Only a Poor Workman Blames His Tools: On Uses and Abuses of Benefit-Cost Analysis in Regulatory Decision Making About the Environment

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ONLY A POOR WORKMAN BLAMES HIS TOOLS: ON USES AND ABUSES OF BENEFIT-COST ANALYSIS IN REGULATORY DECISION MAKING ABOUT THE ENVIRONMENT

E. DONALD ELLIOTT


The debate that has raged in the legal literature for the last decade about benefit-cost analysis (BCA) in regulatory decision making about the environment has not been very productive for two key reasons: (1) it has focused on the way that BCA is used in the OIRA review process to “fine tune” regulations just before they are issued, and (2) it has suffered from “selective realism” by discussing the flaws of BCA but not comparing them to the flaws of human decision making unaided by BCA.

John Graham’s 146 page, full-throated defense of BCA brings much needed balance to this debate by answering the critics. His article is particularly useful for making accessible to lawyers and law students the ethical and philosophical underpinnings of BCA, and also

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for demonstrating by example that BCA is not inherently anti-regulatory and can be useful for convincing skeptical politicians to sign off on tough environmental regulations. But, unfortunately, Graham’s article implicitly buys into the two conceptual traps that it inherits from the critics: both the “fine tuning” and the “selective realism” fallacies.

I. THE FINE-TUNING FALLACY

The limitations of BCA are well-known and are well-documented in the 622 footnotes to the Graham article. The key one was aptly summed up a generation ago: the tyranny of false precision.¹

Assume that a typical political appointee is told that the projected benefits of a reduction in the drinking-water standard for arsenic from 50 to 10 parts per billion (ppb) are (say) $150 million in excess of the costs, but that the costs would be $100 million greater than the incremental benefits if one were to reduce the standard further to 8 ppb. Most political appointees, not being academic experts on BCA, might understandably and foreseeably think that this information counsels in favor of adopting the 10 ppb standard and rejecting the further reduction to 8 ppb. In my experience, debates at OIRA and the White House often come down to issues like this—of selecting among two plausible policy options with minor differences that result in multi-million dollar consequences.⁵ In fact, the debate over whether to reduce the arsenic standard to 10 ppb or 8 ppb is one of the real-world examples that Graham cites.⁶ In actuality, our hypothetical political appointee would be very much mistaken in his or her naïve belief that the hypothetical BCA posited above is actually telling him or her to set the standard at 10 ppb rather than 8 ppb. And that is because BCA is too blunt and imprecise an instrument to rely on for making such fine-grained policy decisions, for the reasons that I explain in the bal-

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¹ See Laurence H. Tribe, Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality, 46 S. Cal. L. Rev. 617, 630 (1973) (observing that the complexity and value-laden nature of environmental problems precludes straightforward applications of instrumental rationality, such as BCA).

⁵ Admittedly, the OIRA process changes from administration to administration, but, in the last three, “return letters,” in which the OIRA Administrator essentially vetoes a proposed regulation outright and sends it back to the agency, have been exceedingly rare. This is not to say that BCA has no effect on agencies, however. Knowing that a regulation will eventually be subject to BCA and review by the OMB may deter agencies from proposing regulations that they might otherwise have pursued, but this effect is difficult to measure.

⁶ See Graham, supra note 3, at 491-94.
The critics are off target when they criticize BCA as “fatally flawed” because it cannot tell us whether to set the arsenic standard at 10 ppb or 8 ppb. The problem lies not in BCA as a technique, but rather in the design of the OMB review process that invites the foreseeable misuse of BCA to “fine tune” regulations, and in the failure of most administrations to train their political appointees adequately to appreciate the limitations of BCA as a technique.9 It makes no sense to condemn BCA as fatally flawed because it cannot validly be used to fine tune regulations. Any tool for supplementing human perceptions has limitations in its resolving power. Condemning BCA as fatally flawed because it cannot distinguish fine gradations in regulatory standard-setting is like saying a telescope is “fatally flawed” because it cannot focus on a microbe. It is the responsibility of the user to pick the right tool for the job at hand.

On the “fine tuning” issues that actually dominate the OIRA review process, such as whether to set the revised arsenic standard at 8 ppb or 10 ppb, BCA is not merely of limited utility, but it is potentially dangerous because it is foreseeably subject to misuse by those who are not attuned to its limitations. The reason was aptly summed up by a famous epidemiologist, Leon Gordis, then Dean of the Johns Hopkins School of Public Health, who once cautioned me “you lawyers torture the epidemiological data until they scream.” That was not, however, a

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7 See infra text accompanying note 13.
8 See, e.g., The Regulators’ Best Friend?, ECONOMIST, Apr. 2, 2005, at 72, 72 (“Is the [BCA] method fatally flawed and intrinsically anti-regulatory? The Centre for Progressive Regulation (CPR), a think-tank that shelters many sceptics, thinks so.”).
9 I made these points some years ago in an article criticizing the design of the OIRA review process. E. Donald Elliott, TQM-ing OMB: Or Why Regulatory Review Under Executive Order 12,291 Works Poorly and What President Clinton Should Do About It, 57 LAW & CONTEMP. PROB. 167 (1994). Unfortunately, rather than making constructive suggestions for how to improve the OIRA review process to ameliorate its weaknesses, most of the subsequent work in the legal academic literature has veered off in the direction of criticizing BCA as inherently flawed. Meanwhile, subsequent OIRA Administrators, including both Sally Katzen and John Graham, have made substantial practical improvements in the process, so that some of my criticisms, such as those relating to lack of transparency, are no longer valid. See id. at 181-82. However, others, such as that OIRA review comes into play too late in the process and that most political appointees lack appropriate training in risk assessment and BCA, are still valid. See id. at 184.
10 Personal communication with Leon Gordis, Dean of the Johns Hopkins School of Public Health (1989). However, Gordis makes some of the same points about what epidemiology can and cannot say on issues of interest to lawyers in Leon Gordis, Epi-
condemnation of epidemiology as a science as being fatally flawed, 
but rather of the lawyers who try to make the data say more than they 
really do.

The essential reason that we should oppose the misuse of BCA in 
fine-tuning regulatory decisions runs throughout Graham’s 146 page 
defense: BCA is a highly technical discipline and its results can be 
skewed widely by small changes in assumptions. Over and over again 
when answering critics, Graham drops back to suggest potential 
“methodological advances”\(^\text{\textsuperscript{11}}\) that might be made to ameliorate difficulties in BCA as currently practiced in government. For example, 
when confronted by the “poster child” for indeterminacy in the legal 
literature—the claim by Professor Sunstein (who has recently been 
named the next OIRA Administrator) that “the benefits could be any-
where from $0 to $3.8 billion per year”\(^\text{\textsuperscript{12}}\) for EPA’s decision to reduce 
the standard for arsenic in drinking water from 50 ppb to 10 ppb\(^\text{\textsuperscript{13}}\) — 
Graham responds that (1) if he “assumed . . . a discount rate of 3% is 
more plausible than 7%”\(^\text{\textsuperscript{14}}\) and (2) commissioned a graduate student 
to conduct 2500 computer runs of probability distributions of uncer-
tainties, there was a roughly two to one chance that the reduction to 
10 ppb actually produced some net benefits.\(^\text{\textsuperscript{15}}\)

“The lady doth protest too much.”\(^\text{\textsuperscript{16}}\) If a sophisticated computer-
ized Monte Carlo analysis (which is not normally done in govern-
ment) is needed to determine that a reduction from 50 ppb to 10 ppb 
for arsenic in drinking water probably produced net benefits (under 
certain discounting assumptions, but not under others), then it is 
unlikely that the technique can contribute much to making such fine-
grained decisions as whether to regulate at 8 ppb or 10 ppb. Graham 
quietly concedes as much in footnote 416, admitting that “[g]iven the 
inherent uncertainties in BCA of lifesaving, results are likely to be 
more determinative for larger policy changes (e.g., 10 versus 50 ppb

demiologic Approaches for Studying Human Diseases in Relation to Hazardous Waste Disposal 
\textsuperscript{11} See, e.g., Graham, supra note 3, at 451-52.
\textsuperscript{12} Id. at 491.
\textsuperscript{13} Cass R. Sunstein, The Arithmetic of Arsenic, 90 GEO. L.J. 2255, 2288 tbl.6 (2002) 
discussed in Graham, supra note 3, at 491 & n.412).
\textsuperscript{14} Graham, supra note 3, at 491-92.
\textsuperscript{15} Id.
\textsuperscript{16} WILLIAM SHAKESPEARE, HAMLET act 3, sc. 2, l. 221 (Burton Raffel ed., Yale Univ. 
arsenic in water) than smaller policy changes (e.g., 9.5 versus 10.0 ppb arsenic in water).”

To reduce the risks of foreseeable misuse of BCA by decision makers who are not as sophisticated as Graham, such decision makers should be trained in the limitations of the technique (a project on which Graham’s article makes a good start). John Graham has spent much of his professional life studying and teaching BCA. He is one of a handful of people in America who is an “intelligent consumer” of BCA, is capable of understanding its limitations and biases, and thus is able to counteract them. But we should not assume that similarly sophisticated consumers of BCA will always be at the helm. To minimize the foreseeable misunderstanding and misuse of BCA, political decision makers should all be taught the limitations, as well as the potential uses, of BCA techniques. This important policy recommendation is, however, conspicuous by its absence from Graham’s laundry list of policy recommendations.

The flaw, however, is not with BCA as a technique per se, but rather its misuse in the procedural system in which it is currently embedded. An OIRA review process that brings BCA into the policy process very late in the day, when the die is largely cast for new regulations and the government is merely fine tuning the final result. This is what now-Justice Stephen Breyer famously called a “mismatch,” using a regulatory technique in a situation for which it is ill-suited. In fact, BCA is much more useful at the front end of the process, when we are setting priorities and evaluating potential candidates for additional regulatory investments. Should we be spending more on improving highway safety, or would our investments save more lives if devoted to prenatal care instead? Here the inherent weaknesses in

17 Graham, supra note 3, at 492 n.416. Graham goes on to argue in the same footnote, however, that “in the range of the incremental policy changes that characterize America’s pluralistic democracy, BCA may often have insights to offer.” Id. I agree, but it is worth noting that the example that Graham gives—climate-change policy—is not a fine-tuning of a proposed regulation in the OIRA review process. Id. (citing John D. Graham, Valuing the Future: OMB’s Refined Position, 74 U. CHI. L. REV. 51, 54-55 (2007)).

18 For more on this, see Elliott, supra note 9.

19 STEPHEN BREYER, REGULATION AND ITS REFORM, at pt. II (1982) (using a “mismatch thesis” to uncover areas of regulatory failure “to match the tool to the problem at hand”).

BCA are less problematic, because BCA provides a consistent, albeit somewhat arbitrary, metric for comparing potential investments. Moreover, the differences among various candidates for future regulatory investments are often very large (differing by several orders of magnitude in terms of the numbers of lives that can be saved for a given investment of resources), so that they dwarf the imprecision in BCA. To his credit, Graham acknowledges that BCA can play a useful role in identifying attractive opportunities for regulatory investments and makes an innovative proposal for the National Academy of Sciences (NAS) to use BCA to recommend attractive opportunities for potential lifesaving investments.\(^{21}\)

But on close questions, such as those that typically arise in the OIRA review process, political judgment and subjective decision making by human beings cannot be replaced by “objective” decision techniques such as BCA for much the same reasons that computers cannot replace judges.\(^{22}\) In the example of changes to the arsenic in drinking water standard, the Bush administration faced a difficult political situation because it had chosen to review a reduction from 50 ppb to 10 ppb that had been promulgated in the last days of the previous administration. This was widely portrayed in the press as indicating that President Bush wanted children to drink more poisonous arsenic in their water.\(^{23}\) The House responded by adopting an appropriations rider that would have precluded the Bush EPA from reconsidering the 10 ppb Clinton standard.\(^{24}\) A panel of the NAS was re-convened to deal with the political hot potato, and it concluded that 10 ppb was

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\(^{21}\) See Graham, supra note 3, at 530-32.

\(^{22}\) On the question of whether computers can replace judges, see Richard Susskind, The Future of Law: Facing the Challenges of Information Technology 278-79 (1996) (speculating that, while future computers may play some role in the judicial process, judges will still have a role in making moral and ethical judgments that computers cannot, or should not, make); Anthony D’Amato, Can/Should Computers Replace Judges?, 11 GA. L. REV. 1277 (1977) (exploring the theoretical and jurisprudential questions of what would be gained and lost if computers were programmed to perform judicial functions). For my own answer, see E. Donald Elliott, Holmes and Evolution: Legal Process as Artificial Intelligence, 13 J. LEGAL STUD. 113, 142-43 (1984), where I argue that judges must use “judgment” to change the common law, as well as replicate pre-existing principles. I do not understand Graham to argue that BCA should replace human judgment. On the contrary, he argues for a “soft” reliance on BCA, and rightly points out that most of the critics are attacking a strawman in a “hard” version of BCA, which makes BCA the sole criterion for decisions. Graham, supra note 3, at 432-34.

\(^{23}\) See, e.g., Maureen Dowd, Op-Ed., The Asbestos President, N.Y. TIMES, Apr. 1, 2001, § 4, at 17 (“W. wants to keep the poison [arsenic] in [drinking water]—to help the enviro-villains who contributed to his campaign.”).

the minimum standard that would be health-protective, and perhaps even a lower standard in the range of 3 ppb was justified. 25

This political context cannot be captured in a BCA, but it is certainly appropriate for decision makers to consider. Moreover, in making a decision today, a policymaker may often have to hazard a guess about the future direction of scientific developments. 26 In light of the NAS report and the emerging science showing harms from arsenic at ever lower levels, one could validly conclude that 10 ppb was the minimum acceptable standard, even if it was not supported by BCA.

II. THE “SELECTIVE REALISM” FALLACY

The second conceptual pitfall into which most critics fall is in comparing a realistic version of BCA, with all of its warts and flaws, with an idealized vision of human decision making unaided by BCA. In a different context, law professor Howard Latin christened this the “selective realism” fallacy, because a realistic account of one flawed alternative is unfairly compared to an idealized version of the other alternative. 27

Graham at least briefly contrasts BCA with the alternative decision making approaches suggested by its critics and finds them wanting. 28 But he does not describe as clearly as he might that one of the great virtues of BCA is that its flaws are known and their direction predict-

25 See generally NATURAL RESEARCH COUNCIL, ARSENIC IN DRINKING WATER: 2001 UPDATE (2001); Nat’l Acad. Of Scis., Arsenic in Drinking Water (2001), http://dels.nas.edu/dels/viewreport.cgi?id=1599 (last visited Feb. 25, 2009). The description of the report on the website of the National Academy Press highlighted its significance as follows: The Environmental Protection Agency’s decision in the summer of 2001 to delay implementing a new, more stringent standard for the maximum allowable level for arsenic in drinking water generated a great deal of criticism and controversy.... The report’s findings are consistent with those of the 1999 report that found high risks of cancer at the previous federal standard of 50 parts per billion. In fact, the new report concludes that men and women who consume water containing 3 parts per billion of arsenic daily have about a 1 in 1,000 increased risk of developing bladder or lung cancer during their lifetime.

26 See E. Donald Elliott, Global Climate Change and Regulatory Uncertainty, 9 ARIZ. J. INT’L & COMP. L. 259 (1992) (balancing the costs and benefits of acting on current science versus waiting for future information in regulatory decision making).

27 See Latin, supra note 2, at 503.

28 Graham, supra note 3, at 438-48 (comparing BCA to the alternative approaches of absolutism, feasibility, and intuitive balancing).
able and that they are different from the flaws of unaided human decision making. Thus, a composite system in which both BCA and human intuition and judgment are combined may result in better decisions than using just either one alone, as each compensates for the weaknesses in the other.

There is a large and growing literature that catalogues the frailties of unaided human decision making in managing risks. For example, as a result of the “availability heuristic,” unaided human judgment may cause us to take regulatory action against a risk that seems obvious, even though our well-intentioned action is actually perverse because it increases overall risks from substitutes. One reason that we are increasingly aware of the perils of making regulatory decisions that unintentionally substitute greater risks is because risk assessment and BCA have given us relatively objective and consistent, albeit arbitrary, tools for measuring and comparing risks.

Equally pertinent to the role of BCA in the OIRA review process are two practical political points: (1) that BCA can be a useful tool for convincing “doubting Thomases” that a regulatory measure is worthwhile, and (2) that BCA may be useful in exposing really bad proposals that produce few measurable benefits but are either symbolically or materially satisfying to a powerful constituency or interest group that has “captured” an agency (i.e., to expose and thereby help to prevent “rent seeking,” whether financial or ideological).

A. Persuading “Doubting Thomases”

In what I find to be one of the most interesting and important parts of his article, Graham reports that BCA actually helped him get

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31 “Risk assessment” is a set of techniques for estimating and comparing risks based upon available scientific evidence. See generally Gail Charuley, Health Risk Assessment, in THE ENVIRONMENTAL SCIENCE DESKBOOK (Jamie W. Conrad ed., 1998). In regulatory decision making about the environment, the “benefit” side of the benefit-cost ratio is generally the risk reduction anticipated from a proposed regulation as predicted by the agency’s risk assessment. See Sally Katzen, Cost-Benefit Analysis: Where Should We Go from Here?, 33 FORDHAM URB. L.J. 1313, 1315-17 (2006) (discussing the use of data for the calculation of costs and benefits by agencies).
several tough environmental regulations approved by a skeptical
White House. This rings true to me based on my own experiences
working in government under a Republican administration. We also
found that we were not very successful when we said to then–White
House Chief of Staff John Sununu, a well-known environmental skep-
tic, the equivalent of “please sign off on this multimillion dollar regu-
lation. It will make the birds and bunnies and their supporters
happy.” But we could win Sununu’s support, and those of others in
the White House who were not true believers in environmental pro-
tection, when we could prove to them via BCA that the measurable
benefits of a proposal far exceeded the costs.

Like other quantitative techniques, BCA is a useful language of
discourse when one is attempting to persuade people who do not in-
tuitively share one’s own values, preconceptions and intuitions about
the world. When most critics imagine policy making without BCA,
they implicitly assume a benign and well-meaning decision maker who
totally shares their values. This can be called the “If I were King” fal-
lacy. It is a dangerous oversimplification of the real world, in which
people often disagree in their unaided intuitions about what is good
policy, and thus techniques of deliberative democracy and rational
dialogue are needed to persuade people whose “holistic, intuitive”
predilections are not always favorable to environmental regulation.

If instead one hopes to persuade the “doubting Thomases” in a
pluralistic society in which not everyone shares the intuition that every
regulation proposed in the name of the environment is self-evidently a
good thing, then one needs a tool such as BCA that relies less on intu-
tion and more on measurable benefits. And note here that the al-
leged anti-regulatory bias in BCA as currently practiced by OIRA actu-
al works in favor of the environmental advocate: “This is so good,
boss, that even the OIRA BCA showed huge measurable economic
benefits to society, and we all know how tough that is!”

The critics underestimate the substantial value that BCA brings to
practical policy making as a language of discourse for persuading
skeptics who are not already convinced.

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52 See Graham, supra note 3, at 465-80 (documenting the use of BCA by OIRA to
convince the White House to support regulations reducing both diesel-engine exhaust
and sulfur and nitrogen oxides from coal-fueled power plants and increasing the fuel
B. Exposing Really Bad Agency Proposals

Finally, another valuable use for BCA is actually the inverse of the one just discussed—sometimes BCA can expose really bad proposals by a single-mission agency that are based solely on ideology or interest-group pressure but little else.

The intellectual roots of the OIRA review process can be traced back to a 1975 article coauthored by Lloyd Cutler, later White House counsel in the Clinton administration. Cutler and Johnson argued that “single mission” agencies would tend to pursue their own goals without properly balancing them sufficiently against other competing values and proposed an enhanced White House review process to weigh desirable social goals against one another.

The emphasis on Kaldor-Hicks “welfarism” at a philosophical level in the Graham article obscures the fact that the “cost” side of the benefit-cost balance is also a measure of “opportunity cost”—the other uses to which the government or the private sector might put scarce resources. Sometimes agencies do lose sight of larger social-policy objectives in the single-minded pursuit of their own missions. When this happens, the OIRA review process using BCA can be helpful to detect a gross disparity between the social resources that an agency proposes to devote to a proposed rule and the value that those resources might produce if put to other competing uses, either in government or in the private sector. For example, one rule that came before us when I was at the EPA initially had a computed cost of $60 billion per statistical life saved over 30 years. In the rare instances when disparities between costs and benefits are really gross, BCA can be a useful tool to put agency proposals into the context of broader social goals.

CONCLUSION

In conclusion, BCA can be a very useful, albeit imperfect, technique for comparing policies. BCA must be used with caution and evaluated carefully, because it is subject to misunderstanding and misuse. These problems are particularly intense when BCA is used to try to set optimal levels of regulatory restrictions, as is sometimes the case in the current OIRA review process, because small differences between policies can be overwhelmed by the effect of the arbitrary as-

34 Id. at 1402-09.
35 Id. at 1414-17.
umptions used. BCA is more helpful when used as a uniform yardstick for setting priorities among different possible lifesaving investments that exhibit large discrepancies in their benefit-cost ratios, because those comparisons are less sensitive to the assumptions used, provided that they are used consistently.

BCA is inherently imperfect, but there are no perfect techniques for making complex policy decisions. Therefore, the user must assess critically whether the technique is appropriate for the task at hand, take the results with a large grain of salt, and mix them with a large helping of old-fashioned human judgment. BCA and intuitive human judgment are stronger together than either alone.

To paraphrase Churchill, BCA is the worst tool currently available for assisting political appointees in making difficult regulatory decisions affecting the environment—except for all of the others!56

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56 As Churchill famously declared in reference to the democratic form of government:

Many forms of Government have been tried, and will be tried in this world of sin and woe... No one pretends that democracy is perfect or all-wise. Indeed it has been said that democracy is the worst form of Government except all those other forms that have been tried from time to time.