

## **Putting Cost-Benefit Analysis in Its Place: Rethinking Regulatory Review**

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Policymakers need to reassess the role of cost-benefit analysis (CBA) in regulatory review. Although it remains a valuable tool, a number of pressing current problems do not fit well into the CBA paradigm. In particular, climate change, nuclear accident risks, and the preservation of biodiversity can have very long-run impacts that may produce catastrophic and irreversible effects. This article seeks to put cost-benefit analysis in its place by demonstrating both its strengths and its limitations. The Obama Administration should rethink the use of CBA as a way to evaluate regulatory policies and develop procedures to restrict its use to policy areas where its underlying assumptions fit the nature of the problem.

CBA is suitable for many conventional policy issues that have limited but significant effects on society in the short to medium run. The best analogy is to the decisions made by large corporations when they decide how to invest to maximize profits. In such cases, both public agencies and firms seek to maximize net gains, holding conditions in the rest of the world constant.<sup>2</sup> However, that is not an appropriate analogy for policies with a significant global impact.

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<sup>2</sup> For a classic introduction to cost-benefit analysis, see E.J. MISHAN, *COST-BENEFIT ANALYSIS* (new & expanded ed. 1976); E.J. MISHAN & EUSTON QUAH, *COST-BENEFIT ANALYSIS* (5th ed. 2007) (1976). For a widely used text in policy schools that presents the basics, see DAVID L. WEIMER & AIDAN R. VINING, *POLICY ANALYSIS* (5th ed. 2011).

Since 1981, the Office of Information and Regulatory Affairs (OIRA) in the White House has reviewed significant proposed and final regulations for conformity with cost-benefit tests.<sup>3</sup> Under a series of executive orders, OIRA has performed this role through Republican and Democratic presidencies.<sup>4</sup> These policy reviews are controversial: Some claim that OIRA promotes the use of sound social-scientific reasoning; others see it as a front for business interests and a triumph of cold and heartless economic reasoning.<sup>5</sup>

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<sup>3</sup> See Exec. Order No. 12,866 §§ 3(d)–(e), 3(f)(1), 6(a)(3)(C), 3 C.F.R. 638, 641, 645–46 (1993), *reprinted as amended in* 5 U.S.C. § 601 (2006). Taken together, these sections of the executive order require agencies to prepare cost-benefit analysis for all proposed and final rules that will have “an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities.” *Id.* § 3(f)(1). The executive order does not apply to independent agencies, such as the Federal Trade Commission or the Federal Communications Commission, but many of them have also created policy analysis offices to review regulations and other policies.

<sup>4</sup> George W. Bush kept Clinton’s Executive Order 12,866 in place, extending its reach to guidance documents and making a few other changes. See Exec. Order No. 13,422, 3 C.F.R. 191 (2007). Obama revoked the Bush modifications, thus returning OIRA to enforcing the original Clinton order. See Exec. Order No. 13,497, 74 Fed. Reg. 6113 (Jan. 30, 2009). Precursors to Ronald Reagan’s Executive Order, see Exec. Order No. 12,291, 3 C.F.R. 127 (1981), *reprinted as amended in* 5 U.S.C. § 601 (2006), date from the Richard Nixon, Gerald Ford, see Exec. Order No. 11,821, 3 C.F.R. 926 (1974), and Jimmy Carter, see Exec. Order No. 12,044, 3 C.F.R. 152 (1978), *reprinted as amended in* 5 U.S.C. § 553 (2006), administrations. See also THOMAS O. MCGARITY, *REINVENTING RATIONALITY: THE ROLE OF REGULATORY ANALYSIS IN THE FEDERAL BUREAUCRACY* 18 (1991); Steven Croley, *White House Review of Agency Rulemaking: An Empirical Investigation*, 70 U. CHI. L. REV. 821, 824–30 (2003); Sidney A. Shapiro & Christopher H. Schroeder, *Beyond Cost-Benefit Analysis: A Pragmatic Reorientation*, 32 HARV. ENVTL. L. REV. 433, 446–47 (2008). On OIRA under George W. Bush, see John D. Graham, *Saving Lives Through Administrative Law and Economics*, 157 U. PA. L. REV. 395, 456–83 (2008).

<sup>5</sup> See Croley, *supra* note 4, at 831–33 (summarizing the arguments on both sides). Clinton’s executive order, which is still in place, responded to some of the criticisms by requiring the transparent reporting of all meetings with outsiders and an opportunity for the regulatory agency to be present when OIRA officials met with outsiders. See Exec. Order No. 12,866, §6(b)(4), 3 C.F.R. 647, *reprinted as amended in* 5 U.S.C. § 601 (2006). It also added time limits to prevent OIRA from simply bottling up disfavored rules. See *id.* § 6(b)(2). For further discussion on the

President Barak Obama has continued the practice of regulatory review under the executive order originally issued by President Bill Clinton and kept in place by President George W. Bush. However, in January 2009, the Administration expressed an interest in revising the executive order. OIRA opened a comment period and received a broad response from the policy community.<sup>6</sup> So far, nothing has happened. The comments seem to have fallen into a black hole. OIRA has not attempted a full-blown reconsideration of the executive order. It has concentrated instead on increasing the transparency of government, and especially, on the ease of access to regulatory information and data sets. Otherwise, it is “business as usual”—with the staff reviewing proposed and final rules with only an occasional flare-up over controversial issues, such as whether or not to designate coal ash as a hazardous waste.<sup>7</sup>

The failure to rethink the executive order is unfortunate—especially given the global trend to institutionalize something called impact assessment (IA). IA is not quite the same thing as CBA, but it is grounded in an identical commitment to promulgating policies that have positive net benefits while at the same time improving public accountability and incorporating

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presidential role in regulatory review, see James R. Bowers, *Looking at OMB's Regulatory Review Through a Shared Powers Perspective*, 23 PRESIDENTIAL STUD. Q. 331 (1993).

<sup>6</sup> The comments are published on the OIRA website. See OFFICE OF INFO. & REGULATORY AFFAIRS, EXEC. OFFICE OF THE PRESIDENT, *Public Comments on OMB Recommendations for a New Executive Order on Regulatory Review*, REGINFO.GOV, <http://www.reginfo.gov/public/jsp/EO/fedRegReview/publicComments.jsp> (last visited Oct. 7, 2010).

<sup>7</sup> To track current OIRA activities, see *Office of Information and Regulatory Affairs*, WHITEHOUSE.GOV, [http://www.whitehouse.gov/omb/inforg\\_default](http://www.whitehouse.gov/omb/inforg_default) (last visited Oct. 7, 2010).

other values.<sup>8</sup> A bandwagon may be starting that needs to be subject to critical scrutiny before it acquires the status of conventional wisdom.<sup>9</sup>

With no change in the executive order, CBA will continue to be enshrined as the ideal standard for regulation in the United States. Even if the actual cost-benefit studies performed by U.S. government agencies are highly variable in quality and often lack key components, the technique remains a benchmark for analysis.<sup>10</sup>

I seek to challenge the hegemony of CBA on two grounds. First, cost-benefit analysis should be used to evaluate only a limited class of regulatory policies, and even then it should be supplemented with value choices not dictated by welfare economics. Second, CBA presents an impoverished normative framework for policy choices that do not fall into this first category.

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<sup>8</sup> On impact assessment in European Union member states, see ANDREA RENDA, *IMPACT ASSESSMENT IN THE EU* (2006); Jonathan B. Wiener, *Better Regulation in Europe*, 59 *CURRENT LEGAL PROBS.* 447 (2006). For material on the European Union's impact-assessment initiative, consult *Impact Assessment–Key Documents*, EUR. COMMISSION, [http://ec.europa.eu/governance/impact/key\\_docs/key\\_docs\\_en.htm](http://ec.europa.eu/governance/impact/key_docs/key_docs_en.htm) (last updated Sept. 28, 2010).

<sup>9</sup> For arguments that cost-benefit analysis has already become and ought to continue to be a routine tool for policymaking, see RICHARD L. REVESZ & MICHAEL A. LIVERMORE, *RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH* (2008); CASS R. SUNSTEIN, *THE COST-BENEFIT STATE: THE FUTURE OF REGULATORY PROTECTION* (2002); Graham, *supra* note 4, at 515–16. Sunstein is, of course, the current head of OIRA. *But see* FRANK ACKERMAN & LISA HEINZERLING, *PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING* (2004); SIDNEY A. SHAPIRO & ROBERT L. GLICKSMAN, *RISK REGULATION AT RISK: RESTORING A PRAGMATIC APPROACH* (2003). An alternative is “feasibility” analysis under which policy is pushing up to the point where widespread plant shutdowns would occur at higher levels of stringency. *See* David M. Driesen, *Distributing the Costs of Environmental, Health, and Safety Protection: The Feasibility Principle, Cost-Benefit Analysis, and Regulatory Reform*, 32 *B.C. ENVTL. AFF. L. REV.* 1 (2005); Amy Sinden et al., *Cost-Benefit Analysis: New Foundations on Shifting Sand*, 3 *REG. & GOVERNANCE* 48, 63–66 (2009) (reviewing MATTHEW D. ADLER & ERIC A. POSNER, *NEW FOUNDATIONS OF COST-BENEFIT ANALYSIS* (2006)). In my view, this option has little to recommend it because of its failure to balance except at the knife edge.

<sup>10</sup> *See* Robert W. Hahn & Patrick M. Dudley, *How Well Does the U.S. Government Do Benefit-Cost Analysis*, 1 *REV. ENVTL. ECON. & POL’Y* 192 (2007).

Policy ought to be made on other grounds even though consideration of the costs and the benefits of a program is obviously a requirement for sound policymaking.

I do not wish to be misunderstood. I favor technocratic analysis that measures both costs and benefits in the most accurate way possible and that uses these data to make intelligent policy choices.<sup>11</sup> Problems arise, however, when the search for a single “best” policy forces analysts to make controversial assumptions simply to produce an answer that “maximizes” social welfare. The debate often conflates two related problems. First, analysts must resolve a set of difficult conceptual issues even where CBA is an appropriate technique on normative grounds. More fundamentally, the second set of problems strikes at the heart of the technique and make it an inappropriate metric for the analysis of some policy issues.

First, difficult issues arise even if net-benefit maximization is a plausible public goal. In the best case for cost-benefit analysis, the program seeks to correct a failure in private markets, and the law’s distributive consequences are not a major concern. Overall distributive effects may be small or, if large, tilt in an egalitarian direction, as when a regulation limits the monopoly power of large businesses. Here, the main problems are measurement difficulties that are sometimes so fundamental that better analysis or consultation with experts cannot solve them. I am thinking mainly of debates over the proper discount rate for future benefits and costs; efforts to incorporate attitudes toward risk; and the vexing problems of measuring the value of human life, of aesthetic and cultural benefits, and of harm to the natural world. Disputes over these issues turn on deep philosophical questions—for example, valuing future generations versus

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<sup>11</sup> See, for example, my advocacy of cost-benefit analysis as a background norm for courts to apply to the review of regulations designed to correct a market failure in SUSAN ROSE-ACKERMAN, *RETHINKING THE PROGRESSIVE AGENDA: THE REFORM OF THE AMERICAN REGULATORY STATE* (1992). Sunstein claims that, in a weaker and modified form, this is already what the courts do. SUNSTEIN, *supra* note 9, at 31–89.

balancing capital and labor in the production of goods and services; acknowledging the value of extra years of life versus “life” itself; taking risk preferences into account; and giving culture, ecosystems, and natural objects a place in the calculus. These issues do not have “right” answers within economics. They should not be obscured by efforts to put them under the rubric of a CBA. Politically responsible officials in the agencies and the White House should resolve them in a transparent way.

Sometimes one policy is much better than many others under a wide range of assumptions. Sensitivity tests can explore this possibility. There is no need to resolve difficult conceptual and philosophical issues if the preferred outcome does not depend on the choice of a discount rate or the value given to human life. Such tests should be a routine part of the analytic toolkit and of the options presented to the ultimate policymakers.

Second, many policies raise important issues of distributive justice, individual rights, and fairness, especially between generations. Talk of “net-benefit maximization” does not help illuminate these value choices. These issues raise measurement problems, but the difficulties with CBA run deeper. Even if everything could be measured precisely, CBA would be an inappropriate metric. Attempts to add distributive weights to CBA are fundamentally misguided. They suppose that technocrats, especially economists, can resolve distributive justice questions.<sup>12</sup> The distributive consequences of policies should be part of the public debate over policies, aided by technocrats who can help to outline the distributive consequences of various policies. The

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<sup>12</sup> For a recent attempt to revive the concept of a social-welfare function (SWF) weighted toward those with low levels of utility, see Matthew D. Adler, *Future Generations: A Prioritarian View*, 77 GEO. WASH. L. REV. 1478 (2009) [hereinafter Adler, *Future Generations*]; see also Matthew D. Adler, *Risk Equity: A New Proposal*, 32 HARV. ENVTL. L. REV. 1 (2008) [hereinafter Adler, *Risk Equity*]. Adler, however, does not explain how a SWF ought to be constructed except that it should be strictly increasing and concave in utilities, and he argues that the resulting SWF, however derived, ought to be only an input into the process of policy choice.

main analytic problem is familiar to students of tax incidence. The nominal cost bearer may pass on some of the costs to others. Distributive impacts are often difficult to measure and trace.

This second category includes policy issues that have a large impact on society, at present and over multiple generations. Choices taken today may be irreversible or very costly to change, and they may risk large negative consequences for future generations. In these cases, the marginal, microanalytic framework characteristic of cost-benefit analysis is not appropriate even if one stays within a utilitarian framework. The problems—climate change, risks from the storage of nuclear waste, loss of biodiversity, to give a few examples—may have large pervasive impacts that stretch far into the future. Catastrophes are possible, even if not likely. These issues raise broad economic and social issues that require a different normative framework.

I review the limitations of CBA as a policy criterion and use my critique as a ground for proposing a revised executive order to the Obama Administration. The new executive order should continue to require both up-front consultation on the regulatory agenda and ongoing review of major regulations above some minimum level of importance. As Revesz and Livermore recommend, OIRA could play a larger role in overall agenda setting and policy coordination across agencies.<sup>13</sup> Such review serves the interest of any president seeking to influence the overall regulatory environment. Hence, both consultation and review should be mandatory for core executive agencies, but, under my proposed framework, the executive order would only require agencies to carry out formal CBAs for a subset of regulations.

To avoid conflicts with the political pressures facing the President, an advisory body independent of the White House should provide expert analytic advice to agency policy analysts and to OIRA. In this, I build on Stephen Breyer, who urges the creation of a separate expert

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<sup>13</sup> See REVESZ & LIVERMORE, *supra* note 9, at 171–83.

agency with the mission of rationalizing regulatory policy across programs that regulate risk.<sup>14</sup> Bruce Ackerman also recommends the creation of an integrity branch, concerned with transparency and limiting corruption, and a regulatory branch insulated from day-to-day political influences but required to justify its actions publicly.<sup>15</sup> Either OIRA, or this new advisory body, should create a library of innovative tools for achieving regulatory goals that go beyond the much criticized command-and-control model. Agency policymakers could access this library as they look for innovative ways to achieve goals, as could those contemplating amendments to existing laws.

OIRA is a mixture of expertise and politics. As such, it is an important part of any President's efforts to control the executive branch.<sup>16</sup> However, it is not a neutral arbitrator. A reformed OIRA can serve an important function, but a more independent source of analytic knowledge could provide a useful check.

I begin with situations where cost-benefit criteria seem unproblematic—at least to those with some training in public-finance economics—that is, government efforts to correct market failures caused by such factors as externalities or monopoly power. Next, I expand my compass to include programs with other goals besides economic efficiency where the regulatory agency may seek cost-efficient solutions but cannot reduce a program's goals to an exercise in net-

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<sup>14</sup> See STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION* 55–81 (1993).

<sup>15</sup> See Bruce Ackerman, *The New Separation of Powers*, 113 HARV. L. REV. 633, 688–714 (2000).

<sup>16</sup> See Graham, *supra* note 4, at 465–80 (defending the role of OIRA during his tenure as OIRA head during the George W. Bush Administration). *But see* Lisa Schultz Bressman & Michael P. Vandenbergh, *Inside the Administrative State: A Critical Look at the Practice of Presidential Control*, 105 MICH. L. REV. 47 (2006) (discussing the relatively limited role of OIRA even within the White House).

benefit maximization. Finally, based on these critiques I conclude with proposals for the restrained use of cost-benefit criteria and policy analytic techniques that acknowledge both the President's interest in managing the regulatory process and the need for some check on the analytic practices of a diverse set of regulatory agencies.

#### CASE 1: CORRECTING MARKET FAILURES

Markets are not always efficient. So much is the conventional wisdom in economics. Externalities, such as air and water pollution, impose costs that a profit-maximizing firm will not take into account unless regulatory laws or the threat of legal liability induce it to do so. Firms may seek to exercise monopoly power, and high entry barriers can make competition unlikely. Information about risks and harms may be unavailable or poorly processed by busy people who lack expertise. One can plausibly view regulatory laws that seek to correct such market failures through the lens of economic efficiency. They aim to correct problems in particular markets and sectors and are not appropriate loci for broad distributive justice concerns that implicate the overall distribution of income, wealth, and economic opportunity. True, some policies may have a particularly severe impact on a narrowly focused group, but such problems can be dealt with as a side constraint.

For such policies, the goal of finding the most economically efficient solution seems relatively unproblematic. The problem is one of measurement, not principle. Yet, even here issues of principle arise in seeking appropriate measuring rods. At the most basic level, the goal is to maximize the net benefits from a policy, but how should one measure benefits and costs so that they are calculated in units that permit comparison? Jeremy Bentham, the ultimate source of the cost-benefit test, thought that individual utility could be measured in cardinal, interpersonal

units and added up to get “the greatest happiness of the greatest number.”<sup>17</sup> Suppose that marginal benefits fall as the scale of the policy increases and that marginal costs rise. Then welfare is at a maximum where the marginal benefits of the policy equal the marginal costs. Leaving aside debates over the implications of his principle for population policy, the key problem with Bentham’s formulation is that no one knows how to measure utility so as to permit cardinal, interpersonal comparisons. Utility is not an essence that can be measured in units like inches and pounds and compared across people.<sup>18</sup> Fortunately, the Marginalist Revolution in economics at the end of the nineteenth century demonstrated that one could obtain the key results in economic theory by doing away with cardinal, interpersonally comparable utility and assuming only that people could order the options available to them in a consistent way. Eventually, revealed-preference theory showed how consistent preference relations could be derived from the study of the actual choices that individuals make in the market.<sup>19</sup> However, that revolution, elegant and important as it was, essentially did away with the normative analysis of policy in utilitarian terms. How could one tell if one policy was better than another if one could not compare the benefits and costs obtained by different people on a single metric? Pareto efficiency seemed to be all that was left—that is, a collection of possible outcomes where no one can be made better off without someone else being made worse off. All societies have many such

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<sup>17</sup> JEREMY BENTHAM, *AN INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION* 5 n.1 (photo. reprint 1907) (1823).

<sup>18</sup> Van Neumann and Morgenstern developed a way to produce a cardinal utility scale for individuals based on their revealed preferences over lotteries, but it does not permit interpersonal comparisons. *See* JOHN VON NEUMANN & OSKAR MORGENSTERN, *THEORY OF GAMES AND ECONOMIC BEHAVIOR* (3d ed. 1953). For criticisms of this approach, *see* KEN BINMORE, *RATIONAL DECISIONS* 58–59 (2009).

<sup>19</sup> *See* PAUL ANTHONY SAMUELSON, *FOUNDATIONS OF ECONOMIC ANALYSIS* 90–124 (1948).

points where no resources are being wasted but that differ in the way resources are allocated across individuals. One can identify market failures that put society below the efficiency frontier, but that leaves open a range of possible ways to move to an efficient outcome that might impose costs on some and benefits on others.

Many Pareto optimal results are not Pareto superior to the status quo; in other words, they are efficient, but getting there imposes costs on some and benefits on others. However, limiting policy only to Pareto superior options places a huge normative weight on the status quo distribution of resources. One would have to argue that the status quo is so fair and just that no one should be made worse off in order to provide social benefits for society.

Economists filled the breach in the mid-twentieth century by positing a “social- welfare function” to represent the way society somehow had decided to trade off the welfare of its citizens. Policymakers should maximize this function subject to the Pareto efficiency frontier to produce the best possible choice given limited resources—an outcome called, oddly, “the bliss point” by some economic analysts.<sup>20</sup> Kenneth Arrow’s Impossibility Theorem demonstrated that such a function did not exist under minimal conditions, something that political scientists and practical politicians with experience of the clash of private interests may not have found surprising.<sup>21</sup> The economics profession seemed to be back to the mere claim that government

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<sup>20</sup> See *id.* at 219–28; Abram Bergson, *A Reformation of Certain Aspects of Welfare Economics*, 52 Q.J. ECON. 310 (1938).

<sup>21</sup> See KENNETH J. ARROW, *SOCIAL CHOICE AND INDIVIDUAL VALUES* (1951).

policy could be used to correct market failures, but with little to say about which option was best.<sup>22</sup>

Cost-benefit analysis entered to fill the gap—first, for dam building by the Army Corps of Engineers and then for a broader range of policies, now including regulatory policies.<sup>23</sup> The basic idea was to stick to a Benthamite utilitarian calculus but to use dollars as the common metric instead of utilities. But there is a familiar problem with dollars. They do not have a one-to-one relationship to utility or happiness. A wealthy person may be willing to pay more dollars for a benefit or to avoid a cost than a poorer person simply because he or she has more money to spend. However, if the program is small relative to the overall size of the economy and is not particularly skewed toward or away from one or another income group, market prices provide a reasonable proxy for the opportunity cost of resources used to carry out the policy. One can think of the policy as a marginal change toward the Pareto frontier with any serious distributive consequences highlighted and dealt with separately.<sup>24</sup>

Suppose one has allayed those fears and is ready to carry out a CBA that isolates the opportunity costs of a program and quantifies the benefits. In other words, the goal is to go beyond the budgetary costs to the government to ask if there are other social costs and to

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<sup>22</sup> A recent attempt to revive the concept by Matthew Adler has not solved the problem of making interpersonal comparisons in a persuasive way. See Adler, *Future Generations*, *supra* note 12; Adler, *Risk Equity*, *supra* note 12.

<sup>23</sup> On the early history of CBA in the federal government, see generally PUBLIC EXPENDITURES AND POLICY ANALYSIS (Robert H. Haveman & Julius Margolis eds., 1970) (assessing the state of policy analysis as a technique and as used within the federal government under the so-called, planning programming budgeting system). For an early collection of cost-benefit studies, see MEASURING BENEFITS OF GOVERNMENT INVESTMENTS (Robert Dorfman ed., 1965). The first mention of cost/benefit balancing was in the 1936 Flood Control Act (P. L. 74-738) that required that “the benefits to whomever they accrue exceed the costs.”

<sup>24</sup> See MISHAN & QUAH, *supra* note 2; WEIMER & VINING, *supra* note 2.

calculate the social benefits. The first task is the unproblematic one of itemizing benefits and costs measured in whatever units are available, be they dollars; expected lives saved or lost; health effects; or benefits to nature and to cultural or historical artifacts. These benefits and costs need to be quantified on an annual basis into the future with any uncertainties noted. These are the basic building blocks, and it is hard to criticize efforts to amass such information, except to note that scarce time and money may limit the quality and quantity of these data.

The easiest cases are those where a reasonably competitive market exists so that analysts can use market prices to measure opportunity costs on the assumption that the policy itself does not affect market prices. For example, when the Army Corps of Engineers considers whether to build a dam, it can use the market prices of cement, sand, and labor to estimate costs. Farmers benefit from cheaper irrigation water. This can translate into higher yields with the benefits measured by the increased sales of farm products, assuming the project has no impact on the overall market. The Corps can discount the stream of benefits back to the present using a discount rate that reflects the opportunity cost of capital. One can criticize the narrow focus on farm productivity and tangible costs, but given this view of the relevant costs and benefits, the Corps can rely on the larger market system to determine the opportunity costs and the benefits of the project.

Note how easily measurement problems arise in regulatory areas that do not track the simple case outlined above. Market prices are not available for many regulatory benefits and costs, and clever attempts to mimic the market are fraught with uncertainty. One possible discount rate is the opportunity cost of capital, but others argue for the consumers' rate of time preference—rates that, in our imperfect world, need not be equivalent. Using the opportunity cost of capital assures a capital-labor ratio for government programs in line with private

investment incentives so that capital is not over- or underused by the government. A familiar problem in the Soviet Union was the overly capital-intensive nature of investment projects because capital, in Marxist theory, had no value and hence was overused. Using the rate of time preference requires one to know how citizens trade off present and future benefits and costs. If capital markets have imperfections, these rates need not be equal.<sup>25</sup>

If the benefits of correcting a market failure extend far into the future, the policy must incorporate the preferences of future generations. The logic of discounting means that these preferences are given little weight beyond fifty or so years at any discount rate close to the long-run rate of return on capital. For most conventional regulatory and spending programs this does not raise any particular problems. The policies correct market failures that will benefit people in the relatively short run, and most importantly, there are no irreversibilities. The effects do not threaten future generations with catastrophe or the possibility of bad macroeconomic outcomes. In general, one can presume that policies that make the economy more efficient and less subject to negative externalities will, on balance, be policies that future generations will want to continue. However, future generations can decide, on their own, whether or not to pursue the policy. One still needs to set a discount rate or, at least, to perform a sensitivity analysis using a range of plausible rates, but the problem arises from market imperfections, not deep philosophical controversies. A key condition is that the policy is reversible in the future if the

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<sup>25</sup> For different perspectives articulated in articles collected in a *University of Chicago Law Review* symposium on intergenerational equity and discounting, see Geoffrey Heal, *Discounting: A Review of Basic Economics*, 74 U. CHI. L. REV. 59 (2007); Louis Kaplow, *Discounting Dollars, Discounting Lives: Intergenerational Distributive Justice and Efficiency*, 74 U. CHI. L. REV. 79 (2007); Douglas A. Kysar, *Discounting . . . on Stilts*, 74 U. CHI. L. REV. 119 (2007); Dexter Samida & David A. Weisbach, *Paretian Intergenerational Discounting*, 74 U. CHI. L. REV. 145 (2007); Cass R. Sunstein & Arden Rowell, *On Discounting Regulatory Benefits: Risk, Money, and Intergenerational Equity*, 74 U. CHI. L. REV. 171 (2007); W. Kip Viscusi, *Rational Discounting for Regulatory Analysis*, 74 U. CHI. L. REV. 209 (2007).

polity so decides. Present-day policymakers are not locking in future governments and are not subjecting future generations to irreversible catastrophic risks.

A second measurement issue is the treatment of risk. Many policies, especially in the area of health and safety, have uncertain benefits. They reduce the risk of cancer or lung disease, say, but there is a large margin of error in the estimates. Furthermore, even if the actual number of cases is known with a high level of certainty, no one may know *ex ante* who will actually get sick. These two kinds of risk raise different, but linked, issues of measurement.

The easiest case is one where the risk is distributed broadly and equally across the population, and the regulation reduces everyone's risk by an equal amount. Then the expected benefit would be the fall in risk multiplied by the average level of harm. If the harm is measurable, the only problem here is the possibility that people have different attitudes toward risk. Should one use expected values, which assume risk neutrality, or assume that people are generally risk averse? This is an issue either of predicting preferences or of arguing that government policy ought to adopt a particular attitude toward risk independent of the expected views of citizens.

More difficult cases arise when the science does not provide good estimates of the risk avoided by the policy. Then the risk is not limited to the identity of the victims but includes uncertainty about the actual level of harm avoided.<sup>26</sup> How precautionary should the regulation be

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<sup>26</sup> See, for example, the debate over the Environmental Protection Agency's regulation of arsenic in drinking water. See ACKERMAN & HEINZERLING, *supra* note 9, at 91–98, 111–14; Jason K. Burnett & Robert W. Hahn, *A Costly Benefit: Economic Analysis Does Not Support EPA's New Arsenic Rule*, REG., Fall 2001, at 44; Lisa Heinzerling, *Markets for Arsenic*, 90 GEO. L.J. 2311 (2002); Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 GEO. L.J. 2255 (2002); Richard Wilson, *Underestimating Arsenic's Risk: The Latest Science Supports Tighter Standards*, REG., Fall 2001, at 50.

when there is some chance that the harm avoided may be quite small? Should this depend upon estimates of risk aversion or, alternatively, on potential victims' fear of being harmed?

Paradoxically, a policy may be harder to put in place if the state knows the identities of the victims, some of whom can be saved depending upon the stringency of the policy. Here, most receive no benefits, and a few receive very large benefits in extra years of life or enhanced quality of life. There is no reason to think that people value life and health in a linear fashion. Perhaps you will pay a small amount to improve the safety of your automobile so that the risk of a fatal car crash is reduced from, say, two percent to one percent, but one cannot multiply that number by 100 to determine the amount you must be paid to be killed for sure. Presumably, the curves relating willingness to pay and probability of death or serious injury are not linear. This poses the familiar conundrum in public policymaking where society spends large amounts to rescue particular individuals trapped in coal mines or under earthquake rubble but does not spend much up front to prevent such accidents in the first place.

Finally, beyond attempts to measure the value of life and morbidity, the market does not price other benefits and costs. These include the value of natural objects, and of historical and cultural monuments and practices. Travel-time studies can proxy recreation benefits so long as there is some parallelism between more distant sites and newly available ones closer to population centers. Property-value gradients can approximate the value of clean air. Surveys help place a value on saving wildlife. All of these methods have weaknesses, but, at least, they recognize that such benefits are not zero.<sup>27</sup> However, they often represent efforts to shoehorn

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<sup>27</sup> For examples, see MARION CLAWSON & JACK L. KNETSCH, *ECONOMICS OF OUTDOOR RECREATION* (1966) (discussing travel costs); Peter A. Diamond & Jerry A. Hausman, *Contingent Valuation: Is Some Number Better Than No Number?*, 8 *J. ECON. PERSP.*, Autumn 1994, at 45 (discussing contingent valuation); V. Kerry Smith & Ju-Chin Huang, *Can Markets*

impressionistic, subjective benefits into objective categories so that one is not sure what has been gained as a result of the Herculean assumptions needed to represent the benefits in dollar terms. Jonathan Wiener makes a distinction between “cold” and “warm” analysis. The former only includes benefits and costs that can be quantified in unproblematic dollar terms. The latter attempts to include the kind of benefits and cost outlined here. Wiener rejects “cold” CBA, but that seems an easy choice.<sup>28</sup> Even to the most committed cost-benefit proponent, “cold” analysis is simply incompetent analysis that does not satisfy the requirements of the technique. The only important conceptual issue raised by these difficult-to-measure factors is not the lack of good-dollar estimates, but the question of whether one should include any benefits and costs outside of those experienced by humans.

Thus, even when one can justify CBA as a normative matter, cost-benefit analysis faces at least four challenges. These are the problematic link between dollar totals and overall utility or net benefits; the choice of a discount rate; the treatment of risk and uncertainty; and the quantification of life, health, and other nonmarket values in the metric of dollars. Economic experts can highlight the wrong way to deal with these difficult problems, but they cannot ultimately solve these problems within the paradigm of welfare economics. Nevertheless, if analysts admit to these difficulties and carry out sensitivity analyses to see if the choice of discount rate or the use of proxies for nonmarket values matters to the outcome, a cost-benefit framework can help structure the policy debate. It can highlight the areas where judgments from outside welfare economics need to be brought in to make the final decision.

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*Value Air Quality? A Meta-Analysis of Hedonic Property Value Models*, 103 J. POL. ECON. 209 (1995) (discussing property values).

<sup>28</sup> See Wiener, *supra* note 8, at 483–89.

## CASE 2: OTHER VALUES IN REGULATORY POLICY

Many regulations are meant to take account of values over and above economic efficiency. They guide transfer programs, such as Social Security, disability, or welfare. They are part of the administration of subsidy programs, such as those under the jurisdiction of the Department of Agriculture (USDA). They are concerned with the fairness and equity of markets, such as the regulations of the Equal Employment Opportunity Commission (EEOC) and some rules issued by the Department of Labor and the Securities and Exchange Commission. They take on moral issues, as in the Federal Communications Commission's (FCC) regulation of speech in the media.<sup>29</sup> A pure cost-benefit test, with its omission of distributive, fairness, and procedural concerns, would not encompass the purposes of these statutory mandates. Transfers from taxpayers to beneficiaries cancel out in a CBA. However, economic analysis can help locate cost-efficient options and can encourage agencies to find ways to give incentives to regulated firms to take these other values into account. It can complement traditional public administration reforms by introducing economic incentives into bureaucratic performance. But for such programs, CBA cannot be the criterion for the choice of a regulatory policy or the scale of a policy already mandated by statute.

One can frame the issue in terms of benefits and costs that should or should not enter the policy calculation. A strong utilitarian in the Benthamite tradition would not omit any gains or losses, including those experienced by other sentient beings that feel pain. However, just as some

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<sup>29</sup> See, for example the recent controversy over the FCC's regulation over "fleeting expletives" which has already gone once to the U.S. Supreme Court on administrative law grounds and may return under a constitutional free-speech challenge. *See* *FCC v. Fox Television Stations, Inc.*, 129 S. Ct. 1800 (2009), *rev'g* 489 F.3d 444 (2d Cir. 2007). On remand, the Second Circuit granted Fox's petition for review of the FCC's order. *Fox Television Stations, Inc., v. FCC*, 613 F.3d 317 (2d Cir. 2010).

want to include a wide range of weakly quantified benefits and costs, others argue for the exclusion of benefits and costs experienced by people as a result of their violent behavior or fraudulent activities. One possible guide is the criminal law. One can argue that if the state designates an action as a crime, then the gains to the perpetrator should not count in the social calculation.<sup>30</sup> In a similar vein, Matthew Adler and Eric Posner, in their effort to give CBA a new and distinctive grounding, argue for “laundering preferences” so only idealized ones count in the cost-benefit calculus.<sup>31</sup> They emphasize cognitive errors and biases in individual choices. However, an alternative based on actual political choices would use the criminal law as a measure of society’s willingness to include certain benefits in the welfare calculus.

OIRA review does not extend to independent agencies, such as the EEOC and FCC. However, it does cover the USDA and Health and Human Services (HHS), which administer many social-benefit programs. During the Clinton Administration, HHS and USDA were second and third after the Environmental Protection Agency (EPA) in the number of economically significant rules reviewed by OIRA.<sup>32</sup> Many of their rules govern the operation of government subsidy programs. For these rules noneconomic values will often be primary. Executive Order 12,866 does permit OIRA and the agencies that prepare the analyses to consider a broad range of values, but just how they should do this is left vague.<sup>33</sup> Hence, OIRA review may at times be

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<sup>30</sup> Consistent application of this criterion, of course, might lead one to advocate decriminalization of some offenses.

<sup>31</sup> See ADLER & POSNER *supra* note 9, at 36–38, 124–53.

<sup>32</sup> Under Clinton, the EPA issued 149 economically significant rules, HHS issued 121 and the USDA issued 118. Croley, *supra* note 4, at 865.

<sup>33</sup> See Exec. Order No. 12,866, 3 C.F.R. 638 (1993), *reprinted as amended in* 5 U.S.C. § 601 (2006).

over-inclusive, applying cost-benefit criteria to policy choices where they do not fit with the underlying purposes of the regulatory policy. A better response would be to require cost-effectiveness analysis in such cases and to help agencies design innovative programs that build on individual incentives to further program goals.

CASE 3: LARGE-SCALE MULTI-GENERATION PROBLEMS:  
IRREVERSIBILITIES AND CATASTROPHES

Welfare economists often study long-run macroeconomic policies where nothing is held constant. The normative framework has traditionally aimed to maximize the sustainable rate of economic growth, a policy position that obviously calls for the present generation to give up consumption in the interest of that goal.<sup>34</sup> Others have pointed out that there is no sound philosophical reason to favor the future over the present so that the goal should be to maximize the steady-state level of per capita income over time.<sup>35</sup> These models assume an infinitely lived civilization that can save and invest at different rates over time. If we add in the possibility that the present can impose large, irreversible, and possibly catastrophic costs on the distant future, this raises the question of intergenerational obligation with particular salience.

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<sup>34</sup> See, e.g., Edmund Phelps, *The Golden Rule of Accumulation: A Fable for Growthmen*, 51 AM. ECON. R. 638 (1961); see also Heal, *supra* note 25, at 67 (distinguishing, as I do, between small projects and those with economy-wide implications). For small projects, the consumers' rate of time preference or the return on capital is appropriate, as argued above. For projects with economy-wide implications, Heal argues that the pure rate of time preference should be used to discount utility, a rate that does not depend on the historical return to capital. His analysis draws on research on economic growth and assumes a utilitarian social-welfare function—not an obvious choice outside of economics. He does not explicitly consider irreversibilities, such as those that may arise with global warming. Both Heal and Kysar argue that for long-term policies, the discount rate is not exogenous but is a function of policy choices. See Kysar, *supra* note 25, at 128. Once again the distinction between partial and general equilibrium analysis is important. *But see* Viscusi, *supra* note 25 (arguing that no distinction should be made).

<sup>35</sup> See, e.g., Samida & Weisbach, *supra* note 25.

To see the problem, consider the issue of climate change. Society will experience many of the benefits of climate change policy far in the future. Using even a low-end discount rate, say 5%, implies that a \$1 benefit obtained 50 years in the future has a present value of 9 cents. At 3%, the present value is 23 cents and at 6% it is 5 cents. Suppose, to keep things simple, that all the benefits will accrue in year 50 and that they will be \$5 billion. At 5%, the discounted present value of these benefits is \$450,000, but it could be much higher or lower depending upon the discount rate chosen. Should that choice determine the global policy on climate change?

Even those who advocate the equal worth of all generations accept a long-run positive growth rate as a fact of human history, in spite of the doubt cast on this claim as a result of climate change or other systemic risks. In other words, they assume that the market will generate a positive interest rate. That assumption produces much of the agonizing over the social rate of discount. Some claim that the lives of those in future generations should count equally to present lives and that that implies a zero discount rate for saved lives or sacrifices under some policy.<sup>36</sup> With a positive rate of return on capital, however, such a philosophical commitment to equity would imply that, under a cost-benefit test, it will always be optimal to accept present risks to life that will reduce comparable future risks by a small amount.<sup>37</sup>

If, instead, one considers the welfare of future generations, and not just the number of people alive, then one can avoid this extreme result. As Samida and Weisbach point out, treating all generations as equally worthy is not the same thing as putting aside the same amount of

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<sup>36</sup> See e.g., Richard L. Revesz, *Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives*, 99 COLUM. L. REV. 941(1999).

<sup>37</sup> John Graham provides an example of the absurdities that can result. See Graham, *supra* note 4, at 442–47.

money in the present for all generations.<sup>38</sup> The present generation must only put aside enough so that compound interest will produce an amount equal to what it has kept for itself. It is one thing to value all generations equally in the social-welfare calculation and quite another to use a discount rate of zero when evaluating the value of saved lives and morbidity. The former assumes a policy goal and asks the state to achieve it by means of choices that take account of the opportunity cost of capital to investors. The latter takes the choice of a discount rate to reflect the social values of benefits and costs occurring at different points in time. If we assume a civilization of infinite (or at least several centuries) duration, with no irreversible links between catastrophe risks and today's policies, then the interests of the future are reflected in the discount rates that exist at present. However, two problems remain: converting wellbeing to a metric that can be measured and compared and dealing with the possibility of catastrophic, irreversible downside risks.

As to the former, Louis Kaplow has tried to get around this problem by assuming that utility at any point in time can be converted to dollars, discounted back to the present at the opportunity cost of capital, and then compared with a similarly monetized value for present lives.<sup>39</sup> That technique is consistent with the Samida and Weisbach approach, but it downplays the problem of making the required conversion. There would be no difficulty if we could assume that different generations are essentially similar on average, that we only care about the average, and that the distortions introduced to the welfare measure by using a monetary proxy are not so severe as seriously to skew the ranking of options. Furthermore, there must not be important irreversibilities that threaten overall wellbeing in a way that cannot be balanced by other

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<sup>38</sup> See Samida & Weisbach, *supra* note 25, at 145.

<sup>39</sup> See Kaplow, *supra* note 25, at 79.

compensating measures. Unfortunately, even if the other assumptions hold, the issue of climate change and other large-scale risks do not satisfy the irreversibility condition. For such issues, one should not waste time worrying about problems that arise in ordinary policy analytic exercises.

If catastrophic and irreversible harms are possible, then conventional cost-benefit analysis is not an appropriate tool. If our present actions increase the chances of a global disaster, this behavior will show up in the long-run rate of interest. The rate on long-run investments ought to rise to reflect that risk so that the certainty equivalents of different investments are kept in line. The supply of funds ought to shrink for projects that will only pay off in the distant future. Those shifts might be sufficient to persuade the government to initiate policies to limit those risks, but note that, because of the logic of discounting, very long-run harms will have little impact on current markets. The debate ought not to be framed as a debate over the discount rate.<sup>40</sup> Rather, it concerns the obligations of the present towards the future. Some economic analysts have dismissed this concern with the claim that future generations will be richer than we are and so we need not worry about them, beyond the incentives for saving and investment given by market interest rates and inter-familial affection. Today, the ground has shifted as climate change and other risks appear to threaten future generations' hold on prosperity. We can still use economics to discuss the cost-effective ways to deal with climate change, but it is not going to resolve the basic issue.

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In short, we should discount all future benefits and costs for focused regulatory and spending programs that correct market failures in the near to medium term. We should be

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<sup>40</sup> As it is in many of the contributions to the *University of Chicago Law Review* symposium on intergenerational equity and discounting. See, e.g., Sunstein & Rowell, *supra* note 25, at 171; Viscusi, *supra* note 25, at 209.

transparent about modeling and measurement choices that require us to bring in noneconomic judgments and use a sensitivity analysis to see if decisions involving these variables matter to the final outcome. We should not, however, force cost-benefit analysis to perform tasks for which it is, in principle, not suited. Those include policies which serve other goals, such as fairness or poverty alleviation, and those that have macroeconomic consequences that are large, multigenerational, and potentially irreversible. In such cases, economic analysts can help to frame cost-effectiveness studies and to assure that policymakers include all the opportunity costs and secondary benefits. However, the ultimate policy choices must be made on other grounds. These distinctions suggest a reconstituted role for OIRA and for economic analysis in general to which I now turn.

#### OIRA AND ORPAT: PUTTING COST-BENEFIT ANALYSIS IN ITS PLACE

OIRA should have two tasks: a broad coordinating and agenda-setting role, and a role for reviewing regulations that seek to correct market failures in the short to medium run. Congress might then create an office charged with developing generic improvements in cost-benefit analysis and related techniques and in carefully separating difficult issues that can be enlightened by better economic analysis and those that require the consideration of other values. Because there may be a mismatch between statutory purposes and economic justifications for regulation, one role for this new office could be to propose amendments to existing statutes that would do a better job of sorting out market failures from other goals and that would tailor regulatory techniques to statutory purposes.

The existing executive order asks the agency to identify the market failure that justifies the regulation.<sup>41</sup> The wording, however, suggests that market failures are the only justifications for regulations—an obvious falsehood—and also that if a market failure exists, then cost-benefit analysis is the proper approach to policymaking—also a mistake. Rather, the wording should be changed to say that *if* a market failure justifies regulation, *if* the program has over \$100 million per year in impact on the economy, *if* the regulated entities are “small” relative to the economy as a whole, and *if* most benefits and/or costs will be felt within fifty years or *if* the policy is reversible, *then* OIRA should require the agency to document the benefits and costs. These should be monetized whenever feasible using opportunity-cost principles and discounted to the present at the riskless rate of return on capital gross of taxes. If this rate is demonstrated to differ from consumers’ rate of time preference, an alternative calculation should document that divergence. Policies that save or take life-years, and/or involve injuries and illnesses should be monetized on the basis of data suggesting willingness to pay for or willingness to accept risks in the job market and in the product market, taking into account the usual caveats. Once again, controversies over the estimates used should be acknowledged and dealt with through a sensitivity analysis. Of course, other problems of valuation exist, including attitudes toward risk, and the valuation of nature and of historical and cultural objects. These add additional complications that will sometimes mean that a cost-benefit analysis is not worthwhile. Even if one can identify a market failure, for example, in the production of culture, a formal cost-benefit analysis might include so many imponderables that it is useless as a policy tool. The same may be true of regulations seeking to prevent terrorism or improve national security. A cost-benefit

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<sup>41</sup> See Exec. Order No. 12,866 § 1(b)(1), 3 C.F.R. 638, 639 (1993), *reprinted as amended in* 5 U.S.C. § 601 (2006).

analysis will only be a salient tool in the policy process if most decision-makers accept its validity as a guide to choice and if measurement problems do not undermine its ability to narrow the policy space.

If the above conditions do not hold, OIRA should not require a CBA of an agency. For rules with short- and medium-term effects, it should ask for a cost-effectiveness analysis that shows how the goals of the program can be attained at the same time as the regulatory burden is kept in check. This exercise may involve a set of options that show how the policy goal can be met at higher or lower costs to the economy.

Broad systemic policies, such as climate change, should be outside the programmatic framework of CBA or cost-effectiveness studies. These policies need to involve the Council of Economic Advisors and other agencies, such as the Federal Reserve System and the Department of the Treasury, which focus on macroeconomic policy. However their involvement is not sufficient. To the extent that these agencies consider the long run, they generally concentrate on measureable economic growth. The economy-wide and even global scale of their concerns is the correct one for the issue of climate change, but their focus is too narrow. Furthermore, conventional intergenerational analysis is limited if there is the added possibility of an irreversible catastrophe, rather than the more familiar financial panics, housing bubbles, and stock market crashes, which eventually bottom out and reverse.

Although the President needs to draw on the expertise of policy analysts in setting and overseeing the regulatory agenda, technical and methodological issues could be better resolved outside the political hothouse of the White House. Even if the staff and the director of OIRA are

devoted to high-quality analysis,<sup>42</sup> they are still in the Office of Management and Budget and are inevitably part of the President's attempts to set policy priorities within the Executive Branch. That seems, on balance, a desirable role for OIRA. It means that the lessons of public-policy analysis are on the table, even if they are not always accepted. However, if OIRA not only tries to shape the substantive policy agenda but also seeks to determine best practices for objective analysis, it may face a conflict of interest. It will face pressures to tailor its recommendations to the President's agenda. For individual regulations that is to be expected, but for generic issues, such as best practice for cost-benefit analysis, responsibility should rest in a group that is independent of the White House and Congress. The Government Accountability Office (GAO) could play that role even though it reports to Congress. The Comptroller General, who heads the agency, is appointed to a long term with removal only for cause.<sup>43</sup> True, the GAO does respond to congressional requests for studies, but it can also take action on its own, and it has become a respected source of policy analytic work. The GAO could be given a statutory mandate to create an Office for the Review of Policy Analytic Techniques (ORPAT) and to appoint an outside board of academic advisors to help it perform its mission. Alternatively, ORPAT might be placed within the National Science Foundation or the National Academy of Sciences. The goal would be to separate the development of better background information and better techniques of CBA from the fundamental policy choice of whether a CBA is an appropriate decision criterion in a particular case.<sup>44</sup>

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<sup>42</sup> See Graham, *supra* note 4, at 465–80 (defending the role of OIRA during his tenure as OIRA head during the George W. Bush administration).

<sup>43</sup> See 31 U.S.C. § 703 (2006).

<sup>44</sup> For similar proposals with respect to environmental science, see Angus Macbeth & Gary Marchant, *Improving the Government's Environmental Science*, 17 N.Y.U. ENVTL. L.J. 134, 162–

## CONCLUSION

The controversy over the use of cost-benefit analysis to make and assess regulatory policy has generated heated debate. Disputants accuse each of other being illogical, elitist, unethical, or lacking in compassion. The political difficulties of making policy in areas that involve morbidity and mortality are either used to justify the rejection of economic analysis or to argue for reliance on impartial expertise instead of mere political rhetoric. CBA is undermined by claims that it is biased in favor of the wealthy and of business. Alternatively, some urge that it can counter the impact of narrow interests by incorporating a comprehensive list of costs and benefits.

These debates often obscure the normative underpinning for cost-benefit analysis—a technique for “project” choice in the public sector that seeks to analogize those choices to the ones made by business firms picking profitable projects. The difference is that, instead of profits, the criterion of choice is overall net social benefit, but the principle is the same. Measurement issues arise in applying the net-benefit criterion, but such concerns do not challenge the basic appropriateness of CBA as a normative principle. However, if the social choice cannot be characterized as a “project” or as a policy whose implications are small relative to the society as a whole, then CBA is not an appropriate tool. System-wide costs and benefits that accumulate over time can change the fundamental character of society; prices and other background conditions cannot be taken as given. Then policy analysis treads on the turf of economic-growth analysis and of political philosophy. It must confront the future of a society over a long time frame. The debate over climate change policy and its intersection with analyses of economic

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68 (2008). Macbeth and Marchant propose an Institute for Scientific Assessments that would be an independent, stand-alone agency to “gather, evaluate, and assess the existing data” for use by regulatory agencies. *Id.* at 162.

growth has highlighted the necessity of taking this perspective. Because climate change could produce catastrophic irreversibilities where the gainers from inaction in the present cannot compensate the losers in the future, ordinary attempts to incorporate the future through interest rates and discounting do not capture the essence of the problem. The logic of discounting, where a small investment today grows by compound interest to a massive sum centuries hence, is irrelevant if there might be few people in existence to enjoy the benefits. If that possibility is simply accepted as given by the present generation, the value of investing will eventually fall, and the present generation, seeing catastrophe looming for its children and grandchildren, will fail to save and invest. This may be a self-fulfilling prophecy for the kinds of society-wide risks that could appear on the horizon in the absence of action in the relatively near future.