficient rigor to be useful.³⁷ In essence, the cost of performing a comprehensive, regime-wide cost-benefit analysis sufficiently rigorous to lead to efficient choices exceeds the net benefit of those choices, and the choices directed by piecemeal cost-benefit analysis do not reliably improve economic efficiency.

33. National Primary Drinking Water Regulations; Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring, 66 Fed. Reg. 6976 (Jan. 22, 2001) (to be codified at 40 C.F.R. pts. 9, 141, and 142).

34. See W. Michael Hanemann, *Valuing the Environment Through Contingent Valuation*, 8 J. OF ECON. PERSPECTIVES 19-43 (1994).

35. John B. Loomis & Douglas S. White, *Economic Benefits of Rare and Endangered Species: Summary and Meta-Analysis*, 18 ECOLOGICAL ECONS. 197, 199 (1996).

36. See, e.g., David M. Driesen, *The Economic Dynamics of Environmental Law: Cost-Benefit Analysis, Emissions Trading, and Priority-Setting*, 31 B.C. ENVTL. AFF. L. REV. 501, 507-13 (2004) [hereinafter, Driesen, *Economic Dynamics*]. See generally Driesen, *supra* note 5.

37. See Driesen, *supra* note 5, at 582-88.

An additional economic critique of cost-benefit analysis is that it causes the misallocation of capital resources by artificially inflating the returns of polluting enterprises. Taking the power-plant hypothetical in which cost-benefit analysis compels the EPA to adopt the \$500,000 pollution control measures while leaving \$300,000 of uncompensated injuries, the true return on the investment was just \$200,000, while the actual return to the investor was \$500,000 (consisting in part of the appropriation of \$300,000 in uncompensated damages to the downwind community). Suppose that the investor declined to make another investment, perhaps in a solar power plant with no externalities, that would have a \$400,000 true social return because the power plant appeared to be more profitable.³⁸ The effect of applying cost-benefit analysis to avoid regulation is to distort capital investments into less socially productive investments.

C. SUBJECTIVITY OF COST-BENEFIT ANALYSIS

Cost-benefit analysis' failure to achieve its own goal of determinism is also a point of criticism. In order to determine the environmental health benefits of a proposed regulation, the EPA must make assumptions based on limited epidemiological evidence about the number of illnesses and deaths that will result from human exposures to toxic chemicals at low doses. This requires assumptions about the dose response curve of toxic exposures at low levels that have not and cannot be studied in actual human populations, as well as assumptions about the level of exposure in the population. Professor Cass Sunstein concluded that, in the case of the EPA's arsenic rule under the Safe Drinking Water Act ("SDWA"), the EPA could have concluded that the dollar value of the net benefit of the regulatory standard was anywhere between \$0 and \$560 million.³⁹ The underlying choice of assumptions is a policy judgment on the part of the agency. The resulting range of monetized values effectively allows an agency to choose from a wide range of regulatory standards defensible with cost-benefit analysis, thereby defeating the purported deterministic advantage of cost-benefit analysis.

III. THE MISSING REGRESSIVE REDISTRIBUTIVE CRITIQUE OF COST-BENEFIT ANALYSIS

Although several commentators have noted the likely regressive distributional impacts of cost-benefit analysis and the lack of compensation mechanisms for

38. It is true that a sophisticated cost-benefit analysis might take into account fuel substitution within the power industry in calculating the net economy-wide "cost" of the regulation, thus obviating this problem. For example, the "cost" of the \$2 million pollution controls discussed in the power plant hypothetical, text *supra*, might be counted as only an economic cost of only \$600,000—the coal plant's opportunity cost of a \$1 million profit offset by the solar plant's \$400,000 profit. This analysis might then justify the imposition of zero emission pollution controls that have a health benefit of \$1.5 million. But such an analysis still does not take into account the misallocation of investments between economic sectors—if the competing investment with a greater net social return were in agriculture, say, rather than in power production.

39. Sunstein, *supra* note 4.

these impacts, few have seized on these distributional impacts as a major argument against the use of cost-benefit analysis.⁴⁰ But these distributional impacts should be of prime importance to environmental policymakers. The failure to respond to the regressive redistribution that inheres in cost-benefit analysis seems to reflect two underlying assumptions, both of which are flawed. One is the underlying baseline assumption that industry has a right to pollute, so that any restriction on emissions constitutes a redistribution from industry to the regulatory beneficiaries, rather than the other way around.⁴¹ The second flaw is that distributional justice should not be the business of regulatory agencies—and, by extension, a system of environmental regulation—but should be left to the legislature. Both of these premises are normatively flawed.

A. FLAWED LIBERTARIAN BASELINE

The first assumption is that the baseline against which cost-benefit analysis is measured is a libertarian state in which there are no limits on a property owner's environmentally destructive activities. This libertarian assumption negates the underlying premise of a system of environmental regulation and its economic justification: that "there is no right to pollute."⁴² A system of environmental regulation is premised on the idea that environmental resources are public goods and private activities that harm these resources without compensation constitute uncaptured externalities — a form of market failure that demands intervention in order to correct and advance towards a more Pareto optimal state.

The libertarian resistance to environmental regulation and support for cost-benefit limitations on regulation seem to have several roots. One essential root is the idea that the existing hierarchies and wealth distributions are just, and that any government-induced modification to the existing distribution of rights is inherently unjust.⁴³ This justification explicitly rejects a Rawlsian system of justice based on ensuring minimum standards for the least well off in society.⁴⁴ Another root of this resistance to environmental regulation is libertarian skepticism about the existence and extent of public rights, and preference for privatization of

40. See, e.g., Matthew D. Adler, *Risk Equity: A New Proposal*, 32 HARV. ENVTL. L. REV. 1, 20 (2008) (discussing equity issues with cost-benefit analysis and the scholarly discussion surrounding distributive weighting as a solution, though the paper ultimately offers another, distinct solution to the equity concern); see also Olof Johansson-Stenman, *Distributional Weights in Cost-Benefit Analysis—Should We Forget About Them?*, 81 LAND ECON. 337, *passim* (2005) (discussing possible regressive effects and distributional concerns regarding cost-benefit analysis).

41. See Driesen, *Economic Dynamics*, *supra* note 36, at 589–90 (arguing that contingent valuation improperly looks at what the consumer would pay to avoid pollution rather than what the polluter would have to pay to buy the right to pollute from the consumer).

42. 117 CONG. REC. 38,797 (1971) (statement of Sen. Cooper in favor of the Clean Water Act).

43. ROBERT NOZICK, *ANARCHY, STATE, AND UTOPIA* *passim* (Basic Books ed. 1st ed. 1974).

44. See *id.*; JOHN RAWLS, *A THEORY OF JUSTICE* (Rev. Ed. Cambridge: Harvard University Press 1999).

public rights with adjustments made through Coasian bargaining.⁴⁵ Libertarian support for cost-benefit limits also derives from a general libertarian endorsement of unrestricted rights to make use of real property free of regulation.

However, the real-property-rights resistance to environmental regulation is internally inconsistent, and thus flawed. The libertarian baseline of unfettered liberty to use one's real property ignores the longstanding common law principle that all real property rights are limited by the principle that one may not use real property in a way that harms the use and enjoyment of another's real property, a principle embodied in the legal Latin phrase *sic utere tuo ut alienum non laedas*.⁴⁶ Though this libertarian assumption of an unrestricted right to pollute is often justified based on private property rights, full recognition of the unfettered property rights of downwind property owners might in fact negate the existence of an unfettered "right to pollute" on the part of upwind property owners.

1. Review of Early History of Common Law Property Rights

A review of the history of common law property rights shows that this property-based limiting principle was itself modified and weakened by judicial decisions accommodating the Industrial Revolution. This accommodation, with its failure to protect the environmental health interests of downwind and downstream private interests, helped give rise to a public law of environmental protection. Cost-benefit analysis proponents thus seek not a return to traditional common law principles, but just to a restoration of the judicial accommodation of industrial interests.

The common law of real property historically gave strong protection to the property rights of downwind and downstream property owners. Common law actions in trespass provided for an absolute right to prevent and recover damages for any physical intrusion, even without showing substantial harm. Historically, this absolute trespass remedy was limited by the common law requirement that an invasion be physical in order to be actionable.⁴⁷ This physicality requirement

45. See NOZICK, *supra* note 43.

46. See generally Elmer E. Smead, *Sic Utere Tuo Ut Alienum Non Laedas A Basis of the State Police Power*, 21 CORNELL L. REV. 276 (1936).

47. FOWLER V. HARPER, FLEMING JAMES, JR., OSCAR S. GRAY, THE LAW OF TORTS 3 (3d ed. 1996). See generally *In re MTBE Products Litigation*, 379 F. Supp. 2d 348, 426 (S.D.N.Y. 2004). More recently, courts in some jurisdictions have abandoned the visibility, or dimensionality, requirements for physical trespass, in recognition of more contemporary scientific understandings of the nature of physical matter. See, e.g., *Borland v. Sanders Lead Co.*, 369 So.2d 523, 529 (Ala.1979) (allowing liability for invasion by invisible particulates); *Maryland Heights Leasing v. Mallinckrodt, Inc.*, 706 S.W.2d 218, 225–26 (Mo. Ct. App.1985) (intrusion by "radioactive emissions" may constitute trespass if it interferes with plaintiffs' exclusive possessory interest in the land); *Martin v. Reynolds Metals Co.*, 221 Or. 86, 342 P.2d 790, 793 (1959) ("It is quite possible that in an earlier day when science had not yet peered into the molecular and atomic world of small particles, the courts could not fit an invasion through unseen physical instrumentalities into the requirement that a trespass can result only from a direct invasion. But in this atomic age even the uneducated know the great and awful force contained in the atom and what it can do to a man's property if it is released."); see also *Baltimore Belt R.R. Co. v.*

precluded trespass actions for smoke and invisible particles at a time when the physical natures of these phenomena were not understood.⁴⁸ However, the corresponding action for private nuisance allowed for remedies for nonphysical interference which substantially and unreasonably interfered with the owner's use and enjoyment of their property, even without a physical invasion.⁴⁹

Thus, between strict liability without harm in trespass for visible physical invasions, and liability in nuisance for invisible invasions that constituted a substantial interference with the use of real property, environmental integrity rights of downwind and downstream property owners were strictly enforced. Moreover, a successful action in either trespass or nuisance would lead to automatic injunctive relief—giving the downstream/downwind landowners the initial distribution of the environmental rights when it came to any bargained-for accommodation of interests. For example, in 1913 the New York Court of Appeals upheld an injunction requiring a \$1 million paper mill to shut down in order to protect the rights of a downstream riparian farmer.⁵⁰ In doing so, the court specifically rejected an invitation to engage in any cost-benefit analysis, acknowledging the regressiveness of such an analysis:

Although the damage to the plaintiff may be slight compared with the defendant's expense of abating the condition, that is not a good reason for refusing the injunction [Refusing the injunction] would deprive the poor litigant of

Sattler, 100 Md. 306, 59 A. 654 (1905) (allowing recovery for damage by noise, smoke, and vapors without specifying whether plaintiffs could proceed under theory of trespass or nuisance); *N. Cent. Ry. Co. v. Oldenburg & Kelley*, 122 Md. 236, 89 A. 601 (1914) (same); *Merrick v. Diageo Americas Supply, Inc.*, 5 F.Supp.3d 865, 880 (W.D. Ky. 2014), aff'd 805 F.3d 685 (6th Cir. 2015) (plaintiffs trespass allegations re: a neighboring facility that emitted ethanol which entered plaintiff's property and caused harm would survive motion to dismiss). These courts have substituted a substantial damage requirement for the traditional dimensionality requirement. *See id.*; *MTBE*, 379 F.Supp. 2d at 426.

48. HARPER, *supra* note 47, ¶ 1.1. *See generally* *MTBE*, 379 F.Supp. 2d at 313–16. More recently, courts in some jurisdictions have abandoned the visibility, or dimensionality, requirements for physical trespass in recognition of more contemporary scientific understandings of the nature of physical matter. *See, e.g., Borland*, 369 So.2d at 529 (allowing liability for invasion by invisible particulates); *Mallinckrodt*, 706 S.W.2d at 225–26 (intrusion by “radioactive emissions” may constitute trespass if it interferes with plaintiffs’ exclusive possessory interest in the land); *Martin*, 221 Or. 86, 342 P.2d at 793 (“It is quite possible that in an earlier day when science had not yet peered into the molecular and atomic world of small particles, the courts could not fit an invasion through unseen physical instrumentalities into the requirement that a trespass can result only from a direct invasion. But in this atomic age even the uneducated know the great and awful force contained in the atom and what it can do to a man’s property if it is released.”); *see also Sattler*, 100 Md. 306, 59 A. at 654 (allowing recovery for damage by noise, smoke, and vapors without specifying whether plaintiffs could proceed under theory of trespass or nuisance); *Northern Central R.R.*, 122 Md. 236, 89 A. at 601 (same); *Merrick*, 5 F.Supp. at 880 (plaintiffs trespass allegations re: a neighboring facility that emitted ethanol which entered plaintiff’s property and caused harm would survive motion to dismiss). These courts have substituted a substantial damage requirement for the traditional dimensionality requirement. *See id.*; *MTBE*, 457 F.Supp. at 298.

49. *See generally* ELIZABETH BRUBAKER, PROPERTY RIGHTS IN THE DEFENCE OF NATURE 39–51 (Earthscan 1995).

50. *Whalen v. Union Bag & Paper Co.*, 208 N.Y. 1 (1913).

his little property by giving it to those already rich.⁵¹

Well into the twentieth century, common law courts thus eschewed the reasoning that law should maximize overall social welfare at the cost of distributional justice. Respecting the traditional rights of the downwind/downstream property owner – the “poor litigant” – resulted in an allocation of the enforceable environmental right to the environmentally interested individuals downstream.

2. Common Law Property Rights and Industrialization

Recall that both Ronald Coase (on efficiency grounds) and Richard Posner (on transaction-cost grounds) resisted allocation of the enforceable environmental right to the downstream interest. As a result of such an allocation, impasses resulting from high transaction costs and the bilateral monopoly problems identified by Ronald Coase and Richard Posner would tend to favor the protection of the dispersed environmental rights, and block the economic benefits expected from industrial activities.

The threat of these impasses eventually led to judicial and legislative accommodation for the industrial development, at the expense of the traditional absolute rights of private downwind property owners. In Great Britain, in the case of railroad spark fire damage described by Coase, a common law court held that where a railway was operating pursuant to expressive legislative authorization, it had no liability for spark damage so long as it was using state-of-the-art spark controls.⁵² Thus arose the “defense of statutory authority” doctrine, which abrogated common law liability rules for defendants carrying out activities with legislative authorization.⁵³ In some common law jurisdictions, this defense has been extended to protect polluting industries from liability for nuisance so long as they are operating in compliance with legislatively authorized environmental regulations.⁵⁴ Notably, in the case of spark damage from railroad locomotives, the British Parliament recognized the regressiveness of absolving railroads from liability for damage caused, and, by statute adopted in 1905, ordered compensation to small landholders for fire damage.⁵⁵

In another accommodation to industrialism, courts began to refuse the award of injunctive relief for traditional trespass and nuisance. Thus, in 1940, the United States Supreme Court held in *United States v. Causby*⁵⁶ that a property

51. *Id.* at 5.

52. *Vaughan v. Taff Vale Railway Co.*, 3 H and N. 743 (Ex. 1858) and 5 H and N 679 (Ex. 1860) (cited in R. Coase, *supra* note 14, at n. 42).

53. *See generally* BRUBAKER, *supra* note 49, at 93–112.

54. *Id.* 103–05. Compliance with regulatory standards has not, however, been generally accepted as a defense to common law liability in United States jurisdictions. *See infra* note 76.

55. *Railway Fires Act of 1905*, Parl. Deb. 142 (4th ser.), cols. 348-74 (1901); Parl. Deb. 148 (4th ser.), cols. 1478-92 (1905); *see also* A.W. Brian Sampson, *Coarse v. Pigou Reexamined*, 25 J. L. STUD. 53, 69 n.69 (1996).

56. 328 U.S. 256 (1946).

owner had no right to enjoin aircraft overflights above his land as a trespass despite the common law doctrine that the owner of the surface in fee had rights “*usque ad coelum*”—up to the heavens.⁵⁷ The Court created an implied navigational easement out of thin air, and subsequently held that no compensation was due to the property owner under the Fifth Amendment compensation clause despite this physical invasion and loss of the right to exclude others.⁵⁸

More critically, common law courts eventually modified the rule that private nuisance plaintiffs were automatically entitled to injunctive relief, and, in an attempt to promote economic efficiency, substituted permanent damages for injunctive relief. Thus, the New York rule of automatic injunctive relief followed in *Whalen v. Union Paper Bag* was abrogated by the New York Court of Appeals in 1970 in *Boomer v. Atlantic Cement Company*.⁵⁹

Boomer is the leading case for the sort of cost-benefit analysis of injunctive relief applauded by economists.⁶⁰ Downwind property owners sued a cement plant for the nuisance of dust emitted from the plant, and won a trial court determination that the plant’s operation constituted a private nuisance.⁶¹ Nevertheless, the trial court denied injunctive relief.⁶² The Court of Appeals affirmed, explicitly rejecting both the reasoning and the result of its prior decision in *Whalen* that the downwind property owner’s rights demanded absolute protection through injunctive relief, no matter the relative cost to industry or benefit to the plaintiff.⁶³ Rather, the court determined that the high value of investment of the cement company in its plant, and the number of its employees constituted a public interest that outweighed the value of the private damages to the individual plaintiffs.⁶⁴

Boomer thus represents the rejection of common law property rights in environmental values in the name of economic efficiency. Three points about this abrogation of environmental policy rights are particularly salient to this discussion. First, the court recognized that common law judges lacked the expertise and tools to address industry-wide and regional environmental contamination such as air pollution:

[I]t seems manifest that the judicial establishment is neither equipped in the limited nature of any judgment it can pronounce nor prepared to lay down and implement an effective policy for the elimination of air pollution. This is an area beyond the circumference of one private lawsuit. It is a direct

57. *Id.* at 261.

58. *See Griggs v. Allegheny County*, 369 U.S. 84 (1962).

59. 26 N.Y. 2d 219 (1970); *see also* BRUBAKER, *supra* note 49, at 119 (citing *Bottom v. Ontario Leaf Tobacco Co., Ltd.*, [1935] O.R. 205 at 206 (CA)).

60. *See* RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 72 (Walters Kluwer Law & Bus 9th ed. 2014).

61. *Boomer*, 26 N.Y.2d at 222.

62. *Id.*

63. *See id.* at 224–26.

64. *Id.* at 225–26.

responsibility for government and should not thus be undertaken as an incident to solving a dispute between property owners and a single cement plant—one of many—in the Hudson River valley.⁶⁵

Second, and relatedly, the court specifically deferred to the potential for a government-imposed regulatory response as an additional reason to modify common law rights:

It seems apparent that the amelioration of air pollution will depend on technical research in great depth; on a carefully balanced consideration of the economic impact of close regulation; and of the actual effect on public health. It is likely to require massive public expenditure and to demand more than any local community can accomplish and to depend on regional and interstate controls.⁶⁶

Finally, the abrogation of the common law right to injunctive relief in favor of social economic welfare was explicitly and emphatically conditioned on equitable compensation for the downwind property owner whose rights were being compromised. The court conditioned the denial of an injunction on the payment of “permanent damages” for the “equitable servitude” being placed on the plaintiff’s land.

This history of the evolving derogation of absolute property rights refutes the idea that the regulatory state somehow constitutes an unjust downward “redistribution” of wealth that needs to be checked by cost-benefit analysis in order to preserve an existing just distribution. Rather, common law courts incrementally abrogated absolute property-based environmental rights in favor of a rough cost-benefit analysis. Courts thus eschewed inefficient Coasian bargaining in an accommodation to the polluting industries, but did so specifically in deference to an evolving regulatory state. At the same time, this judicial and legislative accommodation sought to preserve rough economic justice by preserving the right to compensation as property remedies were eliminated.

Several libertarian-leaning commentators have noted this traditional property-based protection of downwind/downstream environmental interests. So-called free market environmentalists have argued that private rights in environmental values, as represented by expansive property rights of downwind property owners, might protect environmental values more efficaciously than regulation.⁶⁷ Some of these writers acknowledge, and lament, the judicial abrogation of common law property rights that had the effect of limiting private enforcement of

65. *Id.* at 223.

66. *Id.*

67. See generally Jonathan Adler, *Taking Property Rights Seriously: The Case of Climate Change* (2009), https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1029&context=faculty_publications; see also BRUBAKER, *supra* note 49; Roger Meiners & Bruce Yandle, *Common Law Environmentalism*, 94 PUBLIC CHOICE (1998).

environmental rights.⁶⁸ While this author disagrees with this libertarian assessment that a robust property rights regime would better function to internalize pollution harms in a market economy than a system of regulation, their insight that unmodified downwind property rights limited the ability of upwind property owners to cause pollution undercuts the implicit libertarian argument that environmental regulation constitutes a form of unjust redistribution of wealth.

B. ROLE OF POLICYMAKING AGENCIES TO CONSIDER DISTRIBUTIVE JUSTICE

This flawed libertarian premise underlies the second cost-benefit-analysis response to the distributive justice criticism. Proponents of cost-benefit analysis argue that distributional justice should not be the mission of regulatory agencies whose expertise is in environmental science and policy, not economic justice. The implicit premise of this defense is that environmental regulation is itself a form of redistribution of wealth from relatively few upwind, industrial property owners and investors with unfettered property rights to masses of downwind, residential property owners or renters and beneficiaries of public goods such as parks, clean water, and clean air. Described from this libertarian perspective, environmental agencies will, unless restrained, engage in a socialist appropriation of the property of capital investors and redistribution of this property to the masses. This perspective proceeds from the premise that regulatory agencies have no business considering distributive justice, and that agencies must be restrained from their redistributive tendencies. Cost-benefit analysis is meant to prevent this appropriation, unless justified by a hypothetical Coasian bargain in which the masses have to buy these rights from their natural owners. Allowing regulators to consider distributive justice in applying cost-benefit analysis thus thwarts the whole point of cost-benefit analysis, which is to prevent redistribution via environmental regulation. In this view, such a redistributive choice should be made by Congress, not regulatory agencies.

This anti-distributive justice argument is hogwash, of course. As noted, it is premised on the flawed assumption that in some instances upwind property owners would have an unrestricted right to foul the downstream air, wind, and soil. An equally valid development of common law traditions would recognize the absolute right of downstream property owners and trustees of public resources to prevent all physical invasions of their domains. Recognizing these absolute downstream rights would force cost-benefit analysis to ask, how much would the industry have to pay to buy out every last downwind property owner, rather than asking how much the downwind property owners would be able to pay the industrialist not to pollute.⁶⁹

68. Adler & Posner, *supra* note 12, at 307; BRUBAKER, *supra* note 49, at 127–70; *see also* Fred L. Smith, Jr., *The Progressive Era's Derailment of Classical-Liberal Evolution*, *THE FREEMAN: IDEAS ON LIBERTY* 28, 30 (June 2004).

69. *See* Driesen, *supra* note 5, at 582–83.

The argument for cost-benefit analysis thus relies on a flawed libertarian baseline assumption against which all limits on upstream property rights are an inappropriate government redistribution of value.

This argument also fundamentally misperceives the nature of the administrative state. Congress grants agencies authority and discretion to establish standards to achieve an appropriate level of environmental protection while considering economic factors such as cost. Standards adopted by the EPA and other agencies have the force of law because these agencies are involved in the law-making process.⁷⁰ To argue agencies have no business considering distributive justice is to argue that a system of environmental law itself has no business considering distributive justice.

Such an argument refutes itself. In fact, considerations of justice are part of the brief of every juris generative institution, regulatory agencies included.⁷¹ Indeed, achieving economic justice has been part of the rationale of administrative agencies from the dawn of the U.S. administrative state. The first administrative agency, the Interstate Commerce Commission (“ICC”), was established to ensure that railroad rates were “reasonable and just,”⁷² and the ICC’s authority was expanded in 1906 to include setting maximum railroad rates based on a “fair, just, and reasonable” standard.⁷³ The Interstate Commerce Act was adopted specifically with economic social justice in mind, to remedy the imbalance in bargaining power between small-enterprise farmers and monopolistic railroads.⁷⁴

Although the EPA’s statutory authorizations for regulatory standard setting do not generally make specific reference to justice or equity, the agency ultimately came to recognize the importance of economic and social justice in carrying out its regulatory mission. Author Mark Dowie’s critical study of environmentalism, *Losing Ground*, recounts this history in terms that capture the tension between a purely technocratic view of the agency and its role in promoting social and economic justice:

Historically, the agency has deliberately avoided issues of race and class in its deliberations and actions. In a 1971 hearing before the U.S. Civil Rights Commission, the EPA’s first director, William Ruckelshaus, testified that his was a technical and scientific agency that was neither mandated nor equipped

70. See *Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457, 487–89 (2001) (Stevens, J., concurring).

71. Note that the Obama and Clinton regulatory review executive orders adds “equity” to the factors considered along with cost-benefit analysis. Exec. Order No. 13,563, 76 Fed. Reg. 3,821 (Jan. 18, 2011); Exec. Order No. 12,866, 58 Fed. Reg. 190 (Sept. 30, 1993).

72. Interstate Commerce Act of 1887 § 1, ch. 104, 24 Stat. 379.

73. Hepburn Act, ch. 3591, 24 Stat. 584 (1906).

74. Jerry L. Mashaw, *Federal Administration and Administrative Law in the Gilded Age*, 119 YALE L.J. 1362, 1370 (“Their aggressive, not to mention monopolistic, business practices stimulated the Populist and Progressive political movements. The Gilded Age merged with the ‘Age of Reform,’ whose early accomplishments included the Interstate Commerce Act in 1887 and the Sherman Antitrust Act in 1890.”); see also Thomas Merrill, *The Interstate Commerce Act, Administered Contracts, and the Illusion of Comprehensive Regulation*, 95 MARQ. L. REV. 1141, 1143–44 (2012).

to deal with questions of disproportionate environmental impact. Over the years, complaints of racism and injustice at EPA have mounted, many of them internally generated. When African-American academics at Howard University and the University of Michigan organized a conference on the matter in July, 1990, Director William Reilly attended. Shaken by what he heard, Reilly assured the Congressional Black Caucus that he intended to establish a work group of high EPA officials “to study risk and low income communities.” He became an outspoken advocate of environmental justice.⁷⁵

This awakening to environmental justice concerns at the EPA ultimately led to the adoption of President Clinton’s executive order on environmental justice,⁷⁶ and the establishment of the EPA’s Office of Environmental Justice in 1993.⁷⁷ Even more recently, in 2016, the EPA issued guidance for the consideration of environmental justice in agency rulemaking, which explicitly includes the consideration of distributional impacts of regulatory choices.⁷⁸

Professor Tseming Yang has similarly commented on EPA’s delayed acknowledgement of its authority and responsibility to consider equity and justice in administering the environmental laws. His analysis concludes that economic justice and equity are appropriate concerns for environmental agencies despite the technocratic assumptions underlying the regulatory state:

Even though the reliance on quantifiable data for decision-making has improved environmental regulation in many respects, it has also had a subversive influence. Because quantifiables tend to be impressive easy to grasp and identify, they overpower and dominate the unquantifiable aspects of the regulatory decision-making process. They obscure the role of the unknown and the uncertain, as well as the importance of those values, such as ethical and distributional considerations, that cannot be measured. The overall outcome is one that is frequently warped and suspect, but nevertheless possesses the mantle of precision and objectivity.⁷⁹

Yang concludes that “[i]t would be an abdication, however, of EPA’s larger societal responsibilities as well as its specific statutory obligations under Title VI, if it failed to proactively engage civil rights and equity issues within its regulatory jurisdiction.”⁸⁰

75. MARK DOWIE, *LOSING GROUND* 156 (MIT 1995).

76. Exec. Order No. 12,898, 59 Fed. Reg. 7629 (Feb. 11, 1994).

77. Notice of Establishment of the National Environmental Justice Advisory Council and Request for Suggestions of Candidates for Membership, 58 Fed. Reg. 59,723-01 (Nov. 10, 1993).

78. TECHNICAL GUIDANCE FOR ASSESSING ENVIRONMENTAL JUSTICE IN REGULATORY ANALYSIS, ENVTL. PROT. AGENCY, https://www.epa.gov/sites/production/files/2016-06/documents/ejtg_5_6_16_v5.1.pdf (last visited March 3, 2017).

79. Tseming Yang, *The Form and Substance of Environmental Justice: The Challenge of Title VI of the Civil Rights Act*, 29 B.C. ENVTL. AFF. REV. 143, 187–88 (2002).

80. *Id.* at 216; see also H. Spencer Banzhaf, *Regulatory Impact Analyses of Environmental Justice Effects*, 27 J. LAND USE & ENVTL. L. 1 (2011) (arguing for inclusion of distributional impact analysis in all regulatory impact analyses).

Though the EPA may have come late to the table of taking justice and equity concerns into account in performing its regulatory functions, the principle that justice and equity concerns are appropriate considerations for the agency is now well established, and is consistent with the historical functions of regulatory agencies.

IV. AMELIORATING THE POTENTIAL REGRESSIVE REDISTRIBUTIVE EFFECTS OF COST-BENEFIT ANALYSIS BY INCORPORATING A COMPENSATION PRINCIPLE

A significant defect of cost-benefit analysis is thus its potentially regressive redistributive tendency. This regressive redistributive tendency is a significant argument against incorporation of mandatory cost-benefit analysis into regulatory standard setting. However, given its incorporation into several federal statutes, executive orders, and Supreme Court jurisprudence, as well as the strong support for cost-benefit analysis in the regulated community and its political representatives, cost-benefit analysis will likely continue to play a substantial role in regulatory standard setting in the United States for the foreseeable future.⁸¹ If cost-benefit analysis is to be used in regulatory standard setting at all, its application must take into account the redistributive impacts of choices driven by cost-benefit analysis, and the availability of compensation to cost-benefit analysis losers should form a part of the analysis whether to accept the results of cost-benefit analysis.

A. CONSISTENCY OF COMPENSATION PRINCIPLE WITH UNDERLYING ECONOMIC JUSTIFICATIONS FOR COST-BENEFIT ANALYSIS

As noted earlier in this Article, cost-benefit analysis is usually justified on utilitarian economic grounds, either based on an artificial achievement of Pareto efficiency or based on the Kaldor-Hicks principle.

The Kaldor-Hicks principle does not reject or preclude compensation, it is just indifferent to whether compensation is paid; the principle values societal wealth maximization over concern for distributional impacts. An underlying premise of the Kaldor-Hicks principle is that actual compensation for transactional losers imposes excessive transaction costs, due to the large number or inability to identify the transactional losers. Thus, society accepts these uncompensated losses for the net greater good. By extension, cost-benefit analysis would accept these uncompensated losses because it's part of the Kaldor-Hicks justification for cost-benefit analysis. In many cases, the losers in a cost-benefit-analysis-established

81. The most extreme recent example of proposed legislation expanding the use of cost-benefit analysis is the Regulatory Reform Act, H.R. 5, 115th Cong. (2017-2018), which would incorporate formal cost-benefit analysis into all future rulemaking, as well as require cost-benefit analysis review of existing rules.

standard are not identifiable,⁸² but in some, they are. For example, the EPA has set a drinking water standard for arsenic based on its calculation of the number of bladder and lung cancers that might have been avoided with a stricter standard, but at too great an expense. A consumer of a public drinking-water system that just meets the revised standard and has no other risk factors, who then contracts lung or bladder cancer should have a strong claim for compensation despite the Kaldor-Hicks premise that compensation is too inefficient.

Neither should the Pareto efficiency argument preclude compensation, although one must acknowledge that Ronald Coase seemed to argue against compensation for externalities in the pursuit of economic utility. Somewhat incongruously, Professor Coase's seminal article, "The Problem of Social Cost," argued compensation should not be paid to victims of industrial externalities.⁸³ Using the example of steam locomotives and farmers whose crops are destroyed by sparks, Coase reasoned that paying compensation would just encourage more landowners to farm their land, increasing the required compensation to the point that the otherwise welfare-positive railroad became unprofitable. Coase's non-compensation argument is in direct opposition to his suggestion that allocation of the rights to externalities makes no difference to overall efficiency—after all, compensation to landowners for spark damage merely reflects an initial allocation of the right to be free of spark damage to the landowners rather than the right to cause damage to the railroad. Moreover, to reach the result that compensation would be inefficient, Coase makes the arbitrary assumptions that (1) economically productive land was not already being farmed in the absence of compensation, and (2) the annual additional compensation due to this newly farmed land would wipe out the railroad's profit. But if these assumptions were both true, then it is hard to conclude the railroad was economically efficient in the first place, because its internal profits were posited to be less than the combined externalities of (1) crops destroyed by sparks, plus (2) otherwise productive land withheld from production because of the risk of uncompensated spark damage to crops. With all due respect to Professor Coase, compensation for the victims of externalities made acceptable by the pursuit of wealth maximization should not be considered *per se* inefficient.

Compensation to the individually identifiable losers of cost-benefit-analysis-established standards would serve both distributive justice as well as economic efficiency. It serves distributive justice by mitigating the regressive wealth transfer from downwind, cost-benefit analysis losers to upwind, cost-benefit analysis

82. This might be true in the case of environmental contamination linked to common cancers or respiratory illnesses that are also linked to other ubiquitous environmental contaminants, preventing any realistic possibility of proving causation in any individual case. In addition, compensation for harms to widely shared public goods such as aesthetic enjoyment of recreational resources and species may be impracticable due to the sheer number of people injured and the transaction costs of assessing and distributing compensation. Similarly, the transaction costs may overwhelm a system of compensation for relatively small value harms to a vast number of individuals.

83. R.H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960).

winners. It serves economic efficiency by recapturing the externalities lost by cost-benefit analysis in the first place and fostering more socially efficient investment choices. In the power plant hypothetical, the plant investor might invest in the solar farm if she knew that, in addition to having to install the \$500,000 of pollution control equipment, she would ultimately have to compensate the downwind community for its \$300,000 of health impacts as well, reducing the profit on the investment to the truer \$200,000 of net increase in societal wealth.

B. TORT LAW ACCOMMODATION FOR HARMS EXTERNALIZED THROUGH COST-BENEFIT ANALYSIS

Tort law could accommodate this compensation principle in a number of ways. First, strict liability or relaxed standards for proof of causation could be applied to tort plaintiffs with exposure to environmental hazards and the injuries that were the subject of cost-benefit-analysis-based standard setting. Second, a form of market-share liability for proportionate compensation based on an emitters share of overall environmental pollution might be applied to recapture the benefit transfer.⁸⁴ Third, compliance with regulatory standards established by cost-benefit analysis should never be considered a defense in a tort action to recover damages, recognizing that, in essence, standards established by cost-benefit analysis do not constitute due care to prevent injury, but rather recognize the certainty that a level of environmental injury will result from an activity and a determination of whether that level of injury is acceptable to society.⁸⁵ The first two recommendations would represent an expansion of prevailing tort concepts, while the third is consistent with current law but has been subject to attack.

The problem of proving causation, especially where multiple causative factors are at work, is one of the biggest barriers to effective internalization of environmental health harms through common law tort recoveries. Courts struggle with the difficulty of tracing multiple exposure pathways to multiple environmental contaminants in applying the “more likely than not” standard of proving causation by a single source of contamination.⁸⁶ Where a cost-benefit analysis has been

84. See *Sindell v. Abbott Labs.*, 26 Cal.3d 588 (1980).

85. See *Wveth v. Levinte*, 129 S. Ct. 1187 (2009); Lars Noah, *Reconceptualizing Federal Preemption of Tort Claims as the Government Standards Defense*, 37 WM. & MARY L. REV. 903, 907–24 (1996); *Grand Trunk Ry. Co. of Can. v. Ives.*, 144 U.S. 408, 427 (1892). ALI’s 1965 Restatement (Second) of Torts stated that a government safety standard is a “minimum and does not prevent a finding that a reasonable man would have taken additional precautions where the situation is such as to call for them.” Restatement (Second) of Torts § 288C cmt. A (1965); the 1998 Restatement (Third) of Torts: Products Liability, comment e provides that safety regulations “generally are only minimum standards” and “establish a floor of safety below which sellers fall only at their peril.” Restatement (Third) of Torts: Prods. Liab. § 4 cmt. e.

86. See *Donaldson v. Cent. Ill. Pub. Serv. Co.*, 767 N.E.2d 314, 329 (Ill. Sup. Ct. 2002) (need to establish generic causation, potential for contaminant to cause injury as well as specific causation that contaminant was cause of injury in this case); *Velsicol Chem. Co. v. Rowe*, 543 S.W.2d 337, 338 (Tenn. Sup. Ct. 1976) (extending joint and several liability to individual source of pollutants where multiple independent sources of chemical pollutants combine); *Landrigan v. Celotex Corp.*, 605 A.2d

performed and relied on to establish regulatory standards for an acceptable level of public health harm, tort plaintiffs who suffer the very harms that the regulatory agency has deemed to be acceptable should be able to rely on the cost-benefit analysis assumptions to establish generic causation against the very industries benefitting from the cost-benefit-analysis-based relaxation of standards. Plaintiffs should likewise be able to rely on evidence establishing substantial exposure to those contaminants from regulated sources to allow a jury to consider specific causation.

The imposition of joint and several liability in cases where there are multiple sources of a particular contaminant may pose problems of over compensation, possibly including both regulated, unregulated, and natural sources of the contaminant in question. One regulated industry might ultimately be held liable for several multiples of their share of the public health harms deemed acceptable by the underlying cost-benefit analysis. One industrial source could conceivably be held fully liable for the injuries attributable not just to its own emissions (and inherent profits) considered in the cost-benefit analysis, but for other sources' as well under a theory of joint tort liability.⁸⁷ This problem could be ameliorated if common law courts were to adopt a proportionate liability approach similar to the market-share liability approach adopted in *Sindell v. Abbott Laboratories*.

In *Sindell*, the Supreme Court of California adopted a proportionate liability approach to product liability damages for a widely marketed drug, DES, where the exact source of the product used by each plaintiff could not be determined.⁸⁸ Analogously, a similar proportionate liability approach might be used to apportion liability for widely emitted regulated environmental contaminants. This approach would ameliorate the joint and several liability over-compensation problems. However, courts have been reluctant to extend the market-share liability theory of *Sindell* to other contexts, including environmental exposures.⁸⁹

1079 (N.J. 1992) (applying statistical concept of attributable risk to allow jury to find compensation in situation where environmental exposure is not the only statistical causative factor for particular disease); see also James Patrick Logan, *What's Shakin'? Ladra v. New Dominion, LLC: A Case of Consequence for the Hydraulic Fracturing Industry and Those Affected by Induced Seismicity*, 34 PACE ENVTL. L. REV. 207, 234 (2016) (discussing the difficulty of proving causation of anthropogenically induced earthquakes, as well as the possibility of applying market-share liability to injection well operators).

87. See *Velsicol Chem. Co.*, 543 S.W.2d at 338.

88. *Sindell*, 607 P.2d at 936–38.

89. See *Univ. System of N.H. v. U.S. Gypsum Co.*, 756 F. Supp. 640, 655–56 (D.N.H. 1991):

Many courts, however, have declined to apply the market share theory in drug cases, and almost all have refused to apply it in asbestos cases. *Tidler v. Eli Lilly & Co.*, 851 F.2d 418 (D.C. Cir. 1988) (DES); *Bateman v. Johns-Manville*, 781 F.2d 1132 (5th Cir. 1986) (asbestos); *Thompson v. Johns-Manville*, 714 F.2d 581 (5th Cir.), cert. denied, 465 U.S. 1102, (1983) (asbestos); *Dawson v. Bristol Labs*, 658 F. Supp. 1036 (W.D. Ky. 1987) (tetracycline); *In re Related Asbestos Cases*, 543 F. Supp. 1152 (N.D. Cal. 1982) (asbestos); *Morton v. Abbott Labs*, 538 F. Supp. 593 (M.D. Fla. 1982) (DES); *Starling v. Seaboard Coast Line R.R.*, supra, 533 F. Supp. 183 (asbestos); *Hannon v. Waterman Steamship Corp.*, 567 F. Supp. 90 (E.D. La. 1983) (asbestos); *Burke v. Johns-Manville Corp.*, No. C-1-289 (S.D. Ohio Aug. 2, 1983) (asbestos); *Prelick v. Johns-Manville*, 531 F. Supp. 96 (W.D.Pa. 1982) (asbestos); *Mizell v. Eli Lilly & Co.*, 526 F. Supp. 589

Independent from problems of causation and proportionate liability, the compensation problem inherent in cost-benefit-based regulatory standard setting argues against acceptance of regulatory compliance as a defense to a common law tort action, whether it be based in negligence or in property-based torts such as trespass or nuisance. While environmental tort defendants have argued that compliance with regulatory standards should constitute evidence of “due care,” precluding a finding of negligence, most courts have not accepted such a defense.⁹⁰ Regulatory compliance may, however, be offered as evidence of due care before the jury. Some legislative tort reform proposals include provisions to make regulatory compliance a per se defense to tort actions.⁹¹ Because cost-benefit-based standards are not based on preventing harm, but rather on determining whether the profit to the regulated facilities exceeds the value of harms caused, such standards should never be the basis of a tort law defense that would defeat compensation to the parties whose injuries were contemplated by the regulatory standard. Both distributive justice and the cost internalization principles of environmental regulation demand compensation be allowed in such circumstances.

C. COST-BENEFIT ANALYSIS IN LEGISLATION

For similar reasons, where cost-benefit analysis is imposed on agency standard setting by statute, such statutes should incorporate means for recapturing the benefits transfer inherent in the rejection of higher cost pollution control and transferring this benefit to identifiable environmental health victims of the avoidable pollution. Where cost-benefit analysis is not made mandatory by statute, the lack of such compensation mechanisms—due to the lack of a theory for legal relief or insurmountable causation problems—should be a sufficient justification for an agency to reject the adoption of a relaxed standard otherwise indicated by formal cost-benefit analysis.

(D.S.C. 1981) (DES); *Ryan v. Eli Lilly & Co.*, 514 F. Supp. 1004 (D.S.C. 1981) (DES) (applying both North and South Carolina law); *Enright v. Eli Lilly & Co.*, 141 Misc.2d 194, 533 N.Y.S.2d 224 (Sup. Ct.1985) (DES); *Goldman v. Johns-Manville*, 33 Ohio St.3d 40, 514 N.E.2d 691 (1987) (asbestos); *Gaulding v. Celotex*, 748 S.W.2d 627 (Tex.Ct.App. 1988); *Case v. Fibreboard Corp.*, 743 P.2d 1062 (Okla. 1987) (asbestos); *Celotex Corp. v. Copeland*, 471 So.2d 533 (Fla. 1985) (asbestos); *Zafft v. Eli Lilly & Co.*, 676 S.W.2d 241 (Mo. 1984) (DES).

90. See generally Adam D.K. Abelkop, *Tort Law as an Environmental Policy Instrument*, 92 OR. L. REV. 381, 415–17 (2013); see also *Riegel v. Medtronic, Inc.*, 552 U.S. 320, 345 (2008) (“Most States do not treat regulatory compliance as dispositive, but regard it as one factor to be taken into account by the jury.”).

91. See, e.g., Act of July 22, 1987, ch. 197, 1987 N.J. Sess. Law Serv. 188-93 (West). The New Jersey statute makes compliance with FDA-approved warnings presumptively adequate and limits the availability of punitive damages when products approved by the FDA are challenged. Other states also have enacted provisions creating a presumption that products in compliance with government standards are reasonably safe and nondefective. See Kan. Stat. Ann. § 60-3304(a), (b) (1983); Tenn. Code Ann. § 29-28-104 (1980); Utah Code Ann. § 78-15-6(3) (Supp. 1977); H.R. 2238, 100th Cong., 1st Sess. (1987).

V. CONSISTENCY OF COMPENSATION PRINCIPLE WITH EXISTING COST-BENEFIT ANALYSIS PROVISIONS

Current incorporation of cost-benefit analysis into environmental regulatory standard setting takes several forms. Cost-benefit analysis has been imposed on regulatory agencies in some case by statute, by executive order, and by judicial interpretation of general statutory provisions. Cost-benefit analysis is in some cases mandatory, and in others it is precatory. A brief analysis of examples of different instances of environmental cost-benefit analysis, together with an assessment of their consistency with the compensation principle, follows.⁹²

A. STATUTORY PROVISIONS

Several statutes explicitly incorporate variations of cost-benefit analysis into the parameters for regulatory standard setting. The Toxic Substances Control Act (“TSCA”) directs the EPA to prepare a statement assessing the health and environmental impacts of a substance together with the economic costs of a proposed regulation restricting the manufacture, sale, or use of that substance. The SDWA Act directs a more formal sort of cost-benefit analysis, directing the EPA to set drinking water standards based on compliance costs that are justified by the benefits. Several environmental statutes incorporate technology-based standards that, more generally, direct the EPA to consider costs of compliance in relation to environmental benefits, but without a specific direction to match dollar costs and monetized benefits.

1. Toxic Substances Control Act

TSCA gives the EPA broad, but secondary, authority to regulate chemical substances that it determines pose a risk to public health or the environment.⁹³ Permissible regulations, at the EPA’s discretion, range from labeling requirements to outright bans on the manufacture, sale, or use of such substances. By statute, invocation of TSCA to regulate is a last resort; EPA must adopt regulations under other, more specific statutory programs if feasible. TSCA directs the EPA, in the course of rulemaking, to prepare and consider a statement assessing the environmental and public health harms of a suspect chemical together with the economic costs of compliance with the proposed regulation, but it does not by its terms mandate standards based on cost-benefit analysis. TSCA § 6 (prior to its amendment in 2016) provided:

92. An excellent overview of statutory and regulatory approaches to cost-benefit analysis appears in Zygmunt Plater, et al., ENVIRONMENTAL LAW AND POLICY: LAW, NATURE, AND SOCIETY 571–606 (Wolters Kluwer ed., 5th ed. 2016), and this section borrows from the analytical organization of that casebook.

93. See generally 15 U.S.C. §§ 2601-29 (2012).

- (c) Promulgation of subsection (a) rules
- (1) In promulgating any rule under subsection (a) of this section with respect to a chemical substance or mixture, the Administrator shall consider and publish a statement with respect to—
 - (A) the effects of such substance or mixture on health and the magnitude of the exposure of human beings to such substance or mixture,
 - (B) the effects of such substance or mixture on the environment and the magnitude of the exposure of the environment to such substance or mixture,
 - (C) the benefits of such substance or mixture for various uses and the availability of substitutes for such uses, and
 - (D) the reasonably ascertainable economic consequences of the rule, after consideration of the effect on the national economy, small business, technological innovation, the environment, and public health.⁹⁴

By its terms, the TSCA cost-benefit-statement requirement is neither a strict nor mandatory form of cost-benefit analysis. It does not direct the EPA to attempt to monetize the environmental and public health harms resulting from exposure to the chemical substance for direct comparison to the dollar costs of compliance with the rule under consideration. Nor does it direct the EPA to reject a regulation should the cost exceed the benefit; the EPA need only prepare and consider the analysis. The 2016 amendments to TSCA make clear that the results of this cost-benefit analysis should not override the requirement that chemical regulations prevent unreasonable risks to health and the environment.⁹⁵

Nevertheless, in one of the few instances in which the EPA invoked TSCA § 6 to ban a substance, the reviewing court invalidated the rule on cost-benefit

94. 15 U.S.C. § 2605 (2012); *see also id.* at § 2603.

95. *Id.* at § 2605(c)(2)(A)(iv). This section provides that when promulgating a rule under §2605(a) the Administrator must consider “. . . the reasonably ascertainable economic consequences of the rule, including consideration of—

- (I) the likely effect of the rule on the national economy, small business, technological innovation, the environment, and public health;
- (II) the costs and benefits of the proposed and final regulatory action and of the 1 or more primary alternative regulatory actions considered by the Administrator; and
- (III) the cost effectiveness of the proposed regulatory action and of the 1 or more primary alternative regulatory actions considered by the Administrator . . .” The act then says, “In selecting among prohibitions and other restrictions, the Administrator shall factor in, to the extent practicable, the considerations under subparagraph (A) in accordance with subsection (a).” *Id.* at § 2605(c)(2)(B). Amended § 2605 Subsection (a) discusses subsection (c)(2) (mentioned above) and (b)(4)(A), which says “The Administrator shall conduct risk evaluations pursuant to this paragraph to determine whether a chemical substance presents an unreasonable risk of injury to health or the environment, without consideration of costs or other non-risk factors, including an unreasonable risk to a potentially exposed or susceptible subpopulation identified as relevant to the risk evaluation by the Administrator, under the conditions of use.” *Id.* at § 2605(a). Other areas of § 2605 also say that cost won’t be considered when conducting risk evaluation. Cost comes up just during discussion of rule promulgation, which, again, says that it must comply with (a), which states some regulation of chemicals that present an unreasonable risk.

grounds. In *Corrosion Proof Fittings v. EPA*⁹⁶, the Fifth Circuit invalidated EPA's rule banning asbestos-containing materials on the grounds that the number of lives saved by the rule was not justified by the cost of the rule, estimated at a range of \$7 million to \$108 million dollars per life saved (depending on the range of lives saved and the particular banned use of asbestos).⁹⁷ The court rejected the asbestos ban as arbitrary and capricious, finding the EPA's acceptance of such a high cost per life saved to demonstrate that EPA had been "cavalier" in its implementation of the cost-benefit statement requirement of TSCA.⁹⁸

It may be difficult to evaluate TSCA's cost-benefit statement in the rubric of the proposed compensation principle, because TSCA by its terms grants broad discretion to the EPA on whether to invoke its regulatory provisions, and the cost-benefit provisions of TSCA are precatory, not (by their terms) mandatory. Certainly, the lack of realistic compensation mechanisms for victims of exposure to a given chemical should be a valid reason for the EPA to accept apparently disproportionate costs to industry for compliance with a proposed regulation. Lack of realistic compensation mechanisms might be due to the challenges of proving exposure and causation in the case of chemicals in wide use and associated illnesses (like cancers) with multiple potential triggers. In the case of the asbestos ban, compensation may have been unavailable due to bankruptcies in the asbestos industry.⁹⁹

2. The Safe Drinking Water Act

The Safe Drinking Water Act directs the EPA to set maximum contamination limits for potentially harmful contaminants in public drinking water supplies.¹⁰⁰ In setting these limits, the EPA is required to perform a formal, monetized cost-benefit analysis, and is authorized to adopt a less stringent standard than the one achieved by the most advanced technology on the basis that it "maximizes health risk reductions at a cost that is justified by the benefits."¹⁰¹ The SDWA thus incorporates a formal cost-benefit analysis into regulatory standard setting. To accomplish this, it sets forth a relatively sophisticated set of guidelines for monetizing the public-health-benefit-side of the cost-benefit analysis equation:

96. 947 F.2d 1201 (5th Cir. 1991).

97. *Id.*

98. *Id.* at 1223.

99. See MARK D. PLEVIN & PAUL W. KALISH, WHERE ARE THEY NOW? A HISTORY OF THE COMPANIES THAT HAVE SOUGHT BANKRUPTCY PROTECTION DUE TO ASBESTOS CLAIMS, ASBESTOS BANKRUPTCY REPORT (LexisNexis 2001), https://www.crowell.com/documents/DOCASSOCFKTYPE_ARTICLES_424.pdf.

100. 42 U.S.C. § 300f(1) (2012).

101. *Id.* at § 300g-1(b)(6).

(i) Maximum contaminant levels.

When proposing any national primary drinking water regulation that includes a maximum contaminant level, the Administrator shall . . . use . . . an analysis of each of the following:

- (I) Quantifiable and nonquantifiable health risk reduction benefits . . .
- (II) Quantifiable and nonquantifiable health risk reduction benefits . . . from reductions in co-occurring contaminants . . .
- (III) Quantifiable and nonquantifiable costs . . . likely to occur solely as a result of compliance with the maximum contaminant level, including monitoring, treatment, and other costs . . .
- (IV) The incremental costs and benefits associated with each alternative maximum contaminant level considered.
- (V) The effects of the contaminant on the general population and on groups within the general population . . . that are identified as likely to be at greater risk of adverse health effects due to exposure to contaminants in drinking water than the general population.
- (VI) Any increased health risk that may occur as the result of compliance, including risks associated with co-occurring contaminants.
- (VII) Other relevant factors, including the quality and extent of the information, the uncertainties in the analysis . . .¹⁰²

The rulemaking that established a ten-micrograms-per-liter arsenic standard for drinking water provides an example of agency implementation of formal cost-benefit analysis. The EPA rejected a five-microgram standard that would have resulted in the avoidance of 51-100 lung and bladder cancers, for a monetized benefit of between \$190 and \$360 million, and a cost to the water industry of between \$420 and \$470 million.¹⁰³ It adopted the ten-micrograms standard based on a calculation that the standard would avoid 37 to 56 cancers, with a monetized value of between \$140 and \$200 million, at a compliance cost of between \$180 and \$210 million.¹⁰⁴

Application of a compensation principle to the arsenic standard setting might have justified an EPA decision to adopt the stricter standard based on technological feasibility, rather than the more relaxed standard based on a rough balance between cost and benefit. This is because causation issues may, as a practical matter, preclude compensation to the losers of a cost-benefit analysis based standard. By the EPA's estimates, as many as 50 people will contract bladder and lung cancer because the EPA rejected the stricter five-micrograms standard, and these people would be unlikely to be able to prove causation in a personal injury

102. *Id.* at 300g-1(b)(3)(C)(i).

103. National Primary Drinking Water Regulations, *supra* note 33, at 7009, 7017.

104. *Id.*

lawsuit against their water supplier. Application of a cost-benefit analysis compensation-principle in the context of a tort claim would argue for judicial recognition of a rule relaxing proof of causation where a plaintiff can show exposure to a contaminant that would have been regulated more strictly but for the application of cost-benefit analysis, which might be the case for a long-term consumer of water from a system that just meets the relaxed arsenic standard.

On the other hand, the SDWA cost-benefit analysis provision might provide an (possibly inadvertent) example of cost-benefit analysis that does not result in a regressive wealth redistribution. This is because public water suppliers in the United States are regulated public utilities, whose profits are regulated and whose rates are set based on a reasonable return on investment. The costs saved by a utility that is not required to install costly treatment systems are (at least in theory) required to be passed to the consumers, who are placed at risk by the environmental contamination, which generally offsets the regressive redistribution implicit in cost-benefit analysis.¹⁰⁵ Of course, this offset is only true *ex ante*—once a particular unlucky water consumer is afflicted with one of the cancers that could have been avoided, that consumer has not been fully compensated, while other consumers have.¹⁰⁶

3. Statutory Technology-Based Standards

Several regulatory schemes require the EPA to set standards based on available control technologies. The Clean Water Act (“CWA”),¹⁰⁷ Clean Air Act (“CAA”),¹⁰⁸ and Resource Conservation and Recovery Act (“RCRA”)¹⁰⁹ all require such technology-based standards. In determining whether a control technology is available for implementation, the EPA is typically instructed to consider compliance cost. Typical among these provisions is § 304 of the CWA, which defines “best practicable technology” as follows: “Factors relating to the assessment of best practicable control technology currently available . . . shall include consideration of the total cost of application of technology in relation to

105. The arsenic standard rulemaking record acknowledged this potential pass-through: “EPA is also aware that a number of small systems have already installed these technologies and found them to be affordable. Because these technologies are affordable by small systems, economies of scale would also make them affordable to large size systems. The increased cost is expected to be passed on to the consumer either as a water rate increase or as a tax increase.” 50 Fed. Reg. 46914 (Nov. 13, 1985).

106. Risk can, in theory, be spread through economic instruments such as insurance, but there is no reason to think that an individual exposed to a small but significant risk is likely to purchase extra insurance for that risk, or that such extra insurance will provide compensation for injuries beyond the direct medical costs of treatment or mortality. Professor Driesen notes this paradox in the problem of monetizing risk versus monetizing actual injury and suggests that it skews cost-benefit analysis to undervalue the harms caused by deregulation. *See Driesen, supra* note 5, at 587–88.

107. 33 U.S.C. § 1326(b) (2012).

108. 42 U.S.C. § 7412(d)(2) (2012).

109. 42 U.S.C. § 6924(o) (2012).

the effluent reduction benefits to be achieved from such application.”¹¹⁰ Although this section might be literally read to require a strict cost-benefit analysis, with monetization of costs and benefits and establishment of the ultimate standard based on a direct comparison, the legislative history of this section makes clear that a technology should be rejected as best practicable technology only where the costs are “wholly of out proportion” to the benefits,¹¹¹ and the courts have so interpreted this provision in upholding EPA standards that impose compliance costs exceeding the direct monetized benefits of the standard.¹¹²

Because these technology-based standards do not typically impose strict, formal cost-benefit analysis or decision-making, these standards arguably have a less regressive redistributive effect than strict cost benefit-analysis requirements and are less susceptible to a critique based on failure to provide for compensation to the loss of regulatory benefits to the public.

B. EXECUTIVE ORDERS

By executive order, starting with President Reagan, presidents have directed agencies to consider compliance costs in comparison to benefits in all rulemaking, except where precluded by statute.

President Reagan first incorporated cost-benefit analysis into all agency rulemaking in Executive Order 12,291. This order directs:

Sec.2. General Requirements. In promulgating new regulations, reviewing existing regulations, and developing legislative proposals concerning regulation, all agencies, to the extent permitted by law, shall adhere to the following requirements:

- (a) Administrative decisions shall be based on adequate information concerning the need for and consequences of proposed government action;
- (b) Regulatory action shall not be undertaken unless the potential benefits to society for the regulation outweigh the potential costs to society;

110. 33 U.S.C. § 1314(b)(1)(B) (2012).

111. *Chem. Mfrs. Ass'n v. EPA*, 870 F.2d 177, 204 n.80 (1989) (citing U.S. LIBRARY OF CONGRESS, A LEGISLATIVE HISTORY OF THE WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972 170 (1973)).

112. *See id.* (“*See EPA v. National Crushed Stone Assoc.*, 449 U.S. at 71 n. 10, 101 S.Ct. at 300 n. 10; *American Frozen Food Inst. v. Train*, 539 F.2d at 119. The Ninth Circuit has interpreted this legislative history to prohibit EPA from relying upon a cost-benefit comparison to select a lower level of technology than BPT unless increased costs would be wholly disproportionate to potential effluent reduction benefits. *Association of Pacific Fisheries v. EPA*, 615 F.2d at 805.”); *see also Rybachek v. EPA*, 904 F.2d 1276, 1289 (9th Cir. 1990) (“From this statutory language, it is ‘plain that, as a general rule, the EPA is required to consider the costs and benefits of a proposed technology in its inquiry to determine the BPT.’ *Ass’n of Pac. Fisheries v. EPA*, 615 F.2d 794, 805 (9th Cir. 1980). The EPA has broad discretion in weighing these competing factors. *Id.* It may determine that a technology is not BPT on the basis of this cost-benefit analysis only when the costs are “wholly disproportionate” to the potential effluent-reduction benefits.”).

- (c) Regulatory objectives shall be chosen to maximize the net benefits to society;
- (d) Among alternative approaches to any given regulatory objective, the alternative involving the least net cost to society shall be chosen; and
- (e) Agencies shall set regulatory priorities with the aim of maximizing the aggregate net benefits to society, taking into account the condition of the particular industries affected by regulations, the condition of the national economy, and other regulatory actions contemplated for the future.¹¹³

Although Executive Order 12,291 purports to apply only “to the extent permitted by law,” it establishes elaborate procedures which allow the Office of Management and Budget to block the promulgation of regulations seen to conflict with its goals. As a practical matter, then, Executive Order 12,291 had the effect of overlaying a gloss of cost-benefit analysis on all agency rulemaking, whether the underlying statutory standard contemplated cost-benefit analysis or not.

President Bill Clinton expanded upon the procedures implemented by Executive Order 12,291 and refined the direction to conduct regulatory cost-benefit analysis in Executive Order 12,866, issued September 30, 1993. This refinement of cost-benefit analysis responded to some of the criticisms of cost-benefit analysis, including the difficulty in monetizing environmental benefits and the distributive justice difficulties of cost-benefit analysis. Executive Order 12,866 provides:

Section 1. *Statement of Regulatory Philosophy and Principles.*

(a) *The Regulatory Philosophy.* Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.¹¹⁴

Notably, Executive Order 12,866 directs agencies to consider non-quantifiable, qualitative benefits of regulations, as well as “distributive impacts” in establishing regulatory standards.

113. Exec. Order No. 12,291, 46 Fed. Reg. 13,193 (Feb. 19, 1981).

114. Exec. Order No. 12,866, 58 Fed. Reg. 190 (Sept. 30, 1993).

Similarly, President Obama refined the parameters of cost-benefit analysis in regulatory impact review in Executive Order 13,563, issued January 18, 2011. Executive Order 13,563 provides:

(b) This order is supplemental to and reaffirms the principles, structures, and definitions governing contemporary regulatory review that were established in Executive Order 12866 of September 30, 1993. As stated in that Executive Order and to the extent permitted by law, each agency must, among other things: (1) propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor its regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity).¹¹⁵

The Obama Executive Order adds “equity” to the consideration of distributive impacts in agency implementation of cost-benefit analysis.

President Trump has issued two executive orders bearing on the consideration of costs and benefits in regulatory actions. First, Executive Order 13,771,¹¹⁶ issued January 30, 2017, requires that for every new regulation issued for public notice and comment by an agency, that agency must propose the elimination of two existing regulations that would result in compliance cost savings at least equal to the compliance costs expected from the new regulation. Second, Executive Order 13,771,¹¹⁷ issued February 24, 2017, references Executive Orders 12,866 and 13,563 (the Clinton and Obama cost-benefit executive orders) and directs each agency to create a regulatory reform task force to identify regulations for elimination specifically including “regulations that . . . (iii) impose costs that exceed benefits.”¹¹⁸ These Trump executive orders do not fit into the pre-existing parameters of cost-benefit analysis. Executive Order 13,771 seems to mandate the elimination of regulations solely on the basis of compliance costs, without any reference at all to the benefits associated with the regulation. Literally read, this executive order contradicts all of the economic social welfare arguments in favor of cost-benefit analysis. That is, by requiring the elimination of a regulation that, hypothetically, imposes \$100 million dollars of compliance costs but has \$1 billion of easily monetized social benefits, the executive order decreases societal wealth rather than increases it. Executive Order 13,771 references the previous executive orders incorporating non-monetizable benefits and

115. 76 Fed. Reg. 3,821 (Jan. 18, 2011).

116. Exec. Order No. 13,771, 82 Fed. Reg. 9,339 (Feb. 3, 2017).

117. Exec. Order No. 13,777, 82 Fed. Reg. 12,285 (Feb. 24, 2017).

118. *Id.*

distributional impacts into regulatory review, but then directs agencies to target regulations based on a straight cost-benefit comparison, without considering non-quantifiable benefits or distributional impacts.

The inclusion of “distributive impacts” and “equity” in the parameters of cost-benefit analysis under the Clinton and Obama executive orders is broad enough to include consideration of the availability of compensation to cost-benefit analysis losers. But there is no record of any agency including consideration of the availability of compensation to the public health and welfare victims of foregone regulation.¹¹⁹ Achievement of justice and equity would demand that such consideration be made an explicit, and essential, part of cost-benefit analysis performed under executive order regulatory review.

C. JUDICIALLY IMPOSED COST-BENEFIT ANALYSIS

In recent years, culminating in the case of *Michigan v. EPA*,¹²⁰ the Supreme Court has moved toward incorporating some form of cost-benefit analysis into its interpretation of open-ended statutory standards for rulemaking.¹²¹ This represents an evolution in the Court’s jurisprudence, which has migrated from foreclosing consideration of cost in the implementation of health-based statutory standards in *Whitman v. American Trucking Association*,¹²² to the permission of consideration of cost of compliance in a more open-ended statutory standard in *Entergy v. Riverkeeper*,¹²³ to its most recent decision in *Michigan* requiring EPA consideration of costs of compliance in applying an open-ended standard.

In *Whitman*, industry trade groups challenged the EPA’s establishment of the National Ambient Air Quality Standards (“NAAQS”) for particulate matter and ozone. The CAA directs that such standards be set “based on such criteria and allowing an adequate margin of safety, are requisite to protect the public

119. See OFFICE OF MGMT. & BUDGET, REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND AGENCY COMPLIANCE WITH THE UNFUNDED MANDATES REFORM ACT 54 (2015) (recommending regulatory reforms including “clear presentation of quantified and non-quantified costs, benefits, and distributional effects of proposed regulations and their alternatives.”). The Report also says that “[s]o far as we are aware, there is only limited analysis of the distributional effects of regulation.” *Id.* at 10. It goes on to cite two scholarly articles and does not offer any examples of actual regulation that may have taken place and how agencies may have reacted to distributional effects. See also Matthew D. Adler & Eric A. Posner, *Implementing Cost-Benefit Analysis When Preferences Are Distorted*, 29 J. LEGAL STUD. 1105, 1124 (2000) (discussing executive orders instructing agencies to look at distributive impacts and equity: “one might doubt whether these instructions have had much impact. On the one hand, agencies typically publish, alongside the CBA, a discussion of distributive impacts. On the other hand, these discussions are usually formulaic and inconclusive. But they do show that distributive issues have some prominence, contrary to the prescription of textbook CBA.”).

120. 135 S. Ct. 2699 (2015).

121. *Id.*

122. 531 U.S. 457, 468 (2001).

123. 556 U.S. 208 (2009).

health.”¹²⁴ Industry challenged the EPA’s refusal to consider the cost of compliance in establishing this health-based standard. The Supreme Court ultimately rejected this challenge based on the clear statutory direction to base the NAAQS standard solely on health considerations:

Were it not for the hundreds of pages of briefing respondents have submitted on the issue, one would have thought it fairly clear that the test does not permit the EPA to consider costs in setting the standards . . .

To prevail . . . respondents must show a textual commitment of authority to the EPA to consider costs in setting NAAQSs under sec. 109(b)(1). And because sec. 109(b)(1) and the NAAQSs for which it provides are the engine that drives nearly all of title I of the CAA, that textual commitment must be a clear one. Congress, we have held, does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions – it does not, one might say, hide elephants in mouseholes.¹²⁵

Subsequent Supreme Court decisions have been more receptive to importing consideration of compliance costs into more open-ended statutory standards for rulemaking. In *Entergy v. Riverkeeper*, environmental groups challenged the EPA’s refusal to require a particular proven (but expensive) technology—closed cycle cooling—for power plant cooling systems. The CWA requires that such systems reflect the “best technology available” to minimize adverse environmental impacts.¹²⁶ The EPA considered the cost of this closed-cycle technology in rejecting a requirement that it be adopted by the entire industry. The Second Circuit held that the EPA could not consider cost in determining the “best” technology. The Supreme Court reversed, holding that an undefined statutory term as broad as “best technology available” was susceptible to an interpretation that costs be considered.¹²⁷

In *Michigan v. EPA*, the Supreme Court completed its migration towards full incorporation of cost-benefit analysis into agency decision-making, at least where cost-benefit analysis is not facially precluded by the statutory terms. *Michigan* dealt with a CAA provision authorizing the EPA to establish technology-based limits for hazardous air pollutants emitted by fossil fuel fired power plants should it deem such regulation “appropriate and necessary.”¹²⁸ Because the CAA required consideration of compliance costs at a later stage of the regulatory process (once the actual standards are set), the EPA based its determination to regulate such power plants solely on the magnitude of the environmental and public health impacts of emissions from power plants, without reference to the costs of

124. 42 U.S.C. § 7409(b)(1) (2012).

125. *Whitman*, 531 U.S. at 465, 468.

126. 33 U.S.C. § 1326(b) (2012).

127. *Entergy*, 556 U.S. at 218–23.

128. *See* 42 U.S.C. § 7412(m)(1)(A) (2012).

compliance.¹²⁹ The Supreme Court interpreted the term “appropriate” to mandate consideration of compliance costs and remanded the hazardous air pollutants regulations for reconsideration incorporating a cost-benefit analysis. According to the Court:

There are undoubtedly settings in which the phrase “appropriate and necessary” does not encompass cost. But this is not one of them. Section 7412(n)(1)(A) directs EPA to determine whether “*regulation* is appropriate and necessary.” (emphasis added.) Agencies have long treated cost as a centrally relevant factor when deciding whether to regulate. Consideration of cost reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages *and* the disadvantages of agency decisions . . .

Our reasoning so far establishes that it was unreasonable for EPA to read § 7412(n)(1)(A) to mean that cost is irrelevant to the initial decision to regulate power plants. The Agency must consider cost—including, most importantly, cost of compliance—before deciding whether regulation is appropriate and necessary. We need not and do not hold that the law unambiguously required the Agency, when making this preliminary estimate, to conduct a formal cost-benefit analysis in which each advantage and disadvantage is assigned a monetary value.¹³⁰

Although this reasoning rejects the grafting of formal cost-benefit analysis onto open-ended statutory regulatory authority, earlier in the opinion the Court recites with some skepticism that, based on the EPA’s regulatory impact review, “[t]he costs to power plants were thus between 1,600 and 2,400 times as great as the quantifiable benefits from reduced emissions of hazardous air pollutants.”¹³¹ *Michigan* represents the Court’s acceptance of some form of cost-benefit analysis as normal agency practice—the rule rather than the exception.

Although *Michigan* stops short of mandating agency results consistent with cost-benefit analysis, *Corrosion Proof Fittings* demonstrates the perils of agency regulation that imposes apparently disproportionate costs to the quantifiable environmental benefits. A reviewing court may view regulations that impose such costs as per se arbitrary.

Recognition (as argued in this Article) that cost-benefit analysis itself represents a regressively redistributive limit on agency standard setting should temper any judicial presumption of irrationality of imposing costs greater than quantifiable benefits. The economic efficiency inherent in the countervailing polluter-pays principle, together with the lack of mitigating mechanisms for compensation for the public, means downstream “losers” in strict cost-benefit analysis standard setting should argue for great latitude in agency departure from the results of

129. In fact, the EPA also performed cost-benefit analysis as required by Executive Order 12,992, but the Court did not consider that sufficient under the statute.

130. *Michigan v. EPA*, 135 S. Ct. 2699, 2707, 2711 (2015).

131. *Id.* at 2706.

cost-benefit analysis. It bears noting that in *Whitman*, a group of prominent economists filed a brief urging rejection of the EPA's refusal to consider costs in setting the NAAQS. In their brief however, these economists were careful to avoid the argument that the results of cost-benefit analysis should bind agency decision making rather than simply inform it:

Agencies should not be bound by a strict cost-benefit test, but should be required to consider available cost-benefit analyses. There may be factors other than economic benefits and costs that agencies will want to weigh in decisions, such as equity within and across generations.¹³²

Equity includes avoiding regressive redistribution of wealth. Cost-benefit analysis is by its very nature regressively redistributive, because it converts public goods such as clean air and water, as well as dispersed private goods such as good health enjoyed by the less well off in society, into reduced costs and profits for investors in industrial and business enterprises. Equity demands that these regressive effects be resisted, except where adequate provision for compensation to the victims exists. Accordingly, judicial review of agency decision-making following cost-benefit analysis procedures imposed by statute, executive order, or judicial interpretation should recognize the lack of compensation to victims as a reason for rejecting the guidance of cost-benefit analysis.

CONCLUSION

A significant, but under-acknowledged, objection to the use of cost-benefit analysis in environmental standard setting is the regressive benefits transfer inherent in cost-benefit analysis. Whenever stricter environmental controls are rejected because their cost to the polluter exceeds the benefit to communities downstream, the community's losses are being transferred as cost savings to the polluter, usually without compensation. Continued use of cost-benefit analysis must take this benefits-transfer into account by creating mechanisms for compensation to the downstream community or by rejecting application of cost-benefit analysis when no compensation can be made available. Tort principles can also recognize and ameliorate the inequitable redistribution inherent in cost-benefit analysis by relaxing strict causation requirements in the case of injuries acknowledged during cost-benefit analysis standard setting, and by rejecting any liability defense based on compliance with a cost-benefit analysis-established regulatory standard.

132. Brief for AEI-Brookings Joint Center for Regulatory Studies et al. as Amici Curiae Supporting Cross-Petitioners at 10, *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457 (2000) (No. 99-1426), 2000 WL 1015407 at *10.