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CLIMATE JUSTICE

Daniel A. Farber*

CLIMATE CHANGE JUSTICE. By Eric A. Posner and David Weisbach.
Princeton: Princeton University Press. 2010. Pp. viii, 220. \$27.95.

INTRODUCTION

Eric Posner and David Weisbach¹ take the threat of climate change seriously. Their book *Climate Change Justice* offers policy prescriptions that deserve serious attention.² While the authors adopt the framework of conventional welfare economics, they show a willingness to engage with noneconomic perspectives, which softens their conclusions. Although they are right to see a risk that overly aggressive ethical claims could derail international agreement on restricting greenhouse gases, their analysis makes climate justice too marginal to climate policy.³ The developed world does have a special responsibility for the current climate problem, and we should be willing both to agree to more stringent restrictions on emissions to protect future generations and the global poor and to agree to assist poor nations with their own adaptation and mitigation measures.

Climate Change Justice has not had a friendly reception from the readers who care most about the topic. One review bears the pungent title *How Not to Think About Climate Change Justice*.⁴ Another reviewer complains that “it is hard to see the justice in Posner and Weisbach’s *Climate Change*

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1. Posner and Weisbach are both Professors of Law, University of Chicago Law School. Cass Sunstein coauthored some of the articles on which *Climate Change Justice* is based, but could not be included as an author of the book because he now holds a politically sensitive government position. Pp. vii–viii.

2. One policy prescription, for example, is for the use of carbon taxes rather than cap and trade or other regulatory tools. P. 42. A counterargument can be found in Jonathan B. Wiener, *Property and Prices to Protect the Planet*, 19 DUKE J. COMP. & INT’L L. 515 (2009). This Review does not address the choice of regulatory instruments.

3. For responses to earlier parts of this project, see Jonathan C. Carlson, *Reflections on a Problem of Climate Justice: Climate Change and the Rights of States in a Minimalist International Legal Order*, 18 TRANSNAT’L L. & CONTEMP. PROBS. 45 (2009); Daniel A. Farber, *The Case for Climate Compensation: Justice for Climate Change Victims in a Complex World*, 2008 UTAH L. REV. 377; and Amy Sinden, *Allocating the Costs of the Climate Crisis: Efficiency Versus Justice*, 85 WASH. L. REV. 293 (2010).

4. Leonard J. Long, *How Not To Think About Climate Change Justice*, 29 QUINNIPIAC L. REV. 463 (2011) (reviewing *Climate Change Justice*).

Justice.⁵ Yet another is disappointed by “such perfunctory and sweeping dismissals of existing climate justice work.”⁶

This hostile reaction is understandable for reasons of style as well as substance. The book is briskly paced; it often brushes aside opposing viewpoints rather brusquely. It is written from a philosophical perspective (welfarism) that many reject. It also takes for granted the basic validity of a controversial economic approach to social policy that is based on cost-benefit analysis—an approach that holds, for example, that we ought to put a dollar value on human life. In short, the hostile reaction is no wonder.

Nevertheless, it would be wrong to dismiss *Climate Change Justice* as just another Chicago School brief for cost-benefit analysis. The book is not simply a cookie-cutter example of conventional economic analysis. It makes some important pragmatic and ethical points that may surprise readers with a stereotyped view of Chicago-style law and economics. As the authors explain, their “argument is unusual” because they “favor a climate change agreement, especially because it would help poor people in poor nations” (and they also more generally “favor redistribution from the rich to the poor”), but they simultaneously “reject the claim that certain intuitive ideas about justice should play a major role in the design of a climate agreement” (p. 5). Climate justice advocates who view issues of equity as centrally important to climate policy are understandably negative in their view of the book.

Posner and Weisbach’s rejection of these ethical arguments would seem to justify the hostile response of advocates of climate justice. But Posner and Weisbach are far from advocating that we should ignore the issue of climate change or the interests of the global poor and future generations. Posner and Weisbach have no hesitation in stating that “[c]limate change ranks among the most serious problems facing the world today” (p. 1), that it is “entirely beyond debate” that humans are causing significant climate change (p. 16), and that failure to reach an international agreement would “create exceedingly serious risks to human welfare, above all in poor nations.”⁷ Given the state of American political discourse, support for these points cannot simply be taken for granted.

Moreover, parts of Posner and Weisbach’s position should be congenial to their critics. Posner and Weisbach agree with climate justice advocates that the “moral worth of individuals transcends spatial and temporal boundaries” (p. 169), and that “choosing projects solely through cost-benefit analysis with discounting can result in serious injustice to the future”

5. Arvind Subramanian, Book Review, 10 *WORLD TRADE REV.* 277, 280 (2011) (reviewing *Climate Change Justice*).

6. Steve Vanderheiden, Book Review, 9 *PERSP. ON POL.* 133, 135 (2011) (reviewing *Climate Change Justice*).

7. P. 192. It is clear that climate change requires a coordinated global response. Whether that coordination should be embodied in a formal treaty, a less formal multilateral agreement, or an even less formal network of cooperative arrangements is beyond the scope of this Review. References to a “climate treaty” in this Review should be read to include any method of forming an international response to climate change.

(p. 159). They also go on record as “favoring a great deal of redistribution from rich people in rich nations to poor people in poor nations—far more redistribution, in fact, than is being seriously proposed today” (p. 190). Finally, Posner and Weisbach believe that it is unethical for nations to refuse to join a climate treaty because those nations would prefer to free ride, allowing other countries to make the necessary sacrifices to eliminate a threat to global well-being (p. 182).

Despite these areas of harmony between *Climate Change Justice* and the views of climate justice advocates, there is also a large gap between the two. Posner and Weisbach criticize claims that developed countries should have greater responsibility because of their wealth (“distributive justice”) or because their past emissions have disproportionately contributed to climate change (“compensatory justice”) (pp. 72, 100). They are also skeptical of the claim that climate regulations should be tightened because of our ethical duties to later generations (p. 145).

The next three sections of this Review critique Posner and Weisbach’s analysis of key ethical issues. Part I assesses their analysis of wealth distribution issues. They favor strenuous efforts to improve the lot of poor countries, but are skeptical of pursuing this objective as part of a climate agreement. Part II then considers their analysis of compensatory justice (which they often call “corrective justice”). The two issues are closely related to the extent that rich nations have disproportionately contributed to climate change and the poorest nations are likely to be the greatest victims of climate change. Posner and Weisbach reject claims for compensation, partly because they are concerned about whether it is possible to identify victims and culpable actors with sufficient precision, but primarily because they reject the idea of collective national responsibility for wrongdoing. Part III considers another set of victims, the people of later generations. Posner and Weisbach admit that climate change could impose unjust harms on later generations, but they believe that the proper response is to provide compensation through increased savings and investment.

Whether the issue is distributive justice, compensatory justice, or the rights of future generations, Posner and Weisbach vigorously question the relevance of ethical claims as opposed to cost-benefit analysis in climate policy. In each situation, however, they also qualify their criticisms in important ways. This Review suggests that these qualifications may have more validity than the arguments themselves and that ethical claims are more relevant to climate policy than the authors suggest.

Finally, Part IV focuses on two dimensions of climate policy slighted by Posner and Weisbach: the high degree of uncertainty surrounding the impacts of climate change, which makes economic analysis problematic, and the closely connected possibility of local or global catastrophic outcomes. These factors weaken the usefulness of cost-benefit analysis in climate policy and correspondingly call for more weight to be placed on ethical factors.

This Review will focus on the ethical arguments advanced by Posner and Weisbach, but they also make an important pragmatic argument. They worry that aggressive pursuit of ethical issues could derail any possibility of

a climate agreement.⁸ Given the severity of the climate change problem, they are correct that “[i]t would be a cruel irony if the consequence of justice-related arguments were to doom the prospects for an international agreement—and thus to create exceedingly serious risks to human welfare, above all in poor nations” (p. 192). But this is not an argument against the validity of the ethical claims themselves, and it is particularly weak as a response to more nuanced, less extreme claims that would be less disruptive to negotiations. Moreover, refusing to take developing countries’ ethical arguments seriously has the potential to derail negotiations.

I. CLIMATE CHANGE AND THE GLOBAL POOR

Chapter Four of *Climate Change Justice* asks “whether rich nations have a special obligation to deal with climate change, not because they are principally responsible for the problem, but simply because they are rich” (p. 73). The authors hedge their answer to this question, saying “[t]o a great extent, these issues are and should be separate” (p. 73). “Other things being equal,” they reason, “the more sensible kind of redistribution would be a cash transfer, so that poor nations can use the money as they see fit” (p. 78).

It is important to be clear about the baseline for determining whether a redistribution has taken place. For Posner and Weisbach, the baseline is an optimal climate treaty, where “optimal” means the most efficient in terms of economic analysis. Because costs and benefits in such an analysis are assessed in economic terms, the interests of the poor are necessarily downgraded in designing such a treaty. Consider the issue of rising sea levels. The destruction of a Hollywood star’s getaway beach house might translate into millions of dollars in the economic analysis, while the destruction of a Bangladeshi family’s home might account for a fraction of one percent of that amount. The same is true of the value of human life: the deaths of many Bangladeshis might be considered equal to that of a single American because the American is wealthier and willing to pay much more to reduce risks. So Posner and Weisbach’s baseline is one in which the interests of the poor count for little. Given this baseline, any move toward equal treatment of those interests constitutes redistribution, a form of in-kind foreign aid.

Putting aside the question of whether this is a valid way to frame the question, Posner and Weisbach’s argument against this form of “redistribution” is weak if not halfhearted, and in the end even they themselves do not seem persuaded by it. Recall that they argue for cash transfers in order to assist the poor (p. 78). But the option of massive cash transfers, it turns out, is illusory. As they concede, “there are notorious difficulties in making development aid effective,” and “[e]ven when rich countries want to help, it is

8. P. 4. If post-Copenhagen commitments are any guide, the benchmark for negotiations seems to be equalizing reductions in emissions intensity (emissions per unit of energy) across developed and developing countries. See Frank Jotzo, *Comparing the Copenhagen Emissions Targets* (Ctr. for Climate Econ. & Pol’y, Working Paper No. 1.10, Oct. 2010), available at <http://ssrn.com/abstract=1878905>.

hard for them to do so" (p. 90). The absence of cash transfers is critical in terms of the economic analysis. Moreover, in ethical terms, our inability to offset the redistributive effects of climate change impacts by another mechanism means that we must consider those effects in setting climate policy.

Without a viable system for cash transfers, the optimal treaty can no longer be one that equalizes the marginal cost of pollution reductions across countries. Instead, the treaty should equalize countries' marginal sacrifices in welfare stemming from carbon reductions. If one country is making a greater marginal sacrifice in welfare than another, we could increase global welfare by shifting more of the burden of reducing emissions to the other country. The reason that equalizing the marginal financial burden no longer works is that the same abatement cost translates into a greater loss of utility in lower-income countries.⁹ More simply, if we cannot fix the problem of global poverty with cash transfers, then we cannot separate it from the design of climate measures.

Posner and Weisbach argue that the use of a climate treaty to assist the poor "has to be compared to other foreign aid programs," and that "[t]here are any number of other possible methods of making transfers" (p. 176). This argument seems to suffer from what we might call the "fallacy of the hypothetical alternative." It is a common type of argument: although it may be true that *A* would be better than *B*, we should not adopt *A* because there might be some other hypothetical alternative that would be superior to *A*. Yet, we are not told what this other alternative might be, whether its implementation would actually be feasible, or whether it would be politically viable. To say that we should not engage in redistribution unless we can implement the ideal form of redistribution is really to say that we should not engage in redistribution at all.

Posner and Weisbach may be correct that there are other measures, some of them perhaps superior, that could help redistribute income. But this counts as an objection to using climate policy to assist in redistribution only if one of two arguments holds. The first argument is that we are in danger of overly redistributing income if we adopt the other measures and also use climate policy to assist in redistribution. It seems very unlikely, however, that the large redistributions that Posner and Weisbach advocate will be achieved by other worthy projects that are currently politically feasible. The second argument is that using climate policy to assist in redistribution would crowd out other, more desirable forms of redistribution. This might be true if the political process were entirely rational—first settling on the desired level of redistribution and then comparing all possible methods of achieving the goal. But this vision of political rationality seems more than a bit idealized. The possible existence of better methods of redistribution matters little unless Posner and Weisbach can either present a menu of politically feasible, more desirable methods of redistribution or else provide empirical support for crowding out. Without a specific program for redistribution, however, we

9. For a proof of this proposition, see Graciela Chichilnisky & Geoffrey Heal, *Who Should Abate Carbon Emissions? An International Viewpoint*, 44 *ECON. LETTERS* 443 (1994).

should not give up on the possibility of using climate policy to assist, at least at the margins, with income distribution.

Posner and Weisbach end up with an equivocal position on redistribution. They reject the possibility of large cash transfers as part of a climate agreement, but they regard as more plausible the idea that developing countries should be given more time than developed countries to impose emission restrictions (p. 92). They also agree that the net benefits of a climate treaty—what they call the “surplus”—might be used to fund some type of benefits for poor nations, although they are somewhat concerned about the viability of this approach (pp. 94–96, 143). They ultimately agree that “[c]limate change abatement may very well be part of this mix” of methods for assisting the poor (pp. 177–78). And in their conclusion, they concede that “[i]t would be somewhat better for the wealthy nations to agree to a treaty that requires more aggressive reduction than would promote their interests—if that treaty would deliver substantial benefits to poor nations, which are particularly vulnerable to the relevant risks” (p. 190).

In short, despite their initial resistance to including distributional issues in climate negotiations, Posner and Weisbach ultimately go a long way toward accepting distributional claims as part of climate policy, so long as the claims are not pushed to the point of upsetting the negotiations. In other words, there is less to their opposition to using a climate treaty to address distributional concerns than meets the eye.

II. THE ISSUE OF CLIMATE COMPENSATION

Emitters of greenhouse gases will cause serious harm, especially in the poorest countries, which often have very low emissions themselves. Posner and Weisbach concede that “emissions in some countries have imposed serious risks on others, that the United States and China are expected to remain the world’s leading contributors, and that some nations, including those in Africa, face serious risks even though their own emissions are trivial” (p. 101). An obvious case for some form of compensatory response seems to exist at least as to the United States and the other rich countries with the highest per capita emissions, such as Japan and the wealthier members of the European Union.

Posner and Weisbach, however, argue vigorously to the contrary. They deploy a hodgepodge of arguments that are hard to address in a coherent fashion. Some of the arguments seem strained at best, such as their fanciful suggestion that the Bush Administration may have had a secret plan to increase U.S. emissions in order to obtain concessions in a later climate treaty (p. 114). Needless to say, the authors provide no evidence of such a secret plan. But other arguments they make deserve more careful attention.

One issue is how much responsibility for climate change should be assigned to developed countries with high emissions. As Posner and Weisbach indicate, there is a clear relationship between gross domestic product and carbon dioxide emissions; richer countries use more energy and emit more carbon dioxide (pp. 38–39). Posner and Weisbach argue, however, that rich

countries should not be assigned particular blame for current greenhouse gas concentrations for two reasons: (1) responsibility is more evenly divided if we include emissions from land use change and from other greenhouse gases (pp. 35–37); and (2) developing countries like China are rapidly overtaking developed countries in terms of annual absolute emissions (although not per capita emissions) (p. 40).

Not all sources of greenhouse gases are equal in normative terms. Rich countries have the ability to significantly reduce emissions without significant harm to their standards of living. In contrast, emissions due to agricultural activities may be unavoidable in feeding the rapidly expanding world population. In addition, governments of developing countries may have little capacity to control deforestation, much of which may be designed to satisfy the demands of consumers in developed countries for wood.¹⁰ Although emissions from developing countries such as China have been increasing rapidly, developed countries like the United States have contributed to this increase by outsourcing manufacturing to those countries.¹¹

Given this rather complex situation, it seems too facile to dismiss the responsibility of wealthy countries for climate change stemming from the high contribution of energy use in those countries to atmospheric carbon dioxide. However, in light of Posner and Weisbach's individual-centered view of responsibility, per capita emissions are probably more relevant than country-level emissions. Although Posner and Weisbach list a few small countries with unusually high per capita cumulative carbon dioxide emissions (p. 37), emissions from a Luxembourg or Belize are not terribly relevant to global policy issues. The overall trend is quite clear: the twenty richest nations were home to about one-eighth of the world's population in 2000 but were responsible for 40 percent of all greenhouse gas emissions from all sources (p. 37). In contrast, the countries representing the billion people with the lowest incomes were responsible for less than 2 percent of all the atmospheric carbon dioxide created by energy use (p. 38). Quibbling over emissions statistics should not be allowed to obscure the basic facts.

Part of Posner and Weisbach's argument against the relevance of compensatory justice seems to stem from confusion between punishment and remediation. The title of their chapter on compensation is "Punishing the Wrong Doers" (p. 99). They contend that "the idea that nation-states can be moral agents is highly unappealing, as it relies on notions of collective responsibility that have been rejected by mainstream philosophers as well as institutions such as criminal and tort law" (p. 101). But this claim is misplaced for two reasons. First, their argument addresses moral responsibility only in the context of punishment rather than compensation. As a

10. Shadia Duery, *An Overview of World Tropical Hardwood Resources, Forest Products Trade and Environmental Issues* (La. Forest Prods. Dev. Ctr., Working Paper No. 74, 2006), available at www.lfpdc.lsu.edu/publications/working_papers/wp74.pdf.

11. See Glen P. Peters et al., *Growth in Emission Transfers via International Trade from 1990 to 2008*, 108 *PROC. NAT'L ACAD. SCI.* 8903 (2011), available at www.pnas.org/content/108/21/8903.full. This does not mean, however, that the countries now hosting the "exported" industries are free from responsibility for failing to control emissions.

comparison of criminal law with tort law quickly reveals, we are far more demanding of justification for imposing punishment than for compensation. Thus, rejection of group punishment does not disprove a collective obligation of compensation.

Second, Posner and Weisbach's argument ignores the fact that nations are quite commonly required to compensate for past wrongdoing. For example, after the first Gulf War, the United Nations established a tribunal to assess damages against the nation of Iraq, which resulted in substantial compensation for the environmental harm that Iraq caused during the war.¹² The argument also ignores the authors' own position later in the book. They portray nations as moral agents when they say that "it is unethical for a nation to refuse to join a climate treaty in order to free-ride off of others" (p. 170). They also posit that "wealthy nations have an ethical obligation to help the poor, including those living in other, poor nations" (p. 174). Thus, attaching moral responsibilities to nations, even under the authors' own framework, does not seem unacceptable in all settings.

A more important part of their argument is that it cannot be considered blameworthy "for Americans to fail to reduce their greenhouse gas emitting activities" (p. 112), because such unilateral actions would produce "no benefit" (p. 113). This argument is both factually and morally questionable.

In terms of the factual issue, climate models show that any increase in emissions, regardless of the existing level, causes incremental harm.¹³ Unless we assume that the U.S. emissions restrictions would cause other countries' emissions to increase enough in response to fully offset the United States' reductions, any reduction in U.S. emissions would decrease or at least delay damage from climate change, even if the United States acted alone. Posner and Weisbach maintain that unilateral action by the United States could at best "have little effect on overall climate change—not so far from zero even if aggressive and effective."¹⁴ This reflects what has been called "the behavioral tendency to treat very small shares as zero."¹⁵ This assumption is especially misleading when shares are assessed in percentage terms, since a small percentage of a huge amount is still a large amount. When dealing with a problem of the scale of climate change, even a small change at the margin can translate into a substantial amount of harm in ab-

12. For detailed discussion of this compensation scheme and its implementation, see *GULF WAR REPARATIONS AND THE UN COMPENSATION COMMISSION* (Cymie Payne & Peter Sand eds., 2011).

13. The Intergovernmental Panel on Climate Change's synthesis of the physical science for policymakers shows that differences in carbon dioxide concentrations where concentrations are stabilized from 350 ppm to 700 ppm translate into temperature changes from around 2 degrees Celsius to around 5 degrees Celsius. See *INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY* 831 (2008).

14. P. 113. Douglas Kysar refers to this as a "consequentialist alibi." Douglas A. Kysar, *What Climate Change Can Do About Tort Law*, 41 *ENVTL. L.* 1, 35 (2011).

15. See Kevin M. Stack & Michael P. Vandenbergh, *The One Percent Problem*, 111 *COLUM. L. REV.* 1385 (2011).

solute terms.¹⁶ Indeed, it is possible to translate each ton of carbon into an equivalent amount of temperature change.¹⁷ Moreover, U.S. initiatives could spur innovative technologies and practices that could be adopted elsewhere, leading to global improvements.

In terms of the moral issue, even if no single country could unilaterally slow or moderate climate change, it does not follow that each country is free from responsibility for its emissions. Tort law has long rejected the argument that, when harm proceeds from multiple sources, individuals can avoid responsibility by showing that it would have made no difference if they alone had acted properly. For instance, if two actors independently begin fires negligently, neither actor can escape liability by arguing that the other fire would have caused the same harm anyway.¹⁸ The general tort rule is that “at least where both causes involve comparable blameworthiness, both actors are liable, even though the conduct of either one was not a sine qua non of the injury because of the conduct of the other.”¹⁹ Thus, even if action by a single country would have had little effect, assuming that other nations continued unrestrained emissions, nations are still not free from responsibility for their excessive levels of emissions.

Excessive emissions not only harm others but unfairly benefit residents of rich nations. Posner and Weisbach concede that “many Americans have made choices that do not adequately take climate consequences into account.”²⁰ Americans have the benefit of cheap gasoline and low mileage standards, allowing them to drive SUVs, pickup trucks, and other vehicles that produce unduly high greenhouse emissions. They obtain electrical

16. Of course, it is also unquestionably true that “national measures can only be interim steps to a global climate change solution.” Rachel Brewster, *Stepping Stone or Stumbling Block: Incrementalism and National Climate Change Legislation*, 28 YALE L. & POL’Y REV. 245, 271 (2010).

17. See H. Damon Matthews et al., *The Proportionality of Global Warming to Cumulative Carbon Emissions*, 459 NATURE 829 (2009).

18. See KENNETH S. ABRAHAM, *THE FORMS AND FUNCTIONS OF TORT LAW* 111 (3d ed. 2007) (stating that this is the “universal” outcome and that it would be “absurd” to relieve either negligent party of liability).

19. See *Boeing Co. v. Cascade Corp.*, 207 F.3d 1177, 1183 (9th Cir. 2000).

20. P. 104. Some of those choices are political. Posner and Weisbach note as follows:

A more reasonable and serious criticism of American policy until very recently is that the U.S. government did not take seriously the risk of climate change, may have deliberately downplayed the risks when government officials knew better, and did not try to use its diplomatic power to advance climate treaty negotiations as much as it should have.

P. 114. According to Posner and Weisbach, however, “[i]t is certainly plausible to think that voting for politicians who adopt bad policies, or failing to vote for politicians who adopt good policies, is not morally wrong except in extreme or unusual cases.” P. 115. Note that Posner and Weisbach do not directly endorse this proposition themselves but only say that it is plausible, and even then they add a proviso for extreme or unusual cases. It is hard to see why voters should not be considered responsible for policies when they elect the candidates who support those policies.

power from cheap coal rather than more expensive renewable sources.²¹ Americans also benefit as shareholders in companies that have profited from the sale or use of huge amounts of fossil fuels.

These activities have served not to provide necessities or to attain a decent standard of living but to feed a level of consumption that is extraordinary by global standards. With only one-twentieth of the world's population, the United States accounts for a disproportionate level of annual global resource consumption, including a fifth of the fossil fuels, a fifth of the copper, and a quarter of the aluminum.²² Moreover, the United States produces a quarter of the world's carbon dioxide output and uses a third of all paper and plastic.²³ From 1900 to 1990, the U.S. population tripled while its use of raw materials multiplied seventeen times.²⁴

This does not seem to be a difficult case in which to apply the concept of unjust enrichment and require the benefits to be redistributed to others.²⁵ We in the United States have enjoyed the benefits of consuming more than our share of world resources, and in the course of doing so have produced carbon emissions harmful to less fortunate nations. As Posner and Weisbach say in their paraphrase of the opposing argument, "The upshot is a very ugly picture that depicts the citizens of wealthy countries . . . consuming wasteful goods such as SUVs and heated swimming pools over many decades, while people in the poorest countries have barely had enough to eat" (p. 99). At the same time that these activities have benefitted the richer countries, as Posner and Weisbach concede, "some countries . . . have imposed serious risks on others . . . [and] some nations, including those in Africa, face serious risks even though their own emissions [a]re trivial" (p. 101). Posner and Weisbach provide some useful correctives about waxing too self-righteously (or self-loathingly) about the blameworthiness of this conduct. But the fact

21. Roughly one-third of all the U.S. greenhouse emissions can be attributed to individual behavior by consumers. See Michael P. Vandenberg & Anne C. Steinemann, *The Carbon-Neutral Individual*, 82 N.Y.U. L. REV. 1673, 1694 (2007).

22. Dave Tilford, *Why Consumption Matters*, SIERRA CLUB, http://www.sierraclub.org/sustainable_consumption/tilford.asp (last visited Sept. 5, 2011). For additional information on sustainable consumption, see generally ECON. FOR EQUITY & ENV'T, <http://www.e3network.org/> (last visited Aug. 19, 2011); ORG. FOR ECON. COOPERATION & DEV., PROMOTING SUSTAINABLE CONSUMPTION: GOOD PRACTICES IN OECD COUNTRIES (2008), available at <http://www.oecd.org/dataoecd/1/59/40317373.pdf>; *Sustainable Consumption*, UNITED NATIONS ENV'T PROGRAMME, <http://www.unep.org/themes/consumption/index.asp> (last visited Sept. 5, 2011); *Sustainable Consumption*, WORLD ECON. FORUM, <http://www.weforum.org/en/initiatives/DrivingSustainableConsumption/index.htm> (last visited Sept. 5, 2011); UNIV. OF MANCHESTER SUSTAINABLE CONSUMPTION INST., <http://www.sci.manchester.ac.uk/> (last visited Sept. 5, 2011); and WORLD BUS. COUNCIL FOR SUSTAINABLE DEV., SUSTAINABLE CONSUMPTION FACTS & TRENDS FROM A BUSINESS PERSPECTIVE (2008), available at <http://www.wbcsd.org/pages/edocument/edocumentdetails.aspx?id=142&nosearchcontextkey=true>.

23. Tilford, *supra* note 22.

24. *Id.*

25. Unjust enrichment is, of course, a familiar concept in American law. See ELAINE W. SHOEN ET AL., REMEDIES 780–98 (4th ed. 2007).

remains that without consciously intending to do so we have benefitted handily at the expense of others.

Posner and Weisbach are right that responsibility for climate change does not fall neatly within the paradigm of direct individual responsibility. Individual Americans are clearly not responsible for the harm of climate change in the same way as a drunk driver is responsible for hitting a pedestrian. Climate change may not clearly fall into either the traditional understanding of blameworthy conduct or the traditional understanding of blameless conduct. But, as Douglas Kysar says, we may need to “try to build new frameworks for the analysis of justice, ones that are commensurate with the temporal and geographic scale of the problem.”²⁶

Posner and Weisbach do not seem entirely convinced by their argument that it is impossible to draw a link between excessive emissions by individual parties and damage to victims of climate change. They ultimately concede that it would be “plausible to understand corrective justice, in this domain, in probabilistic terms, with the thought that victims should receive . . . the fraction of their injury that is probabilistically connected with climate change” (p. 110). Similarly, although they spend several pages discussing the difficulty of precisely identifying wrongdoers and victims (pp. 111–16), they end up conceding that compensation could be considered on the “basis of a kind of rough justice in an imperfect world” (p. 116). They conclude finally that “it is inconceivable that a climate treaty would properly address a problem of corrective justice” (p. 117). But then they add a critical disclaimer: “unless, of course, the questionable premises of the rough justice argument are accepted” (p. 117).

Indeed, they admit that grievances by one nation against another often do “culminate in reparations, assistance, or apologies that are appropriate to the original wrong” (p. 117). The authors are then reduced to arguing that it is “just not realistic” to expect such complex problems to be addressed in a climate treaty, and they are obviously worried that compensation issues might disrupt the overall negotiations (p. 117). These practical concerns deserve the attention of negotiators but are irrelevant to the ethical validity of compensation claims. In an imperfect world we should not expect perfect justice, but this is hardly a reason to settle for no justice at all.

The real argument should be *how much* developed countries should be responsible for climate impacts, not whether they have *any* responsibility for compensation. Posner and Weisbach’s arguments are best taken as justifications for whittling down the amount of compensation rather than eliminating it entirely. Even relatively modest financial contributions to climate change adaptation or to assisting climate mitigation in developing countries could make a significant practical difference.

More significantly, although Posner and Weisbach reject the idea that causing climate change harm to our contemporaries gives rise to a duty of compensation, we will see in Part III that they do posit such a duty of compensation toward future generations. It is difficult to see why current

26. Kysar, *supra* note 14, at 52.

generations—whose lives overlap with our own life spans—should be entitled to less consideration than generations to be born in the future.

III. FUTURE GENERATIONS

Discounting is a part of cost-benefit analysis that converts future harms into current dollars. Essentially, discounting reverses the process of calculating compound interest to find the present day equivalent of some future cost or benefit.²⁷ As one economist remarks, discounting “forces us to say that what we might otherwise conceptualize as monumental events ‘do not much matter’ when they occur in future centuries or millennia.”²⁸ While they endorse discounting, Posner and Weisbach offer a proposal to reconcile its use with our moral intuitions.

Economists emphasize two explanations for discounting: money could be invested for a greater future return (the “opportunity cost of capital”) and people are impatient (“time preference”). The discount rate suggested by the impatience explanation—the so-called “social discount rate”—is substantially lower than the rate indicated by the opportunity cost of alternative investments.²⁹ Essentially, the cost of capital compares a future environmental benefit with the returns from other investments.

Money spent on environmental improvement might instead go into other investments. There is widespread agreement, even among critics of discounting, that these opportunity costs deserve consideration.³⁰ We might account for the loss of alternate investment opportunities by using the rate of return on alternate investments as the rate for discounting benefits.³¹ This actually provides a measure of opportunity cost only if the lost opportunity actually *is* an investment whose returns accrue in the same future year, a fact that is not always easy to determine.³²

Posner and Weisbach endorse an approach to discounting intended to combine elements of the hard-boiled approach, using the market rate of in-

27. See generally Geoffrey Heal, *Discounting: A Review of the Basic Economics*, 74 U. CHI. L. REV. 59 (2007) (providing a good overview of the complex economic issues raised by discounting).

28. Martin L. Weitzman, *Why the Far-Distant Future Should Be Discounted at Its Lowest Possible Rate*, 36 J. ENVTL. ECON. & MGMT. 201, 201 (1998).

29. In a world without taxes, the social discount rate and the opportunity cost theoretically should be the same. But the tax system drives a wedge between the two. See, e.g., Robert C. Lind, *A Primer on the Major Issues Relating to the Discount Rate for Evaluating National Energy Options*, in DISCOUNTING FOR TIME AND RISK IN ENERGY POLICY 21, 24–32 (Robert C. Lind et al. eds., 1982).

30. See Tyler Cowen & Derek Parfit, *Against the Social Discount Rate*, in JUSTICE BETWEEN AGE GROUPS AND GENERATIONS 144, 151–52 (Peter Laslett & James S. Fishkin eds., 1992).

31. See Edward R. Morrison, Comment, *Judicial Review of Discount Rates Used in Regulatory Cost-Benefit Analysis*, 65 U. CHI. L. REV. 1333, 1341–44 (1998).

32. See Lind, *supra* note 29, at 50–52.

terest, with a more ethics-oriented concern about future generations.³³ They agree that “choosing projects solely through cost-benefit analysis with discounting can result in serious injustice to the future and that we must respect the principle of intergenerational neutrality” by treating members of different generations as equals.³⁴ This may require that we engage in some projects that offer less than the market rate of return in order to maintain a sufficient legacy for future generations. But “we still must carefully consider the opportunity costs of projects and pick those with the highest rate of return” (p. 161). Market rates represent the opportunity cost of investment, so we should avoid choosing projects whose interest rates are markedly lower (p. 160). In short, we should exhaust the available investments at or near the market rate of return before accepting any projects with much lower rates of return (p. 160).

One problem with this argument is that climate change might have catastrophic effects on members of later generations that cannot be offset by increased savings. How seriously we take that argument will depend on how much weight we give to the possibility of such catastrophic outcomes. This issue will be discussed in the next section.

Another problem is that we actually have few, if any, alternative investment projects with payoff periods longer than a century. If such projects are not available, the opportunity cost of climate change mitigation projects is actually much lower (pp. 164–65). Posner and Weisbach have two responses. The first is another version of the fallacy of hypothetical alternatives. Posner and Weisbach do not identify projects that offer long-term returns equivalent to the market rate of interest (let alone projects at the same scale as climate change mitigation). Instead, they merely assert that “it is hard to imagine that there [are] not other projects” with a return closer to the market rate (p. 165). Thus, they argue that we should not adjust climate policy to protect the rights of future generations, even though they admit that (1) doing so means that we will commit an injustice to later generations, and (2) they have not identified any specific way of compensating those victims for the injustice. This is hardly a compelling argument.

Their second argument is that, although we may not be able to set aside investment funds many generations into the future, climate policy has the same problem, since later generations may decide to start using fossil fuels again (p. 165). This argument fails to acknowledge a fundamental difference in the economic dynamics of the two strategies.

33. This approach seems to derive from Louis Kaplow, *Discounting Dollars, Discounting Lives: Intergenerational Distributive Justice and Efficiency*, 74 U. CHI. L. REV. 79 (2007).

34. P. 159. Posner and Weisbach do not fully explain this claim, except to say that “[b]ecause of climate change, our legacy to our descendants seems to be far lower than we once thought. For that reason, we have a moral obligation to adjust.” P. 168. The assumption, although they do not develop it, seems to be that our prior legacy represents more than generosity toward future generations; it in some sense represents our moral sense of what those generations are due. Our moral stance regarding future generations is a complex issue that cannot be discussed here. It seems plausible to assume that justice may require at least some level of concern regarding the interests of later generations.

The financial investment strategy creates an escalating incentive to cheat. Suppose we create an investment trust to hold income for 200 years and then pay out to later generations, either by direct payment to individuals or using the money to offset tax decreases. Assuming the investments are successful, every year the trust is in existence the trust fund grows larger and the temptation to invade it becomes greater. Maintaining the investment strategy is like being on a diet where every day a larger and more enticing slice of chocolate cake is placed in front of you—the difference being that it is necessary to maintain the “diet” not only for years but for centuries.

In contrast, the temptation to return to the use of fossil fuels becomes smaller over time, so cheating becomes continually less likely. If fossil fuels are not allowed or are severely limited, there is a huge incentive to make renewable energy and energy conservation cheaper, so the economic incentive to use fossil fuels becomes smaller. Moreover, use of fossil fuels requires a huge investment in infrastructure—railroads to coal mines, new coal-burning power plants, oil refineries, oil supertankers, and so forth. After the existing infrastructure for fossil fuels decays, use of fossil fuels will be less appealing than at the present, when fossil fuels have the advantage of an existing infrastructure that has already been paid for. Thus, switching away from fossil fuels is like ending an addiction: very difficult at the beginning, but easier over time. Although there is no guarantee against a possible relapse, maintaining a multigenerational policy for a move away from fossil fuels is likely to provide fewer incentives for reversion than a massive investment trust.

In the end, Posner and Weisbach’s defense of market discounting is, like their rejection of redistributive and compensatory justice concerns, rather halfhearted. They admit that it is possible that climate policy “may include elements that redistribute to the future more effectively,” and they say that they are “agnostic” as to this possibility. If they are right to admit the possibility of using climate policy to redistribute to future generations, then an adjustment to the discount rate could serve this purpose. In any event, Posner and Weisbach contend that the applicable market rate for climate change discounting is very low for technical reasons.³⁵ Thus, their ultimate position may not be too different in practical effect from that of the opposing view among economists, which calls for very low rates for ethical reasons.³⁶

35. P. 152. The argument is based on uncertainty about future rates of return, which leads to a kind of averaging in which the possibility of low returns weighs more heavily than the possibility of high returns. Pp. 152–53. This argument derives from Weitzman, *supra* note 28.

36. Posner and Weisbach are correct, however, to reject arguments for giving up discounting altogether. See Daniel A. Farber, *From Here to Eternity: Environmental Law and Future Generations*, 2003 U. ILL. L. REV. 289 (arguing in favor of hyperbolic discounting at low rates).

IV. UNCERTAINTY AND CATASTROPHE, THE MISSING DIMENSIONS OF THE ANALYSIS

Posner and Weisbach use an “optimal climate treaty” as their benchmark, with the optimal treaty to be determined on the basis of economic analysis. Unfortunately, it is far from clear that the requisite economic analysis is possible. Climate change is a prime example of a problem with large downside risks that are not well understood. As Daniel Cole explains, the stumbling block is the “wide range of possible temperature increases . . . including a five-percent probability that temperature increases will equal or exceed 6 degrees Celsius and a two-percent probability of increases equal to or greater than 8 degrees Celsius within the next 100 to 200 years.”³⁷ Yet, without some clear understanding of the probability of various outcomes, assessing the probable costs of climate change (critical for cost-benefit analysis) does not seem possible.

The customary measure for how strongly the climate system responds to changes in the level of greenhouse gases is climate sensitivity. Climate sensitivity is measured as the equilibrium temperature increase caused by a permanent doubling of preindustrial carbon dioxide concentrations.³⁸ Studies based on historical climate data find that climate sensitivity is unlikely to be below 1.5 degrees Celsius. The upper bound, however, is more difficult to determine for technical reasons—it could exceed 4.5 degrees Celsius, although such high values are much less likely on the basis of the historical records for temperature and atmospheric carbon dioxide levels than those in the 1.5–3.5 degrees Celsius range.³⁹ A second line of research examines climate sensitivity in models predicting future climate change. The most frequent sensitivity values are around 3 degrees Celsius, but much higher values cannot be excluded.⁴⁰ Climate sensitivity is almost certainly greater than 1 degree Celsius, but there is between a 2 percent and a 20 percent chance that it exceeds 5 degrees Celsius.⁴¹ A five-degree rise may not sound like much, but it is “equivalent to the change in average temperatures from the last ice age to today.”⁴²

We can be highly confident about the existence of human-caused climate change and the likelihood that it will have serious effects. There is strong

37. Daniel H. Cole, *The Stern Review and Its Critics: Implications for the Theory and Practice of Benefit-Cost Analysis*, 48 NAT. RES. J. 53, 75 (2008). Feedback effects, such as methane releases triggered by temperature increases, threaten to accelerate temperature changes. See Katey Walter Anthony, *Methane: A Menace Surfaces*, SCI. AMER., Dec. 2009, at 69–70.

38. NICHOLAS STERN, *THE ECONOMICS OF CLIMATE CHANGE* 10–11 (2007).

39. Gerald A. Meehl et al., *Global Climate Projections*, in INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS* 747, 747–49, 800–01 (Susan Solomon et al. eds., 2007).

40. *Id.* at 799.

41. *Summary for Policy Makers*, in INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS*, *supra* note 39, at 1, 13.

42. STERN, *supra* note 38, at xvi (2007).

residual uncertainty, however, about the scale of climate change impacts, globally and regionally. Posner and Weisbach acknowledge this problem, observing that there is “a large amount of uncertainty about the impact of emissions” (p. 45), and that “[t]he risk of catastrophe, even if small, may drive policy decisions” (p. 88). As the Council of Economic Advisors wrote recently, “it is evident that policy based on the most likely outcomes may not adequately protect society because such estimates fail to reflect the harms at higher temperatures.”⁴³

Modeling the systemic economic impact of climate change and the costs of adaptation and mitigation involves tremendous challenges, particularly if the projection extends more than a few years.⁴⁴ An expert at the Congressional Research Service indicated that “[l]ong-term projections . . . should be viewed with skepticism. . . . The finer the detail, the greater the skepticism should be.”⁴⁵ Even the more confident economic modelers such as Nordhaus and Boyer admit that attempts to estimate the impacts of climate change continue to be highly “speculative.”⁴⁶

Outputs of various economic models are so far apart as to make it perilous to rely on any one model or even on a small subset of models. According to one reviewer, “Cost estimates of Kyoto emissions reductions diverge by a factor of about 500 (and not all estimates show an economic loss).”⁴⁷ In any event, estimates of mitigation costs must be taken with some skepticism, which makes it difficult to determine how much mitigation to require. Thus, it may not be possible to identify the “optimal treaty” that provides the benchmark for Posner and Weisbach’s conclusions.

The biggest wild card in economic analysis, though, may be the possibility of catastrophic climate change. Based on an analysis of reported studies, economist Martin Weitzman estimates that a “‘best guess’ estimate of the extreme bad tail” places the odds at about 5 percent of a temperature increase over 10 degrees Celsius (18 degrees Fahrenheit) and a 1 percent change of an increase of 20 degrees Celsius (36 degrees Fahrenheit).⁴⁸ As Weitzman explains, this rate of increase would be extraordinary:

43. U.S. COUNCIL OF ECON. ADVISORS, ANNUAL REPORT OF THE COUNCIL OF ECONOMIC ADVISORS 242 (2010).

44. See Jonathan S. Masur & Eric A. Posner, *Climate Regulation and the Limits of Cost-Benefit Analysis* 19–32 (Univ. of Chi. Pub. Legal Theory, Working Paper No. 525, 2010), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1662147.

45. Darren Samuelsohn, *Climate: Uncertain Economic Models Create Headaches for Senate Panel*, ENV’T & ENERGY DAILY, Oct. 14, 2009, available at <http://www.eenews.net/Greenwire/2009/10/14/archive/5?terms=Climate%3A+Uncertain+Economic+Models+Create+Headaches+for+Senate+Panel>.

46. E.g., WILLIAM D. NORDHAUS & JOSEPH BOYER, WARMING THE WORLD: ECONOMIC MODELS OF GLOBAL WARMING 86 (2000) (conditioning their model on the need for a “detailed inventory and valuation of climatically sensitive regions for validation”).

47. Philippe Tulkens & Henry Tulkens, *The White House and the Kyoto Protocol: Double Standards on Uncertainties and Their Consequence* 8 (Fondazione Eni Enrico Mattei, Working Paper No. 89, 2006), available at <http://ssrn.com/abstract=910811>.

48. Martin L. Weitzman, *On Modeling and Interpreting the Economics of Catastrophic Climate Change*, 91 REV. ECON. & STAT. 1, 1 (2009). Antony Millner provides an excellent

Societies and ecosystems in a world whose average temperature has changed in the geologically instantaneous time of two centuries or so [by these amounts] are located in *terra incognita*, since such high temperatures have not existed for hundreds of millions of years and such a rate of global temperature change might be unprecedented even on a timescale of billions of years.⁴⁹

Thus, “the planetary welfare effect of climate changes . . . implies a non-negligible probability of worldwide catastrophe.”⁵⁰ Or, as Posner and Weisbach put it, there is a “genuine risk of a truly catastrophic outcome—for example, significant increases in global temperatures and massive sea level rises that would change human life in terrible ways that are difficult to imagine” (pp. 1–2).

If climate change results in a drastic global threat to society, increasing the rate of savings is not likely to be a workable form of compensation to future generations. If areas of Africa or India face devastating droughts and famine, the dead cannot be comforted by increases in foreign aid. And if excessive carbon emissions in some countries cause devastation in others, it becomes harder to resist the conclusion that a wrong has been done, not merely an innocent spillover effect from the legitimate industrial activities of the more fortunate. Thus, the moral imperative to control emissions seems stronger than in the Posner and Weisbach model, where harm can always be fully offset through financial transfers.

When catastrophic impacts make offsetting transfers to future generations infeasible, discounting at the market level would lead to a lower-than-optimal level of emissions control. We can deal with this misfit between market discounts and optimum policy by making an ad hoc adjustment after performing the economic analysis to reflect our duties toward future generations. But there is a strong argument for making the adjustment through the discount rate instead. After all, the discount rate is the part of the analysis that most explicitly considers tradeoffs over time. Moreover, since the argument for using market rates depends on the availability of offsetting transfers, it would seem odd to continue to use the market rate even when the argument fails. Finally, the market rate itself might be very low (or even negative) if we anticipate catastrophic outcomes: capital investments made today will have poor returns if future catastrophes are in store, so the opportunity cost for investing in climate policy is very low.

review of the Weitzman view and its critics. See Antony Millner, On Welfare Frameworks and Catastrophic Climate Risks (Feb. 10, 2011) (unpublished manuscript), available at ssrn.com/abstract=1799481. Millner concludes that the primary lesson is the need to reconsider methods of assessing social welfare when catastrophic outcomes are possible. *Id.*

49. Weitzman, *supra* note 48, at 1. Even one critic of Weitzman concurs that “[m]any people would agree that a 5 percent chance of a 10° change, or a 1 percent chance of a 20° change, would be a catastrophic prospect for human societies.” William D. Nordhaus, *An Analysis of the Dismal Theorem* 10 (Coales Found., Discussion Paper No. 1686, 2009), available at <http://ssrn.com/abstracts=1330454>. Nordhaus contends, however, that the probabilities are lower. See *id.* at 10–12.

50. Weitzman, *supra* note 48, at 1.

CONCLUSION

In developing their arguments, Posner and Weisbach begin with a conventional economic analysis, which recommends the use of economically efficient regulations based on cost-benefit analysis coupled with cash payments or taxes to handle any concerns about the distribution of wealth. This analysis fits neatly with their recommendation of an optimal climate treaty coupled with foreign aid (to handle distributional issues with poor countries) and increased investment (to transfer funds to future generations harmed by climate change). The analysis separates the shape of the treaty from ethical concerns about the poor or future generations, and the idea of compensatory justice simply does not translate into the resulting framework.

Although this conventional analysis provides the main framework of their proposed approach to climate policy, Posner and Weisbach, to their credit, introduce a number of important qualifications to it. They agree that, as a matter of “rough justice,” the historic role of developed countries in emitting greenhouse gases “could serve as a factor in allocating greenhouse gas reductions,” although they resist this conclusion as an unwarranted imposition of collective responsibility (p. 116). They also agree that the benefits of climate change reduction should be funneled to nations that have taken the lead in controlling emissions (p. 133), which obviously means depriving the laggard nations of benefits they might otherwise receive. More generally, they say that as long as each country does at least as well from a climate agreement as it would from business as usual (globally unrestricted emissions growth), then ethical considerations should reallocate any additional benefits (p. 143). Finally, they agree that even an economically optimal climate treaty might be unjust to future generations (p. 154), although they recommend increasing other investments as a form of compensation rather than reducing carbon emissions further.

This Review suggests that ethical considerations should play an even greater role than Posner and Weisbach suggest. The injustice of causing harm to the poorest countries and future generations provides powerful arguments for stringent limitations on emissions or, where feasible, strenuous efforts to limit the human toll of climate impacts—and cash compensation for possible catastrophic harm may not be adequate even if feasible. To the extent that harmful climate change cannot be avoided, the rich countries that have contributed so much to emissions should provide funding for adaptation and mitigation efforts to reduce harm in the poorest countries.

These ethical concerns should be important considerations in formulating climate policy, not just second-order corrections to economic analysis. As compared with the typical economic focus exclusively on cost-benefit analysis, Posner and Weisbach move in the right direction, but they do not move far enough toward including ethical considerations in their analysis. In trying to free their discussion from ethical arguments, they risk the very breakdown in international dialogue that they hope to avoid.