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The Race to the Bottom and Federal Environmental Regulation: A Response to Critics

Richard L. Revesz*

Five years ago, I challenged the race-to-the-bottom rationale for allocating to the federal government responsibility over environmental regulation.¹ Last year, I criticized the manner in which the federal environmental statutes have dealt with the problem of interstate externalities.² In two more recent works, I have further extended my analysis of federalism and environmental regulation.³

In the past few months, articles by Kirsten Engel,⁴ Daniel Esty,⁵ Joshua Sarnoff,⁶ and Peter Swire⁷ have taken issue with

* Professor of Law, New York University School of Law. I am grateful for the comments of Lewis Kornhauser and Richard Stewart. The generous financial support of the Filomen D'Agostino and Max E. Greenberg Research Fund at the New York University School of Law is also gratefully acknowledged.

1. See Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race to the Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210 (1992).

2. See Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341 (1996).

3. See Richard L. Revesz, *Federalism and Environmental Regulation: A Normative Critique*, in *THE NEW FEDERALISM: CAN THE STATES BE TRUSTED?* 97 (John Ferejohn & Barry R. Weingast eds., 1997) [hereinafter Revesz, *A Normative Critique*]; Richard L. Revesz, *Federalism and Environmental Regulation: Lessons for the European Union and the International Community*, 83 VA. L. REV. 1331 (1997) [hereinafter Revesz, *Lessons for the European Union and the International Community*].

4. See Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is It "to the Bottom"?*, 48 HASTINGS L.J. 271 (1997).

5. See Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570 (1996).

6. See Joshua D. Sarnoff, *The Continuing Imperative (But Only from a National Perspective) for Federal Environmental Protection*, 7 DUKE ENVTL. L. & POL'Y F. 225 (1997).

7. See Peter P. Swire, *The Race to Laxity and the Race to Undesirability: Explaining Failures in Competition Among Jurisdictions in Environmental Law*, 14 YALE J. ON REG. 67 (1996).

my work in this area, particularly with my indictment of the race-to-the-bottom rationale for federal environmental regulation. In this essay, I respond to these critics, hoping that the ensuing debate will help to clarify a set of issues that has considerable public policy significance.

I. MY APPROACH

Before responding to the arguments raised by my critics, I set forth briefly the main components of my approach to the analysis of the allocation of responsibility over environmental regulation between the federal government and the states.

A. A PRESUMPTION IN FAVOR OF DECENTRALIZATION

My starting point is a rebuttable presumption in favor of decentralization.⁸ This presumption rests on three independent grounds.⁹ First, our country is large and diverse; it is therefore likely that different regions have different preferences for environmental protection. Environmental protection addresses an important resource-allocation question: as a society we can generally purchase additional environmental protection at some price, paid in the currency of jobs, wages, shareholders' profits, tax revenues, and economic growth. Given the existence of the states as plausible regulatory units, the tradeoffs reflecting the preferences of citizens of different regions should not be wholly disregarded in the regulatory process, absent strong reasons for doing so.

In the case of some social decisions such reasons are present. The example of federal civil rights legislation, which trumped deeply held preferences of a large region of the country, is perhaps most prominent. But while I am sympathetic to the argument that the protection of a minimum level of public health ought to be viewed in quasi-constitutional terms and guaranteed throughout the country, as I explain below, it would stretch this principle beyond its breaking point to say that it calls for the federalization of every decision having public health consequences.¹⁰

Second, the benefits of environmental protection also vary throughout the country. For example, a stringent ambient standard may benefit many people in densely populated areas

8. See Revesz, *supra* note 1.

9. See Revesz, *A Normative Critique*, *supra* note 3.

10. See *infra* Part I.E.4.

but only a few elsewhere. Similarly, a particular level of exposure to a contaminant may be more detrimental if it is combined with exposure to other contaminants with which it has synergistic effects.¹¹

Third, the costs of meeting a given standard also differ across geographic regions. For example, a source may have a large detrimental impact on ambient air quality if it is directly upwind from a mountain or other topographical barrier. Similarly, a water polluter will have a far larger impact on water quality standards if it disposes its effluents in relatively small bodies of water. Climate might also play a role: certain emission or effluent standards may be easier (and cheaper) to meet in warmer weather.¹²

In principle, federal regulation could be attentive to these differences. Such a differentiated approach, however, would require a staggering amount of information. Clearly, the federal government does not have a comparative advantage at gathering such information. Thus, not surprisingly, federal regulation generally imposes uniform requirements throughout the country. Moreover, even when federal regulation imposes disuniform standards, the differences are not explainable by the factors discussed above.¹³

This presumption for decentralization should be overcome, however, if there is a systemic evil in letting states decide the level of environmental protection that will apply within their jurisdictions. In my work, I have explored in detail the two most prominent justifications for vesting responsibility over environmental regulation at the federal level: that interstate competition over environmental standards would result in a

11. See James E. Krier, *On the Topology of Uniform Environmental Standards in a Federal System—And Why It Matters*, 54 MD. L. REV. 1226 (1995); James E. Krier, *The Irrational National Air Quality Standards: Macro- and Micro-Mistakes*, 22 UCLA L. REV. 323 (1974).

12. See *Chemical Mfrs. Ass'n v. EPA*, 870 F.2d 177 (5th Cir. 1989), cert. denied, 495 U.S. 910 (1990); *Tanners' Council, Inc. v. Train*, 540 F.2d 1188 (4th Cir. 1976); *American Frozen Food Inst. v. Train*, 539 F.2d 107 (D.C. Cir. 1976); *Hooker Chem. & Plastics Corp. v. Train*, 537 F.2d 639 (2d Cir. 1976).

13. For example, the Clean Air Act imposes disuniform ambient standards, determined by whether an area is covered by the Prevention of Significant Deterioration (PSD) or nonattainment programs. 42 U.S.C. §§ 7473, 7502, 7503(1)(A) (1994). These differences turn on what ambient air quality standards regions had at a particular time, rather than differences in preferences, benefits, or costs. See *Revesz supra* note 2, at 2347-49.

"race to the bottom,"¹⁴ and that federal regulation is necessary to prevent interstate externalities.¹⁵

The race-to-the-bottom rationale posits that states will try to induce geographically mobile firms to locate within their jurisdictions, in order to benefit from additional jobs and tax revenues, by offering them suboptimally lax environmental standards. The problem of interstate externalities arises because a state that sends pollution to another state obtains the labor and fiscal benefits of the economic activity that generates the pollution but does not suffer the full costs of the activity. Under these conditions, economic theory maintains that an undesirably large amount of pollution will cross state lines.

So far, my work has dealt only in passing with a third prominent justification—that as a result of public choice problems, state political processes will systematically undervalue the benefits of environmental protection or overvalue its costs, whereas at the federal level the calculus is more accurate. A public choice analysis of the problem of environmental regulation in a federal system is next on my research agenda.

B. THE RACE-TO-THE-BOTTOM JUSTIFICATION

My argument attacking the race-to-the-bottom justification proceeds in four steps.¹⁶ I start by pointing out that when states compete for industry through environmental standards, they are competing for the sale of a good: the right to locate within their jurisdictions. If competition for the sale of most goods is generally good, why should competition for the sale of this good be clearly bad? I show, moreover, why possible distinctions between a state as seller of location rights and sellers of traditional consumer products do not provide support for race-to-the-bottom claims.

Second, I analyze the leading economic model of the effects of interstate competition on the choice of environmental standards, which shows that interjurisdictional competition leads to the maximization of social welfare, rather than to a race to the bottom. In this model, Wallace Oates and Robert Schwab posit jurisdictions that compete for mobile capital through the

14. See Revesz, *supra* note 1.

15. See Revesz, *supra* note 2.

16. See Revesz, *A Normative Critique*, *supra* note 3, at 99-107; Revesz, *supra* note 1, at 1233-44.

choice of taxes and environmental standards.¹⁷ A higher capital stock benefits residents in the form of higher wages, but hurts them as a result of the foregone tax revenues and lower environmental quality needed to attract the capital.

Each jurisdiction makes two policy decisions: it sets a tax rate on capital and establishes an environmental standard. Professors Oates and Schwab show that competitive jurisdictions will set a net tax rate on capital of zero (the rate that exactly covers the cost of public services provided to the capital, such as police and fire protection). In turn, competitive jurisdictions will set an environmental standard that is defined by equating the willingness to pay for an additional unit of environmental quality with the corresponding change in wages. Professors Oates and Schwab show that these choices of tax rates and environmental standards are socially optimal.¹⁸

Third, I acknowledge that, in particular instances, game-theoretic interactions among the states could lead to underregulation absent federal intervention. In such cases, federal minimum standards would be desirable. But it is equally plausible that in other instances the reverse would be true: that game-theoretic interactions among the states would lead to overregulation absent federal intervention.¹⁹ In such cases, federal regulation would be desirable as well, but in such cases federal *maximum* standards would be called for. Accordingly, there is no compelling race-to-the-bottom justification for across-the-board federal minimum standards, which are the cornerstone of federal environmental law. For example, if an industry exhibits increasing returns to scale rather than constant returns to scale (an important assumption in the Oates and Schwab model), depending on the levels of firm-specific costs, plant-specific costs, and transportation costs, interstate competition can produce either suboptimally lax or suboptimally stringent levels of pollution. Similarly, if a firm has market power enabling it to affect prices, it will be able to extract a suboptimally lax standard, but if a state has market power the reverse would be true.

17. Wallace E. Oates & Robert M. Schwab, *Economic Competition Among Jurisdictions: Efficiency Enhancing or Distortion Inducing?*, 35 J. PUB. ECON. 333, 336 (1988).

18. See *id.* at 342.

19. See Revesz, *A Normative Critique*, *supra* note 3, at 104-05; Revesz, *supra* note 1, at 1241-42.

Fourth, I argue that even if states systematically enacted suboptimally lax environmental standards, federal environmental regulation would not necessarily improve the situation. If states cannot compete over environmental regulation because it has been federalized, they will compete along other regulatory dimensions, leading to suboptimally lax standards in other areas, or along the fiscal dimension, leading to the underprovision of public goods. Thus, the reduction in social welfare implicit in race-to-the-bottom arguments would not be eliminated merely by federalizing environmental regulation: the federalization of all regulatory and fiscal decisions would be necessary to solve the problem.

C. THE INTERSTATE EXTERNALITY JUSTIFICATION

With respect to the interstate externality justification for federal environmental regulation, four features of my argument are worth emphasizing.²⁰ First, the presence of interstate externalities provides a compelling argument for federal regulation under conditions in which Coasian bargaining is unlikely to occur. Particularly with respect to air pollution, transaction costs are likely to be sufficiently high to prevent the formation of interstate compacts. It is difficult for such compacts to emerge in the absence of a clearly defined baseline concerning when upwind states have the right to send pollution downwind and in the absence of generally accepted mathematical models for translating a source's emissions into a quantity of ambient air quality degradation at all the places at which the emissions affect ambient air quality. Moreover, for different pollution sources, the range of affected states will vary; this shifting membership among the participants at the bargaining table makes it less likely that the emergence of conditions favoring cooperation will occur.²¹

Second, the fact that interstate externalities provide a compelling justification for intervention does not mean that all federal environmental regulation can be justified on these grounds. For environmental problems such as the control of drinking water quality, there are virtually no interstate pollution externalities; the effects are almost exclusively local. Even with respect to problems for which there are interstate exter-

20. See Revesz, *A Normative Critique*, *supra* note 3, at 107-20; Revesz, *supra* note 2, at 2346-74.

21. See Revesz, *supra* note 2, at 2375 & n.123.

nalities, such as air pollution, the rationale calls only for a response specific to the problem. This may include a limit on the amount of pollution that can cross state lines, rather than across-the-board federal regulation.²²

Third, the environmental statutes have been an ineffective response to the problem of interstate externalities. For example, the core of the Clean Air Act—the statute designed to deal with the pollution that gives rise to the most serious problems of interstate externalities—consists of a series of federally prescribed ambient standards and emission standards.²³ The federal emission standards do not effectively combat the problem of interstate externalities because they do not regulate the number of sources within a state or the location of the sources. Similarly, the various federal ambient air quality standards are not well-targeted to address the problem of interstate externalities. They are overinclusive because they require a state to restrict pollution that has only in-state consequences. But they are also underinclusive because a state could meet the applicable ambient standards but nonetheless export a great deal of pollution to downwind states (through tall stacks or a location near the interstate border). In fact, a state might meet its ambient standards precisely because it exports a large proportion of its pollution.

Fourth, in some ways the federal environmental statutes have exacerbated, rather than ameliorated, the problem of interstate externalities. Again, in the context of the Clean Air Act, the federal ambient standards give states an incentive to encourage sources within their jurisdiction to use taller stacks. In this way, states can externalize not only the health and environmental effects of the pollution but also the regulatory costs of complying with the federal ambient standards. Thus, not surprisingly, the use of tall stacks expanded considerably after the passage of the Clean Air Act in 1970. In 1970, only two stacks in the United States were higher than 500 feet. By 1985, more than 180 stacks were higher than 500 feet and

22. See Revesz, *supra* note 1, at 1222-23 (noting that the distinction between race-to-the-bottom and interstate externality rationales is essential for determining the scope of federal regulation).

23. See 42 U.S.C. § 7409 (1994) (national ambient air quality standards); *id.* § 7411 (emission standards for new sources); see also Revesz, *supra* note 1, at 1225. Ambient standards prescribe maximum permissible concentration of pollutants in air, but do not directly constrain the behavior of individual polluters. Emission standards, in contrast, impose enforceable limitations on individual sources. See *id.*

twenty-three were higher than 1000 feet. While this method of externalizing pollution is now less of a problem as a result of stack height regulations that followed the 1977 amendments to the Clean Air Act, tall stacks remain a means by which excessive pollution can be sent to downwind states.

D. THE PUBLIC CHOICE JUSTIFICATION

As indicated above, I have not yet tackled in any comprehensive way the public choice analysis of issues concerning federalism and environmental regulation. I have taken a somewhat skeptical view, however, of the assertion, largely undefended in the legal literature, that federal regulation is necessary to correct for the systematic underprotection of environmental quality at the state level.²⁴

First, it is not enough to say that state political processes undervalue the benefits of environmental regulation, or overvalue the corresponding costs. Federal regulation is justifiable only if the outcome at the federal level is socially more desirable, either because there is less underregulation or because any overregulation leads to smaller social welfare losses.

Second, given the standard public choice argument for federal environmental regulation, it is not clear why the problems observed at the state level would not be replicated at the federal level. The logic of collective action would suggest that the large number of citizen-breathers, each with a relatively small stake in the outcome of a particular standard-setting proceeding, will be overwhelmed in the political process by concentrated industrial interests with a large stake in the outcome. But this problem could occur at the federal level as well as at the state level. In fact, the logic of collective action makes it difficult to explain why there is any federal regulation at all.

Third, an extensive public choice literature suggests that impetus for environmental regulation sometimes comes, implicitly or explicitly, from the regulated firms themselves, which can obtain rents and barriers to entry that give them an advantage over their competitors.²⁵ At other times, particular

24. See Revesz, *A Normative Critique*, *supra* note 3, at 124-25.

25. See Nathaniel O. Keohane, Richard L. Revesz & Robert N. Stavins, *The Positive Political Economy of Instrument Choice in Environmental Policy*, in ENVIRONMENTAL ECONOMICS AND PUBLIC POLICY: ESSAYS IN HONOR OF WALLACE OATES (Paul Portney & Robert Schwab eds., forthcoming).

regions of the country advocate a federal role, hoping to obtain a comparative advantage over other regions.²⁶

When the relevant interactions are seen in this manner, the case for federal regulation on public choice grounds is considerably weakened. A more definitive conclusion, however, must await further sustained analysis.

E. TOWARD DESIRABLE FEDERAL INTERVENTION

The preceding discussion shows why the three principal justifications for federal intervention are unlikely to justify a large-scale displacement of state authority. Nonetheless, there is an important role for federal intervention to correct various pathologies that otherwise would result.²⁷

1. Interstate Externalities: The preceding discussion has focused on pollution externalities, principally air pollution that crosses state lines, and has shown why the existence of such externalities provides a compelling reason for federal regulation. Other externalities that merit federal regulation arise with respect to different environmental problems. For example, to the extent that certain endangered species are located in a particular state, the costs of protection are largely concentrated in that state. The benefits of preservation, however, accrue nationally, or, for that matter, globally.

Similarly, out-of-state citizens place value on the existence of certain natural resources—even resources that they never plan to use. Such existence, or non-use, values provide a powerful justification for federal control over exceptional natural resources such as national parks.

2. Economies of Scale: Advocates of federal regulation often maintain, though without much empirical support, that centralization has strong economies of scale advantages. The economies-of-scale argument is most plausible in the early stages of the regulatory process, particularly with respect to the determination of the adverse effects of particular pollutants through risk assessment. Indeed, there is little reason for this determination to be replicated by each state.

The force of the rationale, however, is far less compelling at the standard-setting phase. At this stage, not only are the savings from eliminating duplication of efforts likely to be

26. See B. Peter Pashigian, *Environmental Regulation: Whose Self-Interests Are Being Protected?*, 23 *ECON. INQUIRY* 551 (1985).

27. See Revesz, *A Normative Critique*, *supra* note 3, at 121-24.

much lower, but centralization will have serious social costs as a result of the difficulty of setting standards that are responsive to the preferences and physical conditions of different regions.²⁸

3. *Uniformity*: As previously discussed, federal environmental standards are generally minimum standards. The states remain free to impose more stringent standards if they wish. Some standards that apply to pesticides and mobile sources,²⁹ such as automobiles, however, act as both floors and ceilings: they preempt both more stringent and less stringent state standards. Uniformity of this sort can be desirable for products with important economies of scale in production. In such cases, disparate regulation would break up the national market for the product and be costly in terms of foregone economies of scale.

The benefits of uniformity, however, are less compelling in the case of process standards, which govern the environmental consequences of the manner in which goods are produced rather than the consequences of the products themselves. Indeed, unlike the case of dissimilar product standards, there can be a well functioning common market regardless of the process standards governing the manufacture of the products traded in the market.

4. *Protection of Minimum Levels of Public Health*: There is a powerful notion, informed in part by constitutional considerations, that a federal polity should ensure all its citizens a minimum level of environmental protection.³⁰ At some level, this justification is compelling. A minimum level of health ought to count as a basic human right, in the same manner as minimum levels of education, housing, or access to employment.

There are two major problems, however, with justifying federal environmental regulation in this manner. First, for understandable reasons of administrative practicality, federal environmental regulation seeks to limit the risk of exposure to particular pollutants or sources of pollutants, rather than to limit aggregate levels of environmental risk. As a result, such

28. See *supra* text accompanying notes 9-12.

29. See 7 U.S.C. § 136(u) (1994) (pesticides); 42 U.S.C. § 7416 (1994) (mobile sources).

30. Some federal role with respect to environmental regulation might also be justified by the federal government's responsibility to implement obligations flowing from international treaties.

regulation is both overinclusive (it regulates more than that which has a claim to quasi-constitutional legitimacy) and underinclusive (it makes no effort to determine aggregate exposure levels; therefore, some individuals may in fact be less protected than the minimum). Second, because environmental risks are only one component of health risks, it is difficult to understand why the federal government should have such a preeminent role in environmental regulation when it does relatively little with respect to the provision of general health care. In fact, investments in preventive measures such as immunizations or prenatal care would have a far larger impact on health than investments in environmental regulation.

Thus, the justification for federal regulation based on the need to guarantee a minimum level of health calls for a radically different form of regulation than that currently in effect. It demands an approach that focuses on the aggregate of environmental health risks and the interactions between environmental health risks and other health risks.

II. A RESPONSE TO CRITICS

Despite the daunting length of the work of my four critics,³¹ relatively few analytical disagreements separate us. This Part proceeds by categorizing the major areas of dispute and responding to the relevant arguments for each area.

A. COMMINGLING THE ARGUMENTS FOR CENTRALIZATION

In my work, I have been careful to distinguish among race-to-the-bottom, interstate externality, and public choice arguments for federal intervention. I have shown that each of these problems is analytically distinct and can arise without the presence of the others.³²

My goal has been not only to promote analytical clarity, but also to determine the appropriate federal response. For example, a systemic public choice problem at the state level would call for across-the-board federal intervention, though only if the problem was likely to be less serious at the federal

31. My critics' works total approximately 350 pages in length, ten times the length of my original race-to-the-bottom article on which they primarily focus.

32. See Revesz, *A Normative Critique*, *supra* note 3, at 98-99; Revesz, *supra* note 2, at 2343 & n.2; Revesz, *supra* note 1, at 1222-24.

level.³³ A pervasive race-to-the-bottom problem would justify federal environmental regulation of all firms with geographic mobility, with the goal of preventing destructive interstate competition.³⁴ In contrast, an interstate externality problem would call for a far more targeted approach, designed to eliminate the externality without displacing a jurisdiction's ability to choose the levels of environmental protection best suited to its particular characteristics.³⁵

Professor Esty repeatedly conflates these three concepts. For example, he states: "From a policy perspective, the key question is not whether, theoretically, we could design a world without races to the bottom, but whether we now live in one. Interstate pollution spill overs are pervasive, as are public choice distortions of the political process."³⁶ He appears dismissive of any attempts to keep the arguments as analytically distinct:

Revesz could argue that the inefficiency arises here not because of regulatory competition [a race-to-the-bottom issue] but rather because of public choice failures. As a matter of pure theory, this might be correct, but to ignore the realities of the political marketplace reduces the strength of any policy conclusions that might be drawn from such theorizing.³⁷

Obviously, if there are interstate spillovers, one should fashion a federal regulatory response that properly addresses them. Similarly, if there are public choice problems at the state level, one should ask whether they would be less serious at the federal level. Nothing, however, is gained, and a great deal of analytical clarity is lost, by invoking the race-to-the-bottom label whenever some other pathology is present.³⁸

33. See *supra* Part I.D.

34. See Revesz, *supra* note 1, at 1224.

35. See *supra* Part I.C.

36. Esty, *supra* note 5, at 637. Professor Esty also notes that "the assumption of perfect information that undergirds perfect competition theories cannot be squared with the reality of environmental policymaking," which includes factors such as "the natural political tendency to discount unknown and uncertain future harms." *Id.* at 631-32. Similarly, he argues: "It is the very prospect of systematic undervaluation of environmental benefits by politicians that renders the analogy to a perfectly competitive market inapt." *Id.* at 633 n.233.

37. *Id.* at 633 n.237.

38. The existence of one type of problem, however, can exacerbate another problem.

B. CHALLENGING THE PRESUMPTION IN FAVOR OF DECENTRALIZATION

Professor Esty's primary complaint about my work appears to center around my presumption for decentralization.³⁹ He complains that I "go so far as to argue that decentralized regulation should be considered 'presumptively beneficial.'"⁴⁰

Professor Esty attempts to challenge this presumption by noting that states act strategically in competing for industry, and that as a result, interstate competition will not be welfare-enhancing.⁴¹ As set forth above, I explain in my own work that in some cases states will engage in game-theoretic interactions that will be welfare decreasing, but I also stress that these interactions could lead to overregulation as well as underregulation.⁴² But this possibility does not cast a cloud on the presumption for decentralization.

The structure of my argument is reasonably straightforward. The presumption for decentralization rests on three important regional differences in our country: differences in preferences over environmental protection, as well as differences in benefits and costs of such protection.⁴³ This presumption, however, can be rebutted if market failures or other pathologies would result from interstate competition.⁴⁴ Then, one would have to evaluate, without the benefit of any presumption, whether the social-welfare benefits that would come from fed-

39. See *supra* Part I.A.

40. Esty, *supra* note 5, at 572. Professor Esty states that the argument that "decentralized regulation should be considered 'presumptively beneficial,'" *id.* at 572, is "provocatively stark," *id.* at 573 n.9. He adds: "Revesz . . . makes the additional leap to a policy prescription presumptively favoring decentralized regulation. It is here that his logic most seriously falters." *Id.* at 636. Professor Esty also notes that "the goal of giving people control over their own environmental destinies provides no basis for a sweeping presumption in favor of decentralized environmental decision making." *Id.* at 648.

41. Professor Esty asserts: "Revesz asks rhetorically: 'If one believes that competition among sellers of widgets is socially desirable, why is competition among sellers of location rights socially undesirable?' The answer to this question is straightforward: states act strategically." *Id.* at 630; see also *id.* at 634 ("The conclusion that I draw is a modest one: the scope for failure in the market for environmental-policy-determined location rights is significant enough to make untenable a presumption that regulatory competition in this domain will be welfare enhancing.").

42. See *supra* text accompanying note 19.

43. See *supra* text accompanying notes 8-12. Professor Esty does not appear to take issue with the presence of such regional differences. See Esty, *supra* note 5, at 647-48.

44. See *supra* text accompanying notes 14-15.

eral regulation are greater than the losses that would result from a centralized regulatory regime.

Thus, the belief that game-theoretic interactions among the states consistently lead to social-welfare losses is not a reason to reject either my analytical framework or my arguments in favor of a presumption for decentralization. Instead, one might simply say that the presumption is rebutted by the presence of this market failure.

At times, it appears that Professor Esty misunderstands my analytical framework. Referring to my article on interstate externalities, he states that I "seem[] to have begun to back away from [my] position" concerning the presumption for decentralization.⁴⁵ Since that article does not discuss such a presumption at all, Professor Esty must have reached his conclusion on the basis of my discussion about why interstate externalities provide a compelling argument for federal regulation.⁴⁶ That discussion, however, merely implies that the presumption should be rebutted when pollution problems have interjurisdictional consequences.

Of course, Professor Esty is entitled to develop his own analytical framework, rather than to react to mine. Since he does not offer such a framework himself, I speculate on what an approach consistent with his positions might look like. Whereas the regional differences across the country form the starting point for my analysis, his starting point could be the market failure resulting from interstate competition. Then, he could ask whether the presence of regional differences calling for differentiated standards ought to lead to a rebuttal of his presumption for centralized regulation.⁴⁷ In the case of an affirmative answer, he could weigh which policy would lead to smaller social welfare losses.⁴⁸ In fact, at times he does apply such a balancing test.⁴⁹

45. See Esty, *supra* note 5, at 573 n.9.

46. See *supra* Part I.C.

47. Professor Esty acknowledges that benefits to decentralization exist. See Esty, *supra* note 5, at 606-07. In fact, he premises his discussion of what he calls "internalities," *id.* at 587-90, on the notion that welfare losses occur when local preferences diverge from those of the broader jurisdiction, *id.* at 589 n.54.

48. Professor Esty acknowledges that "the welfare losses from less accurate centralized representation can be serious." *Id.* at 647.

49. See, e.g., *id.* at 652 ("Devolution will help to improve environmental policymaking if it better aligns public values and regulatory outcomes, but the welfare losses from creating new interjurisdictional externalities and exposing

To be sure, the two frameworks differ in terms of the evidentiary burdens they impose. But evidentiary issues do not play a significant role in either Professor Esty's approach or in mine. Thus, as a practical matter it is unlikely that a great deal would turn on which framework one chooses.

In sum, Professor Esty obviously disagrees with me concerning the implications of game-theoretic interactions among the states (an issue to which I will return⁵⁰). But despite his many conclusory assertions, Professor Esty does not advance any sustained argument for criticizing my use of the presumption for decentralization, and does not offer an alternative analytical framework.

C. REHABILITATING THE RACE TO THE BOTTOM

To their credit, my critics do not attempt to resurrect the simple-minded, unqualified race-to-the-bottom argument that had been part of the accepted wisdom among legal academics when I was a law student, and which I repeated for a few years after I started teaching. Instead, in each case, the arguments for rehabilitating the race-to-the-bottom justification for federal environmental regulation are more sophisticated.⁵¹

1. Perfect Versus Imperfect Competition

Professor Engel argues that the assumption of perfect competition, which undergirds the Oates and Schwab model, is inapposite to the case of competition among states for mobile

the technical incapacity of many decentralized governmental units may overwhelm any representativeness gains obtained." He adds: "Sometimes, the externalities corrected will be relatively small in comparison to the representativeness losses incurred by moving to a higher level of government. In other cases, regulatory failures . . . will outweigh the gains obtained by correcting a jurisdictional externality." *Id.* at 653.

50. See *infra* Part II.C.2.

51. Susan Rose-Ackerman, *Environmental Policy and Federal Structure: A Comparison of the United States and Germany*, 47 VAND. L. REV. 1587 (1994), presents an interesting example. She examines the situation in which one state levies a tax on those who generate loud noises whereas another state imposes an *ex ante* standard. The firm will prefer to locate in the latter state even though, from an efficiency perspective, it should be indifferent between the two. See *id.* at 1592-93. What is driving this result is the net revenue that the former state receives under the tax scheme, rather than differential noise levels. Her observation that interstate competition will affect states' taxing abilities is generally consistent with the analysis in the model by Professors Baumol and Oates that interstate competition will lead to under-regulation if states choose positive net tax rates. See *infra* text accompanying notes 64-65.

capital. In my work, I pointed out that under certain circumstances interstate competition will depart from the social optimum achieved under perfect competition (and that in those circumstances the result could be either overregulation or underregulation).⁵² Professor Esty, however, appears to believe that the model of perfect competition is *never* appropriate. Professor Esty argues:

Unlike firms in perfect competition, states in their regulatory mode are not pure price takers. They cannot ignore the fact that a slight reduction in environmental standards (the price of their location rights) might bring economic welfare gains in excess of any losses from the resulting environmental degradation. In contrast, perfectly competitive firms face no such incentive because they can sell any quantity that they choose at the market-clearing price.⁵³

Consider the functioning of a competitive market for, say, widgets. The market-clearing price will be determined by the intersection of the aggregate supply and the aggregate demand functions. Individual producers, who cannot affect this market price, must decide the quantity that they want to sell at this price. Each such firm will produce up to the point at which its marginal cost (the cost of an additional unit of production) equals the market-clearing price.

What would happen if the firm attempted to sell at less than the competitive price? Obviously, it would attract more potential customers; in fact, every buyer in the market would want to purchase from this firm. However, if the firm's cost function is convex (a necessary assumption for the functioning of competitive markets), the firm would choose to sell less, rather than more, at this lower price. A convex cost function implies that additional units become progressively more expensive to produce. Thus, there will be units that the firm could have produced at the competitive price but that it cannot produce at an infracompetitive price.

Moreover, the firm will be worse off selling at an infracompetitive price. As indicated above, there are units that it could have sold at a profit at the competitive price but that it will not

52. See *supra* text accompanying note 19.

53. Esty, *supra* note 5, at 630-31. Professor Esty complains that my race-to-the-bottom article takes inconsistent positions: "[W]hile much of the early part . . . focuses on the environmental policy challenges as a prisoner's dilemma and implies strategic behavior and imperfect competition, he then shifts abruptly to a discussion of regulatory competition." *Id.* at 630 n.222. In contrast, Professor Engel rightly recognizes that my purpose in the early part of the article is "to illustrate the approach he then goes on to oppose." Engel, *supra* note 4, at 298 n.73.

produce (and on which it will not make a profit) at an infra-competitive price.

The conclusion would be different, however, if the market-clearing price were a supracompetitive price arising from collusion among the sellers, rather than the competitive price. Then, a firm could indeed increase its profits by expanding its production and selling at less than what had previously been the market-clearing price. The additional profits that the firm received from the additional units that it produced would be greater than the loss of profits resulting from charging a lower price.

The analysis would be no different for a market in location rights. Thus, when Professor Esty asserts that states can obtain net social welfare gains if they reduce their environmental standards below the market-clearing level he must be implicitly assuming that there is collusion among the states, as sellers of location rights, to charge supracompetitive prices.

Professor Esty adduces no evidence showing why the market for location rights might behave this way. But if the market in location rights in fact produced supracompetitive prices (in the form of suboptimally stringent environmental standards), the correct federal policy would be federal ceilings (in the form of maximum standards), which would preempt more stringent state standards. Such a policy would be the precise opposite of the status quo that Professor Esty is attempting to justify, which consists of federal floors (federal minimum standards) that preempt less stringent state standards.⁵⁴

2. Direction of the Race

The primary goal of Professors Engel and Esty appears to be to defend the status quo of federal regulation against arguments in favor of decentralization.⁵⁵ They argue extensively that, as a result of game-theoretic interactions among the states, interstate competition might not lead to the maximization of social welfare. Their theoretical arguments fail to show, however, that the result would be underregulation rather than overregulation.⁵⁶ Thus, their policy prescription—support for

54. See *infra* Part II.C.2.

55. See Engel, *supra* note 4, at 374-75; Esty, *supra* note 5, at 570-71.

56. See *infra* Part II.C.3.

federal minimum standards—does not fit their diagnosis of the problem.⁵⁷

For example, Professor Esty relies on the recent studies, discussed above,⁵⁸ which show that for an industry that exhibits increasing returns to scale, rather than constant returns to scale, interstate competition will not lead to the maximization of social welfare.⁵⁹ But as I previously explained, depending on the structure of various cost functions, suboptimality could result in standards that are either too lax or too stringent.⁶⁰ Professor Esty has made no attempt to argue that the cost functions that lead to underregulation are more likely than the cost functions that lead to overregulation.

Professor Esty also makes inconsistent arguments with respect to the direction of the race. The Oates and Schwab model predicts that if states set a positive net tax rate on capital (a rate higher than that needed to cover the cost of public services provided to the capital), they will choose environmental standards that are suboptimally lax. Professor Esty refers to “the pervasiveness of positive tax rates on capital,”⁶¹ thus implying that interstate competition would produce a race to the bottom. He does not provide any support, however, for his assertion concerning the structure of tax rates, and the evidence on this question is mixed.⁶²

In fact, elsewhere in his article, Professor Esty refers to the fact that there may be a winner’s curse on the part of states bidding for investment under which the states that “win” the competition to attract firms are those that give the firms excessive concessions in the form of suboptimally lax environmental standards.⁶³ If there is indeed such a curse, an obvious

57. See *supra* text accompanying note 55.

58. See *supra* p. 539.

59. See Esty, *supra* note 5, at 631 & nn.224-25.

60. See *supra* text accompanying note 19.

61. See Esty, *supra* note 5, at 635. In fact, Professor Esty states that my initial race-to-the-bottom article “recogniz[es]” this pervasiveness. *Id.* However, I state explicitly that the evidence of whether net tax rates are positive or negative is mixed. See Revesz, *A Normative Critique*, *supra* note 3, at 104 & n.6 (“There is no consensus in the academic literature on whether, on average, states and localities tax or subsidize capital”); Revesz, *supra* note 1, at 1244 (“There is extensive literature on whether local property taxes are nondistortionary benefit taxes . . . or, whether, instead, they are distortionary taxes on capital [N]either the theoretical nor the empirical work points clearly in one direction.”).

62. See *supra* note 61.

63. See Esty, *supra* note 5, at 632. Professor Swire alludes to this issue as

possibility is that states would give firms important tax breaks,⁶⁴ resulting, presumably, in negative tax rates on capital. Then, under the Oates and Schwab model, interstate competition would lead to suboptimally stringent standards.⁶⁵

Professor Engel acknowledges explicitly that when interstate competition leads to suboptimality, the direction of the suboptimality cannot be easily predicted.⁶⁶ She appears to believe, however, that this feature is unimportant from a policy perspective:

The distinction between states following each other in setting more stringent or less stringent standards (or both) is not as important as it might seem Because the race-to-the-bottom is simply a race to inefficiency, the race can occur both when states adopt standards that are too stringent as well as when states adopt standards that are too lax.⁶⁷

well. See Swire, *supra* note 7, at 103. Note, moreover, that a winner's curse could exist on the other side of the transaction, under which firms that "win" the competition to receive permission to locate are the ones that offer excessive concessions in the form of agreeing to comply with suboptimally stringent environmental standards.

64. See Peter D. Enrich, *Saving the States from Themselves: Commerce Clause Constraints on State Tax Incentives for Business*, 110 HARV. L. REV. 377, 382-89 (1996) (discussing state business tax incentives).

65. See Revesz, *supra* note 1, at 1243.

66. See Engel, *supra* note 4, at 345 ("[I]t is unclear whether this strategic interaction prompts states to establish more or less stringent standards [S]tates [may] duplicate each other's standards regardless of whether they are lax or stringent."); see also *id.* at 361, 364 (discussing extensions of the Oates & Schwab model that produce suboptimality).

67. *Id.* at 346. None of the sources on which Professor Engel relies, see *id.* at 298 n.76, provide general support for federal minimum standards as a response to a race to the bottom. Jenna Bednar & William N. Eskridge, Jr., *Steadying the Court's Unsteady Path: A Theory of Judicial Enforcement of Federalism*, 68 S. CAL. L. REV. 1447 (1995), deals primarily with the subject of trade wars. See *id.* at 1475-76. As I explain elsewhere, the problem of interstate competition leading to protectionist trade measures is analytically distinct from the problem of interstate competition leading to suboptimal environmental process standards. See Revesz, *Lessons for the European Union and the International Community*, *supra* note 3. James A. Brander, *Economic Policy Formation in a Federal State: A Game Theoretic Approach*, in INTER-GOVERNMENTAL RELATIONS 33 (Richard Simeon ed., 1985), primarily models a situation in which two states compete over a single firm, *id.* at 47; the firm then has market power and underregulation will result, *id.* at 48-53; see *supra* text accompanying note 19. Kathryn Harrison, *The Regulator's Dilemma: Regulation of Pulp Mill Effluents in the Canadian Federal State*, 29 CAN. J. POL. SCI. 469 (1996) focuses on public choice arguments, stressing the "diffuse benefits of environmental protection relative to job creation." *Id.* at 479; see *infra* Part II.E (challenging simple-minded public choice arguments). Eli M. Noam, *Government Regulation of Business in a Federal State: Allocation of Power Under Deregulation*, 20 OSGOOD HALL L.J. 762 (1982) shows that interstate competition can lead to either underregulation or overregulation. See *id.* at 768.

But if the goal is to justify federal minimum standards, it is critical to know whether they are likely to correct the problem or make it worse.

3. Significance of Empirical Findings

Professor Engel notes that two different types of models are juxtaposed against one another in the current debate over the existence of a race to the bottom:

According to the non-cooperative game-theoretic models relied upon by adherents to the race-to-the-bottom hypothesis, the market for firm location is imperfect; crippled by strategic interactions between the state participants, it causes states to establish suboptimal environmental standards. In contrast, under the neoclassical economic model held out by the revisionists, this same market is perfectly competitive and hence leads to efficient state environmental standards.⁶⁸

On the basis of an extensive empirical study, she argues that the former models are "likely to supply a more appropriate conceptual framework . . . in understanding the interactions of the state market participants."⁶⁹ While the evidence that Professor Engel presents is interesting and will certainly enrich the debate over the future of federal environmental law, one cannot draw from it any clear-cut conclusions concerning the question that she would like to illuminate.

Professor Engel relies on two separate sources of empirical evidence. First, she notes that "nearly one-third of all environmental regulators claimed that their state had altered a standard when another state had a less stringent requirement for a similar standard, and somewhat fewer state regulators claimed that their state had done the same thing when confronted by another state's more stringent standard."⁷⁰

Such "price" adjustments, however, are not necessarily inconsistent with a competitive market. Even in a competitive market, prices are not frozen in time. Changes in prices can occur as a result of shifts in the demand curve, which determines the relationship between the quantity of a good that consumers would be willing to purchase and the price of the good. Such shifts can result, for example, from changes in consumer preferences that make the good either more or less desirable to potential consumers. Alternatively, changes in

68. Engel, *supra* note 4, at 310.

69. *Id.* at 356.

70. *Id.*

prices can occur as a result of shifts in the supply curve, which determines the relationship between the quantity of a good that producers would be willing to supply and the price of the good. Such shifts can result, for example, from technological innovation or from changes in the prices of inputs. The price adjustments caused by shifts in the demand or supply curve need not be instantaneous: one firm might act first and others will then follow. Thus, it is not possible to reach any strong conclusions from Professor Engel's empirical observation.

Professor Engel's other empirical finding is adduced to support both her challenge to models of perfect competition and her argument that interstate competition will lead to suboptimally lax standards. Professor Engel reports, on the basis of a survey of individuals responsible for or influential in state environmental standard-setting, that "a substantial minority of states relax their environmental standards in order to attract industrial firms."⁷¹ Professor Engel couples this finding with the conclusion of a number of empirical studies that show that the level of environmental regulation plays a relatively small role in firm location decisions.⁷² Thus, she argues that "if (1) states compete for industry by lowering environmental standards, but (2) industry location is substantially unaffected by this competition, it logically follows that (3) states' welfare will be reduced because there will be no economic gain to compensate for the environmental quality losses."⁷³

Making environmental standards more lax is undesirable from a social welfare perspective only if the baseline from which the relaxation takes place was optimal. In contrast, the baseline may have been a standard that was too stringent, perhaps because the state believed that it had "monopoly power" in the market. In such cases, the state's monopoly status would give rise to a social welfare loss. This loss would then be reduced by the relaxation of the environmental standards. Professor Engel's empirical study sheds no light on the stringency of the baseline.

Moreover, while the evidence from firm location studies shows, as Professor Engel maintains, that the stringency of environmental standards plays a small role in firm location decisions, it does not show that this factor is wholly irrele-

71. *Id.* at 279; *see id.* at 337-40 (describing the survey).

72. *See id.* at 321-37.

73. *Id.* at 279.

vant.⁷⁴ If relaxing environmental standards has some effect, though smaller than other factors, on industrial location decisions, it could well be the case that states derive positive net benefits when they make their environmental standards less stringent. In addition, Professor Engel's survey does not inquire specifically about firm expansion decisions, which could be affected by the stringency of the environmental standards.

D. FUTILITY OF FEDERAL ENVIRONMENTAL REGULATION AS A CURE TO THE RACE TO THE BOTTOM

Professor Esty also takes issue with my argument that if a race to the bottom exists, federal environmental regulation will simply transfer the race to other regulatory areas, or to the fiscal arena, without any reason to expect social welfare gains. He states that "[t]his suggestion makes little sense."⁷⁵ His full explanation reads as follows:

Fundamentally, this line of analysis fails to recognize the technical complexity of environmental policymaking as well as the irreversible nature of some environmental harms. Thus, driving interstate competition out of the inherently obscure realm of environmental policy and into that of other governmental activities, where the costs and benefits of various policies are more easily compared, will be beneficial.⁷⁶

Professor Esty makes reference to three distinct factors: technical complexity, irreversibility, and difficulty in comparing costs and benefits. He does not explain, however, why these phenomena lead to smaller social welfare losses if the undesirable interstate competition for industry takes place with respect to non-environmental programs.

First, even if there is more uncertainty surrounding the comparison of costs and benefits for environmental regulation than for other regulatory programs, it does not follow that federal environmental regulation would have beneficial effects. The race to the bottom is a form of a prisoner's dilemma.⁷⁷ The traditional representation of a prisoner's dilemma does not de-

74. See *id.* at 321-37; J. Vernon Henderson, *Effects of Air Quality Regulation*, 86 AM. ECON. REV. 789, 800-05 (1996); Richard B. Stewart, *Environmental Regulation and International Competitiveness*, 102 YALE L.J. 2039, 2050, 2076 (1993). For an excellent review of the empirical literature, see Adam B. Jaffe et al., *Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?*, 33 J. ECON. LITERATURE 132 (1995).

75. Esty, *supra* note 5, at 638 n.255.

76. *Id.*

77. See Revesz, *supra* note 1, at 1217-18.

pend on uncertainties in the payoffs of the different outcomes. It is undoubtedly the case that certain types of uncertainty could exacerbate the social welfare losses.⁷⁸ Uncertainty, however, could also have beneficial effects.⁷⁹ Thus, if the race to the bottom could take place over only one regulatory program, social welfare losses would not necessarily be smaller if the competition for capital took place with respect to the program with more certain costs and benefits, as Professor Esty implies.⁸⁰

78. See Stewart, *supra* note 74, at 2059. Uncertainty could turn into a prisoner's dilemma situation that would have had a socially less detrimental structure under conditions of certainty.

79. Consider, first, the operation of a prisoner's dilemma under conditions of certainty. Two prisoners, Row and Column, are to be questioned by a prosecutor. If neither confesses, they each will be convicted of a crime carrying a three-year sentence; if both confess, there is sufficient evidence to convict each of a more serious crime, carrying a five-year sentence. If one of them confesses and the other does not, the defendant who confesses receives a one-year sentence (to reflect the value of his cooperation) whereas the other defendant receives a six-year sentence (to reflect her lack of cooperation). The following matrix presents the various payoffs (the first number in each box is Row's sentence; the second number is Column's sentence).

		Column	
		No confession	Confession
Row	No confession	3,3	6,1
	Confession	1,6	5,5

If the defendants act rationally, they will both confess, even though they would both have been better off if neither had confessed.

Now, assume that there is uncertainty over the payoffs, so that Row and Column both believe, erroneously, that if one defendant confesses and the other does not, the evidence would be insufficient to convict the non-confessing defendant of the more serious crime. The following matrix presents Row's and Column's estimates of the payoffs.

		Column	
		No confession	Confession
Row	No confession	3,3	4,1
	Confession	1,4	5,5

Confession on the part of both defendants is no longer a dominant strategy, because if Row confesses, Column is better off not confessing, and vice versa. The sentence served by each of the defendants is lower than it would have been under conditions of certainty.

80. In part of his article, Professor Swire appears to recognize that the existence of uncertainty could result in either suboptimally stringent or suboptimally lax standards: "[Regulators] may relax environmental laws in situations where stronger laws would increase social welfare. Conversely,

Second, he might be assuming implicitly that the federal government would do a better job than the states at comparing costs and benefits or dealing with the technical complexity inherent in environmental regulation. As I explain above, there are powerful economies of scale arguments for allocating to the federal level the provision of scientific information necessary for environmental regulation.⁸¹ But underregulation because of a lack of access to appropriate information on costs and benefits is not a race-to-the-bottom problem; it would exist even if capital was wholly immobile. Thus, federalizing these determinations, while desirable, should not count as a cure for a race to the bottom, if one existed.

Third, the irreversibility of environmental damage says little about how authority over environmental regulation should be allocated between different levels of government. Rather, it suggests that some uncertainties should be resolved in a particular direction, towards greater precaution, regardless of which level of government is doing the regulating.

E. RELYING ON PUBLIC CHOICE ARGUMENTS

My critics also rely heavily on public choice arguments in making their case for centralization. Professor Swire devotes the most attention to this issue. Relying on familiar concepts concerning the logic of collective action, he notes: "For many important environmental issues, regulations impose costs on cohesive industry groups These industry groups would ordinarily be expected to succeed very well politically against the diffuse individuals who might benefit from environmental controls."⁸²

As I indicate above,⁸³ the case for centralization cannot be made merely by pointing out the disadvantages under which environmental groups operate. The claim must be that they systematically perform worse at the state level than at the federal level. Swire explicitly admits that he cannot make this claim:

they may strengthen environmental laws where the resulting costs to the economy are greater than the benefits." Swire, *supra* note 7, at 96.

81. See *supra* part I.E.2.

82. Swire, *supra* note 7, at 101. He then explains that NIMBY ("Not in My Back Yard") situations are different because there the costs of the pollution are concentrated but the benefits are diffuse. See *id.* at 105-06.

83. See *supra* Part I.D (questioning the public choice justification for federal regulation).

The next task, not undertaken here in detail, would be to assess the relative ability of states and the federal government to correct for public choice problems. The public choice analysis in this article has explained reasons to expect both levels of government to underprovide environmental law, compared with the baseline of what the voters prefer.⁸⁴

Professor Esty attempts to address this question, though only in passing. He states: "At the centralized level, environmental groups find it easier to reach critical mass and thereby to compete on more equal footing with industrial interests."⁸⁵ He adds that "[t]he difficulty of mobilizing the public in many separate jurisdictions is well established."⁸⁶

His claim is far from self-evident. In fact, the logic of collective action might suggest the opposite. The costs of organizing on a larger scale magnify the free-rider problems faced by environmental groups.

Moreover, because environmental concerns vary throughout the country, there will be political conflict in environmental interests when they are aggregated at the federal level, thereby further complicating the organizational problems. For example, environmentalists in Massachusetts may care primarily about air quality whereas environmentalists in Colorado may rank the environmental implications of water allocation as most important. Other things being equal, state-based environmental groups seeking, respectively, better air quality in Massachusetts and a more environmentally sensitive allocation of water in Colorado are therefore likely to be more effective than a national environmental group seeking, at the federal level, better environmental quality with respect to both of these attributes.

In contrast, the situation is likely to be different for industry groups. For many environmental problems, an important portion of the regulated community consists of firms with nationwide operations. For such firms, operating at the federal level poses no additional free-rider problems or loss of homogeneity.

The relevant question is whether the additional problems faced by environmental groups at the federal level are outweighed by benefits arising from the fact that the clash of interest groups takes place before a single legislature, a single administrative agency, and, in part, as a result of the exclusive

84. Swire, *supra* note 7, at 108.

85. Esty, *supra* note 5, at 650 n.302.

86. *Id.* at 650-51.

venue of the D.C. Circuit over important environmental statutes, in a single court.⁸⁷ One can imagine models under which public choice problems are, indeed, ameliorated at the federal level—a task that none of my critics has addressed. The problem, though, is that such models are unlikely to provide a good account of reality.

For example, if one assumed that beyond a certain threshold, additional resources do not increase a group's probability of being successful in the political process, and if this threshold at the federal level is sufficiently lower than the sum of the corresponding thresholds at the state levels, it may be that environmental groups would not be at a disadvantage at the federal level even if they were at a disadvantage in the states. In this case, the economies of scale of operating at the federal level more than outweigh the increased free-rider problems.

The assumptions behind such a model, however, are not particularly plausible. The threshold concept might properly describe certain costs associated with effective participation in the regulatory process. For example, with respect to the regulation of a particular carcinogen, each group might need to hire a scientist to review the regulator's risk assessment. It may well be the case that a certain minimum will secure the services of a competent scientist and that devoting additional resources to the problem would be of little, if any, use. Thus, for costs of this type, the marginal benefit of additional expenditures is zero, or close to zero, regardless of the other party's expenditures.

The structure of other costs, however, is likely to be quite different. For example, with respect to access to the legislative process, the standard public choice account is that the highest bidder prevails.⁸⁸ Thus, the benefit that a party receives from its expenditures is a function of the expenditures of the other party. Unless the costs of this type are quite small, the

87. See Richard L. Revesz, *Environmental Regulation, Ideology, and the D.C. Circuit*, 83 VA. L. REV. (forthcoming 1997).

88. See Sam Peltzman, *Toward a More General Theory of Regulation*, 19 J.L. & ECON. 211 (1976); George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. 3 (1971). For an extended discussion of public choice issues surrounding environmental regulation, see Keohane, Revesz & Stavins, *supra* note 25.

economies of scale of operating at the federal level are unlikely to outweigh the additional free-rider problems.⁸⁹

Finally, if the relevant public choice interactions are characterized as involving the diffuse interests of breathers or other environmental beneficiaries on one side and the concentrated interests of industrial firms on the other side, there would be little practical importance to the debate over which forum is relatively better for the environmentalist interests. What is important, instead, is that both fora are bad for these interests as a result of their diffuse nature. As a result, given this characterization of the problem, it is difficult to explain, in public choice terms, why there would be any environmental regulation at all.⁹⁰ For this reason, as I explain in Part I.D, the most plausible public choice explanations for environmental regulation posit that regulated firms obtain benefits from such regulation in the form of rents and barriers to entry, or that certain regions in our country can obtain from the regulatory process advantages relative to other regions.

F. EXPANDING THE SCOPE OF EXISTENCE VALUES

Professor Sarnoff seeks to challenge "the common claim that federal regulation decreases social welfare by preventing states and localities from tailoring regulatory requirements to their citizens' preferences."⁹¹ In presenting his position, Professor Sarnoff makes reference to "national evaluative norms."⁹² He argues that "[w]hen national evaluative norms are employed, federal regulation is more likely than state or local regulation to increase social welfare."⁹³

In searching through Professor Sarnoff's work for the reason this would necessarily be the case, one discovers a troubling circularity in his argument: "National evaluative norms are the measures of value implicitly adopted when preemptive federal legislation is enacted."⁹⁴ Given this definition, it would

89. A different set of issues is raised by the relative administrative capacity of the federal government and the states.

90. Professor Swire acknowledges this difficulty with his argument: "In light of the straightforward public choice analysis presented here, the puzzle remains how environmental protection ever succeeds in the political process." Swire, *supra* note 7, at 109.

91. Sarnoff, *supra* note 6, at 231.

92. *Id.* at 232, 313.

93. *Id.* at 232 (footnote omitted).

94. *Id.* at 232 n.18.

appear that every federal regulation would be desirable from the standpoint of a "national evaluative norm." Otherwise, presumably, state law would not have been preempted. This formulation does not provide any independent metric by which to judge when federal regulation is desirable.

In other parts of his work, however, Professor Sarnoff makes a better specified and more traditional welfarist claim. He notes: "Tailoring requirements to local preferences will not necessarily increase social welfare, because such tailoring prevents citizens located outside a state from satisfying their preferences for in-state regulation."⁹⁵ According to his view, even in the absence of physical externalities, the level of environmental protection chosen by the citizens of a state is of interest to citizens of other states.⁹⁶

Thus, one way to characterize Professor Sarnoff's argument is by reference to the existence values that citizens of one state attach to the level of environmental quality in other states. As I explain above, the existence values placed on the protection of certain natural resources by out-of-staters provide a powerful justification for federal protection of national parks.⁹⁷ Professor Sarnoff appears to believe, however, that individuals attach significant existence values not only to exceptional natural resources located outside their jurisdiction, but also to the health of out-of-staters. So, the argument goes, even absent interstate externalities, an individual in Virginia ought not to be able to choose the level of environmental protection to which she will be exposed. Indeed, if she picks too lax a level she will impose costs on individuals in, say, New York who would have preferred her to have better health.

There are several weaknesses with this position. First, Professor Sarnoff does not attempt to support his hypothesis with any empirical evidence. There are many empirical studies showing that individuals place high existence values on exceptional natural resources. I am not familiar, however, with a literature seeking to ascertain the value that people attach to the health of unrelated individuals. One could, of course, be asked a question of the following sort: "How much would you be

95. *Id.* at 232.

96. *See id.* at 243 ("State-level values are often employed to assess the social welfare effects of policy. The consequences of a policy for individuals located outside a jurisdiction are ignored, unless the policy clearly and substantially imposes external physical harms.")

97. *See supra* Part I.E.1.

willing to pay to reduce the probability that someone in another state whom you have never met would face an increase in the probability of getting cancer from exposure to an environmental contaminant from one in a hundred thousand to one in a million." My uneducated hunch is that the value given in answer to this question would not be very high.

Second, while some individuals may indeed value reducing the exposure of out-of-staters to environmental harms, others might approach the issue in a diametrically different manner. They might derive value if out-of-staters have access to good jobs and economic well-being, even if these goals come at the expense of environmental protection.⁹⁸ It is even conceivable that the latter effect would dominate the former, thereby pushing Professor Sarnoff, if he is faithful to his position, to advocate federal standards that preempt *more* stringent state standards.

Third, even if individuals would significantly value the goal of preventing out-of-staters from being exposed to egregiously high levels of environmental harms, that would not be true for less stark exposures to risk. At best, Professor Sarnoff's argument might justify some federal control over minimum levels of environmental quality rather than the status quo of extensive centralized regulation.⁹⁹

CONCLUSION

In summary, my critics have not weakened the analytical framework set forth in Part I. Most importantly, they have not provided convincing answers for three key questions concerning the race-to-the-bottom justification for federal environmental regulation: (1) why one ought to reject across-the-board a model of a competitive market in location rights; (2) if game-theoretic interactions among the states lead to a loss in social welfare, why one should assume that these interactions will produce underregulation rather than overregulation; (3) if these interactions produce suboptimally lax standards, why one should think that federal environmental regulation is likely to increase social welfare when states can compete over other regulatory programs or in the fiscal arena.

98. See Donald H. Rosenthal & Robert H. Nelson, *Why Existence Values Should Not Be Used in Cost-Benefit Analysis*, 11 J. POL'Y ANALYSIS & MGMT. 116, 118 (1992).

99. See *supra* Part I.E.4.

My critics have also attempted to shift the debate away from the race-to-the-bottom rationale to interstate externality and public choice rationales.¹⁰⁰ With respect to interstate externalities, they have not taken issue with the central propositions advanced in my work that such externalities cannot justify, on their own, the extensive body of federal regulation that has emerged since 1970, or with the view that the current regime is ill-suited to address the problem of interstate externalities.¹⁰¹ With respect to public choice issues, they have advanced the standard argument for why environmental interests might be underrepresented in the political process without seriously tackling the issue of whether there is likely to be more parity of forces at the federal level, or whether any part of the legal regime, either state or federal, can be explained by reference to a clash between environmentalist and industry groups.

100. See Daniel A. Farber, *Federalism in a Global Economy*, 83 VA. L. REV. (forthcoming 1997) ("Since Revesz's influential article debunking naive theories of the race to the bottom, efforts to rehabilitate the argument often emphasize . . . defects in local governments.").

101. See Esty, *supra* note 5, at 587-97; Swire, *supra* note 7, at 99-100.