Discounting . . . on Stilts

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Jeremy Bentham famously described the concept of natural rights as "nonsense upon stilts."[1] This Response argues that cost-benefit analysis (CBA)—a contemporary applied version of Bentham's utilitarianism for public policy analysis—is also nonsensical in that CBA purports to resolve questions, the answers to which have already been subsumed within the framework's architecture. In particular, CBA subsumes vital questions of intergenerational equity through its use of an exponential discount factor to adjust future costs and benefits to a present value. This discounting procedure has the practical effect of dramatically diminishing the apparent significance of policy effects on future generations in the context of problems such as climate change, species extinction, deforestation, and aquifer depletion. Indeed, the impact of discounting future costs and benefits to a present value tends to swamp all other variables within such long-term policy analyses.[2] Accordingly, arguments in favor of the use and selection of a discount rate for CBA calculation deserve close inspection.[3]

As it turns out, conventional justifications offered for the use of discounting in the intergenerational context do not withstand scrutiny. Moreover, although some analysts are careful to acknowledge the need to address questions of intergenerational equity directly through other policy mechanisms,[4] these analysts understate the difficulty of limiting discounted CBA to its proper sphere of competence. The formal language of CBA offers the promise—but not the reality—of

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1 Jeremy Bentham, *A Critical Examination of the Declaration of Rights*, in Bhikhu Parekh, ed, *Bentham's Political Thought* 257, 269 (Harper 1973).

2 See Clive L. Spash, *Greenhouse Economics: Value and Ethics* 201–03 (Routledge 2002).

3 For overviews of the discounting debate, see Douglas A. Kysar, *Sustainable Development and Private Global Governance*, 83 Tex L Rev 2109, 2118–28 (2005); Douglas A. Kysar, *Climate Change, Cultural Transformation, and Comprehensive Rationality*, 31 BC Envir Aff L Rev 555, 578–85 (2004).

4 See Cass R. Sunstein and Arden Rowell, *On Discounting Regulatory Benefits: Risk, Money, and Intergenerational Equity*, 74 U Chi L Rev 171, 199–200 (2007) (discussing alternatives for providing compensation for risks faced by different generations).

compounding all relevant reasons for deciding into its calculations, including the needs and interests of future generations. Because ex post monetary transfers are thought to compensate for any residual interests that CBA has failed to incorporate into its calculations, policymakers are invited to believe that CBA can resolve most any social dilemma without the need for openly moral judgments concerning fairness or justice. Naturally, when those actors are faced with a dauntingly complex and morally inflected policy conundrum such as climate change, the temptation to delegate responsibility to the calculative process in this manner is overwhelming. Yet, as this Response argues, the compensatory transfers that are thought to sanitize the CBA procedure in the intergenerational context are deeply problematic, both in their conception and in their amenability to concrete realization.

The organizers of the Symposium on Intergenerational Equity and Discounting and the editors of the University of Chicago Law Review have done the legal academy a tremendous service by soliciting and publishing the papers included in this issue, which include contributions from prominent legal scholars, economists, and philosophers, and which cover a range of views on the purpose and practice of discounting. Nevertheless, as this Response argues, a great deal of analytical confusion remains in the literature. In the end, the most important claim in the set of papers is also the one least served by discounted CBA: "If respecting future generations means anything, it should mean respecting our best guess as to their wishes and helping them as much as feasible."[5] Perhaps with the publication of these papers, legal scholars and others interested in long-term policymaking will finally be able to put aside debates over discounting and focus instead on the more important task of conceiving and realizing equitable relations between human generations.

I. DISCOUNTING RESOURCES

Although discounting is most controversial when applied to human lives,[6] the procedure is also problematic when applied to ordinary resources. In that regard, many of the general arguments that have been offered in defense of discounting in the intergenerational policy context can be dismissed summarily. For instance, the possibility that future generations may not come into existence due to extinction—which sometimes is used to provide an analytical foundation for dis-

5 Dexter Samida and David A. Weisbach, *Paretian Intergenerational Discounting*, 74 U Chi L Rev 145, 155 (2007).

6 See Part II (addressing theoretical and practical limitations of discounting posed specifically by the attempt to discount the value of life).

counting[7]—offers little comfort in contexts where the likelihood that future generations will survive is itself a function of policy choices that are being made through discounted welfare analysis. Similarly, the absurd or paradoxical results that are said to flow from a refusal to discount[8] fail as defenses of discounting because they assume prior adherence by society to a mathematical optimization procedure, when in fact the very question being posed is whether intergenerational decisionmaking is best managed through that type of social choice mechanism.

Also problematic are justifications for discounting that are premised on the observed rate of time preference. As Robert Hahn has described it, "The basic rationale for discounting is that consumers are not indifferent between consuming a dollar's worth of a good today and one dollar next year; discount rates are necessary to reflect this preference."[9] However, by taking revealed preference as the exclusive standard for welfare analysis, these justifications fail to acknowledge the fact that a traditional and often quite popular role of democratic government has been precisely to counteract the influence of consumer impatience.[10] Such a role may be all the more important when the interests of future generations are at stake, since members of future generations suffer an even greater tyranny of the present than those currently living.

CBA proponents sometimes respond to this preference-overriding point by making plain their political commitments: "[O]verriding market prices on ethical grounds [] opens the door to irreconcilable inconsistencies. If ethical arguments, rather than the revealed preferences of citizens, form the rationale for a low discount rate, cannot ethical arguments be applied to other questions?"[11] Nowhere in this line of argument, however, has the CBA proponent explained why the observed impatience of individual members of one generation should govern the consumption opportunities left available to future generations. In truth, a need for "ethical arguments" and an "overriding" of preferences is inevitable no matter how the present generation pro-

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7 See P.S. Dasgupta and G.M. Heal, *Economic Theory and Exhaustible Resources* 3 (Cambridge 1979).

8 See W. Kip Viscusi, *Rational Discounting for Regulatory Analysis*, 74 U Chi L Rev 209, 216–17 (2007).

9 Robert W. Hahn, *The Economic Analysis of Regulation: A Response to the Critics*, 71 U Chi L Rev 1021, 1026 (2004).

10 See Lisa Heinzerling, *Regulatory Costs of Mythic Proportions*, 107 Yale L J 1981, 2048 (1998) (recognizing that the government often enacts regulations to restrain harmful private preferences, even when the harm threatened is to the preference holder herself).

11 K.J. Arrow, et al, *Intertemporal Equity, Discounting, and Economic Efficiency*, in James P. Bruce, Hoesung Lee, and Erik F. Haites, eds, *Climate Change 1995: Economic and Social Dimensions of Climate Change* 125, 133 (Cambridge 1996).

ceeds, since the rate of time preference of future generations cannot be observed.

Moreover, even if future generations' rate of time preference could be observed, CBA practitioners have not explained why the relevant period of discounting should commence at the moment of calculation, before the lives of future generations have even begun. If one is truly following the rationale of respecting individuals' preferences, then discounting of future costs and benefits should only begin and extend for the time period that the individuals affected by policy proposals are actually alive and experiencing impatience. The cost-benefit analyst instead adopts a constant rate and an uninterrupted period of discount because she has entertained a subtle conceptual shift from individual preferences to collective welfare impacts. In essence, she has adopted a less transparent version of the infinitely-lived individual from Cass Sunstein and Arden Rowell's Methuselah example,[12] treating all members of future generations as if they were a single, collective interest holder. But it is difficult to imagine why future generations would consent to being treated as if their lives were already in decline when they never enjoyed the period of youthful extravagance that was gained at their current expense. For these and other reasons, many thoughtful commentators have concluded that discounting for pure rate of time preference across generations is simply indefensible.[13]

Defenses of discounting that are premised on opportunity costs are more plausible than the justifications just discussed.[14] By discounting future costs and benefits according to the rate of return available for alternative uses of public funds, policymakers are thought to ensure that future generations will be left with an endowment of resources that has taken advantage of the best available investment opportunities. Louis Kaplow puts the point more succinctly: "Discount-

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12 See Sunstein and Rowell, 74 U Chi L Rev at 190–91 (cited in note 4) (noting the logic of discounting when all goods are commensurable and owned by a single immortal individual named Methuselah).

13 See, for example, Tyler Cowen, *Caring About the Distant Future: Why It Matters and What It Means*, 74 U Chi L Rev 5, 9 (2007) (noting that "[i]t is a moot point whether individual time preference for utility is rational, but pure time preference across the generations is harder to defend"); Robert R.M. Verchick, Book Review, *The Case Against Cost-Benefit Analysis*, 32 Ecol L Q 349, 359 (2005) (arguing that the conventional reasoning "cannot justify the discounting of protections for future generations whose consumers have yet to vote in the marketplace"); Richard L. Revesz, *Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives*, 99 Colum L Rev 941, 998 (1999) (describing "[t]he ethically compromised status of discounting for time preference at a constant rate" across, rather than within, generations); John Rawls, *A Theory of Justice* 253 (Belknap 1999) (stating that "from a moral point of view there are no grounds for discounting future well-being on the basis of pure time preference").

14 See, for example, Viscusi, 74 U Chi L Rev at 221 (cited in note 8) (observing that "the dominant approach" in setting the rate of discount for policy evaluation looks to market rates of interest that reflect the opportunity costs of displacing private capital investment).

ing dollars is justified because the market discount rate is a price that signifies resource costs just like any other price."[15] Moreover, as Dexter Samida and David Weisbach argue, the opportunity costs argument suggests that the practice of discounting in the intergenerational context may in fact be "required by any moral theory that accepts the Pareto principle."[16] This is because any policy expenditure that fails discounted CBA could instead be devoted to an alternative investment, the proceeds of which could in part be used to compensate those harmed by rejection of the policy.

Nevertheless, the opportunity costs defense of discounting in the intergenerational context also fails for a variety of reasons. First, in order to sustain what would otherwise amount to a gross conflation of potential and actual Pareto improvements—between Kaldor-Hicks and Pareto efficiency—these justifications assume that sufficient intergenerational resource transfers will be undertaken to ensure that future generations are left no worse off even after their interests have been exponentially discounted.[17] The precise manner in which such transfers are to be undertaken is generally left unstated or is relegated to the same "political process" dustbin that is often used to address matters of intragenerational equity.[18] Worse still, some analysts revert to a conjuring trick in which compensatory transfers are deemed unnecessary to forgive our future sins, given the legacy of economic growth and technological progress that analysts are confident we will bequeath to future generations so long as public regulators simply stay out of the way.[19] Like the occasional technological pessimism of

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15 Louis Kaplow, *Discounting Dollars, Discounting Lives: Intergenerational Distributive Justice and Efficiency*, 74 U Chi L Rev 79, 84 (2007).

16 Samida and Weisbach, 74 U Chi L Rev at 146 (cited in note 5).

17 Samida and Weisbach, for instance, state that "[t]he main assumption made by the [Pareto dominance] theorem that might affect its application to intergenerational projects is that the tax and transfer system can be adjusted to offset the effect of the project." Id at 162.

18 See Robert N. Stavins, Alexander F. Wagner, and Gernot Wagner, *Interpreting Sustainability in Economic Terms: Dynamic Efficiency Plus Intergenerational Equity*, 79 Econ Let 339, 342 (2003) (recognizing that economic analysis generally leaves questions of cross-sectional and intertemporal distributional equity to the political process).

19 Along these lines, W. Kip Viscusi observes that future generations are likely to be "more affluent and better off economically than we are," and therefore asserts that "[t]he current citizenry . . . might not be too moved by the plight of their more affluent, distant descendants." Viscusi, 74 U Chi L Rev at 210 (cited in note 8). See also Robert C. Lind, *Intergenerational Equity, Discounting, and the Role of Cost-Benefit Analysis*, 23 Energy Policy 379, 382 (1995) ("[I]n all likelihood future generations will be much richer than the present one and if they (future generations) want lower levels of greenhouse gases and lower temperature levels they should pay for them."). Even John Rawls, who deserves credit for reviving interest in the problem of intergenerational justice, seems to implicitly assume a unidirectional upward trend in progress and well-being. See Rawls, *A Theory of Justice* at 253 (cited in note 13) (suggesting that the condition of not knowing to which generation one will belong is equivalent to not knowing which stage of civilization one will experience).

environmentalists, this "trickle forward" defense of discounting is more of a mood than an argument.

Even viewed charitably, the argument misfires for, as Geoffrey Heal points out, it "is not an intertemporal judgment. It is an interpersonal one."[20] That is, the argument seeks to discount impacts on future generations not because they will happen in the future, but because they will happen to individuals who are wealthier than those who presently exist. This point is made plain in Kip Viscusi's contribution, where he shows that if willingness to pay to reduce risks to life were adjusted for economic growth (perhaps on the theory that the demand for safety is elastic with income[21]), then society would be required to greatly favor life saving in the future under certain plausible assumptions regarding the discount rate and the value of a statistical life.[22] Viscusi objects to this conclusion by stating that "[t]here is no valid economic rationale for this preferential treatment of future generations."[23] But the economic rationale is plain: if the goal of public policymaking is simply the maximization of social welfare, and if the chosen mode of analysis fails to account for the declining marginal utility of income in its use of willingness to pay measures for the value of life, then it follows ineluctably that richer generations' lives count more in the social welfare function than poorer. Viscusi is, in fact, objecting to the clear implication of the economic rationale, not to its absence.

Second, to give the compensatory transfer argument practical significance in the environmental context, states would need to develop some more or less comprehensive system of national accounting to ensure that the resource base to support future well-being actually is being expanded (or at least preserved) for the benefit of future generations. At present, the danger is too great that consumption may be confused for investment, that environmental externalities may be inadequately accounted for, and that many important natural resources and ecosystem services may be absent from national ledgers altogether.[24] Moreover, if the system of environmental accounting re-

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20 Geoffrey Heal, *Discounting: A Review of the Basic Economics*, 74 U Chi L Rev 59, 60 (2007).

21 See Frank Ackerman and Lisa Heinzerling, *If It Exists, It's Getting Bigger: Revising the Value of a Statistical Life* 1, 12–16 (Global Development and Environment Institute at Tufts University Working Paper No 01-06, Oct 2001), online at http://www.ecoeco.org/Documents/ValueofLife.pdf (visited Jan 23, 2007) (noting that implicit-value-of-life studies have failed to account for the income elasticity of demand for safety and offering a revised figure of $13.8 million in light of income growth following original wage-risk studies).

22 Viscusi, 74 U Chi L Rev at 231–32 (cited in note 8).

23 Id at 234.

24 See Douglas A. Kysar, *Sustainability, Distribution, and the Macroeconomic Analysis of Law*, 43 BC L Rev 1, 28–44 (2001) (summarizing attempts to improve conventional welfare measurement techniques to take better account of environmental resources and services).

vealed that the total capital stock was not being preserved adequately for the benefit of future generations—as many expect it would[25]—then some socially controlled mechanism of intergenerational capital transfer would be required in order to satisfy the Pareto criterion or, alternatively, in order to guarantee a minimum sustainable level of well-being for all generations across time. The task of designing and implementing such an intergenerational transfer mechanism would, in turn, necessitate societal discussion regarding the most reliable method of accomplishing intergenerational transfers and the precise composition of the resource base to be left for the benefit of posterity.

Along those lines, Samida and Weisbach suggest that all methods of transferring resources intergenerationally may be equally likely to be undone by intervening generations.[26] Their suggestion, however, entails a commensurated view of the world that the public may not widely share: when past generations designated miles of extraordinary lakeshore real estate in the city of Chicago for public purposes, they altered the social meaning of that resource in a way that made it more resistant to raiding by intervening generations. By designating the Chicago lakeshore a "'Public Ground—Common to Remain Forever Open, Clear, and Free of Any Buildings, or Other Obstruction Whatever,'"[27] the planners of Chicago's lakeshore made its continued preservation a matter of intergenerational distributive equity rather than market allocative efficiency. This cultural "coding" renders the space less amenable to characterization as a resource that ethically can be raided by the present generation for some more profitable use. Of course, in the process of shaping the social meaning of Chicago's lakeshore, the city's planners also made an openly normative judgment regarding the kind of city, and the kind of lives, that they believed Chicago and its residents should embody.

Discounters tend to reject such resource- and value-specific intergenerational planning on the theory that perfect substitutability exists among the varieties of human and natural capital. Thus, Kaplow argues that "it is incomplete and potentially misleading to suggest that the present generation does (or does not) have an obligation to a future generation to do one specific thing or another, such as cleaning up the environment, conserving nonrenewable resources, or avoiding

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25 See text accompanying notes 30–31 (recognizing the extensive ecosystem damage already present as a result of human activities).

26 Samida and Weisbach, 74 U Chi L Rev at 160–61 (cited in note 5).

27 Payton Chung, *History of Lake Shore Drive* (Campaign for a Free and Clear Lakefront), online at http://www.foreverfreeandclear.org/node/14 (visited Jan 23, 2007) (describing how the public designation of Lake Shore Drive has resulted in benefits to multiple generations of Chicago residents).

accumulation of a large debt."[28] Similarly, Sunstein and Rowell assert that "there is no abstract reason to believe that preserving a particular environmental amenity (a forest, a lake) is always better for posterity than other investments that do not involve the environment in particular (expenditures on basic research, reductions in national debt)."[29] In short, so long as capital of any description is retained in sufficient amounts to support a theoretically nondeclining stream of welfare, discounters tend to believe that society can remain indifferent concerning the precise composition of the resource base that is bequeathed to future generations.

The assumption that intergenerational equity can be addressed through the transfer of an unspecified resource base deserves more scientific attention than discounting proponents tend to provide. After all, many physical scientists who have addressed the environmental sustainability question are far less sanguine than economists and other social scientists. During the lead-up to the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, for instance, the National Academy of Sciences and the Royal Society of London issued an unprecedented joint statement, entitled *Population Growth, Resource Consumption, and a Sustainable World*. The statement observed that

> [s]cientific and technological innovations, such as in agriculture, have been able to overcome many pessimistic predictions about resource constraints affecting human welfare. Nevertheless, the present patterns of human activity accentuated by population growth should make even those most optimistic about future scientific progress pause and reconsider the wisdom of ignoring these threats to our planet. Unrestrained resource consumption for energy production and other uses, especially if the developing world strives to achieve living standards based on the same levels of consumption as the developed world, could lead to catastrophic outcomes for the global environment.[30]

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28 Kaplow, 74 U Chi L Rev at 87 (cited in note 15).

29 Sunstein and Rowell, 74 U Chi L Rev at 205 (cited in note 4). See also Kenneth Arrow, et al, *Are We Consuming Too Much?*, 18 J Econ Perspectives 147, 151 (2004) ("Even if some resources such as stocks of minerals are drawn down along a consumption path, the sustainability criterion could nevertheless be satisfied if other capital assets were accumulated sufficiently to offset the resource decline."); Robert Solow, *An Almost Practical Step Toward Sustainability*, 19 Resources Policy 162, 168 (1993) ("The duty imposed by sustainability is to bequeath to posterity not any particular thing . . . but rather to endow them with whatever it takes to achieve a standard of living at least as good as our own and to look after their next generation similarly.").

30 Royal Society and National Academy of Sciences, *Population Growth, Resource Consumption, and a Sustainable World* (1992), reprinted in 18 Population & Dev Rev 375, 376 (1992).

An even more strident pre-Rio statement organized by the Union of Concerned Scientists was endorsed by over 1,700 scientists, including a majority of the living Nobel laureates in the sciences. The statement began:

> Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our present course will bring about.[31]

The fact that social scientists continue to adhere to the perfect substitutability assumption in the face of concerns such as these is probably not attributable to a disregard by them for the knowledge and credibility of natural scientists. Instead, it likely originates from a fear that accepting the natural scientists' position would undermine the liberal project of avoiding government arbitration among competing conceptions of the good (or the related economic project of avoiding interpersonal welfare comparisons).[32] After all, even liberal theorists such as John Rawls, who otherwise favor the distribution of certain primary goods to individuals as a matter of right, tend to back away from resourcist approaches in the intergenerational context. Rawls's "just savings" principle of intergenerational justice, for instance, requires each generation only to contribute to an accumulation of capital that would "make possible the conditions needed to establish and to preserve a just basic structure over time,"[33] not necessarily to preserve this or that resource for the benefit of future generations.

Had Rawls further pursued the question of whether the just savings principle could be satisfied through transfer of a relatively undifferentiated resource base—as opposed to resource transfers dictated by more specific ecological needs and constraints—he might have come to perceive that problems of environmental sustainability and intergenerational justice represent a serious challenge to liberal agnosticism on competing accounts of the good.[34] To give just one illus-

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31 Union of Concerned Scientists, *World Scientists' Warning to Humanity* (1992), online at http://www.ucsusa.org/ucs/about/1992-world-scientists-warning-to-humanity.html (visited Jan 23, 2007).

32 See Kysar, 83 Tex L Rev at 2146–47 (cited in note 3) (describing the "dream" of market liberalism that a just, efficient, and sustainable society can be achieved without mechanisms for collective judgment).

33 John Rawls, *Justice as Fairness: A Restatement* 159 (Belknap 2001) (Erin Kelly, ed).

34 Elsewhere, Rawls stated that "[e]ach generation must not only preserve the gains of culture and civilization, and maintain intact those just institutions that have been established, but

tration, the desire to preserve living coral reefs for enjoyment and appreciation by future generations seems to require immediate and drastic changes to the lifestyles of the currently living, given that the food, transportation, energy, agriculture, and land use patterns associated with those lifestyles threaten—both directly and indirectly—the survival of all living coral reefs on the planet.[35] In other words, it does not appear that society *can* have it all, at least not in a sustainable manner. Thus, so long as affluent consumers continue to regard their conception of the good as being dependent on the acquisition of more and better goods, liberalism seems to be in serious conflict with the needs and interests of future generations.

Finally, the opportunity costs defense of discounting suffers from what is arguably a logical error: proponents of discounting hinge the decision of whether to conserve natural resources for future generations on the size of the opportunity cost entailed by conservation, when in fact much of environmental policymaking is better conceived of as being *determinative of*—rather than *determined by*—the market rates of return that embody such opportunity costs. That is, if the savings rate for fossil fuels, arable soil, fresh water, wetlands, and other forms of natural capital in part determines the rate of return for all capital—if, in other words, the decision of whether to conserve natural resources influences the size of the opportunity cost that supposedly determines whether or not it is optimal to conserve—then the justification for discounting by market rates of return is circular.

Samida and Weisbach attempt to avoid this problem of circularity by citing, but not describing, an explanation from John Broome's important article on discounting.[36] Broome's explanation actually turns out only to be an assertion—namely, his assertion that "[i]t is a fair approximation to think of . . . interest rates[] as given independently of deci-

it must also put aside in each period of time a suitable amount of real capital accumulation." Rawls, *A Theory of Justice* at 252 (cited in note 13). This statement seems to imply a worldview in which preserving "the gains of culture and civilization," id, need not come at any cost to present ways of living. Ronald Dworkin similarly suggests that liberals can properly favor conservation out of a desire to preserve the ability of future generations to revere and recreate in natural areas. See Ronald Dworkin, *Liberalism*, in Michael J. Sandel, ed, *Liberalism and Its Critics* 60, 76–77 (NYU 1984) (arguing that if liberals believe natural resources will be destroyed over time, preserving such resources for future generations is consistent with other liberal beliefs). Like Rawls, Dworkin fails to acknowledge that the desire to preserve particular cultural or natural resources for future generations may place serious limitations on a liberal government's ability to afford present individuals wide scope for self-determination and private flourishing.

35 See *Ocean World: Coral Reefs: Coral Reef Destruction and Conservation* (Jason Education Project at Texas A&M University 2004), online at http://oceanworld.tamu.edu/students/coral/coral5.htm (visited Jan 23, 2007).

36 Samida and Weisbach, 74 U Chi L Rev at 165–66 (cited in note 5), citing John Broome, *Discounting the Future*, 23 Phil & Pub Aff 128, 148–50 (1994).

sions about saving."[37] In other words, Broome assumes that interest rates reflect "the relative values people attach to present and future commodities," rather than a much more complex combination of private actions and public policies, including many of the same public policies that supposedly are best addressed by comparison to interest rates.[38] Moreover, by relying on Broome's response to the circularity critique, Samida and Weisbach have smuggled back into their argument the pure rate of time preference argument that they attempted to disclaim at the outset of their piece.[39] Thus, they now must offer an affirmative argument in favor of treating one generation's impatience as a guidepost for its moral responsibilities to another generation, precisely the argument that Richard Revesz and others have shown to be elusive.[40]

To be sure, the circularity of the opportunity costs defense of discounting may not be especially problematic for decisions of modest practical impact, in which the ultimate outcome might not be affected by the specification of a different reference case of resource rights and rate of return. But it seems clearly inappropriate for addressing the type of substantial, long-term issues like climate change and energy policy that motivate critics of discounted CBA. In that respect, commentators may be too optimistic in their view of what counts as a general equilibrium or global problem, as opposed to a partial equilibrium or local problem. For instance, although Heal recognizes the endogeneity associated with using market rates of interest to determine resource policies,[41] he argues that it is still appropriate to use the market rate of interest for "a purely local decision, such as the conservation of a local fishery or forest."[42] But even this limited use of market rates of discount could lead to an intolerable general equilibrium, if the same reasoning is independently applied to a series of seemingly "local" projects across the economy. After all, over the past half century, a series of "local" fishery collapses accumulated into a state of pervasive crisis in the world's oceans.[43]

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37 Broome, 23 Phil & Pub Aff at 140.

38 Id.

39 See Samida and Weisbach, 74 U Chi L Rev at 147 (cited in note 5) (noting that they will not consider "pure time-preference arguments for discounting").

40 See text accompanying notes 11–13 (recognizing the ethically compromised status of imposing the present generation's rate of time preference on future generations).

41 Heal, 74 U Chi L Rev at 71–72 (cited in note 20) (examining general decisions affecting an entire economy and noting that in such instances consumption should not be discounted).

42 Id at 71 (recognizing the appropriateness of such rates when dealing with "marginal alterations").

43 See U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century* 40 (July 22, 2004), online at http://www.oceancommission.gov/documents/full_color_rpt/000_ocean_full_report.pdf (visited Jan 23, 2007) (explaining the crisis in world fisheries); Pew Oceans Commission, *America's Living Oceans: Charting a Course for Sea Change* 35–43 (May 2003), online at

Kaplow also recognizes the endogeneity problem, but argues that the effects for most projects "(short of radical, worldwide shifts) are likely to be very small."[44] But it is an empirical question how significantly environmental policy and market rates of interest would be impacted if policymakers heeded the problem of endogeneity. Considering the current level of environmentally harmful subsidization existing within most industrialized economies,[45] it seems at least plausible that "radical, worldwide shifts" in policy are precisely what is needed before the endogeneity problem can safely be ignored in the manner suggested by Kaplow. After all, there is no objective or free-market price that can be identified for nonrenewable and exhaustible resources such as oil or timber—resources that nevertheless lie at the foundation of a substantial portion of all economic activity in industrialized countries. In the theoretical literature, the standard wisdom regarding such resources is that the net returns from their extraction should be reinvested in reproducible capital in order to ensure sustainability and intergenerational equity.[46] But analysts must have some prior notion of the shadow price of exhaustible resources in order to determine the amount of reinvestment required. That notion, in turn, requires making judgments about the policy features of an idealized economy in which "various components of . . . ecological capital" are maintained above "critical threshold levels which are stipulated to be preserved to ensure system resilience"[47]—precisely the kinds of judgments that welfare economists instead want to subject to discounted CBA using current, unsustainable market prices.

In short, the need to directly address intergenerational resource equity cannot be avoided: even thought experiments involving perfect futures markets and zero transaction costs face the problem of establishing the initial endowment of resources between generations. That is, every distribution of resources between generations gives rise to a different market equilibrium, including within that equilibrium a resultant market rate of interest that reflects the opportunity cost of capital.[48] Because much of environmental law and policymaking is

http://www.pewtrusts.org/pdf/env_pew_oceans_final_report.pdf (visited Jan 23, 2007) (explaining the deleterious effect overfishing has had on world fish stocks).

44 Kaplow, 74 U Chi L Rev at 112 (cited in note 15).

45 See generally Organization for Economic Co-operation and Development, *Environmentally Harmful Subsidies: Policy Issues and Challenges* (OECD 2002) (analyzing environmentally harmful subsidies in an attempt to forge a common ground by which OECD countries can overcome such barriers to sustainable development).

46 John M. Hartwick, *Intergenerational Equity and the Investing of Rents from Exhaustible Resources*, 67 Am Econ Rev 972, 973–74 (1977).

47 P.K. Rao, *Sustainable Development: Economics And Policy* 105 (Blackwell 2000).

48 Analysts identify this contingency when they discuss the possibility of using a contractualist approach to determining the content of intergenerational justice, yet they seem not to rec-

concerned precisely with the analytically prior question of resource distribution among generations, it does not make sense to hinge such policymaking on the existing discount rate.

II. DISCOUNTING LIVES

On top of difficulties associated with intergenerational resource distribution, discounting becomes even more problematic when future impacts of policy proposals include enhanced human mortality and morbidity. Defenders of discounting tend to assume that "the value of life (and nonlife harms) is properly measured, and that life, risks to life, and enjoyment of life can be measured in money,"[49] believing that this assumption will allow them to demonstrate the Pareto superiority of intergenerational discounting separate and apart from problems of valuation. They argue somewhat defensively that their procedure does not require the discounting of future lives, but rather only the discounting of "costs and benefits,"[50] "people's willingness to pay to avoid [ ] risks"[51] or "a monetary amount equal to the willingness to pay to reduce risks to life."[52] They insist that "what is being discounted is the monetary value of the risk itself,"[53] and that the relevant issue is a "technical economics question" and does not concern "an ethical question about whether discounting is appropriate."[54]

These analysts protest too much. The Pareto criterion is normally thought to be the gold standard among welfarists because it avoids the problem of interpersonal welfare comparisons.[55] That is, each individual herself determines whether she is made better off—or at least no worse off—by a proposed project. Whatever one thinks of such an

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ognize how seriously the same contingency limits the normativity of the results of any particular cost-benefit maximization exercise. See, for example, Sunstein and Rowell, 74 U Chi L Rev at 194–95 (cited in note 4):

> [T]he idea of a mutually beneficial deal raises serious conceptual difficulties. . . . To be plausible, any such specification will inevitably have to depend on an independent normative account of some kind, and that independent account, rather than a notion of intergenerational bargaining as such, will be doing the crucial work.

See also Samida and Weisbach, 74 U Chi L Rev at 156 (cited in note 5) (observing that "it is difficult to even imagine a bargain [between generations] because the ethical discussion is about the rights and responsibilities of each generation; without a background set of rights and responsibilities, there cannot easily be a bargain").

49 Samida and Weisbach, 74 U Chi L Rev at 149 (cited in note 5).

50 Id at 152, 154.

51 Sunstein and Rowell, 74 U Chi L Rev at 183 (cited in note 4).

52 Viscusi, 74 U Chi L Rev at 230 (cited in note 8).

53 Sunstein and Rowell, 74 U Chi L Rev at 177 n 26 (cited in note 4).

54 Samida and Weisbach, 74 U Chi L Rev at 167 (cited in note 5).

55 See Daniel A. Farber, *What (If Anything) Can Economics Say About Equity?*, 101 Mich L Rev 1791, 1795 (2003) (observing that "the Pareto standard avoids the need for interpersonal comparisons by giving each individual a veto over changes").

approach for decisionmaking within generations, the framework does not translate smoothly to decisionmaking between generations for the simple reason that future generations do not yet exist. Thus, *there can be no Pareto criterion in the intergenerational context*, at least not so long as that term is understood to include individuals themselves determining whether they are made better or worse off by a policy proposal.[56] This is no minor complication: the practice of divining and satisfying the preference functions of future generations must stand on a normative foothold that is separate and distinct from that which typically supports intragenerational welfare approaches. Such a foothold has yet to be identified.[57]

In that respect, the most powerful normative argument for discounting—that it will leave future generations with a more valuable stock of resources—is embarrassed by the fact that some members of those future generations are sacrificed in favor of the very alternative investments that are supposed to inure to their benefit. At times, this embarrassment seems to be clear to all but the CBA proponent himself. One prominent discussion of CBA and climate change, for instance, included the claim that "whether future generations will accept an increase in the rate of skin cancer or not depends on what they get in exchange for it."[58] Likewise, Samida and Weisbach assert that "[i]f we could ask future generations whether they would want us to engage in [a particular] project [that fails cost-benefit analysis after discounting], they would prefer that we just invest the money at the market rate of return because they would be better off with such an investment."[59]

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56 See Sunstein and Rowell, 74 U Chi L Rev at 181–82 (cited in note 4) (explaining how willingness to pay is determined by observation and survey of the current generation and then applied to both current and future risks).

57 Thus, Samida and Weisbach are not correct to state that "[w]hether life or enjoyment can be measured with money is an interesting problem, but it is orthogonal to the issues presented by discounting." Samida and Weisbach, 74 U Chi L Rev at 149 (cited in note 5). Unless the Pareto standard is to remain at a level of theoretical abstraction that is of only marginal practical and intellectual interest, it must be given operability through the specification of an actual method of determining whether a particular generation is made better or worse off by a policy proposal. Thus, Samida and Weisbach's refusal to make such a specification means that, like other prominent defenders of welfare economic analysis such as Louis Kaplow and Steven Shavell, their argument borders closely on the tautological. See Jules L. Coleman, Book Review, *The Grounds of Welfare*, 112 Yale L J 1511, 1513–14 (2003), reviewing Louis Kaplow and Steven Shavell, *Fairness versus Welfare* (Harvard 2002), and arguing that its central normative claim—"that welfare, and not fairness, is the appropriate basis for assessing law"—is supported only by "empty tautological claims and underdeveloped putative causal explanations."

58 Eric Neumayer, *Global Warming: Discounting Is Not the Issue, But Substitutability Is*, 27 Energy Policy 33, 40 (1999) (analyzing whether higher consumption rates can offset harm to future generations).

59 Samida and Weisbach, 74 U Chi L Rev at 155 (cited in note 5).

But notice what has happened through these rhetorical gestures: the authors have subtly shifted from an individualist to a collectivist conception of the relevant interest holder, such that the same entity ("future generations") that incurs the costs of increased mortality also appears to be the one that receives compensation for the loss.[60] In both instances, future generations are deemed to be the relevant interest holder, but the cost-benefit valuation exercise that led to the imposition of increased risk of death proceeded on the basis on an *individualistic* assessment of welfare. This conceptual shift from the individual to the collective perspective can lead to the absurd result that future generations appear to be "better off" even when they have been rendered extinct.[61] That is, nothing within the framework excludes the possibility that it would be "efficient" or "welfare-maximizing" to kill off every single member of a future generation such that humanity ceases to exist, while the stock of capital that supposedly makes us "better off" continues to grow exponentially in bank accounts that will never be withdrawn.[62]

All the discounting proponent really demonstrates by appealing to opportunity costs is the fact that a life lost in the future may be *compensated for* at lower cost than a life lost today. The decision to actually sacrifice the life—and to thereby bring about a situation in which compensation becomes relevant—remains an entirely separate, and philosophically more problematic, matter.[63] The potential for confusion in this area is evident in Samida and Weisbach's response to Derek Parfit's famous deformity example, in which Parfit argued that the harm associated with genetic deformities—as opposed to the ability to provide financial compensation for them—does not vary with time.[64] Samida and Weisbach counter that discounting future deformities to a present value nevertheless is appropriate because "the cost of care or cost of a cure for deformities is likely to go down over time."[65]

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60 Compare with the text accompanying notes 36–39 (describing a similar conceptual slide with respect to the pure rate of time preference justification for discounting).

61 Compare Lisa Heinzerling, Book Review, *The Accidental Environmentalist: Judge Posner on Catastrophic Thinking*, 94 Georgetown L J 833, 857 (2006) (arguing that no matter how much money is offered, people will always choose the continued existence of humanity over its extinction).

62 See Cowen, 74 U Chi L Rev at 9 (cited in note 13) ("Under a positive discount rate, no matter how low, one life today can be worth more than one million lives in the future, or worth the entire subsequent survival of the human race, if we use a long enough time horizon.").

63 See Spash, *Greenhouse Economics* at 241 (cited in note 2) ("If future generations are to be the losers then an explicit judgment to that effect is required and the consequent moral regret and case for compensation must be considered.").

64 See Derek Parfit, *Reasons and Persons* 483 (Clarendon 1984) (setting out and criticizing the economic reasoning that less money need be set aside to compensate for deformities that will occur far in the future because interest will be earned over time).

65 Samida and Weisbach, 74 U Chi L Rev at 166–67 (cited in note 5).

Even on its own terms, this argument is weakened when evaluated from the standpoint of actual well-being, as opposed to the monetary equivalents of well-being. That is because the same economic forces that purportedly enable a present generation to set aside a lesser amount today to compensate for a harm tomorrow also imply that the amount required to compensate for a harm tomorrow will be greater, due to the declining marginal utility of wealth, commodities, and other tangible forms of compensation. Samida and Weisbach instead argue that "[s]tubbing one's toe remains stubbing one's toe" even with rising income, so long as the discount rate is set equal to the "expected long-run economic growth" of the society.[66] But their argument depends on a host of undefended assumptions regarding the ability to translate well-being into money and to commensurate all potential sources and levels of well-being with each other. The monetary equivalent of stubbing one's toe only remains proportionate with rising income if the pain of stubbing one's toe can be monetized in the same fashion as any other good, and if the "monetary equivalent" of pain behaves similarly to those other goods as income shifts and time progresses. Whatever the validity of this depiction for toe stubbing, it is implausible for death and other extreme inflictions of harm, where the moral and psychological weight of the injury caused to future individuals may bear little relationship to the long-run economic growth rate.[67]

More fundamentally, Samida and Weisbach misstate the nature of the intergenerational policymaking challenge. The moral question on the table is *not* how efficiently to care for or cure a deformity that has already been suffered. The question instead is whether to inflict the harm in the first place. By presuming that there is no difference between living as a nondeformed individual and living as a compensated individual with a deformity, the authors violate the most fundamental ethical precept: that individuals should not be used without their consent as means, rather than as ends. This is why in the intergenerational context one cannot separate the issues of discounting, valuation, and whether and how to monetize life. This is also why asserting that "once the relevant amounts are generated . . . they will be monetary, and they must be discounted,"[68] simply pushes the important moral decision back one step in the analysis, to the question of valuation. It is one thing, in other words, to presume individualized consent to environ-

66 Id.

67 See Broome, 23 Phil & Pub Aff at 149 n 17 (cited in note 36) ("A present deformity will require some quantity of present commodities as compensation. A future deformity will require a greater quantity of future commodities, because the future deformity is just as bad as the present one, but the future commodities are less valuable.").

68 Sunstein and Rowell, 74 U Chi L Rev at 185 (cited in note 4).

mental, health, and safety risks based on revealed preference studies within the current generation. It is quite another to presume such consent among individuals who have neither vote, nor voice, nor volition to leave our political community and its sphere of impact.

III. DISCOUNTING ALTERNATIVES

Nothing in the foregoing discussion is intended to suggest that analysts are not right to be focusing on opportunity costs, only that such costs should not be compounded into the cost-benefit exercise in a mechanical fashion without first asking important normative questions about intergenerational justice. In what remains the most thoughtful discussion of discounting in the environmental law literature, Revesz similarly concludes that intergenerational decisionmaking should "tak[e] account of" opportunity costs, but not be dictated by a particular discount rate.[69] Samida and Weisbach argue that Revesz is incorrect to think that there is a distinction between these two positions.[70] Later, they report that they "fail to see how one mathematical procedure can present different moral issues than another identical mathematical procedure."[71] These arguments miss their mark, for they presume a kind of calculative compulsion that Revesz specifically rejects. Not all rationality is formalized, and despite the frequent claim that cost-benefit analysis is desirable because it encourages comprehensive assessment of outcomes, it is in fact *only* formalized systems such as cost-benefit analysis that must, by their very nature, be incomplete. As Gödel famously demonstrated, no formal system of minimal complexity can be both consistent and complete.[72]

Revesz recognizes this unavoidable dilemma and chooses to sacrifice consistency by viewing opportunity costs as but one factor in a pluralistic assessment of intergenerational obligation.[73] CBA proponents choose to sacrifice completeness by exogenizing the background

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69 Revesz, 99 Colum L Rev at 1008–09 (cited in note 13).

70 Samida and Weisbach, 74 U Chi L Rev at 153 n 24 (cited in note 5).

71 Id at 167.

72 See generally Kurt Gödel, *On Formally Undecidable Propositions of* Principia Mathematica *and Related Systems* (Dover 1992) (B. Meltzer, trans). See also Giuseppe Dari Mattiacci, *Gödel, Kaplow, Shavell: Consistency and Completeness in Social Decisionmaking* 15–20 (George Mason University Law and Economics Working Paper No 03-55, 2003), online at http://www.law.gmu.edu/faculty/papers/docs/03-55.pdf (visited Jan 23, 2007) (explaining Gödel's proof and its implications for policymaking); Paul W. Glimcher, *Decisions, Uncertainty, and the Brain: The Science of Neuroeconomics* 73 (MIT 2003) (noting that Gödel demonstrated that logical mathematical systems could not be "both complete and consistent"); John D. Barrow, *Impossibility: The Limits of Science and the Science of Limits* 218–47 (Oxford 1998) (exploring the implications of Gödel's theorem for the scientific enterprise).

73 Revesz, 99 Colum L Rev at 1008–09 (cited in note 13).

state of intergenerational rights and responsibilities through the use of a discount rate that presumes such questions of equity already have been addressed. Thus, through discounting, the fundamental issues of intergenerational equity—which risks and resources, as an ethical matter, should be imposed or bestowed on future generations?—are conflated with the issue of intergenerational efficiency—which generation, as a technical matter based on a given rate of discount and distribution of entitlements, does or will derive more utility from the use of a resource? Future generations, in essence, are forced to outbid present owners by an amount reflecting not only the strength of their needs, but also the alternative uses to which all resources—including the "monetary equivalents" of their own lives—could be put during the intervening time periods. This is conceptual confusion. Even if transfers of resources to future generations *are* offered as "compensation" for this bidding disparity, the discounting procedure still suffers from a basic flaw: the efficiency exercise that determines the amount of compensation due will have proceeded on the basis of a discount rate that assumes away the hard work of evaluating intergenerational equity.

Defenders of CBA at times recognize the need to begin this hard work. Viscusi, for instance, observes in passing that "we do not know what [future generations'] preferences are."[74] Similarly, at one point Samida and Weisbach state that "[i]f respecting future generations means anything, it should mean respecting our best guess as to their wishes and helping them as much as feasible."[75] But nowhere do the analysts actually engage the question of what "our best guess as to their wishes" is, or how we might go about constructing and operationalizing a process to divine and satisfy those wishes. Instead, they seem to simply assume that future generations will have the same needs and desires as we do, and that their interests may be discounted as if they belonged entirely to the present generation. This is an odd approach, for the one thing we do know about climate change is that the future will be vastly different from the present. The preferences of future generations undoubtedly will reflect these dramatic environmental changes, making them quite different from our own. Thus, in order to truly respect the interests of future generations, we must undertake an engaged effort to anticipate and consider the details of their plight, and to provide the specific institutions and resources they will need in order to endure it.

This is the challenge that the sustainable development policymaking paradigm seeks to address, a challenge that seems underappreci-

74 Viscusi, 74 U Chi L Rev at 211 (cited in note 8).

75 Samida and Weisbach, 74 U Chi L Rev at 155 (cited in note 5).

ated by proponents of discounted CBA. Viscusi, for instance, refers to sustainability as "an ill-defined environmentalist battle cry."[76] He argues that the goal of maintaining a sustainable level of well-being over time is undesirable because it may deprive current generations of a "large current benefit" if the benefit happens to impose "a very small risk that the quality of life for some future generation might be an infinitesimal amount lower than our own."[77] Yet the existence of such an extreme mathematical scenario does not undermine the importance of maintaining a sustainable level of well-being; rather, it underscores the importance of not conflating moral and political judgment with mathematical reflex. Viscusi also argues that the goal of sustainability is impractical because "[w]e don't know the absolute levels of [future generations'] quality of life, how much our decisions today will alter that quality, or how we might go about making a sensible intertemporal interpersonal comparison."[78] Yet the fact that we do not know the answers to these profound questions does not render them moot; rather, it makes the need to address them all the more urgent.

In that respect, one final danger of discounted CBA needs to be mentioned. Moderate defenders of CBA are careful to point out that they do not intend the CBA exercise to displace entirely other policy considerations such as distributive equity. They simply believe that such considerations should be addressed separately from efficiency analysis, typically through the all-purpose vehicle of the tax and transfer system. Sunstein and Rowell, for instance, claim that "[w]hatever the proper approach to intergenerational equity, the debate over that issue should be separated from the debate over discounting, and the former debate should be engaged directly."[79] Kaplow similarly states with respect to intergenerational resource allocation that "however that sort of allocation should ideally be made or is in fact determined, all further consideration of intergenerational dimensions of policies—whether involving the environment, infrastructure, research and development, education, or social security—dissolves almost entirely into matters of efficiency."[80]

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76 Viscusi, 74 U Chi L Rev at 236 (cited in note 8).

77 Id.

78 Id.

79 Sunstein and Rowell, 74 U Chi L Rev at 202 (cited in note 4).

80 Kaplow, 74 U Chi L Rev at 79 (cited in note 15). Similarly, Samida and Weisbach argue that they "do not base [their] analysis on any assumption of baseline entitlements." Samida and Weisbach, 74 U Chi L Rev at 151 n 16 (cited in note 5). Instead, they appear to assume that the background specification of rights and responsibilities among and between generations occurs in a separate forum—or is addressed in a laissez-faire fashion—and that the only responsibility of policymakers is to maximize welfare subject to existing market conditions. Id at 151.

The underlying conceptual problems raised by Gödel's Incompleteness Theorem,[81] however, may haunt even those who defend CBA in this more pragmatic sense. The problem lies in the fact that the formal language of the cost-benefit framework is not only irreducibly incomplete; it also is capable of denying its own incompleteness.[82] That is, even as CBA's moderate proponents depict the procedure as but one tool in an overall suite of policy approaches, CBA implicitly and unavoidably condemns those other approaches as undesirable. The tautological conclusion of the formalized welfarist framework is that justice and fairness *necessarily* derogate from efficiency and welfare. Intergenerational equity therefore can only be achieved at the apparent cost of welfare maximization, at least so long as analysts and observers remain fixed to the status quo distribution of rights and resources as an efficiency baseline. Little wonder, then, that practitioners of CBA attempt to awkwardly subsume the equity interests of future generations into the efficiency maximization calculus, as this Response has argued is done by discounting. That approach seems to preserve the nominal comprehensiveness and optimality of CBA results without revealing that those results are radically contingent on the acceptability of the status quo distribution of rights and resources.

At bottom, the disagreement between defenders and critics of discounting arises from a difference of view over what constitutes an interesting question. With respect to climate change, for instance, a policy approach that focuses on equitable considerations would ask first whether future generations are entitled to a minimal level of climate stability and freedom from catastrophic harm. Only *after* that question had forthrightly and courageously been answered would questions of welfare maximization and discounted CBA become even relevant, let alone interesting. To holders of this perspective, the tendency to narrowly focus on technical aspects of the cost-benefit methodology—while ignoring or burying in footnotes the need to address the equitable distribution of rights and resources across human generations—seems rather like fiddling with deck chairs . . . on stilts.

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81 See text accompanying note 72 (discussing the ineliminable incompleteness of consistent formal systems such as CBA).

82 See Douglas A. Kysar, *It Might Have Been: Risk, Precaution, and Opportunity Costs* 47 (Cornell Law School Research Paper No 06-023, 2006), online at http://ssrn.com/abstract=927995 (visited on Jan 23, 2007).