

## REVIEWS

### **Rethinking the Role of Cost-benefit Analysis**

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*Retaking Rationality: How Cost-benefit Analysis Can  
Better Protect the Environment and Our Health*

Richard L. Revesz and Michael A. Livermore. Oxford, 2008. Pp 1, 236.

#### INTRODUCTION

For almost thirty years, regulatory agencies like the Environmental Protection Agency (EPA) have been required to perform cost-benefit analyses that are subject to review by the Office of Management and Budget (OMB).<sup>1</sup> Richard Revesz and Michael Livermore argue in *Retaking Rationality* that cost-benefit analysis (CBA) has been distorted and misused by conservative opponents of regulation. They persuasively advocate a series of useful reforms to provide more balance while keeping CBA as a key decisionmaking tool. Eschewing any desire to make CBA a “master decisionmaking procedure capable of trumping all other values,” they argue only that it “can be useful without being the alpha and omega of policy analysis” (p 15).

*Retaking Rationality* provides convincing support for environmentalist claims that CBA has been used as a screen for ideologically driven attacks on regulation.<sup>2</sup> These critiques, as Revesz and Livermore

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<sup>1</sup> Regulatory review takes place within the Office of Information and Regulatory Affairs (OIRA). For a description of the development of OMB’s role in regulatory oversight, along with some useful suggestions for improving cost-benefit analysis (CBA), see generally, Daniel H. Cole, “Best Practice” Standards for Regulatory Benefit-cost Analysis, 23 *Rsrch in L & Econ* 1 (2007); Matthew D. Adler and Eric A. Posner, eds, *Cost-benefit Analysis: Legal, Economic, and Philosophical Perspectives* (Chicago 2000) (collecting papers reflecting the spectrum of views about CBA and its validity). A description of the rise of attention to CBA in the legal academy can be found in Don Bradford Hardin, Jr, *Why Cost-benefit Analysis? A Question (and Some Answers) about the Legal Academy*, 59 *Ala L Rev* 1135, 1136–40 (2008) (reporting the substantial upsurge in articles mentioning CBA, as well as the increasing number of references to CBA in casebooks and hornbooks).

<sup>2</sup> As Revesz and Livermore put it,

would be the first to insist, show only that CBA has been used wrongly, not that it is worthless as a tool for policy assessment. As I have indicated in my previous work, I agree with them that CBA can be a useful analytic tool.<sup>3</sup> The question, however, is the extent to which CBA reform will contribute to progress in environmental protection.

Revesz and Livermore's suggestions for how to improve CBA are well taken. But, in my view, what we do about embracing, improving, or rejecting CBA is not critical to the future of environmental law.<sup>4</sup> Reviewing the major areas of environmental law shows that CBA reform would not go to the heart of the problems facing our society. US toxics regulation needs more fundamental reform. Further, CBA does not have the capacity to provide much guidance on climate issues. For CBA to have much relevance to the control of air and water pollution, major legislative changes would be required. But a much more fruitful direction for legislative change in economic terms would be a broad cap-and-trade system for conventional pollutants. In short, the debate about CBA is significant, but in the end it is unlikely to shape the future of environmental law.

Part I of this Review addresses Revesz and Livermore's charge that CBA has been distorted by the antiregulatory agendas of many of its proponents. Those agendas may stem from other sources, such as libertarian philosophy or from corporate influence, but they can hardly be justified as the result of neutral economic analysis. Historically, as Revesz and Livermore show, the use of CBA was rooted in this antiregulatory agenda, which has continued to shape the work of prominent advocates and practitioners of CBA.

Thus, Revesz and Livermore make a compelling case that CBA has been warped by an antiregulatory ideological agenda and has hampered implementation of valuable environmental policies. Indeed, as Part I also explains, their critique does not go far enough. CBA has

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The association between cost-benefit analysis and the institutions of regulatory review has significantly tainted the practice of cost-benefit analysis in the eyes of many proregulatory interests such as consumer groups, organized labor, and environmentalists. This is mostly because of their negative feelings—often fully justified—about Office of Management and Budget (OMB) review. These feelings were especially justified in the early days of OMB review, under Presidents Ronald Reagan and George H.W. Bush, when OIRA was the place good regulations went to die (p 189).

<sup>3</sup> See Daniel A. Farber, *Eco-pragmatism: Making Sensible Environmental Decisions in an Uncertain World* 116 (Chicago 1999) (proposing a “hybrid of feasibility analysis and cost-benefit analysis”).

<sup>4</sup> This Review will primarily focus on the pollution-control side of environmental law, rather than on issues relating to preservation of natural areas and biodiversity. The term “environmental law” will usually be used with this connotation.

also been used as a means of evading clear statutory mandates. Use of CBA to delay or block implementation of these statutory mandates via OMB review of regulations is in serious tension with the presidential duty to “take care that the laws be faithfully executed.”<sup>5</sup> If CBA is to be applied to large areas of pollution law, legislative changes are required. In the meantime, CBA serves only an informational purpose. It would provide more accurate information if it was performed after regulations have gone into effect so actual compliance costs and benefits would be known.

Part II of this Review argues that, although Revesz and Livermore are right that CBA could be much improved as a tool for objective policy analysis, improved CBA is not the answer to the major issues facing environmental protection. Revesz and Livermore focus heavily on the use of CBA to block regulation of toxic chemicals. The reforms that they propose would be helpful, but would not address the fundamental flaws of the current regulatory scheme. Current law places the burden on the government of developing toxicity information for each chemical, proving the existence of a significant risk, and justifying remedial measures.<sup>6</sup> This chemical-by-chemical regulatory approach is hopelessly inadequate. CBA has made a bad situation worse, but the real solution is to adopt a completely different approach of the kind pioneered in the European Union’s Registration, Evaluation, Authorisation, and Restriction of Chemical Substances (REACH) Regulation.

Following this discussion of toxics regulation, Part II turns to the issue of climate change, probably the biggest environmental problem facing the planet. As we will see, CBA has strikingly limited capacity to provide useful policy guidance regarding climate change. Like Revesz and Livermore, I think that the issues here are as much ethical as economic. Rather than searching for economically efficient strategies to address climate change, we should focus on precautionary mitigation strategies that limit the likelihood of catastrophic outcomes and on adaptation strategies that are robust across a broad range of scenarios.

Part III addresses institutional questions. Revesz and Livermore offer cautious suggestions for reforming the future role of OMB in environmental policy, as well as suggesting how OMB can help provide safeguards against underregulation. Less cautiously, I suggest that OMB should be converted into the Office of Management, Budget, and Sustainability (OMBS). In addition to Revesz and Livermore’s

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<sup>5</sup> See US Const Art II, § 3.

<sup>6</sup> See *Corrosion Proof Fittings v EPA*, 947 F2d 1201, 1214 (5th Cir 1991).

suggested response to the underregulation problem, I suggest a series of other action-forcing options that should be considered. These options are particularly promising in the context of climate adaptation, an area where the problem is more likely to be government inaction than overreaction.

Ever since President Ronald Reagan took office, environmentalists have been playing defense against conservative attacks on environmental protection. Understandably, environmentalists have viewed CBA as simply another maneuver in the deregulatory campaign. We are hopefully moving into an era in which it is possible to think more constructively about what environmental law should be, rather than simply arguing about what it should *not* be.

As Revesz and Livermore argue, it is time for environmentalists to move past this focus on attacking CBA. The improvements in CBA that they suggest would be useful, and I hope that *Retaking Rationality* influences how OMB uses CBA during the new presidential administration. But my own view is that fine tuning CBA will result in only marginal policy improvements. We need to turn to other tools in order to make real environmental progress.

In brief, here are my main policy recommendations: First, most EPA regulations should be exempt from OMB's CBA review because their governing statutes mandate the use of standards other than CBA.<sup>7</sup> When CBA *is* used, it should incorporate Revesz and Livermore's reforms. Those who want to increase the economic efficiency of pollution law should focus their legislative reform efforts on expanding the use of cap-and-trade rather than on extending CBA's application to command-and-control regulations.<sup>8</sup>

Second, we should shift to a toxic chemical regulatory regime that follows the broad outlines of the EU's REACH Regulation rather than obsessing about the role of CBA in the current regulatory scheme. Reforming CBA would eliminate one drag on the current system of toxics regulation, but in any event the system is basically incapable of meaningful control of toxics.

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<sup>7</sup> See notes 68–69 and accompanying text.

<sup>8</sup> I will not make the economic case for cap-and-trade, which is familiar to any student of environmental policy. See Richard Stewart and Bruce Ackerman, *Reforming Environmental Law*, 37 *Stan L Rev* 1333, 1341–48 (1985). Suffice it to say that if the goal is improving the economic efficiency of pollution regulation, adopting market-based regulatory tools is clearly more valuable than adding a patina of CBA to a regulatory system most economists view as fatally flawed. Of course, whether economic efficiency should be a goal of the regulatory system is itself open to debate.

Third, we should base climate policy on analytical tools other than CBA that are more suited to dealing with the high level of uncertainty about the scale of impacts. The catastrophic precautionary principle provides guidance about mitigation efforts, and other strands of decision theory are better suited for adaptation planning than is CBA.

And finally, OMB should be revamped as OMBS. The Sustainability branch, replacing the Office of Information and Regulatory Affairs (OIRA) as a new office under OMBS, should oversee the government's response to climate change, biodiversity, natural disasters, and public health (including pollution and toxic chemical exposure, as well as other health threats such as pandemics). It should stress scientific expertise as much as the economic expertise now offered by OMB. OMBS should experiment with a variety of action-forcing mechanisms, including a variant of Revesz and Livermore's proposal.

#### I. CBA AND ANTIREGULATORY IDEOLOGY

Environmentalists have been outspoken critics of the use of CBA for government regulation. It is easy to lampoon this opposition as representing a kind of fanaticism that is blind to the cost of regulation. Actually, the critique is more nuanced. Consider the views of Frank Ackerman and Lisa Heinzerling, two leading environmentalist critics of CBA:

[A]nalysis of costs and benefits, in lowercase letters, is an essential part of any systematic thought about public policy, and has always been involved in government decision making. Our criticism concerns the much narrower doctrine of Cost-Benefit Analysis, which calls for a specific, controversial way of expressing and thinking about costs and benefits.<sup>10</sup>

In their view, "cost-benefit analysis promotes a deregulatory agenda under the cover of scientific objectivity."<sup>11</sup>

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<sup>9</sup> The upshot of all this is that although Revesz and Livermore give us an excellent review of the problems with current CBA and offer helpful recommendations for reform, CBA has taken an undue amount of academic attention. It is a significant subject, but not significant enough to justify the 1,049 unique references in the law review literature in 2007 alone. This figure is based on a Westlaw search for ("cost benefit analysis" "cost-benefit analysis" "benefit-cost analysis" "benefit cost analysis") and date (2007) conducted on January 3, 2009 using the JLR database.

<sup>10</sup> Frank Ackerman and Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* 211 (New Press 2004) (criticizing the "atomistic and reductionist approach adopted in the dominant style of Cost-Benefit Analysis").

<sup>11</sup> Id at 9. See also id at 11–12 ("Cloaked in the language of scientific objectivity, economic arguments have repeatedly played a partisan role.").

Ackerman and Heinzerling may be wrong in seeing this antiregulatory spin as an inherent aspect of CBA. But their jaundiced view of CBA does ring true as an observation about the history of CBA in government. *Retaking Rationality* demonstrates that government use of CBA has been warped by antiregulatory ideology, and some of the discussion in the book also indirectly raises questions about the objectivity of some prominent academic advocates of CBA. In addition, as discussed in Part I.B, CBA has been abused as a way of hindering the implementation of statutory mandates that deliberately ignore cost or require the use of formulae other than CBA for considering economic feasibility.

#### A. CBA and the Campaign against Health and Environmental Regulation

Although it is fairly obvious that conservatives used CBA as part of their deregulatory agenda, reading *Retaking Rationality* is an eye-opening look at the strength of that connection and the ways it has shaped the application of CBA. Revesz and Livermore make this point explicitly, but it is also implicit in some of their critiques of the methodologies endorsed by OMB and nongovernmental advocates of CBA. Some of those methodologies are so obviously unready for serious policy application that their acceptance can only be based on a predisposition toward deregulation rather than objective economic analysis.

##### 1. Conservative ideology and the development of government CBA.

Shortly after taking office, President Reagan signed Executive Order 12291, aimed at improving the efficiency of informal rulemaking by executive agencies.<sup>12</sup> Section 2 prohibited the issuance of “major” regulations unless, “taking into account the condition of the particular industries affected by regulations, [and] the condition of the national economy,” the potential benefits to society outweigh the potential costs, and net benefits are maximized by the regulatory objective.<sup>13</sup> OMB was given the task of reviewing these analyses within the new Office of Information and Regulatory Affairs.

As Revesz and Livermore observe, conservative academics played an important role in building support for Reagan’s antiregulatory agenda. One prime mover was William Niskanen, who viewed bureaucrats as dedicated only to expanding their budgets rather than the public

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<sup>12</sup> Executive Order 12291, 46 Fed Reg 13193 (1981).

<sup>13</sup> Executive Order 12291 § 2, 46 Fed Reg 13193, 13193 (directing that regulatory action should not be taken unless “the potential benefits to society . . . outweigh the potential costs to society”).

interest (p 21). Another prime mover was Murray Weidenbaum, who viewed business firms as representing the general public interest (as proxies for consumers) and condemned environmentalists as a special interest group (p 22). Weidenbaum was an influential member of Reagan's campaign team. The Reagan campaign attacked government regulation with a broad brush, as when Reagan said that there are "literally thousands of unnecessary regulations . . . that have add[ed] \$130 billion to the cost of production in this country . . . [a]nd I would like to see us a little more free, as we once were" (pp 24–25).

When Reagan took office, another conservative economist from the antiregulatory American Enterprise Institute<sup>14</sup> was appointed to head OIRA (p 25). The new office operated in secrecy (p 25), and it became clear that OIRA was operating as a funnel for industry lobbyists to influence the regulatory process (p 28).

In response, Congress refused to reauthorize funding for OIRA or to confirm the president's nominee to head the agency (p 29). President George H.W. Bush responded in turn by creating a new path for industry influence: the Council on Competitiveness headed by Vice President Dan Quayle (pp 30–31). The Council was "sharply critical of any regulation and deeply solicitous of business interests" (p 30). The Council operated in secrecy and understandably so, since both Quayle and the Council's executive director made it a practice to hold covert meetings with business leaders who made sizable political contributions (p 30). In the meantime, OIRA remained in existence via transfers from the OMB budget, and Congress relented and reauthorized its funding in 1986.<sup>15</sup>

In 1993, President Bill Clinton issued an executive order continuing the use of OIRA to review regulatory CBAs, but attempting to streamline the process of OMB review.<sup>16</sup> The rule was intended to reduce the number of regulations sent to OMB for approval and to

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<sup>14</sup> "[The American Enterprise Institute's] purposes are to defend the principles and improve the institutions of American freedom and democratic capitalism—limited government, private enterprise, individual liberty and responsibility, vigilant and effective defense and foreign policies, political accountability, and open debate." American Enterprise Institute, *AEI's Organization and Purposes*, online at <http://www.aei.org/about/filter.all/default.asp> (visited Sept 1, 2009). Note that public health, consumer welfare, worker safety, and the environment are not on the list of the organization's goals.

<sup>15</sup> Curtis W. Copeland, *The Role of the Office of Information and Regulatory Affairs in Federal Rulemaking*, 33 *Fordham Urban L J* 1257, 1267–68 (2006) (recounting the history of controversy surrounding OIRA since its inception).

<sup>16</sup> See Executive Order 12866 § 1, 58 *Fed Reg* 51735, 51735–36.

make OMB's review more flexible.<sup>17</sup> Clinton increased the openness of the review process and required discussion of distributive impacts and equity as well as economic efficiency (pp 31–32). Environmental groups did not participate in the revision of CBA at OMB or at EPA because of both philosophical opposition to CBA and lack of economic expertise (p 35). CBA apparently was not given heavy weight by the administration,<sup>18</sup> but OIRA retained its antiregulatory bias. For instance, in a dispute with EPA over the value to be assigned a statistical life, “it was OIRA officials, supposedly the protectors of cost-benefit analysis and economic efficiency, who were arguing against the use of the latest and most sound economic research” (p 51).

During the Clinton years, the Republicans seized control of Congress, motivated by the philosophy that “[t]he market is rational; the government's dumb.”<sup>19</sup> They found a new group of deregulation advocates to help rationalize their activities, including John Graham<sup>20</sup> and John F. Morall III (p 37).<sup>21</sup> In the meantime, the antiregulatory advocates of the Reagan years continued to pursue their agenda and provide advocacy documents for conservatives. After leaving government, the Reaganites preferred the politicized setting of conservative think tanks dedicated to deregulation over pursuing careers engaging in objective research in the academy or in nonpolitical think tanks such as RAND or Resources for the Future. Niskanen became the chairman of the libertarian Cato Institute,<sup>22</sup> James Miller joined Citizens for a Sound Economy,<sup>23</sup> and Jim Tozzi founded a for-profit, industry-funded group, the Center for Regulatory Effectiveness.<sup>24</sup>

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<sup>17</sup> See Ellen Siegler, *Executive Order 12866: An Analysis of the New Executive Order on Regulatory Planning and Review*, 24 *Envir L Rptr* 10070, 10070–72 (1994) (discussing possible ramifications of EO 12866 and noting that one of its purposes might have been to “expedite OIRA review of regulations”).

<sup>18</sup> Ackerman and Heinzerling, *Priceless* at 42 (cited in note 10) (stating that the Clinton administration made little use of OMB in practice, although it did not diminish the agency's formal power).

<sup>19</sup> *Id.* at 24 (quoting former House Republican Majority Leader Dick Armey).

<sup>20</sup> Ackerman and Heinzerling criticize Graham for pursuing funding for his Harvard Center for Risk Analysis from Phillip Morris, the cigarette company. See *id.* at 128–30 (suggesting that Graham was unconcerned about Philip Morris's reaction to his research because Graham worked to discredit the risk numbers from other analysts that were used to support regulation). But perhaps this was merely an oversight on Graham's part.

<sup>21</sup> For names of other prominent antiregulatory advocates, see *id.* at 41.

<sup>22</sup> “The mission of the Cato Institute is to increase the understanding of public policies based on the principles of limited government, free markets, individual liberty, and peace.” Cato Institute, *Cato's Mission*, online at <http://www.cato.org/about.php> (visited Sept 1, 2009).

<sup>23</sup> The Citizens for a Sound Economy is now known as FreedomWorks. See Bill Berkowitz, *FreedomWorks Challenges Progressive Organizations*, Media Transparency (July 31, 2004), online at <http://www.mediatransparency.org/story.php?storyID=40> (visited Apr 17, 2009) (reporting on the merger of Citizens for a Sound Economy and Empower America that resulted in Freedom-



In his first term, President George W. Bush pursued CBA with renewed fervor:

[T]he battle continued to rage when President George W. Bush appointed John D. Graham, a strong proponent of cost-benefit analysis from the Harvard Center for Risk Analysis, to head the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget. . . . To the chagrin of public interest groups and the joy of industry-funded think tanks, OIRA greatly stemmed the flow of health, safety and environmental regulation during the Bush Administration. Although EPA promulgated several important regulations, most of which were required by statute, [the Occupational Safety and Health Administration] did not promulgate a single significant health standard during the entire four years.<sup>25</sup>

OMB was willing to take aggressive positions in order to ensure deregulatory results. For instance, OMB assigned a benefit of only \$219,000 to a regulation preserving sixty million acres of roadless land within national forests.<sup>26</sup>

Under Graham's leadership, OMB commendably increased its transparency but also adopted controversial positions such as the proposal to count the deaths of senior citizens as less significant than the deaths of younger Americans (p 41). Despite some improvements in transparency, the Government Accountability Office (GAO) issued a blistering report about OIRA's opacity from public oversight as late as

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Works). FreedomWorks, now headed by Dick Armey, "fights for lower taxes, less government and more economic freedom for all Americans." FreedomWorks, *Our Mission*, online at <http://www.freedomworks.org/about/our-mission> (visited Sept 1, 2009).

<sup>24</sup> It might be more accurately called a lobbying firm for trade associations:

CRE is able to offer analysis and advocacy on regulatory issues in cost-effective fashion. Engagement of CRE on your regulatory issue will provide the following benefits:

- Advocacy before the federal agency on the issue.
- Strategy development.
- Technical analysis of the regulatory issue of concern.
- Presentation of analytical papers to federal agencies.
- Coverage of the issue on the CRE website, as appropriate.
- Identification of and consultation with other interested stakeholders, as appropriate.

The Center for Regulatory Effectiveness, *Regulatory Advocacy*, online at <http://www.thecre.com/regreview/index.html> (visited Sept 1, 2009).

<sup>25</sup> Thomas O. McGarity, *The Story of the Benzene Case: Judicially Imposed Regulatory Reform through Risk Assessment*, in Richard J. Lazarus and Oliver A. Houck, eds, *Environmental Law Stories* 141, 169 (Foundation 2005).

<sup>26</sup> Ackerman and Heinzerling, *Priceless* at 6–7 (cited in note 10).

2003 (p 166). Under Graham's leadership, OMB was "extremely active, rejecting dozens of regulations each year."<sup>27</sup>

In an effort to embed the antiregulatory agenda within agencies such as EPA, Bush announced a new executive order placing political appointees as Regulatory Policy Officers within the agencies (p 42).<sup>28</sup> If the desire had been to improve the quality of CBA by agencies, permanent appointment of professional economists as career agency employees would have been the preferred solution, rather than use of temporary political appointees. But professional economists might not always have reached antiregulatory conclusions. Clearly, increased economic expertise was not the goal. In short, as Revesz and Livermore put it, "Under President George W. Bush, the link between the regulatory agenda and cost-benefit analysis has become nearly complete" (p 42).

The push to apply CBA to environmental regulation clearly has had more to do with antiregulatory fervor than with a disinterested attachment to economic efficiency. Indeed, it is hard to see why anyone whose major concern was the nation's economic efficiency would devote much time to environmental regulation. The potential for combating economic waste in environmental regulation is simply not that great in comparison with other areas.

By considering the cost of recent regulations, we can get a sense of whether shaping regulations through use of CBA addresses a significant, ongoing economic issue. Revesz and Livermore provide a ballpark estimate of \$20 billion per year for the cost of complying with US environmental regulations adopted in the last ten years (p 9). Suppose that OMB review saved half of this amount (or could have done so if performed properly)—that is, that it prevented \$10 billion in net regulatory costs or added \$10 billion in net regulatory benefits. This would not be trivial, but by today's standards, it is not big money. In a \$13

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<sup>27</sup> Id at 168–69.

<sup>28</sup> See Executive Order 13422 § 5(b), 72 Fed Reg 2703 (2007) (amending Executive Order 12866). Although this proposal attracted hostile commentary at the time, it may not have had significant effects on agencies. Compare Jerry L. Mashaw, *Soft Law Reform or Executive Branch Hardball: The Ambiguous Message of Executive Order 13422*, 25 Yale J Reg 97, 100–01 (2008) (warning that Executive Order 13422 could provide administrative agencies with "good governance cover" while they engage in antiregulatory "political hardball"), with Cary Coglianese, *The Rhetoric and Reality of Regulatory Reform*, 25 Yale J Reg 85, 85, 95 (2008) (suggesting that the effect of Executive Order 13422 will be largely symbolic since regulatory agencies are unlikely to be hobbled by its requirements).

trillion economy (based on 2007 GDP), \$10 billion per year comes close to being a rounding error.<sup>29</sup>

Of course, this very rough analysis is at best suggestive. Maybe without CBA these recent environmental regulations would have been an order of magnitude more expensive. Or maybe environmental regulations from previous decades produce much higher ongoing net costs for the economy today. But that seems quite unlikely given the huge societal benefits produced by environmental regulation overall.<sup>30</sup>

Thinking that we can improve the efficiency of the economy by applying CBA to environmental regulations simply misunderstands the magnitudes involved. More likely, the economy would be better served if we reassigned the economists now working in OIRA to overseeing health care financing, social security reform, and military spending—where the real money is. Health care alone consumes about 15 percent of GDP, or roughly \$2 trillion per year, roughly ten times as much as environmental compliance.<sup>31</sup>

This does not mean that rigorous analysis of the costs and benefits of environmental regulation is pointless—it is always good to improve. But it does raise a question about the sources of the fervor for environmental cost-cutting, as opposed to reducing health care costs or streamlining the military budget. A public choice explanation would focus on the business interests involved.<sup>32</sup> A non-public choice explanation would focus on ideological opposition to government

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<sup>29</sup> See US Department of Commerce, Bureau of Economic Analysis, *Current-dollar and "Real" Gross Domestic Product* (Mar 26, 2009), online at <http://www.bea.gov/national/xls/gdplev.xls> (visited Sept 1, 2009) (presenting annual GDP in table format).

<sup>30</sup> For a report on the cumulative benefits of air-pollution regulations, see Ackerman and Heinzerling, *Priceless* at 205–06 (cited in note 10) (reporting that an extensive cost-benefit analysis conducted by EPA found that the positive value of air pollution regulations from 1970 to 1990 averaged about \$1 trillion per year, whereas total costs averaged around \$25 billion). See also Cass R. Sunstein, *Cost-benefit Default Principles*, 99 Mich L Rev 1651, 1659 (2001) (calculating a \$130 billion figure for compliance costs of “environmental protection alone” in 1994). If we assume that the benefits of regulation equal only half of the costs (which seems implausible based on EPA analysis), then the \$10 billion figure in the text would have to be multiplied by six. US GDP in 2000 was approximately \$10 trillion, so the waste would have amounted to 0.6 percent of GDP.

<sup>31</sup> Marc Kaufman and Rob Stein, *Record Share of Economy Spent on Health Care*, Wash Post A1 (Jan 10, 2006).

<sup>32</sup> Health care and defense impose costs on wide public groups such as taxpayers while benefitting smaller, more easily organized groups such as health insurers or defense contractors, whereas environmental and safety regulations benefit diffuse members of the public (such as people who breathe) while burdening more concentrated industry groups (such as utilities and manufacturing companies). Hence, cutting environmental compliance costs generates industry support regardless of whether environmental regulations produce social benefits, while cutting defense and health care costs treads on powerful business lobbies.

regulation on libertarian grounds. Either way, the motivating factor is a political bias against regulation.

This bias is reflected not only in the sources of political support for CBA but in how CBA is implemented. Revesz and Livermore give persuasive arguments that CBA as practiced is often biased against regulation.<sup>33</sup> Revesz and Livermore call for upward adjustments in the cost calculations for future harms that involve involuntary risks or dread and suffering, and say that without these adjustments, “benefits attached to programs that reduce long-latency risks will be inappropriately low, and cost-benefit analysis will erroneously discourage the regulation of these risks” (p 106).

CBA tends to overestimate industry compliance costs, sometimes quite seriously (pp 140–41). As Revesz and Livermore point out, estimates rely on industry-supplied data, which are biased because of the industry’s interest in projecting high compliance costs to defeat regulations; and estimates also often rely on existing technology or ignore other potential compliance measures such as process changes, thereby underestimating the ability of innovations to reduce costs (pp 134–35, 147).

The way that CBA is implemented suggests a deregulatory bias, and more direct evidence of such a bias also exists. A study of the experience of appointed EPA officials (including those from Republican administrations) found that, regardless of the presidential administration, OIRA mainly functioned to undercut regulation:

When asked what kind of changes OIRA sought after performing cost-benefit analysis, 89% of respondents stated that OIRA never or only rarely sought changes that would make a regulation more protective of human health and the environment. In addition, 75% said that OIRA often or always sought changes that would make a regulation less protective of human health and the environment. When asked to what extent OIRA sought changes that would make a regulation less burdensome for regulated entities, 89% answered often or always. When asked to what extent OIRA

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<sup>33</sup> Another bias was that, at least through 1991, OMB considered only the most probable estimate for risk rather than the range of estimates. See Thomas O. McGarity, *Reinventing Rationality: The Role of Regulatory Analysis in the Federal Bureaucracy* 278–79 (Cambridge 1991) (explaining that OMB pushed EPA to use moderate rather than pessimistic estimates of risk in the face of uncertainty about absolute probabilities). This is completely unjustifiable as a matter of economic principle—in the absence of risk aversion, analysts should use the expected (mean) estimate of harm, which is different from the most likely (modal) value whenever the probability distribution of hazard levels is skewed. In risk assessment problems, skew is almost inevitable because the hazard cannot fall below zero. The avowed purpose of OMB’s use of the modal value was to limit EPA regulation. See *id.*

sought changes that would make a regulation more burdensome for regulated entities, 89% answered never or rarely.<sup>34</sup>

It is little wonder that environmentalists have viewed CBA with such grave suspicion. Although Revesz and Livermore are right that CBA can be used to justify regulation as well as oppose it, history seems to provide little evidence that the theoretical neutrality of CBA has a strong relationship with its actual practice by the government.

## 2. CBA scholarship and the antiregulatory impulse.

The distortion of CBA by antiregulatory bias can be seen within the academy as well as within the government. Even less overtly politicized figures such as John Graham seem eager to grasp at any straw that would justify less regulation.

A prime example is risk-risk tradeoff, which Revesz and Livermore discuss at length (pp 55–65). It is plain that eliminating one risk may cause another risk to be substituted; Graham and others were quite correct to point this out. But Revesz and Livermore point out that Graham and his colleagues have, with complete illogic, been willing to count only unintended increases in risks from regulation but not unintended decreases in risks. For example, the use of catalytic converters in automobiles has saved an average of twenty-five thousand lives per year by eliminating suicides and accidental deaths from carbon monoxide poisoning (p 59). If we assign a value of \$6 million to each life,<sup>35</sup> this one benefit amounts to a \$150 billion savings per year. This is more than seven times the annual cost of complying with all of the environmental regulations adopted in the past ten years.<sup>36</sup> Graham and others have offered feeble explanations for their refusal to consider the countervailing unintended benefits of regulation, such as a supposed inherent bias of interest group dynamics directed only against consideration of unintended costs, which Revesz and Livermore duly demolish

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<sup>34</sup> Lisa Schultz Bressman and Michael P. Vandenbergh, *Inside the Administrative State: A Critical Look at the Practice of Presidential Control*, 105 Mich L Rev 47, 72–74 (2006). Notably, OIRA's permanent staff (many hired during the Reagan administration) were considered more conservative and antiregulatory than their Clinton-appointed bosses. *Id.* at 74.

<sup>35</sup> See Ackerman and Heinzerling, *Priceless* at 82 (cited in note 10) (noting that W. Kip Viscusi, the leading authority on the subject, suggests a \$6.1 million figure in 1999 dollars).

<sup>36</sup> According to Revesz and Livermore's estimate, the annual cost of complying with all of the EPA regulations adopted in the last ten years is \$20 billion (p 9).

(pp 61–62). Including one side of the balance sheet but not the other is hardly the hallmark of disinterested economic analysis.<sup>37</sup>

An even more telling example is the eagerness with which many CBA advocates embraced the health-wealth hypothesis. Based on studies that show wealthier people are also healthier, CBA advocates concluded that “regulatory expenditures of over \$15 million per human life saved . . . will have net counterproductive effects” (p 69) because the wealth loss will translate into an additional death. Graham “coined the inflammatory phrase *statistical murder* to characterize regulations that impose large economic costs” (p 70).

There certainly is nothing wrong with considering the health-wealth hypothesis as a matter for study. But the eagerness to embrace the hypothesis as proven fact is unjustifiable. Leaping from correlation to causation to policy recommendations is dangerous. It would be equally valid to argue that since higher levels of pollution control are correlated with higher wealth among developed countries,<sup>38</sup> the key to future economic growth is cutting pollution.

Revesz and Livermore explode any claim to intellectual respectability on the part of this unthinking acceptance of the health-wealth hypothesis. The underlying studies showed only that health and wealth are correlated, not that wealth causes health. A causal connection appears to exist, if at all, only for the lower end of the income spectrum, and we know very little about how compliance costs impact the distribution of wealth.<sup>39</sup> Indeed, the most recent study seems to show that the correlation is spurious—both health and wealth are primarily driven by educational level (p 73).

The recent financial crisis may offer a test of the health-wealth hypothesis. In the third quarter of 2008, households lost \$10 trillion in

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<sup>37</sup> Interestingly, OMB itself has recognized this and now recommends that agencies consider both ancillary risks and ancillary benefits (p 212 n 184).

<sup>38</sup> This is part of the so-called reverse Kuznets curve. For less developed countries, increased wealth is associated with increased pollution, but the relationship reverses as countries become more affluent. See Arik Levinson, *Environmental Kuznets Curve*, in Steven N. Durlauf and Lawrence E. Blume, eds, 2 *New Palgrave Dictionary of Economics* 892–93 (Palgrave Macmillan 2d ed 2008).

<sup>39</sup> Besides, economists never tire of telling us that distributional issues should be addressed only through the tax-and-transfer system rather than the regulatory process (p 14). Moreover, it is unclear that the impact of regulation on individual households is big enough to impact health even if a causal relationship does exist. As Ackerman and Heinzerling point out, a \$50 million loss amounts to only about a penny per week per household, “an amount unlikely to change either behavior regarding risk or life expectancy.” Ackerman and Heinzerling, *Priceless* at 57 (cited in note 10). Indeed, they ask, “If everyone looks under the sofa cushion and finds a lost penny every week, will a life be saved as a result?” *Id* at 57–58.

wealth from declines in the real estate and financial markets.<sup>40</sup> If it is true that a \$15 million loss corresponds to one additional death, this loss of wealth should translate into approximately 670,000 deaths. Because of the abruptness of the financial crash, it should be possible to detect such a spike in mortality rates. Of course, even if the financial crisis (as opposed to the ensuing loss of jobs during the recession) does cause an increase in mortality, the result would not necessarily translate into the much different setting of widely dispersed regulatory expenses.

Indeed, if the health-wealth relationship is correct, the implications go well beyond economic policy to include all government policies that seek benefits other than increases in household income. For instance, increases in national security do not translate into wealth that can be used by households to avoid risk or purchase better health care. The taxes used to finance national security investments, however, do reduce discretionary household income. Thus, if the \$15 million per life figure is correct, the Defense Department is responsible for the “statistical murder” of about twenty-five thousand Americans per year.<sup>41</sup> (Of course, defense costs simply go back into the economy, but so do the costs of pollution control equipment.<sup>42</sup>) Notably, advocates of

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<sup>40</sup> Kirk Shinkle, *Damage Report 2008: Household Wealth Down \$10 Trillion* (Dec 15, 2008), online at <http://seekingalpha.com/article/110730-damage-report-2008-household-wealth-down-10-trillion> (visited Sept 1, 2009) (reporting that household wealth dropped precipitously in 2008 and that with weak economic growth prospects there is little chance of a quick recovery); S. Mitra Kalida, *Americans See 18% of Wealth Vanish*, Wall St J A1 (Mar 13, 2009) (noting that the wealth of American families plunged nearly 18 percent in 2008, representing the biggest loss since the Federal Reserve began keeping track after World War II).

<sup>41</sup> See Department of Defense, *The Budget for Fiscal Year 2009* 49 (GPO 2009), online at <http://www.gpoaccess.gov/usbudget/fy09/pdf/budget/defense.pdf> (visited Sept 1, 2009) (listing total outlays for the Department of Defense in 2008 at \$583.58 billion). See also Ackerman and Heinzerling, *Priceless* at 58–59 (cited in note 10) (calculating that if each \$7.5 million spent by the defense department led to one death, defense expenditures would lead to 50,000 deaths per year if the health-wealth hypothesis were valid).

<sup>42</sup> The direct costs of any government program do not represent a decrease in wealth because those funds are transferred to private firms. This is true whether the cost is paid from direct spending financed by households or expenditures that firms have to make to comply with regulations. When money is spent, it has to go somewhere, so neither regulatory expenditures nor government spending financed by taxes are losses of wealth. If there is a loss of wealth associated with regulatory costs, it is really a lost opportunity cost: the money could have been spent on something that households view as adding to their wealth in at least the amount of the cost. (Imagine, for example, that the government invested in projects that produce positive financial returns, which are then returned to taxpayers, or that it imposed regulations that actually caused businesses to make more money, as may be true of some energy conservation rules.) The main way that a government program can decrease household wealth is if the benefits do not show up as household income. If the government spent money to dump gravel in the ocean, the money would be wasted and households would be poorer by the amount of wealth that the money could otherwise have produced. Government programs can also cause deadweight losses such as the failure

the health-wealth connection have used the theory to justify environmental deregulation, but have not pursued the implications of the theory in favor of unilateral disarmament or pacifism. It seems unlikely that the health-wealth hypothesis would be used as an argument for unilateral disarmament; its use in the context of environmental regulation seems more plausible mostly because of antiregulatory bias.

We can draw a similar lesson from the eagerness of CBA advocates to embrace other unproven methodologies. As Revesz and Livermore show, there is tenuous economic support for using life years or QALYs (quality-adjusted life years) in lieu of lives saved in calculating regulatory benefits (pp 77–93). Again, there is nothing wrong with economic research to explore these methodologies, but a disinterested advocate of sound economic analysis would have demanded much more evidence before advocating their use in policymaking. In terms of economic research, these techniques are simply “not ready for prime time.”<sup>43</sup> The techniques have been able to make the transition from being interesting hypotheses to serious policy tools only because their users already “know” there is too much environmental regulation. In short, the appeal of these methodologies lies much more in their capacity to undercut the argument for regulation than in the economic evidence supporting them.<sup>44</sup>

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of taxpayers to work extra hours because of the tax burden or the failure of manufacturers to produce as many goods as consumers would like, but these deadweight losses are different from the out-of-pocket costs that are the subject of the health-wealth argument.

<sup>43</sup> For instance, value-of-life studies show somewhat lower values for both younger and older workers, with peaks for middle-aged workers, rather than a steady decrease in the value of life as the worker ages and has fewer life years left. See W. Kip Viscusi, *How to Value a Life*, \*11–13 (Vanderbilt University Law School Law and Economics Working Paper No 08-16, Mar 2008), online at <http://ssrn.com/abstract=1137978> (visited Sept 1, 2009) (concluding that accounting for age variations in the value of statistical life may not substantially affect benefits assessments because consumption level, rather than remaining duration of life, drives the analysis and the curve does not continue to decline with age).

<sup>44</sup> It is relatively easy to think of equally plausible hypotheses that would call for much stricter regulation. Consider two examples. First, assuming economic growth continues, people in the future will be wealthier and able to pay more to avoid risks. Similarly, people will be willing to pay more to preserve increasingly scarce natural areas and biodiversity. So these regulatory benefits should grow over time, countering possible discounting. See Thomas Sterner and U. Martin Persson, *An Even Sterner Review: Introducing Relative Prices into the Discounting Rate*, \*15–17 (Resources for the Future Discussion Paper, July 2007), online at <http://www.rff.org/Documents/RFF-DP-07-37.pdf> (visited Sept 1, 2009) (identifying variables not considered in *The Stern Review*, see note 124, that could likely operate to increase estimates of future costs independent of discount rates such that the report could be said to have underestimated the need for environmental mitigation now). (Kudos to Sterner for the title, by the way.) Second, risky occupations will be disproportionately appealing to individuals with high discount rates, since they will place a relatively lower value on future years of life. Hence, value-of-life figures should be adjusted upward for the general population.



The politicization of CBA, even in the academy, can also be seen in recent debates over climate change. For example, William Nordhaus's economic model of climate change has been quite influential.<sup>45</sup> Yet Nordhaus seems unable to control the urge to leap far beyond what his model can actually provide so as to strengthen his argument against serious action on climate change.

The description of the model by Nordhaus and his coauthor is replete with concessions about its limitations: "a major uncertainty" involves growth in "total factor productivity";<sup>46</sup> "there are no well-established empirical regularities and very little history can be drawn upon" regarding the link between climate and the economy;<sup>47</sup> there are "major uncertainties about the long-run trajectories of economic growth in different regions";<sup>48</sup> regional growth models "are difficult to validate or estimate and are subject to large and growing projection errors as they run further into the future";<sup>49</sup> and so forth.<sup>50</sup> Despite all of these qualifications, the model could reasonably be used as a basis for tentative policy recommendations in the absence of anything better, but by its own terms, it can hardly be considered a definitive guide to policy.

But the limitations of the model conveniently fall by the wayside when Nordhaus has the opportunity to deliver a strong antiregulatory message. Speculative modeling results miraculously turn into proven fact in a modern version of transubstantiation: "damages for the United States, Japan, Russia, and China are essentially zero" until 2100 (assuming no catastrophe materializes);<sup>51</sup> a delay of ten years in implementing mitigation "leads to a trivially small net loss";<sup>52</sup> limiting global emissions to 1990 levels causes a net "discounted loss of \$3 trillion";<sup>53</sup> "an efficient climate-change policy would be relatively inexpensive and would slow climate change surprisingly little";<sup>54</sup> and "the

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<sup>45</sup> William D. Nordhaus and Joseph Boyer, *Warming the World: Economic Models of Global Warming* 10–26 (MIT 2000) (modeling climate change in order to make predictions regarding the efficiency of various climate change policies).

<sup>46</sup> *Id.* at 17.

<sup>47</sup> *Id.* at 20.

<sup>48</sup> *Id.* at 47.

<sup>49</sup> Nordhaus and Boyer, *Warming the World* at 53 (cited in note 45).

<sup>50</sup> Some additional examples include statements: that "there are no established methodologies for valuing catastrophic risk," *id.* at 71; that findings of climate impact are "highly conjectural" and it is difficult "to make solid estimates of the impacts of climate change," *id.*; and that "[g]iven the lack of any comprehensive estimates, the authors have made rough estimates here of the extent to which the economy and other institutions are vulnerable to climate change," *id.* at 86.

<sup>51</sup> *Id.* at 96.

<sup>52</sup> *Id.* at 127.

<sup>53</sup> Nordhaus and Boyer, *Warming the World* at 129 (cited in note 45).

<sup>54</sup> *Id.* at 174.

Kyoto protocol has no economic or environmental rationale.”<sup>55</sup> This is the language of political advocacy, not a disinterested report on a profoundly difficult area of research.<sup>56</sup>

The antiregulatory ideology that seems to motivate these prominent CBA practitioners does not prove that their conclusions are wrong, still less that CBA is an invalid methodology. What the evidence does show is that in political terms, even within the academy, CBA has sometimes been shaped by adherence to an antiregulatory agenda. Environmentalists may have overreacted in rejecting CBA root-and-stalk, but their intense suspicion of CBA is understandable.

### B. CBA’s Legality Deficit

Reagan’s executive order recognized that some statutes do not allow regulatory decisions to be based on CBA. Because this is phrased as an exception to the general rule of CBA-based decisionmaking, the executive order and its successors give the impression that the exception is a rarity. The contrary is true. The general rule is that environmental statutes provide other regulatory standards and do *not* allow EPA to base regulations on CBA.

Perhaps it would be a better world if Congress had provided broad discretion to regulatory agencies to use CBA, but the reality is quite different. Revesz and Livermore speak of the “vast discretion that is given to administrative agencies,” (p 13) which might suggest that agencies can adopt whatever decision standards they desire. No doubt many administrators wish that were the case. But in fact, agencies like EPA are constrained by a web of statutory requirements.<sup>57</sup>

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<sup>55</sup> *Id.* at 177.

<sup>56</sup> Similarly, Richard Tol contends on the basis of a meta-analysis that “[o]ne can therefore safely say that, for all practical purposes, climate change impacts may be very uncertain but it is unlikely that the marginal damage costs of carbon dioxide emissions exceed \$50 per metric ton of carbon and are likely to be substantially smaller than that.” Richard S.J. Tol, *The Marginal Damage Costs of Carbon Dioxide Emissions: An Assessment of the Uncertainties*, 33 *Energy Policy* 2064, 2073 (2005) (compiling and deciphering more than twenty-eight studies that estimate the marginal damage costs of carbon dioxide emissions). But considering peer-reviewed studies only, table 3 shows a mean marginal cost of \$50, a 10 percent probability that the cost is over \$125, and a 5 percent probability that the result is over \$245. See *id.* at 2071 table 3. If we used standard confidence intervals (5 percent to 95 percent range), the confidence interval for the \$50 per metric ton of carbon estimate would go from -\$9 to +\$245, making any estimate of the level of harm quite speculative. In any event, saying that marginal damages are unlikely to be above \$50 and probably much lower is rather misleading when \$50 is actually the mean estimate.

<sup>57</sup> As Ackerman and Heinzerling put it, “Laws requiring agencies to identify the best technologies to address pollution, for example, do not allow administrative agencies (and reviewing courts) to reopen the basic debate about pollution and public policy.” Ackerman and Heinzerling, *Priceless* at 216 (cited in note 10).

Revesz and Livermore observe that “most major new environmental, health, and safety regulations must pass a cost-benefit test before they can be adopted” (p 11). This may be true in practice, but it is not what Congress has directed. Given that most regulatory statutes provide some test other than CBA, imposing this extra statutory requirement on regulators has dubious legitimacy.

A trio of Supreme Court cases drives home the lesson that Congress has given agencies specific tasks rather than allowing them to engage in an open-ended balancing of costs and benefits. *American Textile Manufacturers v Donovan*<sup>58</sup> involved § 6(b) of the Occupational Safety and Health Act,<sup>59</sup> which governs occupational health standards for toxic chemicals.<sup>60</sup> This section directs the agency to “set the standard which most adequately assures, to the extent feasible . . . that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life.”<sup>61</sup> The textile industry argued that this provision required the agency to show that the benefits of the regulation had a reasonable relationship to costs.<sup>62</sup> The Court rejected this argument based on the plain meaning of the word “feasible.”<sup>63</sup> Indeed, the Court made it clear that CBA was impermissible as a regulatory standard under this statute:

Congress itself defined the basic relationship between costs and benefits, by placing the “benefit” of worker health above all other considerations save those making attainment of this “benefit” unachievable. Any standard based on a balancing of costs and benefits by the Secretary that strikes a different balance than that struck by Congress would be inconsistent with the command set forth in § 6(b)(5). Thus, cost-benefit analysis by OSHA is not required by the statute because feasibility analysis is.<sup>64</sup>

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<sup>58</sup> 452 US 490 (1981).

<sup>59</sup> Occupational Safety and Health Act, Pub L No 91-596, 84 Stat 1590 (1970), codified at 29 USC § 651 et seq.

<sup>60</sup> *American Textile Manufacturers*, 452 US at 509 (reversing the circuit court’s determination that § 6(b)(5) of the Occupational Safety and Health Act requires cost-benefit analysis).

<sup>61</sup> 29 USC § 655(b)(5).

<sup>62</sup> *American Textile Manufacturers*, 452 US at 506 (relating the petitioner’s litigation position that the “risk of material health impairment [must be] significant in light of the costs of attaining that reduction”).

<sup>63</sup> *Id* at 511–12 (finding the “ordinary meaning” of “feasible” to be irreconcilable with a congressional mandate to use CBA when Congress has repeatedly used other language to indicate its intention for an agency to engage in CBA).

<sup>64</sup> *Id* at 509.

We can see just how clearly the statute excludes CBA by contrasting the statutory text with the language that could have been used to require CBA. Recall that the statute requires standards that assure “to the extent feasible . . . no employee will suffer material impairment of health or functional capacity.”<sup>65</sup> Contrast that with a hypothetical mandate to set standards to assure “that the level of risk to employees is economically optimal” or to assure “that the marginal cost of risk reduction does not exceed the monetary value of health or mortality to employees discounted to present value.”

Similarly, in *Whitman v American Trucking Associations, Inc.*,<sup>66</sup> the Court also determined that the statute precluded CBA. Industry argued that EPA must use CBA in setting ambient air quality standards under the Clean Air Act.<sup>67</sup> The provision in question, § 109(b)(1), directs EPA to set standards “the attainment and maintenance of which . . . are requisite to protect the public health” with an “adequate margin of safety.”<sup>68</sup> In an opinion authored by Justice Antonin Scalia, the Court held that this provision precludes the use of CBA. Justice Scalia remarked that “[w]ere it not for the hundreds of pages of briefing respondents have submitted on the issue, one would have thought it fairly clear that this text does not permit EPA to consider costs in setting the standards.”<sup>69</sup> Moreover, he noted that the statute frequently does call for the consideration of costs in other contexts, and that for this reason the Court had “refused to find implicit in ambiguous sections of the Clean Air Act an authorization to consider costs that has elsewhere, and so often, been expressly granted.”<sup>70</sup> Hence, industry had the burden of showing a “textual commitment of authority to EPA to consider costs” in setting air quality standards.<sup>71</sup> Justice Scalia rejected the argument that the statute’s “terms ‘adequate margin’ and ‘requisite’ leave room to pad health effects with cost concerns.”<sup>72</sup> He found it “implausible that Congress would give to the EPA through these

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<sup>65</sup> See text accompanying note 61.

<sup>66</sup> 531 US 457 (2001).

<sup>67</sup> *Id.* at 468–69 (rejecting respondents’ arguments that the language of §§ 108–09 of the Clean Air Act directs OSHA to take industry compliance costs into account). See Air Pollution Prevention and Control Act (“Clean Air Act”), Pub L No 91-604, 84 Stat 1676 (1970), codified as amended at 42 USC § 7401 et seq.

<sup>68</sup> 42 USC § 7409(b)(1).

<sup>69</sup> *American Trucking*, 531 US at 465.

<sup>70</sup> *Id.* at 467.

<sup>71</sup> *Id.* at 468.

<sup>72</sup> *Id.*

modest words the power to determine whether implementation costs should moderate national air quality standards.”<sup>73</sup>

The Court in *Massachusetts v EPA*<sup>74</sup> emphasized the duty of agencies to exclude policy considerations unrelated to statutory mandates.<sup>75</sup> In *Massachusetts v EPA*, states, local governments, and environmental organizations petitioned for review of EPA’s denial of their petition asking EPA to begin the rulemaking process to regulate greenhouse gas emissions from motor vehicles under the Clean Air Act.<sup>76</sup> EPA had argued that CO<sub>2</sub> is not a “pollutant” within the meaning of the Clean Air Act. It supported this argument with a grab bag of arguments intended to show that the Clean Air Act is poorly adapted to deal with climate change. EPA said that even if the statute actually did allow it to regulate greenhouse gases, it would exercise its discretion to avoid regulating because of these factors. In particular, EPA relied on the foreign policy dimensions of the climate change issue as a justification for not invoking domestic regulatory authority.

The Court found EPA’s interpretation of the Clean Air Act incompatible with the plain language of the statute:

The statutory text forecloses EPA’s reading. The Clean Air Act’s sweeping definition of “air pollutant” includes “*any* air pollution agent or combination of such agents, including any physical, chemical . . . substance or matter which is emitted into or otherwise enters the ambient air. . . .” [42 USC] § 7602(g). On its face, the definition embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word “any.” Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt “physical [and] chemical . . . substance[s] which [are] emitted into . . . the ambient air.” The statute is unambiguous.<sup>77</sup>

Thus, as the Court interpreted the statute, greenhouse gases qualify as air pollutants and must be regulated by EPA if it finds that their climate impacts endanger human health or welfare.<sup>78</sup>

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<sup>73</sup> *American Trucking*, 531 US at 468.

<sup>74</sup> 549 US 497.

<sup>75</sup> *Id.* at 532–34 (2007) (holding that the Clean Air Act’s textual commitment of discretion to agency “judgment” is not a “roving license to ignore the statutory text,” and rejecting the EPA’s refusal to take action on carbon dioxide because its reasoning was divorced from the statutory text).

<sup>76</sup> *Id.* at 511–12.

<sup>77</sup> *Id.* at 528–29 (emphasis added).

<sup>78</sup> See *id.* at 532–33.

The Court made it clear that EPA can consider only the existence of endangerment, not other policy factors. The Court reprimanded the agency for considering extraneous factors in exercising its discretion to deny the rulemaking petition:

Although we have neither the expertise nor the authority to evaluate these policy judgments, it is evident they have nothing to do with whether greenhouse gas emissions contribute to climate change. Still less do they amount to a reasoned justification for declining to form a scientific judgment. In particular, while the President has broad authority in foreign affairs, that authority does not extend to the refusal to execute domestic laws.<sup>79</sup>

*American Trucking* involved a provision that precluded any consideration of costs in setting a regulatory standard. There are many other provisions of environmental law that do provide for consideration of costs, but Congress does not generally instruct EPA to engage in open-ended balancing of costs and benefits, or to consider other factors that EPA may consider relevant. Instead, Congress usually gives more specific directions, generally by specifying the level of pollution control technology required in a given context. For instance, in various different settings, the Clean Air Act calls for the use of:

- Reasonably Available Control Technology for existing sources in nonattainment areas;<sup>80</sup>
- Best Demonstrated Available Technology for categories of new sources, based on cost and other factors;<sup>81</sup>
- Best Available Control Technology for new sources in areas that exceed required air quality standards, based on the maximum feasible pollution reductions;<sup>82</sup>
- Maximum Achievable Control Technology for major sources of hazardous air pollutants, requiring existing sources to match the best

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<sup>79</sup> *Massachusetts v. EPA*, 549 US at 533–34. As the Court said,

Under the clear terms of the Clean Air Act, EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do. To the extent that this constrains agency discretion to pursue other priorities of the Administrator or the President, this is the congressional design.

Id at 533.

<sup>80</sup> See 42 USC § 7502(c)(1); 40 CFR § 51.100(o) (defining Reasonably Available Control Technology).

<sup>81</sup> See 42 USC § 7475(a)–(b).

<sup>82</sup> See 42 USC § 7475(a).

12 percent of the industry and new sources to match the best-controlled existing source;<sup>83</sup> and

- Lowest Achievable Emissions Reduction for new or modified stationary sources in nonattainment areas, requiring the most stringent existing emissions limits achieved in practice by the industry or included in any state implementation plan even if not achieved in practice.<sup>84</sup>

The application of these standards is not always clear, and it is even conceivable that some of them allow for the use of CBA.<sup>85</sup> But even if the statutory language were open to this interpretation, it would clearly be unreasonable to view all of these statutory standards as allowing CBA since that would collapse into one the multifarious standards that Congress so carefully distinguished.<sup>86</sup>

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<sup>83</sup> See 42 USC § 7412(g). EPA views this provision as excluding consideration of risk levels, with apparent support from the courts. See Patricia Ross McCubbin, *The Risk of Technology-based Standards*, 16 Duke Envir L & Policy F 1, 42–44 (2005) (suggesting that EPA does covertly consider risk).

<sup>84</sup> See 42 USC § 7412(d). For an extended discussion of this list of requirements, see Daniel A. Farber, et al, *Cases and Materials on Environmental Law* 539 (West 7th ed 2006) (summarizing the organic statutory section, targets for application, and practical consequences of the several Clean Air Act technology-based control standards). For a listing of the similar set of standards under the Clean Water Act, see *id* at 675 (organizing the Clean Water Act's technology-based standards by their increasingly stringent demands, from "Best Management Practices" to "Best Practicable Technology" to "Best Available Technology").

<sup>85</sup> While this Review was in the publication process, the Supreme Court decided *Entergy Corp v Riverkeeper, Inc*, 129 S Ct 1498 (2009). Interpreting a mandate to use the best technology available for minimizing adverse environmental impact of point sources' cooling water intake structures, the Court deferred to EPA's interpretation of the statute as allowing cost-benefit analysis. However, what the agency meant was not formal CBA but merely a requirement that the benefits not be grossly disproportionate to costs. Thus, *Entergy* is not an invitation to substitute CBA for statutory technology standards. Specifically, the Court concluded that

it was well within the bounds of reasonable interpretation for the EPA to conclude that cost-benefit analysis is not categorically forbidden. Other arguments may be available to preclude such a rigorous form of cost-benefit analysis as that which was prescribed under the statute's former BPT standard, which required weighing "the total cost of application of technology" against "the . . . benefits to be achieved." But that question is not before us.

*Id* at 1508–09.

<sup>86</sup> It is hard for me to see how anyone could quarrel with OMB Watch's recommendation:

If a statute directs agencies to promulgate regulations according to standards of best available technology or with an adequate margin of public health protections, for example, the regulatory options should follow that statutory mandate. This fundamental principle must be followed if the president decides he wishes OIRA to continue transactional reviews of individual significant regulations.

OMB Watch, *Advancing the Public Interest through Regulatory Reform: Recommendations for President-Elect Obama and the 111th Congress* 24 (Nov 2008), online at <http://www.ombwatch.org/files/regulatoryreformrecs.pdf> (visited Sept 1, 2009) (advocating that regulatory solutions must be analyzed from within the scope of the organic statute). If this prin-

The upshot of all this is that relatively few environmental statutes allow the kind of open-ended balancing that CBA provides. Congress has carefully specified the factors to be considered in setting environmental standards, usually in terms of public health or delineated levels of technological feasibility.

Importing legally irrelevant factors into a decision violates the basic precepts of modern administrative law. In *Citizens to Preserve Overton Park, Inc v Volpe*,<sup>87</sup> the Court held that agencies must provide a reasoned explanation of their decisions based on the relevant statutory factors.<sup>88</sup> Being within the range of reasonable outcomes is not enough; instead, the reviewing court “must consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.”<sup>89</sup> Thus, when the agency acts, it must do so on the basis of a judgment about the legally relevant factors, not based on extralegal considerations.

Nor does Congress typically give EPA broad discretion to refuse to regulate. Environmental statutes such as the Clean Air Act are replete with regulatory deadlines intended to force EPA’s hand. As *Massachusetts v EPA* makes clear, EPA cannot shirk these congressional mandates based on extralegal factors.<sup>90</sup>

Courts are understandably reluctant to look beyond an agency’s formal explanation of its actions in order to determine whether OMB pressure based on extralegal considerations shaped the decision.<sup>91</sup> But

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principle were respected, however, the ability of CBA to guide EPA regulations would be quite limited under current legislation.

<sup>87</sup> 401 US 402 (1971).

<sup>88</sup> *Id.* at 416 (noting that Congress had specified only a “small range of choices that the Secretary [could] make”).

<sup>89</sup> *Id.* In theory, at least, administrators may be required to testify in order to determine whether the formal findings reflect their actual reasoning:

The court may require the administrative officials who participated in the decision to give testimony explaining their action. Of course, such inquiry into the mental processes of administrative decisionmakers is usually to be avoided. And where there are administrative findings that were made at the same time as the decision . . . there must be a strong showing of bad faith or improper behavior before such inquiry may be made.

*Id.* at 420 (citation omitted).

<sup>90</sup> See notes 66–79 and accompanying text.

<sup>91</sup> White House influence on EPA rulemakings tends to be concealed rather than reflected in the record before a reviewing court:

According to 63% of EPA respondents, only rarely or sometimes were changes arising from White House involvement apparent in the record. This number actually understates the issue because a full 30% indicated that they had no knowledge of the contents of the record. Of the respondents who had awareness of the contents of the record, 90% stated that the record either rarely or sometimes did not contain evidence of White House involvement; the remaining 10% said it never did.



the hesitance of courts to intervene does not excuse efforts to exert such pressure. Article II of the Constitution makes it the duty of the president to “take care that the laws be faithfully executed,”<sup>92</sup> not the duty to “take care that executive branch actions survive judicial review.” Faithfully executing the laws means applying the legal standards prescribed by Congress, even in the absence of judicial enforcement, not the legal standards that the president wishes Congress had prescribed.

In short, for most provisions of the environmental statutes that govern EPA, it is unlawful to shape regulations based on CBA or to block regulations that fail to satisfy CBA. Advocates of CBA may or may not be right that CBA is the best way to set environmental standards. That is an argument that they should make to Congress. Under existing law, however, it is not an argument that the executive branch can lawfully give effect to under most environmental statutes.

This does not make the debate over the value of CBA irrelevant or negate the helpful suggestions for reform made by Revesz and Livermore. There are surely at least some statutes that do allow the use of CBA, such as the provision of the Toxic Substance Control Act discussed in Part II.A. In those settings, if CBA is used, Revesz and Livermore’s suggestions about its application would be quite helpful.

Moreover, there is more to environmental policymaking than executing existing environmental mandates. CBA is potentially relevant to arguments about changing existing statutory standards and tackling new problems like climate change. If CBA is used in those settings, Revesz and Livermore’s suggestions would again be helpful. As we will see, however, CBA is tangential to the major issues facing environmental law today.

## II. CBA’S MARGINAL RELEVANCE TO ENVIRONMENTAL REFORM

Although Revesz and Livermore make a strong case for improving CBA to eliminate its antiregulatory bias, it does not detract from their achievement to point out that CBA has only a limited role to play in improving environmental regulation. In terms of conventional pollution, any major change in regulation must come from Congress and probably would involve broader reforms such as increasing the use of market mechanisms and limiting the favored treatment of existing sources of emission. As we will see, CBA also has only a small role

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Bressman and Vandenberg, 105 Mich L Rev at 81 (cited in note 34).

<sup>92</sup> US Const Art II, § 3.

in the problems besetting toxics regulations, and CBA has very limited ability to provide guidance in dealing with climate change.

#### A. CBA and Toxic Chemicals

Revesz and Livermore devote significant attention to the public health dimension of environmental law and efforts to reduce human exposure to toxic chemicals. Although CBA has contributed to the inability of the regulatory system to come to grips with toxic chemicals, we will see that the real problems lie elsewhere, and require a different solution.

##### 1. Is CBA the problem?

CBA has clearly contributed to the dysfunctionality of US toxics regulation. *Corrosion Proof Fittings v EPA*<sup>93</sup> is a *bête noire* among environmentalists for this reason. The case involved § 6(a) of the Toxic Substances Control Act<sup>94</sup> (TSCA),<sup>95</sup> which is triggered by a finding of a reasonable basis to conclude that the chemical substance presents an “unreasonable risk” of injury to health or the environment.<sup>96</sup> Having made such a finding, EPA may apply by rule one or more of the seven types of restrictions listed in § 6(a) “to the extent necessary to protect adequately against such risk using the least burdensome requirements.”<sup>97</sup> The restrictions range from prohibiting the manufacture or distribution of the chemical in question to directing the manufacturer to give notice of the risk of injury.<sup>98</sup>

In *Corrosion Proof Fittings*, the court vacated a final EPA rule that would have prohibited the manufacture, importation, processing, and distribution of asbestos in almost all products.<sup>99</sup> The rule represented the first time EPA had used its authority under § 6 to place a comprehensive ban on a dangerous substance. The court held that EPA had violated TSCA by not adequately considering the benefits and costs of less burdensome alternatives to a complete ban, by not allowing

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<sup>93</sup> 947 F2d 1201 (5th Cir 1991).

<sup>94</sup> Toxic Substances Control Act, Pub L 94-469, 90 Stat 2003 (1976), codified at 15 USC § 2601 et seq.

<sup>95</sup> See *Corrosion Proof Fittings*, 947 F2d at 1208.

<sup>96</sup> See 15 USC § 2605(a) (establishing that EPA “shall” take remedial action to the extent necessary to protect against unreasonable risks to health or the environment using the “least burdensome requirements” authorized by the statute).

<sup>97</sup> *Id.*

<sup>98</sup> See *id.*

<sup>99</sup> See 947 F2d at 1215–16.

public comment and cross-examination on methodology adopted at the last minute by EPA to support its benefits calculation, and by not evaluating the toxicity of likely substitute products (some of which were also carcinogens) that would replace asbestos in its various applications.<sup>100</sup> With respect to CBA, the court said that, while “Congress did not dictate . . . an exhaustive, full-scale cost-benefit analysis, it did require the EPA to consider both sides of the regulatory equation, and it rejected the notion that the EPA should pursue the reduction of workplace risk at any cost.”<sup>101</sup> The court concluded, “[U]ntil an agency can provide substantial evidence that the benefits to be achieved by [a regulation] bear a reasonable relationship to the costs imposed by the reduction, it cannot show that the standard is reasonably necessary.”<sup>102</sup>

After this decision, the agency abandoned the use of § 6. It is easy to blame CBA for this outcome. But the real problem lies deeper. It had taken EPA ten years and forty-five thousand pages of evidence to come to a decision to ban asbestos.<sup>103</sup> At that rate, with or without CBA, not much is going to be done to address toxic chemicals.

It is also easy to blame CBA for the failure of OSHA to guard against toxic exposures in the workplace. No doubt, if OSHA had been allowed to implement the statute rather than being squelched by OIRA, it would have done more to deal with this problem. But the basic problem is not CBA. Rather, it is the statutory scheme itself, which requires chemical-by-chemical risk assessments.<sup>104</sup>

The chemical-by-chemical approach is doomed to failure, not only by the time and expense involved in considering each chemical, but also because the basic information needed to assess risks is lacking:

In the regulation of chemicals, manufacturers are not required to do any testing unless commanded by EPA, and the EPA must

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<sup>100</sup> Id at 1229–30.

<sup>101</sup> Id at 1222.

<sup>102</sup> Id at 1223. For a criticism of the decision, see Thomas O. McGarity, *Some Thoughts on “Deossifying” the Rulemaking Process*, 41 Duke L J 1385, 1423 (1992) (claiming the decision is “lacking in deference to the agency’s exercise of expertise and policy judgment” and “full of attempts to impose on the agency the judges’ own views of the proper role of regulation in society”).

<sup>103</sup> *Corrosion Proof Fittings*, 947 F2d at 1229 (noting the ten years that EPA took to issue a final regulation on asbestos); 54 Fed Reg 29460 (1989) (explaining that the final regulation contained therein was based on “over 45,000 pages of analyses, comments, testimony, correspondence, and other materials,” as well as the record developed by OSHA in 51 Fed Reg 22612 (1986)).

<sup>104</sup> See Mary O’Brien, Book Review, *Our Current Toxics Use Framework, Our Stolen Future, and Our Options*, 11 J Envir L & Litig 331, 347 (1996), reviewing Theo Colborn, Dianne Dumanoski, and John Peterson Myers, *Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival?* (Penguin 1996) (describing how the toxics regulatory system relies on chemical-by-chemical risk assessments, as opposed to focusing on the cumulative nature of toxic chemical exposure).

justify its demand with some scientific evidence. Due in part to this formidable burden, in the nearly thirty years of its regulatory authority, the EPA has issued testing mandates for fewer than 200 chemicals. Most of the remaining chemicals, which include approximately 75,000 individual chemical substances, are effectively unrestricted and often unreviewed with regard to their health and environmental impacts. Even when there is considerable information indicating that a chemical is unsafe, as there was in the case of asbestos, the EPA still must engage in a long and difficult regulatory struggle before imposing the “death penalty” on the hazardous chemical.<sup>105</sup>

What data are available about chemicals generally do not include exposures,<sup>106</sup> let alone toxicity rates at environmental exposure levels. Thus, the basic problem is that the regulatory scheme generates little risk information about the large number of chemicals in the market, relies on chemical-by-chemical precautions against toxic releases, and places the burden on the agency to establish the existence of a significant risk for each chemical. It also takes the inventory of industrial chemicals as a given rather than providing incentives to develop safer chemicals or to shift toward existing chemicals that are less likely to pose health problems. This is a recipe for failure, with or without CBA.

Even if we had better data on risk levels, imposing regulatory restrictions is an arduous process. Risk assessment is “a complex, judgment-filled process,” rather than “a simple matter of scientific observation,” and “the uncertainties operate as a serious limitation on the

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<sup>105</sup> Wendy Wagner, *Using Competition-based Regulation to Bridge the Toxics Data Gap*, 83 *Ind L J* 629, 629–30 (2008) (arguing for a “competition-based approach to chemical regulation” because TSCA overburdens EPA with data generation, perverts incentives for industry to develop data, and is shielded from reform by public choice dynamics). Similar conclusions were reached in studies by the European Commission:

The European Commission sponsored several studies of the data gap in preparing its legislative proposal for REACH, a complete overhaul of the European Union’s chemical regulation system. The absence of chemical information was a major motivation for the overhaul, just as it had been thirty years earlier with TSCA (*plus ça change, plus c’est la même chose*). One such study concluded that publicly available base data existed for only 14% of the HPV [High Production Volume] chemicals studied, less than a base set existed for 65%, and no data existed for 21%.

John S. Applegate, *Bridging the Data Gap: Balancing the Supply and Demand for Chemical Information*, 86 *Tex L Rev* 1365, 1383 (2008) (discussing the imbalance between information about chemical toxicities and the demand for such information created by the risk-based approach to regulation).

<sup>106</sup> *Id.* at 1383.

ability of risk assessment to quantify risk.”<sup>107</sup> This is bound to be a difficult, time-consuming process, even apart from the relatively small number of chemicals whose risk levels have been the subject of scientific investigation.

For example, in *Industrial Union Department, AFL-CIO v American Petroleum Institute* (“The Benzene Case”),<sup>108</sup> a leading case on risk regulation, OSHA compiled fifty volumes of evidence and conducted seventeen days of hearings to justify restrictions on occupational exposures to benzene.<sup>109</sup> Apart from the fact that the Supreme Court ultimately found the agency’s findings insufficient, it is obvious that this kind of effort can only be made infrequently. CBA adds additional data and analytical requirements, perhaps making a bad situation worse, but the chemical-by-chemical approach can never hope to address the vast number of chemicals now in use. If we are going to get a handle on regulation of toxic chemicals, we need a new approach.

## 2. A more promising model.

The European REACH Regulation<sup>110</sup> represents a much more promising approach. REACH was enacted at the end of 2006.<sup>111</sup> It con-

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<sup>107</sup> John S. Applegate and Celia Campbell-Mohn, *Risk Assessment: Science, Law and Policy*, 14 *Natural Resources & Envir* 219, 220–21 (2000) (distinguishing between speaking probabilistically about a known phenomenon, like a roulette wheel, and an incompletely understood phenomenon, like cancer causation, because the latter is necessarily premised on “inferences, extrapolation, and assumptions”). See also Alon Rosenthal, George M. Gray, and John D. Graham, *Legislating Acceptable Cancer Risk from Exposure to Toxic Chemicals*, 19 *Ecol L Q* 269, 278 (1992) (stating that a good risk characterization would discuss the uncertainties and assumptions behind the assessment, but lamenting that such work is rare).

<sup>108</sup> 448 US 607 (1980).

<sup>109</sup> *Id.* at 696–97 (Marshall dissenting) (criticizing the majority’s lack of deference to the agency based on the extensive process that OSHA provided for the politically powerful regulated parties to defend their interests).

<sup>110</sup> See Regulation (EC) No 1907/2006, 49 *Off J Eur Communities* (L 396) 1 (Dec 30, 2006) (establishing a new system for the regulation of chemicals, including a new European Chemicals Agency, by amending and repealing existing regulation on the subject); Directive 2006/12/EC, 27 *Off J Eur Union* (L 114) 9 (Apr 27, 2006) (regulating the collection, transport, treatment, storage, and tipping of waste to protect human health and the environment).

<sup>111</sup> For a discussion of REACH, see John S. Applegate, *Synthesizing TSCA and REACH: Practical Principles for Chemical Regulation Reform*, 35 *Ecol L Q* 721, 741–51 (Apr 18, 2009) (arguing that despite their differences, REACH can serve as a model for reforming TSCA to make it more precautionary while keeping the “risk-based, chemical-based, and cost-sensitive” format); Mark Schapiro, *Exposed: The Toxic Chemistry of Everyday Products and What’s at Stake for American Power* 137–58 (Chelsea Green 2007) (reporting on the transatlantic effects of REACH, including increased costs for American multinationals and an incentive for American industry to support amendments to TSCA to remove any advantage to their non-exporting competitors); David A. Wirth, *The EU’s New Impact on U.S. Environmental Regulation*, 31 *Fletcher F World Aff* 91 (2007) (exploring the way in which the recent deregulatory focus in the

tains “the most rigorous testing requirements of any regulatory regime in the world, [and] requires registration of all existing and new chemicals produced or imported in volumes of a ton or more per year per manufacturer or importer.”<sup>112</sup> This measure was prompted in part by widespread concerns about toxic chemicals in products for children.<sup>113</sup>

Under REACH, substances imported or manufactured in amounts exceeding one ton in weight must be accompanied by a technical dossier giving background information, while a chemical safety report is required if the amount is over ten tons.<sup>114</sup> Testing requirements are set forth in annexes to the Regulation.<sup>115</sup>

REACH makes special provision for high-risk chemicals. To obtain authorization for these chemicals, firms must show that the risks are sufficiently controlled or that the benefits of using the chemicals exceed the risks. They must also discuss the existence of safer alternative substances or technologies and must submit plans to substitute these safer alternatives if available (or plans for research and development if no such substance currently exists).<sup>116</sup> Although a compari-

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United States, combined with intensifying regulation in the European Union, has reversed the relationship of leader and follower in environmental regulation); DaeYoung Park, et al, *REACHing Asia: Recent Trends in Chemical Regulation of China, Japan, and Korea* (2007), online at <http://ssrn.com/abstract=1121404> (visited Sept 1, 2009) (discussing how Asian countries are reacting to the regulatory gap between REACH and their systems, and arguing that REACH will have a significant impact on Asian regulatory regimes). For a detailed comparison of REACH with US and Canadian chemical regulation, see Richard A. Denison, *Not That Innocent: A Comparative Analysis of Canadian, European Union and United States Policies on Industrial Chemicals* (Environmental Defense Fund 2007), online at <http://www.environmentaldefense.org/go/chempolicyreport> (visited Sept 1, 2009) (comparing across national regimes the movement away from a “presumption of innocence” for industrial chemicals and finding that the US is severely lagging); Christian Hey, Klaus Jacob, and Axel Volkery, *Better Regulation by New Governance Hybrids? Governance Models and the Reform of European Chemicals Policy* 9–26, (Environmental Policy Research Centre, Free University of Berlin 2006), online at <http://ssrn.com/abstract=926980> (visited Sept 1, 2009) (discussing REACH and describing it as a successful hybrid “of governance modes, providing for cooperative and conflict-oriented arenas both in the decision-making and the implementation processes and combining hierarchical, cooperative and self-regulatory modes of governance”).

<sup>112</sup> Wirth, 31 Fletcher F World Aff at 100 (cited in note 111) (commenting on the sweeping scope of REACH, from mandatory registration in order to have access to the common market, to progressively more rigorous testing for larger market participants).

<sup>113</sup> Schapiro, *Exposed* at 136 (cited in note 111) (reporting on the toxin scandals in Europe that led to public dissatisfaction with the lack of information created by their TSCA-inspired regime when their regulators did not know enough to satisfy public demands for safe products).

<sup>114</sup> European Commission Environment Directorate General, *REACH in Brief* 6–7 (Oct 2007), online at [http://ec.europa.eu/environment/chemicals/reach/pdf/2007\\_02\\_reach\\_in\\_brief.pdf](http://ec.europa.eu/environment/chemicals/reach/pdf/2007_02_reach_in_brief.pdf) (visited Sept 1, 2009).

<sup>115</sup> *Id.*

<sup>116</sup> *Id.* at 5. Certain substances are singled out for special treatment such as persistent bioaccumulative and toxic chemicals; very bioaccumulative chemicals; and those carcinogenic, mu-

son of costs and benefits is relevant to whether a chemical can be used, REACH does not seem to make CBA determinative if safer alternatives exist. Note that for these chemicals, the burden is on the manufacturer or importer to justify use of the chemical, as opposed to US law, where the agency must justify regulation. The very existence of this burden creates an incentive to search for safer alternatives in order to avoid the difficulty of proving the need to use a dangerous chemical.

REACH uses a mix of regulatory techniques. Public disclosure of risk information and the use of self-regulation along the supply chain go beyond traditional regulation. On the other hand, the authorization requirements for chemicals of special concern are classic prescriptive regulations, differing from the norm only in that the burden of proof is on industry. One possible difficulty is that industry will deemphasize the self-enforcement provisions of the law in order to avoid exposing problems that might lead to heavier regulation.<sup>117</sup> Yet, industry also has incentives to voluntarily switch away from chemicals of high concern or from those whose tests suggest possible risks in order to avoid the possible burdens of regulation.

Elsewhere, I have discussed several lessons of REACH for US policymakers.<sup>118</sup> REACH illustrates the power of “next generation” environmental policies to mold industry behavior, including the potential for public disclosure requirements to trigger market pressures against toxics sources, the desirability of avoiding grandfathering of existing facilities and products,<sup>119</sup> and the advantages of using supply-chain leverage to broaden the impact and effectiveness of regulation.

The more fundamental points are that REACH provides incentives to use substitutes for potentially toxic chemicals rather than focusing its efforts on chemical-by-chemical regulation; that it uses market incentives

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tagenic and reproduction-impairing substances for which a safe level cannot be defined, and therefore cannot be authorized based on adequate control of risk. In six years, the Commission will review whether endocrine disrupters should also be excluded from the adequate control route. Id at 7, 13.

<sup>117</sup> See Hey, Jacob, and Volkery, *Better Regulation by New Governance Hybrids?* at 13 (cited in note 111) (claiming that REACH inverts the typical dynamic of self-regulation because diligent self-regulation only leads to additional government intervention).

<sup>118</sup> See generally Daniel A. Farber, *Five Regulatory Lessons from REACH* (UC Berkeley Public Law Research Paper No 1301306 Nov 13, 2008), online at <http://ssrn.com/abstract=1301306> (visited Sept 1, 2009) (promoting REACH as a model for policies that aim to mold industry behavior and leverage market relationships to maximize regulatory impact).

<sup>119</sup> For an insightful commentary on this issue, see Jonathan Remy Nash and Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 *Nw U L Rev* 1677, 1677–80 (2007) (arguing that transition relief in the context of environmental regulation can be efficient but only if limited in time and with disincentives for extending the period of relief).

as much, or more, than direct regulation; and that it places the burden of developing toxicity information and determining the net benefits of using a toxic chemical on the user rather than the government.<sup>120</sup>

Trying to improve US toxics regulation by reforming or even eliminating CBA is like putting lipstick on a pig (or, to recall a phrase from the recent presidential campaign, on a pit bull<sup>121</sup>). Certainly, the incremental improvements suggested by Revesz and Livermore should be used to whatever extent CBA remains part of the process. But to make serious progress in addressing toxics issues, we need something quite different, along the general lines of REACH.

## B. CBA and Climate Change

Climate change is probably the most serious environmental issue facing the world today. Although we can endlessly debate whether CBA would be a valid method of setting climate policy, this is, at least for the present, beside the point. CBA simply is not capable of generating clear conclusions regarding climate change. Instead, we must turn to other sources of guidance in order to make sensible decisions.

### 1. The inability of CBA to drive climate policy analysis.

For policymaking purposes, we would like to know not only how much climate change to expect but also what costs these changes will impose on society and what it would cost to ameliorate climate change. Unfortunately, our knowledge of these economic issues is still quite crude.

There are now about a dozen models that connect climate change predictions to economic analysis.<sup>122</sup> These models differ in a number of dimensions: their focus on the energy sector or reliance on a broad macroeconomic analysis, the degree to which they analyze localized versus average global impacts, and their treatment of uncertainty.<sup>123</sup> Model results differ correspondingly.

For example, the Mendelsohn model estimates impacts for five market sectors and finds positive economic effects for temperature in-

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<sup>120</sup> California is already moving in the direction of REACH with the enactment of AB 1879 on September 29, 2008. See Assembly Bill No 1879, An Act to Add Sections 25252, 25252.5, 25254, 25255, and 25257 to the Health and Safety Code, relating to hazardous materials, codified at Cal Health & Safety Code § 25252 et seq (West).

<sup>121</sup> Jeff Zeleny, *The Lipstick Dialogues*, NY Times A23 (Sept 11, 2008).

<sup>122</sup> For a list, see Kendal McGuffie and Ann Henderson-Sellers, *A Climate Modeling Primer* 242 (Wiley 3d ed 2005) (presenting summary characterization of integrated assessment models).

<sup>123</sup> *Id.* at 240–43.



creases up to about 4°C, whereas the Tol model finds small net economic losses at all levels in terms of global output but estimates the losses to be twice as high when measured in terms of individual welfare rather than dollars (because many of the costs fall on poorer populations).<sup>124</sup>

The Nordhaus model includes a broader range of impacts (market and nonmarket) and also made the first effort to take into account the economic costs of potential catastrophic impacts.<sup>125</sup> The Nordhaus model assumes nonlinear effects of climate change, so that a 6°C change produces about twice as much harm as a 4°C change.<sup>126</sup> Despite these attractive features, the Nordhaus model also has significant limitations, where modeling had to be based on assumptions rather than data or theory. For example, the shift away from carbon intensive energy sources is assumed to follow historical trends, rather than reflecting incentives for new technologies.<sup>127</sup>

In contrast to Nordhaus, *The Stern Review* finds considerably higher levels of harm.<sup>128</sup> In terms of policy, Stern reaches much different conclusions than Nordhaus. Stern argues that, “if we don’t act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever.”<sup>129</sup> Indeed, if “a wider range of risks and impacts is taken into account, the estimates of

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<sup>124</sup> Nicholas Stern, *The Economics of Climate Change: The Stern Review* 166–67 (Cambridge 2007) (comparing several models that estimate the future economic impact of global climate change).

<sup>125</sup> Id at 167 (summarizing the formerly “pioneering” Nordhaus model).

<sup>126</sup> Id (noting the assumption of increasing marginal harm from increases in mean temperature in the Nordhaus model based on the increasing chance of “abrupt and large-scale changes”). See also id at 166 figure 6.2 (graphing the relationship between global GDP and global mean temperature in several different models).

<sup>127</sup> See id at 51. Compare Richard S.J. Tol, *Carbon Dioxide Emission Scenarios for the USA* § 4.1 (FEEM Working Paper No 117.2006 Sept 2006), online at <http://ssrn.com/abstract=932508> (visited Sept 1, 2009) (noting that the “model cannot anticipate structural breaks. This is a humbling conclusion for a 100 year forecast” and “history-based projections are not robust to radically new technologies.”). Another example of the roughness of the modeling can be seen in Nordhaus and Boyer’s work. Their calculations of the impact of a sea level rise exclude storms, impacts on undeveloped lands, and the cost of resettlements, which the authors attempt to compensate for by providing what they consider to be a conservative estimate. See Nordhaus and Boyer, *Warming the World* at 76–77 (cited in note 45). Similarly, the cost of catastrophic harm was roughly estimated via a survey of experts followed by some “assumptions” about the degree of harm. See id at 87–88.

<sup>128</sup> Stern, *The Stern Review* at 186 & table 6.1 (cited in note 124) (charting the effects on global GDP from alternative scenarios).

<sup>129</sup> Id at xv.

damage could rise to 20% of GDP or more.”<sup>130</sup> Not surprisingly, Stern recommends stringent control of emissions.

Models also differ in their assessments of the costs of complying with the Kyoto Protocol, with the range running from negligible losses to at least 1 to 2 percent of GDP annually.<sup>131</sup> The models differ in terms of three critical assumptions about the timing of abatement efforts, the types of policy instruments used, and the likelihood of technological innovation.<sup>132</sup> Other relevant factors include the willingness of economic actors to substitute away from high-carbon technologies and trends in energy efficiency.<sup>133</sup>

There are similar difficulties in modeling the costs of mitigating and adapting to climate change. Most of the model results are in the range of 2 to 5 percent of GDP in 2050. However, the range spans from a 4 percent *gain* in GDP due to reduced use of carbon to a 15 percent *loss* of GDP.<sup>134</sup> A meta-analysis shows that key factors in explaining these differences include the following: whether revenue from carbon taxes is recycled; what kinds of technological changes are assumed; whether shifts in energy sources have nonclimate benefits; and whether the model includes international carbon trading.<sup>135</sup> Hopefully, economists will be able to narrow the uncertainty, but it is discouraging that at this point they cannot even agree on whether the economic effect is positive or negative.

Remarkably, many economists’ models assume that placing a higher price on carbon will not cause increased innovation toward clean technologies.<sup>136</sup> If it is true that financial incentives do not affect the rate of innovation, the entire law of intellectual property is radically misguided. One wonders if the same economists would be willing to support a proposal to abolish intellectual property rights in energy technologies on the ground that technological innovation is exogenous.

Many individual elements of the economic impact analysis are the subjects of serious debate. For instance, economists hotly dispute

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<sup>130</sup> Id (noting the dramatic increase in cost to global GDP when the model includes non-market losses—a 32 percent loss in global GDP at the 95th percentile).

<sup>131</sup> See Jason F. Shogren and Michael A. Toman, *How Much Climate Change Is Too Much? An Economics Perspective*, in Michael A. Toman, ed, *Climate Change Economics and Policy* 42 (RFF 2001) (reporting the disparity between cost figures and a study that helped explain the discrepancies by showing that estimates for the price of a emissions permit varied from \$70 to \$400 per metric ton).

<sup>132</sup> Id.

<sup>133</sup> Id at 43.

<sup>134</sup> Stern, *The Stern Review* at 269 (cited in note 124).

<sup>135</sup> Id at 271 & table 10.1.

<sup>136</sup> Id.

the net effect of climate change on agriculture, with some finding an overall positive effect on US agriculture (but with very large regional variations),<sup>137</sup> while others find substantial negative effects.<sup>138</sup> If we do not even know the signs of important elements of the economic impact, our ability to predict overall impact (taking into account all of the feedback loops of the economy) is obviously going to be difficult.

Modeling the systemic economic impact of climate change as well as the costs of adaptation and mitigation involves tremendous challenges, particularly if the projection goes out more than a few years.<sup>139</sup> Even Nordhaus and Boyer emphasize that attempts to estimate the impacts of climate change continue to be highly “speculative.”<sup>140</sup> Economic models must build on the outputs of climate change models, which are themselves uncertain in terms of the high end of the risk spectrum. Then there is the difficulty of forecasting the trajectory of the economy over future decades. This clearly cannot be done in detail—for example, no forecaster in 1970 would have predicted the explosive growth of personal computers, let alone the Internet, neither of which existed at the time, nor that complex financial derivatives, which also did not exist in 1970, would threaten a major economic depression today.

Forecasting even at a crude level must rely heavily on the assumption that the future will on average be much like the recent past: for example, that technological progress will continue at something like its current pace and that some unforeseen catastrophe will not cause a long-lasting economic crash. Even predictions for specific

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<sup>137</sup> See Oliveir Deschênes and Michael Greenstone, *The Economic Impacts of Climate Change: Evidence from Agricultural Output and Random Fluctuations in Weather*, 96 *Am Econ Rev* 354, 381 (2007) (finding that the most likely result of climate change on American agricultural profits is an annual increase in profits of roughly 4 percent, but with California losing 15 percent). Note, however, that this study excludes possible impacts of increases in extreme events such as storms and droughts. See *id.* at 357–62.

<sup>138</sup> See Wolfram Schlenker, W. Michael Hanemann, and Anthony C. Fisher, *The Impact of Global Warming on U.S. Agriculture: An Econometric Analysis of Optimal Growing Conditions*, 88 *Rev Econ & Stat* 113, 122–24 (2006) (estimating the potential impact on farmland values east of the one-hundredth meridian for a range of warming scenarios and concluding that aggregate losses could be quite severe if fossil fuel use increases).

<sup>139</sup> For a good overview of modeling issues, see J.C. Hourcade, et al, *Estimating the Costs of Mitigating Greenhouse Gases*, in James P. Bruce, Hoesung Lee, and Erik F. Haites, eds, *Climate Change 1995: Economic and Social Dimensions of Climate Change: Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change* 268 (Cambridge 1996) (discussing the “critical determinants likely to influence the overall cost of climate policies and of the main methodologies employed to account for them”). Of course, in the decade since this report, models have improved in their capacity to handle these issues.

<sup>140</sup> Nordhaus and Boyer, *Warming the World* at 86 (cited in note 45) (conditioning their model on the need for a “detailed inventory and valuation of climatically sensitive regions for validation”).

economic sectors are difficult. Past experience with models that project energy use do not lend much confidence to these predictions. The projections have generally been too high, by as much as a factor of two.<sup>141</sup> Projecting the use of adaptation measures, which is important in terms of determining the harms created by climate change, is made more difficult by the institutional barriers that may prevent optimal use of adaptation: for instance, the history of federal flood control gives little ground for optimism that flood control projects will be optimally designed.<sup>142</sup> To the extent that climate change scenarios are based on projections of future emissions, they implicitly make assumptions about future political and economic developments, which are imperfectly known (to say the least).

These difficulties in constructing reliable economic models suggest any CBA is unlikely to be reliable. Two further problems with CBA have particular relevance for climate change. First, nonmarket benefits in the form of ecosystem preservation are difficult to assess, yet ecosystem damage is a critical factor in assessing climate change. Climate change will transform existing ecosystems and endanger biodiversity, and this harm needs to be part of the CBA calculation.<sup>143</sup> Second, climate change requires the use of discounting because of the long time spans involved in climate policy, yet the legitimacy of discounting is contested, as is the choice of discount rate.<sup>144</sup>

The choice of a discount rate has a profound effect on policy recommendations regarding climate change and other long-term environmental issues.<sup>145</sup> There is nothing approaching a professional consensus, however, about the appropriate rate. As Daniel Cole explains:

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<sup>141</sup> Stephen J. DeCanio, *Economic Models of Climate Change: A Critique* 138–43 (Palgrave 2003) (reviewing the forecasts made in the 1980s by the US Department of Energy regarding global oil prices, and noting that within a single decade the forecasts had error rates of 100 to 200 percent).

<sup>142</sup> See Matthew D. Zinn, *Adapting to Climate Change: Environmental Law in a Warmer World*, 34 *Ecol L Q* 61, 72–73 (2007) (arguing that adaptation may not be successfully managed to minimize ecological or other impacts).

<sup>143</sup> Some economists advocate the use of “contingent valuation” studies to measure how much people are willing to pay to preserve the intrinsic value of nature as opposed to how they value their own uses or potential uses. Revesz and Livermore endorse this approach (pp 119–30). Another approach for valuation of nonmarket costs and benefits is the concept of ecosystem services. For a discussion of this approach, see James Salzman, *Creating Markets for Ecosystem Services: Notes from the Field*, 80 *NYU L Rev* 870, 884–88 (2005); James Salzman, Barton H. Thompson, Jr, and Gretchen C. Daily, *Protecting Ecosystem Services: Science, Economics, and Law*, 20 *Stan Envir L J* 309, 309–13 (2001).

<sup>144</sup> For my view of this issue, along with a review of the literature up to 2003, see Daniel A. Farber, *From Here to Eternity: Environmental Law and Future Generations*, 2003 *U Ill L Rev* 289, 289–92, 297–301 (2003).

<sup>145</sup> As Cass Sunstein explains:

Perhaps the most obvious lesson from the *Stern Review* and its critics (at least for those who have not already learned it) is that the choice of parameter values (including discount rates, coefficients of relative risk aversion, and per capita consumption growth rates) can decisively influence the outcome [of CBA]. Unfortunately the *Stern Review* and its critics also remind us of just how far away we remain from being able to specify a consensus “best practice” for selecting parameter values.<sup>146</sup>

The extent of disagreement about discounting can be seen in a recent symposium on the subject in the pages of this Law Review, where recommendations ranged from rejection of discounting entirely;<sup>147</sup> to use of the riskless rate of return, perhaps coupled with hyperbolic discounting;<sup>148</sup> to use of an infinite discount rate by administrative agencies for effects beyond thirty to fifty years.<sup>149</sup>

Outputs of various economic models are so far apart as to make it perilous to rely on any one model or even a small subset. According to a recent review, “cost estimates of Kyoto emissions reductions diverge by a factor of about five-hundred (and not all estimates show an

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If an agency chooses a discount rate of 2%, the outcome will be very different from what it would be if an agency were to choose a discount rate of 10%; the benefits calculation will shift dramatically as a result. If a human life is valued at \$8 million, and if an agency chooses a 10% discount rate, a life saved 100 years from now is worth only \$581. “At a discount rate of 5%, one death next year counts for more than a billion deaths in 500 years.”

Sunstein, *Cost-benefit Default Principles* at 1711 (cited in note 30), quoting Derek Parfit, *Reasons and Persons* 357 (Oxford 1984).

<sup>146</sup> Daniel H. Cole, *The Stern Review and Its Critics: Implications for the Theory and Practice of Benefit-cost Analysis*, 48 *Natural Resources J* 53, 81 (2008) (arguing that the choice of discount rate involves an ethical, as well as mathematical, component).

<sup>147</sup> See Douglas A. Kysar, *Discounting . . . on Stilts*, 74 *U Chi L Rev* 119, 119–20 (2007) (criticizing CBA for subsuming “vital questions of intergenerational equity” through discounting and artificially simplifying “dauntingly complex and morally inflected” policy conundrums). The title of Kysar’s work is a reference to Bentham’s phrase “nonsense on stilts” as a description for natural rights.

<sup>148</sup> See W. Kip Viscusi, *Rational Discounting for Regulatory Analysis*, 74 *U Chi L Rev* 209, 221–22, 239–40 (2007) (advocating that the government bond rate be adopted as the riskless rate of return, and that hyperbolic discounting, although not ideal, captures an actual irrational weighting of near-term benefits that is relevant to policy analysis and public sentiment toward regulation).

<sup>149</sup> See Eric A. Posner, *Agencies Should Ignore Distant-future Generations*, 74 *U Chi L Rev* 139, 140 (2007) (arguing that agencies should use a discount rate of infinity for generations more than thirty years in the future because agencies operate within a “thick institutional and political environment that bars them from directly implementing moral precepts”). The title is misleading since the recommendation would affect not only near generations but younger members of the current generation. Note that this proposal would not only discourage investments in environmental protection but also in public health measures for young people and all forms of long-lived infrastructure. But perhaps the proposal was tongue-in-cheek.

economic loss).”<sup>150</sup> As noted above, there is also evidence of a systematic bias in ex ante economic studies to overestimate the cost of complying with environmental regulations. In any event, estimates of mitigation costs must be taken with a large grain of salt.

On the book jacket of *Retaking Rationality*, Judge Richard Posner writes that “in noncommercial settings, cost-benefit analysis often cannot yield definitive conclusions without the analyst’s adopting assumptions that may be politically charged.” That may or may not be accurate as a general statement, but it is clearly true regarding CBA of climate change. We need to make intelligent decisions about climate mitigation, but CBA cannot do very much at this point to help us make them.

## 2. Climate mitigation, uncertainty, and precaution.

In terms of mitigation efforts, the weaknesses of current economic models of climate change make CBA quite problematic. Simply put, the uncertainties seem to swamp the ability of the models to provide reliable information on costs and benefits. Moreover, the economic models must rely on scientific models of climate that also present significant (though smaller) uncertainties.

There seems to be a broad consensus among economists that uncertainty about climate change is not an excuse for inaction. As Thomas Schelling says, “[T]his idea that costly actions are unwarranted if the dangers are uncertain is almost unique to climate.”<sup>151</sup> “In other areas of policy, such as terrorism, nuclear proliferation, inflation, or vaccination,” he continues, “some ‘insurance’ principle seems to prevail: if there is a sufficient likelihood of sufficient damage[,] we take some measured anticipatory action.”<sup>152</sup> Nobel Laureate Kenneth Arrow suggests that we should take uncertainties into account by adding an extra 50 percent to our estimates of harm.<sup>153</sup> Innovative theoretical work

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<sup>150</sup> Philippe Tulkens and Henry Tulkens, *The White House and the Kyoto Protocol: Double Standards on Uncertainties and Their Consequence* \*8 & figure 4 (FEEM Working Paper No 89, June 2006), online at <http://ssrn.com/abstract=910811> (visited Sept 1, 2009).

<sup>151</sup> Thomas C. Schelling, *Climate Change: The Uncertainties, the Certainties, and What They Imply about Action*, 4 *Economists’ Voice*, Issue 3, Article 3, at 4 (2007), online at <http://www.bepress.com/ev/vol4/iss3/art3> (visited Sept 1, 2009) (chastising those who take extreme positions on either side of the uncertainty and advocating the dispassionate weighing of the costs, benefits, and probabilities as well as they are known, without obsessing over the tails of the distribution).

<sup>152</sup> *Id.*

<sup>153</sup> Kenneth J. Arrow, *Global Climate Change: A Challenge to Policy*, 4 *Economists’ Voice*, Issue 3, at 4–5 (2007), online at <http://www.bepress.com/ev/vol4/iss3/art2> (visited Sept 1, 2009) (concluding that the present value of the benefits of mitigating carbon dioxide emissions exceeds the present value of the costs for all reasonable values of the social rate of time preference).

by economist Martin Weitzman suggests that uncertainty about possible catastrophic climate change should loom large as a justification for controlling climate change.<sup>154</sup>

If we cannot rely on CBA for guidance, how should we make decisions about climate mitigation? One promising approach is called robust optimal control. Under this approach, to correct for uncertainty about the correctness of their preferred model, policymakers consider alternate models that are close to their baseline model, in the sense of being statistically hard to distinguish from the baseline model. Other economists have reached similar conclusions about the need for precaution from different starting points, such as considering the nonlinear feedbacks in physical systems that could lead to multiple economic equilibria.<sup>155</sup> In the climate change context, the implication is that policymakers should react more aggressively and pursue more stringent mitigation strategies in order to avoid capture by an undesirable equilibrium.<sup>156</sup>

The high-end risks are very important and suggest a strong emphasis on precaution in designing climate change policy. Given our inability to specify the probabilities of climate outcomes and the extreme severity of some of those outcomes, the most reasonable conclusion is that we should take all feasible measures to avert them. This means keeping climate change low enough to avoid triggering dangerous feedback loops in the climate system. This can be seen as an application of what Cass Sunstein has called the “catastrophic harm precautionary principle.”<sup>157</sup> It is also justified because, if we enter one

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<sup>154</sup> Martin L. Weitzman, *The Role of Uncertainty in the Economics of Catastrophic Climate Change*, \*1–3 (AEI-Brookings Joint Center for Regulatory Studies Working Paper No 07-11, May 2007), online at <http://ssrn.com/abstract=992873> (visited Sept 1, 2009) (showing that even a small degree of uncertainty about a single model parameter, like a crucial scaling or amplifying multiplier, can become magnified into substantial economic risk at the tails that swamps the effect of discounting). This paper builds on his earlier paper. See Martin L. Weitzman, *A Review of the Stern Review on the Economics of Climate Change*, 45 *J Econ Lit* 703, 704–05 (2007) (identifying in the *Stern Review* the theme that “it might be very important to avoid possibly large uncertainties that are difficult to quantify” and proposing a reconceptualization of spending on climate change as insurance).

<sup>155</sup> See William Brock and Anastasios Xepapadeas, *Regulating Nonlinear Environmental Systems under Knightian Uncertainty*, in Richard Arnott, et al, eds, *Economics for an Imperfect World: Essays in Honor of Joseph E. Stiglitz* 127–28 (MIT 2003).

<sup>156</sup> See Michael Funke and Michael Paetz, *Environmental Policy under Model Uncertainty: A Robust Optimal Control Approach* \*10–11 (CESifo Working Paper No 1938, Mar 2007), online at <http://ssrn.com/abstract=971461> (visited Sept 1, 2009). In essence, robust optimal control requires the policymaker to consider alternative models that are in some sense close to the preferred model but that produce more drastic predictions; thus, it could be considered a way of contemplating plausible worst-case scenarios. See *id.* at 2.

<sup>157</sup> Cass R. Sunstein, *The Catastrophic Harm Precautionary Principle*, *Issues in Legal Scholarship*, Issue 10, Article 3, at 1–2 (2007), online at <http://www.bepress.com/ils/iss10/art3> (visited

of those feedback loops, we may lose the ability to control climate change. There is consequently a high premium on preserving our future ability to control climate change by keeping within the “guideposts,” whereas we can always loosen climate controls later if further scientific investigation reveals that the climate system is sufficiently stable to eliminate concern about runaway feedback.

Although CBA cannot provide us with the answers about climate change policy, it may still be able to play a smaller supporting role. CBA can help map out the scenarios and assist in getting a sense of when expenditures on climate change might be clearly excessive. *The Stern Review* is a useful exercise in that regard. Thinking that we will get clear answers from CBA, however, is a delusion. We would do better to follow the general environmental principle of taking all feasible action to eliminate significant risks, using CBA only as a very loose check as we seek determinations of feasibility.<sup>158</sup>

### 3. Climate adaptation: focusing on robustness rather than efficiency.

Adaptation planning requires an assessment of how climate will impact human activities and how to respond to those changes. These assessments flip current practices in environmental law around: instead of asking how human activities impact the environment, we instead begin by asking how environmental change will impact humans. Adaptation planning has three key elements: (1) identification of possible climate alterations; (2) analysis of how these climate changes

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Sept 1, 2009). Another attempt to provide a rigorous basis for the precautionary principle can be found in Christian Gollier, Bruno Jullien, and Nicolai Treich, *Scientific Progress and Irreversibility: An Economic Interpretation of the ‘Precautionary Principle,’* 75 J Pub Econ 229, 239 (2000) (recommending precaution when “prudence is larger than twice absolute risk aversion”). See also J. Barkley Rosser, Jr., *Complex Ecologic-economic Dynamics and Environmental Policy*, 37 Ecological Econ 23, 32 (2001) (applying, among other theories, the precautionary principle to fishery management and commenting that “the Precautionary Principle is crucial in situations with critical threshold levels or effects”).

<sup>158</sup> I have previously argued that the following principle reflects the best approach to implementing our society’s values: “To the extent feasible without incurring costs grossly disproportionate to any benefit, the government should eliminate significant environmental risks.” Farber, *Eco-pragmatism* at 131 (cited in note 3). Thus, “[w]hen even an environmentally sensitive analysis—using a high value of life, conservative risk estimates, and a low discount rate for future benefits—shows that regulation is clearly unwarranted, we ought to think very carefully about whether a regulation really is a feasible response to a significant risk.” *Id.* at 116. As *The Stern Review* indicates, an environmentally sensitive analysis of climate change shows that very major costs are well worth incurring. See Stern, *The Stern Review* at xv (cited in note 124) (concluding that climate change left unchecked will cost between 5 and 20 percent of global GDP, whereas mitigation of the worst impacts will cost less than 1 percent of global GDP).



would impact human society or natural ecosystems; and (3) an analysis of alternative methods of addressing the impacts.<sup>159</sup>

The difficulty is the great amount of uncertainty surrounding adaptation needs. Climate models differ in terms of the severity of climate change that they predict for any given future emissions path, and the future emissions path depends on mitigation limits that are not yet known.<sup>160</sup> Downscaling the models to predict local impacts introduces further uncertainties. These uncertainties make the use of conventional CBA unreliable in making long-term plans for adaptation. Yet at least some forms of adaptation will require investment in long-term infrastructure such as dams and aqueducts, or in long-term research programs to develop new heat- or drought-resistant crops. These investments may not be able to await a resolution of uncertainties about climate change. Fortunately, some alternative decision tools have been developed that may be useful in these situations.

RAND researchers have developed a particularly promising method to use computer assistance in scenario planning.<sup>161</sup> The key is a technique called Robust Decision Making (RDM):

RDM uses computer models to estimate the performance of policies for individually quantified futures, where futures are distinguished by unique sets of plausible input parameter values. Exploiting recent advances in computing power, RDM evaluates policy models once for each combination of candidate policy and plausible future state of the world to create large ensembles of futures. These ensembles may include a few hundred to hundreds of thousands of cases.<sup>162</sup>

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<sup>159</sup> If the government proposes an action that has significant environmental impacts, major economic costs, or a potential effect on an endangered species, climate impacts might be considered through an environmental impact statement, CBA or biological opinion under the Endangered Species Act. But these mechanisms may not directly apply when the government is ignoring the fact that change is occurring due to climate change, as opposed to when adaptation is relevant to active government plans. The need for adaptation rather than the proposal of a new project should trigger these forms of review.

<sup>160</sup> For an extensive discussion of these uncertainties, see Daniel A. Farber, *Modeling Climate Change and Its Impacts: Law, Policy, and Science*, 86 Tex L Rev 1655, 1656–57 (2008) (discussing the difficulties of making public policy based on computer models that estimate the future effects of climate change).

<sup>161</sup> See David G. Groves, *New Methods for Identifying Robust Long-term Water Resources Management Strategies for California* 12 (RAND 2006), online at [http://www.rand.org/pubs/rgs\\_dissertations/2006/RAND\\_RGSD196.pdf](http://www.rand.org/pubs/rgs_dissertations/2006/RAND_RGSD196.pdf) (visited Sept 1, 2009).

<sup>162</sup> Id at 124–25 (describing how the method achieves “robust” policies that are “relatively insensitive to the key uncertainties and different preferences held by decision makers”). See also David G. Groves and Robert J. Lempert, *A New Analytic Method for Finding Policy-relevant*

This technique provides a method for examining many potential scenarios in order to determine which characteristics of the scenarios are critical to the success or failure of particular strategies.<sup>163</sup>

RDM provides a systematic way of exploring large numbers of possible policies to identify robust solutions.<sup>164</sup> During each stage, RDM uses statistical analysis to identify policies that perform well over many possible situations. It then uses data mining techniques to identify the future conditions under which such policies fail. New policies are then designed to cope with those weaknesses, and the process is repeated for the revised set of policies. As the process continues, policies become robust under an increasing range of circumstances, and the remaining vulnerabilities are pinpointed for decisionmakers.<sup>165</sup>

These methods may be especially useful when we must make large, long-term investments in infrastructure such as dams, water supply systems, or major power plants. Investments that fare well under some future scenarios may do badly in others, and a major purpose is to choose investments that are resilient across the most relevant risks. Computerized scenario analysis can help us determine the key areas in which investments vary in their resilience, so that policymakers can make informed choices between them. Scenario analysis may also help determine what factual issues are critical for deciding between options. This makes it possible to focus climate research on policy-relevant issues. We should not consider the degree of uncertainty to be fixed forever. One role of modeling is to help us identify research priorities.

We have fairly good methods for analyzing situations in which risks can be quantified with reasonable confidence. We need improved methods for dealing with situations where such estimates do not exist or are subject to considerable uncertainty. The RAND methodology is a good start toward achieving such improved methodologies.

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*Scenarios*, 17 *Global Envir Change* 73, 75 (2007) (“The central idea is to use multiple runs of computer simulation models to identify those scenarios most important to the choices facing decision makers,” based on the foundation of RDM.).

<sup>163</sup> For an effort to test the usability of this approach for water agencies, see David G. Groves, et al, *Presenting Uncertainty to Water-resource Managers: A Summary of Workshops with the Inland Empire Utilities Agency* 74 (RAND 2008).

<sup>164</sup> This is a more formalized version of the familiar technique of scenario analysis. For a description of scenario analysis, see James A. Dewar, *Assumption-based Planning: A Tool for Reducing Avoidable Surprises* 130–42 (Cambridge 2002).

<sup>165</sup> *Id.* at 132.

### III. INSTITUTIONAL ISSUES

The justification for CBA review by OMB is to improve regulatory decisionmaking. Revesz and Livermore make it clear that in practice OIRA has failed to achieve this goal, partly because of its flawed reviews of regulatory initiatives and partly because it has one-sidedly focused on blocking supposedly unneeded regulation rather than identifying the need for stronger regulation. *Retaking Rationality* suggests some institutional improvements to allow OMB to play a more constructive role. These institutional issues are addressed below.

#### A. Transforming OMB

Revesz and Livermore call for important changes at OIRA. They recommend that OIRA's guidelines on CBA be based on notice-and-comment rulemaking, perhaps with judicial review. They also argue that "OIRA should be subject to the same rules regarding transparency, such as the rules concerning public meetings, that govern agencies" (p 172). In addition, they suggest that OIRA could play a coordinating role by alerting agencies to situations where their rules may conflict, convening working groups of agencies with overlapping jurisdiction and helping to formulate a centralized policy (p 177). They also see a role for OIRA in "harmonizing scientific procedures," such as providing uniform guidelines on determining cancer risks (pp 177–79). Finally, they call on OIRA to help identify areas of underregulation<sup>166</sup> and to consider distributional effects (pp 180–83).

The trouble is that OIRA is utterly unsuited to perform some of these roles, such as harmonizing scientific procedures, considering distributional effects, or searching for areas of underregulation. Its expertise is in economics, not the sciences, so scientific coordination is a poor assignment. A 2003 study of OIRA noted, "Of the three Branch Chiefs who occupied that position at the close of the relevant study period, two were economists and one was a lawyer. OIRA's two-and-a-half-dozen desk officers, most of whom have advanced degrees, are trained in public policy, policy analysis, economics, or statistics."<sup>167</sup> Until John Graham hired a few scientists during the George W. Bush administration, OMB had no

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<sup>166</sup> See Part III.B.

<sup>167</sup> Steve Croley, *White House Review of Agency Rulemaking: An Empirical Investigation*, 70 U Chi L Rev 821, 841–42 (2003) (noting the competence of OIRA staff in quantitative analysis, and arguing that greater White House influence on agency rulemaking is, "on balance, a welcome development in administrative law").

scientists on its staff.<sup>168</sup> Not surprisingly, OIRA's attempt to harmonize methodologies for risk assessment received a decidedly mixed review from the National Research Council.<sup>169</sup>

OIRA is also poorly suited to take on issues of environmental justice or underregulation. Economists usually eschew distributional issues outside of fiscal policy, also making the agency a poor choice. And staff members who have spent their entire careers doggedly trying to block environmental and safety regulation are poor bets as scouts for new regulatory opportunities.

We should not assign issues of science, environmental justice, or underregulation to OIRA as presently constituted. Nevertheless, these are tasks that presidents may well want someone to perform, as well as OIRA's traditional tasks of guiding agencies' use of economic analysis. Because of OMB's established role in agency oversight, it makes sense to keep these functions under OMB's umbrella. But once we begin to consider the scope of the environmental issues involved, a different way of defining OMB's role becomes appealing. I propose replacing OIRA with a much broader Office of Sustainability within OMB, which would be reconstituted as the Office of Management, Budget, and Sustainability (OMBS).

Climate change creates links between: EPA regulations of emission; Department of Energy policies on energy conservation, renewable energy, and fossil fuels; Department of Interior policies on biodiversity and planning for public lands; and government programs dealing with natural disasters such as floods. We need an agency that can provide guidance and coordination for all of these efforts as well as others relevant to environmental issues. Unlike OIRA, it should include physical and biological scientists, engineers, and lawyers, as well as economists.

For this reason, the Sustainability Office should include what are now OIRA, the Council on Environmental Quality (a White House agency with oversight responsibility for environmental impact statements), and perhaps elements of NOAA and the Fish & Wildlife Service. The Obama administration's appointment of an "environmental

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<sup>168</sup> Ackerman and Heinzerling, *Priceless* at 110–11 (cited in note 10) (describing the new emphasis on the analysis of scientific research at OIRA as highly invasive and potentially lethal to regulations if "peer review" style standards are set for regulatory agencies).

<sup>169</sup> Committee to Review the OMB Risk Assessment Bulletin, *Scientific Review of the Proposed Risk Assessment Bulletin from the Office of Management and Budget* 3 (National Academies 2008) (expressing concern that the bulletin is "inconsistent with previous recommendations in a number of ways" and attempts to move standards for risk assessment into "territory that is . . . beyond the current state of the science").

czar” in the White House is a step in the right direction, but such a person cannot function effectively without adequate expert staffing. Moreover, adding the office to OMB has the advantage of institutionalizing this function, rather than making it an ad hoc arrangement that is likely to disappear with the next change in administration.

Creating an Office of Sustainability would also reflect our increasing knowledge of the interconnections between issues that were previously considered separate. Some of this knowledge stems from climate science. Scientists now use extraordinarily complex models to predict climate change, which can take weeks to run on supercomputers.<sup>170</sup> The models demonstrate the powerful interdependence of our world. Human actions in one part of the world affect climate far across the globe, which in turn drives other climate changes.<sup>171</sup> Pictures from space already allow us to envision that essential unity of our planet’s physical, biological and social systems. Climate modeling is beginning to show us how these systems are wired together.<sup>172</sup>

One of the lessons of climate science is that human land use and industrial activities, biological systems, and climate are intimately connected.<sup>173</sup> Indeed, CBA of climate policies would also require consideration of adaptation measures, changes in land use and energy technologies, and environmental impacts. We need an entity in the government such as the Office of Sustainability that would be charged with keeping an eye on the “big picture” while agencies work on more specialized issues.

#### B. Action-forcing Techniques

Revesz and Livermore point out that CBA generally applies when an agency proposes a new regulation but not when an agency attempts to deregulate. Nor is CBA generally applied to identify fruitful new areas of regulation (pp 151–61). OIRA has made token efforts to identify new areas that require regulation, but nothing comparable to its crusade to identify existing regulations that it believes should be relaxed (p 156).

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<sup>170</sup> National Research Council, et al, *Improving the Effectiveness of U.S. Climate Modeling* 13–28 (National Academies 2001) (providing an overview of climate models and the computer architectures used to run those models).

<sup>171</sup> Intergovernmental Panel on Climate Change, *Summary for Policymakers*, in Susan Solomon, et al, eds, *Climate Change 2007: The Physical Science Basis* 2–17 (Cambridge 2007) (concluding that “past and future anthropogenic carbon dioxide emissions will continue to contribute to warming and sea level rise for more than a millennium”).

<sup>172</sup> *Id.* (incorporating improvements in modeling to eliminate issues that had previously been raised about the evidentiary support for climate change).

<sup>173</sup> *Id.* (“The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land use change, while those of methane and nitrous oxide are primarily due to agriculture.”).

The disparity in OMB's efforts might be justifiable if agencies like EPA generally have a bias of their own in favor of regulation. There is little, however, to support such a theory (pp 163–65). EPA officials are said to have a particular enthusiasm for their agency's mission and a faith in regulatory solutions (pp 164–65), but there is no evidence of efforts by EPA to go beyond the mandate given by Congress. Presumably, it is not OMB's function to correct legislative biases. Thus, there is little or no reason to assume that agencies are predisposed to overregulate above the statutory baseline. If OMB plays a role in reviewing government programs, the role should be evenhanded, rather than biased in favor of deregulation.

Revesz and Livermore argue that CBA has “an important role to play in centralized review, but not exclusively to check agencies. It must also spur them to action” (p 173). Thus, they suggest that OIRA should review some denials of petitions by citizens asking for the government to engage in rulemaking (pp 173–74). If the CBA makes a “strong enough case for regulation,” OIRA would either “mediate between the agency and the groups, or issue a finding of fact that a regulation is justified” (p 174). A court would then give less deference to the agency's decision against regulation, and the agency would at least have to develop a reasoned response to OIRA (p 174). This is not a bad idea, but it is too tied to CBA.

Climate adaptation in particular cries out for mechanisms to prompt government action. Neither CBA as presently instituted nor existing environmental review processes address this issue. Existing environmental assessment procedures are triggered by agency *actions*. They do not require assessments of the status quo but only of proposed changes in the status quo. There is nothing to prevent an agency from simply ignoring an emerging problem; the requirement for producing an environmental impact statement kicks in only when the agency considers actually doing something rather than sitting still.<sup>174</sup> As Revesz and Livermore show, in practice the same has been true for OIRA review.

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<sup>174</sup> By its terms, the National Environmental Policy Act (NEPA) requires an environmental assessment only when the agency is considering a proposal to take action, not when it is completely passive. See *Defenders of Wildlife v Andrus*, 627 F2d 1238, 1240 (DC Cir 1980) (holding that the government was not subject to NEPA when it failed to halt actions by private parties on public lands). See also Comments, *Inaction as Action under NEPA: EIS Not Required for Interior's Failure to Halt Alaskan Wolf Hunt*, 10 *Envir L Repr* 10055, 10059 (1980) (reviewing *Andrus* and noting that it “now seems established that an agency's failure to invoke its supervisory authority to stop environmentally significant state or private activity cannot constitute ‘major Federal action’ for NEPA purposes”).

The reactive nature of the assessment process may be appropriate in contexts where the status quo is presumptively desirable, appropriate, or unchanging; but it is definitely not acceptable when dealing with climate adaptation, where the whole point is that the status quo will become unsustainable due to climate change. For example, “Proactive adaptation to climate change may necessitate periodic reassessment of the adequacy and preparedness of relief systems and programs, particularly in light of changing frequency and intensity of extreme events.”<sup>175</sup>

There are several potential responses to the problem of policing agency failure to take action, whether on climate change or regulatory needs. Authorizing OMB to hear appeals from denials of rulemaking petitions, as Revesz and Livermore advocate, would be a good start, though there is no reason why CBA has to provide the sole basis for review. In terms of climate adaptation, we could envision a petition process akin to that used under the Endangered Species Act for listing species,<sup>176</sup> where citizens could petition the agency to list a “critical adaptation need.” For this to be effective, some specific metrics to determine the significance of an adaptation need would be required. OMB could then review denials. Investigative reports by independent bodies such as the GAO or the National Academy of Science could also be used as triggers for OMB review of government inaction.

Some less conventional approaches also deserve consideration. One possibility would be a system of prizes to reward citizens who successfully identify unaddressed, high priority environmental problems. The prizes would be awarded by an independent entity, providing a carrot to the citizen, but would be funded out of the agency’s operating budget, providing a small stick to the agency in addition to bad publicity for overlooking an important problem.

Another unconventional possibility would be to waive sovereign immunity to make agencies liable in some situations for their inaction. This is not entirely unprecedented. For instance, California law in ef-

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<sup>175</sup> William E. Easterling III, Brian H. Hurd, and Joel B. Smith, *Coping with Global Climate Change: The Role of Adaptation in the United States* 25 (Pew Center on Global Climate Change 2004) (illustrating successes and failures in “reactive adaptation” to past environmental changes and exploring the potential challenges and benefits of proactively adapting in anticipation of climate change).

<sup>176</sup> See 16 USC § 1533(b)(3) (instructing the Secretary of the Interior to respond within ninety days to a petition by an “interested party” to add or remove a species from the lists of endangered and threatened species).

fect imposes liability when an agency fails to ensure that flood control systems meet their design standards.<sup>177</sup>

Finally we might be able to use risk markets to identify areas that need action. We could establish trading in forecasts about climate impacts in particular regions or economic sectors, with the parameters being set at levels that would indicate a failure of current systems. For example, participants might in effect place bets on the longest drought that will occur in California between 2020 and 2040. Those with the best sense of the trends in the emerging science could cash in long in advance of 2040 by selling their bets to others.<sup>178</sup>

Several of these techniques are promising. The use of outside reviewers such as GAO should clearly be regularized as a way of checking for overlooked adaptation needs. A less conventional approach is the use of prizes, but this might provide a way of opening the process to broader public participation. In any event, we need to be attentive to the danger that agencies will take the status quo for granted and consider adaptation issues only when required to do so in the context of specific project proposals. Revesz and Livermore have provided a helpful suggestion about one first step in addressing this problem.

### C. OIRA and the Obama Administration

While this Review was in production, President Obama selected Cass Sunstein to head OIRA, much to the dismay of many environmentalists. Sunstein is a long-time advocate of CBA as a check on overly zealous risk regulation.<sup>179</sup> He has called for giving OIRA ex-

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<sup>177</sup> The modern development of flood liability in California began with *Belair v Riverside County Flood Control District*, 764 P2d 1070 (Cal 1988) (en banc). In *Belair*, a flood control levee on the San Jacinto gave way, flooding parts of the City of San Jacinto. The California Supreme Court took this occasion to establish a new rule for determining the state's responsibility for flood damages, based firmly on the need to spread the risks created by unreasonably flawed flood control systems:

Permitting recovery where the public entity's unreasonable conduct constitutes a substantial cause of damage to property owners negates the apprehension commonly associated with a rule of absolute liability—the discouragement of beneficial flood control improvements—yet properly compensates for losses unfairly incurred. . . . Reasonableness, in this context, is not entirely a matter of negligence, but represents a balancing of public need against the gravity of private harm.

Id at 1079–80.

<sup>178</sup> For a discussion of the advantages of prediction markets, see Cass R. Sunstein, *Deliberating Groups versus Prediction Markets (or Hayek's Challenge to Habermas)*, 3 *Episteme* 192, 192–93 (2006).

<sup>179</sup> See, for example, Cass R. Sunstein, *The Cost-benefit State: The Future of Regulatory Protection* 22, 25–28 (ABA 2002) (describing CBA as a useful tool for making determinations



panded powers to bring the government into compliance with the principles of cost-benefit balancing.<sup>180</sup>

It seems unlikely that Sunstein will abandon his enthusiasm for CBA, but he may be open to persuasion on some key points. In terms of risk regulation, his desire to apply CBA to existing statutes does not necessarily mean that he would oppose reforming those statutes themselves—for instance by changing the incentives of chemical producers via a version of the REACH Regulation or expanding the use of cap-and-trade under the pollution statutes. In terms of climate change, some of his writings seem unsympathetic to aggressive action on climate change. On the other hand, he has endorsed a version of the precautionary principle for catastrophic risks, and he may be persuadable that this principle applies to climate change.<sup>181</sup>

Sunstein has also endorsed some questionable methodologies such as the use of years-of-life rather than numbers of lives in evaluating risk regulations.<sup>182</sup> Sunstein writes, “Other things being equal, a program that protects young people seems far better than one that protects old people, because it delivers greater benefits.”<sup>183</sup> As we have seen, the economic basis for this position is shaky at best. But Sunstein may well be open to argument on methodological issues, as shown by his jacket endorsement of *Retaking Rationality* as a “truly superb contribution to the debate over cost-benefit analysis.”

It remains to be seen how influential Sunstein will be in shaping the Obama administration’s regulatory agenda. But it would be a mistake to assume either that his views of CBA will necessarily control that agenda or that his views themselves are carved in stone. Thus, while the Sunstein appointment is probably not a step forward in

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related to safety issues in society, especially in light of cognitive biases); Cass R. Sunstein, *Risk and Reason: Safety, Law, and the Environment* 106–08 (Cambridge 2002) (defending CBA as a means to overcome cognitive limitations and serve as a check on interest-group manipulation).

<sup>180</sup> Robert W. Hahn and Cass R. Sunstein, *A New Executive Order for Improving Federal Regulation? Deeper and Wider Cost-benefit Analysis*, 150 U Pa L Rev 1489, 1494–95 (2002) (calling for the practice of CBA to be strengthened and broadened, in part through giving OIRA the power to “prompt” regulation as well as to constrain it).

<sup>181</sup> See note 157 and accompanying text.

<sup>182</sup> See Cass R. Sunstein, *Lives, Life-years, and Willingness to Pay*, 104 Colum L Rev 205, 208 (2004) (arguing that “[n]o program literally ‘saves’ lives; life extension is always what is at issue,” so CBA should measure life years saved, not just lives).

<sup>183</sup> Id at 206 (questioning rhetorically “If a program would prevent fifty deaths of people who are twenty, should it be treated the same way as a program that would prevent fifty deaths of people who are seventy?” and answering in the negative for CBA writ large).

terms of the reforms proposed here, neither should it be seen as an insuperable roadblock.<sup>184</sup>

We should have a better sense of the direction of the Obama administration on these issues soon. On February 3, 2009, President Obama issued a directive to OMB to “produce within 100 days a set of recommendations for a new Executive Order on Federal regulatory review.”<sup>185</sup> In the meantime, the president rescinded earlier Bush administration executive orders.<sup>186</sup>

### CONCLUSION

In their excellent book, Revesz and Livermore have made a strong case for reforming CBA. Too often, as they convincingly document, CBA has been identified with an antiregulatory agenda rather than reflecting sound economic analysis—and I would add, too often CBA has served as a means of hindering the implementation of statutory mandates. Their specific proposals for reforming CBA seem sensible. So does their desire to reform the role of OMB in overseeing regulatory policy.

The trouble is that these reforms do not go far enough. The anti-regulatory bias of CBA certainly has handicapped environmental policy, but more fundamental changes are needed if we are to achieve real progress. In my view, toxics policy needs to be rethought from the ground up along the lines of the EU REACH Regulation, while climate policy needs to be guided by a precautionary attitude toward mitigation (that is, taking an active approach even if there is uncertainty as to the degree of predicted future harm) and a search for robust adaptation strategies. As we are faced with the very real possibility of triggering feedback loops in climate change and thus may be near a point at which we can no longer adapt or mitigate climate change, we must admit that CBA can play only a minor supporting role in these efforts. Finally, as an institutional home for overseeing

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<sup>184</sup> Notably, Lisa Heinzerling, whose criticisms of CBA are cited at various points in this Review, has also been given an important position in the administration as a senior advisor to the EPA administrator. See Georgetown University News, *Law Professors Serving under Obama Administration* (Feb 23, 2009), online at <http://explore.georgetown.edu/news/?ID=40143> (visited Sept 1, 2009).

<sup>185</sup> President Barack H. Obama, *Memorandum for the Heads of Executive Departments and Agencies Regulatory Review* (Jan 30, 2009), 74 Fed Reg 5977 (expressing a conviction that “[a] great deal has been learned since [Executive Order 12866]” and thus seeking input for a revised approach to CBA).

<sup>186</sup> Executive Order 13497, 74 Fed Reg 6113 (2009) (revoking Executive Orders 13258 and 13422). The effect of the revocation is to revive the Clinton-era orders that Bush had rescinded, although the executive order does not address this question directly.

these efforts, we should consider revamping OMB into an Office of Management, Budget, and Sustainability.

It is understandable that environmentalists have been repelled by the antiregulatory bias in CBA. Revesz and Livermore are right that we should work on reducing that bias. In the end, however, disputes over CBA do not go to the heart of the policy issues we face. Real progress requires other ways of addressing environmental problems.